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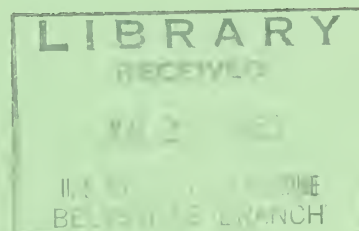
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**HYDROLOGIC DATA**  
**FOR**  
**EXPERIMENTAL AGRICULTURAL**  
**WATERSHEDS IN THE**  
**UNITED STATES**  
**1960-61**

Miscellaneous Publication No. 994



**Agricultural Research Service**  
**U.S. DEPARTMENT OF AGRICULTURE**

In Cooperation With

**State Agricultural Experiment Stations**





**Hydrologic Data**  
**for**  
**Experimental Agricultural Watersheds**  
**in the United States**  
**1960-61**

Compiled by  
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Soil and Water Conservation Research Division

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Washington, D.C.

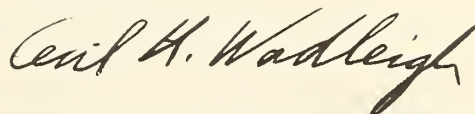
Issued May 1965



## FOREWORD

This publication presents basic data on monthly precipitation and runoff; annual maximum discharges and volumes of runoff; and selected runoff events with associated data on rainfall, land use, and antecedent conditions for agricultural watersheds where research studies were in progress in the period 1960-61. Its presentation is a continuation of the activity of processing and releasing hydrologic data of general interest gathered cooperatively with other agencies. Throughout the life of the watershed studies the State agricultural experiment stations have collaborated in the selection, planning, and operation of the research studies. In several cases, the U.S. Geological Survey and State and local agencies, such as State water boards and highway departments or local drainage and conservation districts, have assisted in the work. The classification and correlation of soils and evaluation of other watershed characteristics in the descriptions have been based mostly on field surveys of the Soil Conservation Service.

The data included here are primarily in response to a request by the Soil Conservation Service, but the information will also be useful to other governmental agencies, private engineers, and others concerned with the development and conservation of the Nation's water resources.



Director, Soil and Water Conservation  
Research Division

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The decimal system of paging is used to index the watershed data. Pages are numbered at the bottom according to location and watershed number, and the data for each watershed are given on one or more pages. For example, page 5.6-2 is location 5 (College Park, Md.), watershed 6 (W-6 at College Park), and page 2 of the data for that watershed.

For convenience in finding items listed in tables 2 and 3 and in the "Contents" above, pages are also numbered consecutively at the top.

In table 1, page 8, discontinued watersheds are listed by State, locality, number of units, record period, and location number. Table 2, page 9, shows a list of continuing or new watersheds by State, locality, assigned location numbers, watershed units, and number of selected runoff events that are reported for 1960-61 in this publication. Table 3, page 10, lists revisions or additions to watershed descriptions or data. Table 4, page 488, indexes the 920 selected runoff events, by location and watershed, that have been published through 1961.

# HYDROLOGIC DATA FOR EXPERIMENTAL AGRICULTURAL WATERSHEDS IN THE UNITED STATES, 1960-61

This publication presents selected hydrologic data for the calendar years 1960-61, inclusive. The data include monthly precipitation and runoff for 160 watersheds, annual maximum discharges and annual maximum volumes of runoff for 145 of the watersheds for time intervals of 1, 2, 6, and 12 hours and for 1, 2, and 8 days, and detailed information for one or more selected typical storm events for 133 of them. Page numbers for older watersheds at the various locations are the same as those given in four previous publications (see next section), so that old records and general descriptions can be readily consulted. New watersheds—the 24 not included in the previous publications—were generally assigned higher location numbers.

Information on selected storm events includes (1) tabular data for the 30-day antecedent rainfall and runoff prior to the events, (2) data on rainfall and runoff intensity or rate for the event and on accumulated depths of rainfall and runoff, (3) description of watershed conditions at the time of the selected events, (4) graphs of hydrographs and rainfall histograms, (5) watershed maps, and (6) for some of the larger drainage areas, isohyetal maps of storm rainfall distribution.

For newly established watersheds, descriptions of watershed physical characteristics, instrumentation, graphs, maps, land management, and recommended area of application of the results are also given.

## PUBLICATIONS OF EARLIER DATA

Hydrologic data for past years on many of the currently operating experimental agricultural watersheds have been previously summarized in three looseleaf publications by the Agricultural Research Service of the U.S. Department of Agriculture, Washington, D.C., 20402. These reports are listed and summarized below as references 1, 2, and 3. Beginning with the hydrologic data for 1956-59 calendar years, the types of data previously published separately in these three references were combined in U.S. Department of Agriculture Miscellaneous Publication No. 945. This is listed below as reference 4. All four publications have been assigned these reference numbers to simplify citations to them in this and future publications:

\* **Reference 1.**—MONTHLY PRECIPITATION AND RUNOFF FOR SMALL AGRICULTURAL WATERSHEDS IN THE UNITED STATES. Soil and Water Conservation Research Branch, 691 pp. June 1957. (Includes physical descriptions and land use of 334 experimental agricultural watersheds at 60 locations in 27 States for the period 1923-57. Many of these watersheds had been discontinued prior to 1955.)

\* **Reference 2.**—ANNUAL MAXIMUM FLOWS FROM SMALL AGRICULTURAL WATERSHEDS IN THE UNITED STATES. Soil and Water Conservation Research Division, 330 pp. June 1958. (Includes records from 322 watersheds at 59 locations in 27 States for the period 1923-57. Many of these watersheds had been discontinued prior to 1957.)

\* **Reference 3.**—SELECTED RUNOFF EVENTS FOR SMALL AGRICULTURAL WATERSHEDS IN THE UNITED STATES. Soil and Water Conservation Research Division, 374 pp. January 1960. (Includes a sampling of 1 to 6 typical runoff events from 68 watersheds at 40 locations in 25 States for the period from 1933-59. The publication presents maps of each watershed, watershed conditions for each event, including the 30-day antecedent rainfall and runoff, and tabular as well as graphical data on each storm.)

\* **Reference 4.**—HYDROLOGIC DATA FOR EXPERIMENTAL AGRICULTURAL WATERSHEDS IN THE UNITED STATES, 1956-59. Harold W. Hobbs, Soil and Water Conservation Research Division, Agricultural Research Service, USDA Miscellaneous Publication No. 945, 672 pp. November 1963. (Includes monthly precipitation and runoff from 157 watersheds, including 45 newly established watersheds for which data had not been previously published; annual maximum discharges and annual maximum volumes for 1 hour to 8 days for 142 watersheds; and one or more typical selected runoff events for 134 watersheds. The publication presents watershed maps, when new or revised, and graphs of each selected event, together with tabular data. Locations of experimental studies are shown on U.S. map of land resource areas in 48 States.)

The above four publications have been furnished to the Soil Conservation Service and to other governmental agencies—Federal, State, and local. They have also been distributed to State agricultural experiment stations, university libraries, and engineering departments, and, when requested, to private engineers and individuals.

### \* NAL call numbers:

Ref. 1.	A341	Ref. 2.	A341
	R312		R312A

Ref. 3.	A292	Ref. 4	1
	R313		Ag84M
			945



## FORM OF DATA PRESENTATION

The data in this volume are presented for each watershed in the following order: (1) watershed description, if not previously published; (2) monthly precipitation and runoff; (3) local monthly normal precipitation, if not previously published; (4) annual maximum flows; (5) tabulations of data for selected runoff events; (6) graphs of selected runoff events; (7) watershed maps, if not previously published or if revised; and (8) isohyetal maps (in some cases) of storm rainfall distribution for selected runoff events.

### Continuing Watersheds

Since the descriptions of 136 of the current watersheds have been published in *References 1 or 4*, the tabular data presentation for these begins at the top of the first page. Above the border at the left, the month and year of data preparation are given.

In the space to the right of the first table title MONTHLY PRECIPITATION AND RUNOFF (inches), the location *name*, watershed *number* (or designation), and watershed *size* are given. In the table, for each current *calendar* year, the *precipitation* (P) in inches is listed in the monthly columns, with the yearly total given in the last column headed "Year." In the line below, the corresponding *runoff* (Q) in inches is similarly listed for each month and year.

In the second table, entitled ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS, data are also given for the *calendar* years listed in the first column. Under the *maximum discharge* heading, the date column shows the day and month the instantaneous peak rate in inches per hour occurred. In computing the rate, corrections were made for any significant pondage above the runoff measuring device. Under the *maximum volume* heading, the date refers to the day and month on which the interval began; for example, if the interval began on August 30 at 11:59p, the entry in the date column will be 8-30. The depths for 1 hour to 8 days are the annual maximum values recorded, without regard to even clock hours or days; thus, if the 6-hour interval began at 1:32p, the interval would end exactly 6 hours later at 7:32p. The volume given is in inches of average depth over the watershed for each of the seven selected time intervals (1, 2, 6, and 12 hours, and 1, 2, and 8 days).

Notes and footnotes in explanation of the data given below the first two tables include (1) a statement on the quality of records based on the following criteria: *excellent* indicates in general that the records are probably accurate within 5 percent, *good* within 10 percent, *fair* within 15 percent, and *poor* that the records may be in error by over 15 percent; (2) a general statement as to watershed conditions and other physical changes

for the period covered; (3) corrections for previously reported data; and (4) other pertinent material or explanations of the hydrologic data in the two tables.

The tabular data for *selected runoff events* begin in the remaining space on the first page and then are carried forward on continuation sheets (or pages) until completed. One to five storm runoff events were chosen, from data available, for presentation. In general, the *selected runoff events* were those in which runoff was produced by a relatively uniform rainfall excess of short duration. The information for each event includes tabulation of (1) *antecedent* daily rainfall and runoff for 30 days before the event; (2) rainfall *intensities* and *accumulated amounts* for the event; (3) runoff *rates* and *accumulated amounts* for the event; and (4) specific *watershed conditions* at the time of the event. Simple graphs of the rates of rainfall and runoff are shown for all events on pages following the tabular data.<sup>1</sup> Maps follow the graphs unless previously published in *References 3 or 4*, or if they were shown herein on the map of another watershed. Isohyetal maps, if any, generally follow the regular maps.

In the "Notes" space at the bottom of the first page for runoff events, the multiplier to convert runoff rates in inches per hour to cubic feet per second is given, followed by references to maps, if required, and explanatory notes or footnotes relating to the tabular data. Below the bottom border and above the first index page number, the cooperating agencies are listed. The notes on continuation pages contain the statement on the multiplier and similar explanations of the data on each page.

### New Watersheds

For the 24 watersheds installed in recent years that have not been reported previously, the presentation begins with the watershed description in the upper part of the first page. The explanations and definitions upon which the description is based are given in the next section.

The first line, centered at the top of the sheet, gives the *project location*, which is the nearest city or town, and the *number* or *name* of the watershed as used locally. The descriptive material is then given under the 13 major topics listed generally down the left side of the sheet: *Location*, *Area*, *Shape*, *Slopes*, *Soils*, *Erosion*, *Land Capability*, *Geology* (for some), *Surface Drainage*, *Character of Flow*, *Instrumentation*, *Watershed Conditions*, and *Generally Represents*.

After this description, the tabular data are then summarized in the first two tables and notes as previously described for "Continuing Watersheds," except that the local monthly normal precipitation figures, based on the nearest Weather

<sup>1</sup> In some cases, noncritical points were eliminated from original tabulations to reduce the number of lines required in the tables for times, rates, and accumulations.

Bureau gage of long record, are given on the last line of the table MONTHLY PRECIPITATION AND RUN-OFF (INCHES). The tabular data for SELECTED RUN-OFF EVENTS and the rest of the material of the series for the particular watershed follows in the same order as previously indicated.

## WATERSHED DESCRIPTIONS

The following definitions and explanations were used in describing watershed location, watershed characteristics, instrumentation, land management, and recommended area of application of the hydrologic data:

**LOCATION** gives county and State, distance and direction of the runoff gaging station from the nearest city or town, and the major river basin in which it lies. When two or more basins are involved, the tributary or subbasin is given first, followed by the major basin.

**AREA** of watershed is given in acres if under 640 acres, in both acres and square miles (in parentheses) if over 1 square mile. If areas are revised, additional values are given with notes on date of change.

**SHAPE** is described in simple terms with overall dimensions in feet or miles, depending on size.

**SLOPES** are given in terms of the ranges commonly used in soil survey work in the locality. The percentages of the watershed lying in each slope class are listed. As an example, "8% is in 0-2% class" means that 8 percent of the watershed area has slopes ranging from 0 to 2 percent. The "Aspect" refers to the general direction of the slope; a watershed having a southeast (SE) aspect would slope downstream from *northwest* to *southeast*.

**SOILS** are described briefly, according to definitions from the U.S. Department of Agriculture SOIL SURVEY MANUAL, Agriculture Handbook 18, published in 1951.

**SOIL TEXTURE** refers to the relative proportions of the various size groups (or separates) of individual soil grains in a mass of soil. Specifically, it refers to the proportions of clay, silt, and sand below 2 millimeters in diameter. The various classes of texture in order of increasing percentages of the smaller size groups and decreasing percentages of the larger size groups are (1) sands, (2) loamy sands, (3) sandy loams, (4) loam, (5) silt loam, (6) silt, (7) sandy clay loam, (8) clay loam, (9) silty clay loam, (10) sandy clay, (11) silty clay, and (12) clay. In some of the descriptions, the broader classification of coarse, moderately coarse, medium, moderately fine, and fine has been used—the coarse soils are the sands and the fine soils the clays.

**Soil structure** refers to the aggregation of primary soil particles into compound particles, or clusters of primary particles, that are separated from adjoining aggregates by surfaces of weakness. Structure *grade*, or the durability of the

aggregates when subjected to disturbance, is described as *structureless*, *weak*, *moderate*, or *strong*. The *size* of the aggregates is described as *very fine*, *fine*, *medium*, *coarse*, and *very coarse*. Structure *shape* is described as being *platy*, *prismatic*, *columnar*, *angular blocky*, *subangular blocky*, *granular*, or *crumb*.

**Permeability** is the quality of a soil that enables it to transmit water or air. This quality is described by the terms *very slow*, *slow*, *moderately slow*, *moderate*, *moderately rapid*, *rapid*, and *very rapid*.

**Internal soil drainage** is the quality of a soil that permits the downward flow of excess water through it. Internal drainage is reflected in the frequency and duration of periods of saturation with water. It is determined by the texture, structure, and other characteristics of the soil profile and of underlying layers and by the height of the water table, either permanent or perched, in relation to the water added to the soil. Internal soil drainage is described as *none*, *very slow*, *slow*, *medium*, *rapid*, and *very rapid*.

**Erosion** conditions on the watershed are described in accordance with the following classification for water and wind erosion, also briefed from Agriculture Handbook 18. The percentage of the watershed in the following erosion classes is given.

**Class 1.**—The soil has a few rills or places with thin A horizons that give evidence of accelerated erosion, but not to an extent to alter greatly the thickness and character of the A horizon. Except for soils having very thin A horizons (less than 8 inches), the surface soil consists entirely of A horizon throughout nearly all of the delineated areas. Up to about 25 percent of the original A horizon, or original plowed layer in soils with thin A horizons, has been removed from most of the area. This class also includes the areas of no erosion.

**Class 2.**—The soil has been eroded to the extent that ordinary tillage implements reach through the remaining A horizon or well below the depth of the original plowed layer in soils with thin A horizons. Generally, the plow layer consists of a mixture of the original A horizon and the underlying horizons. Mapped areas of eroded soil usually have patches in which the plow layer consists wholly of the original A horizon and others in which it consists wholly of underlying horizons. Shallow gullies may be present. Approximately 25 to 75 percent of the original A horizon or surface soil may have been lost from most of the area.

**Class 3.**—The soil has been eroded to the extent that all or practically all of the original surface soil, or A horizon, has been removed. The plow layer consists essentially of materials from the B or other underlying horizons. Patches in which the plow layer is a mixture of the original A horizon and the B horizon or other underlying horizons may be included within mapped areas.



Shallow gullies, or a few deep ones, are common in some soil types. More than about 75 percent of the original surface soil, or A horizon, and commonly part or all of the B horizon or other underlying horizons has been lost from most of the area.

Class 4.—The land has been eroded until it has an intricate pattern of moderately deep or deep gullies. Soil profiles have been destroyed except in small areas between the gullies. Such land is not useful for crops in its present condition. Reclamation for crop production or for improved pasture is difficult, but may be practicable if other characteristics of the soil are favorable and erosion can be controlled.

Class +.—Recent alluvial and colluvial deposition.

LAND CAPABILITY is given as classified by Klingebiel and Montgomery in U.S. Department of Agriculture LAND-CAPABILITY CLASSIFICATION, Agriculture Handbook 210, published in 1961. The classification expresses the suitability of land for use without deterioration. The eight land-capability classes are distinguished according to the risk of land damage or difficulty of land use. The following classes I to IV are suitable for cultivation and other uses, whereas classes V to VIII are not suitable for cultivation.

Class I.—Very good land for cultivation; nearly level and productive; not subject to erosion; needs only ordinary good farming methods.

Class II.—Good land for cultivation; mostly gently sloping; not more than moderately subject to erosion; some land may be rather wet; can be farmed safely with easily applied practices.

Class III.—Moderately good land for cultivation; mostly moderately sloping; some areas too wet or too dry; can be farmed safely with practical conservation measures, carefully applied; usually a combination of two or more measures is needed.

Class IV.—Fairly good land, suitable for occasional cultivation; generally strongly sloping; often shallow or very sandy; often found in dry climate.

Class V.—Land very well suited for grazing or forestry; requires good range or woodland management.

Class VI.—Land well suited for grazing or forestry; steeply sloping land, stony or shallow soil, eroded land, droughty land, or wet land; requires careful management.

Class VII.—Land fairly well suited for grazing or forestry; severely limited in use by such factors as very steep slope, shallow or droughty soil, wetness, severe erosion, or excessive salinity; requires very careful management.

Class VIII.—Land not suitable for cultivation, grazing, or forestry; may be useful for wildlife, recreation, or protection of water supplies.

GEOLOGY of a few of the new watersheds is described herein. A brief description of the portion of the watershed occupied by various geologic

formations or series is given together with strike and dip of the strata, thickness, and relative position. Faults, perched water tables, outcrops, if present, and other details that relate to the movement of water within the drainage area or that affect the hydrology of the watershed are described.

SURFACE DRAINAGE refers to the ease with which excess water flows from the watershed area. The length of principal waterway is the distance from the gaging station to the most remote point on the watershed boundary, measured along the flood plain of the watercourse.

CHARACTER OF FLOW describes the flow of the principal watercourse with respect to permanence and space. The following definitions are from Meinzer's OUTLINE OF GROUND-WATER HYDROLOGY, U.S. Geological Survey Water-Supply Paper 494, published in 1923.

With respect to permanence, streams may be divided into perennial streams, intermittent streams, and ephemeral streams.

A *perennial stream*, or stretch of a stream, is one that flows continuously. Perennial streams are generally fed in part by springs, and their upper surfaces generally stand lower than the water table in the localities through which they flow.

*Intermittent streams* may be divided, with respect to the source of their water, into spring-fed intermittent streams and surface-fed intermittent streams. They also flow in direct response to precipitation.

A *spring-fed intermittent stream*, or stretch of a stream, is one that flows only at certain times when it receives water from springs. The intermittent character of streams of this type is generally caused by fluctuations of the water table whereby the stream channels stand a part of the time below and part of the time above the water table. This is the ordinary type of intermittent stream.

A *surface-fed intermittent stream*, or stretch of a stream, is one that flows during protracted periods when it receives water from some surface source, generally the gradual and long-continued melting of snow in a mountainous or other cold tributary area. The term may be arbitrarily restricted to streams or stretches of streams that flow continuously during periods of at least 1 month.

An *ephemeral stream*, or stretch of a stream, is one that flows only in direct response to precipitation. It receives no water from springs and no long-continued supply from melting snow or other surface source. Its stream channel is at all times above the water table. The term may be arbitrarily restricted to streams or stretches of streams that do not flow continuously during periods of as much as 1 month.

With respect to continuity in space, streams may be divided into continuous streams and interrupted streams. An *interrupted stream* is one that contains (1) perennial stretches with intervening



intermittent or ephemeral stretches or (2) intermittent stretches with intervening ephemeral stretches. These two classes of interrupted streams are designated, respectively, *perennial interrupted streams* and *intermittent interrupted streams*. A *continuous stream* is one that does not have interruptions in space. It may be perennial, intermittent, or ephemeral, but it does not habitually have wet and dry stretches.

**INSTRUMENTATION** describes type of runoff control or measuring device, number and type of precipitation gages, type of charts used, and snow covers, if employed.

**WATERSHED CONDITIONS** describes the general use and farm, forest, or range practices prior to the period of record and the conservation measures, crops, yields, and general cultural operations and practices during the period of record. Rotation crops are listed in the order that they were grown. Operations are described with commonly used agricultural terms, and only those that appear to have a significant relationship to the hydrology of the watershed are mentioned.

**GENERALLY REPRESENTS** gives the broad area of application for which the data of the specific watershed are recommended. The areas named are those delineated on the map "Location of Experimental Agricultural Watersheds of the Agricultural Research Service," previously published as cover page 3 of *Reference 4* for 1956-59. The location of each project is shown by number on this Soil Conservation Service base map of numbered land resource areas in the United States prepared in January 1963. Solid red circles show the location of "continuing" or "new" watersheds, and open red circles show areas where experimental studies have been discontinued, but for which records have been previously published in *References 1, 2, or 3*.

In some cases there is an apparent contradiction between the watershed location on the map and the descriptive information given under "Generally Represents." This is due to the small scale of the map; it is difficult to show many small local variations in boundaries of the land resource areas. The descriptive statements, rather than the map location, should be the guide to the application of the data.

## STANDARD SYMBOLS FOR TABULAR DATA

The following letters have been used as standard symbols throughout this volume to designate specific items or meanings:

- a*—used with clock time, and means before noon.
- p*—similar to "a" above, but means afternoon.
- m*—indicates 12:00 midnight.
- n*—similar to "m" above, but signifies 12:00 noon.

*e*—shows that a figure is estimated or partially estimated.

*T*—denotes a trace, generally less than 0.005 inch.

*nr*—used instead of a figure to indicate "no record."

## REVISIONS OF PREVIOUSLY PUBLISHED DATA

In some instances, it has been necessary to revise previously published data on specific watersheds. If the corrections involve changed values of monthly precipitation or runoff or annual maximum discharges or maximum volumes for various durations, whole lines for the year are republished with the changed items underlined. These revisions are explained in footnotes following the tables in which they appear.

If additions or revisions are made to watershed descriptions, they are placed following the above tables. In some cases, a statement on geology has been added to the original descriptions. In a few cases, selected events, tabular or graphical data, have been revised by inserting whole pages labeled "1956-59, p. No. — (revised)."

Several pages in *Reference 4* were not clearly reproduced and are reprinted in this volume. Such pages are labeled "reprinted" and are to be found immediately preceding the current 1960-61 sheets for the particular watershed. All of the above changes are listed by States in table 3, page 10.

## PERSONNEL RESPONSIBLE FOR COMPILATIONS

At each research location, many individuals have contributed to the planning and establishment of the watersheds and the collection, compilation, and analysis of the data. Some of those who made substantial contributions to the success of the research work behind this report are as follows:

<i>Location</i>	<i>Name or names</i>
5	Harold W. Hobbs
8	William H. Speir, John C. Stephens
10	Aurelius P. Barnett
13, 66	James B. Burford, Vernon O. Shanholtz
21, 25, 61	Keith E. Saxton
26	Roy L. Roberts, Jr., Lloyd L. Harrold
29, 31, 32	Neal E. Minshall
34, 42	Walter G. Knisel, Ralph W. Baird
37	Wendell R. Gwinn, William O. Ree
44	John A. Allis, Frank J. Dragoun

<i>Location</i>	<i>Name or names</i>
45, 47, 63, 64	Herbert B. Osborn, Robert V. Keppel
62	W. Russell Hamon
65	John W. Neuberger
67	George H. Comer, Martin L. Johnson

## ADDITIONAL PUBLICATIONS BY LOCATION

In References 1 and 4 (see p. 1), references to other publications that presented watershed data and interpretations of results in various journals, bulletins, and periodicals were given at the end of the introductions for many of the locations. Below is a listing, by location number, of additional references to results that have been reported through 1961. At the end, several that could not be tied to a specific location are listed in a general group.

5. *College Park, Md.*  
MATTHEWS, E. D., and others.  
1961. SOIL SURVEY OF MONTGOMERY COUNTY, MARYLAND. U.S. Dept. Agr. SCS 1958 (7), 107 pp., maps.
7. *Auburn, Ala.*  
WONSER, C. H., and others.  
1950. SOIL SURVEY OF LEE COUNTY, ALABAMA. U.S. Dept. Agr. ARA 1938 (23), 80 pp., illus., maps.
8. *Vero Beach, Fla.*  
WEAVER, H. A., and SPEIR, W. H.  
1960. APPLYING BASIC SOIL WATER DATA TO WATER CONTROL PROBLEMS IN EVERGLADES PEATY MUCK. U.S. Dept. Agr. ARS 41-40, 15 pp.
10. *Watkinsville, Ga.*  
GLIDDENS, J., PERKINS, H. F., and CARTER, R. L.  
1960. SOILS OF GEORGIA. Soil Sci. 89 (4) : 229-238.
15. *Staunton, Va.*  
JURNEY, R. C., and others.  
1939. SOIL SURVEY OF AUGUSTA COUNTY, VIRGINIA. U.S. Dept. Agr. BCS 1932 (13), 46 pp., maps.
17. *Edwardsville, Ill.*  
HOLTAN, H. N.  
1961. A CONCEPT FOR INFILTRATION ESTIMATES IN WATERSHED ENGINEERING. U.S. Dept. Agr. ARS 41-51, 25 pp., illus.  
MINSHALL, N. E.  
1960. PREDICTING STORM RUNOFF ON SMALL EXPERIMENTAL WATERSHEDS. Amer. Soc. Civil Engin. Proc., Hydraul. Div. Jour. 86 (HY8) : 17-38.
19. *Lafayette, Ind.*  
ULRICH, H. P.  
1959. SOIL SURVEY OF TIPPECANOE COUNTY, INDIANA. U.S. Dept. Agr. SCS 1940 (22), 117 pp., illus., maps.
25. *McCredie, Mo.*  
WHITAKER, F. D., JAMISON, V. C., and THORNTON, J. F.  
1961. RUNOFF AND EROSION LOSSES FROM MEXICO SILT LOAM IN RELATION TO FERTILIZATION AND OTHER MANAGEMENT PRACTICES. Soil Sci. Soc. Amer. Proc. 25 (5) : 401-403.
26. *Coshocton, Ohio.*  
BRAKENSIEK, D. L.  
1961. ESTIMATING DEPENDABLE ANNUAL STREAMFLOW IN THE UNGLACIATED ALLEGHENY PLATEAU. U.S. Dept. Agr. ARS 41-56, 34 pp., illus.
- BRAKENSIEK, D. L., and AMERMAN, C. R.  
1960. EVALUATING EFFECT OF LAND USE ON STREAM FLOW. Agr. Engin. 41 (3) : 158-161, 167, illus.
- DREIBELBIS, F. R.  
1961. COMPARISON OF THE SOIL MOISTURE REGIMEN IN LYSIMETERS WITH THAT ON ADJACENT WATERSHEDS. U.S. Dept. Agr. ARS 41-47, 18 pp.  
— and HARROLD, L. L.  
1955. THE ROLE OF SOIL IN HYDROLOGIC CYCLE. Internatl. Cong. Soil Sci. 5th Cong. 1954 Trans. 3 : 371-375.
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TABLE 1.—Watersheds, listed by State, where observations were discontinued before January 1, 1960

State	Locality	Discontinued watershed units		
		Number	Record period <u>1</u> /	Location No.
Alabama.....	Auburn.....	1	1945-47.....	7
Arkansas.....	Bentonville.....	6	1933-47 (SE) ..	33
California.....	Placerville.....	1	1936-44 (SE) ..	50
	Santa Paula .....	9	1934-43 .....	51
	Sebastopol.....	2	1936-43 (SE) ..	52
	Vacaville.....	1	1936-42 .....	53
	Watsonville .....	4	1938-42 (SE)...	54
Colorado.....	Colorado Springs .....	4	1938-46 (SE)...	46
Georgia.....	Americus.....	4	1938-43 (SE)...	9
Idaho.....	Emmett.....	2	1938-41 (SE)...	55
	Moscow.....	2	1937-42 (SE)...	56
Illinois.....	Edwardsville.....	4	1938-55 (SE)...	17
	Elmwood.....	12	1945-46.....	18
Indiana.....	Lafayette.....	20	1940-53 (SE)...	19
Iowa.....	Clarinda.....	5	1932-42.....	20
	Shenandoah.....	2	1934-40.....	22
Kansas.....	Hays.....	2	1932-47.....	43
Maryland.....	College Park.....	8	1939-54 (SE)...	5
	Hagerstown.....	2	1938-47 (SE)...	6
Michigan.....	East Lansing.....	3	1941-59 (SE)...	23
Missouri.....	Bethany.....	8	1932-42 (SE)...	24
Mississippi.....	Oxford.....	1	1957-59 (SE)...	62
Nebraska.....	Hastings.....	15	1939-54 (SE)...	44
New Jersey.....	Freehold.....	3	1938-43 (SE) <sup>2/</sup> .	4
New Mexico.....	Mexican Springs.....	12	1937-42 (SE)...	48
	Santa Fe.....	3	1939-48 (SE)...	49
New York.....	Arnot Forest.....	2	1941-47.....	1
	Cohocton.....	2	1938-45 (SE)...	2
North Carolina.....	High Point.....	3	1934-58 (SE)...	11
	Statesville.....	2	1933-38.....	12
Ohio.....	Coshocton.....	4	1937-47 (SE)...	26
	Hamilton.....	4	1938-44 (SE)...	27
	Zanesville.....	3	1934-45.....	28
Oklahoma.....	Cherokee.....	9	1942-60 (SE) <sup>3/</sup> .	34
	Guthrie.....	11	1930-55 (SE) <sup>4/</sup> .	35
	Muskogee.....	3	1938-47.....	36
Oregon.....	Newberg.....	4	1938-42 (SE)...	57
Texas.....	Garland.....	3	1938-47.....	38
	Riesel (Waco).....	14	1937-43 (SE)...	42
	Spur.....	9	1927-45.....	39
	Tyler.....	4	1931-44 (SE)...	40
	Vega.....	2	1938-43 (SE)...	41
Virginia.....	Chatham (Danville).....	3	1938-48 (SE)...	14
	Staunton.....	3	1948-56 (SE)...	15
Washington.....	Dayton.....	1	1939-42.....	58
	Pullman <sup>5/</sup> .....	3	1934-40.....	59
	Pullman <sup>6/</sup> .....	8	1931-47 (SE)...	60
Wisconsin.....	Coon Valley.....	2	1934-40.....	30
	La Crosse.....	4	1933-54 <sup>7/</sup> .....	32

1/ (SE) indicates locations where selected runoff events were published in References 3 and/or 4.

2/ 1 watershed also operated during 1950-55.

3/ 9 watersheds discontinued July or Aug. 1960.

4/ Watersheds operated for varying periods of 12 to 23 yr.

5/ SCS Demonstration Project.

6/ Soil and Water Conservation Experiment Station.

7/ 1 watershed discontinued in 1942, 2 in 1947.

TABLE 2.—Experimental agricultural watershed research locations under study for 1960-61 hydrologic data, by States<sup>1/</sup>

State	Locality	Assigned location No.	Watershed Units (number)	Events reported (number)	Pages (inclusive)
Arizona.....	Safford.....	45	4	7	<u>2/</u> 355-366
	Tombstone.....	63	5	3	419-428
Florida.....	Vero Beach.....	8	3	6	23-36
Georgia.....	Watkinsville.....	10	1	5	37-41
Illinois.....	Monticello <sup>3/</sup> .....	61	---	---	---
Iowa.....	Iowa City.....	21	1	1	113-114
Maryland.....	College Park.....	5	2	10	12-22
Mississippi.....	Oxford.....	62	<u>4/</u> 17	32	370-418
Missouri.....	McCredie.....	25	2	0	115
Nebraska.....	Hastings.....	44	13	26	319-354
New Mexico.....	Albuquerque.....	47	3	3	367-369
	Santa Rosa.....	64	1	2	429-434
Ohio.....	Coshocton.....	26	<u>5/</u> 35	65	<u>2/</u> 116-220
Oklahoma.....	Cherokee.....	34	<u>6/</u> 6	14	226-251
	Stillwater.....	37	3	6	<u>2/</u> 252-262
South Dakota.....	Newell.....	65	15	0	<u>2/</u> 435-455
Texas.....	Riesel (Waco).....	42	<u>7/</u> 20	37	<u>2/</u> 263-318
Vermont.....	North Danville.....	67	<u>4/</u> 4	8	471-487
Virginia.....	Blacksburg.....	13	<u>8/</u> 14	42	42-112
West Virginia.....	Moorefield.....	66	4	8	<u>9/</u> 456-470
Wisconsin.....	Colby.....	29	1	1	221-222
	Fennimore.....	31	4	0	223-224
	La Crosse.....	32	2	0	225

<sup>1/</sup> Studies at East Lansing, Mich. (23); High Point, N. C. (11); and Staunton, Va. (15) have been discontinued.

<sup>2/</sup> Includes reprinted pages from USDA Misc. Pub. 945 (1956-59) which did not reproduce clearly (Reference 4).

<sup>3/</sup> Report deferred on the 2 watersheds.

<sup>4/</sup> Includes data for 2 new watersheds.

<sup>5/</sup> 4 previously reported watersheds discontinued in 1947; 2 new watersheds reported.

<sup>6/</sup> 9 previously reported watersheds discontinued; 6 new ones formed from some of them.

<sup>7/</sup> Includes data for 4 new watersheds.

<sup>8/</sup> Includes data for 8 new watersheds.

<sup>9/</sup> Includes 3 full pages of revised data.

TABLE 3.—List, by States, of additions or revisions to previously published data

State	Locality	Location page No.	Page No.	Nature of addition or revision
Arizona.....	Safford.....	45.1-4	355	Maps for W-I and W-IV, which were not reproduced clearly in Ref. 4 (1956-59), are <u>reprinted</u> .
		45.3-4	361	
Florida.....	Vero Beach.....	8.2-1	28	Monthly runoff (Q) for W-2 for Mar., Sept., Oct., and Dec., and annual <u>revised</u> for 1956.
Georgia.....	Watkinsville...	10.1-1	37	Monthly runoff (Q) and maximum volumes <u>revised</u> for Aug. 1958. Monthly runoff (Q) for Mar. 1959 also <u>revised</u> (W-1).
Ohio.....	Coshocton.....	26.28-2	182	Data sheets for W-177 and W-97, which were not reproduced clearly in Ref. 4 (1956-59), are <u>reprinted</u> .
		26.36-2	208	
		26.30-1	189	Monthly runoff (Q) for Nov. 1958 <u>revised</u> to 0.14 in. for W-196.
		26.34-1	202	Monthly runoff (Q) for July 1958 <u>revised</u> to 2.43 in. for W-94.
Oklahoma.....	Cherokee.....	26.37-1	212	Maximum volumes for 8 days for W-994 <u>added</u> for 1957, 1958, and 1959 ( <u>delayed data</u> ).
		34.8-1	493	Tabular data for W-8 peak for selected runoff event of June 24, 1958 <u>revised</u> in table 4, see footnote 2/. Plotted hydrograph in Ref. 4 was correct.
		37.1-1	252	Data sheets for W-1, which were not reproduced clearly in Ref. 4 (1956-59), are <u>reprinted</u> .
		37.1-2	253	
South Dakota.....	Newell.....	65.7-1	440	Watershed descriptions for W-7, W-13, W-14, and W-15, which were not reproduced clearly in Ref. 4 (1956-59), are <u>reprinted</u> .
		65.13-1	447	
		65.14-1	449	
		65.15-1	451	
Texas.....	Riesel (Waco)..	65.16-1	453	Watershed description and data sheets for W-16, which were not reproduced clearly in Ref. 4, are <u>reprinted</u> .
		65.16-2	454	
		42.2-1	263	Data page and map for Watersheds C and Y, respectively, which were not reproduced clearly in Ref. 4 (1956-59), are <u>reprinted</u> .
		42.11-5	284	
Vermont.....	North Danville.	42.31-1	306	<u>Delayed data</u> on monthly precipitation (P) and runoff (Q) and annual maximum discharges and volumes for watersheds P-1 to -4 for 1938 to 1943 are given.
		42.32-1	310	
		42.33-1	313	
		42.34-1	316	
Virginia.....	Blacksburg.....	67.1-1	471	Monthly runoff (Q) and annual maximum volumes for W-1 and W-2 <u>revised</u> for 1958-59.
		67.2-1	474	
Virginia.....	Blacksburg.....	13.6-1	57	Watershed description for Thorne Creek Watershed W-1 for SURFACE DRAINAGE <u>revised</u> to indicate that 2.9 percent (not 29 percent) of area is above sinks and does not contribute to surface runoff.
West Virginia.....	Moorefield.....	66.1-2	456	Tabular data and hydrographs for W-1, W-2, and W-4 for Aug. 3, 1958, selected runoff event are <u>revised</u> and whole sheets <u>reprinted</u> .
		66.2-2	460	
		66.4-2	464	
Wisconsin.....	Fennimore.....	31.1-1	223	Monthly precipitation (P) for W-1 for July and Dec. 1958 <u>revised</u> .

**WATERSHED DATA BY LOCATION NUMBER AND DECIMAL PAGING**

[5.6-1 to 67.5-6, a total of 476 data sheets]



3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								College Park, Maryland Watershed W-6 (Area - 3.53 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.71	3.84	1.95	3.11	5.66	1.55	5.90	5.15	6.12	2.33	1.14	2.46	41.92
	Q	.01	.03	.07	.03	.02	.02	.03	.13	.34	.02	T	.04	.74
1961	P	2.28	4.48	4.09	3.95	2.74	4.21	2.64	6.89	.86	3.25	2.20	3.26	40.85
	Q	.14	.51	.04	.21	.02	.04	.01	.09	T	.01	.01	.02	1.10

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								College Park, Maryland Watershed W-6								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-12	.154	9-12	0.12	9-12	0.17	9-12	0.23	9-11	0.28	9-11	0.29	9-10	0.34	9-9	0.34
1961	2-25	.113	2-18	.08	2-18	.15	2-18	.36	2-18	.42	2-18	.43	2-18	.44	2-17	.49

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Watershed conditions: 1960-61, heavily grazed by 12 to 25 head of 2-year-old steers April to November. Spring fertilization with 350 lb of 0.20-20 per ac. Occasionally mowed for control of weeds and excess forage growth. 1/ Rainfall equivalent of snow falling, in inches: 1960 - Jan. (.10), Feb. (.81), Mar. (1.60), Dec. (1.31); 1961 - Jan. (.94), Feb. (1.20), Nov. (.33), Dec. (.36). Precipitation from Raingage R-4.

SELECTED RUNOFF EVENTS									College Park, Maryland Watershed W-6		
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
<u>Event of September 11, 1960</u>											
	Raingage R-4		9-11-60	Raingage R-4		9-11-60					
8-13-60	.83	.0042	5:34a	0	0	6:34a	0	0			
8-14	.02	0	:37	.60	.03	:39	.0066	.0001			
8-15	1.20	.0500	:45	.23	.06	:41	.0376	.0008			
8-16	0	.0003	6:00	.04	.07	:42	.0657	.0017			
8-30	.85	.0507	:30	.06	.10	:44	.0927	.0043			
8-31	.18	.0083	:36	1.05	.17	:47	.130	.0099			
9-5	.12	0	:38	4.80	.33	:49	.113	.0140			
9-9	.49	.0005	:40	2.70	.42	:51	.142	.0182			
9-10	.14	.0001	:42	4.80	.58	:54	.113	.0246			
9-11	.11 2/	.0012 3/	:44	3.00	.68	:56	.0927	.0280			
			:46	2.40	.76	7:00	.0657	.0353			
			:50	.15	.77	:03	.0581	.0364			
						:07	.0438	.0398			
						:12	.0264	.0427			
<u>Event of September 11, 1960</u>											
	Raingage R-4		9-11-60	Raingage R-4		9-11-60					
8-13-60	.83	.0042	3:43p	0	0	4:01p	0	0			
8-14	.02	0	:45	1.50	.05	:04	.0002	T			
8-15	1.20	.0500	:48	0	.05	5:20	0	.0001			
8-16	0	.0003	:53	1.32	.16	:25	.0006	.0001			
8-30	.85	.0507	4:00	.17	.18	:26	.0052	.0002			
8-31	.18	.0083	5:00	.02	.20	:27	.0132	.0003			
9-5	.12	0	:17	.04	.21	:28	.0264	.0007			
9-9	.49	.0005	:20	2.20	.32	:31	.0264	.0020			
9-10	.14	.0001	:22	3.00	.42	:34	.0193	.0031			
9-11	.88 4/	.0490 5/	5:25	1.60	.50	5:38	.0151	.0043			
			6:00	.07	.54	:43	.0215	.0058			
			7:00	.04	.58	:48	.0193	.0075			
			8:00	.03	.61	:51	.0193	.0085			

Notes: To convert runoff in in/hr to cfs, multiply by 3.56. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 5.6-6. 2/ Rain ended 12:36a. 3/ Runoff ended 4:00a. 4/ Rain ended 6:50a. 5/ Runoff ended 2:00p.



SELECTED RUNOFF EVENTS			College Park, Maryland Watershed W-6					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 11, 1960 - Continued								
Watershed conditions: Bluegrass and white clover pasture, 4 to 10 inches high with moderately heavy grazing by 25 steers. Mowed for weed control in late May. Good ground cover.			9-11-60			9-11-60		
			9:00p	.04	.65	6:00p	.0097	.0106
			:30	.08	.69	:07	.0040	.0114
						:16	.0013	.0118
						:22	.0006	.0119
						8:42	0	.0126
Event of September 11-12, 1960 1/								
8-13-60	Raingage R-4 .83	.0042	9-11-60	Raingage R-4	0	9-11-60	0	0
8-14	.02	0	10:40p 2/	0	0	11:00p	0	T
8-15	1.20	.0500	:50	.12	.02	:14	.0002	
8-16	0	.0003	11:00	.24	.06	:18	.0021	.0001
			:04	.15	.07	:28	.0006	.0003
8-30	.85	.0507	:11	.69	.15	:41	.0021	.0006
8-31	.18	.0083	:17	.10	.16	:47	.0066	.0010
9-5	.12	0	:20	.20	.17	:54	.0081	.0019
9-9	.49	.0005	:30	.42	.24	12:00m	.0097	.0028
9-10	.14	.0001	:42	.60	.36	9-12-60		
9-11	1.57 3/	.0616 4/	12:00m	.23	.43	12:24a	.0052	.0058
			9-12-60			:30	.0066	.0064
			12:10a	.18	.46	:44	.0040	.0076
			:20	.24	.50	1:00	.0021	.0084
			:35	.16	.54	:06	.0040	.0087
Watershed conditions: Pasture 5 to 12 inches high, ground fairly well saturated from rains of September 5 to 11. Good ground cover.			1:00	.24	.64	:08	.0081	.0089
			:03	.60	.67	:09	.0171	.0091
			:07	1.80	.79	:11	.0290	.0099
			:14	1.03	.91	:15	.0376	.0121
			2:00	.10	.99	:19	.0618	.0154
			3:00	.09	1.08	:24	.0618	.0206
			:10	.12	1.10	:30	.0787	.0276
			:24	.26	1.16	:36	.0581	.0344
			:30	.20	1.18	:43	.0438	.0404
			:48	.33	1.28	:50	.0317	.0448
			4:00	.30	1.34	2:00	.0215	.0492
			:10	.06	1.35	:14	.0097	.0529
			:20	.18	1.38	:24	.0040	.0540
			:24	.50	1.40	:32	.0013	.0544
			:28	1.20	1.48	:42	.0002	.0545
			:32	1.65	1.59	3:26	.0002	.0546
			:40	.53	1.66	:30	.0006	.0546
			:46	.50	1.71	:35	.0006	.0547
			5:00	.54	1.79	:40	.0013	.0547
			:13	.83	1.97	:46	.0013	.0549
:18	.36	2.00	:52	.0029	.0551			
:31	.18	2.04	4:00	.0040	.0555			
6:00	.29	2.18	:02	.0052	.0557			
:14	.50	2.25	:08	.0052	.0562			
:20	.80	2.33	:22	.0029	.0572			
:45	.29	2.45	:28	.0040	.0575			
7:00	.20	2.50	:32	.0097	.0580			
8:00	.18	2.68	:34	.0215	.0585			
:40	.15	2.78	:36	.0317	.0594			
9:00	.21	2.85	:39	.0376	.0611			
:30	.12	2.91	:42	.0545	.0634			
			:49	.0742	.0709			
			:52	.0927	.0751			
			:55	.1025	.0800			
			5:00	.0879	.0879			
			:07	.113	.0996			
			:13	.142	.1124			
			:22	.154	.1346			
			:34	.119	.1619			
			:42	.0975	.1763			

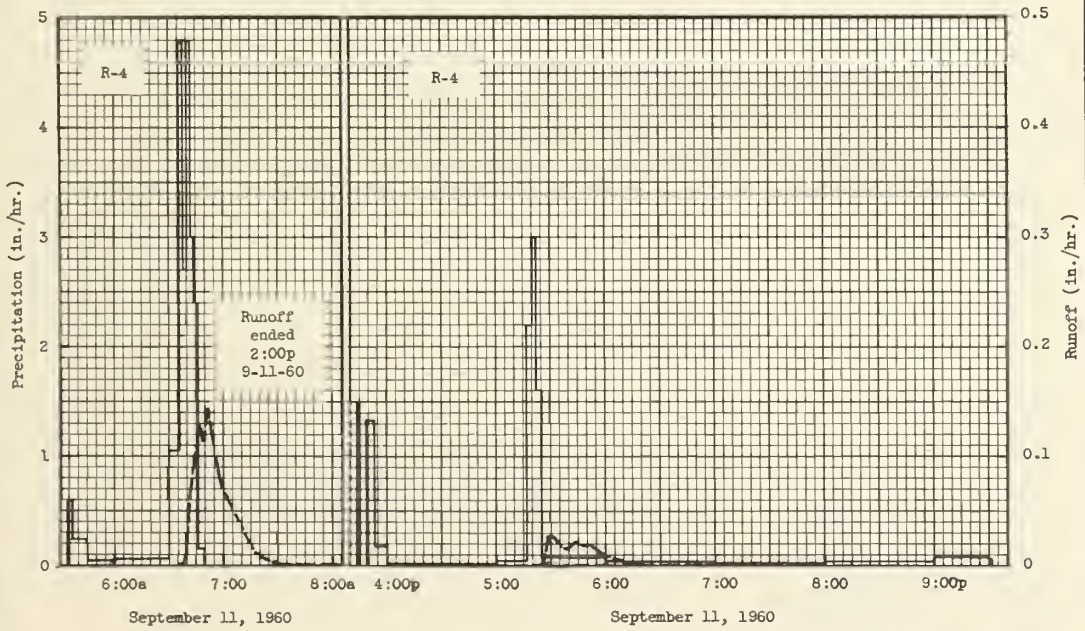
Notes: To convert runoff in in/hr to cfa, multiply by 3.56.  
 1/ Hurricane Donna. 2/ Beginning of precipitation of Hurricane Donna. 3/ Rainfall prior to 9:30p.  
 4/ Runoff prior to 8:42p.

SELECTED RUNOFF EVENTS						College Park, Maryland Watershed W-6		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 11-12, 1960 - Continued								
						9-12-60		
						5:50a	.0742	.1878
						6:00	.0581	.1968
						:08	.0472	.2058
						:16	.0407	.2117
						:24	.0472	.2175
						:32	.0472	.2238
						:46	.0508	.2353
						:56	.0438	.2431
						7:04	.0438	.2490
						:15	.0346	.2562
						:26	.0264	.2618
						:40	.0171	.2668
						:52	.0114	.2697
						8:08	.0081	.2723
						:22	.0066	.2740
						:40	.0052	.2758
						:58	.0066	.2775
						9:18	.0040	.2793
						:45	.0006	.2803
						3:00p	0	.2819
Event of August 25-26, 1961								
	Raingage R-4		8-25-61	Raingage R-4		8-25-61		
7-29-61	.25	.0013	9:56p	0	0	10:14p	0	0
8-2	.02	0	10:04	.60	.08	:16	.0066	.0001
8-3	.03	0	:06	0	.08	:17	.0215	.0003
8-6	.10	0	:07	2.40	.12	:19	.0508	.0016
8-7	.02	0	:10	1.40	.19	:22	.0264	.0035
8-9	.42	.0003	:13	6.00	.49	:26	.0151	.0049
8-11	.12	0	:15	4.20	.63	:30	.0215	.0061
8-12	.16	0	:17	.30	.64	:37	.0097	.0079
8-16	.04	0	:20	.40	.66	:43	.0021	.0085
8-20	.67	.0011	11:00	.03	.68	:48	.0006	.0086
8-21	.25	.0022	:14	.09	.70	11:16	.0002	.0088
8-23	2.12	.0281	:16	5.10	.87	:20	.0006	.0088
8-25	.12 <sup>1/</sup>	0	:18	.60	.89	:22	.0052	.0089
			:24	1.00	.99	:26	.0081	.0093
			:30	.20	1.01	:32	.0040	.0099
			:32	.30	1.02	:37	.0029	.0102
			:45	.05	1.03	:42	.0040	.0105
			:52	.51	1.09	:50	.0021	.0109
			8-26-61			12:00m	.0006	.0112
			12:33a	0	1.09	8-26-61		
			:37	.30	1.11	12:05a	.0006	.0112
			:42	.12	1.12	:40	.0002	.0114
			:45	1.20	1.18	:56	.0006	.0115
			1:00	.20	1.23	1:26	.0002	.0117
			:24	.25	1.33	:36	.0006	.0118
			:29	.96	1.41	:42	.0006	.0118
			:40	.22	1.45	:48	.0052	.0121
			:42	1.80	1.51	:53	.0066	.0126
			:45	1.20	1.57	:55	.0081	.0129
			:51	.50	1.62	:58	.0097	.0133
			:56	.36	1.65	2:03	.0171	.0144
			:58	1.50	1.70	:20	.0052	.0176
			2:00	1.20	1.74	:39	.0006	.0185
						5:00a	0	.0192
<p>Watershed conditions: Bluegrass and white clover pasture 5 to 8 inches high, moderately grazed by 21 head of cattle, beginning in late April. Good cover.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 3.56.  
<sup>1/</sup> Rain 6:05p to 6:10p.

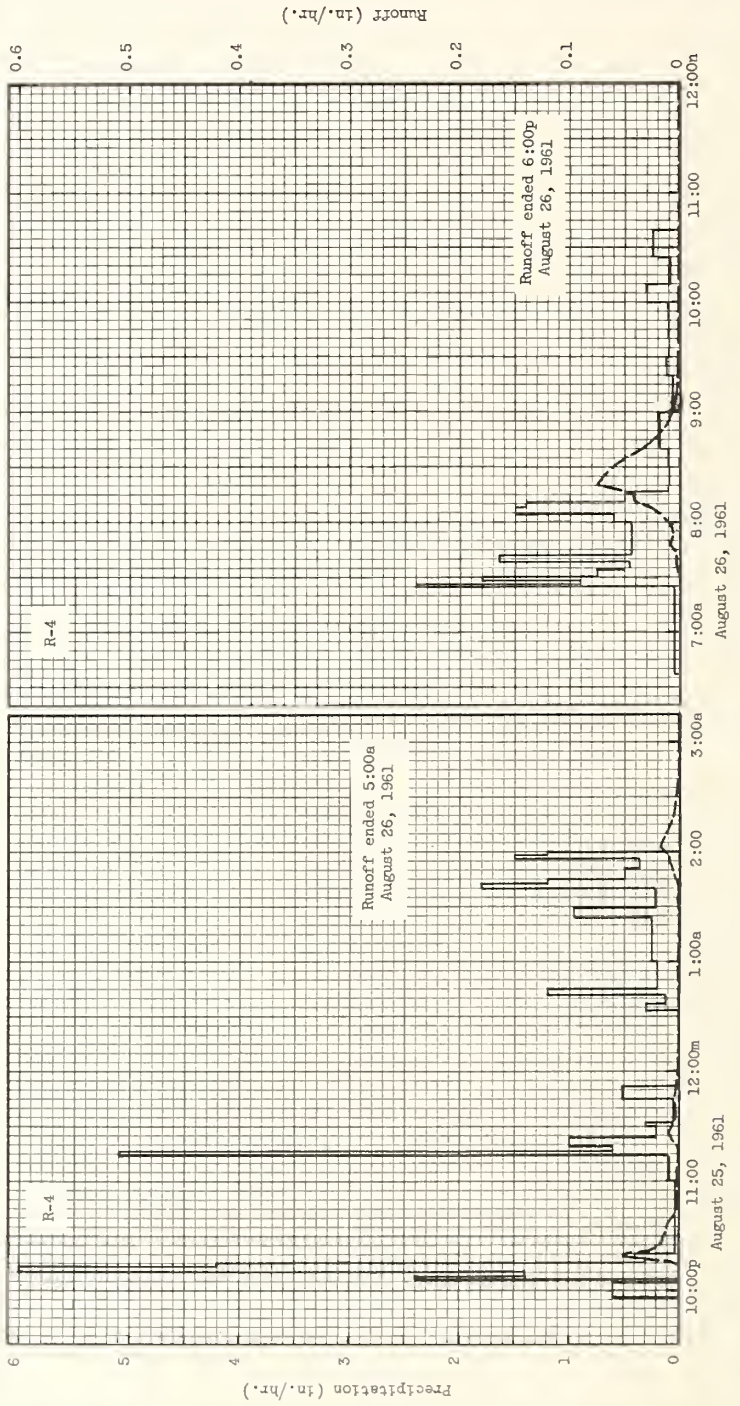
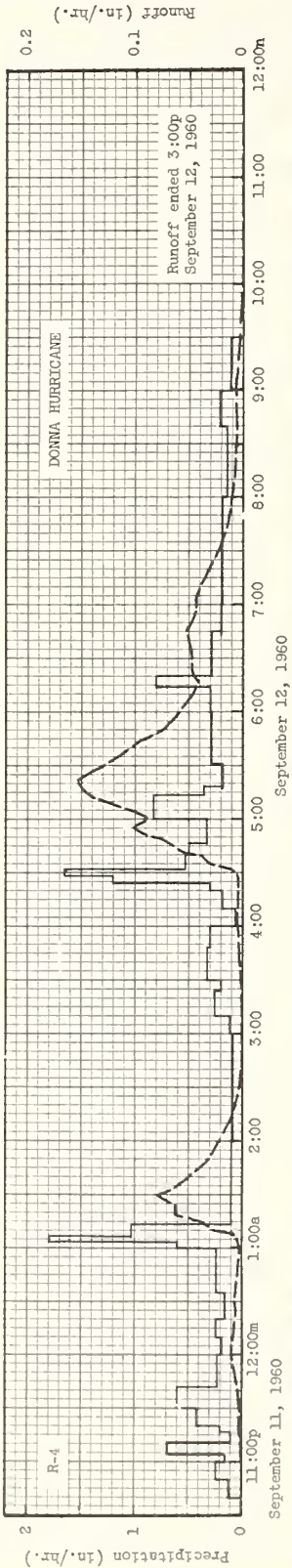
SELECTED RUNOFF EVENTS			College Park, Maryland Watershed W-6					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 26, 1961								
7-29-61	Raingage R-4 .25	.0013	8-26-61 6:37a	Raingage R-4 0	0	8-26-61 7:32a	0	0
8-2	.02	0	7:00	.05	.02	:38	.0006	T
8-3	.03	0	:25	.05	.04	:44	.0029	.0002
8-6	.10	0	:26	2.40	.08	:48	.0081	.0006
8-7	.02	0	:28	.90	.11	:55	.0052	.0014
8-9	.42	.0003	:30	1.80	.17	8:00	.0066	.0019
8-11	.12	T	:34	.75	.22	:04	.0151	.0026
8-12	.16	T	:38	.45	.25	:09	.0264	.0043
8-16	.04	0	:42	1.65	.36	:12	.0407	.0060
8-20	.67	.0011	8:00	.43	.49	:16	.0407	.0087
8-21	.25	.0022	:04	.60	.53	:21	.0742	.0135
8-23	2.12	.0281	:08	1.50	.63	:30	.0618	.0237
8-25	1.21	.0112	:11	1.40	.70	:40	.0346	.0317
8-26	.65 1/	.0080 2/	:17	.50	.75	:49	.0171	.0356
			:40	.10	.79	:56	.0097	.0372
			9:00	.18	.85	9:05	.0040	.0382
			:20	.06	.88	:12	.0013	.0385
			:30	.12	.89	:20	.0006	.0386
			10:00	.10	.94	6:00p	0	.0412
Watershed conditions: Grsaa 5 to 8 inches high, good pasture cover. Ground fairly well saturated from rains of August 20 to 25.			:10	.30	.99			
			:25	.08	1.01			
			:40	.24	1.07			

Notes: To convert runoff in in/hr to cfs, multiply by 3.56.  
 1/ Rainfall 12:33a to 2:00a. 2/ Runoff ended 5:00a.



COLLEGE PARK, MARYLAND WATERSHED W-6





COLLEGE PARK, MARYLAND WATERSHED W-9

MONTHLY PRECIPITATION AND RUNOFF (Inches)							College Park, Maryland Watershed W-7 (Area - 3.52 acres)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.71	3.84	1.95	3.11	5.66	1.55	5.90	5.15	6.12	2.33	1.14	2.46	41.92
Q	.02	.17	.06	.17	.02	.01	.02	.20	.96	.05	.01	.01	1.70
1961 P	2.28	4.48	4.09	3.95	2.74	4.21	2.64	6.89	4.86	3.25	2.20	3.26	40.85
Q	.17	.71	.07	.63	.02	.05	.01	.33	T	.01	T	.03	2.03

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS  
College Park, Maryland Watershed W-7

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-12	.355	9-12	0.26	9-12	0.42	9-12	0.71	9-11	0.86	9-11	0.89	9-10	0.96	9-9	0.96
1961	8-26	.335	8-26	.16	4-13	.26	4-13	.58	4-12	.61	4-12	.61	4-12	.61	2-17	.66

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent.  
 Watershed conditions: 1960-61, heavily grazed by 12 to 25 head of 2-year-old steers April to November. Spring fertilization with 350 lb of 0-20-20 per ac. Occasionally mowed for control of weeds and excess forage growth.  
 1/ Rainfall equivalent of snow falling, in inches: 1960 - Jan. (.10), Feb. (.81), Mar. (1.60), Dec. (1.31); 1961 - Jan. (.94), Feb. (1.20), Nov. (.33), Dec. (.36). Precipitation from Raingage R-4.

SELECTED RUNOFF EVENTS  
College Park, Maryland Watershed W-7

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 11, 1960								
8-13-60	Raingage R-4 .83	0.0029	9-11-60 5:34a	Raingage R-4 0	0	9-11-60 6:36a	0	0
8-14	.02	0	:37	.60	.03	:41	.0021	.0001
8-15	1.20	.1286	:45	.23	.06	:43	.0152	.0004
8-16	0	.0006	6:00	.04	.07	:44	.0377	.0008
8-30	.85	.0404	:30	.06	.10	:46	.0659	.0025
8-31	.18	.0052	:36	1.05	.17	:48	.1082	.0055
9-5	.12	0	:38	4.80	.33	:50	.130	.0094
9-9	.49	.0022	:40	2.70	.42	:51	.142	.0117
9-10	.14	T	:42	4.80	.58	:52	.175	.0143
9-11	.11 2/	.0015 3/	:44	3.00	.68	:53	.260	.0179
			:46	2.40	.76	:58	.175	.0361
			:50	.15	.77	7:00	.136	.0413
						:02	.114	.0454
						:07	.0834	.0537
Watershed conditions: Mostly blue-grass with some orchard graas 3 to 10 inches high, with moderately heavy pasturing by 25 steers. Mowed for weed control in early June. Good ground cover.								
						:11	.0583	.0584
						:16	.0377	.0624
						:21	.0216	.0649
						:27	.0098	.0664
						:33	.0040	.0671
						:39	.0013	.0674
						8:10	.0002	.0678
						2:30p	0	.0683
Event of September 11, 1960								
8-13-60	Raingage R-4 0.83	0.0029	9-11-60 3:43p	Raingage R-4 0	0	9-11-60 3:50p	0	0
8-14	.02	0	:45	1.50	.05	4:00	.0013	.0001
8-15	1.20	.1286	:48	0	.05	:20	.0006	.0004
8-16	0	.0006	:53	1.32	.16	5:18	.0002	.0008
8-30	.85	.0404	4:00	.17	.18	:21	.0013	.0008
8-31	.18	.0052	5:00	.02	.20	:23	.0098	.0010
9-5	.12	0	:17	.04	.21	:24	.0172	.0012
9-9	.49	.0022	:20	2.20	.32	:29	.0265	.0031
9-10	.14	T	:22	3.00	.42	:32	.0240	.0043
9-11	.88 4/	.0698 5/						

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 3.549.  
 For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 5.6-6.  
 2/ Rain ended 12:36a. 3/ Runoff ended 5:00a. 4/ Rain prior to 6:50a. 5/ Runoff prior to 2:30p.

SELECTED RUNOFF EVENTS						College Park, Maryland Watershed W-7		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 11, 1960 - Continued								
<p>Watershed conditions: Mostly blue-grass with some orchard grass 3 to 10 inches high, with moderately heavy pasturing by 25 steers. Mowed for weed control in early June. Good ground cover.</p>			9-11-60			9-11-60		
			5:25p	1.60	0.50	5:35p	0.0318	0.0057
			6:00	.07	.54	:39	.0291	.0077
			7:00	.04	.58	:43	.0408	.0101
			8:00	.03	.61	:49	.0318	.0137
			9:00	.04	.65	:53	.0216	.0155
			:30	.08	.69	:58	.0133	.0169
						6:06	.0115	.0182
						:17	.0052	.0201
						:26	.0021	.0207
			:31		.0013	.0208		
			9:30	0		.0217		
Event of September 11-12, 1960 1/								
8-13-60	Raingage R-4 0.83	0.0029	9-11-60	Raingage R-4	0	9-11-60	0	0
8-14	.02	0	10:40p 2/	0	0	11:00p	0	0
8-15	1.20	.1286	:50	.12	.02	:22	.0021	.0004
8-16	0	.0006	11:00	.24	.06	:40	.0040	.0013
			:04	.15	.07	:54	.0133	.0033
8-30	.85	.0404	:11	.69	.15	:59	.0133	.0044
8-31	.18	.0052	:17	.10	.16	12:00m	.0152	.0047
9-5	.12	0	:20	.20	.17	9-12-60		
9-9	.49	.0022	:30	.42	.24	12:03a	.0216	.0056
9-10	.14	T	:42	.60	.36	:07	.0265	.0072
9-11	1.57 3/	.0915 3/	12:00m	.23	.43	:16	.0265	.0112
			9-12-60			:26	.0291	.0158
			12:10a	.18	.46	:46	.0193	.0239
			:20	.24	.50	1:08	.0115	.0295
			:35	.16	.54	:12	.0193	.0305
			1:00	.24	.64	:14	.0346	.0314
			:03	.60	.67	:16	.0510	.0329
			:07	1.80	.79	:20	.0744	.0370
			:14	1.03	.91	:23	.1028	.0415
			2:00	.10	.99	:24	.125	.0434
			3:00	.09	1.08	:25	.175	.0458
			:10	.12	1.10	:27	.189	.0519
			:24	.26	1.16	:29	.175	.0580
			:30	.20	1.18	:32	.161	.0664
			:48	.33	1.28	:34	.161	.0718
			4:00	.30	1.34	:40	.130	.0863
			:10	.06	1.35	:45	.114	.0965
			:20	.18	1.38	:52	.0834	.1080
			:24	.30	1.40	:58	.0620	.1153
			:28	1.20	1.48	2:04	.0473	.1208
			:32	1.65	1.59	:15	.0318	.1280
			:40	.53	1.66	:28	.0172	.1333
			:46	.50	1.71	:41	.0081	.1361
			5:00	.34	1.79	:51	.0040	.1371
			:13	.83	1.97	3:20	.0006	.1380
			:18	.36	2.00	:38	.0013	.1383
			:31	.18	2.04	:48	.0066	.1389
			6:00	.29	2.18	:53	.0098	.1396
			:14	.30	2.25	4:00	.0193	.1413
			:20	.80	2.33	:06	.0291	.1437
			:45	.29	2.45	:10	.0346	.1459
			7:00	.20	2.50	:16	.0377	.1495
			8:00	.18	2.68	:28	.0408	.1572
			:40	.15	2.78	:32	.0510	.1603
			9:00	.21	2.85	:36	.0789	.1646
			:30	.12	2.91	:40	.1082	.1708
						:43	.175	.1779
						:45	.204	.1842
						:49	.211	.1980
						:59	.235	.2352

Notes: To convert runoff in in/hr to cfs, multiply by 3.549.  
 1/ Hurricane Donna. 2/ Beginning of precipitation of Hurricane Donna. 3/ Rainfall and runoff prior to 9:30p.



SELECTED RUNOFF EVENTS			College Park, Maryland Watershed W-7					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 11-12, 1960 - Continued								
						9-12-60		
						5:04a	0.227	0.2544
						:13	.287	.2930
						:22	.355	.3411
						:32	.287	.3946
						:40	.227	.4289
						:51	.175	.4658
						:58	.148	.4846
						6:06	.130	.5031
						:19	.119	.5301
						:26	.148	.5457
						:30	.175	.5564
						:36	.189	.5746
						:50	.175	.6171
						:58	.161	.6395
						7:20	.114	.6899
						:36	.0834	.7162
						:48	.0701	.7316
						8:01	.0620	.7459
						:48	.0620	.7945
						9:08	.0659	.8158
						:33	.0439	.8387
						:53	.0265	.8504
						10:10	.0152	.8563
						:24	.0098	.8592
						:42	.0052	.8615
						:58	.0030	.8626
						11:40	.0013	.8639
						6:00 p	0	.8680
Event of August 25-26, 1961								
7-29-61	Rainage R-4 0.25	0.0016	8-25-61 9:56p	Rainage R-4 0	0	8-25-61 9:57p	0	0
8-2	.02	0	10:04	.60	.08	10:06	.0021	.0002
8-3	.03	0	:06	0	.08	:08	.0172	.0005
8-6	.10	0	:07	2.40	.12	:10	.0510	.0016
8-7	.02	0	:10	1.40	.19	:12	.0789	.0038
8-9	.42	.0005	:13	6.00	.49	:14	.0930	.0067
8-10	0	.0002	:15	4.20	.63	:15	.1610	.0088
8-11	.12	.0003	:17	.30	.64	:16	.204	.0118
8-12	.16	0	:20	.40	.66	:18	.148	.0177
8-16	.04	0	11:00	.03	.68	:26	e .0930	.0337
8-20	.67	.0012	:14	.09	.70	:32	e .0620	.0415
8-21	.25	.0009	:16	5.10	.87	:37	e .0744	.0472
8-23	2.12	.0452	:18	.60	.89	:43	e .0318	.0525
8-25	.12 1/	.0002 2/	:24	1.00	.99	:50	e .0098	.0549
			:30	.20	1.01	:57	e .0013	.0556
			:32	.30	1.02	11:11	.0002	.0557
			:45	.05	1.03	:14	.0013	.0558
			:52	.51	1.09	:17	.0052	.0559
			8-26-61			:24	.0133	.0570
			12:33a	0	1.09	:28	.0098	.0578
			:37	.30	1.11	:31	.0152	.0584
			:42	.12	1.12	:34	.0133	.0591
			:45	1.20	1.18	:37	.0240	.0601
			1:00	.20	1.23	:47	.0098	.0629
			:24	.25	1.33	:51	.0115	.0636
			:30	.96	1.41	:54	.0081	.0641
			:40	.22	1.45	12:00m	.0040	.0647
			:42	1.80	1.51	8-26-61		
			:45	1.20	1.57	12:08a	.0013	.0650
			:51	.50	1.62	:32	.0002	.0653
			:56	.36	1.65	:48	.0013	.0655
<p><u>Watershed conditions:</u> Mostly blue-grass pasture 5 to 8 inches high which had moderate grazing by 21 head of cattle beginning in late April. Good cover.</p>								

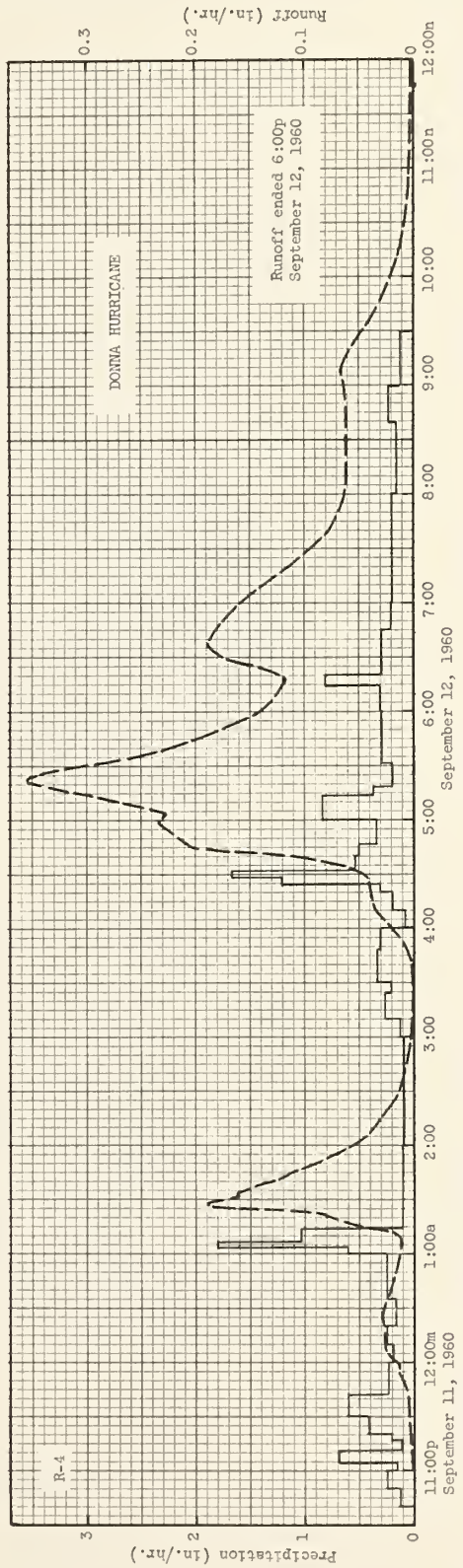
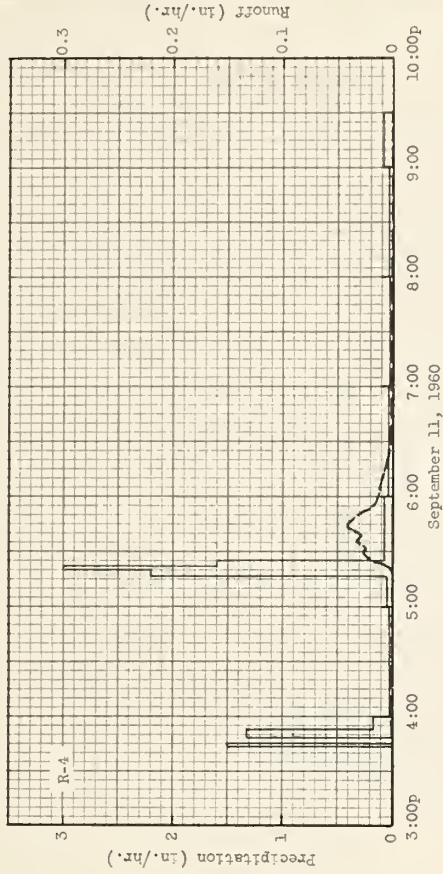
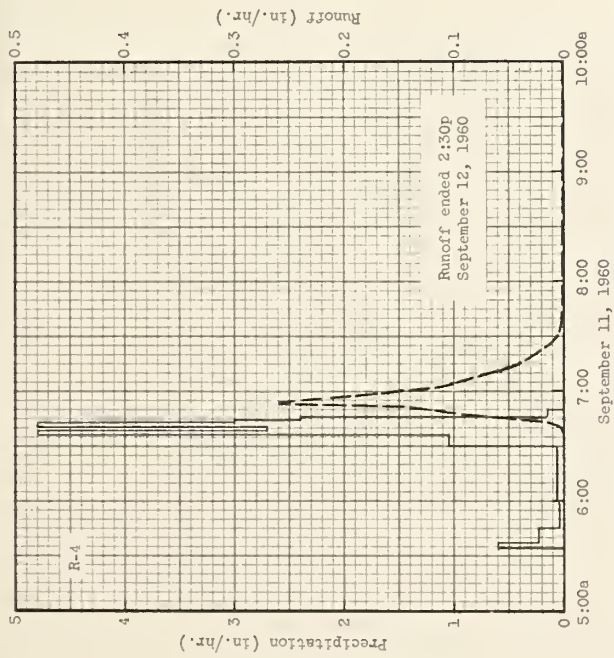
Notes: To convert runoff in in/hr to cfs, multiply by 3.549.  
 1/ Rain 6:05p to 6:10p. 2/ Runoff 6:06p to 8:50p.

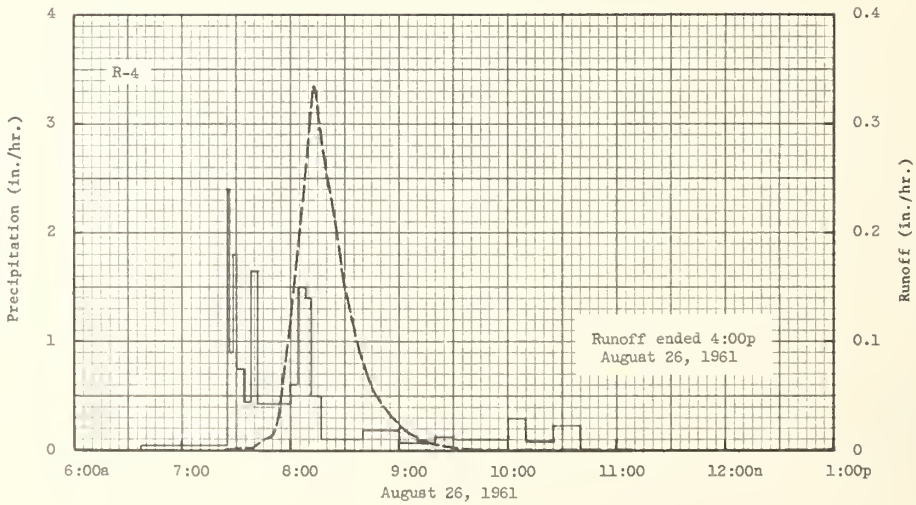
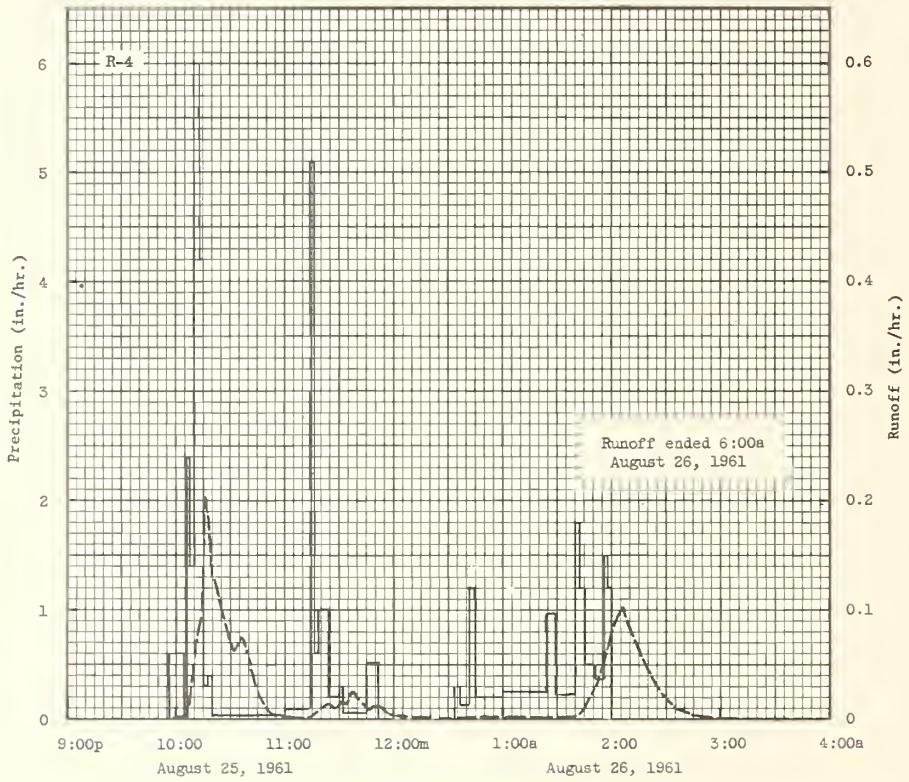
SELECTED RUNOFF EVENTS						College Park, Maryland Watershed W-7		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 25-26, 1961 - Continued</u>								
			8-26-61 1:58a 2:00	1.50 1.20	1.70 1.74	8-26-61 1:22a :30 :42 :46 : :52 :58 2:02 :06 :14 : :24 :28 :36 :46 :52 : 3:08 6:00a	0.0013 .0021 .0030 .0115 : .0318 .0659 .0882 .1028 .0659 : .0318 .0216 .0098 .0030 .0013 : .0002 0	0.0662 .0664 .0670 .0674 : .0696 .0745 .0796 .0860 .0972 : .1054 .1072 .1092 .1103 .1105 : .1107 .1109
<u>Event of August 26, 1961</u>								
	Raingage R-4		8-26-61 6:37a	Raingage R-4 0	0	8-26-61 7:24a	0	0
7-29-61	0.25	0.0016	7:00	.05	.02	:33	.0021	.0002
8-2	.02	0	:25	.05	.04	:39	.0021	.0004
8-3	.03	0	:26	2.40	.08	:43	.0081	.0007
8-6	.10	0	:28	.90	.11	:51	.0152	.0023
8-7	.02	.0005	:30	1.80	.17	:54	.0318	.0034
8-9	.42	.0002	:34	.75	.22	:55	.0510	.0041
8-10	0	.0003	:38	.45	.25	:57	.0789	.0063
8-11	.12	0	:42	1.65	.36	8:00	.114	.0111
8-12	.16	0	8:00	.43	.49	:04	.175	.0207
8-16	.04	0	:04	.60	.53	:08	.251	.0349
8-20	.67	.0012	:08	1.50	.63	:13	.335	.0594
8-21	.25	.0009	:11	1.40	.70	:21	.251	.0984
8-23	2.12	.0452	:17	.50	.75	:28	.175	.1233
8-25	1.21	.0648	:40	.10	.79	:34	.119	.1380
8-26	.65 <u>1/</u>	.0462 <u>2/</u>	9:00	.18	.85	:38	.0882	.1449
			:20	.06	.88	:46	.0546	.1544
			:30	.12	.89	:56	.0318	.1616
			10:00	.10	.94	:05	.0172	.1653
Watershed conditions: Pasture grass 5 to 8 inches high, good cover. Ground well saturated from rains of August 20 to 25.			:10	.30	.99	:14	.0098	.1673
			:25	.08	1.01	:21	.0052	.1672
			:40	.24	1.07	:29	.0030	.1687
						:38	.0013	.1690
						10:00	.0002	.1693
						:30	.0002	.1694
						:44	.0006	.1695
						11:08	.0002	.1696
						4:00 p	0	.1700

Notes: To convert runoff in in/hr to cfa, multiply by 3.549.  
1/ Rainfall 12:35a to 2:00a. 2/ Runoff 12:00m to 6:00a.



7-M-DEHARD WATERSHED, MARYLAND, COLLEGE PARK





COLLEGE PARK, MARYLAND WATERSHED W-7



9-62

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF <sup>2/</sup> (Inches)								Vero Beach, Florida Watershed W-1 Area 49,915 ac. (78.0 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	0.24	4.88	7.02	4.02	3.45	8.75	7.64	4.74	21.23	0.99	2.12	0.64	65.72
	Q	1.08	2.09	4.77	2.15	2.24	3.90	3.42	2.27	15.03	2.74	1.37	1.13	42.19
1961	P	3.35	.83	3.52	1.68	4.35	3.88	4.22	6.29	3.24	4.85	1.45	.14	37.80
	Q	1.56	1.03	1.56	1.02	1.31	1.25	1.36	2.13	1.40	1.42	1.08	1.07	16.19

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Vero Beach, Florida Watershed W - 1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-23	.103	9-23	.103	9-23	.205	9-23	.612	9-23	1.220	9-23	2.370	9-23	4.510	9-22	13.310
1961	8-22	.025	8-22	.024	8-22	.045	8-22	.110	8-22	.202	8-22	.336	8-22	.437	8-22	1.147

Notes: Quality of records: Monthly P, excellent; monthly Q, good to excellent except during Sept. 1960 which is fair. Watershed conditions: 1960 - citrus, 42%; pasture, 10%; range and forest, 18%; miscellaneous, 30% (roads, airfields, towns, etc.) Stage controls installed in all 3 outlet canals in 1954 and 1955.

SELECTED RUNOFF EVENTS					Vero Beach, Florida Watershed W-1				
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>			
Date	Rainfall <sup>1/</sup> (inches)	Runoff <sup>2/</sup> (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
Event of March 15-25, 1960 <sup>3/</sup>									
2-14-60	0	.040	3-15-60	5 raingages <sup>1/</sup>		3-15-60			
2-15	0	.022	1:00p	0	0	1:00p	.0019	0	
2-16	0	.036	2:00	.10	.10	8:00	.0140	.0556	
2-17	0	.050	4:00	0	.10	10:00	.0149	.0845	
2-18	.32	.058	5:00	.95	1.05	3-16-60			
2-19	0	.049	7:00	.05	1.15	2:00a	.0144	.1431	
2-20	0	.041	8:00	.08	1.23	6:00	.0112	.1943	
2-21	0	.040	9:00	.19	1.42	1:00p	.0028	.2433	
2-22	0	.042	11:00	.10	1.62	4:00	.0042	.2538	
2-23	.28	.072	3-16-60			7:00	.0063	.2696	
2-24	.60	.052	1:00p	0	1.62	9:00	.0170	.2929	
2-25	.07	.101	2:00	.81	2.43	12:00a	.0161	.3425	
2-26	0	.068	7:00	0	2.43	3-17-60			
2-27	0	.040	8:00	.11	2.54	5:00a	.0137	.4170	
2-28	0	.046	3-17-60			10:30	.0169	.5012	
2-29	.14	.057	3:00a	0	2.54	3:00p	.0117	.5656	
3-1	0	.059	5:00	.10	2.74	8:00	.0093	.6181	
3-2	0	.053	11:00p	0	2.74	11:00	.0086	.6449	
3-3	.15	.048	3-18-60			3-18-60			
3-4	0	.047	1:00a	.91	4.56	5:00a	.0419	.7964	
3-5	0	.043	2:00	.36	4.92	10:00	.0748	1.088	
3-6	0	.041	3:00	.59	5.51	12:00a	.0727	1.235	
3-7	0	.042	4:00	.36	5.87	3:00p	.0717	1.452	
3-8	0	.041	6:00	.13	6.13	7:00	.0480	1.691	
3-9	0	.041	10:00	0	6.13	3-19-60			
3-10	0	.042	12:00a	.26	6.65	7:00a	.0434	2.239	
3-11	.09	.049				6:00p	.0231	2.605	
3-12	0	.022				9:00	.0216	2.672	
3-13	0	.036				3-20-60			
3-14	0	.050				6:00a	.0147	2.835	
3-15	0	.040 <sup>4/</sup>				6:00p	.0108	2.988	
Watershed Conditions: Approximate land use (from ACS, 1960): 21,000 acres in citrus groves, 2,500 acres in improved pasture, 2,500 acres in unimproved pasture, 8,915 acres in range and forest, 15,000 acres in miscellaneous use (roads, canals, towns, etc.)							3-21-60		
							6:00a	.0083	3.103
							4:00p	.0170	3.179
							7:00	.0056	3.198
							3-22-60		
							12:00a	.0040	3.280
							2:00p	.0036	3.288

Notes: To convert runoff in in/hr to cfs, multiply by 50352. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 8.1-7. <sup>1/</sup> All precipitation is Thiessen weighted, using 5 raingages. <sup>2/</sup> Runoff is graphical sum of three outlet canals, computed from USGS stage records and rating tables. <sup>3/</sup> Isohyetal map on page 8.1-4. <sup>4/</sup> Runoff prior to 1:00p.

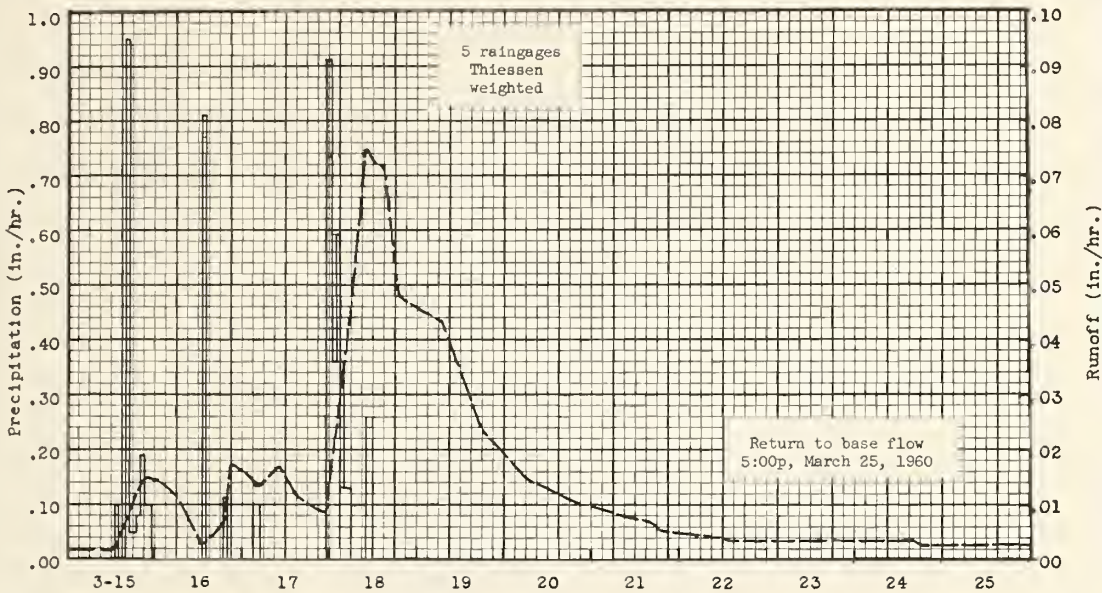
Cooperative Research Project of USDA, Florida Agricultural Experiment Station, and the Central and Southern Florida Flood Control District

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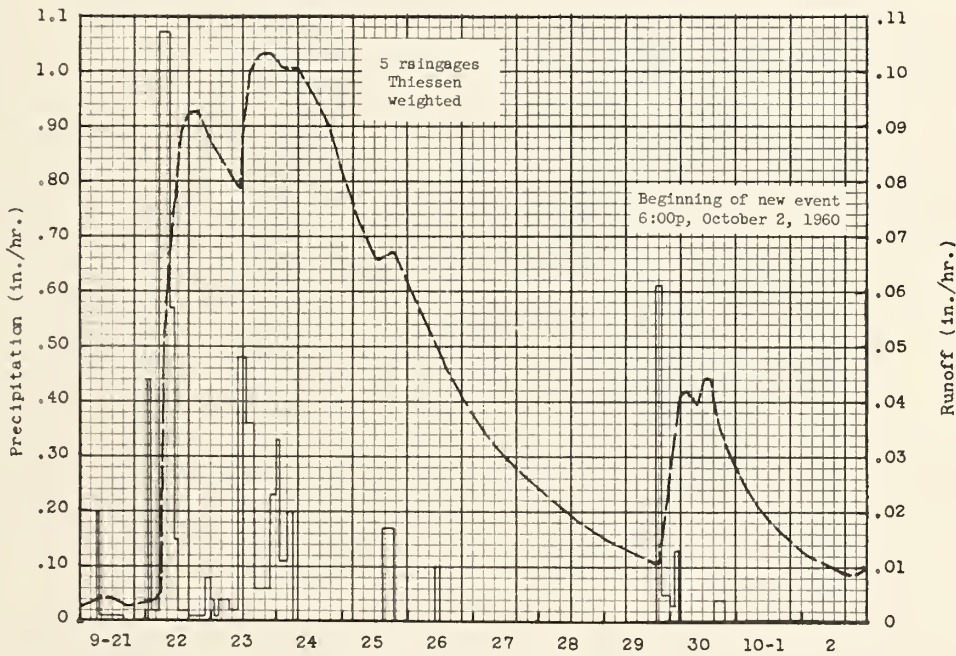
SELECTED RUNOFF EVENTS			Vero Beach, Florida Watershed W - 1					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff <sup>2/</sup> (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of March 15 - 25, 1960 (continued)								
						3-24-60 4:00p	.0039	3.476
						6:00	.0028	3.483
						3-25-60 5:00p	.0029 <sup>3/</sup>	3.548
Event of September 21 - October 2, 1960 <sup>4/</sup>								
8-22-60	0	.077	9-21-60	5 raingages <sup>1/</sup>		9-21-60		
8-23	1.02	.166	6:30a	0	0	10:00a	.0043	0
8-24	.79	.174	7:00	.20	.10	6:00p	.0030	.0292
8-25	.16	.150	4:00p	.01	.19	12:00m	.0034	.0484
8-26	.29	.119	9-22-60			9-22-60		
8-27	0	.107	12:30a	0	.19	4:00a	.0040	.0632
8-28	0	.063	2:00	.44	.85	6:00	.0054	.0726
8-29	0	.052	5:00	.02	.91	7:00	.0539	1.023
8-30	.36	.056	9:00	1.07	5.19	12:00m	.0828	.4441
8-31	.29	.078	11:00	.57	6.33	2:00p	.0897	.6166
9-1	0	.077	12:00m	.15	6.48	4:00	.0924	.7987
9-2	0	.056	4:00p	.02	6.56	7:00	.0926	1.076
9-3	.72	.053	10:00	.01	6.62	12:00m	.0871	1.526
9-4	.39	.138	12:00m	.08	6.78	9-23-60		
9-5	1.36	.197	9-23-60			11:00a	.0786	2.437
9-6	0	.214	1:00a	.04	6.82	12:00m	.0682	2.520
9-7	.80	.227	3:00	.01	6.84	2:30p	.1002	2.756
9-8	.13	.176	7:00	.04	7.00	6:00	.1029	3.111
9-9	.20	.112	10:00	.02	7.06	10:00	.1033	3.524
9-10	1.89	.371	1:00p	.48	8.50	9-24-60		
9-11	.26	.567	4:00	.36	9.58	2:00a	.1009	3.932
9-12	.06	.232	10:00	.06	9.94	8:00	.1005	4.536
9-13	.14	.147	12:00m	.23	10.40	4:00p	.0931	5.311
9-14	0	.123	9-24-60			7:00	.0902	5.586
9-15	0	.097	1:00a	.33	10.73	12:00m	.0818	6.016
9-16	0	.081	4:00	.11	11.06	9-25-60		
9-17	1.23	.061	6:00	.20	11.46	6:00a	.0729	6.480
9-18	.20	.233	9-25-60			1:00p	.0659	6.966
9-19	0	.182	3:00p	0	11.46	7:00	.0671	7.365
9-20	0	.165	7:00	.17	12.14	9-26-60		
9-21	0	.034 <sup>5/</sup>	9-26-60			3:00p	.0451	8.487
Watershed Conditions Approximate land use: (From SCS) 21,000 acres in citrus groves 2,500 acres in improved pasture 2,500 acres in unimproved pasture 8,815 acres in range and forest 15,000 acres in misc. use (towns, etc.)			10:00a	0	12.14	10:00	.0392	8.782
			12:00m	.10	12.34	9-27-60		
			9-29-60			6:00a	.0336	9.073
			7:00p	0	12.34	4:00p	.0279	9.380
			9:00	.61	13.56	9-28-60		
			12:00m	.05	13.71	11:30a	.0194	9.842
			9-30-60			9-29-60		
			2:00a	.03	13.77	2:00a	.0147	9.884
			3:00	.13	13.90	8:00p	.0106	10.112
			4:00p	0	13.90	9-30-60		
8:00	.04	14.06	4:00a	.0412	10.319			
			6:00	.0420	10.402			
			10:00	.0397	10.566			
			1:00p	.0441	10.691			
			2:30	.0441	10.758			
			6:00	.0353	10.896			
			12:00m	.0281	10.087			
			10-1-60					
			6:00a	.0225	11.238			
			1:00p	.0181	11.381			
			12:00m	.0130	11.552			
			10-2-60					
			10:00a	.0102	11.668			
			6:00p	.0088 <sup>6/</sup>	11.744			

Notes: To convert runoff in in/hr to cfs, multiply by 50332. <sup>1/</sup> All precipitation is Thiessen weighted, using 5 raingages. <sup>2/</sup> Runoff is taken by USGS from stage records and rating tables. <sup>3/</sup> Normal base flow. <sup>4/</sup> Isohyetal map on page 8.1-5. <sup>5/</sup> Runoff prior to 10:00a. <sup>6/</sup> Beginning of new event.

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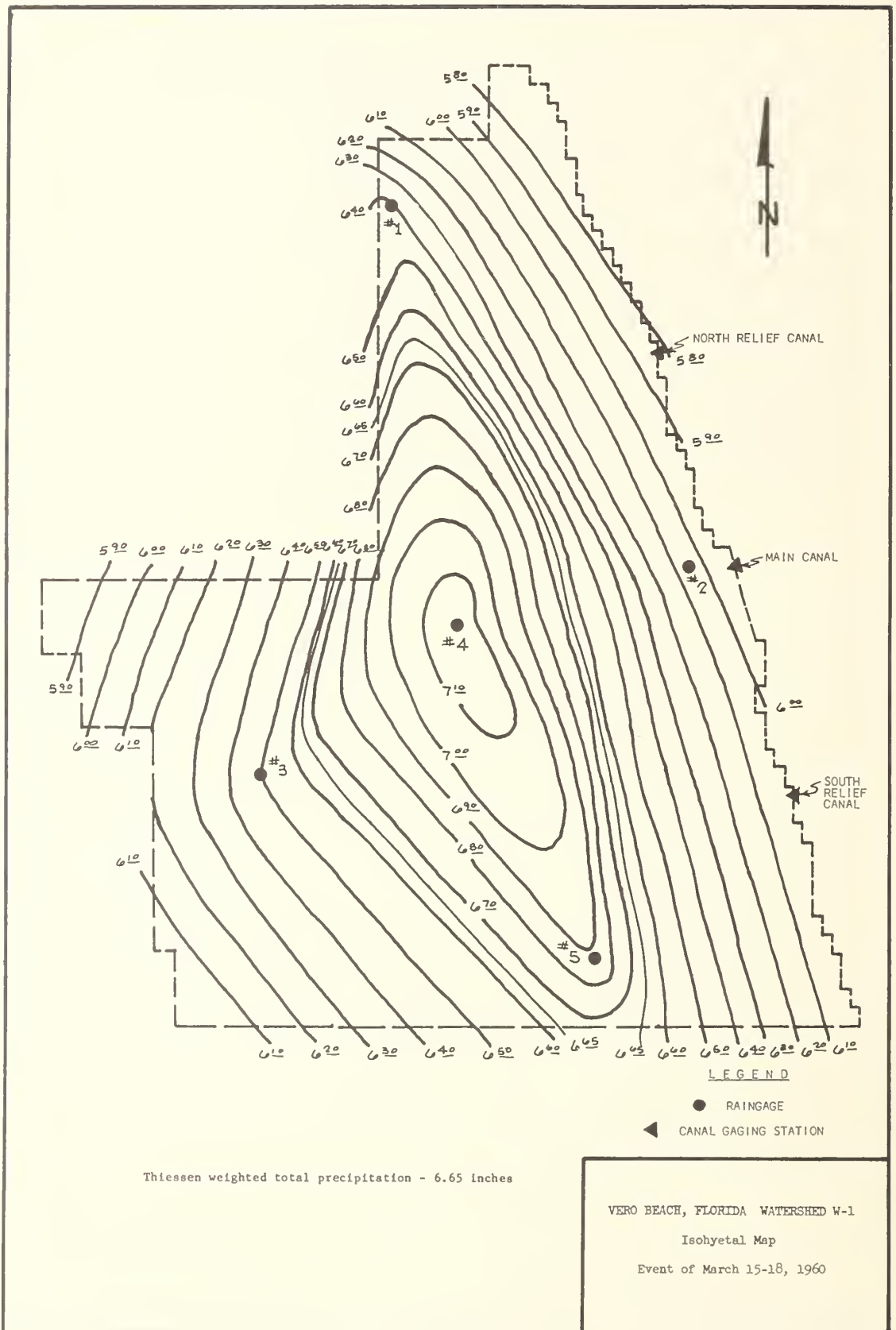
March 15 -25, 1960

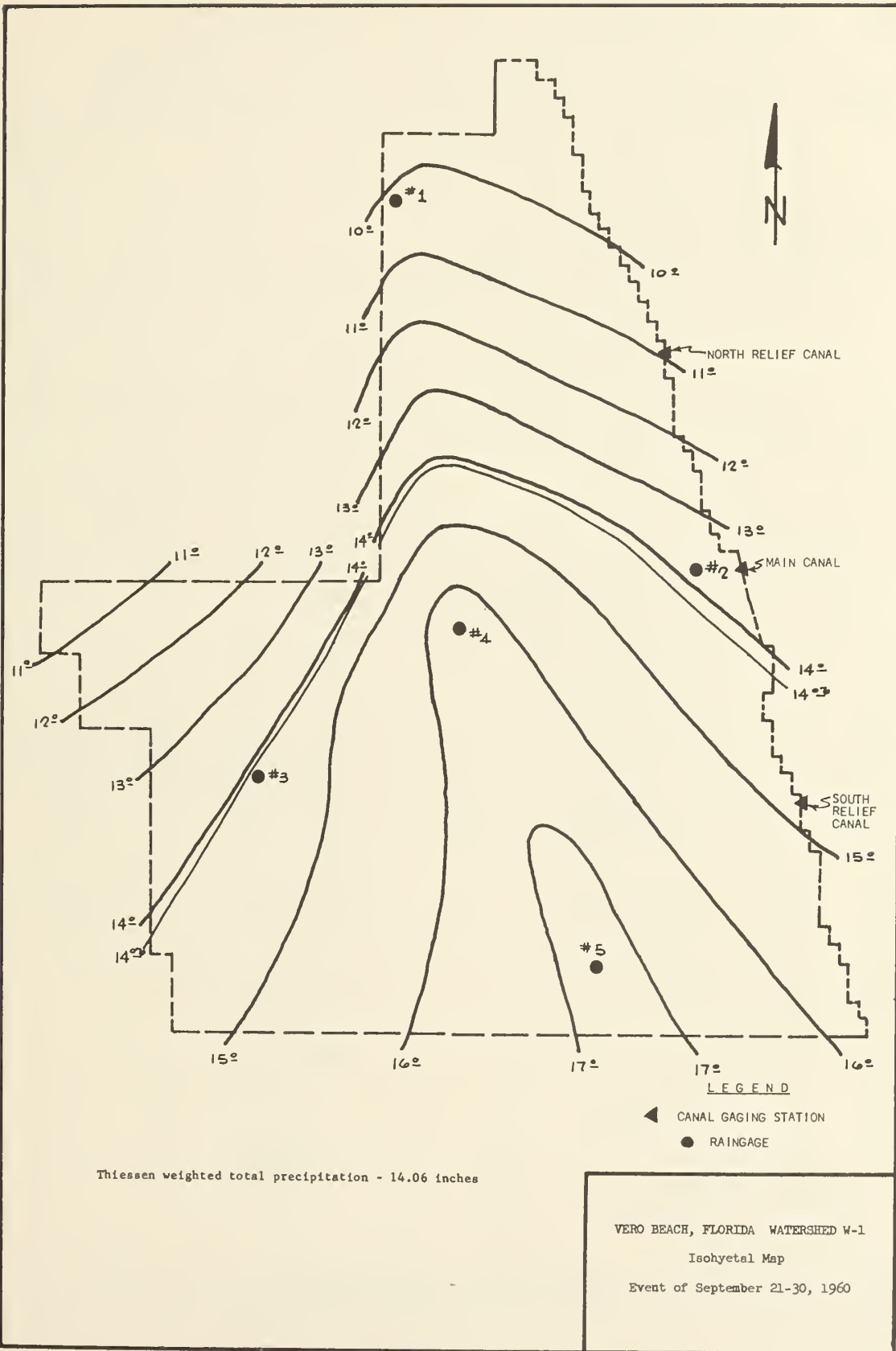


September 21 - October 2, 1960

VERO BEACH, FLORIDA WATERSHED W-1







9-62

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF <sup>2/</sup> (Inches)								Vero Beach, Florida Watershed W-2 Area - 63,170 ac. (98.7 sq. mi.)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1956 <sup>3/</sup> Q	0.04	0.01	0	0	0.66	0.28	0.30	0.02	2.64	9.80	.22	0.04	14.01
1960 P	.34	6.53	5.12	2.26	2.29	10.15	8.92	4.41	15.26	1.78	1.29	.73	59.08
Q	.25	2.86	3.54	.30	.09	2.79	2.20	4.20	10.80	4.09	.26	.03	31.44
1961 P	1.91	.83	1.56	1.24	4.48	4.27	3.91	6.12	1.78	3.04	1.09	.18	30.41
Q	.12	.04	.02	.01	.01	.07	.06	.09	.10	.03	.03	.01	.59

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Vero Beach, Florida Watershed W - 2

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-26	0.037	9-26	0.037	9-26	0.074	9-26	0.219	9-26	0.430	9-26	0.840	9-26	1.645	9-24	5.182
1961	1-14	.001	1-14	.001	1-14	.002	1-14	.005	1-14	.009	1-14	.016	1-14	.026	1-13	.072

Notes: Quality of records: Monthly P, excellent; monthly Q, good to excellent. Watershed conditions: 1960 - improved pasture, 26%; unimproved pasture, 42%; range and forest, 17%; miscellaneous, 15% (roads, canals, towns, etc.)

SELECTED RUNOFF EVENTS

Vero Beach, Florida Watershed W - 2

Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>			
Date	Rainfall <sup>1/</sup> (inches)	Runoff <sup>2/</sup> (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
Event of March 15 - April 1, 1960 <sup>4/</sup>									
2-14-60	0.34	0.086	3-15-60	7 rainages		3-15-60			
2-15	0	.073	4:00p	0	0	4:00p	0.0002	0	
2-16	0	.067	5:00	.01	.01	5-17-60			
2-17	0	.062	7:00	.08	.17	12:00m	.0002	.0112	
2-18	.43	.062	8:00	.27	.44	3-18-60			
2-19	0	.065	3-17-60			4:00a	.0020	.0156	
2-20	0	.058	3:00a	0	.44	7:00	.0062	.0279	
2-21	0	.050	4:00	.07	.51	12:00n	.0097	.0677	
2-22	.23	.042	5:00p	0	.51	6:00p	.0131	.1361	
2-23	0	.042	8:00	.05	.66	12:00a	.0154	.2216	
2-24	.39	.044	10:00	0	.66	3-19-60			
2-25	.12	.086	11:00	.20	.86	10:00a	.0224	.4106	
2-26	0	.070	3-18-60			8:00p	.0291	.6681	
2-27	0	.052	1:00a	.92	2.70	3-20-60			
2-28	.02	.038	3:00	.58	3.86	3:00a	.0303	.8760	
2-29	0	.032	4:00	.03	3.89	12:00n	.0295	1.145	
3-1	0	.028	5:00	.15	4.04	12:00m	.0259	1.477	
3-2	0	.024	7:00	.08	4.20	3-21-60			
3-3	.45	.023	9:00	.01	4.22	12:00a	.0217	1.763	
3-4	0	.026	11:00	.21	4.64	3-22-60			
3-5	0	.021	12:00a	.04	4.68	12:00n	.0154	2.208	
3-6	0	.017				3-23-60			
3-7	0	.015				2:00p	.0109	2.550	
3-8	0	.014				12:00m	.0096	2.652	
3-9	0	.013				3-24-60			
3-10	0	.012				12:00m	.0069	2.850	
3-11	.04	.010				3-25-60			
3-12	0	.009				12:00m	.0050	2.993	
3-13	0	.008				3-26-60			
3-14	0	.009				12:00m	.0037	3.097	
3-15	0	.004 <sup>5/</sup>				3-27-60			
Watershed Conditions: Approximate land use: (from SCS) 16,600 acres in improved pasture 26,600 acres in unimproved pasture 10,500 acres in range and forest 9,500 acres in miscellaneous use (Roads, canals, towns, etc.)							12:00m	.0029	3.176
							3-28-60		
							12:00m	.0023	3.238
							4-1-60		
							5:00p	.0010 <sup>5/</sup>	3.385

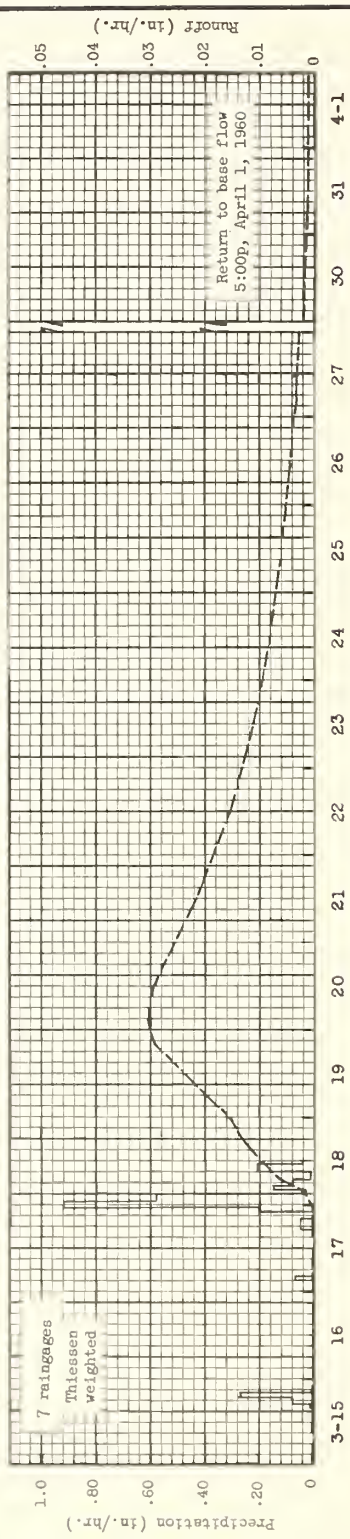
Notes: To convert runoff in in/hr to cfs, multiply by 63696. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 8.2-4. <sup>1/</sup> All precipitation is Thiessen weighted, using 7 rainages. <sup>2/</sup> Runoff is taken by USGS from stage records and rstin tables. <sup>3/</sup> Previously published values revised. <sup>4/</sup> Isohyetal map of event for areal distribution shown on page 8.2-4. <sup>5/</sup> Prior to 4:00p. <sup>6/</sup> Normal base flow.



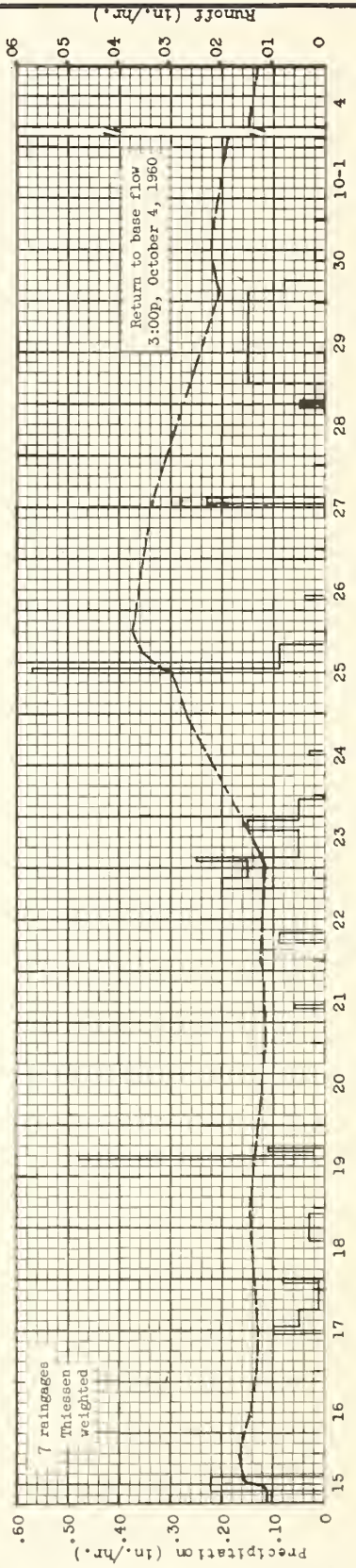
SELECTED RUNOFF EVENTS			Vero Beach, Florida Watershed W - 2					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff <sup>2/</sup> (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 15 - October 4, 1960 <sup>3/</sup>								
8-16-60	0	0.100	9-15-60	7 raingages		9-15-60		
8-17	0	.089	1:00p	0	0	1:00p	0.0111	0
8-18	0	.079	5:00	.22	.88	2:00	.0112	.0112
8-19	0	.069	9-17-60			4:00	.0157	.0381
8-20	0	.061	11:00a	0	.88	12:00m	.0165	.1661
8-21	.10	.055	1:00p	.10	1.08	9-16-60		
8-22	.67	.050	6:00	.05	1.33	12:00n	.0114	.3503
8-23	.05	.047	9-18-60			12:00m	.0132	.5159
8-24	.55	.053	2:00a	.01	1.41	9-17-60		
8-25	.03	.101	3:00	.08	1.49	12:00n	.0130	.6731
8-26	.16	.101	2:00p	0	1.49	12:00m	.0138	.8339
8-27	0	.118	10:00	.03	1.73	9-18-60		
8-28	0	.101	9-19-60			12:00m	.0112	1.170
8-29	.13	.080	2:00p	0	1.73	9-20-60		
8-30	.26	.068	3:00	.48	2.21	12:00m	.0118	1.794
8-31	.47	.058	4:00	.02	2.23	9-21-60		
9-1	.25	.055	5:00	.11	2.34	10:00p	.0120	2.056
9-2	1.07	.085	9-21-60			11:00	.0123	2.068
9-3	1.78	.128	10:00a	0	2.34	9-23-60		
9-4	.15	.227	11:00	.06	2.40	4:00a	.0118	2.417
9-5	.23	.248	9-22-60			6:00p	.0161	2.612
9-6	.23	.284	5:00a	0	2.40	9-24-60		
9-7	.10	.239	8:00	.09	2.67	12:00m	.0270	3.258
9-8	.11	.268	9:00p	0	2.67	9-25-60		
9-9	.25	.236	12:00m	.20	3.27	12:30p	.0300	3.614
9-10	1.50	.225	9-23-60			1:00	.0319	3.629
9-11	.22	.266	5:00a	.15	4.02	6:00	.0359	3.799
9-12	.08	.294	6:00	.25	4.27	12:00m	.0374	4.019
9-13	.06	.218	2:00p	.05	4.67	9-26-60		
9-14	0	.303	8:00	.15	5.57	12:00m	.0349	4.887
9-15	0	.152 <sup>4/</sup>	11:00	.05	5.72	9-27-60		
<u>Watershed Conditions:</u>  Approximate land use: (from SCS) 16,500 acres in improved pasture 26,800 acres in unimproved pasture 10,500 acres in range and forest 9,500 acres in miscellaneous use (Roads, canals, towns, etc.)			9-24-60			3:00p	.0333	5.399
			12:00n	0	5.72	9-30-60		
			1:00p	.03	5.75	3:00a	.0207	7.019
			9-25-60			5:00	.0210	7.061
			12:00n	0	5.75	3:00p	.0221	7.277
			1:00p	.57	6.32	12:00m	.0218	7.475
			8:00	.09	6.95	10-4-60		
			9-26-60			3:00p	.0132 <sup>5/</sup>	8.997
			9:00a	0	6.95			
			10:00	.04	6.99			
			9-27-60					
			1:00p	0	6.99			
			3:00	.23	7.45			
			9-28-60					
			5:00p	0	7.45			
			7:00	.05	7.55			
			12:00m	0	7.55			
			9-30-60					
			3:00a	.15	8.00			
			6:00	.08	8.24			
12:00n	0	8.24						
3:00p	.02	8.30						

Notes: To convert runoff in in/hr to cfs, multiply by 63696. <sup>1/</sup> All precipitation is Thiessen weighted, using 7 raingages. <sup>2/</sup> Runoff is taken by USGS from stage records and rating tables. <sup>3/</sup> Isohyetal map of event for areal distribution is shown on page 8.2-5. <sup>4/</sup> Runoff prior to 1:00p. <sup>5/</sup> Normal base flow.

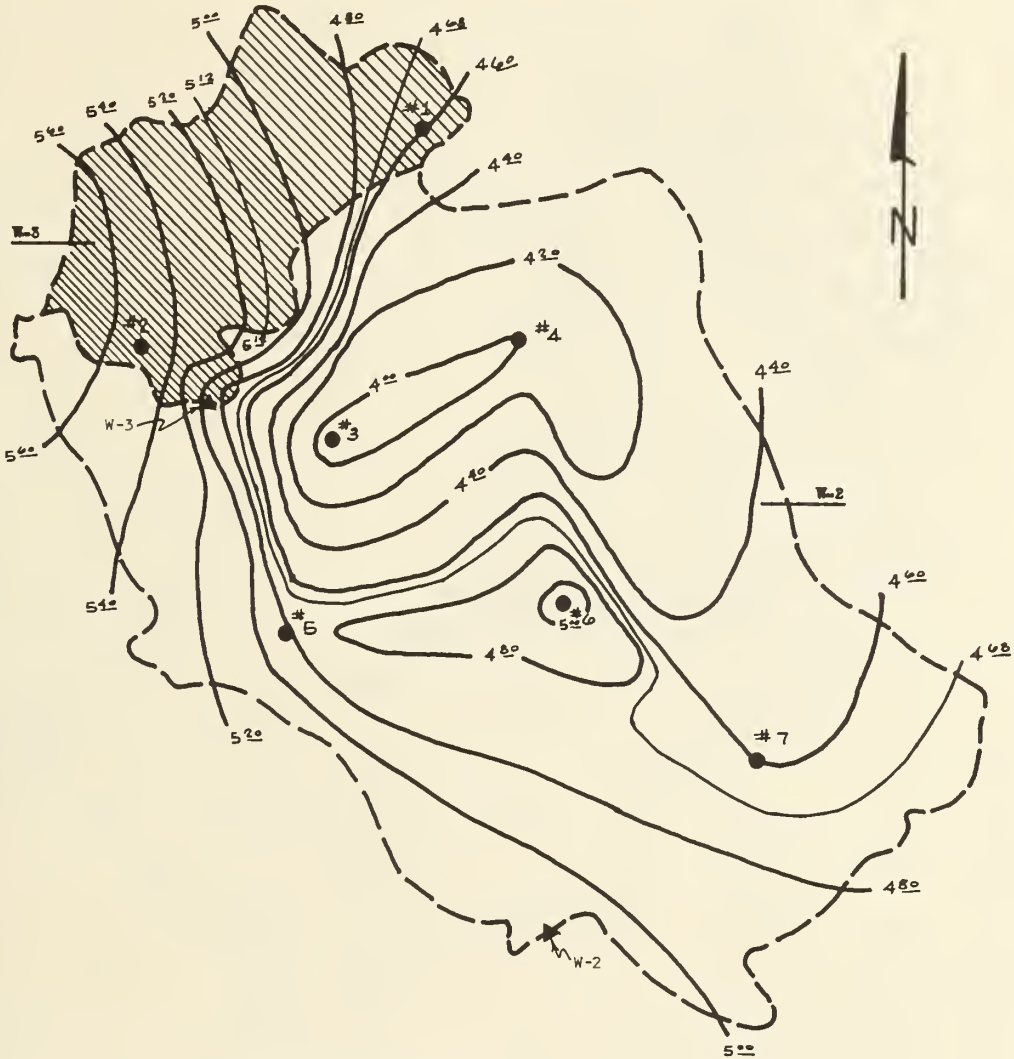
VERO BEACH, FLORIDA WATERSHED W-2



March 15 - April 1, 1960



September 15 - October 4, 1960



Thiessen weighted total precipitation:

W-2 - 4.68 inches

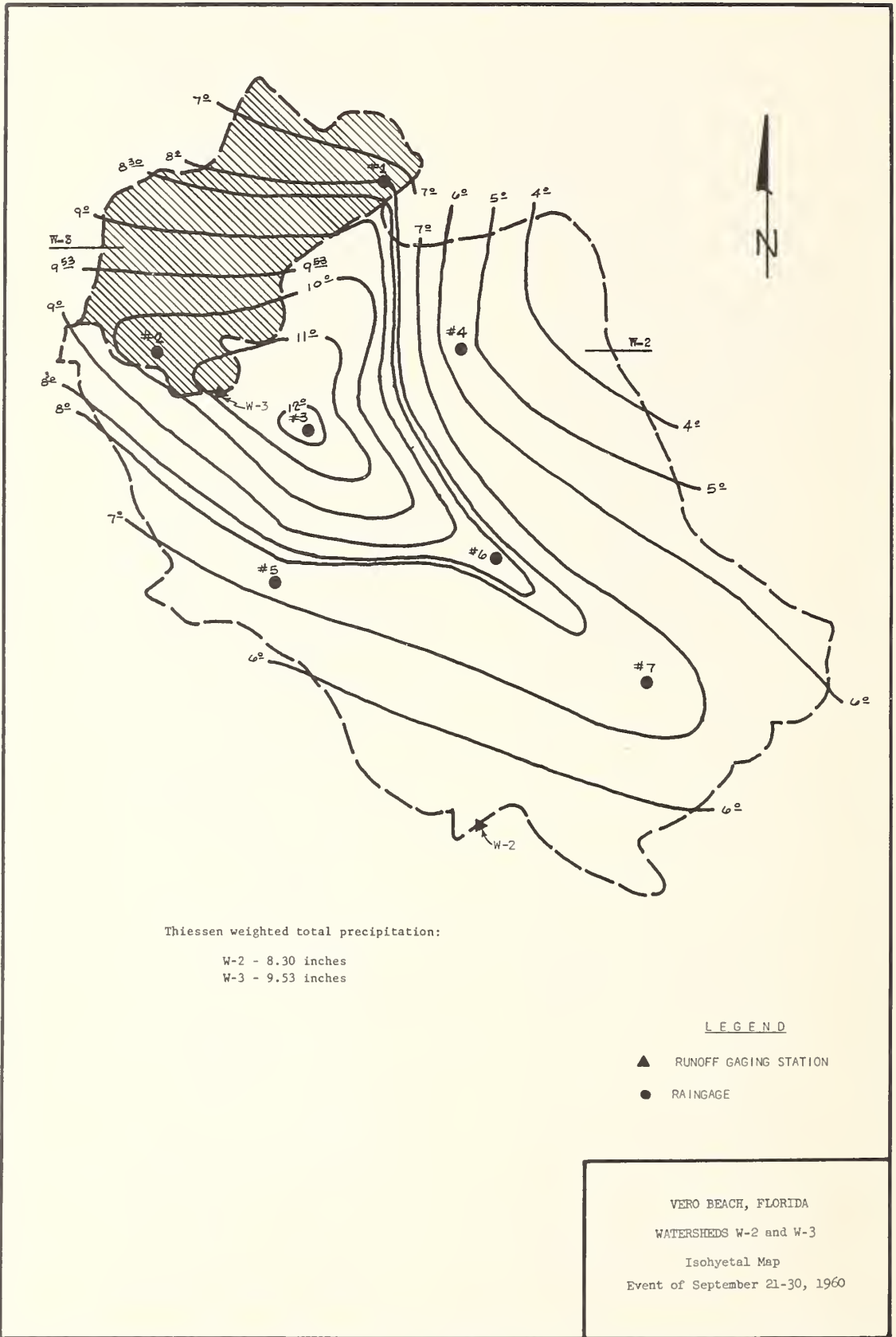
W-3 - 5.12 inches

LEGEND

▲ RUNOFF GAGING STATION

● RAINGAGE

VERO BEACH, FLORIDA  
 WATERSHEDS W-2 and W-3  
 Isohyetal Map  
 Event of March 15-18, 1960





MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF <sup>2/</sup> (Inches)							Vero Beach, Florida Watershed W-3 Area - 10,050 ac. (15.7 sq. mi.)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	0.37	4.27	5.68	1.87	1.90	11.59	11.15	5.41	16.47	1.97	0.77	0.53	61.98
1960 Q	.10	.97	3.58	.08	.01	2.72	4.54	1.92	10.93	1.53	.11	.03	26.52
1961 P	1.80	1.23	2.03	1.76	4.22	4.77	4.68	4.81	2.72	1.68	.64	.25	30.59
1961 Q	.06	.03	.02	.02	.01	.13	.06	.05	.06	.02	.01	.01	.48

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Vero Beach, Florida Watershed W - 3

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-18	0.083	3-18	0.083	3-18	0.166	3-18	0.486	3-18	0.912	3-18	1.656	3-18	2.304	9-23	4.351
1961	6-12	.003	6-12	.003	6-12	.005	6-12	.015	6-12	.028	6-11	.041	6-11	.058	6-10	.083

Notes: Quality of records: Monthly P, excellent; monthly Q, good to excellent. Watershed conditions: 1960 - improved pasture, 50%; unimproved pasture, 17%; range and forest, 18%; miscellaneous, 15% (canals, roads, etc.).

SELECTED RUNOFF EVENTS Vero Beach, Florida Watershed W - 3

Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
Event of March 15 - 31, 1960 <sup>3/</sup>									
2-14-60	0.36	0.064	3-15-60	2 raingages		3-15-60			
2-15	0	.033	4:00p	0	0	4:00p	0.0001	0	
2-16	0	.023	5:00	.04	.04	3-16-60			
2-17	0	.019	7:00	.22	.48	3:00a	.0002	.0016	
2-18	.40	.024	8:00	.20	.68	8:00	.0006	.0036	
2-19	0	.029	9:00	.06	.74	10:00p	.0009	.0141	
2-20	0	.020	3-17-60			3-17-60			
2-21	0	.015	3:00a	0	.74	10:00a	.0007	.0237	
2-22	.29	.014	4:00	.16	.90	6:00p	.0013	.0317	
2-23	0	.015	5:00p	0	.90	11:30	.0017	.0399	
2-24	.09	.019	7:00	.12	1.14	3-18-60			
2-25	.07	.019	11:00	0	1.14	2:00a	.0126	.0578	
2-26	0	.015	12:00m	1.71	2.85	3:00	.0267	.0774	
2-27	0	.012	3-18-60			6:00	.0677	.2190	
2-28	0	.010	2:00a	.22	3.29	7:00	.0785	.2921	
2-29	0	.009	3:00	.83	4.12	9:00	.0871	.4577	
3-1-60	0	.008	6:00	.18	4.66	11:00	.0878	.6326	
3-2	0	.007	9:00	0	4.66	1:00p	.0911	.8115	
3-3	.53	.011	11:00	.20	5.06	3:00	.0785	.9811	
3-4	0	.019	12:00n	.06	5.12	12:00m	.0612	1.610	
3-5	0	.011				3-19-60			
3-6	0	.008				2:00p	.0366	2.295	
3-7	0	.006				3-20-60			
3-8	0	.005				6:00a	.0190	2.740	
3-9	0	.005				6:00p	.0132	2.933	
3-10	.05	.004				3-21-60			
3-11	0	.004				6:00a	.0100	3.072	
3-12	0	.004				3-22-60			
3-13	0	.004				6:00a	.0057	3.260	
3-14	0	.005				3-23-60			
3-15	0	.002 <sup>4/</sup>				2:00p	.0041	3.417	
Watershed Conditions: Approximate land use: (from SCS) 5,000 acres in improved pasture 1,700 acres in unimproved pasture 1,800 acres in range and forest 1,500 acres in miscellaneous use (Roads, canals, towns, etc.)							3-24-60	.0032	3.541
							12:00m		
							3-25-60	.0017	3.570
							12:00n		
							3-26-60	.0013	3.606
							12:00n		

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 10134. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 8.2-4. <sup>1/</sup> All precipitation is Thiessen weighted, using 2 raingages. <sup>2/</sup> Runoff is taken by USGS from stage records and rating tables. <sup>3/</sup> Isohyetal map of event for areal distribution is shown on page 8.2-4. <sup>4/</sup> Runoff prior to 4:00p.

SELECTED RUNOFF EVENTS						Vero Beach, Florida Watershed W - 3		
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of March 15-31, 1960 (continued)</u>								
						3-28-60 12:00a	0.0010	3.661
						3-29-60 12:00a	.0006	3.680
						3-31-60 12:00a	.0004 <sup>3/</sup>	3.704
<u>Event of September 15 - October 1, 1960 <sup>4/</sup></u>								
8-16-60	0	0.038	9-15-60	2 raingages		9-15-60		
8-17	0	.026	1:00p	0	0	2:00p	0.0049	0
8-18	0	.019	5:00	.44	1.76	3:00	.0129	.0089
8-19	0	.013	9-17-60			4:00	.0290	.0290
8-20	0	.010	2:00p	0	1.76	7:00	.0421	.1365
8-21	.09	.009	5:00	.18	2.30	8:00	.0441	.1796
8-22	.40	.008	7:00	0	2.30	10:00	.0445	.2682
8-23	.13	.008	8:00	.10	2.40	12:00a	.0421	.3548
8-24	.75	.009	10:00	.03	2.46	9-16-60		
8-25	0	.017	9-18-60			2:00a	.0388	.4357
8-26	.13	.021	5:00p	0	2.46	5:30	.0332	.5617
8-27	0	.020	8:00	.07	2.67	12:00a	.0261	.7544
8-28	0	.015	9-19-60			9-17-60		
8-29	.11	.012	2:00p	0	2.67	6:00a	.0114	1.092
8-30	1.00	.011	3:00	.55	3.22	1:00p	.0085	1.162
8-31	.11	.016	9-22-60			6:00	.0108	1.210
9-1-60	.08	.043	1:00a	0	3.22	10:00	.0139	1.259
9-2	.60	.029	3:00	.10	3.42	9-18-60		
9-3	2.50	.287	6:00	0	3.42	2:00a	.0146	1.316
9-4	.07	.914	7:00	.12	3.54	8:00	.0134	1.400
9-5	0	.466	10:00	.03	3.63	6:00p	.0094	1.514
9-6	1.01	.240	10:00p	0	3.63	8:00	.0091	1.532
9-7	.30	.490	12:00a	.33	4.29	9-19-60		
9-8	.04	.226	9-23-60			3:00a	.0099	1.598
9-9	.42	.143	2:00a	.17	4.63	7:00	.0101	1.638
9-10	1.80	.288	4:00	.32	5.27	12:00a	.0096	1.687
9-11	.22	.640	10:00	.07	5.69	6:00p	.0086	1.742
9-12	0	.424	11:00	.14	5.83	9-20-60		
9-13	.13	.207	1:00p	.12	6.07	2:00a	.0075	1.806
9-14	0	.195	3:00	.19	6.45	10:00	.0070	1.864
9-15	0	.220 <sup>5/</sup>	8:00	.07	6.80	9:00p	.0077	1.945
			11:00	.03	6.89	9-21-60		
			9-25-60			12:00a	.0064	2.051
			12:00a	0	6.89	9-22-60		
			1:00p	.76	7.65	7:00a	.0052	2.161
			2:00	.26	7.91	10:00p	.0051	2.238
			5:00	0	7.91	9-23-60		
			6:00	.07	7.98	1:00a	.0062	2.255
			7:00	0	7.98	2:00	.0083	2.262
			8:00	.71	8.69	3:00	.0169	2.275
			9-27-60			6:00	.0266	2.340
			2:00p	0	8.69	12:00a	.0366	2.530
			3:00	.25	8.94	5:00p	.0421	2.727
			9-28-60			9-24-60		
			5:00p	0	8.94	1:00a	.0441	3.072
			6:00	.09	9.03	7:00	.0413	3.328
			9-29-60			12:00a	.0366	3.523
			12:00a	0	9.03	9-25-60		
			9-30-60			12:00a	.0238	4.248
			2:00a	.15	9.33	5:00p	.0261	4.373
			12:00a	0	9.33	6:00	.0317	4.402
			2:00p	.10	9.53	11:00	.0441	4.592
						9-26-60		
						2:00a	.0462	4.727
						6:00	.0437	4.907
						10:30	.0366	5.088

Watershed Conditions:

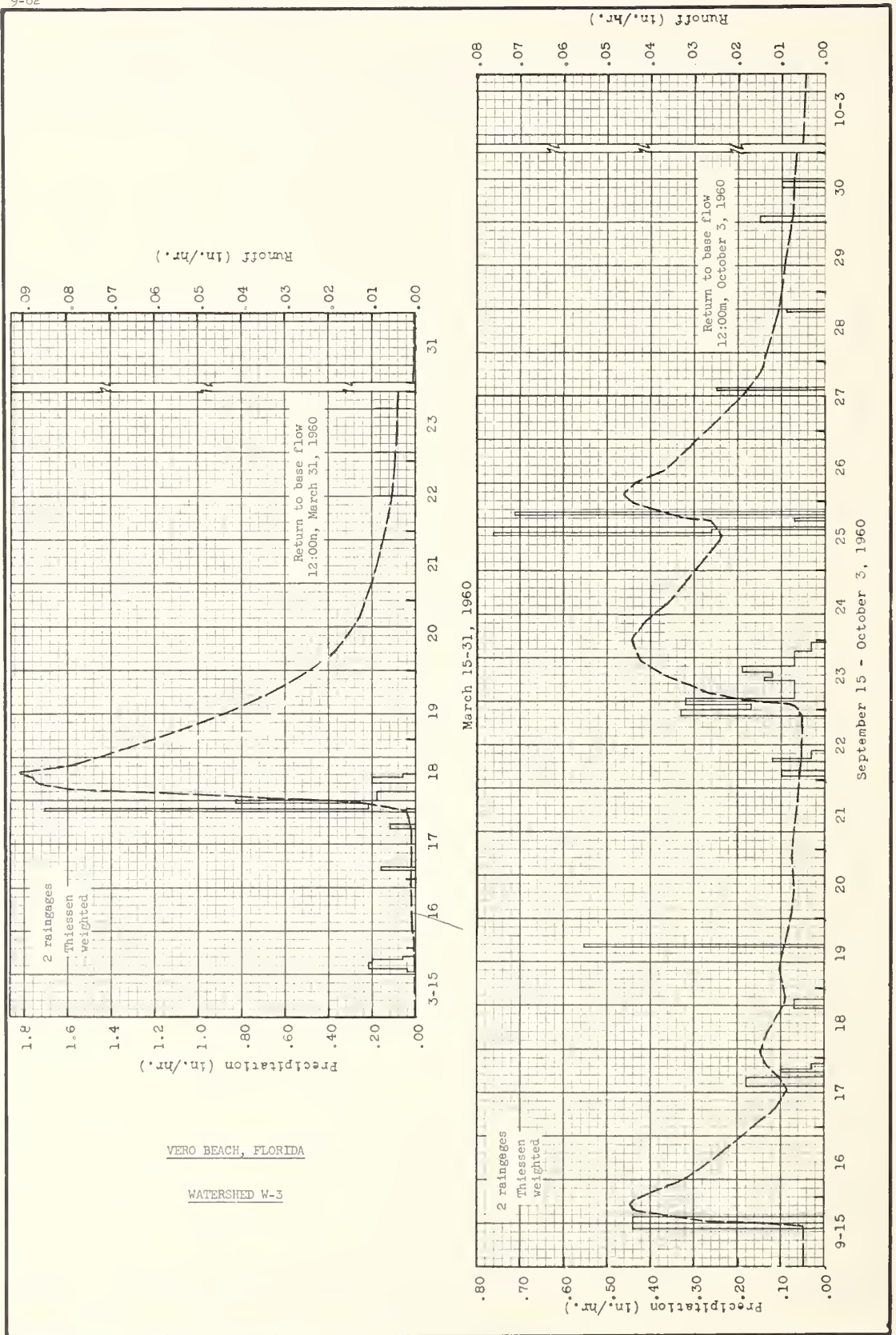
Approximate land use: (from SCS)  
 5,000 acres in improved pasture  
 1,700 acres in unimproved pasture  
 1,800 acres in rangeland and forest  
 1,600 acres in miscellaneous uses  
 (Roads, canals, towns, etc.)

Notes: To convert runoff in in/hr to cfs, multiply by 10134. <sup>1/</sup> All precipitation is Thiessen weighted, using 2 raingages. <sup>2/</sup> Runoff is taken by USGA from stage records and rating tables. <sup>3/</sup> Normal base flow. <sup>4/</sup> Isohyetal map of event for areal distribution is shown on page 8.2-5. <sup>5/</sup> Runoff prior to 2:00p.

9-62

SELECTED RUNOFF EVENTS			Vero Beach, Florida Watershed W - 3					
Antecedent conditions			Rainfall			Runoff <sup>1/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of September 15 - October 1, 1960 (continued)</u>								
						9-27-60		
						12:00a	0.0189	5.796
						9:00p	.0116	5.947
						9-28-60		
						7:00p	.0108	6.226
						9-29-60		
						12:00a	.0089	6.393
						9-30-60		
						2:00a	.0076	6.508
						1:00p	.0072	6.589
						10-1-60		
						6:00a	.0067	6.707
						10-3-60		
						12:00a	.0047 <sup>2/</sup>	7.083

Notes: To convert runoff in in/hr to cfs, multiply by 10134. <sup>1/</sup> Runoff is taken by USGS from stage records and rating tables. <sup>2/</sup> Normal base flow.





MONTHLY PRECIPITATION AND RUNOFF (Inches)								Watkinsville, Georgia Watershed W-1 (Area - 19.2 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958	P	3.74	4.76	6.21	5.05	2.88	1.08	5.68	3.70	1.29	0.72	1.39	3.04	39.54
	Q <u>2/</u>	<u>T</u>	.03	.03	.02	0	0	.01	.44	0	0	0	0	.53
1959	P	2.65	5.14	6.15	2.08	6.88	2.94	6.40	1.42	2.85	6.08	2.08	2.86	47.53
	Q <u>2/</u>	.04	.30	<u>.35</u>	.13	.41	.21	.16	0	T	T	T	T	1.60
1960	P	9.05	6.36	4.96	3.19	2.85	1.61	4.55	5.20	3.54	2.69	1.27	2.66	47.93
	Q	.44	.39	.06	.05	T	0	.02	.04	T	T	0	0	1.00
1961	P	2.78	9.37	6.30	6.28	3.26	4.83	6.72	9.37	1.34	.20	2.66	7.42	60.53
	Q	0	.81	.37	.04	0	0	.34	1.38	0	0	T	.23	3.17

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Watkinsville, Georgia Watershed W-1

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958 <u>2/</u>	8-13	1.42	8-13	0.43	8-13	<u>0.44</u>	8-13	<u>0.44</u>	8-13	<u>0.44</u>	8-13	<u>0.44</u>	8-13	<u>0.44</u>	8-13	<u>0.44</u>
1960	2-5	.12	2-5	.18	2-5	.21	2-5	.28	2-5	.30	2-5	.30	1-29	.38	1-27	.39
1961	8-1	1.83	8-1	1.04	8-1	1.28	8-1	1.30	8-1	1.30	8-1	1.30	8-1	1.30	8-1	1.34

Notes: Quality of records: excellent. Cropping and management history: Excellent Coastal Bermudagrass pasture. Management level high (approximately 1000 lbs/ac 6-12-12 + 160 lbs. N annually). 1/ Precipitation from Raingage R1-W1. 2/ Previously reported runoff is revised; quantities changed are underlined.

SELECTED RUNOFF EVENTS

Watkinsville, Georgia Watershed W-1

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage R1-W1			<u>Event of August 13, 1958</u>					
7-11-58	0.02	0	8-13-58	Raingage R1-W1		8-13-58		
7-12	.02	0	4:55a	0	0	8:00a	0	0
7-14	.35	0	5:55	.01	.01	:30	.0085	.0021
7-15	.06	0	6:50	.01	.02	:32	.0288	.0027
7-21	.08	0	:55	.48	.06	:34	.1188	.0051
7-22	.20	0	7:15	0	.06	:35	.5372	.0107
7-23	.07	0	:40	.24	.14	:36	1.1828	.0253
7-24	.55	0	8:03	0	.14	:40	.9400	.0964
7-26	.15	0	:08	1.32	.25	:42	1.3377	1.1340
7-27	.06	0	:15	.94	.36	:44	1.2396	1.1765
7-30	.04	0	:23	1.35	.54	:46	1.0846	.2148
8-2	.30	0	:30	4.28	1.04	:48	.9004	.2476
8-11	.22	0	:35	1.08	1.13	:54	.6869	.3275
8-12	1.36	0	:45	1.32	1.35	:56	.5785	.3484
			:55	.24	1.39	:58	.4494	.3654
<p>Watershed Conditions: Coastal Bermudagrass planted July 16-26, 1958. Land clean with little cover, some weeds. Good tilth as a result of previous kudzu still apparent.</p>			9:55	.05	1.44	9:00	.3801	.3791
			10:55	.10	1.54	:05	.2438	.4053
			11:55	.13	1.67	:10	.1482	.4218
			12:55p	.02	1.69	:15	.0785	.4313
						:20	.0131	.4351
						:30	.0129	.4373
						:40	.0013	.4385
						:50	0	.4386
Raingage R1-W1			<u>Event of March 5-6, 1959</u>					
2-5-59	0	0	3-5-59	Raingage R1-W1		3-5-59		
2-8	.58	0	11:02a	0	0	12:11p	0	0
2-10	.32	.0044	:22	.03	.01	1:41	.0069	.0017
2-12	1.96	.2641	:52	.12	.07	:44	.0016	.0019
2-14	.41	.0185	12:17p	.17	.13	:48	.0939	.0021

Notes: To convert runoff in in/hr to cfs, multiply by 19.3599.

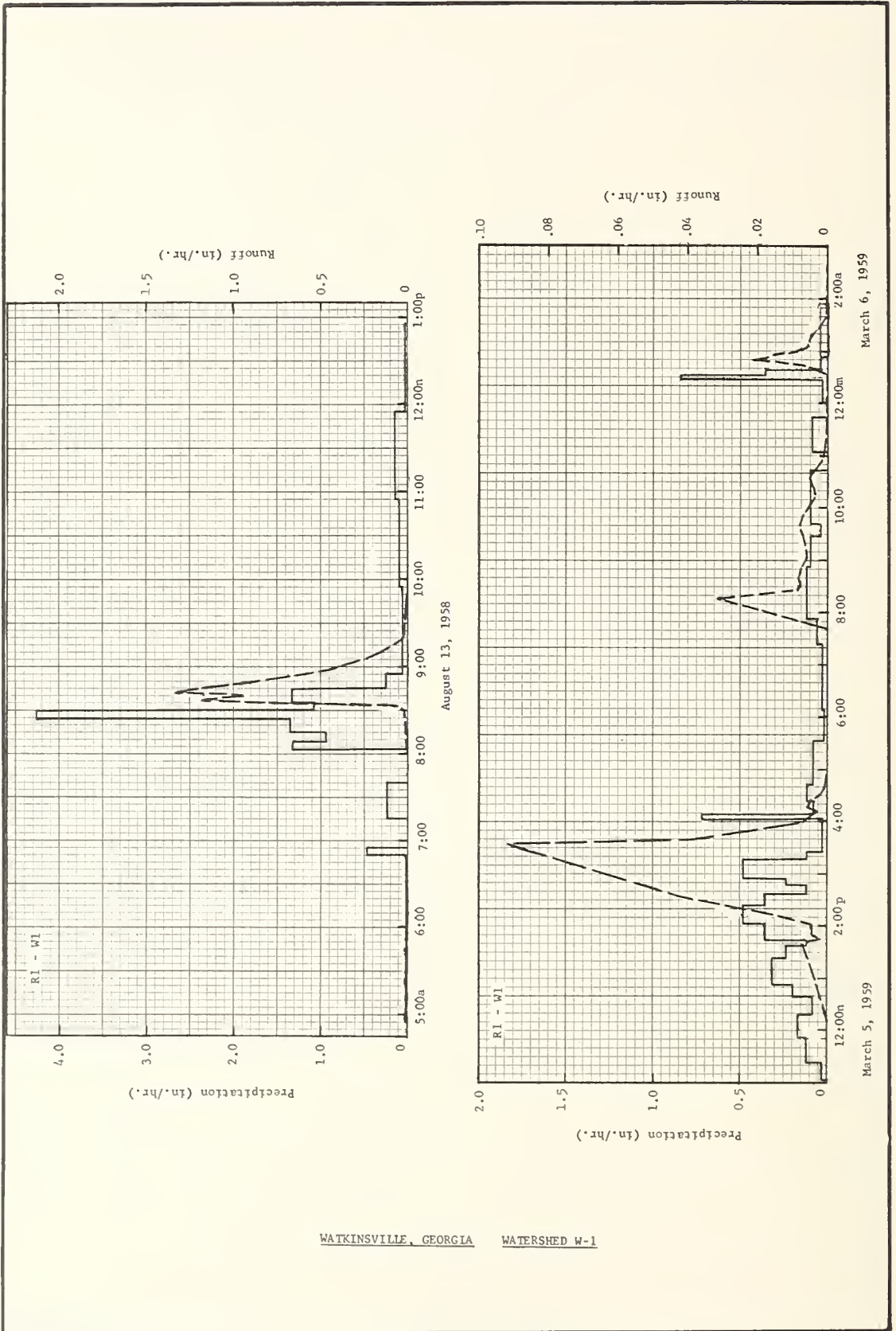
For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 10.1-8.

SELECTED RUNOFF EVENTS			Watkinsville, Georgia Watershed W-1					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of March 5-6, 1959 - continued</u>								
2-15	0.17	0.0080	3-5-59 12:37p	0.09	0.16	3-5-59 1:52p	0.0041	0.0024
2-23	.04	0	:52	.20	.21	2:01	.0041	.0030
2-25	.03	0	1:07	.32	.29	:10	.0121	.0042
2-27	.02	0	:22	.32	.37	:20	.0245	.0073
3-3	.07	0	:37	.24	.43	:30	.0382	.0125
Watershed Conditions: Winter weeds, some volunteer rescue grass. Good tilth as a result of previous kudzu still evident.			:42	.12	.44	:43	.0504	.0221
			:52	.36	.50	3:00	.0644	.0670
			2:02	.36	.56	:34	.0914	.1112
			:12	.48	.64	:40	.0384	.1177
			:22	.48	.72	4:00	.0068	.1252
			:37	.36	.81	:10	.0031	.1259
			:47	.12	.83	:16	.0052	.1263
			:52	.24	.85	:25	.0044	.1270
			3:17	.48	1.05	:30	.0021	.1273
			:22	.12	1.06	:55	0	.1277
			4:02	.03	1.08	7:40	0	.1277
			:07	.72	1.14	8:17	.0318	.1375
			:22	.08	1.16	:25	.0080	.1401
			:42	.12	1.20	:30	.0077	.1407
			5:32	.08	1.27	:40	.0083	.1420
			6:07	.02	1.28	9:02	.0059	.1446
			7:22	.03	1.32	:12	.0062	.1457
			:52	.06	1.35	:30	.0073	.1477
			8:52	.12	1.47	:40	.0076	.1489
			9:27	.10	1.53	10:00	.0055	.1511
:42	.04	1.54	:14	.0036	.1522			
10:42	.10	1.64	:35	.0052	.1537			
11:02	0	1.64	11:00	.0016	.1551			
:42	.09	1.70	:30	.0005	.1556			
12:00m	0	1.70	12:00m	.0003	.1558			
<u>Event of January 29-31, 1960</u>								
Raingage R1-W1			Raingage R1-W1					
12-29-59	0	0	1-29-60	0	0	1-29-60	0	0
1-1-3-60	1.44	.0158	11:08a	0	.04	1:48p	.0013	.0002
1-5-7	1.53	.0273	12:15p	.34	.06	2:00	.0020	.0018
1-15	.04	0	:30	.08	.13	3:00	.0007	.0032
1-17	1.53	.0125	1:00	.14	.17	4:00	.0163	.0089
1-18	.13	0	1:15p	.22	.28	4:40p	.0197	.0239
1-27	1.30	.0050	:45	.16	.32	5:30	.0101	.0314
Watershed Conditions: Good cover of dormant Coastal Bermudagrass.			:30	.32	.48	6:00	.0081	.0405
			:40	.06	.49	7:00	.0097	.0464
			3:00	.15	.54	:40	.0035	.0519
			:30	.12	.60	8:30	.0020	.0547
			4:00	.20	.70	9:30	0	.0572
			:30	.12	.76	12:00m	0	.0572
			:45	.12	.79	1-30-60	0	.0572
			5:00	.64	.95	9:25a	.0005	.0573
			:30	.14	1.02	:45	.0029	.0590
			:45	.08	1.04	10:45	.0023	.0599
			6:05	.18	1.10	11:05	.0034	.0613
			:35	.08	1.14	:35	.0054	.0635
			7:15	.18	1.26	12:00m	.0132	.0728
			:45	.10	1.31	1:00p	.0325	.0956
			8:45	.01	1.32	2:00	.0325	.1713
9:15	.12	1.38	3:45	.0202	.1911			
:45	.04	1.40	4:30	.0126	.2075			
9:15	.12	1.38	5:30	.0126	.2075			

Notes: To convert runoff in in/hr to cfs, multiply by 19.3599.

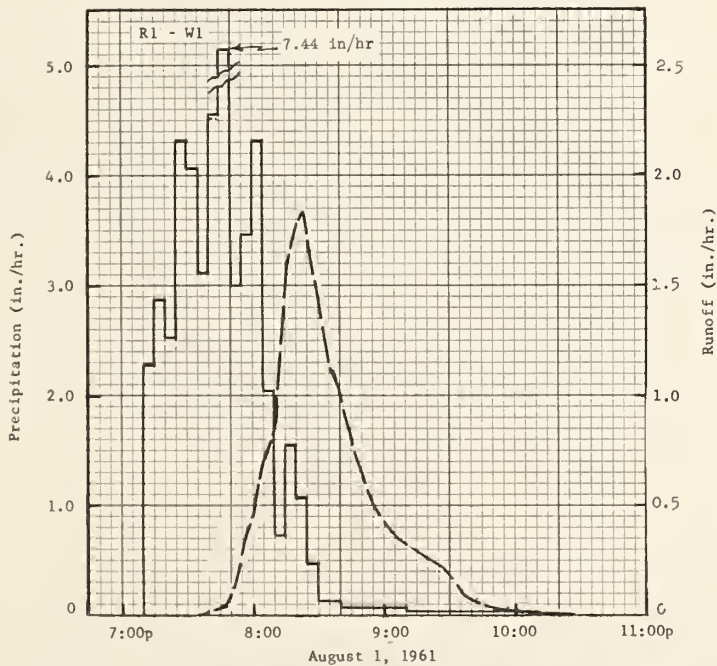
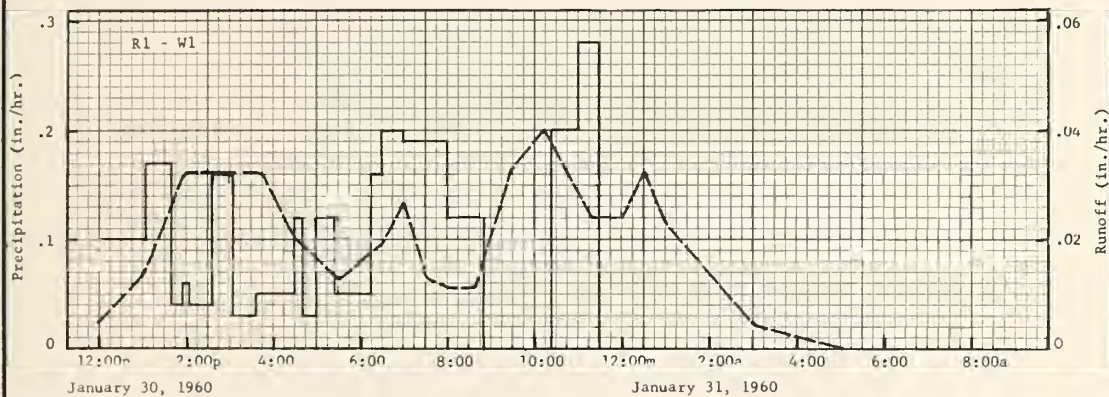
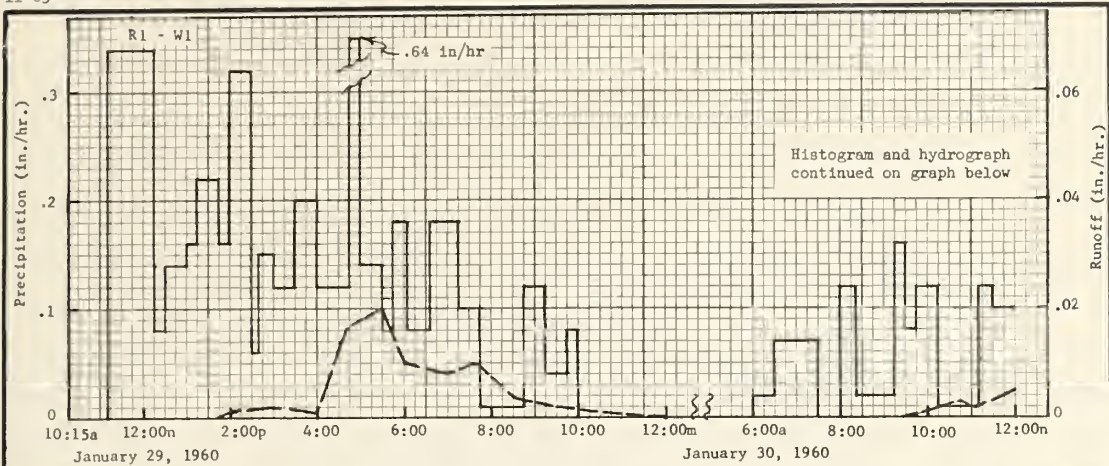
SELECTED RUNOFF EVENTS			Watkinsville, Georgia Watershed W-1					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 29-31, 1960 - Continued								
			1-29-60			1-30-60		
			10:00p	.08	1.42	6:30p	.0192	.2234
			1-30-60			7:00	.0272	.2350
			6:00a	0	1.42	:30	.0131	.2451
			:30	.02	1.43	8:00	.0116	.2513
			7:30	.07	1.50	:40	.0116	.2590
			8:00	0	1.50	9:30	.0330	.2776
			:20	.12	1.54	10:15	.0405	.3052
			9:15	.02	1.56	11:20	.0240	.3079
			:30	.16	1.60	12:00m	.0240	.3239
			:45	.08	1.62	1-31-60		
			10:15	.12	1.68	12:30a	.0325	.3380
			11:10	.01	1.69	1:00	.0231	.3519
			:30	.12	1.73	3:00	.0045	.3795
			12:00m	.10	1.78	5:00	0	.3839
			1:05p	.10	1.89			
			:40	.17	1.99			
			:55	.04	2.00			
			2:05	.06	2.01			
			:35	.04	2.04			
			3:05	.16	2.12			
			:35	.04	2.14			
			4:30	.05	2.16			
			:40	.12	2.18			
			5:00	.03	2.19			
			:25	.12	2.24			
			6:15	.05	2.28			
			:30	.16	2.32			
			7:00	.20	2.42			
			8:00	.19	2.61			
			:50	.12	2.71			
			10:20	0	2.71			
			11:00	.20	2.84			
			:30	.28	3.08			
Event of August 1, 1961								
	Raingage R1-W1		8-1-61	Raingage R1-W1		8-1-61		
7-1-61	0	0	7:10p	0	0	7:36p	0	0
7-7	.65	0	:15	2.28	.19	:41	.0201	.0008
7-11	.43	0	:20	2.88	.43	:46	.0266	.0027
7-12	1.14	0	:25	2.52	.64	:48	.0431	.0038
7-13	2.09	.3357	:30	4.32	1.00	:50	.0726	.0057
7-15	.29		:35	4.08	1.34	:52	.1322	.0091
7-17	1.20	.0052	:40	3.12	1.60	:54	.2159	.0148
7-18	.38	0	:45	4.56	1.98	:56	.3486	.0241
7-19	.36	0	:50	7.44	2.60	:58	.4034	.0365
7-22	.18	0	:55	3.00	2.85	8:00	.4426	.0505
			8:00	3.48	3.14	:02	.5511	.0669
			:05	4.32	3.50	:04	.6838	.0873
			:10	2.04	3.67	:06	.7122	.1103
			:15	.72	3.73	:11	.8786	.1763
			:20	1.56	3.86	:16	1.6063	.2794
			:25	1.08	3.95	:23	1.8336	.4806
			:30	.48	3.99	:26	1.6533	.5678
			:40	.12	4.01	:36	1.1704	.8036
			9:10	.08	4.05	:46	.7438	.9634
			10:10	.03	4.08	:56	.4922	1.0666
						9:06	.3492	1.1369
						:27	.2050	1.2339
						:36	.0966	1.2716
						:51	.0365	1.2882
						10:06	.0090	1.2996
						:21	.0030	1.3011
						:36	0	1.3015
Watershed conditions: Good Coastal Bermudagrass pasture grazed by beef cattle.								

Notes: To convert runoff in in/hr to cfs, multiply by 19.3599.



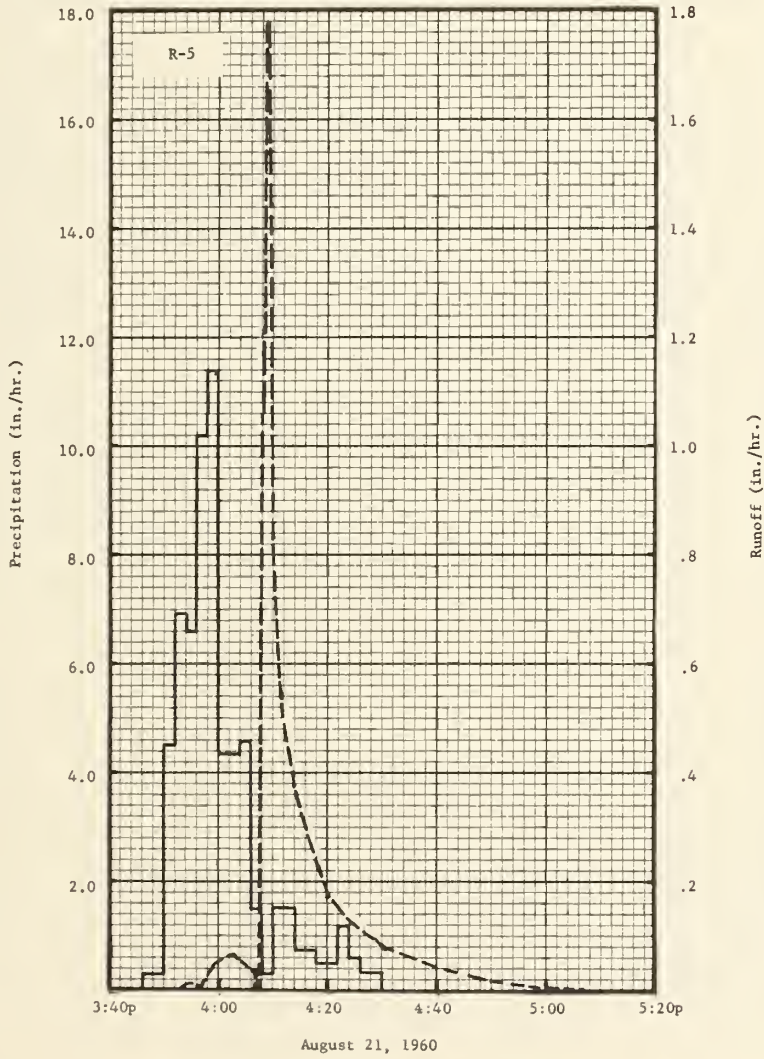


11-63



WATKINSVILLE, GEORGIA WATERSHED W-1

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Blacksburg, Va. Watershed W-III (Area - 19.30 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P Q	1.72 T	5.23 T	3.62 T	2.95 .77	4.56 .09	1.67 T	1.31 T	5.21 .15	2.47 T	2.72 T	0.82 T	2.37 T	34.65 1.01
1961	P Q	1.10 0	3.41 .02	3.69 T	2.33 T	3.25 T	4.26 .01	2.45 T	4.78 .01	.67 T	3.81 T	2.99 T	5.45 T	38.19 .04		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Blacksburg, Va. Watershed W-III								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-21	1.77	8-21	0.14	8-21	0.14	8-21	0.14	8-21	0.14	8-21	0.14	8-21	0.14	8-21	0.14
1961	8-25	.004	2-14	.004	2-14	.006	2-14	.02	2-14	.02	2-14	.02	2-14	.02	2-14	.02
Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Volumes - excellent. Watershed Conditions: Cultivated - 89%; contoured strips with a rotation of corn, small grain and clover. Pasture - 9%, usually good cover. Woodland - 2%. <sup>1/</sup> Precipitation obtained from Raingage R-5, which is located a few feet from Raingage R-3.																
SELECTED RUNOFF EVENTS								Blacksburg, Va. Watershed W-III								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
<u>Event of August 21, 1960</u>																
7-23-60	Raingage R-5 0.02	0	8-21-60	Raingage R-5		8-21-60										
7-24	.05	0	3:46p	0	0	3:53p	0	0								
7-26	.31	T	:50	.30	.02	:55	.010	T								
7-27	.06	0	:52	4.50	.17	:57	.006	T								
8-5	.12	0	:54	6.90	.40	4:00	.050	.002								
8-6	.95	T	:56	6.60	.62	:03	.062	.004								
8-7	.07	0	:58	10.20	.96	:05	.047	.006								
8-8	.03	0	4:00	11.40	1.34	:07	.038	.008								
8-9	.04	0	:04	4.35	1.63	:08	0	.008								
8-10	.34	T	:06	4.50	1.78	:09	1.775	.023								
8-12	.20	0	:08	1.50	1.83	:10	.830	.045								
8-13	.32	0	:10	.30	1.84	:11	.573	.056								
8-14	.53	T	:14	1.50	1.94	:14	.376	.080								
8-15	.02	0	:18	.75	1.99	:20	.175	.107								
8-20	.06 <sup>2/</sup>	0	:22	.45	2.02	:26	.112	.122								
			:24	1.20	2.06	:30	.083	.129								
			:26	.60	2.08	:40	.040	.139								
			:30	.30	2.10	:50	.018	.144								
						5:00	.003	.146								
						:06	0	.146								
Watershed Conditions: The cultivated portion, 89% of the watershed, was in contour strip crops of clover, 5 to 6 inches high (58% of area) and corn, 7 to 8 ft. tall (31% of area). 9% of area was in pasture and 2% in woods.																
Notes: To convert runoff in in/hr to cfs, multiply by 19.4544. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 13.2-4. <sup>2/</sup> 7:30a to 8:44a.																



BLACKSBURG, VIRGINIA, WATERSHED W-III



MONTHLY PRECIPITATION AND RUNOFF (Inches)							Blacksburg, Va. Watershed W-IV (Area - 3.49 acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	1.62	4.12	2.32	2.84	4.42	3.11	1.29	2.93	2.40	3.17	0.96	2.15	31.33
	Q	0	T	0	.09	.01	.03	0	0	T	0	0	0	.13
1961	P	1.17	4.40	4.24	2.57	2.35	4.07	2.49	4.62	.86	3.60	2.96	5.79	39.12
	Q	0	.02	0	0	T	T	0	.04	0	.01	0	.02	.09

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Blacksburg, Va. Watershed W-IV									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-5	0.14	4-4	0.05	4-4	0.06	4-4	0.06	4-4	0.06	4-3	0.09	4-3	0.09	4-3	0.09
1961	8-21	.09	8-21	.04	8-21	.04	8-21	.04	8-21	.04	8-21	.04	8-21	.04	8-21	.04

Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Volumes - excellent. Watershed Conditions: All cultivated; contoured strips with a rotation of corn, small grain and clover. A mulch tillage program is practiced. No crop residue is removed except one clover hay crop each year. <sup>1/</sup> Precipitation obtained from Raingage R-3F.

12-63				SELECTED RUNOFF EVENTS				Blacksburg, Va. Watershed W-IV			
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
<u>Event of May 5, 1958</u>											
4-5-58	Raingage R-3F 0.01	0	5-5-58	Raingage R-3F		5-5-58					
4-6	.70	T	9:19a	0	0	10:22a	0	0			
4-7	.09	0	:38	.03	.01	:32	.002	T			
4-10	.17	0	:42	0	.01	:35	.013	T			
4-11	.09	0	:47	.24	.03	:40	.017	T			
4-15	.04	0	:56	0	.03	:45	.048	T			
4-16	.06	0	:58	.30	.04	:48	.094	.01			
4-21	.06	0	10:03	.36	.07	:49	.138	.01			
4-22	1.62	T	:10	.17	.09	:50	.198	.01			
4-23	.12	0	:14	.30	.11	:51	.271	.02			
4-25	.08	0	:20	.60	.17	:52	.378	.02			
4-26	.08	0	:22	1.20	.21	:53	.506	.03			
4-27	.12	0	:24	.60	.23	:54	.614	.04			
4-28	.58	0	:26	0	.23	:55	.716	.05			
5-1	.30	0	:34	.30	.27	:57	.747	.07			
5-2	.50	0	:36	.90	.30	:58	.716	.09			
5-3	.01	0	:40	.75	.35	11:00	.600	.11			
5-5	.70 <sup>2/</sup>	.01 <sup>3/</sup>	:43	.80	.39	:02	.480	.13			
			:47	1.35	.48	:03	.435	.13			
			:50	2.40	.60	:05	.347	.15			
			:54	3.60	.84	:06	.307	.15			
			:55	.60	.85	:07	.280	.16			
			11:24	0	.85	:10	.213	.17			
			:43	.03	.86	:14	.150	.18			
			12:08p	0	.86	:17	.114	.19			
			:11	.20	.87	:20	.084	.19			
			:12	.60	.88	:23	.067	.20			
			:19	.17	.90	:27	.051	.20			
			:24	0	.90	:33	.032	.20			
			:26	1.80	.96	:38	.022	.21			
			:28	.90	.99	:43	.015	.21			
			:31	.20	1.00	:52	.008	.21			
			:32	1.80	1.03	12:21p	.001	.21			
			:34	.30	1.04	:24	.001 <sup>4/</sup>	.21			
			:36	.60	1.06						

Continued on next page

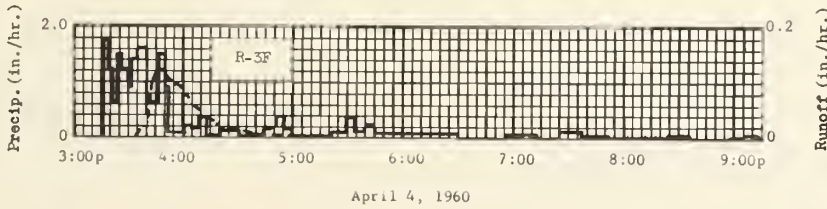
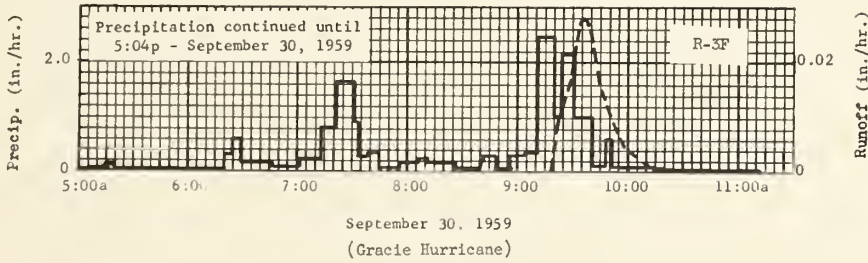
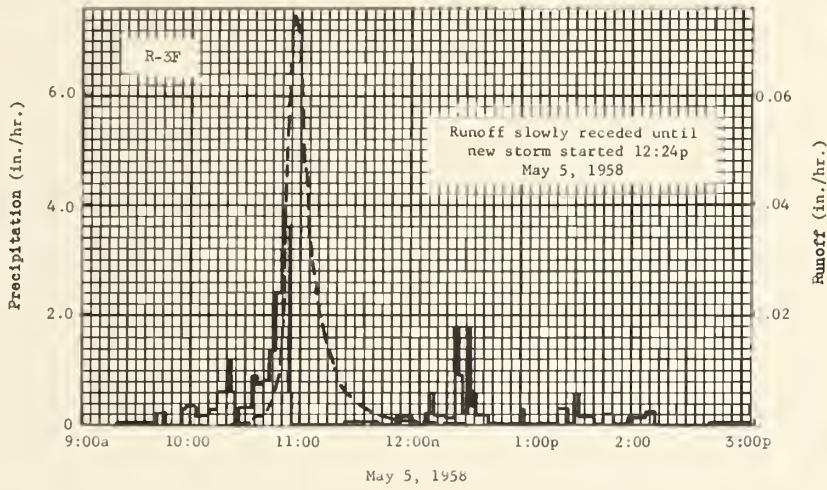
Notes: To convert runoff in in/hr to cfs, multiply by 3.519.  
<sup>1/</sup> 1:54a to 4:20a  
<sup>2/</sup> 3:21a to 4:43a  
<sup>3/</sup> Beginning of new runoff event.



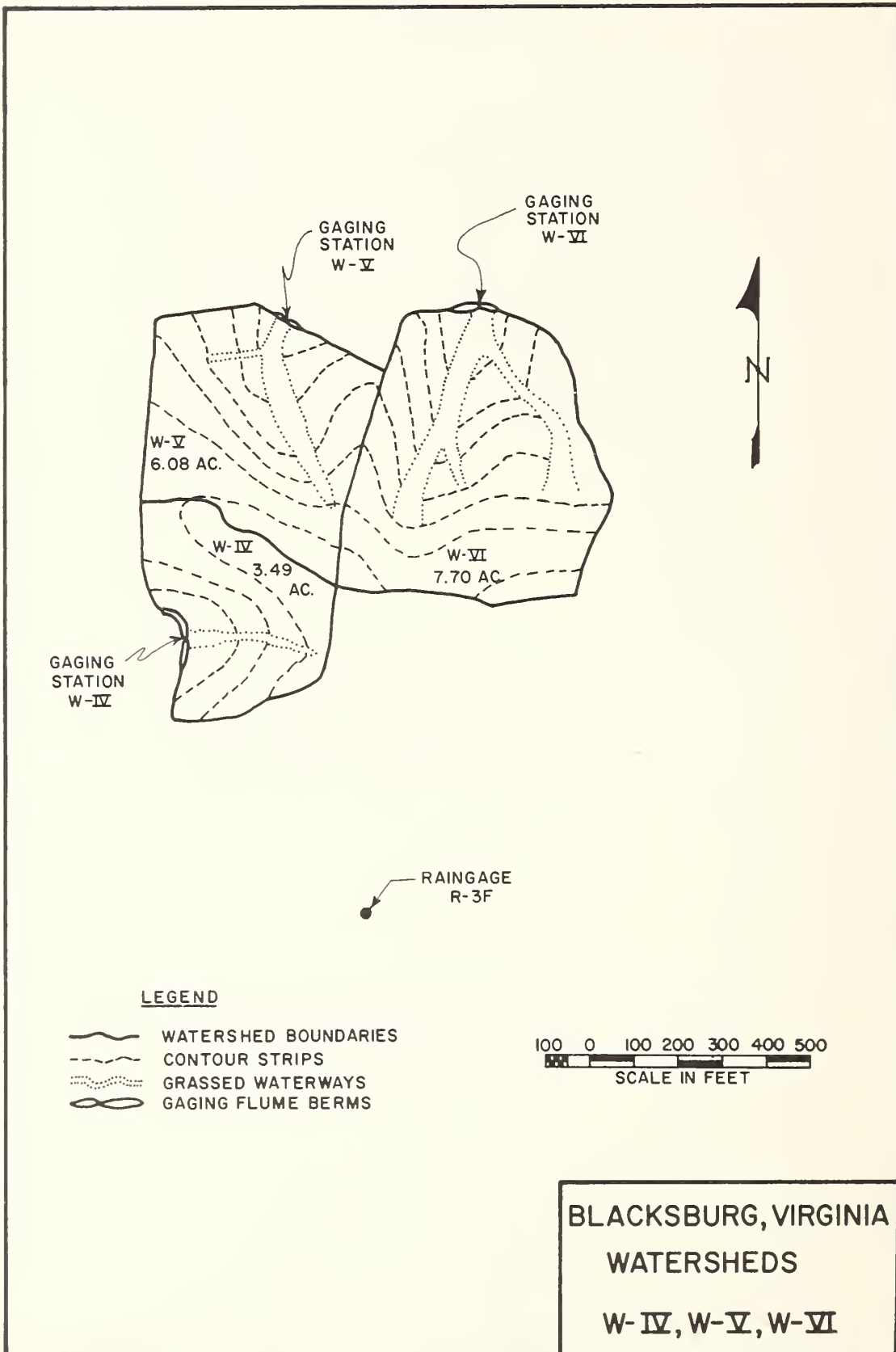
SELECTED RUNOFF EVENTS			Blacksburg, Va. Watershed W-IV					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 5, 1958 (Continued)								
			5-5-58 12:43p	0.17	1.08			
			1:00	0	1.08			
			:02	.30	1.09			
			:20	0	1.09			
			:26	.30	1.10			
			:29	0	1.10			
			:31	.60	1.12			
			:40	.13	1.14			
			:45	0	1.14			
			:51	.20	1.16			
			:58	0	1.16			
			2:08	.12	1.18			
			:13	.24	1.20			
			:42	0	1.20			
			3:04	.03	1.21			
Event of September 30, 1959 <sup>1/</sup>								
9-1-59	Raingage R-3F 1.19	0	9-30-59	Raingage R-3F 0	0	9-30-59		
9-5	.29	0	5:02a			9:18a	0	0
9-6	.30	0	:16	.04	.01	:20	.038	T
9-29 <sup>1/</sup>	1.75	0	:20	.15	.02	:22	.080	T
9-30 <sup>1/</sup>	.59 <sup>2/</sup>	0	6:20	.05	.07	:23	.097	T
			:24	.30	.09	:26	.132	.01
			:28	.60	.13	:28	.169	.01
			:48	.15	.18	:30	.191	.02
			7:02	.09	.20	:32	.237	.03
			:13	.22	.24	:34	.271	.04
			:22	.80	.36	:36	.280	.05
			:27	1.66	.49	:38	.271	.05
			:31	1.65	.60	:39	.262	.06
			:33	.90	.63	:42	.221	.07
			:38	.24	.65	:43	.198	.07
			:45	.34	.69	:45	.169	.08
			:56	.05	.70	:47	.138	.09
			8:06	.12	.72	:48	.126	.09
			:11	.24	.74	:52	.094	.10
			:28	.18	.79	:57	.059	.10
			:40	.05	.80	10:01	.038	.11
			:46	.20	.82	:03	.032	.11
			:48	.30	.83	:07	.020	.11
			:58	.12	.85	:09	.015	.11
			9:02	.30	.87	:15	.010	.11
			:04	.30	.88	:23	.005	.11
			:11	.34	.92	:29	.004	.11
			:20	2.47	1.29	:53	0	.11
			:24	1.50	1.39			
			:31	2.14	1.64			
			:42	.98	1.82			
			:48	.10	1.83			
			:52	.60	1.87			
			10:14	.08	1.90			
			11:12	.05	1.95			
			12:04p	.10	2.04			
			:49	.13	2.14			
			1:46	.04	2.18			
			3:26	.06	2.28			
			4:12	0	2.28			
			:22	.12	2.30			
			5:04	.03	2.32			
<p><b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 3.519.  <sup>1/</sup> Gracie Hurricane  <sup>2/</sup> 12:00m, 9-29-59 to 4:00a, 9-30-59</p>								

12-63





SELECTED RUNOFF EVENTS					Blacksburg, Va. Watershed W-IV			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of April 4, 1960</u>								
3-4-60	Raingage R-3F 0	0	4-4-60	Raingage R-3F		4-4-60		
3-9	.26s	0	3:17p	0	0	3:34p	0	0
3-10	.04s	0	:19	1.80	.06	:36	.013	T
3-12	.10s	0	:22	1.20	.12	:38	.020	T
3-16	.26s	0	:24	.60	.14	:39	.024	T
3-29	.07	0	:26	1.50	.19	:40	.038	T
3-30	.39	0	:30	1.20	.27	:43	.094	.01
3-31	.04	0	:32	.90	.30	:46	.120	.01
4-3	1.11	.03	:35	1.40	.37	:48	.120	.01
			:38	1.60	.45	:50	.109	.02
			:40	1.20	.49	:52	.104	.02
			:47	.60	.56	:53	.099	.02
			:50	1.50	.61	:56	.094	.03
			:52	.90	.64	:57	.094	.03
			4:01	.07	.65	:59	.089	.03
			:04	.20	.66	4:05	.059	.04
			:08	.15	.67	:08	.048	.04
			:13	.36	.70	:13	.032	.05
			:20	0	.70	:16	.027	.05
			:28	.08	.71	:18	.024	.05
			:32	.15	.72	:19	.024	.05
			:45	0	.72	:26	.015	.05
			:49	.15	.73	:29	.013	.05
			:52	.20	.74	:30	.013	.05
			:55	.40	.76	:40	.006	.05
			5:00	.12	.77	:49	.003	.05
			:22	.03	.78	:51	.003	.05
			:29	.09	.79	:54	.002	.05
			:34	.36	.82	5:20	0	.06
			:40	.10	.83			
			:45	.24	.85			
			6:30	.04	.88			
			:56	.02	.89			
			7:13	.04	.90			
			:25	0	.90			
			:36	.11	.92			
			:52	.04	.93			
			8:24	0	.93			
			:36	.05	.94			
			:58	.03	.95			
			9:04	0	.95			
			:14	.06	.96			
<p>Watershed Conditions: Contour strips, with rotation of corn, small grain and clover. Clover seeded in wheat during spring. Corn followed second year clover. At the time of event 51.5% of area was in dormant clover and orchard grass sod, good cover; and 48.5% was in fall wheat seeded in corn stover, medium cover.</p>								
<p>Notes: To convert runoff in in/hr to cfs, multiply by 3.519.</p>								

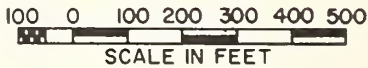


BLACKSBURG, VIRGINIA WATERSHED W-IV



**LEGEND**

-  WATERSHED BOUNDARIES
-  CONTOUR STRIPS
-  GRASSED WATERWAYS
-  GAGING FLUME BERMS



**BLACKSBURG, VIRGINIA  
WATERSHEDS  
W-IV, W-V, W-VI**



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Blacksburg, Va. Watershed W-V (Area - 6.08 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	1.62	4.12	2.32	2.84	4.42	3.11	1.29	2.93	2.40	3.17	0.96	2.15	31.33
	Q	0	T	T	.04	T	.02	0	0	0	0	0	0	.06
1961	P	1.17	4.40	4.24	2.57	2.35	4.07	2.49	4.62	.86	3.60	2.96	5.79	39.12
	Q	0	0	0	0	T	T	T	.01	0	0	0	.02	.03

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Blacksburg, Va. Watershed W-V								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-5	0.11	4-4	0.03	4-4	0.03	4-4	0.03	4-4	0.03	4-3	0.04	4-3	0.04	4-3	0.04
1961	8-21	.04	12-18	.01	12-18	.01	12-18	.01	12-18	.01	12-18	.01	12-18	.01	12-10	.02

Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Volumes - excellent. Watershed Conditions: All cultivated; contoured strips with a rotation of corn, small grain and clover. A mulch tillage program is practiced. No crop residue is removed except one clover hay crop each year. 1/ Precipitation from Raingage R-3F.

12-63 SELECTED RUNOFF EVENTS						Blacksburg, Va. Watershed W-V			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of May 5, 1958</u>									
4-5-58	Raingage R-3F 0.01	0	5-5-58	Raingage R-3F		5-5-58			
4-6	.70	0	9:19a	0	0	10:35a	0	0	
4-7	.09	0	:38	.03	.01	:37	.007	T	
4-10	.17	0	:42	0	.01	:40	.008	T	
4-11	.09	0	:47	.24	.03	:42	.010	T	
4-15	.04	0	:56	0	.03	:43	.013	T	
4-16	.06	0	:58	.30	.04	:45	.025	T	
4-21	.06	0	10:03	.36	.07	:47	.054	T	
4-22	1.62	0	:10	.17	.09	:48	.079	T	
4-23	.12	0	:14	.30	.11	:50	.183	.01	
4-25	.08	0	:20	.60	.17	:51	.269	.01	
4-26	.08	0	:22	1.20	.21	:53	.657	.03	
4-27	.12	0	:24	.60	.23	:54	.705	.04	
4-28	.58	0	:26	0	.23	:55	.669	.05	
5-1	.30	0	:34	.30	.27	:56	.600	.06	
5-2	.50	0	:36	.90	.30	:58	.525	.08	
5-3	.01	0	:40	.75	.35	:59	.466	.09	
5-5	.70 <u>2/</u>	.01 <u>3/</u>	:43	.80	.39	11:03	.276	.11	
			:47	1.35	.48	:05	.230	.12	
			:50	2.40	.60	:06	.199	.12	
Watershed Conditions: Contour strips with rotation of corn, small grain and clover. Clover seeded in wheat during spring. Corn follows second year clover sod. At the time of event 24.8% of area had been plowed prior to corn planting; 33.6% of area was in wheat, 9 to 12" high; 32.2% of area was in clover-orchard grass mixture, good cover, 10 to 12" high; and 9.4% in grassed waterway, good cover.			:54	3.60	.84	:08	.155	.13	
			:55	.60	.85	:09	.136	.13	
			11:24	0	.85	:13	.086	.14	
			:43	.03	.86	:18	.054	.15	
			12:08p	0	.86	:20	.043	.15	
			:11	.20	.87	:23	.032	.15	
			:12	.60	.88	:30	.015	.15	
			:19	.17	.90	:35	.011	.15	
			:24	0	.90	:39	.008	.15	
			:26	1.80	.96	:58	0	.15	
			:28	.90	.99				
			:31	.20	1.00				
			:32	1.80	1.03				
			:34	.30	1.04				
			:36	.60	1.06				

Continued on next page

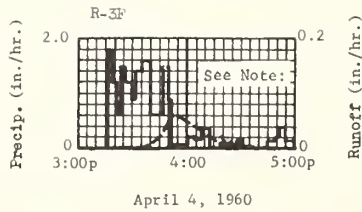
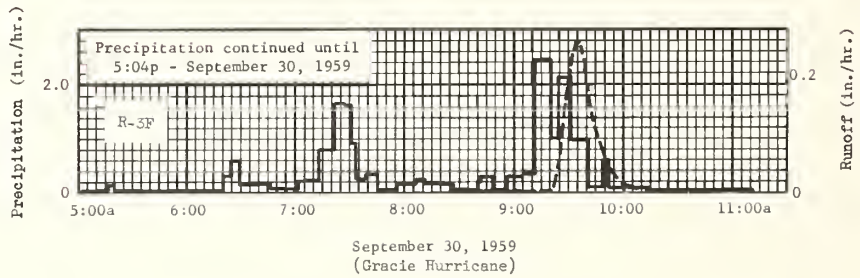
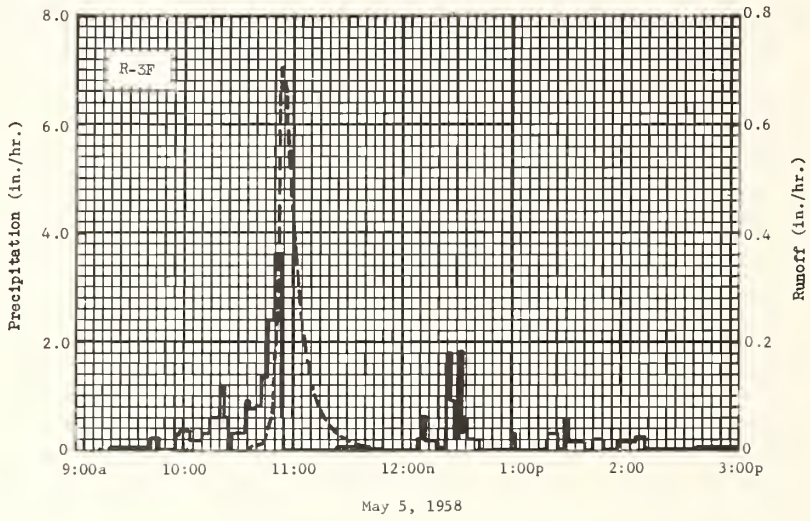
Notes: To convert runoff in in/hr to cfs, multiply by 6.131. For map of watershed, see page 13.3-5.  
2/ 1:54a to 4:20a  
3/ 3:19a to 4:20a

SELECTED RUNOFF EVENTS						Blacksburg, Va. Watershed W-V		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 5, 1958 (Continued)</u>								
			5-5-58					
			12:43p	0.17	1.08			
			1:00	0	1.08			
			:02	.30	1.09			
			:20	0	1.09			
			:26	.30	1.10			
			:29	0	1.10			
			:31	.60	1.12			
			:40	.13	1.14			
			:45	0	1.14			
			:51	.20	1.16			
			:58	0	1.16			
			2:08	.12	1.18			
			:13	.24	1.20			
			:42	0	1.20			
			3:04	.03	1.21			
<u>Event of September 30, 1959 <sup>1/</sup></u>								
9-1-59	Raingage R-3F 1.19	0	9-30-59	Raingage R-3F 0	0	9-30-59	0	0
9-5	.29	0	5:02a			8:25a	.001	T
9-6	.30	0	:16	.04	.01	:30	.001	T
9-29 <sup>1/</sup>	1.75	0	:20	.15	.02	9:21	.011	T
9-30 <sup>1/</sup>	.59 <sup>2/</sup>	0	6:20	.05	.07	:22	.030	T
			:24	.30	.09	:23	.060	T
			:28	.60	.13	:25	.166	.01
			:48	.15	.18	:28	.256	.02
			7:02	.09	.20	:32	.276	.03
			:13	.22	.24	:34	.276	.04
			:22	.80	.36	:35	.256	.04
			:27	1.66	.49	:37	.223	.05
			:31	1.65	.63	:43	.131	.06
			:33	.90	.63	:43	.082	.07
			:38	.24	.65	:47	.048	.08
			:45	.34	.69	:51	.038	.08
			:56	.05	.70	:53	.030	.08
			8:06	.12	.72	:55	.017	.08
			:11	.24	.74	:59	.004	.08
			:28	.18	.79	10:08	.002	.08
			:40	.05	.80	:11	.001	.08
			:46	.20	.82	:17	.001	.08
			:48	.30	.83	:35	.001	.08
			:58	.12	.85	:58	0	.08
			9:02	.30	.87			
			:04	.30	.88			
			:11	.34	.92			
			:20	2.47	1.29			
			:24	1.50	1.39			
			:31	2.14	1.64			
			:42	.98	1.82			
			:48	.10	1.83			
			:52	.60	1.87			
			10:14	.08	1.90			
			11:12	.05	1.95			
			12:04p	.10	2.04			
			:49	.13	2.14			
			1:46	.04	2.18			
			3:26	.06	2.28			
			4:12	0	2.28			
			:22	.12	2.30			
			5:04	.03	2.32			
<p><b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 6.131.  <sup>1/</sup> Gracie Hurricane  <sup>2/</sup> 12:00m, 9-29-59 to 4:00a, 9-30-59</p>								

SELECTED RUNOFF EVENTS			Blacksburg, Va. Watershed W-V					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 4, 1960								
3-4-60	Raingage R-3F 0	0	4-4-60	Raingage R-3F 0	0	4-4-60	0	0
3-9	.26s	0	3:17p	0	0	3:22p	0	0
3-10	.04s	0	:19	1.80	.06	:25	0	T
3-12	.10s	0	:22	1.20	.12	:29	.001	T
3-16	.26s	0	:24	.60	.14	:33	.001	T
3-23	0	T	:26	1.50	.19	:35	.002	T
3-29	.07	0	:30	1.20	.27	:36	.002	T
3-30	.39	0	:32	.90	.30	:39	.004	T
3-31	.04	0	:35	1.40	.37	:40	.005	T
4-3	1.11	.03	:38	1.60	.45	:42	.006	T
			:40	1.20	.49	:47	.024	T
			:47	.60	.56	:48	.027	T
			:50	1.50	.61	:49	.041	T
			:52	.90	.64	:51	.054	T
			4:01	.07	.65	:55	.060	.01
			:04	.20	.66	:56	.060	.01
			:08	.15	.67	:58	.057	.01
			:13	.36	.70	4:00	.054	.01
			:20	0	.70	:02	.048	.01
			:28	.08	.71	:07	.038	.02
			:32	.15	.72	:09	.032	.02
			:45	0	.72	:13	.024	.02
			:49	.15	.73	:24	.011	.02
			:52	.20	.74	:30	.008	.03
			:55	.40	.76	:33	.007	.03
			5:00	.12	.77	:49	.001	.03
			:22	.03	.78	6:50	0	.03
			:29	.09	.79			
			:34	.36	.82			
			:40	.10	.83			
			:45	.24	.85			
			6:30	.04	.88			
			:56	.02	.89			
			7:13	.04	.90			
			:25	0	.90			
			:36	.11	.92			
			:52	.04	.93			
			8:24	0	.93			
			:36	.05	.94			
			:58	.03	.95			
			9:04	0	.95			
			:14	.06	.96			

Watershed Conditions: Contour strips with rotation of corn, small grain and clover. Clover seeded in wheat during spring. Corn followed second year clover. At the time of this event 58.4% of area was in dormant clover and orchard grass sod, good cover; 32.2% of area was in fall wheat seeded in corn stover, medium cover; 9.4% of area in grassed waterway, good cover.

Notes: To convert runoff in in/hr to cfs, multiply by 6.131.



Note: Precipitation continued until 9:14p - April 4, 1960.  
Runoff continued until 6:50p - April 4, 1960.

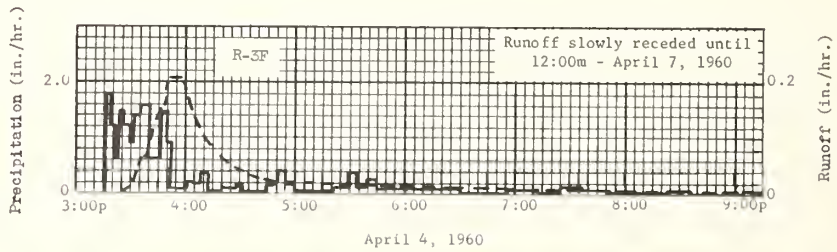
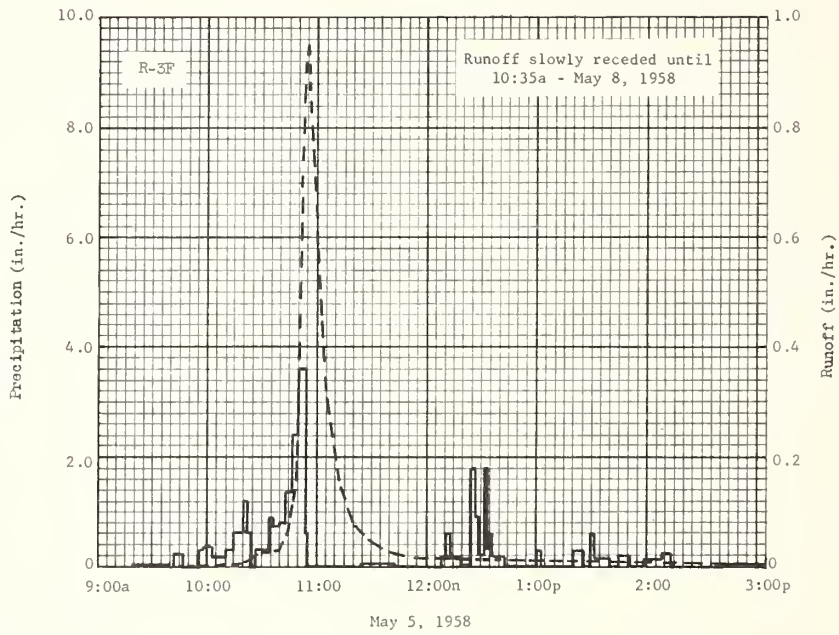
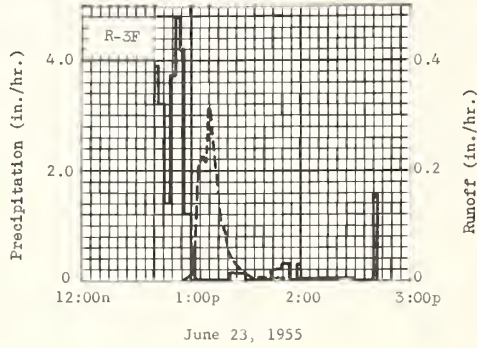


MONTHLY PRECIPITATION AND RUNOFF (Inches)								Blacksburg, Va. Watershed W-VI (Area - 7.70 acres)									
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
		1960	P	1.62	4.12	2.32	2.84	4.42	3.11	1.29	2.93	2.40	3.17	0.96	2.15	31.33	
	Q	T	.10	.27	.38	.04	.06	0	T	.01	T	0	T	.86			
1961	P	1.17	4.40	4.24	2.57	2.35	4.07	2.49	4.62	.86	3.60	2.96	5.79	39.12			
	Q	T	.10	.02	T	T	T	.03	0	0	.02	.03	.28	.48			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Blacksburg, Va. Watershed W-VI									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL														
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days		
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	
1960	6-5	0.24	4-4	0.11	4-4	0.13	4-3	0.16	4-3	0.18	4-3	0.28	4-3	0.36	4-3	0.38	
1961	12-18	.08	12-18	.07	12-18	.10	12-18	.11	12-18	.16	12-18	.16	12-18	.16	12-13	.28	
Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Volumes - excellent. Watershed Conditions: All cultivated; contoured strips with a rotation of corn, small grain, and clover. A mulch tillage program is practiced. No crop residue is removed except one clover hay crop each year. 1/ Precipitation from Raingage R-3F.																	
12-63 SELECTED RUNOFF EVENTS								Blacksburg, Va. Watershed W-VI									
Antecedent conditions			Rainfall			Runoff											
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)									
<u>Event of June 23, 1955</u>																	
5-23-55	Raingage R-3F 0.08	0	6-23-55	Raingage R-3F 6-23-55	0	6-23-55	0	0									
5-24	.09	0	12:40p	0	0	12:57p	0	0									
6-6	.20	0	:42	3.90	.13	1:01	.072	T									
6-7	.80	0	:45	3.20	.29	:02	.062	T									
6-8	.01	0	:48	1.40	.46	:03	.157	T									
6-10	.24	0	:52	3.75	.71	:04	.206	.01									
6-11	.77	0	:54	4.80	.87	:05	.218	.01									
6-12	.03	0	:56	4.20	1.01	:06	.223	.01									
6-19	.11	0	1:00	1.20	1.09	:07	.229	.02									
			:02	.60	1.11	:08	.212	.02									
Watershed Conditions: Contour strips, cultivated with a rotation of corn, small grain and clover. Clover seeded in wheat during spring. Corn follows second year clover sod plowed so mulch remained on surface. At the time of event 22% (2 strips) was in corn 8 to 12" high; 34.3% of area (2 strips) was in wheat 34 to 38" high with an undergrowth of spring seeded clover; 28.9% of area (3 strips) was in second year clover 18 to 20" high, good cover; 14.8% of area was in grassed waterway, good cover.																	
												:22	0	1.11	:09	.302	.02
												:30	.15	1.13	:10	.317	.03
												:44	0	1.13	:11	.290	.04
												:50	.20	1.15	:13	.206	.04
												:54	.30	1.17	:14	.171	.05
												:58	0	1.17	:17	.107	.05
												2:00	.30	1.18	:20	.060	.06
												:30	.02	1.19	:21	.049	.06
												:40	0	1.19	:23	.034	.06
			:42	1.50	1.24	:27	.017	.06									
						:33	.006	.06									
						2:15	0	.06									
<u>Event of May 5-8, 1958</u>																	
4-5-58	Raingage R-3F 0.01	0	5-5-58	Raingage R-3F 5-5-58	0	5-5-58	0	0									
4-6	.70	.02	9:19a	0	0	9:44a	0	0									
4-7	.09	0	:38	.03	.01	:51	.001	T									
4-10	.17	0	:42	0	.01	10:05	.001	T									
4-11	.09	0	:47	.24	.03	:10	.002	T									
4-15	.04	0	:56	0	.03	:19	.005	T									
4-16	.06	0	:58	.30	.04	:25	.017	T									
4-21	.06	0	10:03	.36	.07	:30	.022	T									
4-22	1.62	.03	:10	.17	.09	:35	.023	.01									
4-23	.12	T	:14	.30	.11	:39	.028	.01									
Continued on next page																	
Notes: To convert runoff in in/hr to cfs, multiply by 7.764. For map of watershed, see page 13.3-5.																	

SELECTED RUNOFF EVENTS						Blacksburg, Va. Watershed W-VI		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 5-8, 1956 (continued)</u>								
4-25-58	.08	0	5-5-58 10:20a	0.60	0.17	5-5-58 10:40a	0.032	0.01
4-26	.08	0	:22	1.20	.21	:44	.062	.01
4-27	.12	0	:24	.60	.23	:46	.093	.01
4-28	.58	T	:26	0	.23	:48	.144	.02
5-1	.30	T	:34	.30	.27	:49	.176	.02
5-2	.50	T	:36	.90	.30	:50	.265	.02
5-3	.01	0	:40	.75	.35	:52	.711	.04
5-5	.70 <u>1/</u>	.03 <u>2/</u>	:43	.80	.39	:54	.927	.07
<b>Watershed Conditions:</b> Contour strips, cultivated with a rotation of corn, small grain and clover. Clover seeded in wheat during spring. Corn follows second year clover sod plowed so mulch remained on surface. At event time 22.0% of area had been plowed prior to corn planting; 34.3% of area was in wheat 9 to 12" high; 28.9% of area was in clover-orchard grass mixture, good cover 10 to 12" high; 14.8% of area was in grassed waterway, good cover.			:47	1.35	.48	:55	.953	.08
			:50	2.40	.60	:57	.827	.11
			:54	3.60	.84	:59	.679	.14
			:55	.60	.85	11:00	.586	.15
			11:24	0	.85	:02	.456	.17
			:43	.03	.86	:04	.368	.18
			12:08p	0	.86	:06	.304	.19
			:11	.20	.87	:10	.207	.21
			:12	.60	.88	:11	.192	.21
			:19	.17	.90	:12	.171	.22
			:24	0	.90	:15	.127	.22
			:26	1.80	.96	:20	.083	.23
			:28	.90	.99	:23	.068	.24
			:31	.20	1.00	:29	.047	.24
			:32	1.80	1.03	:31	.042	.24
			:34	.30	1.04	:33	.038	.24
			:36	.60	1.06	:37	.030	.25
			12:43p	0.17	1.08	:43	.023	.25
			1:00	0	1.08	:48	.019	.25
			:02	.30	1.09	12:01p	.012	.25
:20	0	1.09	:23	.012	.26			
:26	.30	1.10	5-8-58					
:29	0	1.10	10:35a	0	.42			
:31	.60	1.12						
:40	.13	1.14						
:45	0	1.14						
:51	.20	1.16						
:58	0	1.16						
2:08	.12	1.18						
:13	.24	1.20						
:42	0	1.20						
3:04	.03	1.21						
<u>Event of April 4-7, 1960</u>								
3-4-60	Raingage R-3F 0	0	4-4-60	Raingage R-3F 0	0	4-4-60	0	0
3-9	.26s	0	3:17p	0	0	3:24p	0	T
3-10	.04s	0	:19	1.80	.06	:27	.004	T
3-12	.10s	0	:22	1.20	.12	:31	.017	T
3-16	.26s	0	:24	.60	.14	:33	.036	T
3-24	0	.03	:26	1.50	.19	:34	.050	T
3-26	0	.05	:30	1.20	.27	:36	.062	T
3-27	0	.10	:32	.90	.30	:37	.062	.01
3-28	0	.02	:35	1.40	.37	:38	.065	.01
3-29	.07	.02	:38	1.60	.45	:44	.135	.02
3-30	.39	.05	:40	1.20	.49	:46	.153	.02
3-31	.04	.02	:47	.60	.56	:48	.157	.03
4-1	0	T	:50	1.50	.61	:49	.182	.03
4-3	1.11	.13	:52	.90	.64	:50	.197	.03
4-4	0	.02 <u>3/</u>	4:01	.07	.65	:52	.207	.04
			:04	.20	.66	:56	.207	.05
			:08	.15	.67	:58	.202	.06
			:13	.36	.70	4:02	.171	.07
			:20	0	.70	:03	.157	.07
			:28	.08	.71	:05	.139	.08
Continued on next page								
<b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 7.764. <u>1/</u> 1:54a to 4:20s <u>2/</u> 2:16a to 9:05a <u>3/</u> 12:00m, 4-3-60 to 3:24p, 4-4-60								

SELECTED RUNOFF EVENTS			Blacksburg, Va. Watershed W-VI					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of April 4-7, 1960 - Continued</u>								
<p><u>Watershed Conditions:</u> Contour strips, with rotation of corn, small grain and clover. Clover seeded in wheat during spring. Corn followed second year clover. At the time of this event 56.3% of area was in dormant clover and orchard grass sod, good cover; 28.9% of area was in wheat, fall seeded in corn stover, medium cover; 14.8% of area was in grassed waterway, good cover.</p>			4:32p	0.15	0.72	4:07p	0.127	0.08
			:45	0	.72	:10	.104	.09
			:49	.15	.73	:14	.083	.10
			:52	.20	.74	:19	.068	.10
			:55	.40	.76	:24	.052	.11
			5:00	.12	.77	:29	.042	.11
			:22	.03	.78	:40	.027	.12
			:29	.09	.79	:55	.017	.12
			:34	.36	.82	:58	.017	.12
			:40	.10	.83	5:03	.019	.13
			:45	.24	.85	:05	.019	.13
			6:30	.04	.88	:34	.012	.13
			:56	.02	.89	:37	.012	.13
			7:13	.04	.90	:53	.016	.14
			:25	0	.90	:55	.016	.14
			:36	.11	.92	7:02	.007	.15
			:52	.04	.93	:50	.006	.16
			8:24	0	.93	9:41	.004	.16
			:36	.05	.94	10:15	.004	.17
			:58	.03	.95	4-7-60		
		9:04	0	.95	12:00m	0	.23	
		:14	.06	.96				

Notes: To convert runoff in in/hr to cfs, multiply by 7.764.



BLACKSBURG, VIRGINIA WATERSHED W-VI



MONTHLY PRECIPITATION AND RUNOFF (Inches) <sup>1/</sup>										Blacksburg, Va. Thorne Creek Watershed W-I Area - 3,054 acres (4.77 sq. mi.)				
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	1.60	5.43	3.19	2.53	3.24	2.30	3.72	2.77	2.80	2.98	0.74
	Q	.40	.87	1.62	2.11	.75	.47	.45	.29	.23	.19	.16	.15	7.69
1961	P	1.09	3.59	4.14	2.26	3.41	3.75	2.32	5.26	1.04	3.20	3.05	5.00	38.11
	Q	.22	.37	.36	.40	.31	.23	.11	.12	.07	.02	.03	.26	2.50

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Blacksburg, Va. Thorne Creek Watershed W-I						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	4-3	0.04	4-3	0.04	4-3	0.07	4-3	0.12	4-3	0.16	4-3	0.23	4-3	0.45	3-30	1.09
1961	2-12	.01	2-12	.01	2-12	.01	2-12	.03	2-12	.04	12-18	.05	12-18	.07	2-7	.16

Notes: Quality of records: Monthly P - excellent; Q - fair prior to July 1961, then good. Annual Maximum Discharges and Volumes - good. Watershed conditions: as described under "Watershed Conditions" for event of April 3-4, 1960. Previously published SURFACE DRAINAGE (page 13.6-1, Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, ARS, SWC, MP 945) should be revised to show that 2.9% of area is above sinks with no contribution to surface runoff.

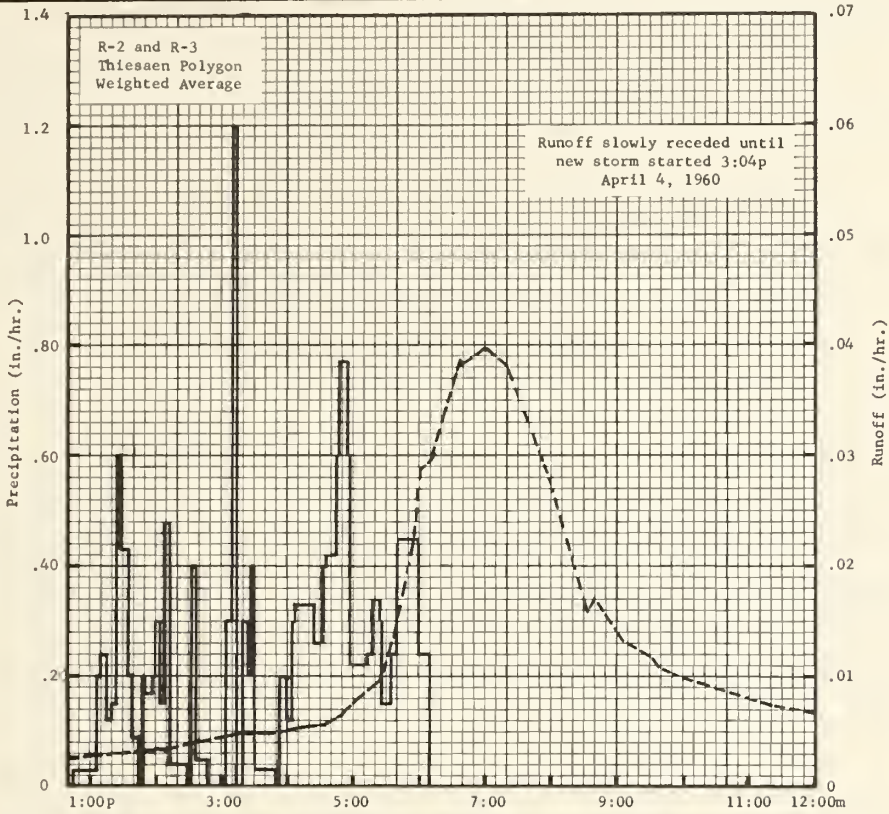
SELECTED RUNOFF EVENTS										Blacksburg, Va. Thorne Creek Watershed W-I				
Antecedent conditions			Rainfall <sup>1/</sup>				Runoff <sup>2/</sup>							
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)						
Rain gages R-1, R-2, R-3 <sup>1/</sup>			Event of April 3 and 4, 1960											
3-4,8-60	0	0.3631	4-3-60	Rain gages R-2 and R-3 <sup>1/</sup>	0	4-3-60	0	0						
3-9	.60	.0468	12:45p	0	0	12:55p	0.0027	0						
3-10	.01	.0456	1:07	.03	.01	2:10	.0033	.0037						
3-11	.02	.0408	:10	.20	.02	:38	.0040	.0054						
3-12	.12	.0360	:15	.24	.04	3:16	.0048	.0082						
3-13,15	0	.0954	:20	.12	.05	:48	.0048	.0108						
3-16	.51	.0288	:24	.15	.06	4:08	.0053	.0124						
3-17,28	0	.5127	:28	.60	.10	:33	.0056	.0147						
3-29	.10	.0957	:35	.43	.15	:50	.0066	.0164						
3-30	.39	.1265	:38	.20	.16	5:25	.0098	.0213						
3-31	.03	.1028	:45	.09	.17	:36	.0130	.0234						
4-1,2	0	.1636	:47	0	.17	:54	.0221	.0286						
4-3	.01 <sup>3/</sup>	.0364 <sup>4/</sup>	:50	.20	.18	6:01	.0287	.0316						
			:57	.17	.20	:10	.0295	.0360						
			2:00	.20	.21	:25	.0342	.0439						
Watershed Conditions:	Farm wood		:04	.30	.23	:37	.0387	.0512						
	lots - 5%; cultivated - 33%, common		:08	.15	.24	:38	.0381	.0519						
	rotation is corn, small grain and		:13	.48	.28	7:00	.0397	.0662						
	hay; pasture - 62%, usually good		:30	.04	.29	:20	.0381	.0792						
	cover of native bluegrass combined		:33	0	.29	:57	.0284	.0997						
	with other grasses and clover.													
	Conditions are consistent from year		:36	.40	.31	8:33	.0159	.1131						
	to year.		:47	.05	.32	:40	.0171	.1151						
			3:05	0	.32	9:06	.0132	.1216						
			:11	.30	.35	:30	.0119	.1266						
			:13	1.20	.39	:38	.0109	.1281						
			:20	0	.39	:55	.0100	.1311						
			:24	.30	.41	11:20	.0074	.1434						
			:27	.20	.42	12:00m	.0068	.1481						
			:30	.40	.44	4-4-60								
			:50	.03	.45	2:10a	.0057	.1617						
			:54	0	.45	7:40	.0052	.1917						
			4:00	.20	.47	3:04p	.0049 <sup>5/</sup>	.2296						
			:05	.12	.48									
			:07	.30	.49									
			:25	.33	.59									

Notes: To convert runoff in in/hr to cfs, multiply by 3079.4. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA, Misc. Pub. 945, p. 13.6-5. <sup>1/</sup> All precipitation is Thiessen polygon weighted amounts. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> 5:40a to 6:30a. <sup>4/</sup> Prior to 12:55p. <sup>5/</sup> Beginning of new runoff event.

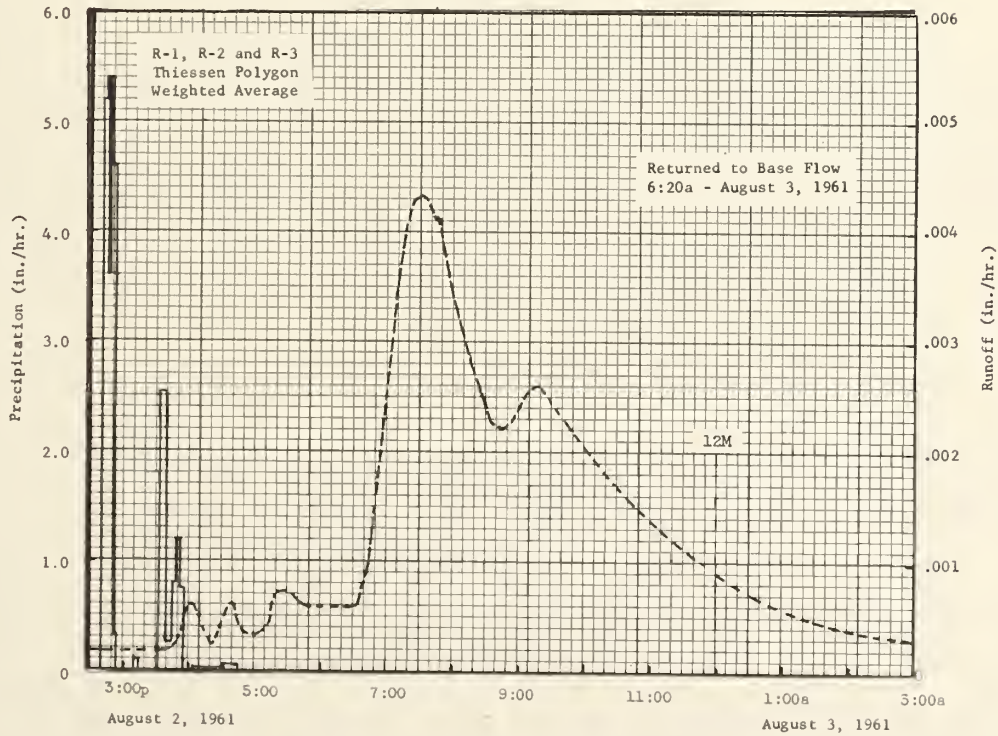
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SELECTED RUNOFF EVENTS				Blacksburg, Va. Thorne Creek Watershed W-I				
Antecedent conditions			Rainfall <u>1/</u>			Runoff <u>2/</u>		
Date	Rainfall <u>1/</u> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of April 3 and 4, 1960 (Continued)</u>								
			4-3-60					
			4:32	.26	.62			
			:35	.40	.64			
			:45	.42	.71			
			:48	.60	.74			
			:55	.77	.83			
			:57	.60	.85			
			5:13	.22	.91			
			:18	.24	.93			
			:25	.34	.97			
			:27	.30	.98			
			:35	.15	1.00			
			:40	.24	1.02			
			6:00	.45	1.17			
			:10	.24	1.21			
			<u>Total Rainfall</u>					
					R-2 1.19			
					R-3 1.23			
			<u>Event of August 2 and 3, 1961</u>					
	Rain gages R-1, R-2, R-3 <u>1/</u>			Rain gages R-1, R-2 & R-3 <u>1/</u>				
7-3-61	0.03	0.0048	8-2-61			8-2-61		
7-4,6	0	.0144	2:40p	0	0	3:40p	0.0002	0
7-7	.08	.0048	:43	5.20	.26	:57	.0005	T
7-8	.13	.0048	:45	5.40	.44	4:02	.0006	.0001
7-9,11	0	.0082	:48	3.60	.62	:06	.0006	.0001
7-12	.52	.0043	:50	5.40	.80	:14	.0004	.0002
7-13	0	.0037	:53	4.60	1.03	:26	.0002	.0002
7-14	.02	.0024	:55	.30	1.04	:32	.0005	.0003
7-15	.05	.0024	3:10	0	1.04	:40	.0006	.0003
7-16	.10	.0024	:15	.12	1.05	:44	.0004	.0004
7-17	.02	.0024	:33	0	1.05	:52	.0003	.0004
7-18	.26	.0043	:42	2.53	1.43	5:04	.0003	.0005
7-19	.05	.0045	:47	.24	1.45	:12	.0004	.0005
7-20	.31	.0052	:50	.80	1.49	:20	.0007	.0006
7-21	.06	.0024	:53	1.20	1.55	:32	.0007	.0007
7-22	.11	.0024	:57	.75	1.60	:44	.0006	.0009
7-23	.27	.0032	4:05	0	1.60	6:36	.0006	.0014
7-24	.03	.0037	:35	.02	1.61	:48	.0010	.0015
7-25	.10	.0036	:45	.06	1.62	7:09	.0034	.0023
7-26	0	.0024				:20	.0042	.0030
			<u>Total Rainfall</u>					
7-27	T	.0074				:28	.0043	.0036
7-28,30	0	.0072	R-1	1.47		:36	.0043	.0042
7-31	T	.0024	R-2	1.74		:44	.0041	.0047
8-1	0	.0024	R-3	1.62		:48	.0041	.0050
8-2	0	.0026 <u>3/</u>				:55	.0036	.0055
						8:08	.0031	.0062
						:36	.0023	.0074
						:48	.0022	.0079
						:56	.0023	.0082
						9:04	.0025	.0085
						:20	.0026	.0092
						:32	.0024	.0097
						:52	.0022	.0105
						10:56	.0014	.0117
						11:48	.0010	.0135
						12:00m	.0009	.0137
						8-3-61		
						1:00a	.0006	.0144
						2:00	.0004	.0150
						3:00	.0003	.0154
						5:40	.0003	.0162
						6:20	.0002 <u>4/</u>	.0164
<u>Watershed Conditions:</u> Same as event of April 3 and 4, 1960.								

Notes: To convert runoff in in/hr to cfs, multiply by 3079.4. 1/ All rainfall Thiessen polygon weighted amounts. 2/ Only selected point values which adequately define the hydrograph are shown. 3/ Prior to 3:56p. 4/ Normal base flow.



April 3, 1960



August 2, 1961

August 3, 1961

BLACKSBURG, VA. THORNE CREEK WATERSHED W-I



BLACKSBURG, VA. CRAB CREEK WATERSHED W-I

LOCATION: Montgomery County, Va., 2 mi. W. of Christiansburg, Va., New River.

AREA: 786 acres (1.23 sq. mi.)

SHAPE: Roughly rectangular, about 1.3 mi. by 0.95 mi.

SLOPES: 6% is in 0-2%; 22% is in 2-7%; 50% is in 7-15%; 17% is in 15-25%; 4% is in 25-45% and 1% is 45% (+). Aspect (N)

SOILS: Parent material - dolomitic and calcic limestones and shales. Lodi loam and cherty loam - 35%; well drained with medium-textured surface and moderately fine to fine-textured subsoil with moderate permeability. Fredrick silt loam and cherty silt loam - 27%; well drained with medium-textured surface and moderately fine to fine-textured, moderately permeable subsoil. Greendale - 16%; moderately well drained with medium-textured surface and fine-textured subsoil with compacted layer, moderately slow permeability. Litz silt loam - 9%; medium-textured surface, little or no subsoil. Other associated soils - 13%.

EROSION: 1 - 83%; 2 - 15%; 3 - 0.6%; 4 - 1.4%.

LAND CAPABILITY: II - 32%; III - 36%; IV - 24%; VI - 4%; VII - 4%.

SURFACE DRAINAGE: Good, principal waterway - 2.7 mi.

CHARACTER OF FLOW: Perennial.

INSTRUMENTATION: Runoff - prior to June, 1959, all flows measured with double 6 ft. x 6 ft. box highway culvert. After June, 1959, low flows measured with double Virginia V-notch weirs located at culvert entrance, medium and high flows measured with double 6 ft. x 6 ft. box highway culvert-V-notch combination. FW-1 water level recorder for entire period. Precipitation - two recording rain gage stations.

WATERSHED CONDITIONS: Farm woods (hardwood predominating) - 12%; cultivated - alfalfa and other hay crops - 19%, small grain or corn - 10%, (total - 29%); pasture - 57%, usually good cover of native bluegrass combined with other grasses and clover; idle land - 1%; roads - 1%. Conditions are consistent from year to year.

GENERALLY REPRESENTS: Complex land use areas in the Southern Appalachian Ridges and Valleys land resource area (N-128) and the Northern Appalachian Ridges and Valleys land resource area (S-147) in Tennessee, Virginia, Maryland and Pennsylvania.

MONTHLY PRECIPITATION AND RUNOFF (Inches)													Blacksburg, Va. Crab Creek Watershed W-I	
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	1957	P								1.54	6.11	1.70	3.59	2.44
	Q								.25	.35	.33	.60	1.17	2.70
1958	P	2.21	2.05	3.53	3.44	4.70	2.59	4.00	2.80	1.44	1.68	1.84	3.96	34.24
	Q	1.06	1.27	1.57	1.83	2.09	.73	.64	.46	.47	.29	.27	.55	11.23
1959	P	2.31	1.14	2.62	4.37	3.29	1.46	3.59	2.92	6.44	3.53	2.06	2.48	36.21
	Q	.82	.48	.70	1.18	.68	.27	.26	.25	.31	.46	.38	.70	6.49
1960	P	1.32	4.79	3.25	2.72	3.92	2.74	1.61	4.04	2.25	3.74	.64	1.52	32.54
	Q	.65	1.14	2.50	2.22	.78	.44	.36	.31	.25	.29	.23	.24	9.31
1961	P	1.10	3.94	4.45	2.29	2.31	4.22	3.06	5.18	.41	3.34	3.72	5.27	39.29
	Q	.28	.81	1.02	.78	.48	.35	.27	.58	.23	.26	.31	1.09	6.46
Normal P <u>2/</u>		2.90	2.93	3.33	3.14	4.47	4.20	4.79	3.83	2.97	2.81	2.26	2.98	40.61

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													Blacksburg, Va. Crab Creek Watershed W-I			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	7-28	0.07	7-28	0.04	7-28	0.05	7-28	0.08	7-28	0.08	11-25	0.11	12-7	0.17	12-6	0.40
1958	2-27	.03	2-27	.03	2-27	.05	12-28	.13	12-28	.21	3-30	.27	5-5	.42	5-5	1.02
1959	1-22	.04	1-21	.03	1-21	.06	1-21	.16	1-21	.20	1-21	.25	1-21	.28	4-12	.50
1960	4-3	.14	4-3	.13	4-3	.22	4-3	.32	4-3	.42	4-3	.52	4-3	.73	3-27	1.76
1961	8-25	.17	8-25	.12	8-25	.21	8-25	.30	8-25	.32	8-25	.33	8-25	.34	12-11	.56

Notes: Records began July 2, 1957. Quality of records: Monthly P - excellent; Q - fair prior to June 1959, then good. Annual Maximum Discharges and Volumes - good. Watershed conditions: as described under "Watershed Conditions" above. 1/ Monthly precipitation is Thiessen polygon weighted amounts. 2/ Normal P based on 69-year record (1893-1961) at Blacksburg, Virginia.



SELECTED RUNOFF EVENTS			Blacksburg, Va. Crab Creek Watershed W-I					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 28 and 29, 1957</u>								
7-2,8-57	0	nr	7-28-57	Rain gages	R-1 and R-2 <sup>1/</sup>	7-28-57		
7-9	.56	nr	2:20p	0	0	2:46p	0.0006	0
7-10	T	nr	:25	.12	.01	3:29	.0012	.0007
7-11,16	0	nr	:28	1.60	.09	:32	.0037	.0008
7-17	.33	nr	:30	1.80	.15	:36	.0090	.0012
7-18	.27	nr	:33	1.40	.22	:38	.0185	.0017
7-19	0	0.0081	:35	2.70	.31	:42	.0265	.0032
7-20,22	0	.0360	:38	4.00	.51	:44	.0377	.0043
7-23	.30	.0125	:40	1.20	.55	:46	.0679	.0060
7-24	.01	.0120	:42	.60	.57	:52	.0728	.0131
7-25,26	0	.0240	:45	1.80	.66	4:00	.0656	.0223
7-27	.33	.0128	:47	1.20	.70	:04	.0480	.0261
7-28	.02 <sup>3/</sup>	.0086 <sup>4/</sup>	:50	.20	.71	:10	.0380	.0304
			3:50	.02	.73	:24	.0231	.0373
						:32	.0204	.0402
<u>Watershed Conditions:</u>			<u>Total Rainfall</u>					
As described under "Watershed Conditions" on page 13.7-1.				R-1	0.18	:44	.0135	.0436
				R-2	.80	:58	.0105	.0464
						5:16	.0151	.0503
						:28	.0159	.0534
						:40	.0151	.0565
						6:26	.0070	.0647
						:36	.0076	.0659
						:40	.0070	.0664
						7:30	.0043	.0712
						8:26	.0027	.0743
						9:00	.0022	.0757
						12:00m	.0010	.0797
						7-29-57		
						6:20a	.0006 <sup>5/</sup>	.0845
<u>Event of July 21, 1959</u>								
6-21,22-59	0	0.0144	7-21-59	Rain gages	R-1 and R-2 <sup>1/</sup>	7-21-59		
6-23	.45	.0089	12:00m	0	0	12:02p	0.0003	0
6-24	0	.0084	:02	.60	.02	:08	.0004	0
6-25	T	.0072	:04	2.40	.10	:12	.0010	.0001
6-26	.05	.0072	:06	3.30	.21	:18	.0025	.0003
6-27,7-11	0	.1080	:10	1.05	.28	:27	.0090	.0011
7-12	.18	.0072	:12	3.90	.41	:28	.0146	.0013
7-13	0	.0072	:16	3.15	.62	:32	.0189	.0025
7-14	.26	.0072	:19	2.80	.76	:35	.0187	.0034
7-15,17	0	.0216	:21	2.40	.84	:47	.0100	.0063
7-18	T	.0072	:27	.90	.93	:50	.0150	.0069
7-19,20	0	.0144	:30	3.20	1.09	:52	.0166	.0074
7-21	0	.0036 <sup>6/</sup>	:33	.80	1.13	:56	.0153	.0085
			:35	.60	1.15	1:09	.0084	.0110
			:50	.04	1.16	:16	.0063	.0119
<u>Watershed Conditions:</u>								
As described under "Watershed Conditions" on page 13.7-1.			1:15	.02	1.17	:28	.0047	.0130
						:46	.0033	.0142
						:50	.0025	.0144
						:54	.0026	.0146
						2:08	.0017	.0151
						3:00	.0010	.0162
						6:44	.0004 <sup>5/</sup>	.0183
<u>Event of July 27, 1959</u>								
8-27,7-31-59	0	0.1000	7-27-59	Rain gages	R-1 and R-2 <sup>1/</sup>	7-27-59		
7-12	.18	.0072	2:12p	0	0	2:12p	0.0006	0
7-13	0	.0072	:14	1.80	.06	:20	.0026	.0002
7-14	.26	.0072	:16	4.20	.20	:28	.0048	.0007
7-15,17	0	.0216	:18	9.60	.52	:36	.0062	.0014

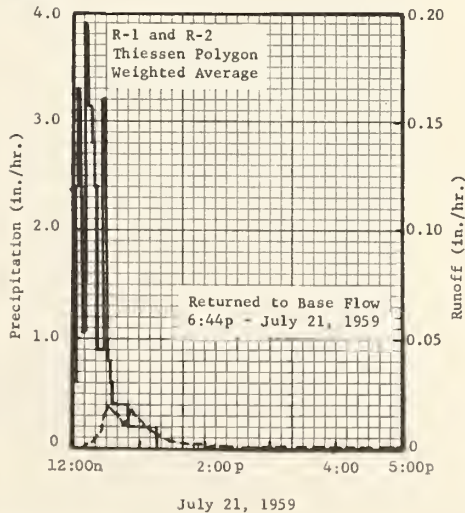
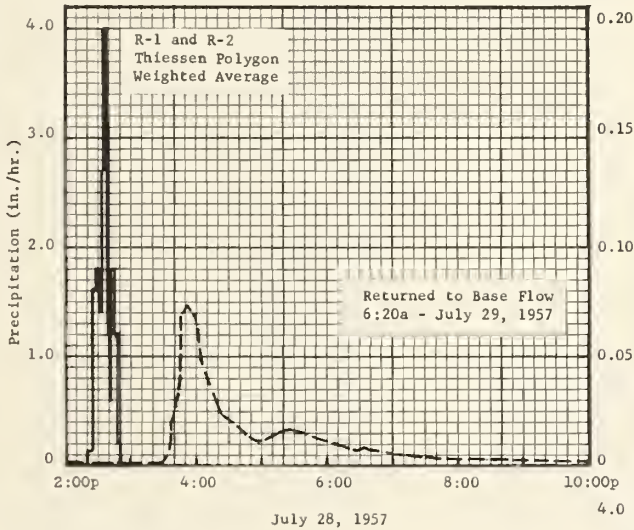
Notes: To convert runoff in in/hr to cfs, multiply by 792.55. <sup>1/</sup> All rainfall Thiessen Polygon weighted amounts - R-1 and R-2 gages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown for events of July 28-29, 1957 and July 21, 1959. <sup>3/</sup> 8:15a to 8:30a. <sup>4/</sup> Prior to 2:46p. <sup>5/</sup> Normal base flow. <sup>6/</sup> Prior to 12:02p.



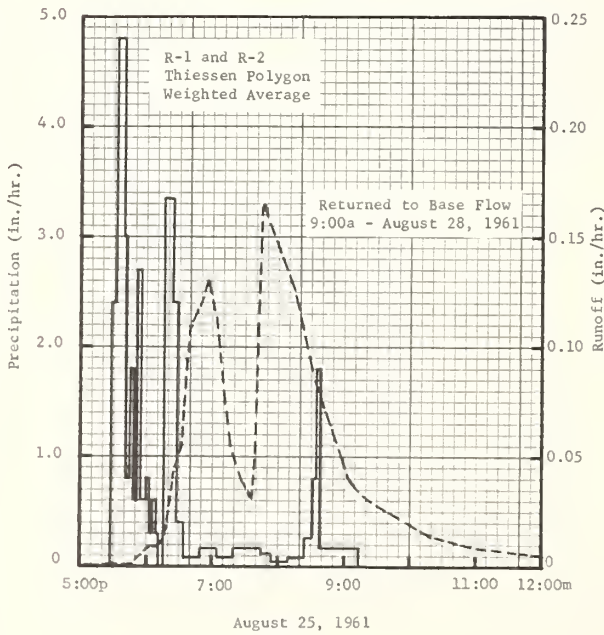
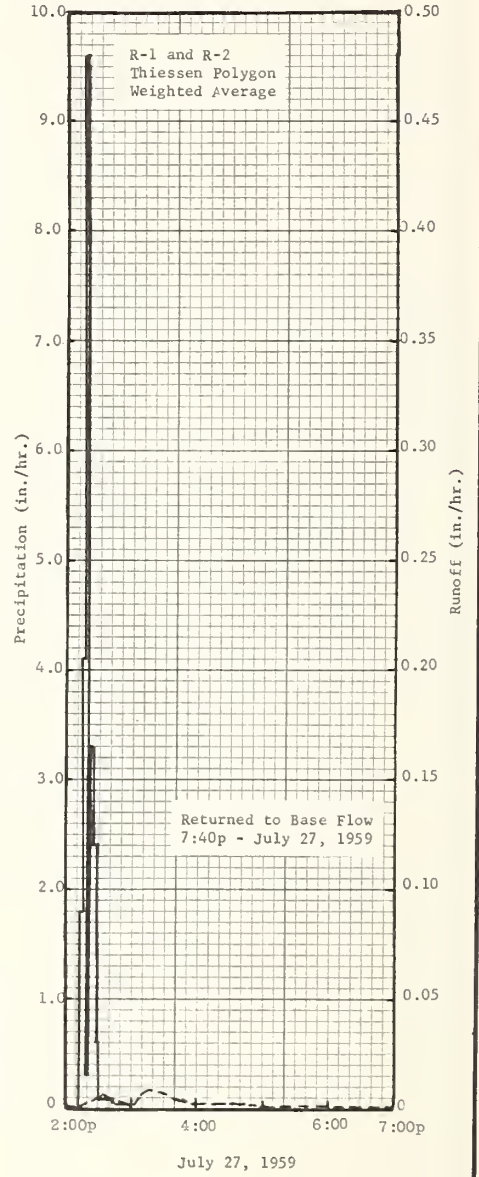
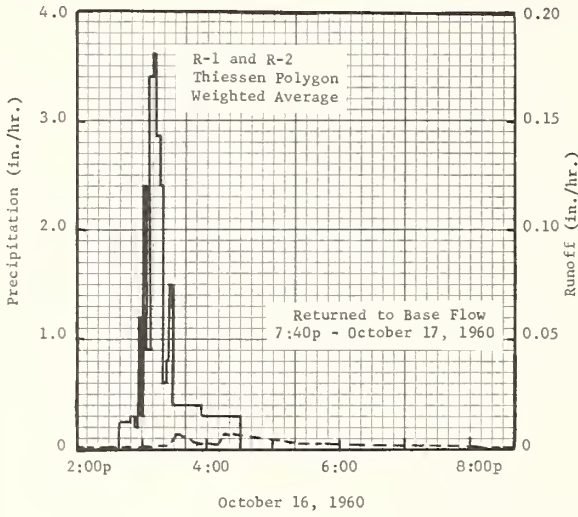
SELECTED RUNOFF EVENTS			Blacksburg, Va. Crab Creek Watershed W-I					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 25, 26, 27 and 28, 1961 (Continued)								
			8-25-61 7:20p	.08	2.04	8-25-61 8:16p	.1252	.1916
			:45	.17	2.11	:36	.0849	.2267
			:55	.12	2.13	9:08	.0362	.2589
			8:10	.04	2.14	:24	.0297	.2677
			:25	.08	2.16	10:20	.0138	.2876
			:32	.26	2.19	:56	.0092	.2945
			:35	.80	2.23	12:00m	.0056	.3021
			:38	1.80	2.32	8-26-61 2:00a	.0028	.3105
			9:08	.14	2.39	12:00m	.0006	.3331
				<u>Total Rainfall</u>		8-27-61 12:00m	.0005	.3458
				R-1	2.28	8-28-61		
				R-2	2.40	9:00a	.0004 <sup>3/</sup>	.3498

Watershed Conditions:  
As described under "Watershed Conditions" on page 13.7-1.

**Notes:** To convert runoff in in/hr to cfs, multiply by 792.55. <sup>1/</sup> All rainfall Thiessen Polygon weighted amounts - R-1 and R-2 gages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Normal base flow.

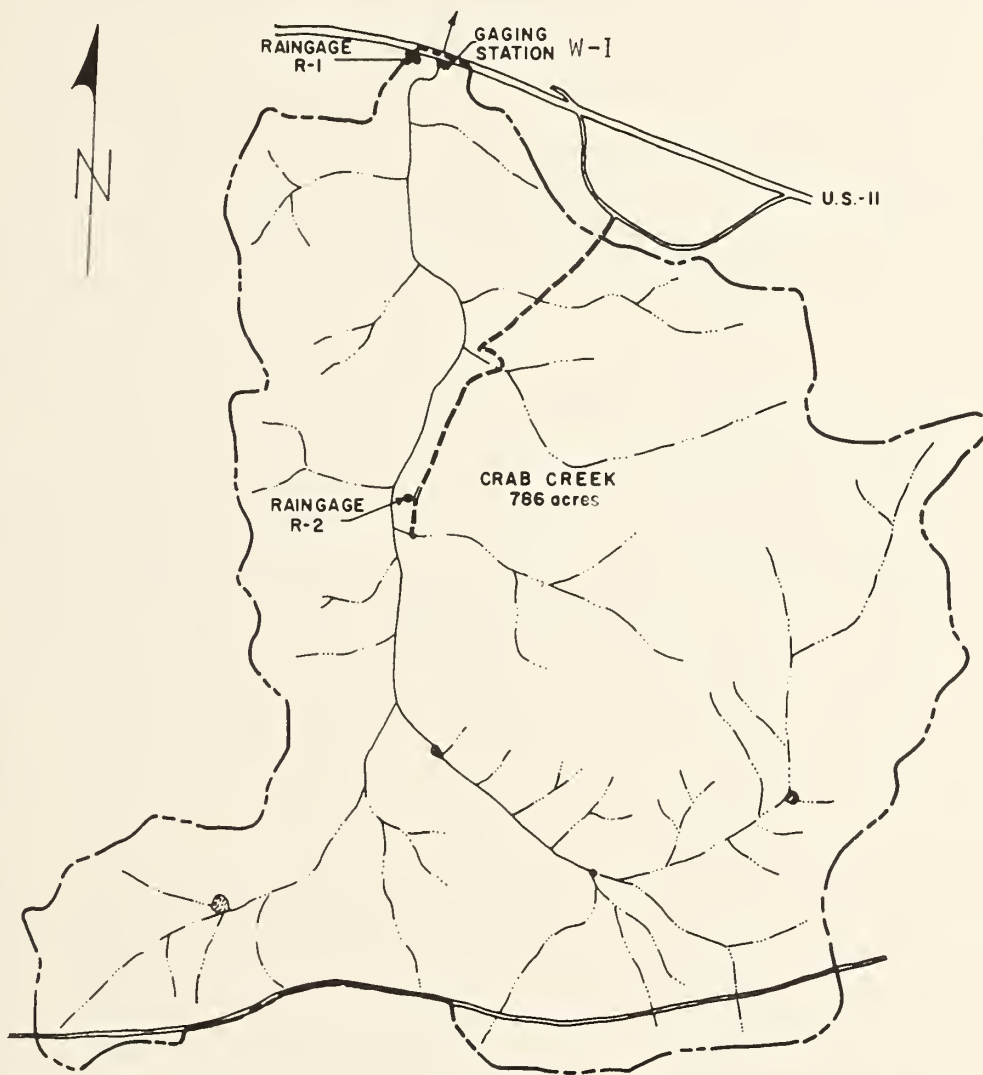


BLACKSBURG, VIRGINIA CRAB CREEK WATERSHED W-I



BLACKSBURG, VIRGINIA CRAB CREEK WATERSHED W-1





LEGEND

- WATERSHED BOUNDARY
- WATERWAY
- (CONTINUAL FLOW)
- (INTERMITTENT FLOW)
- ROAD 3 LANE
- IMPROVED ROAD
- FARM ROAD
- POND

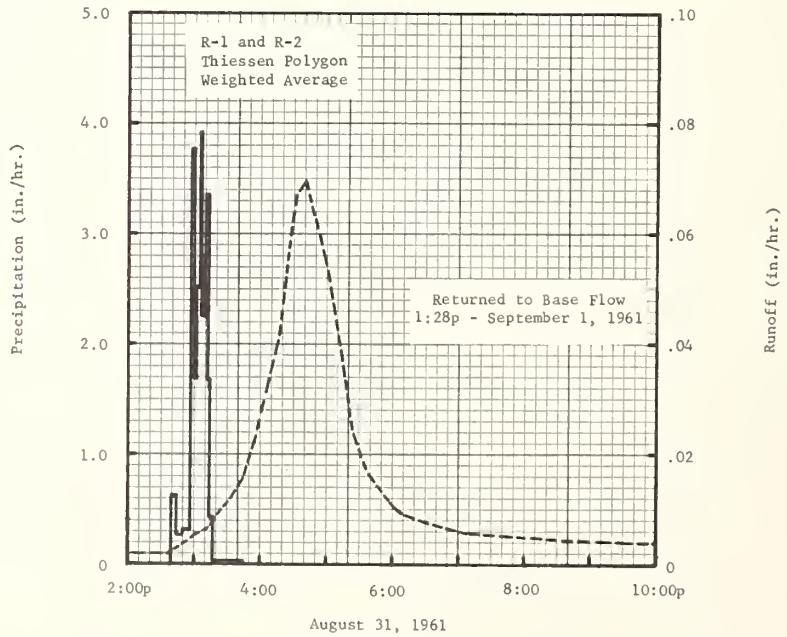
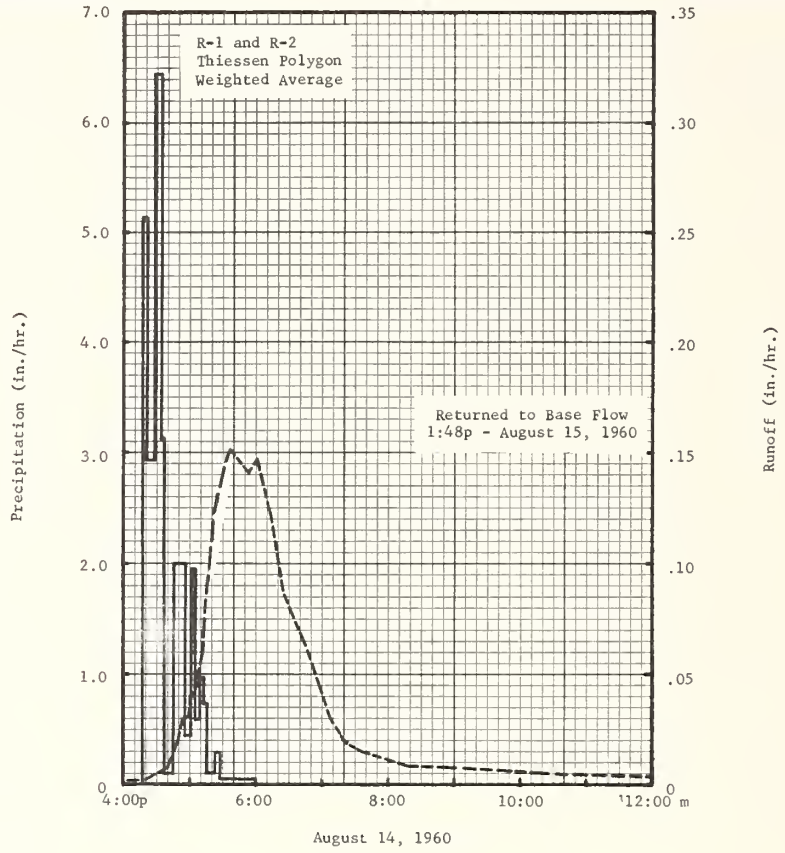


CRAB CREEK  
 WATERSHED W-I  
 MONTGOMERY COUNTY, VIRGINIA  
 (BLACKSBURG, VIRGINIA)



SELECTED RUNOFF EVENTS			Blackaburg, Va. Brush Creek Watershed W-I					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall (inches) <sup>1/</sup>	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31 and September 1, 1961								
8-1-61	0.52	0.0246	8-31-61	Raingages R-1 and R-2 <sup>1/</sup>	0	8-31-61		
8-2	.25	.0515	2:40p		0	2:35p	0.0021	0
8-3,4	0	.0565	:44	.63	.04	:40	.0024	.0002
8-5	.40	.0434	:50	.28	.07	3:00	.0055	.0015
8-6	.07	.0276	:58	.32	.11	:04	.0058	.0018
8-7	0	.0261	3:00	3.78	.24	:13	.0065	.0028
8-8	.02	.0260	:02	1.68	.29	:16	.0075	.0031
8-9	.03	.0256	:04	2.52	.38	:24	.0100	.0043
8-10,11	0	.0484	:07	3.92	.57	:30	.0114	.0053
8-12	.23	.0255	:10	2.24	.69	:44	.0157	.0085
8-13,16	0	.0858	:12	3.36	.80	:56	.0233	.0124
8-17	.01	.0202	:14	1.68	.85	4:16	.0403	.0230
8-18,19	0	.0404	:16	.42	.87	:24	.0541	.0293
8-20	.53	.0340	:45	.03	.88	:28	.0613	.0332
8-21	.24	.0332		Total Rainfall		:32	.0670	.0374
8-22	1.95	.2990		R-1	1.05	:40	.0697	.0465
8-23	.14	.0583		R-2	.63	:48	.0637	.0554
8-24	.56	.0581				5:00	.0543	.0672
8-25	.77	.1234				:20	.0293	.0813
8-26	.02	.0751				:24	.0243	.0831
8-27	.01	.0430				:36	.0173	.0872
8-28,30	0	.0976				:56	.0119	.0921
8-31	.02 <sup>3/</sup>	.0454 <sup>4/</sup>				6:08	.0097	.0943
						:20	.0084	.0961
						:32	.0076	.0977
						:48	.0069	.0996
						7:08	.0059	.1018
						8:16	.0047	.1077
						:48	.0043	.1101
						9:52	.0039	.1145
						11:00	.0035	.1187
						12:00m	.0033	.1221
						9-1-61		
						1:28p	.0019 <sup>5/</sup>	.1565
<p>Watershed Conditions: Same as Event of August 14-15, 1960.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 900.44. <sup>1/</sup> All rainfall Thiessen Polygon wtd. amounts (R-1 & R-2 gages). <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> 2:23a to 2:27a. <sup>4/</sup> Prior to 2:35p. <sup>5/</sup> Normal base flow.



BLACKSBURG, VA. BRUSH CREEK WATERSHED W-I





SELECTED RUNOFF EVENTS						Blacksburg, Va. Powells Creek Watershed W-I		
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 10, 11 and 12, 1959								
6-10,12-59	0	0.0288	7-10-59	Rain gages R-1 and R-2 <sup>1/</sup>		7-10-59		
6-13	.11	.0096	3:28p	0	0	3:30p	0.0002	0
6-14,20	0	.0624	:30	.57	.02	:40	.0003	0
6-21	.01	.0048	:33	.95	.07	:52	.0003	.0001
6-22	.01	.0048	:35	1.71	.12	4:00	.0008	.0002
6-23	.55	.0082	:37	1.99	.19	:04	.0025	.0003
6-24	.01	.0060	:39	.28	.20	:08	.0076	.0006
6-25	0	.0048	:44	.45	.24	:12	.0186	.0015
6-26	.01	.0048	:50	.19	.26	:16	.0385	.0034
6-27,30	0	.0192	:54	.71	.30	:22	.0668	.0087
7-1	.01	.0048	:58	2.42	.46	:24	.0816	.0111
7-2,8	0	.0336	4:00	5.12	.63	:30	.0807	.0193
7-9	.44	.0074	:05	3.87	.96	:34	.0652	.0241
7-10	.25 <sup>3/</sup>	.0039 <sup>4/</sup>	:10	2.16	1.14	:48	.0369	.0360
			:13	2.27	1.25	5:00	.0266	.0424
Watershed Conditions:			:15	2.84	1.35	:30	.0106	.0517
As described under "Watershed Conditions" on page 13.9-1.			:17	1.14	1.38	:52	.0057	.0547
			:19	.85	1.41	6:10	.0037	.0561
			:30	.15	1.44	:30	.0024	.0571
						7:00	.0015	.0581
Total Rainfall								
				R-1	1.38	8:00	.0008	.0592
				R-2	1.52	10:00	.0005	.0605
						12:00m	.0004	.0614
						7-11-59		
						12:00m	.0004	.0710
						7-12-59		
						12:00m	.0003 <sup>5/</sup>	.0794
Event of October 8, 1959								
9-8,28-59	0	0.1261	10-8-59	Rain gages R-1 and R-2 <sup>1/</sup>		10-8-59		
9-29	1.82	.0446	4:38p	0	0	4:52p	0.0003	0
9-30	.42	.0460	:40	.89	.03	5:00	.0004	0
10-1,4	0	.0329	:44	.45	.06	:04	.0005	.0001
10-5	.01	.0072	:50	.99	.16	:08	.0014	.0001
10-6	0	.0072	:55	.84	.23	:10	.0031	.0002
10-7	.13	.0072	5:00	2.98	.48	:14	.0086	.0006
10-8	0	.0051 <sup>6/</sup>	:04	5.96	.87	:15	.0149	.0008
			:07	4.97	1.12	:16	.0200	.0011
			:11	4.47	1.42	:18	.0360	.0020
Watershed Conditions:			:13	1.49	1.47	:20	.0691	.0038
As described under "Watershed Conditions" on page 13.9-1.			:20	.26	1.50	:21	.0873	.0051
			:25	.36	1.53	:24	.1166	.0102
			:40	.24	1.59	:28	.1390	.0187
			:50	.30	1.64	:30	.1415	.0234
			6:00	.18	1.67	:32	.1554	.0283
			:20	.30	1.77	:34	.1542	.0335
			:48	.06	1.80	:35	.2176	.0366
			:50	1.19	1.84	:36	.3866	.0416
			7:00	.18	1.87	:38	.3908	.0546
			:10	.12	1.89	:40	.3708	.0673
						:41	.3752	.0735
						:43	.3359	.0853
						:44	.3113	.0907
						:46	.2824	.1006
Total Rainfall								
				R-1	1.88	:48	.2645	.1097
				R-2	1.90	:50	.2391	.1181
						:52	.2048	.1255
						:54	.1858	.1320
						:56	.1626	.1378

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 183.52. <sup>1/</sup> All rainfall Thiessen Polygon weighted amounts - R-1 and R-2 gages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> .15 inch of rain 11:45p (7/9) to 3:00a (7/10), .03 in. 4:00a to 5:00a, .01 in. 5:05a to 6:30a and .06 in. 6:30a to 8:40a. <sup>4/</sup> Prior to 3:30p. <sup>5/</sup> Normal base flow. <sup>6/</sup> Prior to 4:52p.

SELECTED RUNOFF EVENTS			Blacksburg, Va. Powells Creek Watershed W-I					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of October 8, 1959 (Continued)								
						10-8-59		
						5:58p	0.1505	0.1431
						6:01	.1386	.1503
						:04	.1300	.1570
						:12	.1117	.1731
						:16	.0979	.1801
						:20	.0843	.1862
						:24	.0729	.1914
						:29	.0655	.1972
						:35	.0592	.2034
						:48	.0421	.2144
						:54	.0370	.2184
						:58	.0350	.2208
						7:04	.0329	.2241
						:11	.0309	.2279
						:19	.0266	.2317
						:32	.0186	.2366
						:35	.0177	.2375
						:40	.0167	.2389
						:45	.0147	.2402
						:54	.0132	.2423
						8:00	.0126	.2436
						:10	.0107	.2456
						:26	.0085	.2481
						:34	.0076	.2492
						:44	.0068	.2504
						:50	.0072	.2511
						9:00	.0054	.2522
						:10	.0052	.2530
						:22	.0048	.2540
						:36	.0045	.2551
						:54	.0041	.2564
						10:02	.0041 <sup>3/</sup>	.2570
Event of April 9, 10, 11 and 12, 1961								
3-10-61	0	0.0324	4-9-61	Rain gages R-1 and R-2 <sup>1/</sup>		4-9-61		
3-11, 12	0	.0468	4:10p	0	0	5:20p	0.0008	0
3-13	.28	.0274	5:30	.15	.05	6:16	.0009	.0008
3-14	.44	.1050	:50	.06	.07	:44	.0013	.0013
3-15, 17	0	.0820	6:10	.09	.10	:56	.0018	.0016
3-18	.13	.0222	:40	.20	.20	7:16	.0024	.0023
3-19	.12	.0342	:52	.15	.23	:20	.0026	.0025
3-20	0	.0240	7:07	0	.23	:36	.0028	.0032
3-21	1.19	.4910	:15	.15	.25	:44	.0034	.0036
3-22	.11	.1618	:30	.04	.26	:48	.0040	.0039
3-23	.02	.0525	:45	.36	.35	8:00	.0054	.0048
3-24	.36	.1447	8:05	.39	.48	:28	.0153	.0096
3-25, 27	0	.1167	:10	.36	.51	:52	.0668	.0261
3-28	.05	.0264	:18	.22	.54	9:00	.1401	.0398
3-29, 30	0	.0545	:30	.60	.66	:01	.1910	.0426
3-31	1.32	.6347	:40	.72	.78	:04	.2021	.0524
4-1	.06	.1293	:44	1.05	.85	:05	.2484	.0562
4-2	0	.0429	:47	.60	.88	:06	.3018	.0608
4-3	.04	.0413	:50	1.60	.96	:08	.3539	.0717
4-4, 6	0	.0787	:54	3.00	1.16	:10	.3825	.0840
4-7	.01	.0168	:57	2.00	1.26	:12	.4115	.0972
4-8	0	.0168	9:03	.50	1.31	:18	.4277	.1392
4-9	.01 <sup>4/</sup>	.0125 <sup>5/</sup>	:19	.08	1.33	:20	.3908	.1528
			:22	.20	1.34	:22	.3845	.1657
			:40	.10	1.37	:25	.3966	.1853
Watershed Conditions:								
As described under "Watershed Conditions" on page 13.9-1.			Continued on next page					
<p>Notes: To convert runoff in in/hr to cfs, multiply by 183.52. <sup>1/</sup> All rainfall Thiessen Polygon weighted amounts - R-1 and R-2 gages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Beginning of new runoff event. <sup>4/</sup> 1:20p to 2:45p. <sup>5/</sup> Prior to 5:20p.</p>								

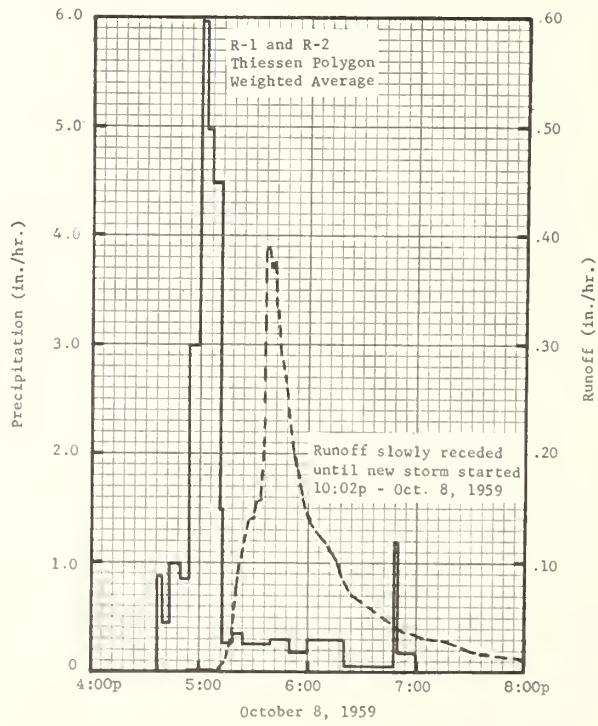
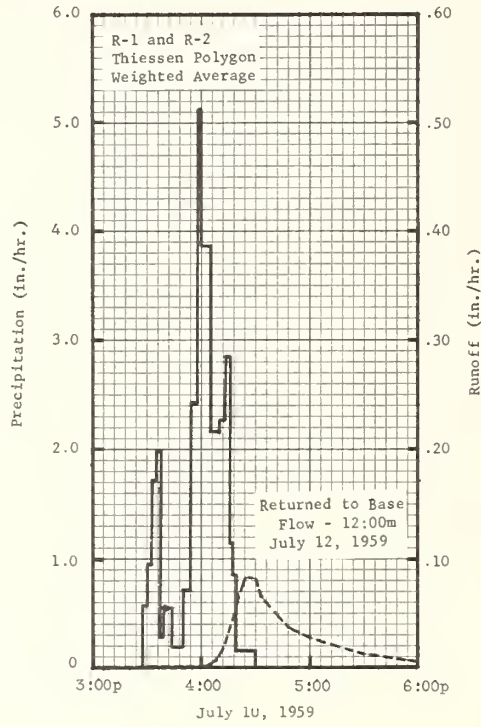
SELECTED RUNOFF EVENTS					Blacksburg, Va. Powells Creek Watershed W-I			
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of April 9, 10, 11 and 12, 1961 (Continued)</u>								
			4-9-61			4-9-61		
			10:30p	0	1.37	9:26p	0.3653	0.1916
			:33	.40	1.39	:28	.3367	.2033
			:50	.04	1.40	:30	.3145	.2142
			:55	.36	1.43	:32	.2830	.2241
			11:00	.48	1.47	:36	.2579	.2421
					<u>Total Rainfall</u>	:38	.2203	.2501
						:40	.1858	.2569
				R-1	1.48	:44	.1693	.2687
				R-2	1.45	:48	.1553	.2795
						:56	.1253	.2982
						10:02	.1118	.3101
						:08	.0981	.3206
						:22	.0654	.3397
						:36	.0497	.3531
						:56	.0350	.3672
						11:04	.0352	.3719
						:08	.0398	.3744
						:20	.0398	.3824
						:24	.0424	.3851
						:32	.0448	.3909
						:44	.0447	.3999
						12:00m	.0371	.4108
						4-10-61		
						12:36a	.0235	.4289
						1:20	.0138	.4426
						:44	.0119	.4478
						2:00	.0109	.4506
						:20	.0097	.4542
						:44	.0092	.4580
						:48	.0092	.4586
						3:00	.0097	.4605
						:52	.0097	.4689
						4:40	.0086	.4763
						6:00	.0068	.4865
						:48	.0059	.4916
						9:20	.0045	.5048
						1:00p	.0030	.5185
						2:40	.0027	.5233
						5:00	.0023	.5291
						7:00	.0020	.5334
						12:00m	.0018	.5429
						4-11-61		
						3:40a	.0017	.5493
						10:00	.0015	.5595
						4:00p	.0012	.5676
						12:00m	.0012	.5772
						4-12-61		
						9:00a	.0012 <sup>3/</sup>	.5880
			<u>Event of April 12, 13 and 14, 1961</u>					
3-15-61	0	0.0356	4-12-61	Raingages R-1 and R-2 <sup>1/</sup>		4-12-61		
3-16, 17	0	.0464	5:50p	0	0	6:34p	0.0018	0
3-18	.13	.0222	7:00	.05	.06	:40	.0021	.0002
3-19	.12	.0342	:03	.80	.10	:44	.0024	.0003
3-20	0	.0240	:10	.26	.13	7:02	.0025	.0011
3-21	1.19	.4910	:15	.36	.16	:07	.0031	.0013
3-22	.11	.1618	:20	.60	.21	:08	.0037	.0014
3-23	.02	.0525	:23	1.60	.29	:12	.0036	.0016
3-24	.36	.1447	:27	.75	.36	:20	.0050	.0022
3-25, 27	0	.1167	:37	.18	.39	:24	.0088	.0026

Notes: To convert runoff in in/hr to cfs, multiply by 183.52. <sup>1/</sup> All rainfall Thiessen Polygon weighted amounts - R-1 and R-2 gages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Normal base flow.

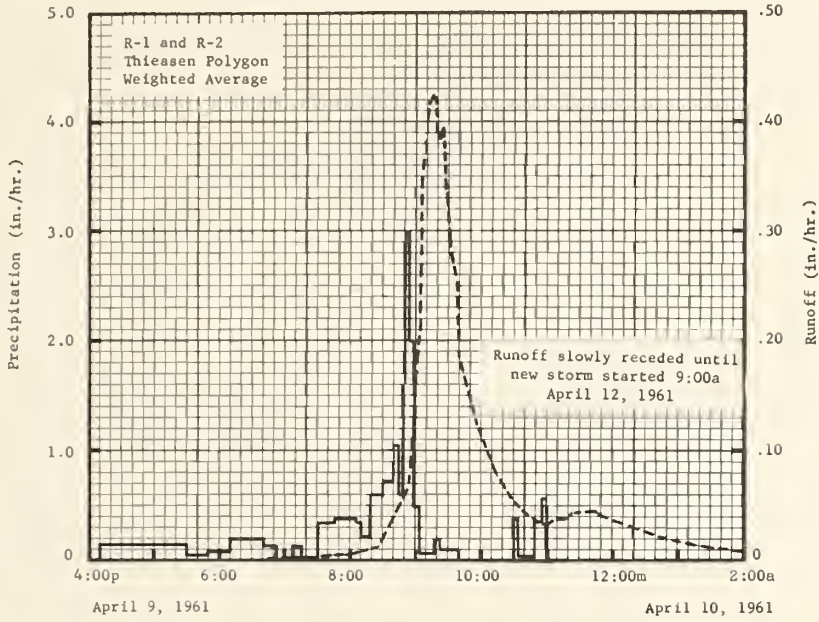


SELECTED RUNOFF EVENTS			Blacksburg, Va. Powells Creek Watershed W-I					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 12, 13 and 14, 1961 (Continued)								
3-28	0.05	0.0264	7:46p	0.73	0.50	7:28p	0.0160	0.0035
3-29,30	0	.0545	:50	1.05	.57	:34	.0273	.0056
3-31	1.32	.6347	:55	.36	.60	:40	.0314	.0086
4-1	.06	.1293	8:03	.30	.64	:51	.0676	.0176
4-2	0	.0429	:17	.17	.68	:53	.1127	.0206
4-3	.04	.0413	:30	.32	.75	:54	.1369	.0227
4-4,6	0	.0787	:43	.23	.80	:55	.1469	.0251
4-7	.01	.0168				8:00	.1593	.0379
4-8	0	.0168				:02	.1843	.0436
4-9	1.47	.4233				:04	.2018	.0500
				<u>Total Rainfall</u>				
				R-1	.82			
				R-2	.77			
4-10	.07	.1321				:08	.2113	.0638
4-11	0	.0343				:12	.2401	.0788
4-12	.08 <sup>3/</sup>	.0263 <sup>4/</sup>				:15	.2502	.0911
						:24	.2137	.1259
						:30	.1842	.1458
Watershed Conditions:								
As described under "Watershed Conditions" on page 13.9-1.								
						:31	.1842	.1489
						:32	.1790	.1519
						:36	.1701	.1635
						:40	.1651	.1747
						:44	.1509	.1852
						:48	.1297	.1946
						:52	.1236	.2030
						9:08	.1073	.2338
						:34	.0654	.2712
						:48	.0472	.2844
						10:16	.0288	.3021
						:48	.0187	.3148
						11:40	.0119	.3280
						12:00m	.0108	.3318
						4-13-61		
						1:00a	.0077	.3411
						2:00	.0068	.3483
						3:20	.0055	.3565
						5:40	.0045	.3682
						10:00	.0033	.3851
						11:28	.0030	.3897
						1:00p	.0027	.3941
						3:00	.0025	.3993
						7:00	.0020	.4083
						12:00m	.0020	.4183
						4-14-61		
						5:52a	.0018 <sup>5/</sup>	.4294

Notes: To convert runoff in in/hr to cfs, multiply by 183.52. <sup>1/</sup> All rainfall Thiessen Polygon weighted amounts - R-1 and R-2 gages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> .04 inch of rain 9:15a to 11:00a and .04 inch 3:00p to 5:00p. <sup>4/</sup> Prior to 6:34p. <sup>5/</sup> Normal base flow.

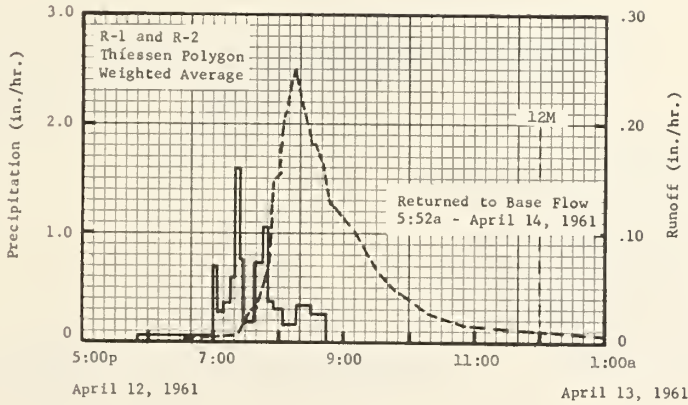


BLACKSBURG, VA. POWELLS CREEK WATERSHED W-1



April 9, 1961

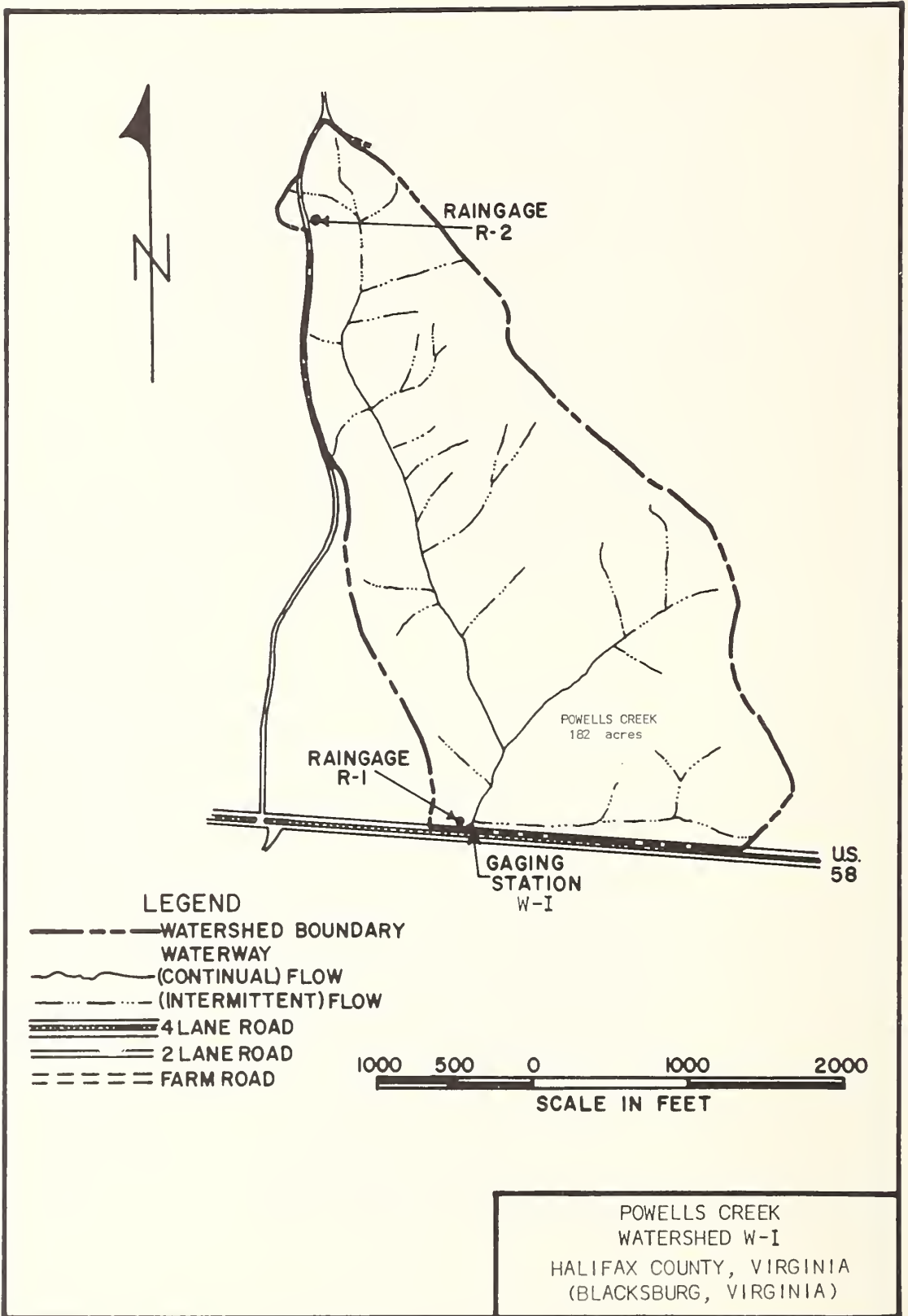
April 10, 1961



April 12, 1961

April 13, 1961

BLACKSBURG, VA. POWELLS CREEK WATERSHED W-1



LEGEND

- WATERSHED BOUNDARY
- ~~~~~ WATERWAY
- (CONTINUAL) FLOW
- (INTERMITTENT) FLOW
- ==== 4 LANE ROAD
- ==== 2 LANE ROAD
- FARM ROAD



POWELLS CREEK  
WATERSHED W-I  
HALIFAX COUNTY, VIRGINIA  
(BLACKSBURG, VIRGINIA)



BLACKSBURG, VA. LITTLE WINNS CREEK WATERSHED W-1

LOCATION: Halifax County, Va., 3½ mi. SW of Turbeville, Va., Winns Creek, Dan River.

AREA: 1471 acres (2.30 sq. mi.)

SHAPE: Roughly leaf shape, about 1.77 mi. long by 1.30 mi. wide

SLOPES: Pending detailed survey. Preliminary information indicates prevailing slopes range from 3% to 8%. Aspect - NW.

SOILS: Pending detailed survey. Preliminary information indicates that the soils are of the Appling and Cecil series which have formed from crystalline acidic rocks such as granite, gneiss and schist.

EROSION: Pending detailed survey.

LAND CAPABILITY: Pending detailed survey.

SURFACE DRAINAGE: Good; principal waterway about 12,500 ft. A well-defined, evenly distributed pattern of drainage ways.

CHARACTER OF FLOW: Perennial.

INSTRUMENTATION: Runoff - prior to June, 1960, double 6 ft. x 6 ft. concrete, box-type, highway culvert. After June, 1960, low flows measured with modified Virginia V-notch weir; medium and high flows measured with V-notch weir-highway culvert combination; continuous water-level recorder for period of record. Precipitation - three recording gages, one with weekly chart and two with 12-hour charts.

WATERSHED CONDITIONS: Mixed cover: farm woods - mixture of hardwoods and conifers. with pine predominating - 58%; row crops, mostly corn and tobacco - 13%, small grain - 4%, alfalfa and other hay crops - 5%, (total cultivation - 22%); pasture, native grass mixture, usually fair cover, 9%; idle land, 11%. Conditions are consistent from year to year.

GENERALLY REPRESENTS: Complex land use areas in the Southern Piedmont land resource area (P-136) lying in Southern Virginia, Central North Carolina, and Western South Carolina.

1/  
MONTHLY PRECIPITATION AND RUNOFF (Inches)

Blacksburg, Va. Little Winns Creek Watershed W-I

Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1958	P	4.17	3.34	3.26	4.88	5.57	1.79	3.74	5.89	1.07	3.70	
	Q	1.80	1.03	1.13	1.45	1.53	.29	.44	.76	.44	.68	.69	1.93	12.17
1959	P	1.93	1.75	1.79	4.80	4.19	2.71	3.85	3.12	5.91	7.43	2.14	2.82	42.44
	Q	.55	.47	.45	.70	.46	1.04	.25	.21	.42	2.21	.52	.91	8.19
1960	P	3.50	5.21	4.05	4.96	3.77	1.09	2.92	8.44	4.32	2.70	.52	1.93	43.41
	Q	1.05	2.36	1.89	1.78	2.25	.53	.44	1.39	.90	.56	.51	.57	14.23
1961	P	1.80	4.31	5.34	3.43	3.20	7.18	2.08	6.84	.93	2.30	1.64	5.30	44.35
	Q	.69	1.83	1.84	1.97	.94	1.51	.49	.96	.31	.31	.37	1.24	12.46
Normal	P 2/	3.48	2.87	3.92	3.42	3.96	4.30	5.15	4.43	3.75	2.74	3.12	3.16	44.30

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Blacksburg, Va. Little Winns Creek Watershed W-I

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	12-28	0.18	12-28	0.17	12-28	0.32	12-28	0.71	12-28	1.04	12-28	1.25	12-28	1.40	12-28	1.61
1959	10-10	1.12	10-10	.71	10-10	1.03	10-10	1.41	10-10	1.51	10-10	1.58	10-10	1.62	10-10	1.91
1960	8-26	.24	8-26	.20	8-26	.32	8-26	.52	8-26	.52	8-26	.63	4-3	.78	5-8	1.50
1961	6-24	.22	6-23	.20	6-23	.29	6-23	.38	6-23	.42	6-23	.46	2-7	.50	4-9	1.14

Notes: Records began 1-1-58. Quality of records: P - excellent; Q - fair prior to June 1960, then good; Annual Maximum Discharges and Volumes - good. Watershed conditions: as described under "Watershed Conditions" above. 1/ Monthly precipitation is Thiessen polygon weighted amounts. 2/ Normal P based on 29-yr. record (1933-1961) at Halifax, Virginia.



SELECTED RUNOFF EVENTS			Blacksburg, Va. Little Winns Creek Watershed W-I					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of October 10, 11 and 12, 1959 (Continued)								
						10-10-59		
						5:53p	.1460	1.2127
						:55	.1597	1.2177
						:56	.1839	1.2205
						:59	.0369	1.2275
						6:02	.1354	1.2321
						:05	.0982	1.2380
						:06	.1222	1.2398
						:08	.1309	1.2440
						:10	.0919	1.2474
						:12	.1353	1.2511
						:14	.1223	1.2553
						:16	.1201	1.2593
						:17	.1012	1.2612
						:20	.1280	1.2671
						:22	.1198	1.2713
						:26	.1168	1.2791
						:28	.1178	1.2830
						:32	.1082	1.2905
						7:12	.0686	1.3495
						:36	.0548	1.3740
						:55	.0518	1.3909
						8:26	.0343	1.4143
						:52	.0296	1.4285
						9:20	.0277	1.4417
						10:06	.0210	1.4600
						:20	.0186	1.4647
						12:00m	.0141	1.4912
						10-11-59		
						12:00m	.0019	1.6035
						10-12-59		
						2:00p	<sup>3/</sup> .0012	1.6239
Event of August 26, 27 and 28, 1960								
7-27-60	0.55	0.0192	8-26-60	Rain gages R-1, R-2, R-3 <sup>1/</sup>		8-26-60		
7-28	0	.0132	12:30p	0	0	1:00p	0.0010	0
7-29	.65	.0188	:40	.14	.02	2:00	.0017	.0013
7-30	0	.0141	:50	.22	.06	:20	.0067	.0022
7-31	.05	.0123	1:05	.14	.09	:32	.0078	.0035
8-1,3	0	.0352	:19	.37	.18	:36	.0128	.0042
8-4	.54	.0171	:35	.77	.38	:37	.0154	.0044
8-5	.02	.0141	:38	.78	.42	:43	.0156	.0060
8-6	0	.0132	2:00	.39	.57	:48	.0194	.0074
8-7	.02	.0122	:28	.76	.92	3:08	.0430	.0179
8-8	.71	.0291	:35	1.27	1.07	:17	.0574	.0254
8-9	0	.0129	:43	.98	1.20	:20	.0659	.0285
8-10	.49	.0283	:51	.54	1.27	:28	.0735	.0278
8-11	T	.0138	3:00	1.52	1.50	:38	.0909	.0514
8-12	.77	.0349	:05	.81	1.57	:40	.0973	.0546
8-13	.07	.0204	:14	.82	1.69	:42	.0990	.0578
8-14	.56	.0342	:35	.13	1.73	:47	.1146	.0667
8-15,20	0	.0770	:50	.39	1.83	:50	.1259	.0728
8-21	.39	.0118	4:17	.21	1.93	:53	.1623	.0801
8-22	1.87	.2128	:22	.30	1.95	:56	.1559	.0881
8-23	.09	.0330	:30	.23	1.98	4:00	.2566	.1014
8-24	0	.0187	:50	.03	1.99	:02	.2124	.1092
8-25	.01	.0157	:53	.20	2.00	:04	.2175	.1164
8-26	.24 <sup>4/</sup>	.0096 <sup>5/</sup>	5:10	.48	2.14	:07	.2169	.1273
			:40	.10	2.19	:12	.2356	.1461

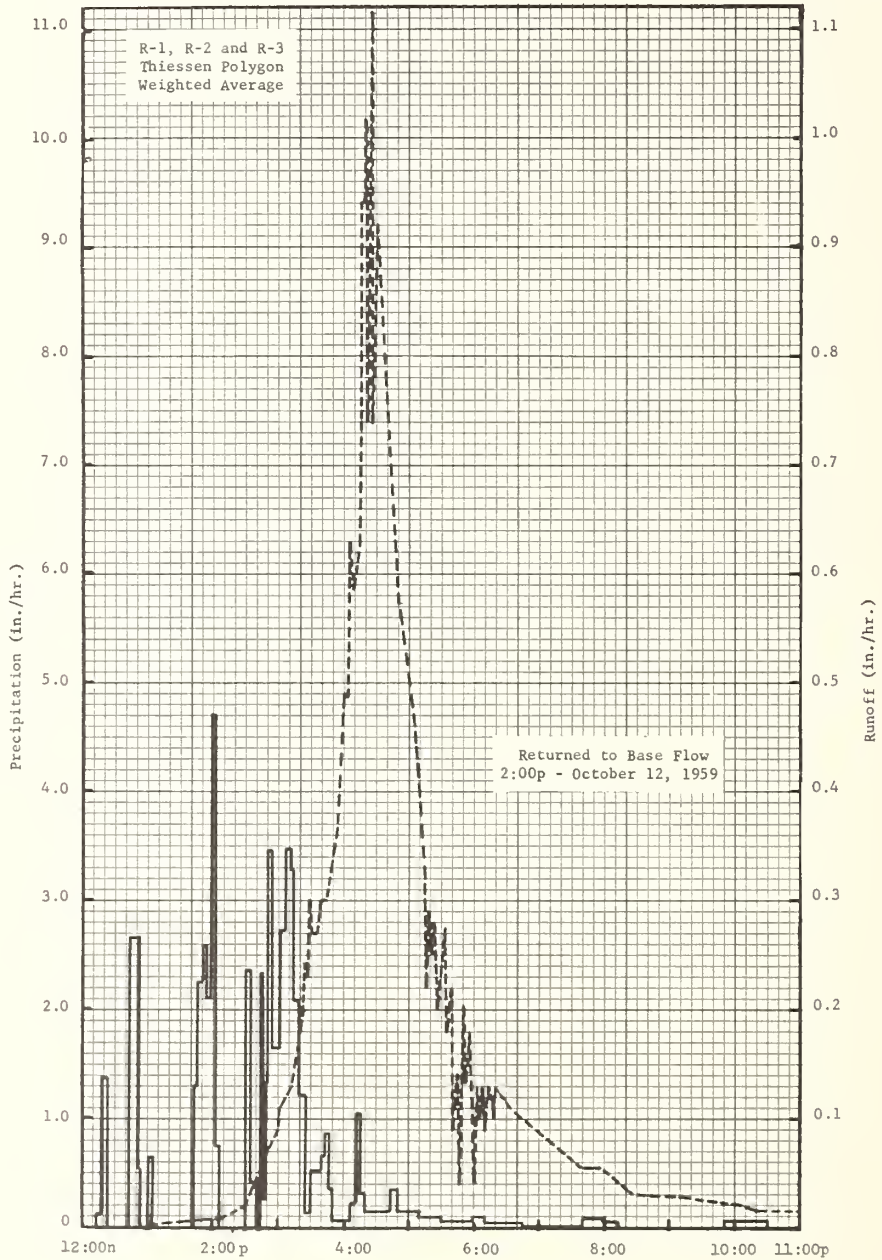
Notes: To convert runoff in in/hr to cfs, multiply by 1483.3. <sup>1/</sup> All rainfall Thiessen Polygon wtd. amounts - rain gages R-1, R-2 and R-3. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Normal base flow. <sup>4/</sup> 7:00a to 11:30a. <sup>5/</sup> Prior to 1:00p.





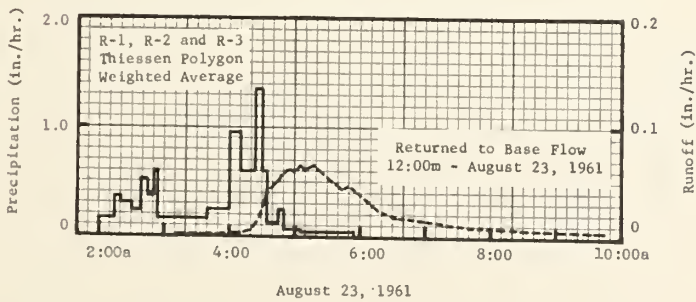
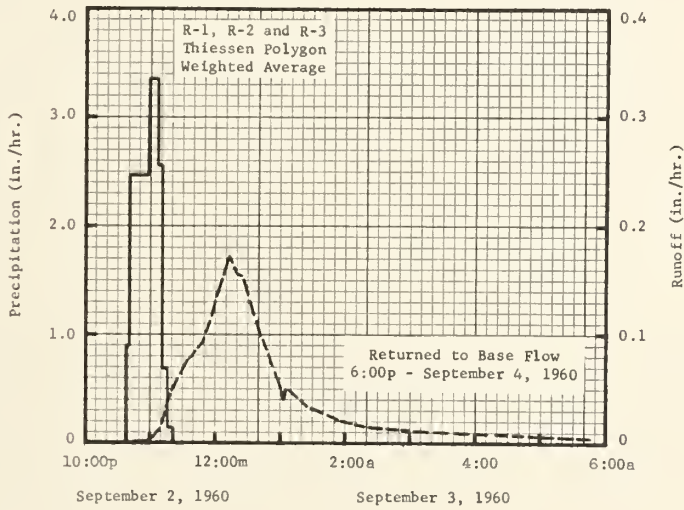
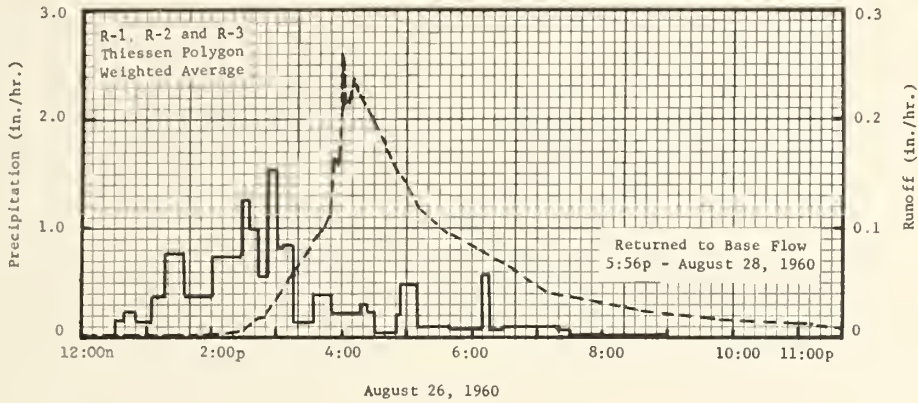
SELECTED RUNOFF EVENTS			Blacksburg, Va. Little Winns Creek Watershed W-I					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 23, 1961								
7-23-61	0.23	0.0151	8-23-61	Raingages R-1,	R-2, R-3 <sup>3/</sup>	8-23-61		
7-24	.83	.0546	2:00a	0.0	0.0	3:12a	0.0008	0
7-25	.01	.0159	:15	.16	.04	:44	.0011	.0005
7-26, 31	0	.0707	:20	.36	.07	4:10	.0026	.0013
8-1,2	0	.0227	:30	.30	.12	:20	.0061	.0020
8-3	.01	.0114	:38	.23	.15	:26	.0131	.0030
8-4	.11	.0114	:45	.51	.21	:36	.0413	.0075
8-5	.21	.0117	:50	.36	.24	:46	.0515	.0153
8-6	.22	.0111	:54	.60	.28	:48	.0571	.0171
8-7	.06	.0128	3:40	.16	.40	:52	.0598	.0210
8-8,11	0	.0372	4:00	.24	.48	:56	.0610	.0250
8-12	.02	.0083	:10	.96	.64	5:00	.0590	.0290
8-13,16	0	.0346	:23	.60	.77	:05	.0660	.0342
8-17	.37	.0196	:30	1.37	.93	:09	.0612	.0384
8-18,19	0	.0185	:35	.60	.98	:17	.0672	.0469
8-20	2.46	.1340	:45	.12	1.00	:34	.0499	.0635
8-21	.06	.0252	:50	.24	1.02	:40	.0478	.0684
8-22	.16	.0150	5:05	.08	1.04	:44	.0424	.0714
8-23	.07 <sup>3/</sup>	.0015 <sup>4/</sup>	:55	.06	1.09	6:16	.0226	.0887
						:34	.0179	.0947
				Total	Rainfall			
				R-1	1.29	:40	.0177	.0965
				R-2	1.17	7:16	.0114	.1053
				R-3	.78	:44	.0086	.1099
						:52	.0086	.1111
						8:24	.0063	.1151
						9:46	.0036	.1218
						12:24p	.0022	.1292
						4:04	.0013	.1354
						12:00m	.0009 <sup>5/</sup>	.1441
<p><b>Watershed Conditions:</b> As described under "Watershed Conditions" on page 13.10-1.</p>								

**Notes:** To convert runoff in in/hr to cfs multiply by 1483.3. <sup>1/</sup> All rainfall Thiessen Polygon wtd. amounts - rain gages R-1, R-2 and R-3. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> 1:00a to 1:30a. <sup>4/</sup> Prior to 3:12a. <sup>5/</sup> Normal base flow.

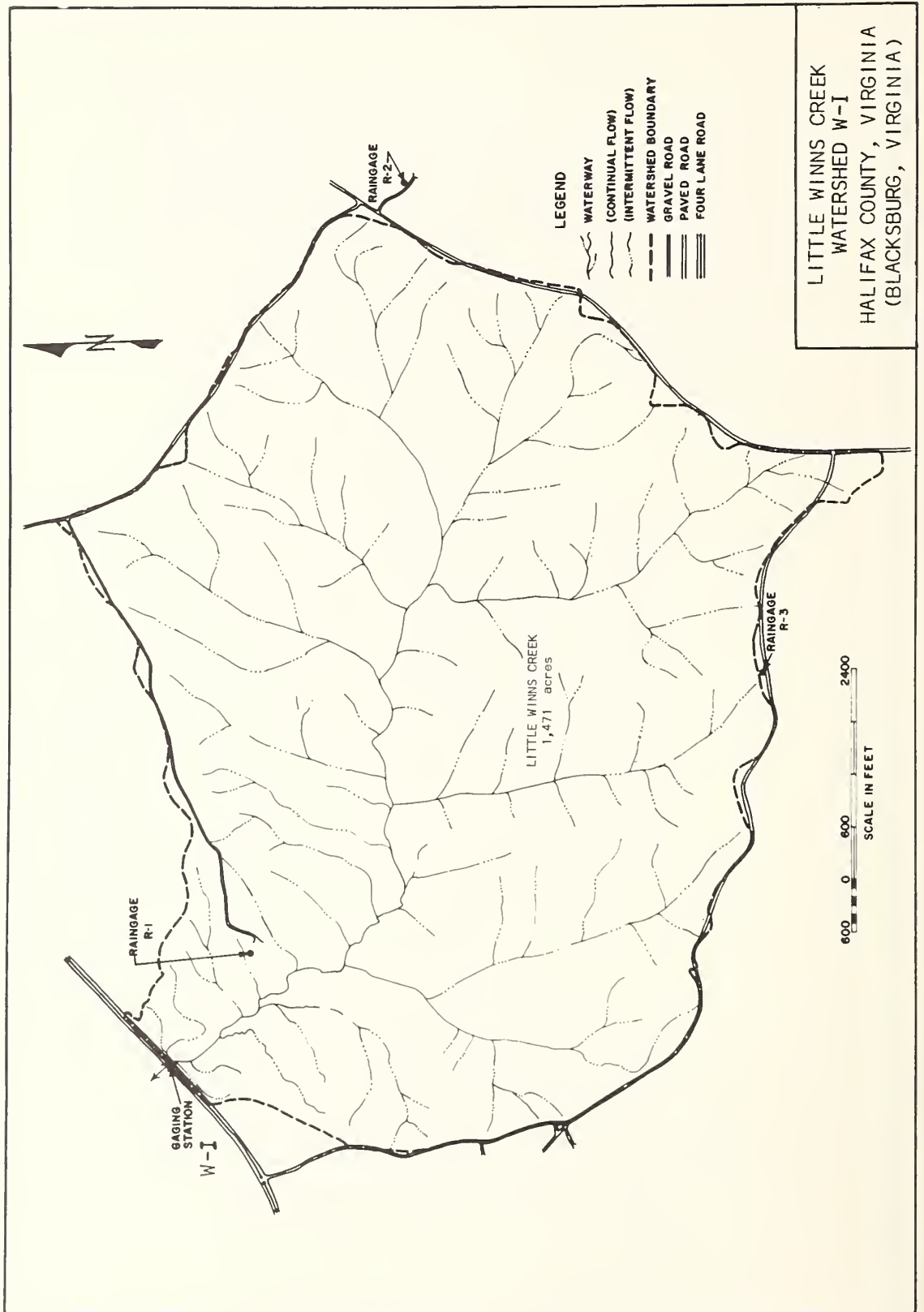


October 10, 1959

BLACKSBURG, VA. LITTLE WINNS CREEK WATERSHED W-I



BLACKSBURG, VA. LITTLE WINNS CREEK WATERSHED W-1



LITTLE WINNS CREEK  
 WATERSHED W-1  
 HALIFAX COUNTY, VIRGINIA  
 (BLACKSBURG, VIRGINIA)

- LEGEND**
- WATERWAY (CONTINUAL FLOW)
  - WATERWAY (INTERMITTENT FLOW)
  - WATERSHED BOUNDARY
  - GRAVEL ROAD
  - PAVED ROAD
  - FOUR LANE ROAD

LITTLE WINNS CREEK  
 1,471 acres

600 0 600 2400  
 SCALE IN FEET



BLACKSBURG, VA. ROCKY RUN BRANCH WATERSHED W-I

LOCATION: Brunswick County, Va., on Route No. 58, 4 mi. W of Lawrenceville, Va., Meherrin River.

AREA: 555 acres                      SHAPE: Roughly ham shape - about 8000 ft. long and maximum width of 4700 ft.

SLOPES: Pending detailed survey. Preliminary information indicates prevailing slopes range from 3% to 25%. Aspect: S.

SOILS: Pending detailed survey. Preliminary information indicates that the soils are predominantly of the Cecil and Appling series which have formed from crystalline acidic rocks such as granite, gneiss and schist.

EROSION: Pending detailed survey.

LAND CAPABILITY: Pending detailed survey.

SURFACE DRAINAGE: Good, principal waterway about 9,100 ft. The flood plane along the lower 1,000 ft. of main channel varies in width from about 100 ft. to 200 ft., and is covered with a heavy undergrowth of vines and brush.

CHARACTER OF FLOW: Perennial, continuous.

INSTRUMENTATION: Runoff - prior to August 4, 1959, 6 ft. x 6 ft. concrete, box-type, highway culvert. After August 4, 1959, low flow measured with Virginia V-notch weir; medium and high flows measured with V-notch weir-highway culvert combination; continuous water-level recorder for period of record. Precipitation - two recording gages, one with weekly chart and one with 12-hour chart.

WATERSHED CONDITIONS: Mixed cover: farm woods, a mixture of hardwoods and pine - 54%; permanent pasture, usually a good cover of native grass and clover mixture - 9%; small grain usually followed with lespedeza - 2%, soybeans, usually drilled and cut as forage - 3%, corn - 4%, tobacco - 2%, cotton - 1%, alfalfa and other hay crops - 6%, (total area subject to cultivation - 18%); idle, usually a good cover of tall weeds, vines and short-growing plants - 19%; road surface - 1%. Conditions are fairly consistent from year to year.

GENERALLY REPRESENTS: Complex land use areas in the Southern Piedmont land resource area (P-136) lying in Southern Virginia, Central North Carolina and Western South Carolina.

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)													Blacksburg, -Va. Rocky Run Branch Watershed W-I	
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958	P				4.79	7.77	5.56	3.83	5.75	1.28	3.98	1.58	4.07	38.61
	Q				2.64	4.16	1.69	1.13	.89	.78	1.11	1.24	1.92	15.56
1959	P	1.80	2.24	2.50	5.01	2.73	.52	9.28	1.25	3.96	5.50	4.52	2.15	41.46
	Q	1.14	1.03	.91	1.54	.67	.49	1.07	.32	.30	.73	1.52	1.16	10.88
1960	P	3.45	5.08	3.31	3.09	3.87	2.01	5.05	3.66	3.92	2.68	.55	2.39	39.06
	Q	1.21	2.89	1.89	1.48	.73	.33	.31	.32	.26	.33	.30	.40	10.45
1961	P	1.87	4.18	3.60	1.66	5.98	7.98	1.39	4.82	1.73	4.23	1.17	4.99	43.60
	Q	.58	1.48	1.00	.75	1.02	1.84	.32	.22	.13	.21	.19	.95	8.69
Normal	P 2/	3.35	3.17	3.65	3.35	4.00	4.28	6.12	5.16	3.94	2.28	2.83	2.80	44.93

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													Blacksburg, Va. Rocky Run Branch Watershed W-I			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	5-6	0.19	5-6	0.18	5-6	0.34	5-6	0.71	5-6	0.98	5-6	1.45	5-5	2.09	4-30	2.86
1959	7-10	.13	7-10	.12	7-10	.19	7-10	.31	7-10	.35	7-10	.36	11-24	.44	4-12	.71
1960	2-18	.06	2-18	.06	2-18	.12	2-18	.29	2-18	.43	2-18	.56	2-18	.70	2-18	1.21
1961	6-7	.22	6-7	.19	6-7	.30	6-7	.40	6-7	.45	6-7	.49	6-21	.60	6-21	.83

Notes: Records began 4-1-58. Quality of records: Monthly P - excellent; monthly Q - fair prior to August 4, 1959, then good. Annual Maximum Discharges and Volumes of Runoff - good. Watershed conditions: as described under "Watershed Conditions" above. 1/ Monthly Precipitation is Thiessen polybon weighted amounts - rain gages R-1 and R-2. 2/ Normal P based on 31-year record (1931-1961) at Emporia, Virginia.



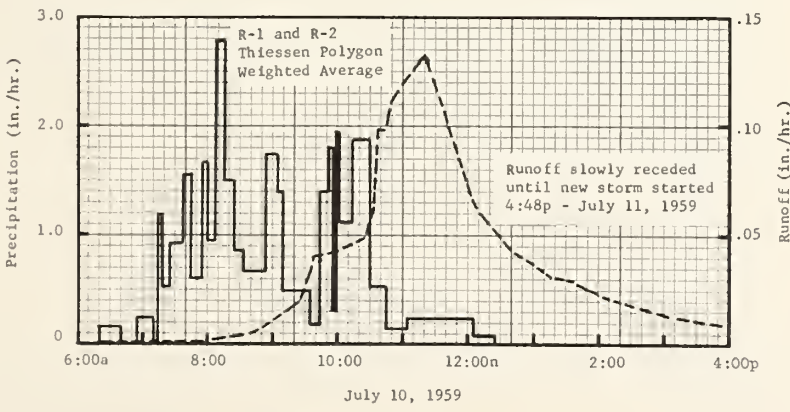
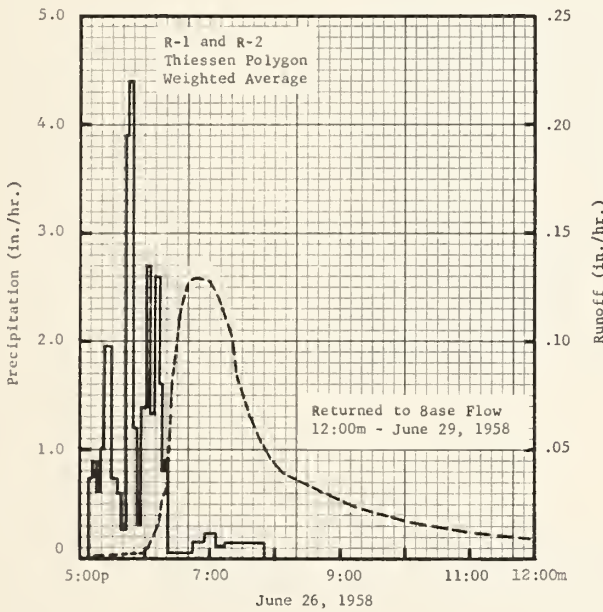




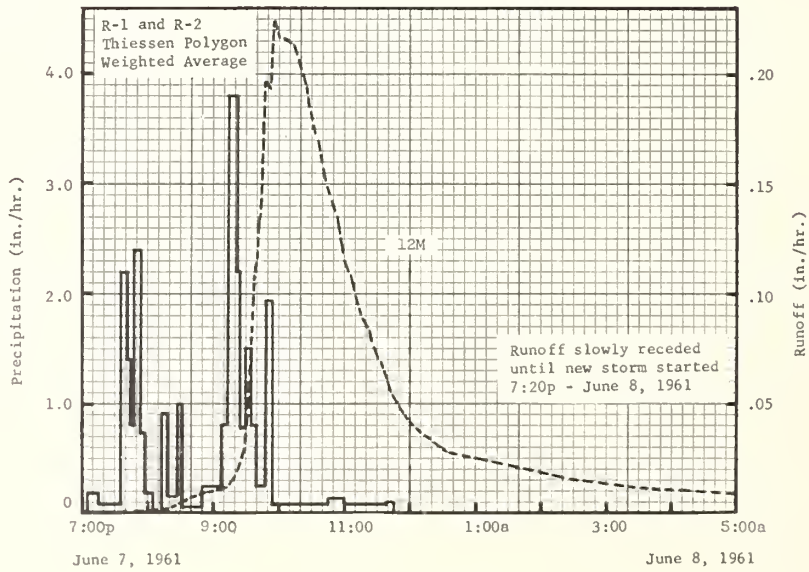
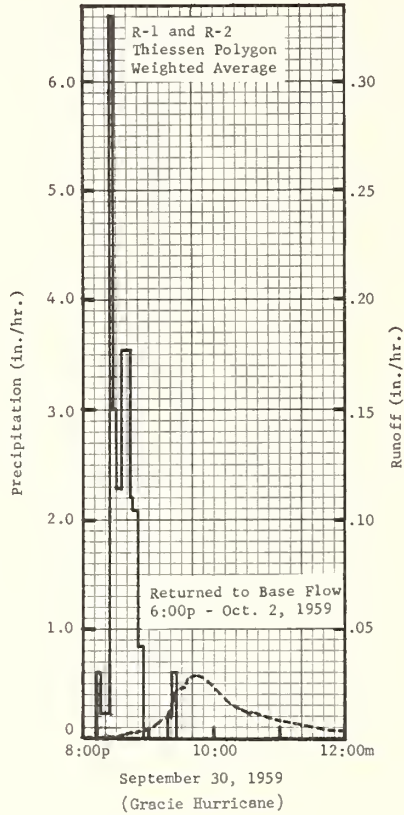


SELECTED RUNOFF EVENTS				Blacksburg, Va. Rocky Run Branch Watershed W-I				
Antecedent conditions			Rainfall			Runoff <sup>1/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			Event of June 7 and 8, 1961 (Continued)					
						6-7-61		
						11:06p	0.1077	0.2759
						:10	.0993	.2828
						:16	.0882	.2922
						:22	.0826	.3007
						:28	.0752	.3086
						:32	.0686	.3134
						:38	.0637	.3200
						:44	.0538	.3259
						:52	.0457	.3325
						12:00m	.0420	.3384
						6-8-61		
						12:12a	.0350	.3461
						:22	.0319	.3517
						:28	.0298	.3547
						:36	.0271	.3585
						1:00	.0253	.3690
						2:00	.0177	.3905
						:08	.0161	.3928
						:20	.0162	.3960
						3:28	.0110	.4114
						4:16	.0095	.4196
						5:20	.0079	.4289
						:56	.0075	.4335
						6:44	.0069	.4393
						7:36	.0065	.4451
						8:36	.0059	.4513
						10:16	.0051	.4604
						:36	.0049	.4621
						1:20p	.0035	.4736
						2:54	.0030	.4787
						4:56	.0025	.4843
						5:40	.0024	.4861
						7:20	.0023 <sup>2/</sup>	.4900

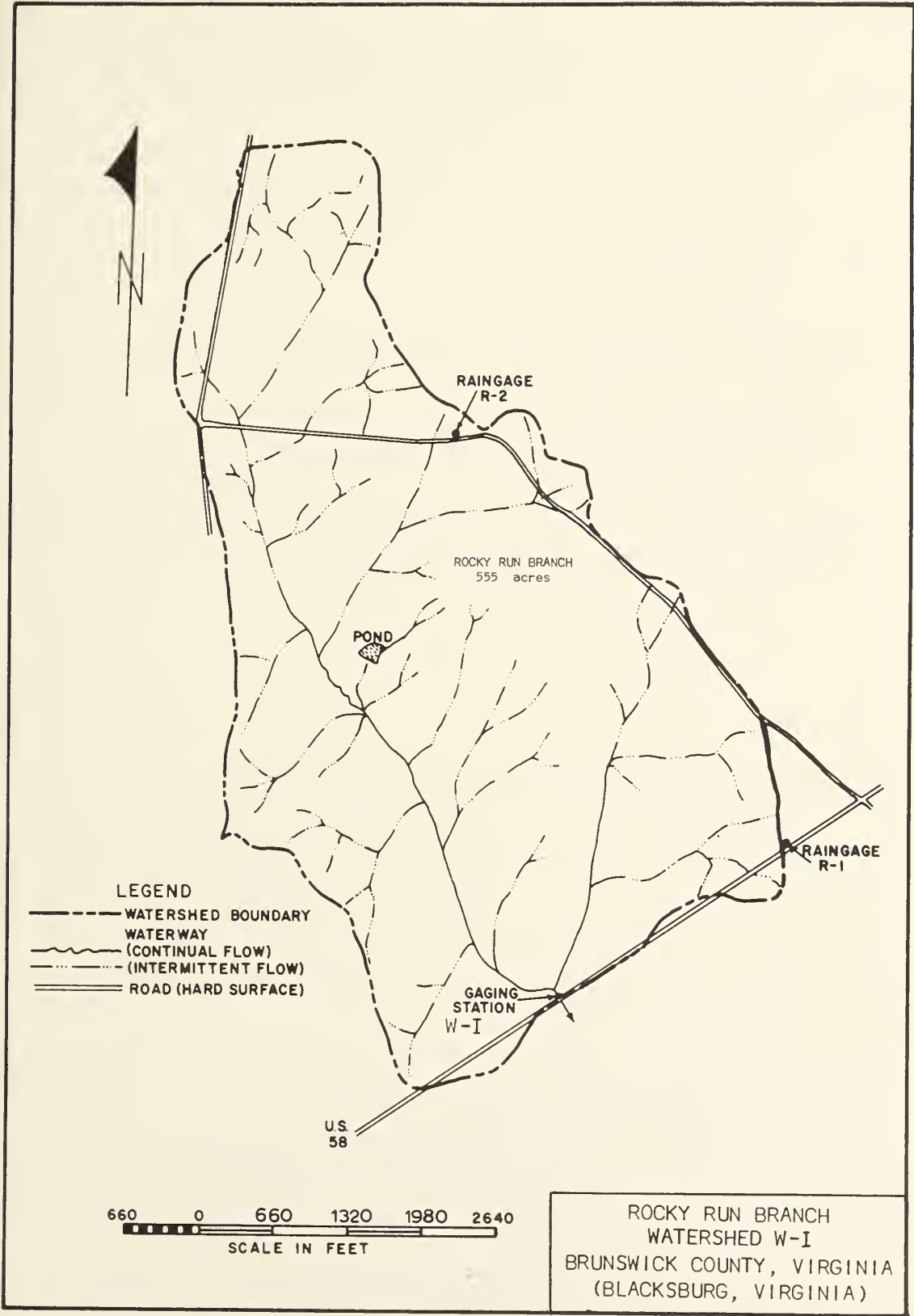
Notes: To convert runoff in in/hr to cfs, multiply by 559.62. <sup>1/</sup> Only selected values which adequately define the hydrograph are shown. <sup>2/</sup> Beginning of new runoff event.



BLACKSBURG, VA. ROCKY RUN BRANCH WATERSHED W-I



BLACKSBURG, VA. ROCKY RUN BRANCH WATERSHED W-1



BLACKSBURG, VA. PONY MOUNTAIN BRANCH WATERSHED W-I

LOCATION: Culpeper County, Va., on Route No. 3 about 3.75 mi. (by road) Southeast of Culpeper, Va., Mountain Run, Rappahannock River.

AREA: 192 acres

SHAPE: Roughly a trapezoid with an average base of about 3500 ft. and average altitude of about 2400 ft.

SLOPES: Pending detailed survey. Preliminary information indicates that about 66% of area has a slope range from nearly level to 4% with about 33% having slopes ranging from 12% to 25%. Aspect N.

SOILS: Pending detailed survey. Preliminary information indicates that the watershed is located within the Triassic Basin area, with soils of the Penn and Bucks series which have developed from sandstone and shale.

EROSION: Pending detailed survey.

LAND CAPABILITY: Pending detailed survey.

SURFACE DRAINAGE: Good, principal waterway about 4250 ft. Drained by two separate channel systems with confluence just above the gaging station. Total area is divided about 40% and 60% between the two systems.

CHARACTER OF FLOW: Intermittent, spring-fed, continuous.

INSTRUMENTATION: Runoff - prior to August 27, 1959, flow control was 4 ft. high x 8 ft. wide, concrete, box-type, highway culvert. After August 27, 1959, low flow measured with Virginia V-notch weir; medium and high flows measured with V-notch weir-highway culvert combination; continuous water-level recorder for period of record. Precipitation - two recording gages, one with weekly chart and one with 12-hr. chart.

WATERSHED CONDITIONS: Mixed cover: farm woods, predominantly hardwood - 52%; permanent pasture usually a fair cover of native grass mixture - 30%; hay, usually a mixture of orchard grass, clover or alfalfa - 14%; small grain or corn - 3%; road surface - 1%. Conditions are usually consistent from year to year.

GENERALLY REPRESENTS: Complex land use areas in the shallow red shale and sandstone (of Triassic origin) portion of the Northern Piedmont land resource area (S-148) in Northern Virginia, Maryland and Southern Pennsylvania.

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)													Blacksburg, Va. Pony Mountain Branch Watershed W-I	
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1958 P						8.00	4.43	4.16	1.56	2.47	1.53	1.01	23.16	
Q						2.05	.45	.49	.01	.06	.07	.22	3.35	
1959 P	2.26	1.04	2.47	3.69	2.34	4.64	5.19	2.99	2.50	4.58	2.12	2.82	36.64	
Q	.73	.54	1.27	1.51	.24	.92	.12	.04	.06	.32	.31	.92	6.98	
1960 P	2.25	4.65	2.44	3.26	4.67	1.04	1.51	6.26	6.43	1.44	1.04	1.26	36.25	
Q	1.11	2.91	1.70	1.56	.28	T	0	.30	1.12	.01	.01	.09	9.09	
1961 P	2.48	4.52	4.04	3.81	3.77	2.43	3.90	4.36	1.22	2.40	1.99	3.63	38.55	
Q	.62	3.36	1.79	2.26	.75	.03	.07	.10	T	.02	.02	.40	9.42	
Normal P 2/	3.20	2.37	3.42	3.68	4.27	3.69	4.77	4.48	3.53	3.08	3.17	2.94	42.60	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													Blacksburg, Va. Pony Mountain Branch Watershed W-I			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958	6-24	0.48	6-12	0.28	6-24	0.37	6-24	0.46	6-24	0.51	6-24	0.56	6-24	0.66	6-22	1.18
1959	6-2	.28	6-2	.23	6-2	.36	6-2	.55	6-2	.62	6-2	.66	6-2	.69	4-10	1.06
1960	9-19	.33	9-19	.26	9-19	.36	9-19	.69	2-18	.93	2-18	1.17	2-18	1.31	2-18	1.76
1961	4-13	.15	4-13	.13	4-12	.23	4-12	.51	4-12	.76	4-12	.97	2-18	1.22	2-18	2.76

Notes: Records began 5-9-58. Quality of records: Monthly P - excellent; monthly Q - fair prior to August 27, 1959, then good. Annual Maximum Discharges and Volumes of Runoff - good. Watershed conditions: as described under "Watershed Conditions" above. 1/ Monthly precipitation is Thiessen polygon weighted amounts - rain gages R-1 and R-2. 2/ Normal P based on 55-yr. record (1907-1961) at Culpeper, Virginia.



SELECTED RUNOFF EVENTS			Blacksburg, Va. Pony Mountain Branch Watershed W-I					
Antecedent conditions			Rainfall			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 9 and 10, 1958								
5-10-58	0	0.0360	6-9-58	Rain gage R-2		6-9-58		
5-11	.03	.0279	7:12p	0	0	7:14p	0.0003	0
5-12	T	.0252	:15	.40	.02	:28	.0150	.0018
5-13,16	0	.0600	:17	1.20	.06	:41	.0600	.0099
5-17	.27	.0149	:20	2.00	.16	:44	.0848	.0135
5-18	.38	.0156	:22	4.20	.30	:50	.0921	.0224
5-19	.06	.0178	:25	4.40	.52	:58	.0831	.0341
5-20	.11	.0163	:30	3.36	.80	8:06	.0579	.0435
5-21,22	0	.0216	:33	2.00	.90	:23	.0294	.0558
5-23	.03	.0072	:35	2.40	.98	:36	.0158	.0607
5-24	0	.0048	:40	2.40	1.18	:56	.0094	.0649
5-25	.03	.0048	:45	1.68	1.32	9:48	.0018	.0698
5-26,27	0	.0096	:47	1.80	1.38	10:20	.0010	.0705
5-28	.14	.0049	:50	.60	1.41	12:00m	.0006	.0719
5-29,31	0	.0144	8:00	.06	1.42	6-10-58		
6-1	.50	.0068				12:00m	.0004 <sup>3/</sup>	.0839
6-2,6	0	.0216						
Total Rainfall R-1 = 1.17								
Thiessen Wtd. Average <sup>1/</sup> = 1.25								
Watershed Conditions:								
As described under "Watershed Conditions" on page 13.12-1.								
Event of June 12 and 13, 1958								
5-13,16-58	0	0.0600	6-12-58	Rain gage R-2		6-12-58		
5-17	.27	.0149	3:30a	0	0	3:44a	0.0011	0
5-18	.38	.0156	:40	.06	.01	:52	.0115	.0008
5-19	.06	.0178	:45	.12	.02	:56	.0112	.0016
5-20	.11	.0163	:47	.60	.04	4:00	.0128	.0024
5-21,22	0	.0216	:50	.60	.07	:05	.0128	.0035
5-23	.03	.0072	:52	2.10	.14	:16	.0161	.0061
5-24	0	.0048	:55	2.00	.24	:26	.0160	.0088
5-25	.03	.0048	:57	2.40	.32	5:08	.0078	.0171
5-26,27	0	.0096	4:02	.96	.40	:18	.0078	.0184
5-28	.14	.0049	:05	.80	.44	:28	.0104	.0199
5-29,31	0	.0144	:13	.75	.54	:36	.0121	.0214
6-1	.50	.0068	:25	.10	.56	:40	.0163	.0224
6-2,6	0	.0216	5:08	0	.56	:56	.0241	.0278
6-7,8	0	0 <sup>4/</sup>	:13	.24	.58	6:04	.0240	.0310
6-9	1.27	.0747	:17	.60	.62	:22	.0184	.0373
6-10	0	.0120	:27	.10	.63	:28	.0232	.0394
6-11	.66	.0563	:30	2.20	.74	:36	.0349	.0433
6-12	0	.0039 <sup>5/</sup>	:33	.80	.78	:42	.0421	.0471
			:36	1.60	.86	:46	.0891	.0515
			:41	1.44	.98	:47	.1264	.0533
			:45	.90	1.04	:48	.1576	.0557
			:48	.40	1.06	:49	.1891	.0586
			:52	.15	1.07	:50	.2375	.0621
			:55	.20	1.08	:51	.2836	.0665
			6:10	.04	1.09	:52	.3029	.0714
			:18	.08	1.10	:56	.3666	.0937
			:25	.26	1.13	7:00	.4200	.1199
			:32	.60	1.20	:05	.4323	.1554
			:45	2.03	1.64	:12	.3629	.2018
			:48	2.20	1.75	:16	.3038	.2240
			:55	1.11	1.88	:18	.2908	.2339
			7:00	.72	1.94	:24	.2469	.2608
			:05	.48	1.98	:30	.2064	.2835
			:10	.48	2.02	:38	.1688	.3085
			:12	1.20	2.06	:46	.1404	.3291
			:22	.60	2.16	:58	.1069	.3538
						8:10	.0830	.3728
						:20	.0581	.3846
						:38	.0391	.3992
Total Rainfall R-1 = 1.78								
Thiessen Wtd. Average <sup>1/</sup> = 1.90								
Watershed Conditions:								
As described under "Watershed Conditions" on page 13.12-1.								

Notes: To convert runoff in in/hr to cfs, multiply by 193.60. <sup>1/</sup> Rainfall Thiessen Polygon weighted amounts - R-1 and R-2 rain gages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Normal base flow. <sup>4/</sup> Stream flow ended 6-6-58. <sup>5/</sup> Prior to 3:44a.

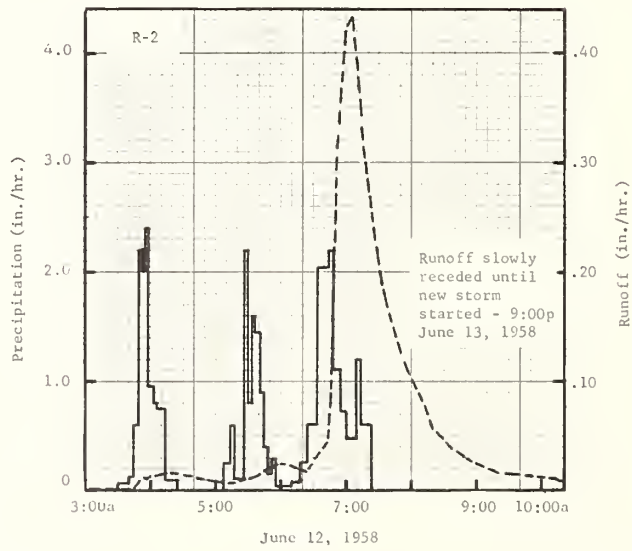
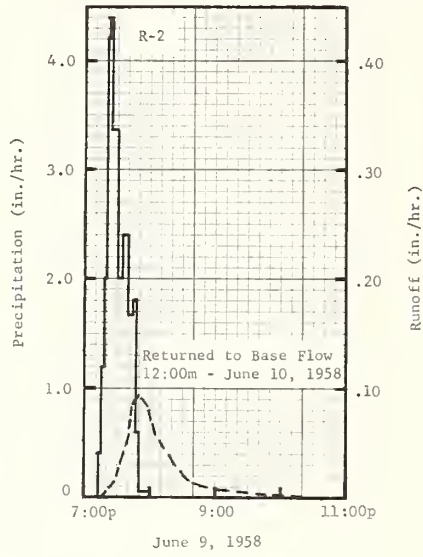
SELECTED RUNOFF EVENTS						Blacksburg, Va. Pony Mountain Branch Watershed W-I		
Antecedent conditions			Rainfall			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 12 and 13, 1958 (Continued)								
						6-12-58		
						8:56a	0.0274	0.4091
						9:20	.0182	.4182
						:40	.0143	.4237
						:52	.0135	.4264
						10:13	.0121	.4309
						:14	.0089	.4311
						11:40	.0050	.4411
						1:00p	.0027	.4462
						3:00	.0017	.4506
						5:40	.0015	.4549
						12:00m	.0013	.4637
						6-13-58		
						9:00p	.0006 <sup>3/</sup>	.4837
Event of June 2 - 10, 1959								
5-3-59	0.08	0.0096	6-2-59	Rain gage R-2		6-2-59		
5-4,11	0	.0753	4:05a	0	0	5:20a	0	0
5-12	.54	.0028 <sup>4/</sup>	5:10	.02	.02	6:12	.0002	.0001
5-13	.86	.0434	:23	.14	.05	:32	.0004	.0002
5-14,17	0	.0432	:45	.14	.10	7:00	.0008	.0005
5-18	.11	.0096	6:00	.08	.12	7:20	.0010	.0008
5-19,21	0	.0179	:20	.15	.17	8:40	.0010	.0021
5-22	.03	.0048	:40	.09	.20	9:48	.0008	.0031
5-23	.29	.0048	7:30	.06	.25	10:40	.0010	.0039
5-24,26	0	.0129 <sup>5/</sup>	9:10	.01	.27	11:20	.0010	.0046
5-27	0	0	:30	.09	.30	12:00n	.0034	.0060
5-28	.01	0	:50	.03	.31	:12p	.0069	.0071
5-29	0	0	10:00	.12	.33	:32	.0279	.0129
5-30	.01	0	11:00	.02	.35	:48	.0568	.0242
5-31	.39	.0014 <sup>5/</sup>	:10	.12	.37	:52	.0848	.0289
6-1	.23	.0038 <sup>6/</sup>	:25	.28	.44	1:04	.1184	.0492
6-2	0	.0005 <sup>7/</sup>	:32	.17	.46	:16	.1583	.0769
			:50	.30	.55	:24	.2014	.1008
			12:06p	.41	.66	:36	.2514	.1461
			:12	1.30	.79	:44	.2842	.1818
Watershed Conditions:								
As described under "Watershed Conditions" on page 13.12-1.			:14	.30	.80	2:04	.2160	.2652
			:22	1.50	1.00	:16	.1777	.3046
			:28	1.40	1.14	:32	.1448	.3476
			:35	2.06	1.38	3:08	.1004	.4211
			:39	.30	1.40	:24	.0834	.4456
			:48	1.00	1.55	:48	.0609	.4745
			:55	1.71	1.75	4:04	.0529	.4897
			1:00	.24	1.77	5:00	.0345	.5305
			:10	1.74	2.06	6:00	.0229	.5592
			:20	1.14	2.25	7:00	.0151	.5782
			:28	.75	2.35	9:00	.0095	.6028
			:32	1.50	2.45	12:00m	.0061	.6262
			:43	.27	2.50	6-3-59		
			:46	.40	2.52	5:00a	.0033	.6497
			2:03	.18	2.57	10:10	.0019	.6631
			:30	.22	2.67	12:00n	.0017	.6664
			3:00	.06	2.70	12:00m	.0013	.6844
			:12	0	2.70	6-4-59		
			4:00	.05	2.74	10:00a	.0008	.6949
			:20	.03	2.75	12:00m	.0008	.7061
						6-5-59		
						12:00m	.0008	.7253
						6-6-59		
						12:00m	.0006	.7421
Total Rainfall R-1 =					2.66			
Thiessen Wtd. Average <sup>1/</sup> =					2.69			

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 193.60. <sup>1/</sup> Rainfall Thiessen Polygon weighted amounts - R-1 and R-2. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Beginning of new runoff event. <sup>4/</sup> No stream flow Mdt. 5-11-59 to 7:32p 5-12-59. <sup>5/</sup> No stream flow Mdt. 5-26-59 to 4:08p 5-31-59, 4:48p to 4:56p and 6:04p to 6:12p on 5-31-59. <sup>6/</sup> No stream flow Mdt. 5-31-59 to 9:40a 6-1-59. <sup>7/</sup> Prior to 5:20a.

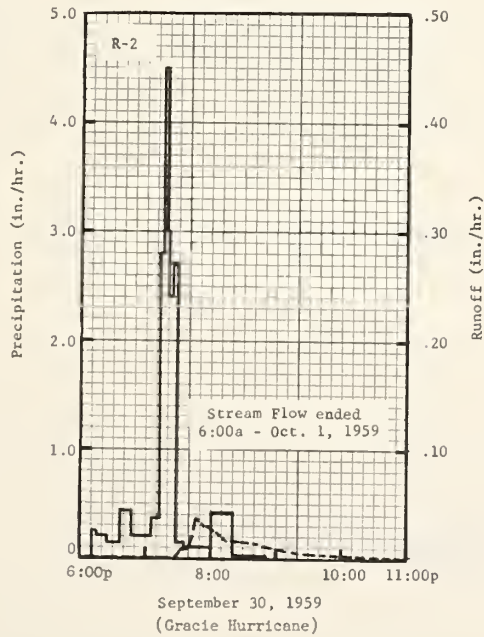
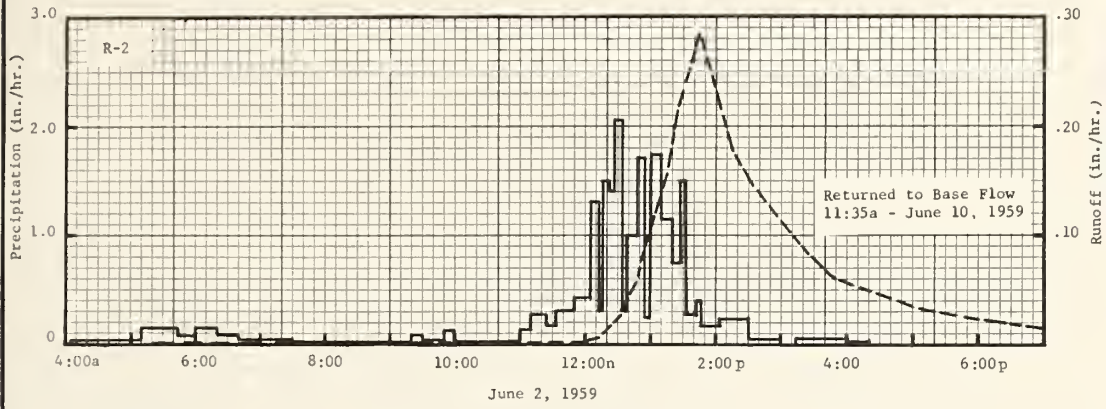
SELECTED RUNOFF EVENTS			Blacksburg, Va. Pony Mountain Branch Watershed W-I					
Antecedent conditions			Rainfall			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 2 - 10, 1959 (Continued)								
						6-7-59 12:00m	0.0006	0.7565
						6-8-59 12:00m	.0004	.7685
						6-9-59 12:00m	.0004	.7781
						6-10-59 11:35a	.0002 <sup>3/</sup>	.7816
Event of September 30 <sup>4/</sup> , October 1, 1959								
8-31-59	0.13	0.0001	9-30-59	Rain gage R-2		9-30-59		
9-1	.46	.0057	6:10p	0	0	7:28p	0.0019	0
9-2	0	.0011	:15	.24	.02	:29	.0033	0
9-4,5	0	0	:24	.20	.05	:31	.0043	.0002
9-6	.01	0	:37	.14	.08	:32	.0069	.0003
9-7,27	0	0	:47	.42	.15	:33	.0073	.0004
9-28	.22	0	:50	.20	.16	:36	.0080	.0008
9-29 <sup>4/</sup>	.15	0	7:05	.20	.21	:40	.0100	.0014
9-30 <sup>4/</sup>	.49 <sup>5/</sup>	.0185 <sup>6/</sup>	:13	.38	.26	:41	.0182	.0016
			:16	2.80	.40	:44	.0280	.0028
Watershed Conditions:			:18	4.50	.55	:46	.0367	.0038
As described under "Watershed Conditions" on page 13.12-1.			:20	3.00	.65	:48	.0352	.0050
			:25	2.40	.85	:52	.0331	.0073
			:27	2.70	.94	:53	.0297	.0078
			:35	.15	.96	:56	.0294	.0093
			8:00	.10	1.00	8:01	.0271	.0117
			:20	.42	1.14	:12	.0180	.0158
			:50	.02	1.15	:19	.0175	.0179
						:32	.0151	.0214
						:40	.0131	.0233
				Total Rainfall R-1 =	1.18			
				Thiessen Wtd. Average <sup>1/</sup> =	1.17			
						:52	.0101	.0256
						9:08	.0072	.0279
						:20	.0059	.0292
						:36	.0038	.0305
						:54	.0025	.0315
						10:04	.0020	.0318
						:20	.0015	.0323
						:32	.0012	.0326
						:52	.0009	.0329
						11:12	.0007	.0332
						:28	.0006	.0334
						:40	.0005	.0335
						12:00m	.0004	.0336
						10-1-59		
						12:16a	.0002	.0337
						1:40	.0001	.0339
						3:08	.0001	.0341
						4:20	.0001	.0342
						6:00	0	.0343

Notes: To convert runoff in in/hr to cfs, multiply by 195.60. <sup>1/</sup> rainfall Thiessen Polygon weighted amounts - rsingages R-1 and R-2. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Base flow. <sup>4/</sup> Gracie Hurricane. <sup>5/</sup> .01 inch of rain 12:30a to 1:30a; .32 in. 3:30a to 8:30a and .16 in. 10:30a to 1:00p. <sup>6/</sup> No stream flow from 8:00a 9-2-59 to 7:28p 9-30-59 at which time the main event started.

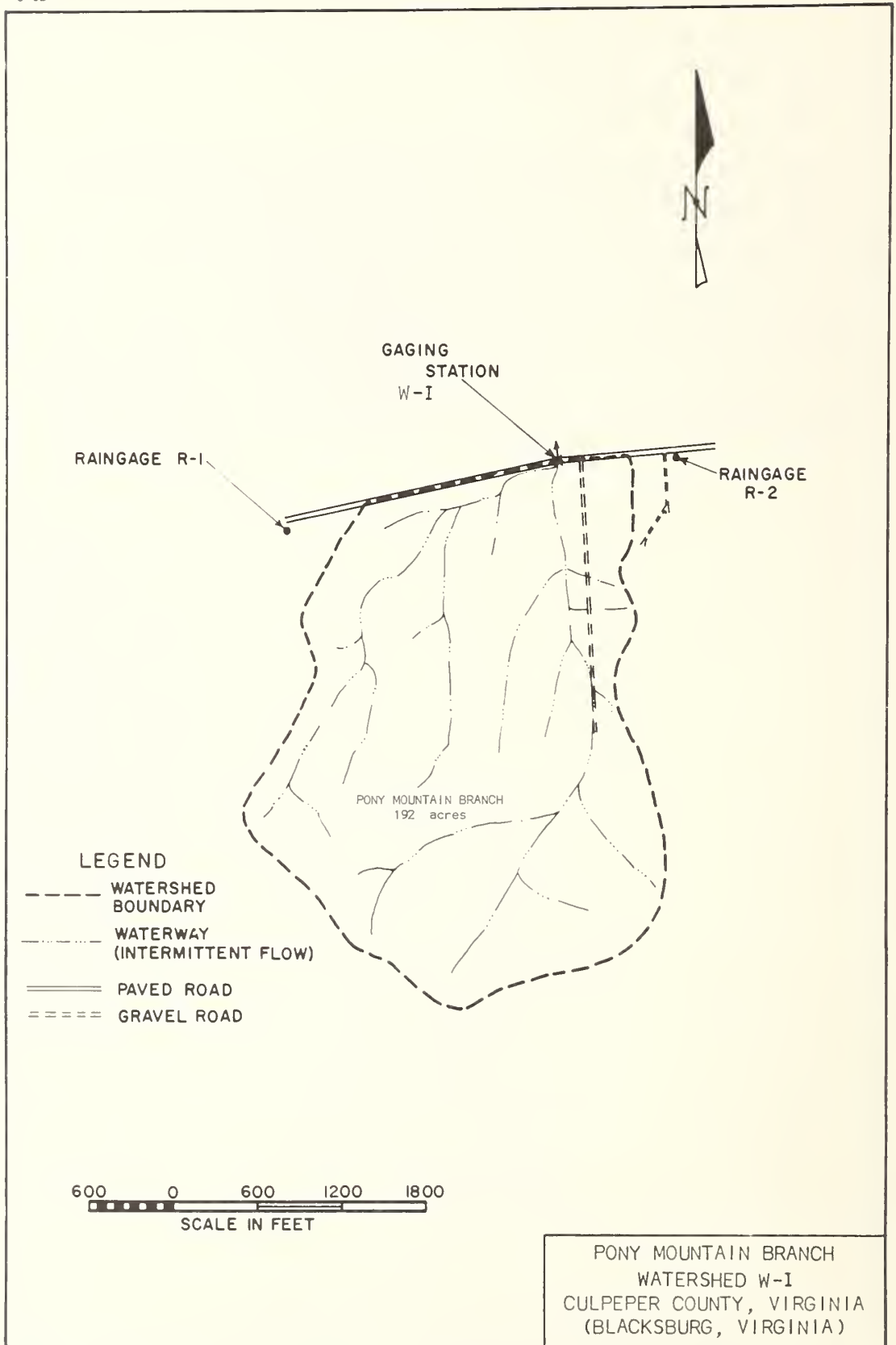


BLACKSBURG, VA. PONY MOUNTAIN BRANCH WATERSHED W-1





BLACKSBURG, VA. PONY MOUNTAIN BRANCH WATERSHED W-1



## BLACKSBURG, VA. CHUB RUN WATERSHED W-I

**LOCATION:** Page County, Va., about 2½ road mi. E. of Stanley, Va., on secondary route no. 689. Hawksbill Creek, South Fork Shenandoah River.

**AREA:** 2023 acres (3.16 sq. mi.)

**SHAPE:** Roughly bird wing, with gaging station located at body end. Maximum length - about 2.6 mi., maximum width - about 2.12 mi.

**SLOPES:** Pending detailed survey. Preliminary information indicates that slopes range from very flat in the lower reaches to about 40% on the hills. Aspect W.

**SOILS:** Pending detailed survey. Preliminary information indicates that the soils are of the Holston, Dyke and Porter series.

**EROSION:** Pending detailed survey.

**LAND CAPABILITY:** Pending detailed survey.

**SURFACE DRAINAGE:** Good, except area along lower 3000 ft. reach of stream which is poor, to fair. Length of principal waterway about 3.31 mi.

**CHARACTER OF FLOW:** Perennial, continuous.

**INSTRUMENTATION:** Runoff - Basic control is a double 7 ft. wide x 8 ft. high, concrete, box-type, highway culvert modified with the Virginia V-notch for low flow measurements, continuous water-level recorder for period of record. Precipitation - three recording rain gages, one with weekly chart and two with 12-hour charts.

**WATERSHED CONDITIONS:** Mixed cover: farm woods, predominantly hardwood mixed with pine - 57%; permanent pasture, usually a fair cover of native grass mixture - 30%; small grain - 1%, corn - 2%, idle - 4%, (total area subject to cultivation - 7%); hay mixtures, such as alfalfa, orchard grass, lespedeza and clover - 5%; road surface - 1%.

**GENERALLY REPRESENTS:** Complex land use areas of the Blue Ridge land resource area (N-130) in Virginia, Maryland and North Carolina.

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Blacksburg, Va. Chub Run Watershed W-I						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1959	P										3.52	1.16
	Q										.91	.44	.62	1.97
1960	P	1.55	5.47	2.28	2.41	6.31	3.01	3.12	3.25	4.04	1.66	.89	1.57	35.56
	Q	.67	1.87	1.81	2.32	1.54	.65	.22	.14	.18	.16	.18	.18	9.92
1961	P	2.09	5.39	3.18	5.06	3.48	4.74	3.28	4.57	2.02	2.58	1.80	3.27	41.46
	Q	.40	1.68	1.24	2.33	1.08	.51	.28	.20	.12	.20	.23	.53	8.80
Normal P	2/	2.46	2.15	3.25	2.76	3.99	3.55	3.88	4.76	3.59	3.82	2.55	2.57	39.33

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Blacksburg, Va. Chub Run Watershed W-I								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1959	9-30	0.24	9-30	0.17	9-30	0.24	9-30	0.34	9-30	0.40	9-30	0.46	9-30	0.53	9-30	0.67
1960	2-18	.05	2-18	.04	2-18	.07	2-18	.15	4-4	.24	4-4	.43	4-4	.64	3-29	1.58
1961	4-12	.06	4-12	.06	4-12	.10	4-12	.22	4-12	.32	4-12	.47	4-12	.66	4-9	1.46

Notes: Records began 9-23-59. Quality of records: Monthly P - excellent; monthly Q - good. Annual Maximum Discharges and Volumes of Runoff - good. Watershed conditions: as described under "Watershed Conditions" above.  
<sup>1/</sup> Monthly precipitation is Thiessen polygon weighted amounts - rain gages R-1, R-2 and R-3. <sup>2/</sup> Normal P based on 20-yr. record (1942-1961) at Luray, Virginia, 5 mi. E.

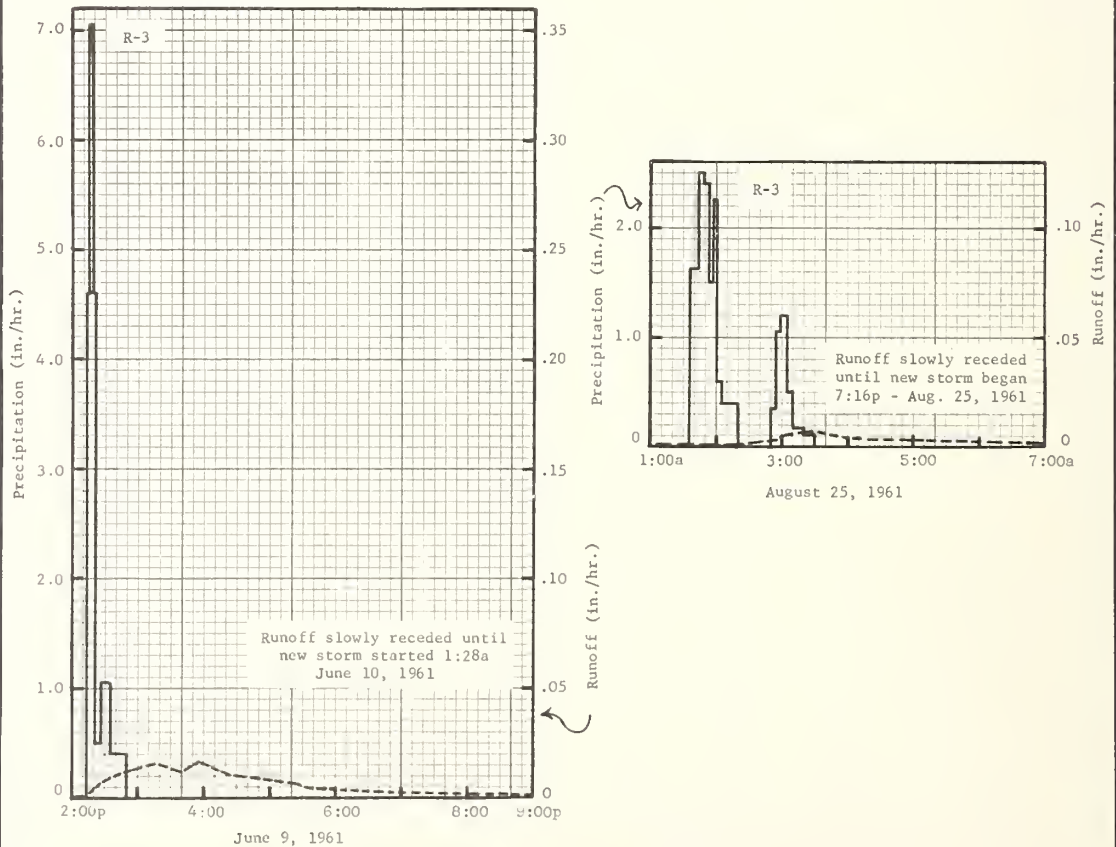
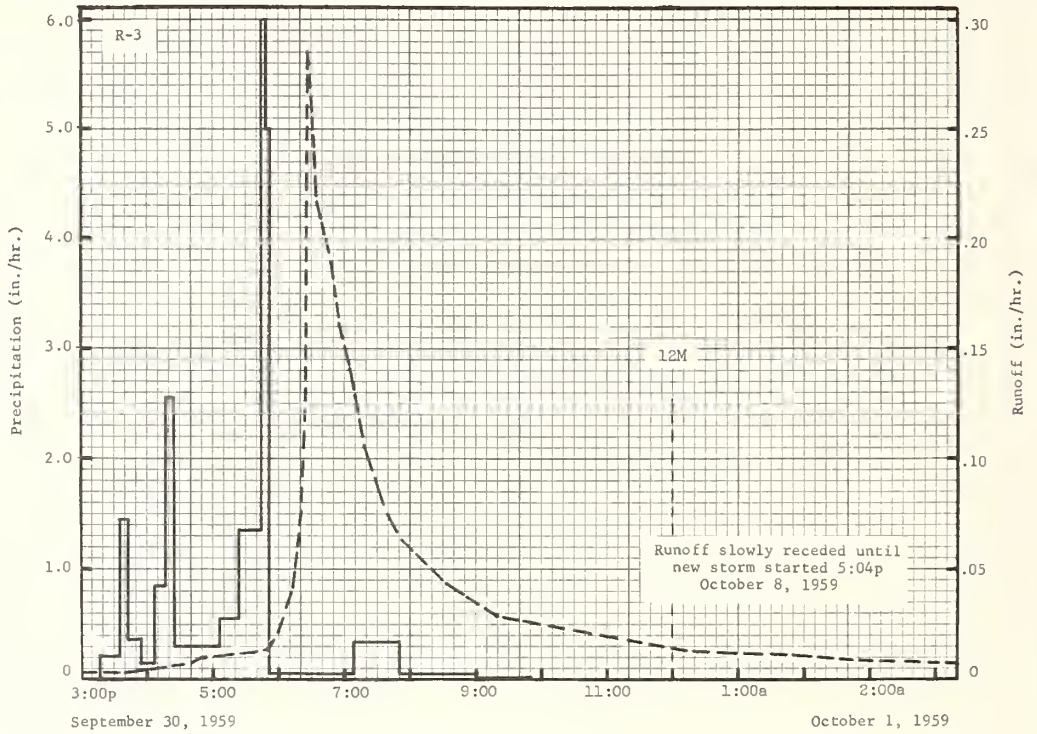
SELECTED RUNOFF EVENTS			Blacksburg, Va. Chub Run Watershed W-I					
Antecedent conditions			Rainfall			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of September 30 - October 8, 1959								
8-31-59	0.38	nr	9-30-59	Raingage R-2		9-30-59		
9-1	0	nr	3:07p	0	0	3:40p	0.0034	0
9-2	.07	nr	:16	.38	.05	4:40	.0070	.0041
9-3	.11	nr	:20	.30	.15	:58	.0105	.0069
9-4,5	0	nr	:26	.20	.17	5:48	.0134	.0169
9-6	.42	nr	:30	1.65	.28	6:00	.0202	.0200
9-7	.02	nr	:50	.30	.38	:12	.0405	.0261
9-8,16	0	nr	4:00	.18	.41	:20	.0695	.0334
9-17	.02	nr	:04	2.10	.55	:25	.1258	.0415
9-18,28	0	nr	:10	.50	.60	:28	.2855	.0509
9-29	.64	0.0017	:17	1.28	.75	:32	.2372	.0653
9-30	2.96 <sup>3/</sup>	.0357 <sup>4/</sup>	:30	.12	.81	:36	.2170	.0801
Watershed Conditions:  As described under "Watershed Conditions" on page 13.13-1.			:40	.06	.85	:48	.1895	.1213
			5:13	.45	1.10	:56	.1611	.1448
			:20	1.71	1.30	7:04	.1409	.1651
			:33	.88	1.49	:10	.1288	.1787
			:37	1.65	1.60	:19	.1060	.1968
			:48	4.64	2.45	:30	.0877	.2145
			6:05	.71	2.65	:40	.0749	.2280
			:30	.05	2.67	:52	.0626	.2415
			:55	.07	2.70	8:32	.0435	.2765
			7:00	.60	2.75	9:20	.0280	.3045
			:10	.30	2.80	12:00m	.0142	.3590
			:30	.15	2.85	10-1-59		
			8:05	0	2.85	12:20a	.0133	.3635
			10:00	.07	2.98	2:00	.0105	.3827
						4:20	.0077	.4036
						7:00	.0061	.4218
						4:00p	.0034	.4623
						12:00m	.0027	.4866
9-30-59 Raingage R-3								
			3:18p	0	0	10-2-59		
			:35	.21	.06	9:00a	.0021	.5082
			:43	1.43	.25	12:00m	.0016	.5352
			:56	.37	.33	10-3-59		
						12:00m	.0012	.5672
			4:08	.15	.36	10-4-59		
			:18	.84	.50	12:00m	.0009	.5912
			:26	2.55	.84	10-5-59		
			5:06	.30	1.04	12:00m	.0007	.6100
			:23	.56	1.20	10-6-59		
			:43	1.35	1.65	12:00m	.0006	.6255
			:48	6.00	2.15	10-7-59		
			:51	5.00	2.40	12:00m	.0005	.6389
			7:09	.05	2.75	10-8-59		
			:50	.34	2.98	5:04p	.0004 <sup>5/</sup>	.6472
			9:00	.06	3.05			
			:50	.01	3.06			
			Total rainfall R-1		2.46			
			Thiessen wtd. average:					
			R-1, R-2, R-3		2.95			
Event of June 9 and 10, 1961								
5-11-61	0.81	0.0579	6-9-61	Raingage R-2		6-9-61		
5-12	.42	.0733	2:00p	0	0	2:08p	0.0008	0
5-13	.03	.0721	:08	.08	.01	:12	.0013	.0001
5-14,15	0	.1114	:12	.90	.07	:20	.0040	.0004
5-16	.40	.0592	:15	3.60	.25	:24	.0058	.0007
5-17	0	.0429	:20	4.80	.65	:44	.0106	.0034
5-18	.04	.0389	:25	3.24	.92	3:16	.0151	.0096
5-19	.15	.0390	:34	.13	.94	:40	.0124	.0151
5-20,25	0	.1673	:45	.05	.95	:56	.0160	.0189
5-26	.14	.0222				4:24	.0105	.0251

Notes: To convert runoff in in/hr to cfs, multiply by 2039.9. <sup>1/</sup> Antecedent rainfall compiled from U.S.W.B. records at Luray, Va. until 9-29-59; thereafter, Thiessen wtd. average of R-1, R-2 & R-3 raingages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> 2.96 inches of rain Mdt. (9-29) to 1:00p (9-30). <sup>4/</sup> Prior to 3:40p. <sup>5/</sup> Beginning of new runoff event.



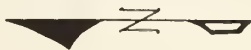
SELECTED RUNOFF EVENTS					Blacksburg, Va. Chub Run Watershed W-I			
Antecedent conditions			Rainfall			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 9 & 10, 1961 (Continued)								
5-27,28-61	0	0.0412	6-9-61	Raingage R-3		6-9-61 5:00p	0.0074	0.0308
5-29	.14	.0193	2:12p	0	0	:28	.0053	.0338
5-30,6-5	0	.1044	:15	4.60	.23	:40	.0048	.0348
6-6	.59	.0127	:19	7.05	.70	6:00	.0041	.0363
6-7	.45	.0272	:21	4.50	.85	:20	.0036	.0375
6-8	.06	.0156	:27	.50	.90	:44	.0031	.0389
6-9	.58 <sup>3/</sup>	.0209 <sup>4/</sup>	:35	1.05	1.04	7:04	.0030	.0399
			:50	.40	1.05	8:12	.0024	.0429
						9:00	.0021	.0447
						12:00m	.0018	.0506
Watershed Conditions:			Total Rainfall R-1 = 0.98					
As described under "Watershed Conditions" on page 13.13-1.			Thiessen Wtd. Average <sup>1/</sup> = 1.01			6-10-61 1:28a	.0017 <sup>5/</sup>	.0532
Event of August 25, 1961								
7-26,27-61	0	0.0131	8-25-61	Raingage R-2		8-25-61		
7-28	.03	.0047	1:43a	0	0	1:38a	0.0002	0
7-29,8-1	0	.0149	:50	1.71	.20	2:00	.0005	.0001
8-2	.14	.0048	:55	3.00	.45	:24	.0019	.0006
8-3	.17	.0059	2:02	2.14	.70	:32	.0023	.0009
8-4	.03	.0042	:10	1.35	.88	:40	.0025	.0012
8-5	.17	.0068	:25	.24	.94	:48	.0027	.0016
8-6,8	0	.0128	:30	.12	.95	:56	.0043	.0020
8-9	.05	.0039	:50	0	.95	3:04	.0054	.0027
8-10	0	.0036	3:00	.06	.96	:20	.0061	.0042
8-11	.70	.0080	:06	1.60	1.12	:28	.0061	.0050
8-12	.08	.0065	:20	.34	1.20	4:00	.0048	.0079
8-13,19	0	.0247	:33	.09	1.22	:12	.0044	.0088
8-20	.16	.0029				5:00	.0034	.0120
8-21	.20	.0058				:07	.0034	.0124
8-22	0	.0040	8-25-61	Raingage R-3		:44	.0027	.0143
8-23	.10	.0045	1:36a	0	0	6:20	.0020	.0157
8-24	.39 <sup>6/</sup>	.0073	:43	1.63	.91	:56	.0016	.0167
8-25	.05 <sup>7/</sup>	.0003 <sup>8/</sup>	:49	2.50	.44	7:40	.0013	.0178
			:54	2.40	.64	8:08	.0011	.0184
			:56	1.50	.69	9:20	.0009	.0196
			2:00	2.25	.84	12:20p	.0006	.0218
			:05	.60	.89	3:48	.0004	.0235
			:20	.40	.99	5:20	.0004	.0242
			:50	0	.99	7:16	.0003 <sup>5/</sup>	.0248
			:55	.36	1.02			
			:59	1.05	1.09			
			3:04	1.20	1.19			
			:10	.50	1.24			
			:20	.18	1.27			
			:30	.12	1.29			
			Total Rainfall R-1 = 1.14					
			Thiessen Wtd. Average <sup>1/</sup> = 1.24					

Notes: To convert runoff in in/hr to cfs, multiply by 2039.9. <sup>1/</sup> Rainfall Thiessen Polygon wtd. amounts - R-1, R-2 & R-3 raingages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Rain from Mdt. 6-8-61 to 1:00a 6-9-61. <sup>4/</sup> Prior to 2:08p. <sup>5/</sup> Beginning of new runoff event. <sup>6/</sup> Rain from Mdt. 8-23-61 to 1:00a 8-24-61. <sup>7/</sup> Rain from 12:45a to 1:00a, <sup>8/</sup> Prior to 1:38a.

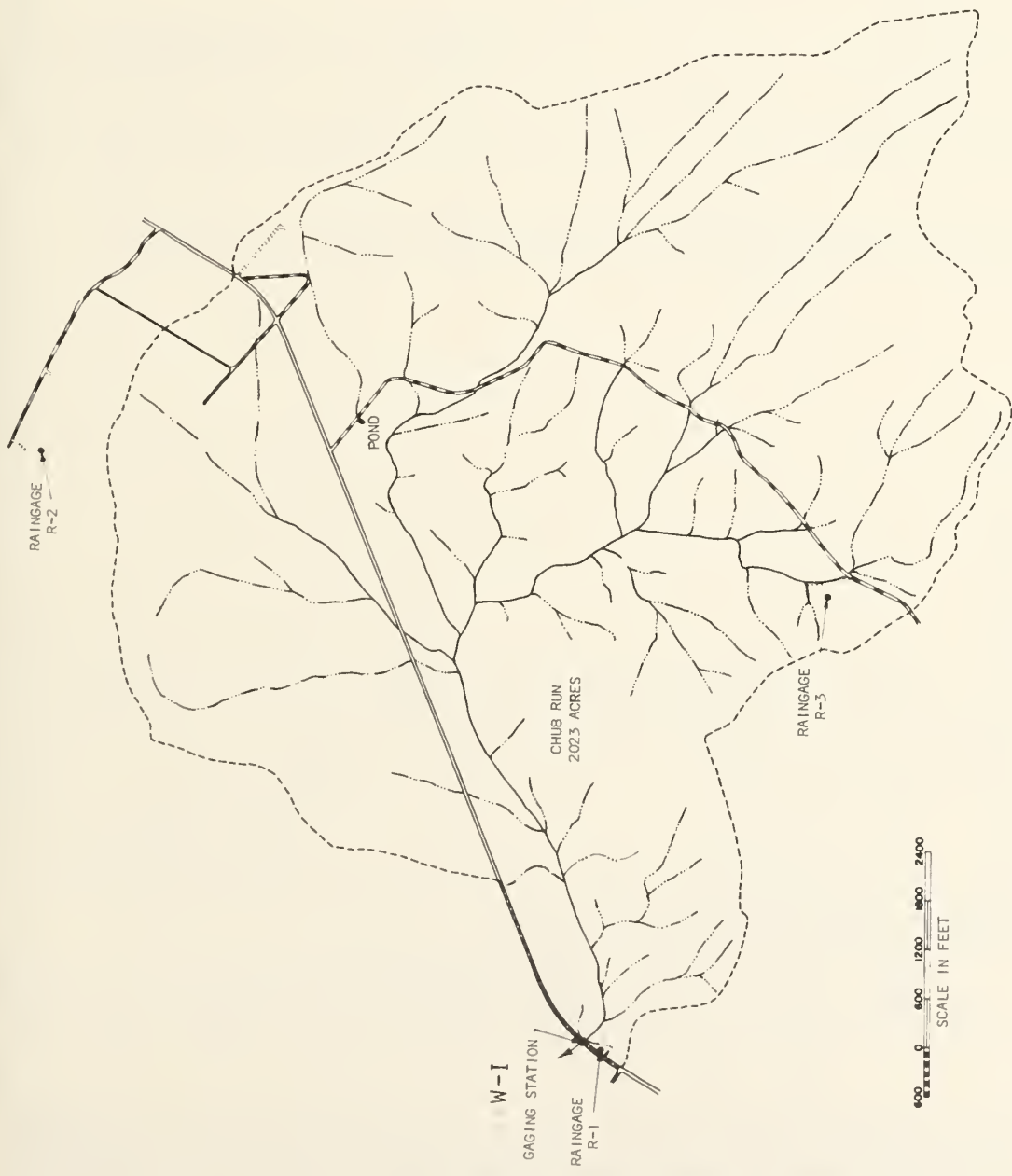


BLACKSBURG, VA. CHUB RUN WATERSHED W-1

CHUB RUN  
 WATERSHED W-1  
 PAGE COUNTY, VIRGINIA  
 (BLACKSBURG, VIRGINIA)



- LEGEND
- WATERWAY (CONTINUAL FLOW)
  - - - WATERWAY (INTERMITTENT FLOW)
  - - - WATERSHED BOUNDARY
  - IMPROVED ROAD (PAVED)
  - - - GRAVEL ROAD
  - - - FIELD ROAD
  - POND



BLACKSBURG, VA. FOSTERS CREEK WATERSHED W-I

LOCATION: Louisa County, Va., on Route No. 250, 2 mi. east of Zion Crossroads, Va., South Anna River.

AREA: 389 acres.

SHAPE: Roughly elliptical. Major axis - 6150 ft. Minor axis - 3550 ft.

SLOPES: Pending detailed survey. Preliminary information indicates that the prevailing slopes range from about 5 to 15%. Aspect NE.

SOILS: Pending detailed survey. Preliminary information indicates that the soils are of the Nason and Tatum series, which have derived from fine grained schist (sercite schist) rocks.

EROSION: Pending detailed survey.

LAND CAPABILITY: Pending detailed survey.

SURFACE DRAINAGE: Good, length of principal waterway about 6100 ft.

CHARACTER OF FLOW: Perennial, continuous.

INSTRUMENTATION: Runoff - flow control is a 6-ft. x 6-ft. concrete, box-type, highway culvert, modified with the Virginia V-notch weir for low flow measurement. Continuous water-level recorder for period of record. Precipitation - two recording rain gages; one with weekly chart and one with a 12-hr. chart.

WATERSHED CONDITIONS: Mixed cover: farm woods, predominantly hardwood - 46%; permanent pasture, usually a good cover of native grass and clover mixture - 26%; hay mixtures such as alfalfa, orchard grass, lespedezas and other clovers - 12%; small grain or corn - 3%; idle land, usually in tall weeds, brush and native grass - 11%; road surface - 2%.

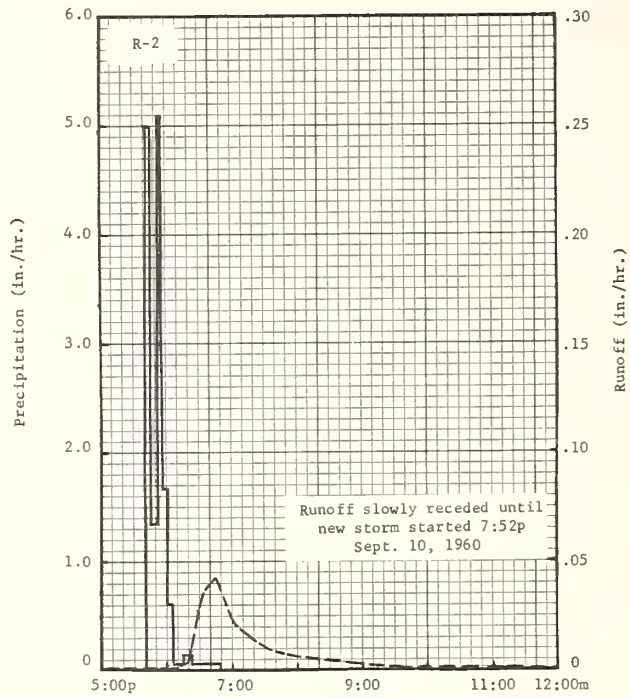
GENERALLY REPRESENTS: Complex land use areas in crystalline rock portion of the Northern and Southern Piedmont land resource areas (S-148 and P-136). This watershed specifically represents complex land use areas of the sercite schist belt of Virginia, Maryland, North and South Carolina. Soils of this formation are the Tatum-Nason series in Virginia.

MONTHLY PRECIPITATION AND RUNOFF (Inches)													Blacksburg, Va. Fosters Creek Watershed W-I			
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
	1960 P									4.65	3.25	0.99	2.30	11.19		
Q									.66	1.06	.32	.39	2.43			
1961 P	2.04	5.25	4.77	3.26	5.17	3.62	1.89	5.12	2.00	9.61	1.85	4.60	49.18			
Q	1.01	4.57	1.89	2.17	1.62	.48	.22	.30	.19	6.11	.44	1.45	20.45			
Normal P 2/	3.12	2.64	3.38	3.14	3.82	4.14	4.40	4.50	3.07	3.28	2.26	3.08	40.83			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													Blacksburg, Va. Fosters Creek Watershed W-I			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-20	0.13	10-20	0.11	10-20	0.20	10-20	0.44	10-20	0.68	10-20	0.73	10-20	0.75	10-20	0.82
1961	10-20	1.71	10-20	0.76	10-20	1.02	10-20	2.06	10-20	3.02	10-20	4.96	10-20	5.89	10-20	5.96
Notes: Records began 9-1-60. Quality of records: Monthly P - excellent; monthly Q - good. Annual Maximum Discharges and Volumes of Runoff - good. Watershed conditions: as described under "Watershed Conditions" above. 1/ Monthly precipitation is Thiessen polygon weighted amounts - rain gages R-1 and R-2. 2/ Normal P based on 40-yr. record (1922-1961) at Louisa, Virginia, taken from U.S. Weather Bureau Climatological Data Series.																

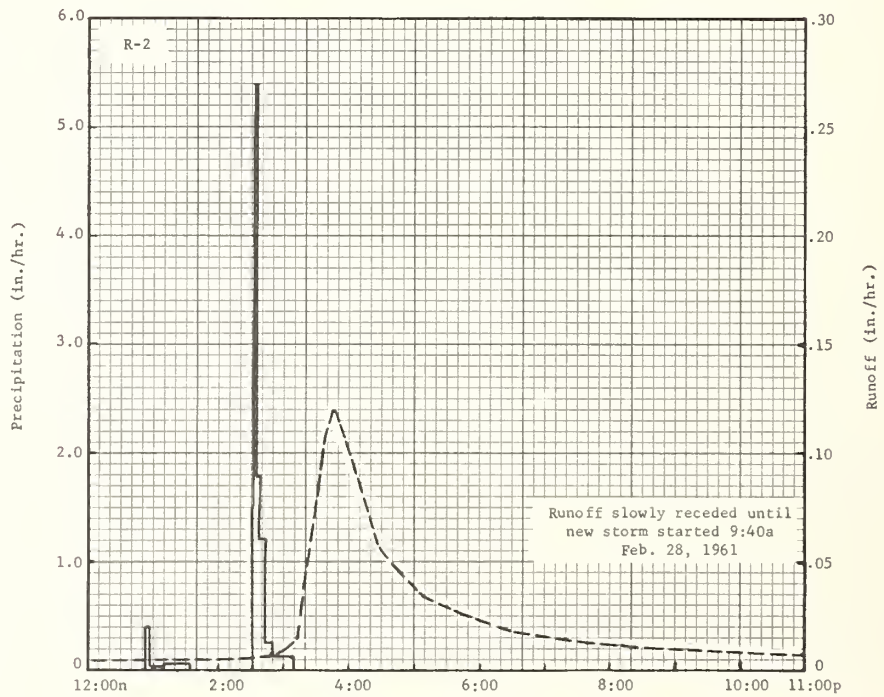


SELECTED RUNOFF EVENTS			Blacksburg, Va. Fosters Creek Watershed W-I					
Antecedent conditions			Rainfall			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of September 5 - 10, 1960</u>								
8-6-60	0.37	nr	9-5-60	Raingage R-2		9-5-60		
8-8	.75	nr	5:42p	0	0	5:40p	0.0001	0
8-10	.24	nr	:45	5.00	.25	:50	.0005	0
8-13	.75	nr	:54	1.33	.45	6:00	.0010	.0002
8-14	.26	nr	:56	5.10	.62	:20	.0043	.0009
8-22	.02	nr	6:01	1.68	.76	:23	.0089	.0013
8-27	.26	nr	:05	.60	.80	:28	.0273	.0028
8-31	.26	nr	:15	.06	.81	:34	.0363	.0060
9-1	0	.0083	:24	.13	.83	:44	.0427	.0125
9-2	.05	.0072	:50	.07	.86	7:00	.0234	.0213
<b>Watershed Conditions:</b> As described under "Watershed Conditions" on page 13.14-1.			Total Rainfall R-1 = .95			:04	.0202	.0228
			Thiessen Wtd. Average (R-1 and R-2) = .92			:16	.0153	.0264
			:36	.0094	.0305			
			8:02	.0057	.0337			
			:44	.0030	.0367			
			9:14	.0020	.0379			
			:36	.0015	.0386			
			10:44	.0013	.0402			
			12:00m	.0011	.0417			
			9-6-60					
4:00a	.0007	.0449						
12:00m	.0004	.0546						
9-7-60								
12:00m	.0003	.0632						
9-10-60								
7:52p	.0002 <sup>3/</sup>	.0835						
<u>Event of February 25 - 28, 1961</u>								
1-26-61	0.37 s	0.0144	2-25-61	Raingage R-2		2-25-61		
1-27,2-2	0	.1008	12:53p	0	0	2:00p	0.0050	0
2-3	.69 s	.0144	:56	.40	.02	:36	.0060	.0033
2-4	.01 s	.0144	1:10	.04	.03	:52	.0063	.0049
2-5,6	0	.0288	:35	.05	.05	3:12	.0139	.0083
2-7	.19 s	.0144	2:32	0	.05	:18	.0382	.0109
2-8	.86 s	.0144	:34	1.50	.10	:32	.0835	.0261
2-9,11	0	.0438	:36	5.40	.28	:36	.1017	.0323
2-12	.19 s	.0350	:38	1.80	.34	:46	.1200	.0508
2-13,16	0	.4004	:43	1.20	.44	4:08	.0875	.0888
2-17	.01	.1988	:50	.26	.47	:28	.0563	.1128
2-18	.75	1.2457	3:05	.12	.50	5:08	.0347	.1426
2-19	0	.6909				:48	.0253	.1626
2-20	.06	.0643				6:28	.0172	.1768
2-21	.34	.1248	Total Rainfall R-1 = .46			7:40	.0123	.1940
<b>Waterahed Conditions:</b> As described under "Watershed Conditions" on page 13.14-1.			Thiessen Wtd. Average (R-1 and R-2) = .48			8:36	.0102	.2045
			12:00m	.0066	.2327			
			2-26-61					
			5:40	.0041	.2631			
			11:20a	.0027	.2823			
			12:00m	.0017	.3102			
			2-27-61					
			12:00m	.0014	.3488			
			2-28-61					
			9:40a	.0014 <sup>3/</sup>	.3623			

**Notes:** To convert runoff in in/hr to cfs, multiply by 392.24. s = snow. <sup>1/</sup> All Antecedent Rainfall Thiessen Polygon weighted amounts - R-1 & R-2 raingages except for 8-6 thru 8-31-60 (at Louisa, Va.) which was taken from U.S.W.B. Climatological Data Summaries. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Beginning of new runoff event. <sup>4/</sup> .22 inch of rain 2:15a to 8:35a, .01 inch 9:30a to 11:00a. <sup>5/</sup> Prior to 2:00p.

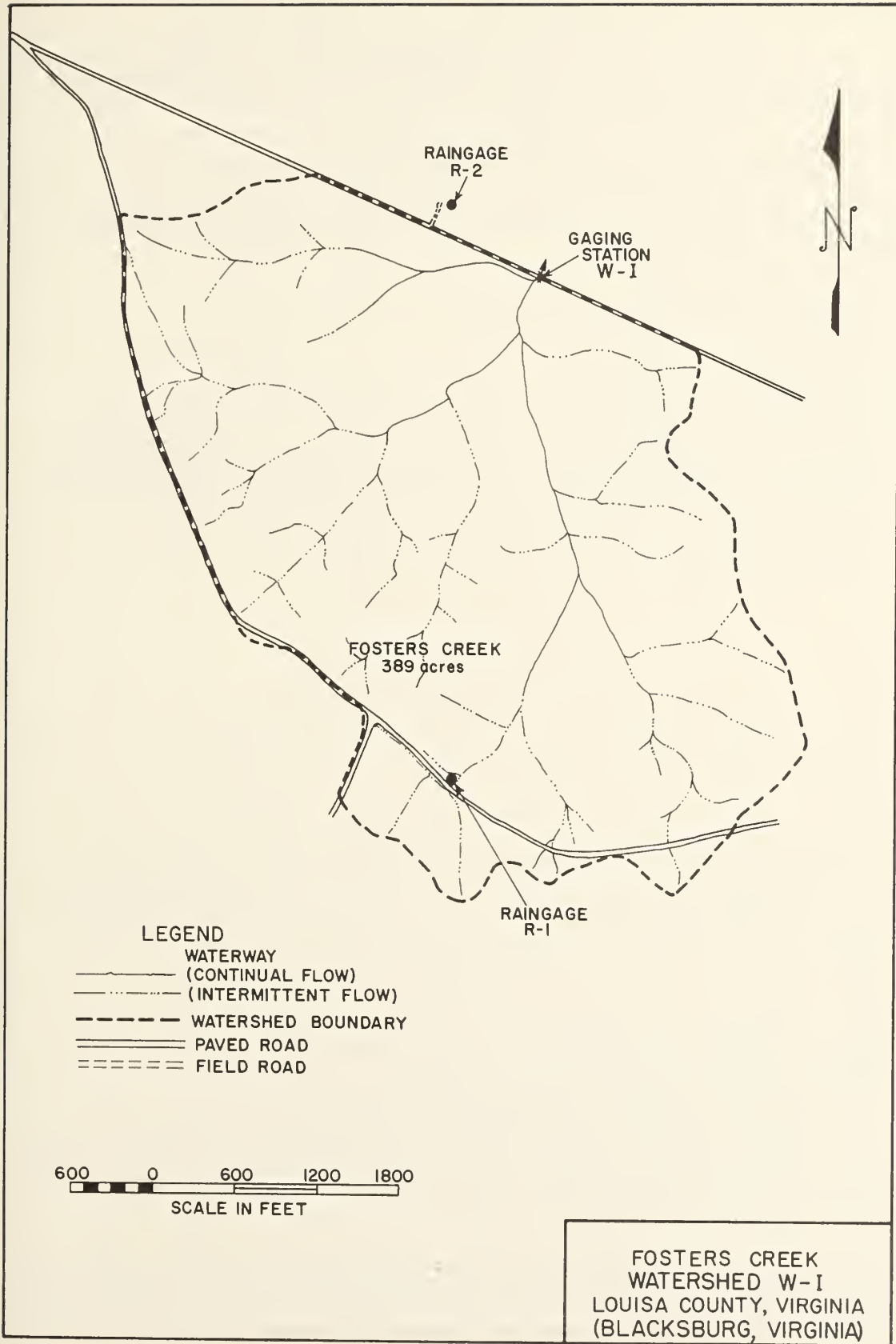


September 5, 1960



February 25, 1961

BLACKSBURG, VIRGINIA FOSTERS CREEK WATERSHED W-I



BLACKSBURG, VA. CHESTNUT BRANCH WATERSHED W-I

LOCATION: Bedford County, Va., on Route No. 460, about 6 mi. west of Forest, Va., near Goode, Va., Elk Creek, Big Otter River.

AREA: 1058 acres (1.65 sq. mi.)      SHAPE: Roughly rectangular - about 2.56 mi. long by 0.639 mi. wide.

SLOPES: Pending detailed survey. Preliminary information indicates that the slope range varies from about 22% in the wooded areas to about 2% in the flood plane, with an average slope of about 6%. Aspect S.

SOILS: Pending detailed survey. Preliminary information indicates that the soils are a composite of the Cecil series - derived from weathered acidic rocks; the Davidson series - derived from dark basic rocks; the Madison series derived from fine grained, weathered quartz mica schist and the Lloyd series - derived from the intermediate or mixed rocks.

EROSION: Pending detailed survey.

LAND CAPABILITY: Pending detailed survey.

SURFACE DRAINAGE: Good, principal waterway about 3.03 mi. with a well-defined system of drainage ways.

CHARACTER OF FLOW: Perennial, continuous.

INSTRUMENTATION: Runoff - flow control is a concrete, box-type, highway culvert, 10-ft. wide and 12-ft. high, combined with a modified, Virginia V-notch weir for low flow measurements. Continuous water-level recorder for period of record. Precipitation - three recording gages; one with weekly chart and two with twelve-hour charts.

WATERSHED CONDITIONS: Mixed cover: tobacco - 0.4%, corn - 5.6%, (total row crops - 6.0%); small grain followed by lespedeza - 0.6%, hay mixtures such as alfalfa, red clover, lespedeza and native grass - 25.8%, (total cultivated - 32.4%); pasture, usually good cover of native grass mixture - 24.7%; farm woods, a mixture of hardwood and pine - 35.6%; idle land, usually a good cover of weeds and annual grasses - 6.4%; road right-of-way - 0.9%.

GENERALLY REPRESENTS: Complex land use areas of the Northern and Southern Piedmont land resource areas (S-148 and P-136) lying east of and adjacent to the Blue Ridge land resource area (N-130) in Virginia, Maryland, and North Carolina.

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)													Blacksburg, Va. Chestnut Branch Watershed W-I			
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P									3.70	2.51	0.78	2.29	9.28
	Q									.42	.45	.44	.49	1.80		
1961	P	1.09	5.94	4.12	3.36	2.16	4.74	3.12	4.62	4.73	4.18	4.10	5.18	47.34		
	Q	.58	2.13	1.41	1.38	.66	.53	.40	.49	.56	.84	1.18	2.03	12.19		
	Normal P 2/	3.64	2.73	4.18	3.43	4.25	4.59	4.55	5.51	3.15	2.97	3.01	3.59	45.60		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													Blacksburg, Va. Chestnut Branch Watershed W-I			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-18	0.02	9-18	0.01	9-18	0.02	9-18	0.05	9-18	0.06	9-18	0.07	9-18	0.09	9-18	0.17
1961	11-6	.26	11-6	.19	11-6	.27	11-6	.35	11-6	.40	11-6	.45	2-22	.50	2-18	1.42

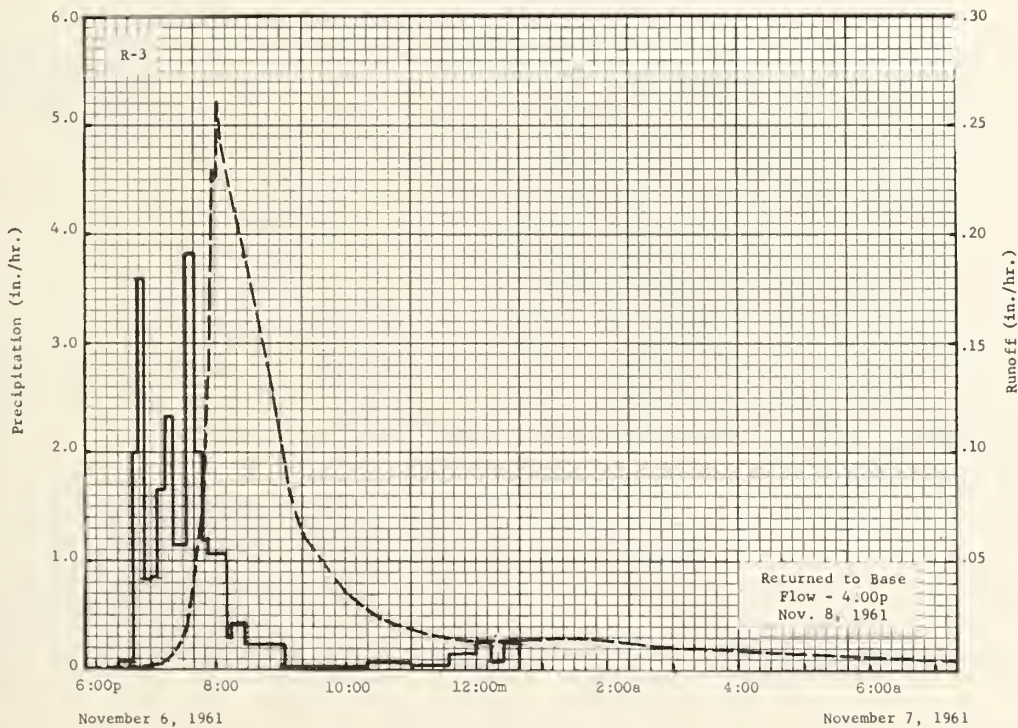
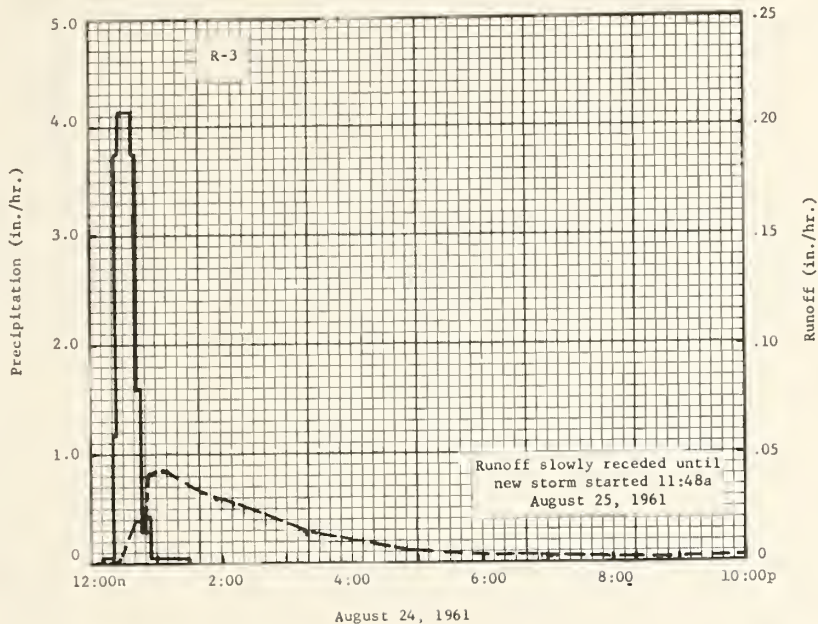
Notes: Records began 9-1-60. Quality of records: Monthly P - excellent; monthly Q - good. Annual Maximum Discharges and Volumes of Runoff - good. Watershed conditions: as described under "Watershed Conditions" above. <sup>1/</sup> Monthly precipitation is Thiessen Polygon weighted amounts - rain gages R-1, R-2, R-3. <sup>2/</sup> Normal P based on 47-yr. record (1915-1961) at Bedford, Virginia.



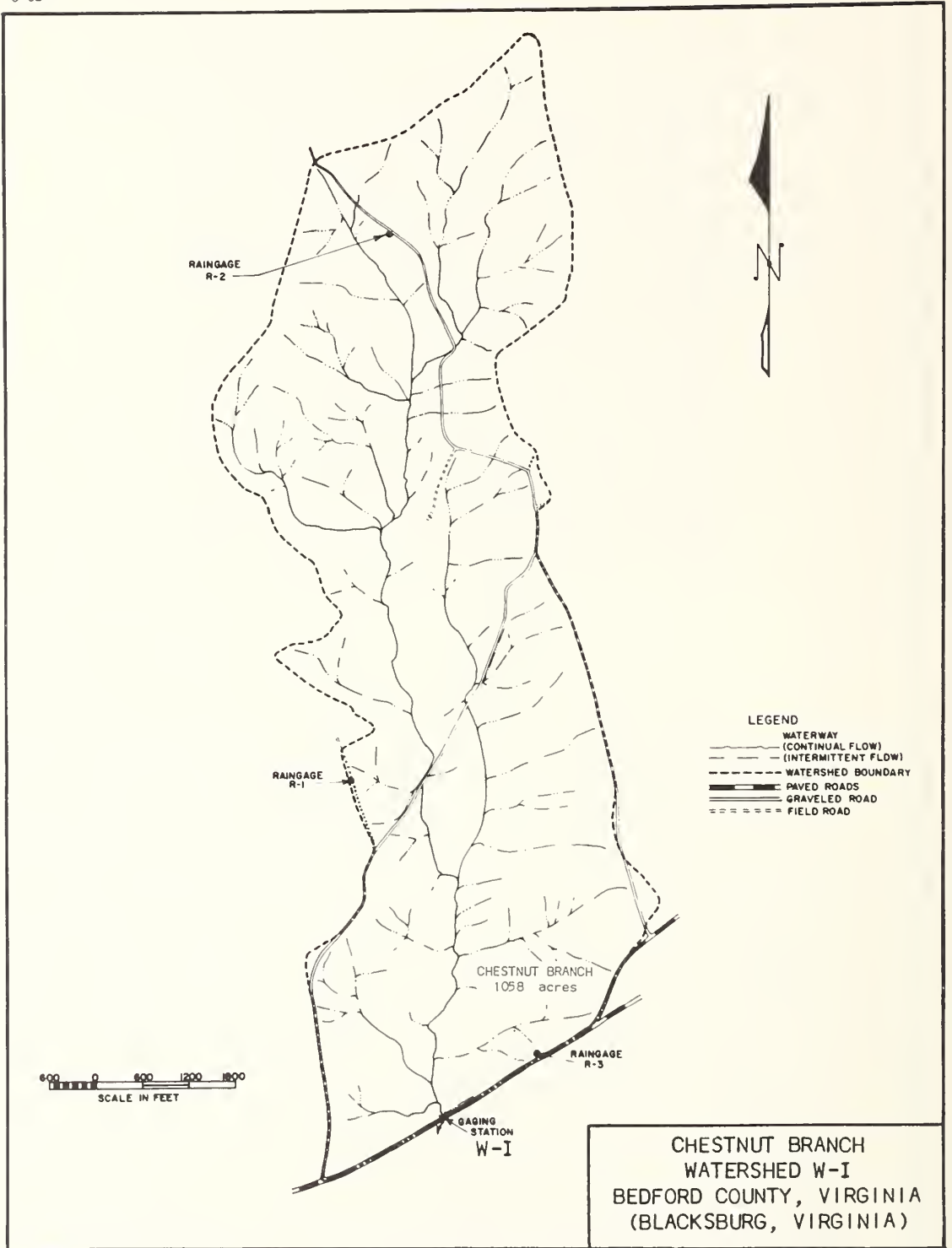
SELECTED RUNOFF EVENTS			Blacksburg, Vs. Chestnut Branch Watershed W-I					
Antecedent conditions			Rainfall			Runoff <sup>2/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<b>Event of August 24 &amp; 25, 1961</b>								
7-25,31-61	0	0.0613	8-24-61	Raingage R-2		8-24-61		
8-1	.06	.0084	12:00n	0	0	12:12p	0.0004	0
8-2	1.00	.0287	:05p	1.20	.10	:27	.0034	.0004
8-3	.08	.0143	:10	1.80	.25	:32	.0091	.0008
8-4	0	.0104	:13	2.00	.35	:40	.0203	.0022
8-5	.02	.0101	:20	1.71	.55	:43	.0203	.0042
8-6	.02	.0092	:30	1.50	.80	:48	.0197	.0055
8-7	0	.0084	:34	.75	.85	:52	.0417	.0075
8-8	.12	.0096	:40	2.50	1.10	1:08	.0423	.0187
8-9,19	0	.0776	:44	.60	1.14	:14	.0420	.0229
8-20	.99	.0112	:49	.12	1.15	:48	.0309	.0436
8-21	.20	.0115				2:12	.0276	.0552
8-22	0	.0084				:40	.0226	.0670
8-23	.28	.0106				3:20	.0145	.0792
8-24	0	.0048 <sup>3/</sup>				4:04	.0100	.0880
<b>Watershed Conditions:</b>			8-24-61	Raingage R-3		5:08	.0056	.0960
As described under "Watershed Conditions" on page 13.15-1.			12:10p	0	0	6:44	.0030	.1026
			:20	.06	.01	9:20	.0016	.1083
			:22	1.20	.05	8-25-61		
			:26	3.75	.30	1:20a	.0010	.1133
			:39	4.15	1.20	11:48	.0009 <sup>4/</sup>	.1272
			:43	3.75	1.45			
			:46	1.60	1.53			
			:50	.30	1.55			
			:54	.45	1.58			
			1:30	.03	1.60			
			Total Rainfall R-1 = 1.40					
			Thiessen Wtd. Average <sup>1/</sup> = 1.31					
<b>Event of November 6 - 8, 1961</b>								
10-7,19-61	0	0.1248	11-6-61	Raingage R-2		11-6-61		
10-20	2.69	.0981	6:39p	0	0	6:40p	0.0006	0
10-21	.98	.2786	:47	.22	.03	:48	.0007	.0001
10-22,11-3	0	.3343	:55	.22	.06	:54	.0013	.0002
11-4	.03	.0168	7:05	2.28	.44	7:08	.0023	.0006
11-5	0	.0168	:18	.78	.61	:12	.0035	.0008
11-6	0	.0120 <sup>5/</sup>	:20	2.10	.68	:16	.0038	.0010
			:25	.84	.75	:32	.0170	.0033
			:55	1.04	1.27	:47	.0707	.0113
			8:13	.57	1.44	:51	.1314	.0181
			:20	.26	1.47	:57	.2291	.0351
			:30	.18	1.50	8:00	.2260	.0461
			:34	.15	1.51	:02	.2610	.0544
			:57	.08	1.54	:04	.2442	.0628
			9:11	.04	1.55	:18	.2122	.1150
			10:25	.02	1.57	:32	.1767	.1608
			11:39	.05	1.63	:52	.1269	.2116
			12:00m	.06	1.65	9:08	.0848	.2406
			11-7-61			:20	.0618	.2547
			12:28a	.20	1.75	10:02	.0347	.2886
			11-6-61	Raingage R-3		:36	.0230	.3045
			6:30p	0	0	11:36	.0146	.3224
			:44	.08	.02	12:00m	.0135	.3281
			:47	2.00	.12	11-7-61		
			:52	3.60	.42	12:08a	.0133	.3298
			7:00	.82	.53	:20	.0129	.3325
			:07	.86	.63	:36	.0129	.3359
			:12	1.68	.77	1:00	.0140	.3413
			:20	2.32	1.08	:36	.0140	.3497
			:32	1.15	1.31	2:04	.0129	.3560

Notes: To convert runoff in in/hr to cfs, multiply by 1066.8. <sup>1/</sup> Rainfall Thiessen Polygon weighted amounts - R-1, R-2 & R-3 raingages. <sup>2/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>3/</sup> Prior to 12:12p. <sup>4/</sup> Beginning of new runoff event. <sup>5/</sup> Prior to 6:40p.

SELECTED RUNOFF EVENTS						Blacksburg, Va. Chestnut Branch Watershed W-I		
Antecedent conditions			Rainfall			Runoff <sup>1/</sup>		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of November 6 - 8, 1961 (Continued)								
			11-6-61			11-7-61		
			7:40p	3.82	1.82	4:28a	0.0084	0.3814
			:46	2.00	2.02	8:52	.0053	.4106
			:51	1.20	2.12	6:20p	.0029	.4481
			8:10	1.07	2.46	11-8-61		
			:12	.30	2.47	4:00p	.0009 <sup>2/</sup>	.4840
			:29	.42	2.59			
			9:05	.12	2.66			
			10:20	.02	2.69			
			11:00	.09	2.75			
			:34	.05	2.78			
			12:00m	.16	2.85			
			11-7-61					
			12:16a	.26	2.92			
			:24	.08	2.93			
			:40	.26	3.00			
			Total Rainfall R-1 =		2.53			
			Thiessen Wtd. Average <sup>3/</sup> =		2.31			
<p>Notes: To convert runoff in in/hr to cfs, multiply by 1066.8. <sup>1/</sup> Only selected point values which adequately define the hydrograph are shown. <sup>2/</sup> Normal base flow. <sup>3/</sup> Raingages R-1, R-2 and R-3.</p>								



BLACKSBURG, VA. CHESTNUT BRANCH WATERSHED W-1





MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Iowa City, Iowa Ralston Creek Area - 1926 ac. (3.01 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	3.30	1.41	1.47	3.59	4.61	5.26	4.72	1.38	3.83	5.89	2.30
	Q	2.04	.44	1.71	2.03	1.72	2.19	1.25	.10	.11	.62	1.12	.19	13.52
1961	P	.36	1.09	3.65	1.42	1.71	2.54	8.12	3.50	7.96	2.45	5.41	.91	39.12
	Q	.10	.73	3.25	.64	.33	.32	.50	.67	1.51	.71	4.17	.64	13.57

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-4	0.30	6-4	0.23	6-4	0.38	6-4	0.62	6-4	0.76	1-11	0.96	1-11	1.10	3-28	1.94
1961	11-16	.13	11-16	.13	11-16	.25	11-15	.66	11-15	.98	11-15	1.25	11-15	1.40	11-15	2.14

Notes: Quality of records: P, good; Q, good, except during periods of ice effect which are fair. Watershed conditions: Approximately 45% of area is cultivated; 35% is in pasture; and 20% is in brush, timber, and orchards.

SELECTED RUNOFF EVENTS

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of November 15-16, 1961</u>								
10-16-61	0	0.0161	11-15-61	Raingage #2		11-15-61		
10-17	0	.0161	6:00p	0	0	6:00p	0.0013	0
10-18	.16	.0148	:30	.02	.01	7:00	.0017	.0014
10-19-22	0	.0531	7:00	.14	.08	8:00	.0020	.0033
10-23	.17	.0161	:20	.15	.13	:30	.0033	.0046
10-24	.13	.0136	:40	.12	.17	9:00	.0111	.0082
10-25-27	0	.0371	8:00	.24	.25	:30	.0269	.0177
10-28	.32	.0185	:20	.30	.35	10:00	.0634	.0403
10-29	.55	.0284	:40	.39	.48	:30	.0884	.0783
10-30,31	0	.0791	9:00	.30	.58	11:00	.106	.1269
11-1	.21	.0482	:15	.16	.62	12:00m	.121	.2405
11-2	2.22	.7662	:20	.12	.63	11-16-61		
11-3	0	.2101	:40	.21	.70	1:00a	.128	.3654
11-4	0	.0989	10:00	.33	.81	:30	.129	.4300
11-5	0	.0717	:20	.24	.89	2:00	.126	.4941
11-6	0	.0618	:40	.30	.99	:30	.116	.5549
11-7-12	0	.2311	11:00	.45	1.14	3:00	.103	.6099
11-13	.24	.0297	:08	0	1.14	:30	.0932	.6591
11-14	0	.0272	:16	1.13	1.29	4:00	.0819	.7029
11-15	.06 <sup>2/</sup>	.0219 <sup>3/</sup>	:20	.15	1.30	:30	.0721	.7414
			:40	.21	1.37	5:00	.0620	.7749
			:50	.18	1.40	:30	.0540	.8039
			12:00m	0	1.40	6:00	.0477	.8294
			11-16-61			7:00	.0434	.8749
			12:20a	0	1.40	8:00	.0484	.9208
			:40	.12	1.44	9:00	.0520	.9710
			:50	1.26	1.65	11:00	.0498	1.0729
			1:00	.36	1.71	12:00n	.0412	1.1184
			:20	.09	1.74	1:00	.0276	1.1529
			:40	.12	1.78	2:00	.0203	1.1768

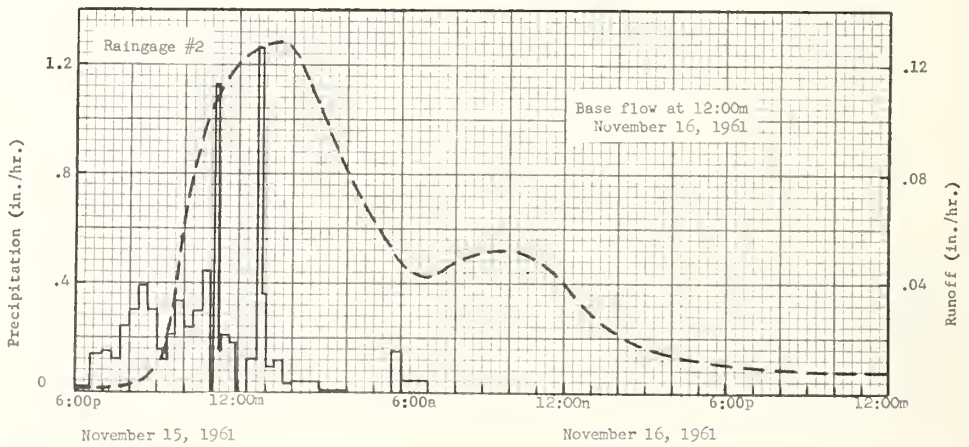
Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 1942.04. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, p. 21.1-6. <sup>1/</sup> Arithmetical averages of 5 raingages. <sup>2/</sup> Accumulation from 4:00 to 6:00p. <sup>3/</sup> Amount accumulated to 6:00p.

11-63

SELECTED RUNOFF EVENTS						Iowa City, Iowa - Ralston Creek		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of November 15-16, 1961 - Continued								
			11-16-61			11-16-61		
			2:00a	0.03	1.79	4:00p	0.0141	1.2113
			3:00	.04	1.83	6:00	.0111	1.2365
			4:00	.01	1.84	9:00	.0090	1.2668
			5:40	0	1.84	12:00m	.0081 <u>1/</u>	1.2924
			6:00	.15	1.89			
			7:00	.05	1.94			
			11-15,16-61	Raingage #1	1.96			
			11-15,16-61	Raingage #3	1.70			
			11-15,16-61	Raingage #4	1.99			
			11-15,16-61	Raingage #5	2.04			
			Arithmetical average of 5 raingages		1.93			

Notes: To convert runoff in in/hr to cfs, multiply by 1942.04. 1/ Base flow.



IOWA CITY, IOWA RALSTON CREEK

1-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)													McCredie, Missouri Station Reservoir Watershed W-1 (Area - 153 acres)			
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P	1.22	1.47	1.65	4.34	2.99	3.48	3.73	1.27	0.68	4.06	1.29	2.10	28.28
	Q	.24	.48	1.84	1.07	.42	.02	.40	0	0	.06	0	.05	4.58		
1961	P <sup>1/</sup>	.16	1.82	3.98	4.64	5.16	5.44	5.56	1.86	6.27	2.12	3.07	1.39	41.47		
	Q	0	.14	1.19	1.89	2.70	.52	.93	0	.46	0	.78	.55	9.16		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													McCredie, Missouri Station Reservoir Watershed W-1			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-27	1.56	3-27	0.79	3-27	1.02	3-27	1.41	3-27	1.52	3-27	1.61	3-27	1.70	3-27	1.90
1961	5-5	.41	5-5	.28	5-5	.47	4-4	.91	5-5	1.14	5-5	1.25	5-5	1.33	5-4	2.51
Notes: Quality of records: Monthly P and Q excellent except for periods of ice formation when they were good. Maximum rates and volumes excellent except for periods of ice formation when they were good. Watershed conditions: 22% in row crops of corn or soybeans; 16% in row crop plots of corn or soybeans; 56% in idle grasslands; 6% in roads and farmstead. Crops good to excellent both years. <sup>1/</sup> Weighted average of one recording and one non-recording gage.																
NO SELECTED RUNOFF EVENTS REPORTED																
Notes: For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, ARS, SWC, MP 945, page 25.1-8.																

Cooperative Research Project of USDA and the Missouri Agricultural Experiment Station

25.1-1

1-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)													McCredie, Missouri S. W. Pond No. 2 Watershed (Area - 44.33 acres)			
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P	1.18	1.35	1.64	4.20	2.93	3.50	3.72	1.23	0.75	4.01	1.28	2.03	27.82
	Q	.06	.55	2.74	1.06	.48	.03	.31	0	0	.02	.01	.02	5.28		
1961	P	.15	1.78	3.94	4.56	5.07	5.44	5.38	1.78	6.25	2.07	2.99	1.40	40.81		
	Q	0	.11	1.34	1.87	2.69	.39	.72	.07	.35	.01	.72	.61	8.88		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													McCredie, Missouri S. W. Pond No. 2 Watershed			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-27	1.02	3-27	0.55	3-27	0.95	3-27	1.73	3-27	1.91	3-27	2.14	3-26	2.42	3-26	2.84
1961	5-5	.39	5-5	.31	5-5	.56	5-5	1.04	5-5	1.27	5-5	1.37	5-4	1.41	5-4	2.54
Notes: Quality of records: Monthly P and Q excellent except for periods of ice formation when they were good. Maximum rates and volumes excellent except for periods of ice formation when they were good. Watershed conditions: 25% in contour corn; 73% in grassland; 2% in road and miscellaneous. Crops good to excellent both years. <sup>1/</sup> Monthly precipitation from Raingage R-7.																
NO SELECTED RUNOFF EVENTS REPORTED																
Notes: For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 25.2-4.																

Cooperative Research Project of USDA and Missouri Agricultural Experiment Station

(See 25.1-1 above)

25.2-1

3-64

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Coshocton, Ohio Watershed 102 <sup>2/</sup> (Area—1.26 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P				1.67	3.27	6.88	3.06	6.64	0.48	1.91	1.73	1.54	27.18
	Q				0	0	.03	0	.31	0	0	0	0	.34
1961	P	0.88	3.89	3.51	6.67	2.26	3.12	5.08	1.94	1.23	2.24	3.13	2.40	36.35
	Q	0	0	0	.96	0	0	.02	0	0	0	0	0	.98

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 102								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-21	0.725	8-21	0.20	8-21	0.26	8-21	0.27	8-21	0.27	8-21	0.27	8-21	0.27	8-21	0.27
1961	4-25	1.42	4-25	.78	4-25	.92	4-25	.92	4-25	.92	4-25	.94	4-25	.94	4-21	.96

Notes: Quality of records: Monthly P & Q, good; annual maximum discharges and volumes, excellent. Watershed conditions: Cover, 1960-61 - birdsfoot trefoil. <sup>1/</sup> Precipitation from Raingage Y101. <sup>2/</sup> Watershed discontinued January 1, 1947 to April 30, 1957 and September 1, 1957 to March 29, 1960.

SELECTED RUNOFF EVENTS				Coshocton, Ohio Watershed 102				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage Y101			Event of August 21 and 22, 1960					
7-21-25-60	0	0	8-21-60	Raingage Y101	0	8-21-60	0	0
7-26	.27	0	9:37p	0	0	9:52p	0	0
7-27	.02	0	:42	.36	.03	:53	.0945	T
7-28-29	0	0	:45	.20	.04	:54	.213	T
7-30	.32	0	:48	1.40	.11	10:00	.0803	.02
7-31-8-2	0	0	:54	5.90	.70	:05	.0433	.02
8-3	.47	0	10:00	1.00	.80	:10	.0079	.03
8-4	1.93	.04	:04	.75	.85	:22	.0032	.03
8-5-7	0	0	:09	.48	.89	:25	.0079	.03
8-8	.03	0	:15	.10	.90	:27	.0433	.03
8-9-14	0	0	:18	.80	.94	:30	.272	.04
8-15	.08	0	:24	1.40	1.08	:32	.362	.05
8-16-19	0	0	:28	4.20	1.36	:34	.607	.06
8-20	.15	0	:33	1.80	1.51	:36	.725	.08
8-21	.52 <sup>3/</sup>	0	:37	2.40	1.67	:41	.607	.14
			:40	1.20	1.73	:44	.402	.17
			:54	.17	1.77	:48	.232	.19
			11:01	.43	1.82	:54	.0945	.20
			:10	.07	1.83	11:00	.0433	.21
			:22	.40	1.91	:06	.0079	.21
			:25	2.20	2.02	:24	.0032	.21
			:28	3.00	2.17	:26	.0236	.21
			:31	1.00	2.22	:28	.0677	.22
			12:00m	.02	2.23	:34	.213	.23
			8-22-60			:36	.213	.24
			12:04a	.15	2.24	:44	.0945	.26
			:07	1.80	2.33	:50	.0433	.26
			:14	.09	2.34	12:00m	.0079	.27
			:18	.60	2.38	8-22-60	0	.27
						12:40a		

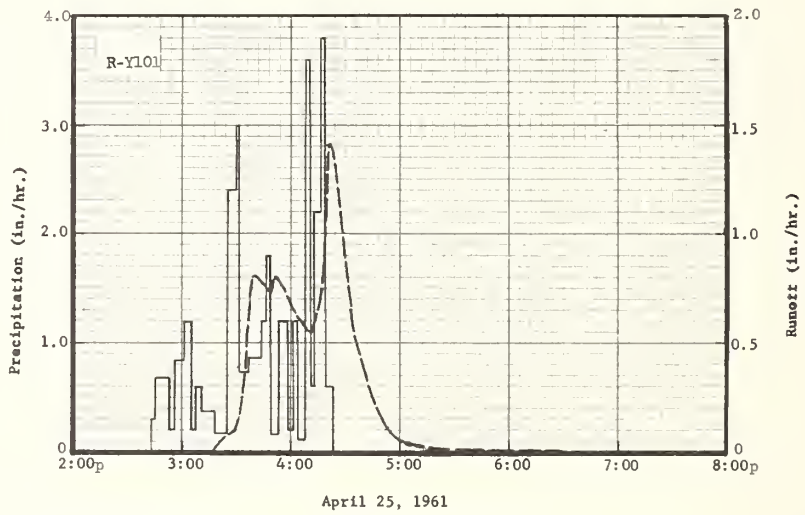
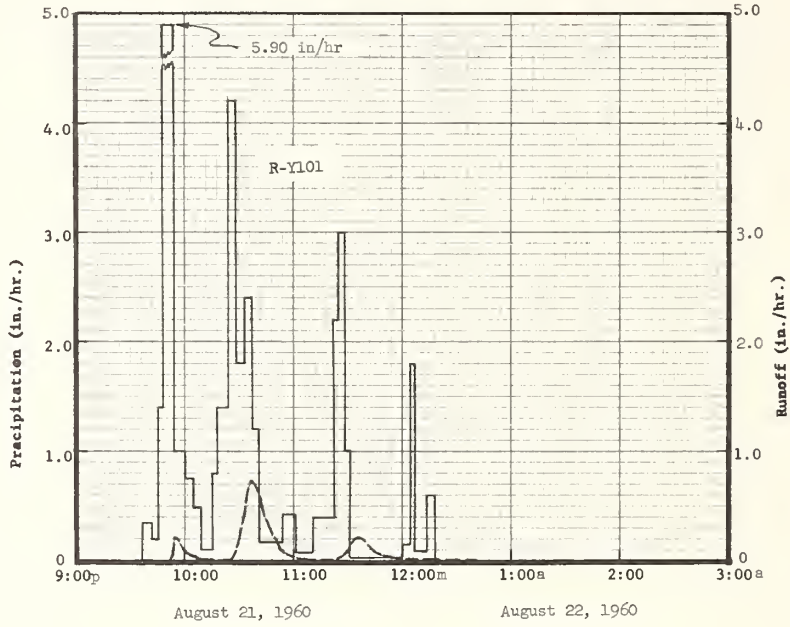
Watershed conditions: Cover in pastured birdsfoot trefoil (improved practice) since 1957. Legumes, grass and weeds 10" high; density of cover 100%.

Notes: To convert runoff in in/hr to cfs, multiply by 1.2705. For map of watershed, refer to Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.1-4. <sup>3/</sup> Rain ended about noon.



SELECTED RUNOFF EVENTS			Coshoooton, Ohio Watershed 102					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25, 1961								
3-25-30-61	Raingage Y101 0	0	4-25-61	Raingage Y101		4-25-61		
3-31	.27	0	2:43p	0	0	3:17p	0	0
4-1	.62	0	4:5	.30	.01	4:23	.0677	T
4-2	.03	0	4:53	.68	.10	4:29	.0945	.01
4-3-4	0	0	4:56	.20	.11	4:31	.158	.02
4-5	.03	0	3:01	.84	.18	4:33	.291	.02
4-6	.05	0	4:05	1.20	.26	4:35	.457	.04
4-7-8	0	0	4:08	.20	.27	4:37	.662	.05
4-9	.60	0	4:10	.60	.29	4:39	.811	.08
4-10	.65	0	4:18	.38	.34	4:49	.725	.21
4-11	.05	0	4:25	.17	.36	4:51	.811	.23
4-12	.25	0	4:30	2.40	.56	4:59	.693	.33
4-13	.04	0	4:32	3.00	.66	4:03	.607	.38
4-14	0	0	4:37	.72	.72	4:11	.536	.45
4-15	.05	0	4:44	.86	.82	4:13	.607	.47
4-16	.67	0	4:46	1.20	.86	4:16	.725	.50
4-17	.34 rs	0	4:49	1.80	.95	4:18	.906	.53
4-18-20	0	0	4:53	.15	.96	4:19	1.09	.55
4-21	.87	.02	4:58	1.20	1.06	4:21	1.42	.59
4-22	.61	.01	4:01	.20	1.07	4:25	1.24	.68
4-23	.05	0	4:03	1.20	1.11	4:29	.906	.75
4-24	0	0	4:08	.12	1.12	4:33	.607	.80
4-25	.64 1/	0	4:10	3.60	1.24	4:39	.386	.85
			4:13	.60	1.27	4:45	.232	.88
			4:16	2.20	1.38	4:53	.109	.90
			4:19	3.80	1.57	5:05	.0433	.92
			4:22	.60	1.60	5:13	.0236	.92
						5:23	.0150	.93
						6:03	.0079	.93
						6:23	.0032	.94
						6:29	0	.94
<p>Watershed conditions: In pastured birdsfoot trefoil (improved practice) since 1957. Legumes, grass, and weeds 4" high; density of cover 95%.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 1.2705. 1/ Rain ended about 12:30p.



COSHOCTON, OHIO      WATERSHED 102

3-44

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshooton, Ohio Watershed 129 (Area 2,71 acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.86	3.21	0.95	1.14	3.03	6.66	2.81	6.07	0.40	1.92	1.51	1.48	32.34
	Q	T	0	.03	0	0	.12	0	.26	0	0	0	0	.41
1961	P	.77	3.95	3.36	6.43	2.09	3.00	5.07	1.81	1.01	2.15	3.09	2.41	35.14
	Q	0	.01	.01	.79	0	0	.08	0	0	0	0	0	.89

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS  
Coshooton, Ohio Watershed 129

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-21	0.56	8-21	0.16	8-21	0.21	8-21	0.21	8-21	0.21	8-21	0.21	8-21	0.21	8-21	0.21
1961	4-25	1.16	4-25	.65	4-25	.77	4-25	.77	4-25	.77	4-25	.77	4-25	.77	4-21	.79

Notes: Quality of records: Monthly P, excellent; monthly Q, good; annual maximum discharges and volumes, good.  
Cover 1960 and 1961, 100% improved practice pasture.  
1/ Precipitation from Raingage 100.

SELECTED RUNOFF EVENTS  
Coshooton, Ohio Watershed 129

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
7-21-25-60	Raingage 100	0	Event of August 21 and 22, 1960			8-21-60		
7-26	.23	0	8-21-60	Raingage 100	0	10:26p	0	0
7-27-29	0	0	9:30p	0	0	:28	.0439	T
7-30	.34	0	:44	.70	.07	:30	.168	T
7-31-8-2	0	0	:50	5.50	.62	:32	.282	.01
			10:04	.86	.82			
8-3	.25	0	:16	.30	.87	:34	.392	.02
8-4	1.75	.05	:20	2.10	1.01	:36	.480	.04
8-5-7	0	0	:25	3.60	1.31	:38	.556	.05
8-8	.04	0	:33	1.88	1.56	:42	.509	.09
8-9-14	0	0	:40	.77	1.65	:44	.450	.11
8-15	.05	0	:53	.99	1.67	:46	.337	.12
8-16-19	0	0	:58	.48	1.71	:50	.223	.14
8-20	.12	0	11:09	0	1.71	:52	.146	.14
8-21	.56 <sup>2/</sup>	0	:13	.75	1.76	:56	.0816	.15
			:20	.26	1.79	11:00	.0439	.16
			:25	2.76	2.02	:06	.0201	.16
			:28	1.00	2.07	:20	.0015	.16
			12:00m	0	2.07	:26	.0015	.16
			8-22-60			:28	.0110	.16
			12:05a	1.20	2.17	:30	.0315	.16
			:12	.26	2.20	:32	.0736	.16
			:16	.30	2.22	:34	.126	.17
			1:56	.01	2.23	:36	.168	.17
			2:10	.17	2.27	:44	.126	.19
			:14	.75	2.32	:48	.0901	.20
			:45	.19	2.42	:52	.0315	.20
						12:00m	.0110	.21
						8-22-60		
						12:06a	.0070	.21
						:16	.0070	.21
						:24	.0337	.21
						:40	0	.21

Notes: To convert runoff in in/hr to cfs, multiply by 2.7326. For map of watershed, refer to Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.3-5. 2/ Rain ended about noon.

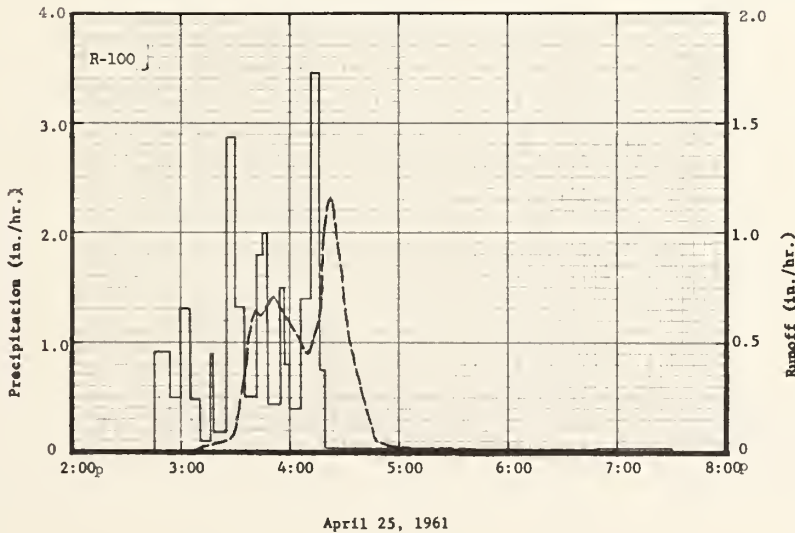
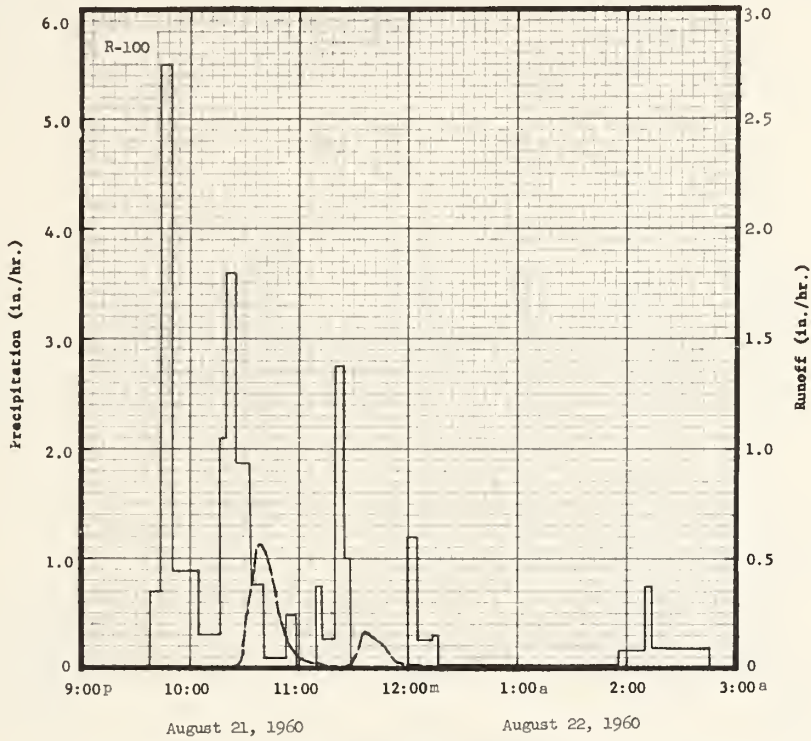
3-64

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 129					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
	Raingage 100		Event of April 25, 1961					
3-25-30-61	0	0	4-25-61	Raingage 100	0	4-25-61	0	0
3-31	.29	0	2:45 p	0	0	3:07 p	0	T
4-1	.61	0	:54	.93	.12	:11	.0201	T
4-2	.02 s	0	3:00	.50	.17	:17	.0373	T
4-3-4	0	0	:05	1.32	.18	:21	.0439	.01
4-5	.03	0	:10	.48	.32	:27	.0582	.01
4-6	.04	0	:16	.10	.33	:29	.0901	.01
4-7-8	0	0	:18	.90	.36	:31	.146	.02
4-9	.76	0	:25	.17	.38	:33	.260	.03
4-10	.07	0	:30	2.88	.62	:35	.362	.04
4-11	0	0	:35	1.32	.73	:37	.509	.05
4-12	.29	0	:42	.51	.79	:41	.641	.09
4-13	.05	0	:45	1.80	.88	:44	.622	.12
4-14-15	0	0	:48	2.00	.98	:47	.659	.15
4-16	.74	T	:55	.43	1.03	:51	.707	.20
4-17	.15 rs	0	:57	1.50	1.08	:57	.622	.26
4-18-20	0	0	4:00	.80	1.12	4:07	.480	.36
4-21	.77	.01	:06	.40	1.16	:09	.450	.37
4-22	.56	0	:12	1.40	1.30	:13	.509	.40
4-23	.01	0	:16	3.45	1.53	:15	.575	.42
4-24	0	0	:20	.75	1.58	:17	.707	.44
4-25	.62 1/	T	5:20	.02	1.60	:20	1.04	.48
			6:50	.01	1.61	:22	1.16	.52
			7:30	.02	1.62	:25	1.04	.58
						:27	.908	.61
						:29	.743	.64
						:31	.638	.66
						:35	.421	.69
						:41	.234	.73
						:47	.0582	.76
						5:07	.0256	.77
						:27	.0037	.77
						:47	0	.77
<p>Watershed conditions: In pasture (improved practice) mostly timothy, bluegrass and alfalfa, 4" high; density of cover 100%.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 2.7326. 1/ Rain ended about 12:30p.



3-64



COSHOCTON, OHIO - WATERSHED 129

3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 135 (Area - 2.69 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.86	3.21	0.95	1.44	3.03	6.66	2.81	6.07	0.40	1.92	1.51	1.48	32.34 .38
	Q	0	0	.03	0	0	.21	0	.14	0	0	0	0	
1961	P	0.77	3.95	3.36	6.43	2.09	3.00	5.07	1.81	1.01	2.15	3.09	2.41	35.14 .75
	Q	0	T	T	.68	0	0	.07	0	0	0	0	0	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 135								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.64	6-14	0.19	6-14	0.20	6-14	0.20	6-14	0.20	6-14	0.20	6-14	0.20	6-14	0.21
1961	4-25	1.32	4-25	.61	4-25	.68	4-25	.68	4-25	.68	4-25	.68	4-25	.68	4-25	.68

Notes: Quality of records: Monthly P, excellent; monthly Q, good; annual maximum discharges and volumes, good. Watershed conditions, 1960 and 1961, 100% unimproved pasture. 1/ Precipitation from Raingage 100.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 135					
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Raingage 100			Event of August 21 and 22, 1960								
7-21-25-60	0	0	8-21-60	Raingage 100	0	8-21-60	0	0			
7-26	.23	0	9:38p	0	0	9:58p	0	0			
7-27-29	0	0	1:44	.70	.27	10:00	.0560	.1			
7-30	.34	0	:50	5.50	.62	:04	.0203	T			
7-31-8-2	0	0	10:04	.86	.82	:12	0	.01			
8-3	.25	0	:16	.30	.87	:25	0	.01			
8-4	1.75	.02	:20	2.10	1.01	:30	.0258	.01			
8-5-7	0	0	:25	3.60	1.31	:32	.0258	.01			
8-8	.04	0	:33	1.88	1.56	:34	.108	.31			
8-9-14	0	0	:40	.77	1.65	:36	.214	.01			
8-15	.05	0	:53	.09	1.67	:39	.310	.03			
8-16-19	0	0	:58	.48	1.71	:42	.324	.04			
8-20	.12	0	11:09	0	1.71	:47	.236	.07			
8-21	.56	2/	:13	.75	1.76	:50	.170	.08			
			:20	.26	1.79	:54	.0907	.09			
			:25	2.76	2.02	:58	.0376	.09			
			:28	1.00	2.07	11:04	.0111	.09			
			12:00m	0	2.07	:12	.0015	.09			
			8-22-60			:24	.0015	.09			
			12:05a	1.20	2.17	:30	.0258	.09			
			:12	.26	2.20	:32	.0258	.10			
			:16	.30	2.22	:36	.0907	.10			
			1:56	.01	2.23	:44	.0512	.11			
			2:10	.17	2.27	:46	.0586	.11			
			:14	.75	2.32	:52	.0376	.12			
			:45	.19	2.42	12:00m	.0070	.12			
						8-22-60					
						12:12a	.0070	.12			
						:20	.0015	.12			
						:32	0	.12			

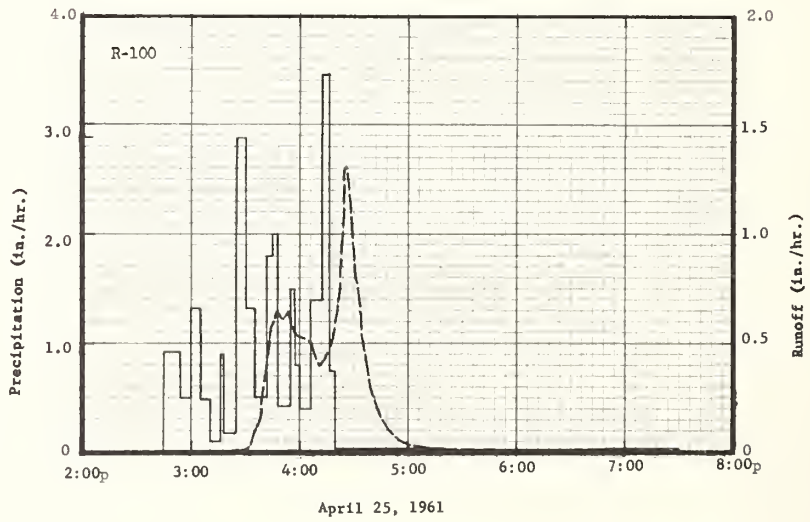
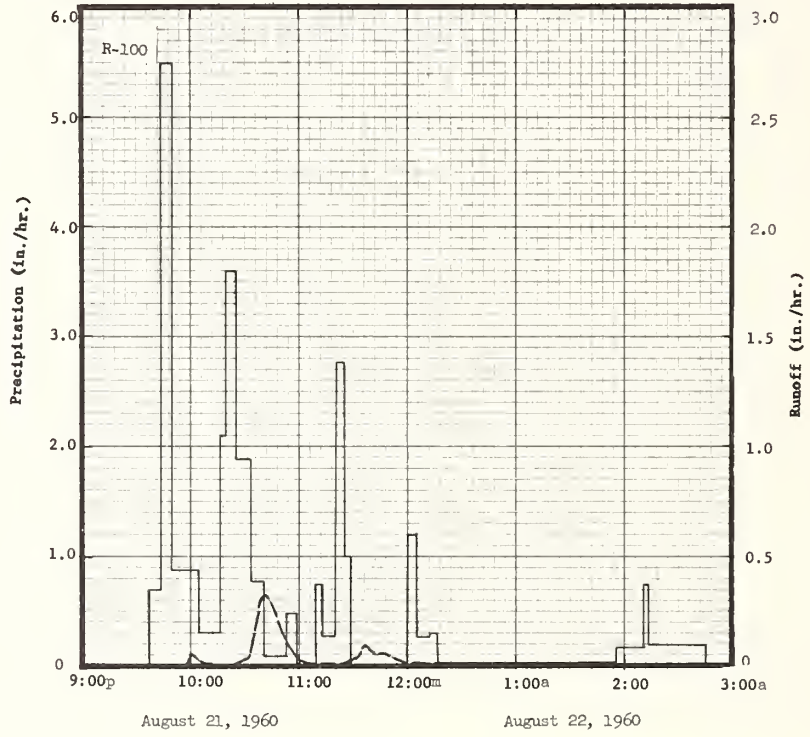
Notes: To convert runoff in in/hr. to cfs, multiply by 2.7124. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.4-5. 2/ Rain ended about noon.

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 135					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
3-25-30-61	Raingage 100	0	Event of April 25, 1961			4-25-61		
3-31	.29	0	4-25-61	Raingage 100	0	4-25-61		
4-1	.61	0	2:45p	0	0	3:23p	0	0
4-2	.02	0	5:4	.93	.12	:27	.0015	T
4-3-4	0	0	3:00	.50	.17	:31	.0111	T
4-5	.03	0	:05	1.32	.18	:33	.0142	T
4-6	.04	0	:10	.48	.32	:35	.0907	T
4-7-8	0	0	:16	.10	.33	:37	.127	.01
4-9	.76	0	:18	.90	.36	:39	.236	.01
4-10	.07	0	:25	.17	.38	:42	.124	.03
4-11	0	0	:30	2.88	.62	:44	.546	.05
4-12	.29	0	:35	1.32	.73	:47	.645	.08
4-13	.05	0	:42	.51	.79	:51	.612	.12
4-14-15	0	0	:45	1.80	.88	:53	.645	.14
4-16	.74	0	:48	2.00	.98	:57	.597	.18
4-17	.15	rs	:55	.43	1.03	4:05	.512	.25
4-18-20	0	0	:57	1.50	1.08	:07	.468	.27
4-21	.77	0	4:00	.80	1.12	:11	.394	.30
4-22	.56	0	:06	.40	1.16	:15	.453	.33
4-23	.01	0	:12	1.40	1.30	:17	.498	.34
4-24	0	0	:16	3.45	1.53	:20	.597	.37
4-25	.62	1/	:20	.75	1.58	:23	.970	.41
			5:20	.02	1.60	:26	1.32	.47
			6:50	.01	1.61	:29	1.01	.52
			7:30	.02	1.62	:31	.822	.56
						:33	.645	.58
						:35	.483	.60
						:37	.380	.61
						:41	.262	.63
						:47	.127	.65
						:57	.0142	.67
						5:07	.0155	.67
						:27	.0015	.68
						:47	0	.68

Watershed conditions:  
In pasture (prevailing practice) mostly timothy, poverty grass, and weeds, 3" high; density of cover 90%. Grazed by cattle.

Notes: To convert runoff in in/hr to ofc, multiply by 2.7124. 1/ Rain ended about 12:30p.

3-64



COSHOCTON, OHIO      WATERSHED 135



3-64

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Coshooton, Ohio Watershed 130 (Area - 1.63 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.77	3.41	0.94	1.51	3.09	6.44	2.89	5.58	0.41	1.97	1.81	1.52	32.34
	Q	.07	.04	.16	0	0	.47	0	.06	0	0	0	0	.80
1961	P	.80	3.92	3.52	6.35	2.11	2.91	4.99	1.96	.93	2.09	3.06	2.30	34.94
	Q	0	.04	.04	.95	0	0	.03	0	0	0	0	0	1.06

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Coshooton, Ohio Watershed 130

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	1.03	6-14	0.38	6-14	0.40	6-14	0.40	6-14	0.43	6-14	0.46	6-14	0.47	6-14	0.47
1961	4-25	1.23	4-25	.67	4-25	.82	4-25	.83	4-25	.84	4-25	.84	4-25	.84	4-21	.86

Notes: Quality of records: Monthly P, excellent; monthly Q, good; annual maximum discharges and volumes, good.  
 Cover 1960 and 1961, 100% improved practice meadow.  
<sup>1/</sup> Precipitation from Raingage 103.

SELECTED RUNOFF EVENTS

Coshooton, Ohio Watershed 130

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 103			Event of August 21 and 22, 1960			Raingage 103		
7-21-25-60	0	0	8-21-60	0	0	8-21-60	0	0
7-26	.21	0	9:40p	.45	.08	10:26p	.0249	.08
7-27	.02	0		.96	.58		.0913	.08
7-28-29	0	0	:50	6.00	.75	:32	.195	.01
7-30	.38	0	10:05	.68		:36		
7-31-8-2	0	0	:10	.12	.76	:42	.158	.03
8-3	.24	0	:13	.80	.80	:44	.116	.03
8-4	1.64	0	:18	.72	.86	:48	.0548	.04
8-5-7	0	0	:26	2.92	1.25	:52	.0322	.04
8-8	.04	0	:33	2.31	1.52	11:02	.0085	.04
8-9-14	0	0	:35	.30	1.53	:12	.0018	.04
8-15	.07	0	:37	1.50	1.58	:22	.0018	.04
8-16-19	0	0	:54	.14	1.62	:28	.0049	.04
8-20	.15	0	11:00	.20	1.64	:34	.0468	.05
8-21	.51 <sup>2/</sup>	0	:10	.06	1.65	:52	.0249	.05
			:17	.43	1.70	12:00m	.0049	.05
			:27	1.38	1.93	8-22-60		
			:58	.02	1.94	12:22a	.0049	.05
			12:00m	1.20	1.98	:32	.0018	.06
			8-22-60			1:32	0	.06
			12:03a	1.20	2.04			
			:12	.07	2.05			
			:17	.36	2.08			
			2:00	.01	2.10			
			:10	.24	2.14			
			:16	.50	2.19			
			:45	.17	2.29			

Watershed conditions: In permanent meadow (improved practice) mostly birdsfoot trefoil, alfalfa and timothy. Hay cut June 17, 1960. Grass and legumes 10" high; density of cover 100%.

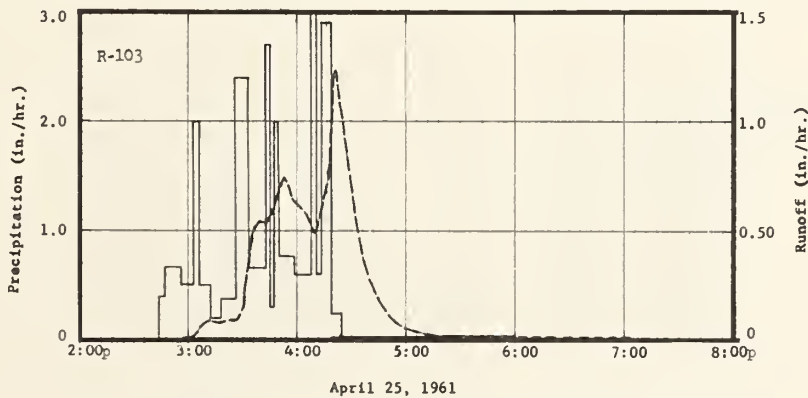
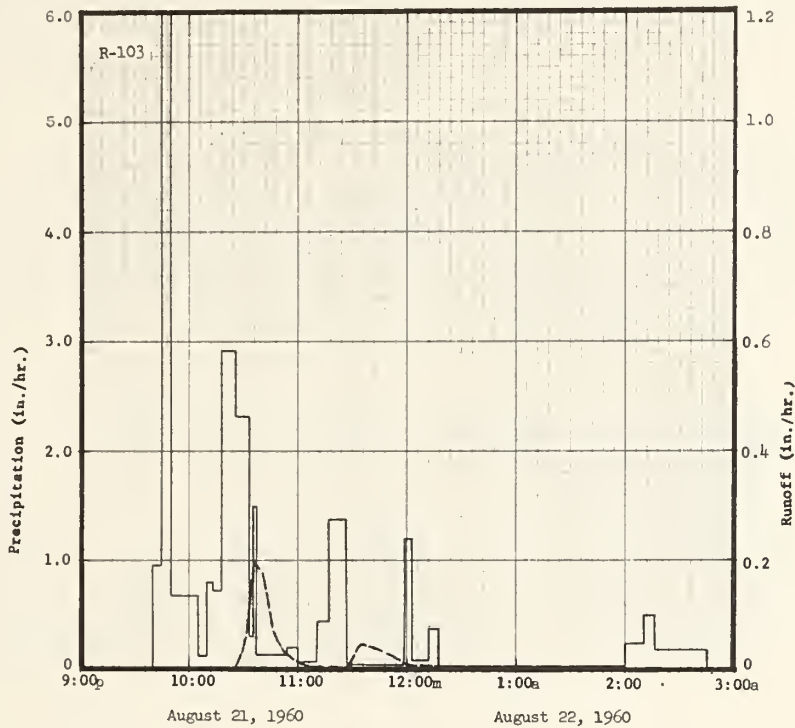
Notes: To convert runoff in in/hr to cfs, multiply by 1.486. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.5-5. <sup>2/</sup> Rain ended about noon.

3-64

SELECTED RUNOFF EVENTS			Coshooton, Ohio Watershed 130					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
3-25-30-61	Raingage 103 0	0	Event of April 25, 1961			4-25-61		
3-31	.28	0	4-25-61	Raingage 103 0	0	4-25-61		
4-1	.47	0	2:44p			2:57p	0	0
4-2	.02 s	0	4:17	.40	.02	3:03	.0085	T
4-3-4	0	0	4:56	.67	.12	4:05	.0322	T
4-5	.02	0	3:03	.51	.18	4:07	.0730	T
4-6	.04	0	4:06	2.00	.28	4:11	.0913	.01
4-7-8	0	0	4:12	.50	.33	4:15	.0652	.01
4-9	.70	0	4:18	.20	.35	4:23	.0913	.03
4-10	.08	0	4:26	.36	.40	4:27	.0913	.03
4-11	0	0	4:33	2.40	.68	4:29	.134	.04
4-12	.30	0	4:43	.66	.79	4:31	.237	.04
4-13	.04	0	4:45	2.70	.88	4:33	.377	.05
4-14	0	0	4:47	.30	.89	4:35	.493	.07
4-15	.03	0	4:50	2.00	.99	4:39	.548	.10
4-16	.66	.09	4:58	.75	1.09	4:43	.529	.14
4-17	.28 rs	0	4:08	.60	1.19	4:49	.645	.20
4-18-20	0	0	4:10	3.00	1.29	4:52	.748	.23
4-21	.79	.02	4:14	.60	1.33	4:57	.645	.29
4-22	.56	T	4:20	2.90	1.62	4:05	.572	.37
4-23	.04	0	4:25	.24	1.64	4:09	.493	.41
4-24	0	0	5:20	.01	1.65	4:13	.590	.44
4-25	.59 1/	.01 2/	6:00	.02	1.66	4:17	.730	.49
						4:19	.943	.51
						4:21	1.23	.55
						4:23	1.08	.59
						4:27	.852	.65
						4:29	.730	.66
						4:33	.511	.72
						4:37	.359	.75
						4:43	.225	.78
						4:51	.116	.80
						5:01	.0548	.82
						4:13	.0249	.82
						4:33	.0085	.83
						4:49	.049	.83
						6:13	.0018	.83
						7:03	0	.83
<p>Watershed conditions: In permanent meadow (improved practice) mostly birdsfoot trefoil, alfalfa, and timothy, 5" high; density of cover 95%.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 1.484. 1/ Rain ended about 12:30p. 2/ Runoff prior to 2:57p.

3-64



COSHOCTON, OHIO      WATERSHED 130

5-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshooton, Ohio Watershed 131 (Area - 2.21 Acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.77	3.41	0.94	1.51	3.09	6.44	2.89	5.58	0.41	1.97	1.81	1.52	32.34
Q	0	0	.01	0	0	.08	0	0	0	0	0	0	.09
1961 P	.80	3.92	3.52	6.35	2.11	2.91	4.99	1.96	.93	2.09	3.06	2.30	34.94
Q	0	0	0	.27	0	0	0	0	0	0	0	0	.27

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Coshooton, Ohio Watershed 131									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.11	6-14	0.07	6-14	0.08	6-14	0.08	6-14	0.08	6-14	0.08	6-14	0.08	6-14	0.08
1961	4-25	.28	4-25	.18	4-24	.24	4-25	.27	4-25	.27	4-25	.27	4-25	.27	4-25	.27

Notes: Quality of records: Monthly P, excellent; monthly Q, good; annual maximum discharges and volumes, good. Cover 1960 and 1961, 100% uneven age hardwoods. 1/ Precipitation from Raingage 103.

SELECTED RUNOFF EVENTS							
Antecedent conditions			Rainfall			Runoff	
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)
Raingage 103		Event of August 21-22, 1960					
7-21-25-60	0	0	8-21-60	Raingage 103			No Runoff
7-26	.21	0	9:40p	0	0		
7-27	.02	0	:50	3.48	.58		
7-28-29	0	0	10:18	.60	.86		
7-30	.38	0	:37	2.27	1.58		
7-31-8-2	0	0	11:17	.18	1.70		
8-3	.24	0		0	0		
8-4	1.64	0	:27	1.38	1.93		
8-5-7	0	0	:58	.02	1.94		
8-8	.04	0	8-22-60				
8-9-14	0	0	12:03a	1.20	2.04		
8-15	.07	0	:17	.17	2.08		
8-16-19	0	0	2:10	.03	2.14		
8-20	.15	0	:45	.22	2.27		
8-21	.51 2/	0					

Watershed conditions: Uneven age stand of hardwoods; good woodland management, no grazing. Trees up to 80'; shrubs 18", herbs 12" and litter 1".

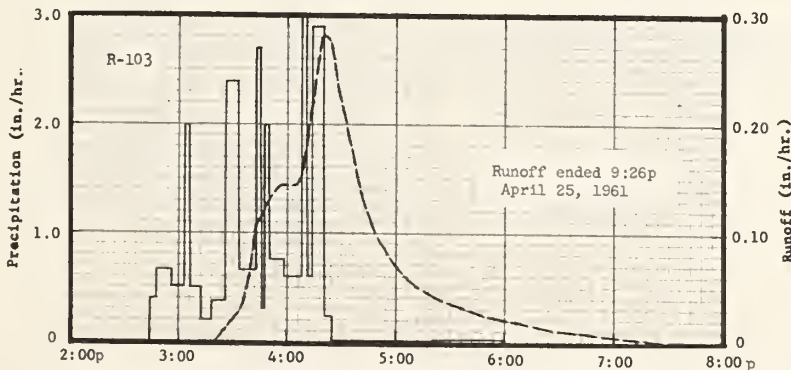
Notes: For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 26.7-5. 2/ Rain ended about noon.



SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 131					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 103			<u>Event of April 25, 1961</u>					
3-25-30-61	0	0	4-25-61	Raingage 103		4-25-61		
3-31	.28	0	2:44p	0	0	3:20p	0	0
4-1	.47	0	:47	.40	.02	:30	.0215	T
4-2	.02 s	0	:56	.67	.12	:33	.0256	T
4-3-4	0	0	3:03	.51	.18	:38	.0592	.01
4-5	.02	0	:06	2.00	.28	:40	.0749	.01
4-6	.04	0	:12	.50	.33	:42	.107	.01
4-7-8	0	0	:18	.20	.35	:46	.114	.02
4-9	.70	0	:26	.38	.40	:56	.144	.04
4-10	.08	0	:33	2.40	.68	4:04	.144	.06
4-11	0	0	:43	.66	.79	:08	.153	.07
4-12	.30	0	:45	2.70	.88	:12	.184	.08
4-13	.04	0	:47	.30	.89	:14	.215	.09
4-14	0	0	:50	2.00	.99	:16	.260	.10
4-15	.03	0	:58	.75	1.09	:20	.283	.11
4-16	.66	0	4:08	.60	1.19	:24	.274	.13
4-17	.28 rs	0	:10	3.00	1.29	:30	.215	.16
4-18-20	0	0	:14	.60	1.33	:34	.184	.17
4-21	.79	0	:20	2.90	1.62	:40	.139	.19
4-22	.56	0	:25	.24	1.64	:48	.101	.20
4-23	.04	0	5:20	.01	1.65	5:06	.0592	.23
4-24	0	0	6:00	.02	1.66	:26	.0395	.24
4-25	.59 <u>1</u> /	0				:46	.0256	.25
						6:26	.0113	.27
						7:26	.0005	.27
						8:26	.0001	.27
						9:26	0	.27

Watershed conditions: Uneven age stand of hardwoods; good woodland management, no grazing. Trees up to 80'; shrubs 6', herbs 6", litter 1".

Notes: To convert runoff in in/hr to cfs, multiply by 2.2284. 1/ Rain ended about 12:30p.



April 25, 1961

COSHOCOTON, OHIO WATERSHEO 131

3-21

MONTHLY PRECIPITATION AND RUNOFF (Inches)										Coshooton, Ohio Watershed 132 (Area - 0.59 Acres)				
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.77	3.41	0.94	1.51	3.09	6.44	2.89	5.58	0.41	1.97	1.81	1.52	32.34
	Q	.18	.20	.58	0	.03	.97	0	0	0	0	0	0	1.96
1961	P	.80	3.92	3.52	6.35	2.11	2.91	4.99	1.96	.93	2.09	3.06	2.30	34.94
	Q	0	.13	.63	2.40	.04	.04	T.	0	0	0	0	0	3.24

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Coshooton, Ohio Watershed 132						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.41	6-14	0.31	6-14	0.45	6-14	0.72	6-14	0.82	6-14	0.88	6-13	0.94	6-13	0.96
1961	4-25	1.05	4-25	.73	4-25	.99	4-25	1.37	4-25	1.52	4-25	1.60	4-25	1.60	4-21	2.08

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good. Cover 1960 and 1961, 100% uneven age hardwoods.  
 1/ Precipitation from Raingage 103.

SELECTED RUNOFF EVENTS						Coshooton, Ohio Watershed 132		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21-22, 1960</u>								
7-21-25-60	Raingage 103 0	0	8-21-60	Raingage 103			No runoff	
7-26	.21	0	9:40p	0	0			
7-27	.02	0	:50	3.48	.58			
7-28-29	0	0	10:18	.60	.86			
7-30	.38	0	:37	2.27	1.58			
7-31-8-2	0	0	11:17	.18	1.70			
8-3	.24	0		0	0			
8-4	1.64	0	:27	1.38	1.93			
8-5-7	0	0	:58	.02	1.94			
8-8	.04	0	8-22-60					
8-9-14	0	0	12:03a	1.20	2.04			
8-15	.07	0	:17	.17	2.08			
8-16-19	0	0	2:10	.03	2.14			
8-20	.15	0	:45	.22	2.27			
8-21	.51 2/	0						

Watershed conditions: Uneven age stand of hardwoods; good woodland management, no grazing. Trees up to 70'; shrubs 18"; herbs 12"; litter 1/2".

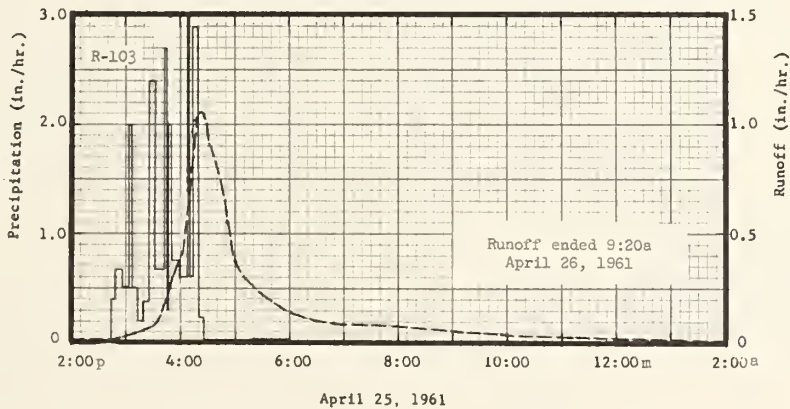
Notes: For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p.28.8-2. 2/ Rain ended about noon.

3-64

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 132					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 103			Event of April 25 and 26, 1961					
3-25-30-61	0	0	4-25-61	Raingage 103	0	4-25-61		
3-31	.28	0	2:44p	0	0	2:40p	0.0094	0
4-1	.47	.04	:47	.40	.02	:56	.0252	T
4-2	.02 s	0	:56	.67	.12	3:10	.0476	.01
4-3-4	0	0	3:03	.51	.16	:30	.0778	.03
4-5	.02	0	:06	2.00	.28	:40	.151	.05
4-6	.04	0	:12	.50	.33	:50	.289	.09
4-7-8	0	0	:18	.20	.35	4:02	.411	.16
4-9	.70	.07	:26	.38	.40	:10	.671	.23
4-10	.08	.04	:33	2.40	.68	:20	1.05	.38
4-11	0	0	:43	.66	.79	:26	1.05	.48
4-12	.30	0	:45	2.70	.88	:30	.936	.55
4-13	.04	0	:47	.30	.89	:40	.797	.69
4-14	0	0	:50	2.00	.99	:50	.586	.81
4-15	.03	0	:58	.75	1.09	:56	.411	.86
4-16	.66	.17	4:08	.60	1.19	5:10	.289	.94
4-17	.28 rs	0	:10	3.00	1.29	:30	.221	1.02
4-18-20	0	0	:14	.60	1.33	6:00	.139	1.11
4-21	.79	.30	:20	2.90	1.62	:50	.0960	1.21
4-22	.56	.11	:25	.24	1.64	7:50	.0778	1.30
4-23	.04	.07	5:20	.01	1.65	8:50	.0616	1.37
4-24	0	T	6:00	.02	1.66	10:00	.0476	1.43
4-25	.59 1/	.03 2/				:46	.0354	1.46
						12:00m	.0205	1.50
						4-26-61		1.52
						1:30a	.0163	1.55
						4:00	.0067	1.57
						7:10	.0012	1.57
						9:20	0	

Watershed conditions: Uneven age stand of hardwoods; good woodland management, no grazing. Trees up to 70', shrubs 6"; herbs 6", litter 1".

Notes: To convert runoff in in/hr to cfs, multiply by 0.5949. 1/ Rain ended about 12:30p. 2/ Runoff prior to 2:40p.



COSHOCTON, OHIO WATERSHED 132

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 123 (Area - 1.37 Acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	3.09	3.52	1.18	1.71	3.40	7.03	3.24	6.60	0.38	2.02	1.73	1.59	35.49
	Q	.38	.23	.46	0	0	.68	0	.36	0	0	0	0	2.11
1961	P	.80	4.20	3.65	6.73	2.20	3.24	5.20	1.96	1.28	2.30	3.11	2.50	37.17
	Q	0	.40	.75	1.95	0	.02	T	0	0	0	0	0	3.12

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Coshocton, Ohio Watershed 123						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.57	6-14	0.30	6-14	0.33	6-14	0.34	6-14	0.35	6-14	0.63	6-14	0.65	6-14	0.67
1961	4-25	1.23	4-25	.93	4-25	1.22	4-25	1.36	4-25	1.41	4-25	1.41	4-25	1.41	4-21	1.78

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, 2nd year meadow; 1961, corn; improved practice.  
 1/ Precipitation from Raingage Y103.

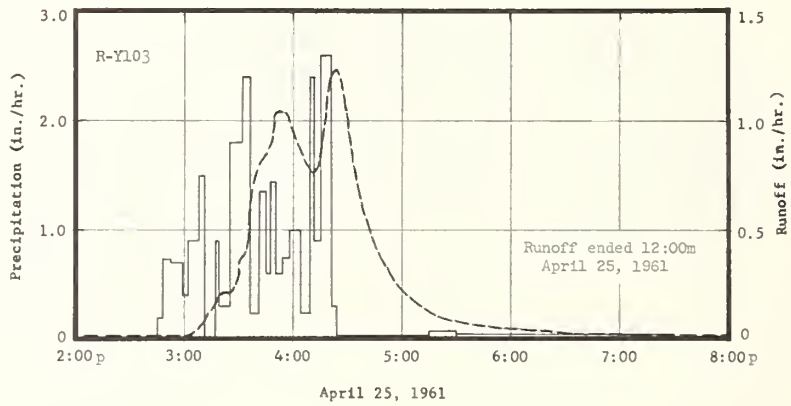
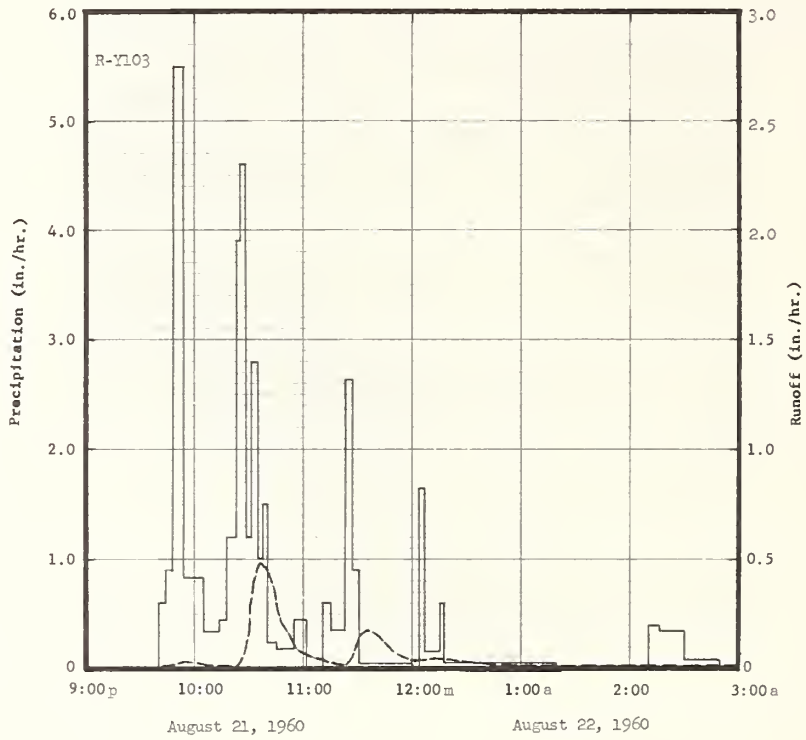
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 123					
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Event of August 21 and 22, 1960											
7-21-25-60	Raingage Y103	0	8-21-60	Raingage Y103	0	8-21-60	0	0			
7-26	.24	0	9:40p	0	0	9:42p	0	0			
7-27	.02	0	:44	.60	.04	:50	.0044	T			
7-28-29	0	0	:48	.90	.10	:52	.0145	T			
7-30	.30	0	:54	5.50	.65	:54	.0294	T			
7-31-8-2	0	0	10:05	.82	.80	10:00	.0179	T			
8-3	.41	0	:14	.33	.85	:06	.0044	T			
8-4	1.92	.11	:18	.45	.88	:10	.0013	.01			
8-5-7	0	0	:23	1.20	.98	:22	.0013	.01			
8-8	.03	0	:25	3.90	1.11	:26	.0216	.01			
8-9-14	0	0	:28	4.60	1.34	:30	.203	.02			
8-15	.10	0	:32	1.20	1.42	:32	.317	.02			
8-16-19	0	0	:35	2.80	1.56	:34	.443	.04			
8-20	.17	0	:38	1.00	1.61	:36	.478	.05			
8-21	.54 2/	0	:40	1.50	1.66	:40	.443	.08			
			:45	.24	1.68	:44	.347	.11			
			:55	.18	1.71	:48	.214	.13			
			11:02	.43	1.76	:52	.151	.14			
			:10	0	1.76	:56	.0999	.15			
			:15	.60	1.81	11:06	.0483	.16			
			:22	.34	1.85	:10	.0294	.16			
			:27	2.64	2.07	:18	.0145	.17			
			:31	.90	2.13	:23	.0145	.17			
			12:00m	.02	2.14	:26	.0483	.17			
			8-22-60			:28	.0999	.17			
			12:03a	0	2.14	:32	.151	.18			
			:07	1.65	2.25	:36	.171	.19			
			:15	.15	2.27	:40	.151	.20			
			:17	.60	2.29	:45	.116	.21			
			1:20	.03	2.32	:50	.0782	.22			

Notes: To convert runoff in in/hr to cfs, multiply by 1.3814. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.10-6. 2/ Rain ended about noon.



SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 123					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960 - Continued								
			8-22-60			8-21-60		
			2:10a	0	2.32	12:00m	0.0337	0.23
			:16	.40	2.36	8-22-60		
			:30	.34	2.44	12:02a	.0294	.23
			:50	.09	2.47	:10	.0431	.24
						:20	.0383	.24
						:34	.0216	.25
						:46	.0088	.25
						1:08	.0013	.25
						:20	.0004	.25
						2:50	.0004	.25
						3:30	0	.26
Event of April 25, 1961								
	Raingage Y103		4-25-61	Raingage Y103		4-25-61		
3-25-30-61	0	0	2:45p	0	0	2:50p	0.0013	0
3-31	.33	0	:48	.20	.01	:57	.0044	T
4-1	.52	T	:53	.72	.07	3:00	.0114	T
4-2	.05 a	0	:59	.70	.14	:04	.0294	T
4-3-4	0	0						
4-5	.03	0	3:02	.40	.16	:08	.0717	.01
4-6	.06	0	:08	.90	.25	:14	.124	.02
4-7-8	0	0	:11	1.50	.30	:20	.203	.03
4-9	.73	.01	:17	0	.30	:26	.226	.05
4-10	.06	T	:19	.90	.33	:28	.263	.06
4-11	0	0	:25	.30	.36	:30	.347	.07
4-12	.30	0	:32	1.80	.57	:34	.410	.10
4-13	.04	0	:36	2.40	.73	:36	.594	.11
4-14	0	0	:41	.24	.75	:38	.722	.14
4-15	.05	0	:45	1.35	.84	:42	.818	.19
4-16	.68	.10	:47	.60	.86	:48	.919	.27
4-17	.32 rs	.05	:52	1.44	.98	:50	1.03	.31
4-18-20	0	0	:54	.60	1.00	:56	1.03	.41
4-21	.89	.21	:58	.75	1.05	4:00	.948	.47
4-22	.57	.17	4:04	1.00	1.15	:10	.767	.62
4-23	.05	0	:09	.24	1.17	:14	.818	.67
4-24	0	0	:11	2.40	1.25	:16	.919	.70
4-25	.60 <sup>1/</sup>	.05 <sup>2/</sup>	:15	.90	1.31	:18	1.08	.73
			:21	2.60	1.57	:22	1.23	.81
			:24	.20	1.58	:28	1.08	.93
			5:15	.01	1.59	:30	.948	.96
			:30	.08	1.61	:36	.678	1.04
			7:30	.02	1.65	:40	.534	1.08
						:46	.410	1.13
						:56	.263	1.18
						5:10	.151	1.23
						:20	.108	1.25
						:42	.0717	1.29
						6:10	.0431	1.31
						:50	.0216	1.34
						8:00	.0064	1.35
						:20	.0044	1.35
						9:30	.0013	1.36
						11:00	.0004	1.36
						12:00m	0	1.36
<p>Watershed Conditions: In second-year meadow prior to tillage for corn in a corn, wheat, meadow, meadow rotation (improved practice). Grass, legumes and weeds 6" high; density of cover 98%.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 1.3814. <sup>1/</sup> Rain ended about 12:30 p. <sup>2/</sup> Runoff prior to 2:50p.



COSHOCTON, OHIO      WATERSHED 123

3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 115 (Area - 1.61 Acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	3.09	3.52	1.18	1.71	3.40	7.03	3.24	6.60	0.38	2.02	1.73
	Q	.11	.06	.34	0	0	.72	0	.18	0	0	0	0	1.41
1961	P	.80	4.20	3.65	6.73	2.20	3.24	5.20	1.96	1.28	2.30	3.11	2.50	37.17
	Q	0	.18	.19	1.16	T	.19	.03	0	0	0	0	0	1.75

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshooton, Ohio Watershed 115

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.97	6-14	0.41	6-14	0.45	6-14	0.46	6-14	0.64	6-14	0.67	6-14	0.70	6-14	0.72
1961	4-25	1.16	4-25	.74	4-25	.92	4-25	.97	4-25	.99	4-25	.99	4-25	.99	4-21	1.12

Notes: Quality of records: Monthly B, good; Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, 2nd year meadow; 1961, corn; prevailing practice. 1/ Precipitation from Raingage Y103.

SELECTED RUNOFF EVENTS Coshooton, Ohio Watershed 115

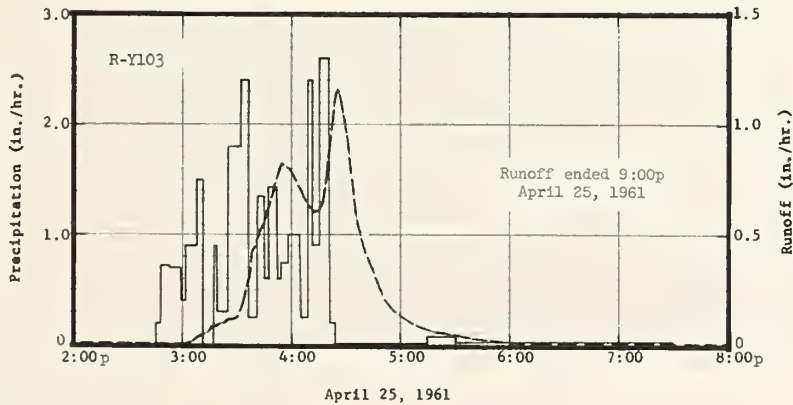
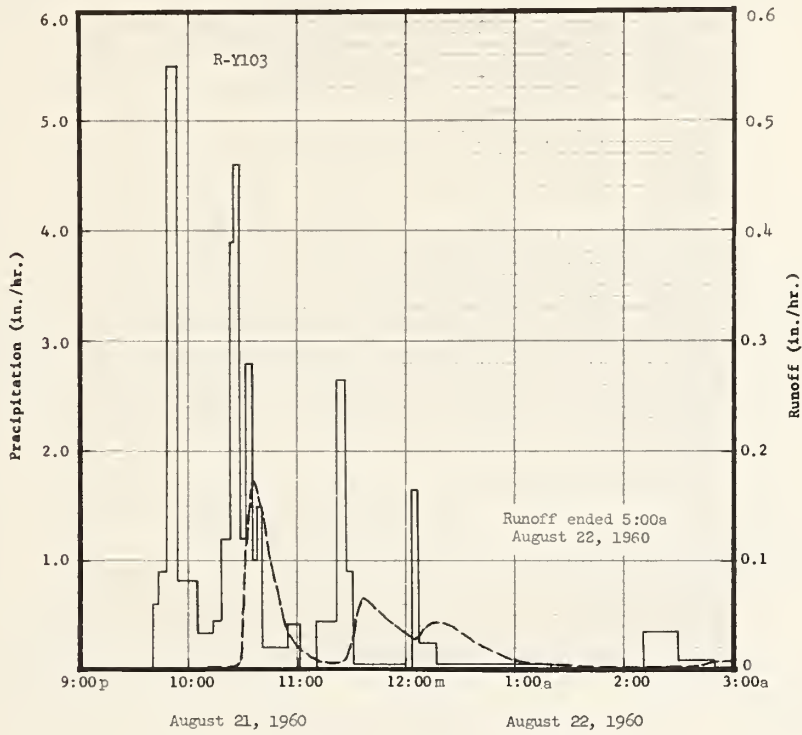
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage Y103			Event of August 21 and 22, 1960			8-21-60		
7-21-25-60	0	0	8-21-60	Raingage Y103	0	8-21-60		0
7-26	.24	0	9:40p	0	0	10:10p	0	0
7-27	.02	0	1:4	.60	.04	:20	.0003	T
7-28-29	0	0	4:8	.90	.10	:28	.0038	T
7-30	.30	0	5:4	5.50	.65	:30	.0506	T
7-31-8-2	0	0	10:05	.82	.80	:32	.113	T
8-3	.41	0	1:4	.33	.85	:36	.172	.01
8-4	1.92	.06	1:8	.45	.68	:42	.129	.03
8-5-7	0	0	:23	1.20	.98	:52	.0411	.04
8-8	.03	0	:25	3.90	1.11	11:02	.0124	.05
8-9-14	0	0	:28	4.60	1.34	:10	.0097	.05
8-15	.10	0	:32	1.20	1.42	:20	.0055	.05
8-16-19	0	0	:35	2.80	1.56	:26	.0075	.05
8-20	.17	0	:38	1.00	1.61	:30	.0290	.05
8-21	.54 2/	0	:40	1.50	1.66	:32	.0457	.05
			:55	.20	1.71	:36	.0665	.06
			11:02	.43	1.76	12:00m	.0326	.08
			:10	0	1.76	8-22-60		
			:22	.45	1.85	12:04a	.0286	.08
			:27	2.64	2.07	:14	.0411	.09
			:31	.90	2.13	:24	.0411	.09
			12:00m	.02	2.14	:38	.0250	.10
			8-22-60			1:00	.0075	.11
			12:03a	0	2.14	:30	.0011	.11
			:07	1.65	2.25	2:26	.0003	.11
			:17	.24	2.29	:40	.0038	.11
			1:20	.03	2.32	:50	.0097	.11
			2:10	0	2.32	3:04	.0097	.11
			:30	.36	2.44	:30	.0038	.11
			:50	.09	2.47	5:00	0	.12

Notes: To convert runoff in in/hr to cfs, multiply by 1.6234. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.11-6. 2/ Rain ended about noon.

3-64

SELECTED RUNOFF EVENTS			Coshooton, Ohio Watershed 115					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			Event of April 25, 1961					
3-25-30-61	Raingage Y103 0	0	4-25-61	Raingage Y103		4-25-61		
3-31	.33	0	2:45p	0	0	3:00p	0.0003	0
4-1	.52	T	4:8	.20	.01	:04	.0075	T
4-2	.05 s	0	:53	.72	.07	:08	.0326	T
4-3-4	0	0	:59	.70	.14	:15	.0610	T
4-5	.03	0	3:02	.40	.16	:16	.0788	.01
4-6	.06	0	:08	.90	.25	:18	.0788	.01
4-7-8	0	0	:11	1.50	.30	:22	.0986	.02
4-9	.73	0	:17	0	.30	:26	.113	.03
4-10	.06	0	:19	.90	.33	:30	.121	.03
4-11	0	0	:25	.30	.36	:32	.163	.04
4-12	.30	0	:32	1.80	.57	:34	.246	.04
4-13	.04	0	:36	2.40	.73	:36	.321	.05
4-14	0	0	:41	.24	.75	:38	.407	.07
4-15	.05	0	:45	1.35	.84	:40	.471	.08
4-16	.68	.03	:47	.60	.86	:44	.540	.11
4-17	.32 rs	T	:52	1.44	.98	:48	.653	.15
4-18-20	0	0	:54	.60	1.00	:52	.782	.20
4-21	.89	.08	:58	.75	1.05	:54	.825	.23
4-22	.57	.05	4:04	1.00	1.15	4:00	.782	.31
4-23	.05	0	:09	.24	1.17	:08	.653	.40
4-24	0	0	:11	2.40	1.25	:12	.596	.45
4-25	.60 1/	.02 2/	:15	.90	1.31	:16	.615	.49
			:21	2.60	1.57	:19	.739	.52
			:24	.20	1.58	:20	.825	.53
			5:15	.01	1.59	:22	1.02	.56
			:30	.08	1.61	:25	1.16	.62
			7:30	.02	1.65	:30	.973	.71
						:32	.825	.74
						:36	.577	.78
						4:0	.423	.82
						4:6	.295	.85
						:50	.224	.87
						:56	.163	.89
						5:06	.0986	.91
						:18	.0610	.93
						:34	.0411	.94
						6:00	.0184	.95
						:30	.0075	.96
						7:00	.0038	.96
						:30	.0011	.97
						8:00	.0003	.97
						9:00	0	.97
<p>Notes: To convert runoff in in/hr to cfs, multiply by 1.6234. 1/Rain ended about 12:30p. 2/ Runoff prior to 3:00p.</p>								





COSHOCTON, OHIO WATERSHED 115

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 127 (Area - 1.65 Acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	3.09	3.52	1.18	1.71	3.40	7.03	3.24	6.60	0.38	2.02	1.73	1.59	35.49
Q	.68	.17	.36	T	0	.84	.07	1.00	0	0	0	0	3.12
1961 P	.80	4.20	3.65	6.73	2.20	3.24	5.20	1.96	1.28	2.30	3.11	2.50	37.17
Q	0	.72	1.00	2.16	T	0	.01	0	0	0	0	0	3.89

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshocton, Ohio Watershed 127

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-21	1.18	8-21	0.41	8-21	0.59	8-21	0.65	8-21	0.65	8-21	0.65	8-21	0.65	8-21	0.65
1961	4-25	1.39	4-25	.90	4-25	1.16	4-25	1.27	4-25	1.39	4-25	1.40	4-25	1.40	4-21	1.80

Notes: Quality of records: Monthly P, excellent; Q, good; annual maximum discharges and volumes, good. Cover 1960, 2nd year meadow; 1961, corn; improved practice plus mulch tillage.  
 1/ Precipitation from Raingage Y103.

SELECTED RUNOFF EVENTS Coshocton, Ohio Watershed 127

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960								
7-21-25-60	Raingage Y103	0	8-21-60	Raingage Y103	0	8-21-60		0
7-26	.24	0	9:40p	0	0	9:48p	0	0
7-27	.02	0	:44	.60	.04	:50	.0044	T
7-28-29	0	0	:48	.90	.10	:52	.0086	T
7-30	.30	0	:54	5.50	.65	:54	.141	T
7-31-8-2	0	0	10:05	.82	.80	:56	.209	.01
8-3	.41	0	:14	.33	.85	10:04	.159	.03
8-4	1.92	.35	:18	.45	.88	:06	.125	.04
8-5-7	0	0	:23	1.20	.98	:10	.0807	.04
8-8	.03	0	:25	3.90	1.11	:14	.0566	.05
8-9-14	0	0	:28	4.60	1.34	:20	.0367	.05
8-15	.10	0	:32	1.20	1.42	:22	.0413	.06
8-16-19	0	0	:35	2.80	1.56	:24	.0807	.06
8-20	.17	0	:38	1.00	1.61	:26	.243	.06
8-21	.54 2/	0	:40	1.50	1.66	:28	.537	.07
Watershed Conditions: In second-year meadow of a corn, wheat, meadow, meadow rotation (improved practice with mulch tillage). Hay cut July 29, 1960. Legumes, grass, and weeds 6" high; density of cover 90%.								
			:45	.24	1.68	:30	.967	.10
			:55	.18	1.71	:34	1.18	.17
			11:02	.43	1.76	:38	1.13	.25
			:10	0	1.76	:40	.969	.28
			:15	.60	1.81	:42	.825	.31
			:22	.34	1.85	:44	.650	.34
			:27	2.64	2.07	:46	.502	.36
			:31	.90	2.13	:48	.404	.37
			12:00m	.02	2.14	:52	.266	.39
			8-22-60			:58	.159	.42
			12:03a	0	2.14	11:06	.0939	.43
			:07	1.65	2.25	:10	.0680	.44
			:15	.15	2.27	:20	.0512	.45
			:17	.60	2.29	:22	.0680	.45
			1:20	.03	2.32	:24	.125	.45

Notes: To convert runoff in in/hr to cfs, multiply by 1.6637. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59. USDA Misc. Pub. 945, p. 26.12-5. 2/ Rain ended about noon.

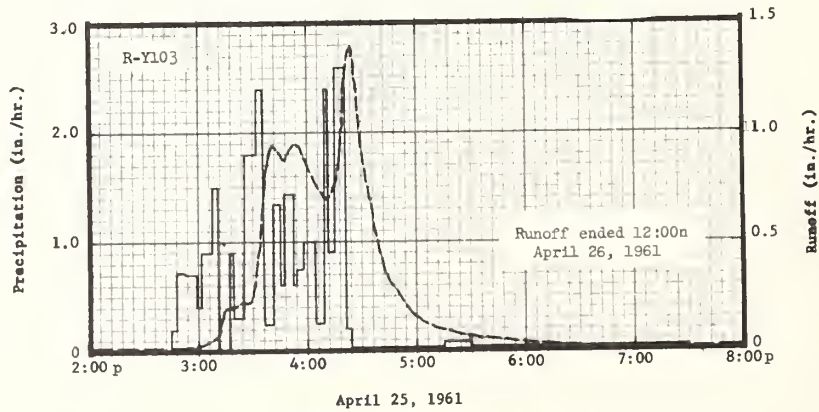
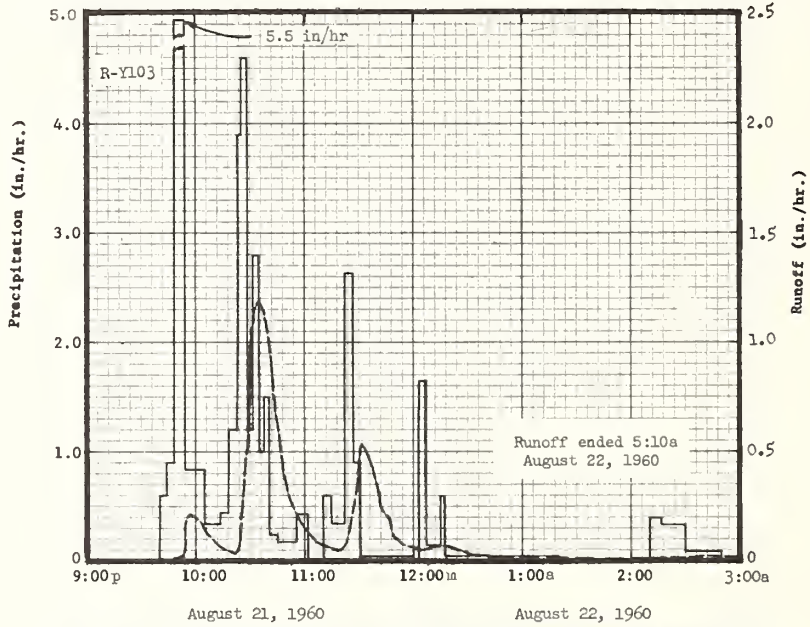
SELECTED RUNOFF EVENTS					Coshocton, Ohio Watershed 127			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - Continued</u>								
			8-22-60			8-21-60		
			2:10a	0	2.32	11:26p	0.199	0.46
			:16	.40	2.36	:28	.317	.47
			:30	.34	2.44	:30	.468	.48
			:50	.09	2.47	:32	.537	.50
						:36	.468	.53
						:40	.317	.56
						:42	.243	.57
						:46	.178	.58
						:50	.101	.59
						12:00m	.0566	.60
						8-22-60		
						12:04a	.0462	.61
						:10	.0620	.61
						:20	.0620	.62
						:30	.0413	.63
						:42	.0210	.64
						1:00	.0086	.64
						:20	.0027	.64
						:50	.0004	.64
						2:18	.0004	.64
						:26	.0044	.64
						:40	.0086	.65
						:54	.0086	.65
						3:16	.0044	.65
						:40	.0013	.65
						4:00	.0004	.65
						5:10	0	.65
<u>Event of April 25 and 26, 1961</u>								
3-25-30-61	Raingage Y103		4-25-61	Raingage Y103		4-25-61		
	0	0	2:45p	0	0	2:46p	0.0027	0
3-31	.33	0	:48	.20	.01	:54	.0044	T
4-1	.52	.05	:53	.72	.07	3:00	.0173	T
4-2	.05 s	0	:59	.70	.14	:06	.0367	T
4-3-4	0	0						
4-5	.03	0	3:02	.40	.16	:10	.0807	.01
4-6	.06	0	:08	.90	.25	:12	.125	.01
4-7-8	0	0	:11	1.50	.30	:14	.178	.02
4-9	.73	.08	:17	0	.30	:20	.199	.04
4-10	.06	.01	:19	.90	.33	:22	.220	.04
4-11	0	0	:25	.30	.36	:28	.220	.06
4-12	.30	.01	:32	1.80	.57	:30	.266	.07
4-13	.04	0	:36	2.40	.73	:32	.345	.08
4-14	0	0	:41	.24	.75	:34	.537	.10
4-15	.05	0	:45	1.35	.84	:36	.735	.12
4-16	.68	.14	:47	.60	.86	:40	.945	.17
4-17	.32 rs	.08	:52	1.44	.98	:48	.873	.30
4-18-20	0	0	:54	.60	1.00	:52	.945	.36
4-21	.89	.21	:58	.75	1.05	:56	.945	.42
4-22	.57	.19	4:04	1.00	1.15	4:00	.849	.48
4-23	.05	T	:09	.24	1.17	:10	.692	.61
4-24	0	0	:11	2.40	1.25	:14	.735	.65
4-25	.60 <sup>1/</sup>	.11 <sup>2/</sup>	:15	.90	1.31	:16	.801	.68
			:21	2.60	1.57	:18	.969	.71
			:24	.20	1.58	:20	1.24	.75
			5:15	.01	1.59	:24	1.39	.83
			:30	.08	1.61	:26	1.24	.88
			7:30	.02	1.65	:28	1.02	.92
						:30	.897	.95
						:34	.692	1.00
						:38	.537	1.04
						:40	.451	1.06
						:44	.345	1.09
						:50	.266	1.12
						:56	.199	1.14

Watershed conditions: In second-year meadow prior to tillage for corn in a corn, wheat, meadow, meadow rotation (improved practice with mulch tillage). Legumes, grass, and weeds 6" high; density of cover 98%.

Notes: To convert runoff in in/hr to cfs, multiply by 1.6637. <sup>1/</sup> Rain ended about 12:30p. <sup>2/</sup> Runoff prior to 2:46p.

SELECTED RUNOFF EVENTS					Coshocton, Ohio Watershed 127			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25 and 26, 1961 - cont'd								
						4-25-61		
						5:06p	0.125	1.17
						:20	.0873	1.19
						:30	.0680	1.20
						6:00	.0367	1.23
						:40	.0210	1.25
						8:00	.0086	1.27
						9:10	.0044	1.28
						11:00	.0027	1.28
						12:00m	.0013	1.29
						4-26-61		
						3:30a	.0004	1.29
						9:00	.0004	1.29
						12:00n	0	1.29

Notes: To convert runoff in in/hr to cfs, multiply by 1.6637.



COSHOCTON, OHIO WATERSHED 127



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MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 109 (Area - 1.69 Acres)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	3.24	3.43	1.17	1.66	3.30	7.18	3.02	5.94	0.48	1.90	1.78	1.52	34.62
Q	0	0	0	0	0	.31	0	.04	0	0	0	0	.35
1961 P	.84	4.01	3.50	6.77	2.27	3.42	5.29	1.92	1.08	2.20	3.02	2.44	36.76
Q	0	T	.01	.56	0	.12	T	0	0	0	0	0	.69

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshocton, Ohio Watershed 109

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.739	6-14	0.21	6-14	0.21	6-14	0.21	6-14	0.21	6-14	0.28	6-14	0.29	6-14	0.30
1961	4-25	.83	4-25	.48	4-25	.55	4-25	.56	4-25	.56	4-25	.56	4-25	.56	4-25	.56

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, 2nd year meadow; 1961, corn; improved practice.  
 1/ Precipitation from Raingage Y102.

SELECTED RUNOFF EVENTS Coshocton, Ohio Watershed 109

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage Y102			Event of August 21 and 22, 1960			8-21-60		
7-21-25-60	0	0	8-21-60	Raingage Y102	0	8-21-60		
7-26	.23	0	9:42p	0	0	10:19p	0	0
7-27	.02	0	46	1.20	.08	:25	.0043	T
7-28-29	0	0	:51	5.76	.56	:27	.0276	T
7-30	.40	0	10:00	1.00	.71	:29	.0766	T
7-31-8-2	0	0	:05	.60	.76	:33	.106	.01
8-3	.28	0	:10	0	.76	:41	.0552	.02
8-4	1.71	.01	:17	.43	.81	:47	.0239	.02
8-5-7	0	0	:20	1.40	.88	:53	.0043	.02
8-8	.06	0	:25	3.12	1.14	11:01	.0004	.03
8-9-14	0	0	:33	2.48	1.46	:27	.0004	.03
8-15	.08	0	:40	.43	1.51	:37	.0062	.03
8-16-19	0	0	:55	.20	1.56	:47	.0012	.03
8-20	.13	0	:58	.60	1.59	12:00m	.0004	.03
8-21	.52 2/	0	11:10	.10	1.61	8-22-60		
			:12	.60	1.63	12:27a	0	.03
			:19	.26	1.66			
			:22	1.20	1.72			
			:28	1.50	1.87			
			:30	.30	1.88			
Watershed conditions: In second year meadow of a corn, wheat, meadow meadow rotation (improved practice). Second cutting of hay July 22. Grass, legumes, and weeds 7" high; density of cover 90%.			12:00m	.02	1.89			
			8-22-60					
			12:05a	1.20	1.99			
			:12	.09	2.00			
			:15	.40	2.02			
			:30	.08	2.04			
			2:05	.02	2.07			
			:10	.12	2.09			
			:20	.48	2.17			
			3:00	.15	2.27			

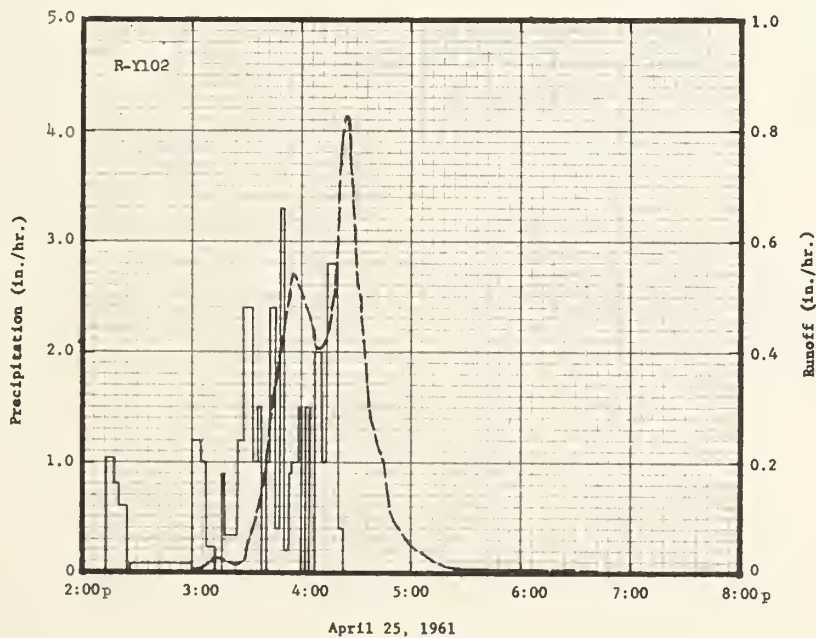
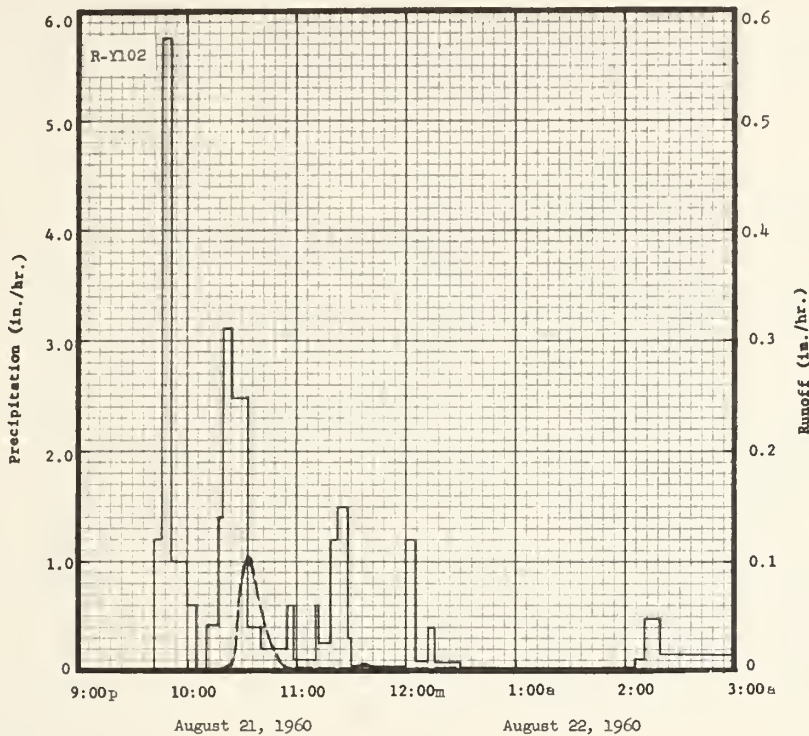
Notes: To convert runoff in in/hr to cfs, multiply by 1.7041. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.13-4. 2/ Rain ended about noon.

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SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 109					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
3-25-30-61			Event of April 25, 1961					
	Rainage Y102		4-25-61	Rainage Y102		4-25-61		
	0	0	4-25-61	0	0	3:01p	0	0
3-31	.27	0	2:13p	0	.07	:06	.0084	T
4-1	.48	0	:17	1.05	.80	:10	.0204	T
4-2	.05 s	0	:20	.80	.11	:12	.0239	T
4-3-4	0	0	:24	.60	.15			
4-5	.02	0	:26	0	.15	:16	.0204	T
4-6	.05	0	3:00	.09	.20	:26	.0169	.01
4-7-8	0	0	:05	1.20	.30	:28	.0204	.01
4-9	.67	0	:08	1.00	.35	:30	.0403	.01
4-10	.11	0	:13	.24	.37	:32	.0606	.01
4-11	0	0	:16	0	.37	:34	.0915	.01
4-12	.30	0	:18	.90	.40	:38	.155	.02
4-13	.02	0	:25	.34	.44	:40	.214	.03
4-14	0	0	:28	1.20	.50	:42	.259	.03
4-15	.02	0	:33	2.40	.70	:46	.336	.05
4-16	.79	0	:36	1.00	.75	:50	.440	.08
4-17	.27 rs	0	:38	1.50	.80	:52	.506	.10
4-18-20	0	0	:40	0	.80	:55	.541	.12
4-21	.90	0	:43	1.00	.85	4:00	.506	.17
4-22	.60	0	:45	2.40	.93	:05	.456	.21
4-23	.05	0	:48	.40	.95	:08	.408	.23
4-24	0	0	:50	3.30	1.06	:14	.424	.27
4-25	.65 1/	0	:53	.20	1.07	:18	.524	.30
			:55	.90	1.10	:20	.675	.32
			:58	1.00	1.15	:24	.827	.37
			4:00	1.50	1.20	:26	.757	.40
			:02	0	1.20	:28	.657	.42
			:04	1.50	1.25	:30	.559	.44
			:08	0	1.25	:34	.394	.47
			:11	2.00	1.35	:38	.284	.50
			:14	1.00	1.40	:42	.225	.51
			:20	2.80	1.68	:46	.155	.53
			:23	.40	1.70	:50	.0986	.53
			5:24	0	1.70	:56	.0663	.54
			6:30	.02	1.72	5:02	.0450	.55
						:10	.0239	.55
						:20	.0109	.55
						:38	.0043	.56
						6:40	0	.56

Watershed conditions: In second year meadow prior to tillage for corn in a corn, wheat, meadow, meadow rotation (improved practice). Legumes and grass 6" high; density of cover 98%.

Notes: To convert runoff in in/hr to cfs, multiply by 1.7041. 1/ Rain ended about 12:30p.



COSHOCTON, OHIO WATERSHED 109

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 103 (Area - 0.65 Acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	2.87	3.19	1.00	1.54	2.99	6.73	2.87	5.27	0.39	1.93	1.76
	Q	.29	.09	1.37	0	0	.32	0	.02	0	0	0	0	2.09
1961	P	.62	3.83	3.40	6.34	2.09	3.11	5.35	1.80	1.19	2.04	3.07	2.52	35.36
	Q	0	.26	.74	2.29	.01	T	.15	0	0	0	0	0	3.45

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshooton, Ohio Watershed 103								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.66	6-14	0.22	6-14	0.23	3-27	0.60	3-27	0.90	3-27	1.22	3-27	1.37	3-27	1.37
1961	4-25	1.63	4-25	1.07	4-25	1.39	4-25	1.52	4-25	1.62	4-25	1.63	4-25	1.64	4-16	2.07

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, first year meadow; 1961, second year meadow; improved practice.  
 1/ Precipitation from Raingage 107.

SELECTED RUNOFF EVENTS						Coshooton, Ohio Watershed 103		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 107			Event of August 21 and 22, 1960					
7-21-25-60	0	0	8-21-60	Raingage 107		8-21-60		
7-26	.21	0	9:43p	0	0	10:30p	0	0
7-27	.02	0	:46	1.40	.07	:31	.0313	T
7-28-29	0	0	:51	5.16	.50	:34	.0598	T
7-30	.30	0	:55	.75	.55	:38	.0598	.01
7-31-8-2	0	0	10:06	.33	.61	:40	.0380	.01
8-3	.26	0	:18	.45	.70	:44	.0153	.01
8-4	1.51	0	:23	1.32	.81	:50	.0047	.01
8-5-7	0	0	:27	3.75	1.06	11:03	.0006	.01
8-8	.07	0	:33	1.90	1.25	:32	.0006	.01
8-9-14	0	0	:38	.12	1.26	:38	.0076	.01
8-15	.06	0	:42	.45	1.29	:50	.0021	.01
8-16-19	0	0	11:00	.20	1.35	12:00m	.0021	.01
8-20	.12	0	:21	.11	1.39	8-22-60		
8-21	.50 <u>2/</u>	0	:30	1.13	1.56	12:22a	.0047	.01
			12:00m	0	1.56	:30	.0047	.02
			8-22-60			:40	.0021	.02
			12:03a	.60	1.59	1:00	.0006	.02
			:13	.18	1.62	:30	0	.02
			:16	1.80	1.71			
			1:30	.02	1.74			

Watershed conditions: In first year meadow of a corn, wheat, meadow, meadow rotation (improved practice). Second cutting of hay, August 1. Grass, legumes and weeds 5" high; density of cover 80%.

Notes: To convert runoff in in/hr to cfs, multiply by 0.66542. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.14-5. 2/ Rain ended about noon.



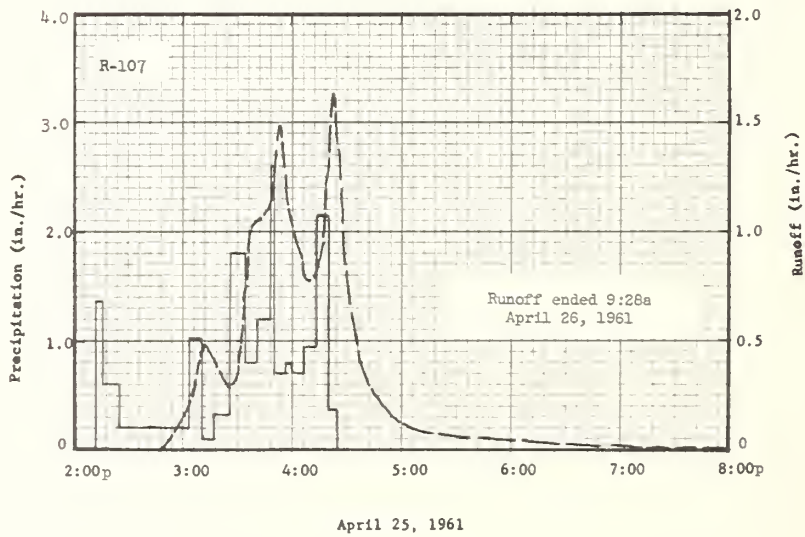
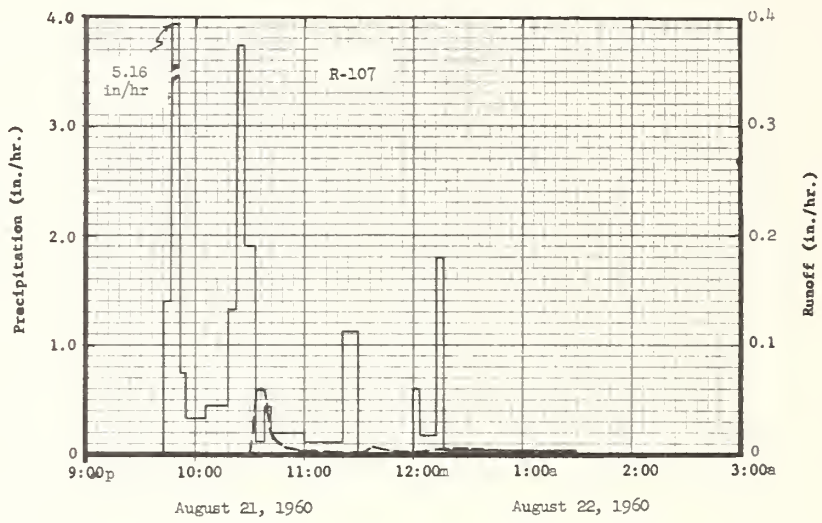
3-64

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 103					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 107			Event of April 25-26, 1961					
3-25-30-61	0	0	4-25-61	Raingage 107	0	4-25-61	T	0
3-31	.28	T	2:12p	0	0	2:48p		
4-1	.47	.04	:16	1.35	.09	:52	.0380	T
4-2	.04	T	:25	.60	.18	:54	.0682	T
4-3-4	0	0	:28	.20	.19	:58	.118	.01
4-5	.01	0	3:03	.21	.31	3:02	.155	.02
4-6	.04	0	:10	1.03	.43	:04	.212	.02
4-7-8	0	0	:17	.09	.44	:06	.317	.03
4-9	.75	.05	:26	.33	.49	:12	.494	.07
4-10	.05	.01	:34	1.80	.73	:18	.400	.12
4-11	0	0	:40	.80	.81	:26	.298	.17
4-12	.30	T	:48	1.20	.97	:30	.357	.19
4-13	.03	0	:50	2.60	1.10	:32	.494	.20
4-14	0	0	:57	.69	1.18	:34	.716	.22
4-15	.03	0	4:00	.80	1.22	:38	1.02	.28
4-16	.67	.08	:06	.70	1.29	:48	1.14	.46
4-17	.17 rs	.04	:13	.94	1.40	:52	1.49	.55
4-18-20	0	0	:20	2.14	1.65	:58	1.10	.68
4-21	.80	.22	:25	.36	1.68	4:04	.914	.78
4-22	.56	.20	5:30	.02	1.70	:08	.778	.83
4-23	.04	.01	7:30	.01	1.72	:14	.845	.91
4-24	0	0				:16	.986	.95
4-25	.56 <u>1/</u>	.09 <u>2/</u>				:18	1.14	.98
						:20	1.40	1.02
						:22	1.63	1.07
						:26	1.31	1.17
						:28	.986	1.21
						:34	.572	1.29
						:38	.400	1.32
						:44	.279	1.35
						:58	.130	1.40
						5:14	.0865	1.43
						:24	.0682	1.44
						:48	.0520	1.47
						6:18	.0313	1.49
						7:02	.0153	1.51
						8:18	.0076	1.52
						9:58	.0047	1.53
						12:00m	.0021	1.54
						4-26-61		
						9:28a	0	1.55

Watershed conditions: In second year meadow of a corn, wheat, meadow, meadow rotation (improved practice). Grass, legumes, and weeds 6" high; density of cover 100%.

Notes: To convert runoff in in/hr to cfs, multiply by 0.65542. 1/ Rain ended about 12:30p. 2/ Runoff prior to 2:48p.

3-64



COSHOCTON, OHIO      WATERSHED 103

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 110 (Area - 1.27 Acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.87	3.19	1.00	1.54	2.99	6.73	2.87	5.27	0.39	1.93	1.76	1.50	32.04
	Q	.06	.03	.22	T	.02	.29	0	0	0	0	0	0	.62
1961	P	.62	3.83	3.40	6.34	2.09	3.11	5.35	1.80	1.19	2.04	3.07	2.52	35.36
	Q	0	.03	.11	1.18	0	0	.15	0	0	0	0	0	1.47

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Coshocton, Ohio Watershed 110									
YEAR	MAXIMUM DISCHARGE	MAXIMUM VOLUME FOR SELECTED TIME INTERVAL														
		1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days		
		Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	
1960	6-14	0.64	6-14	0.24	6-14	0.24	6-14	0.25	6-13	0.28	6-13	0.29	6-13	0.29	6-11	0.29
1961	4-25	1.23	4-25	.80	4-25	.99	4-25	1.04	4-25	1.06	4-25	1.06	4-25	1.06	4-21	1.15

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, first year meadow; 1961, second year meadow; prevailing practice.  
1/ Precipitation from Raingage 107.

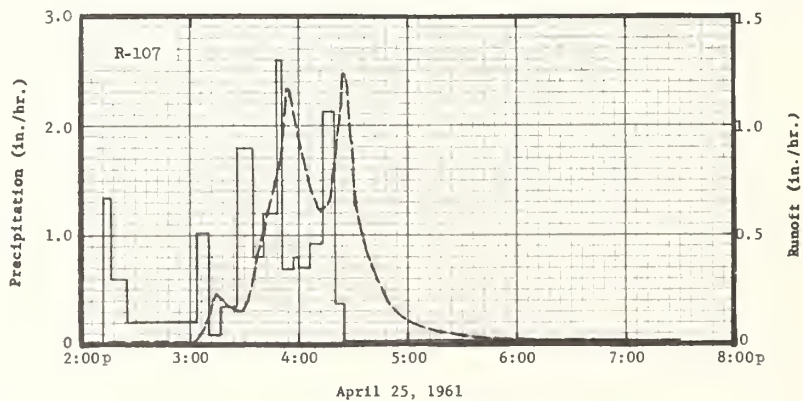
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 110		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 107			Event of August 21 and 22, 1960					
7-21-25-60	0	0	8-21-60	Raingage 107			No runoff	
7-26	.21	0	9:43p	0	0			
7-27	.02	0	:46	1.40	.07			
7-28-29	0	0	:51	5.16	.50			
7-30	.30	0	:55	.75	.55			
7-31-8-2	0	0	10:06	.33	.61			
8-3	.26	0	:18	.45	.70			
8-4	1.51	0	:23	1.32	.81			
8-5-7	0	0	:27	3.75	1.06			
8-8	.07	0	:33	1.90	1.25			
8-9-14	0	0	:38	.12	1.26			
8-15	.06	0	:42	.45	1.29			
8-16-19	0	0	11:00	.20	1.35			
8-20	.12	0	:21	.11	1.39			
8-21	.50 <u>2/</u>	0	:30	1.13	1.56			
Watershed conditions: In first year meadow of a corn, wheat, meadow, meadow rotation (prevailing practice). Second cutting of hay, August 1. Grass and weeds 4" high; density of cover 75%.			12:00m	0	1.56			
			8-22-60					
			12:03a	.60	1.59			
			:13	.18	1.62			
			:16	1.80	1.71			
			1:30	.02	1.74			

Notes: For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.14-5. 2/ Rain ended about noon.

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 110					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
3-25-30-61	Raingage 107 0	0	Event of April 25, 1961			4-25-61		
3-31	.28	0	4-25-61	Raingage 107	0	4-25-61		
4-1	.47	0	2:12p	0	0	3:02p	0.0003	0
4-2	.04 s	0	:16	1.35	.10	:04	.0233	T
4-3-4	0	0	:25	.60	.18	:06	.0521	T
			:28	.20	.19	:08	.0774	T
4-5	.01	0	3:03	.21	.31	:10	.163	.01
4-6	.04	0	:10	1.03	.43	:14	.231	.02
4-7-8	0	0	:17	.09	.44	:20	.184	.04
4-9	.75	0	:26	.33	.49	:28	.153	.06
4-10	.05	0	:34	1.80	.73	:32	.207	.08
4-11	0	0	:40	.80	.81	:34	.284	.08
4-12	.30	0	:48	1.20	.97	:36	.374	.10
4-13	.03	0	:50	2.60	1.10	:40	.536	.13
4-14	0	0	:57	.69	1.18	:44	.640	.16
4-15	.03	0	4:00	.80	1.22	:48	.779	.21
4-16	.67	.03	:06	.70	1.29	:50	.882	.24
4-17	.17 rs	0	:13	.94	1.40	:53	1.17	.29
4-18-20	0	0	:20	2.14	1.65	4:00	.937	.41
4-21	.80	.06	:25	.36	1.68	:06	.731	.50
4-22	.56	.02	5:30	.02	1.70	:11	.619	.55
4-23	.04	0	7:30	.01	1.72	:16	.640	.61
4-24	0	0				:18	.731	.63
4-25	.56 <sup>1/</sup>	.02 <sup>2/</sup>				:20	.882	.66
						:22	1.05	.69
						:24	1.23	.73
						:28	.991	.80
						:30	.804	.83
						:32	.640	.85
						:36	.478	.89
						:40	.358	.92
						:44	.284	.94
						:50	.184	.96
						5:00	.108	.99
						:18	.0521	1.01
						:40	.0317	1.03
						6:10	.0123	1.04
						:40	.0048	1.04
						:58	0	1.04

Watershed conditions: In second year meadow of a corn, wheat, meadow, meadow rotation (prevailing practice). Grass, legumes and weeds 5" high; density of cover 95%.

Notes: To convert runoff in in/hr to cfs, multiply by 1.2806. <sup>1/</sup> Rain ended about 12:30p. <sup>2/</sup> Runoff prior to 3:02p.



COSHOCTON, OHIO WATERSHED 110



3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 113 (Area - 145 Acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.89	3.06	0.95	1.75	3.33	7.05	3.58	5.28	0.36	2.10	1.83	1.55	33.73
	Q	.01	T	T	T	0	.32	0	.23	0	0	0	0	
1961	P	.82	4.10	3.56	6.59	2.16	3.13	5.53	1.72	1.31	2.29	3.16	2.67	37.04
	Q	0	.25	.24	1.76	T	.02	.19	0	0	0	0	0	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshooton, Ohio Watershed 113								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.49	6-14	0.18	6-14	0.20	6-14	0.20	6-14	0.32	6-14	0.32	6-14	0.32	6-14	0.32
1961	4-25	1.20	4-25	.85	4-25	1.20	4-25	1.28	4-25	1.33	4-25	1.33	4-25	1.33	4-21	1.59

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, wheat; 1961, 1st year meadow; improved practice.  
 1/ Precipitation from Raingage 109.

SELECTED RUNOFF EVENTS						Coshooton, Ohio Watershed 113			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
Raingage 109			Event of August 21 and 22, 1960						
7-21-25-60	0	0	8-21-60	Raingage 109		8-21-60			
7-26	.25	0	9:42p	0	0	9:50p	0	0	
7-27	.01	0	48	1.90	.19	54	.0026	T	
7-28-30	.33	0	53	3.84	.51	58	.0003	T	
7-31-8-2	0	0	57	.75	.56	10:00	.0108	T	
8-3	.25	0	10:06	.53	.64	:02	.0318	T	
8-4	1.49	.10	:17	.38	.71	:06	.0204	T	
8-5-7	0	0	:27	2.10	1.06	:10	.0083	T	
8-8	.06	0	:33	2.00	1.26	:16	.0012	T	
8-9-14	0	0	:39	.10	1.27	:24	.0012	T	
8-15	.06	0	:55	.15	1.31	:28	.0083	T	
8-16-19	0	0	11:00	.36	1.34	:30	.0239	.01	
8-20	.10	0	:10	.06	1.35	:32	.0678	.01	
8-21	.50 2/	0	:19	.20	1.38	:34	.145	.01	
			:29	1.08	1.56	:36	.224	.02	
			12:00m	.02	1.57	:38	.274	.02	
			8-22-60			:42	.224	.04	
			12:13m	.65	1.71	:46	.161	.05	
			:16	1.20	1.77	:50	.118	.06	
			2:00	.02	1.81	:55	.0678	.07	
			:08	.08	1.82	11:00	.0362	.08	
			:13	.96	1.90	:10	.0137	.08	
			:45	.21	2.01	:24	.0042	.08	
						:30	.0108	.08	
						:34	.0362	.08	
						:38	.0562	.09	
						:48	.0362	.09	
						12:00m	.0137	.10	
						8-22-60			
						12:06m	.0083	.10	
						:12	.0083	.10	
						:18	.0137	.10	
						:22	.0278	.10	
						:24	.0456	.11	
						:28	.0562	.11	

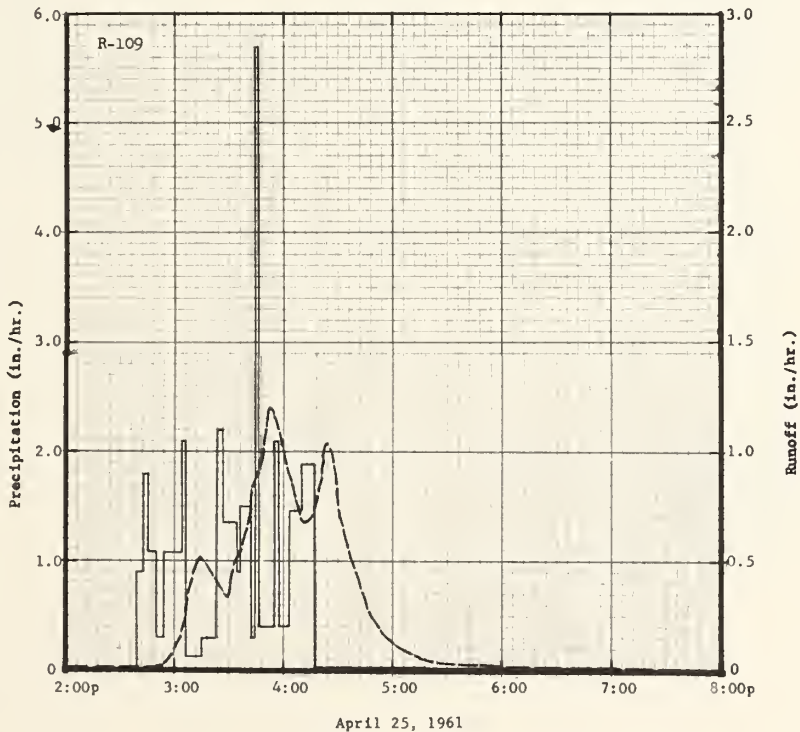
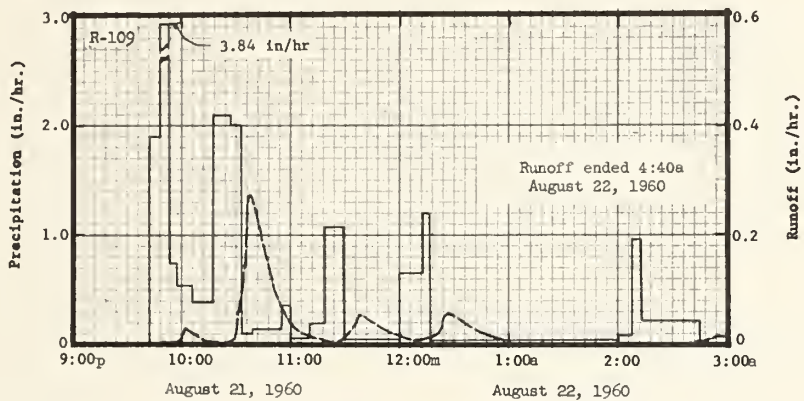
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Notes: To convert runoff in in/hr to cfs, multiply 1.4621. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p.26.16-5. 2/ Rain ended about noon.

3-64

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 113		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - Continued</u>								
						8-22-60		
						12:38a	0.0362	0.12
						:50	.0169	.12
						1:00	.0083	.12
						:20	.0012	.13
						:40	.0003	.13
						2:00	0	.13
						:16	0	.13
						:30	.0003	.13
						:40	.0012	.13
						:50	.0061	.13
						:54	.0137	.13
						3:00	.0137	.13
						:16	.0083	.13
						:30	.0042	.13
						:50	.0012	.13
						4:40	0	.13
<u>Event of April 25, 1961</u>								
3-25-30-61	Rainage 109	0	4-25-61	Rainage 109	0	4-25-61		
3-31	.33	0	2:39p	0	0	2:50p	0.0042	0
4-1	.57	.02	:43	.90	.06	:52	.0204	T
4-2	.03	0	:45	1.80	.12	:58	.0678	T
4-3-4	0	0	:50	1.08	.21	3:02	.143	.01
4-5	T	0	:54	.30	.23	:04	.202	.02
4-6	.05	0	3:04	1.08	.41	:06	.274	.03
4-7-8	0	0	:06	2.10	.48	:08	.371	.04
4-9	.66	.02	:15	.13	.50	:10	.452	.05
4-10	.05	T	:23	.30	.54	:14	.523	.08
4-11	0	0	:26	2.20	.65	:22	.419	.15
4-12	.25	0	:34	1.35	.83	:28	.328	.18
4-13	.04	0	:36	.90	.86	:30	.356	.19
4-14	0	0	:42	1.50	1.01	:32	.452	.21
4-15	.02	0	:44	.30	1.02	:36	.561	.24
4-16	.75	.11	:46	5.70	1.21	:40	.683	.28
4-17	.17	.02	:55	.40	1.27	:42	.821	.31
4-18-20	0	0	:57	2.10	1.34	:48	.971	.40
4-21	.84	.14	4:03	.40	1.38	:52	1.20	.47
4-22	.62	.13	:10	1.46	1.55	:58	1.03	.58
4-23	.05	0	:17	1.89	1.77	4:04	.869	.68
4-24	0	0	5:18	.02	1.79	:10	.683	.75
4-25	.59	.05	7:00	.01	1.81	:14	.683	.80
						:18	.773	.85
						:20	.869	.88
						:23	1.03	.92
						:28	.896	1.00
						:32	.683	1.06
						:36	.523	1.10
						:42	.387	1.14
						:48	.248	1.17
						:58	.143	1.21
						5:08	.0944	1.23
						:26	.0456	1.25
						:58	.0204	1.26
						6:32	.0083	1.27
						:54	.0042	1.27
						7:14	.0012	1.28
						:39	.0003	1.28
						8:04	0	1.28
<p>Watershed conditions: In first-year meadow of a corn, wheat, meadow, meadow rotation (improved practice). Legumes, grass and weeds 4" high; density of cover 98%.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 1.4621. 1/ Rain ended about 12:30p. 2/ Runoff prior to 2:50p.



COSHOCTON, OHIO WATERSHED 113

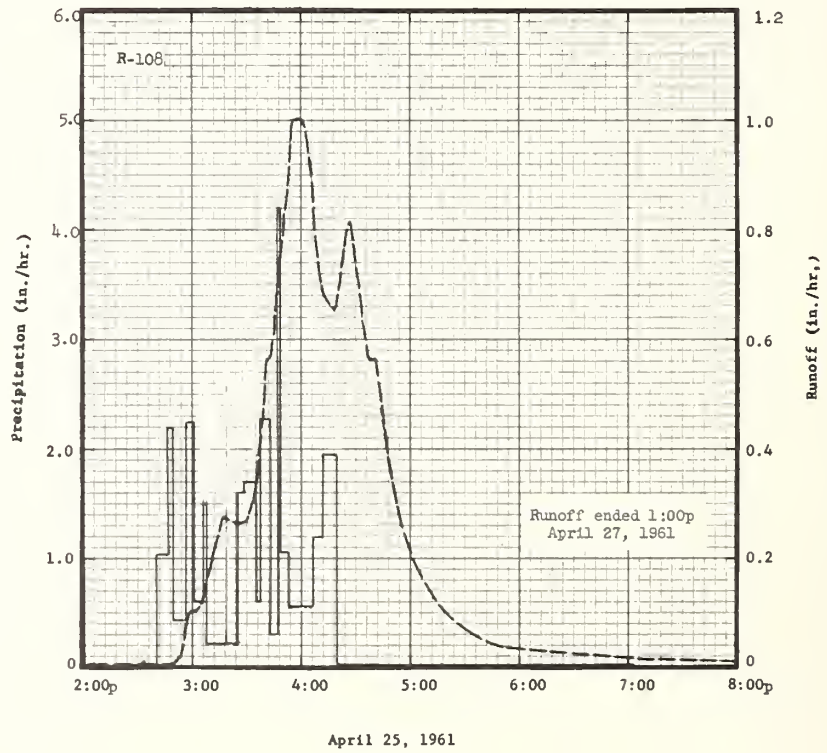
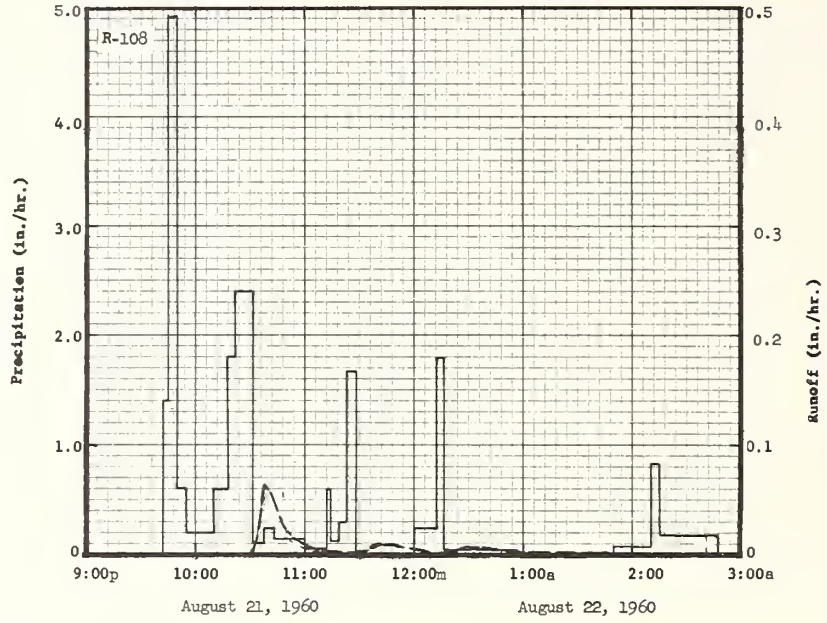
MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Coshocton, Ohio Watershed 118 (Area - 1.96 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1960 I Q	2.72 .08	3.17 .03	0.92 .11	1.68 0	3.18 0	7.05 .30	3.55 0	5.06 .04	0.35 0	2.12 0	1.87 0	1.16 0	32.83 .56			
1961 P Q	.67 0	4.15 .38	3.56 1.04	6.83 1.89	2.10 .01	3.12 .01	5.41 .07	1.09 0	1.23 0	2.21 0	3.14 0	2.64 0	36.75 3.40			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 118								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.27	6-14	0.13	6-14	0.14	6-14	0.14	6-14	0.14	6-14	0.29	6-14	0.30	6-14	0.30
1961	4-25	1.02	4-25	.76	4-25	1.06	4-25	1.20	4-25	1.28	4-25	1.35	4-25	1.41	4-21	1.75
Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, wheat; 1961, first year meadow; prevailing practice. <sup>1/</sup> Precipitation from Raingage 108.																
SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 118								
Antecedent conditions			Rainfall				Runoff									
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Raingage 108			Event of August 21 and 22, 1960													
7-21-25-60	0	0	8-21-60	Raingage 108		8-21-60										
7-26	.23	0	9:42p	0	0	10:32p	0	0								
7-27	.03	0	:45	1.40	.07	:34	.0238	T								
7-28-29	0	0	:50	4.92	.48	:38	.0622	T								
7-30	.30	0	:55	.60	.53	:44	.0476	.01								
7-31-8-2	0	0	10:10	.20	.58	:48	.0272	.01								
8-3	.27	0	:18	.60	.66	:58	.0094	.01								
8-4	1.44	.01	:22	1.80	.78	11:08	.0037	.02								
8-5-7	0	0	:32	2.40	1.18	:18	.0011	.02								
8-8	.07	0	:38	.10	1.19	:30	.0011	.02								
8-9-14	0	0	:43	.24	1.21	:38	.0072	.02								
8-15	.06	0	11:00	.14	1.25	:40	.0094	.02								
8-16-19	0	0	:12	.05	1.26	:46	.0094	.02								
8-20	.07	0	:14	.60	1.28	12:00m	.0037	.02								
8-21	.54 <sup>2/</sup>	0	:19	.12	1.29	8-22-60										
Watershed conditions: In wheat to meadow of a corn, wheat, meadow, meadow rotation (prevailing practice). Wheat cut July 22, 1960. Grass and legumes 3" high; density of cover 70%.			:23	.30	1.31	12:08a	.0023	.02								
			:28	1.68	1.45	:18	.0023	.02								
			12:00m	0	1.45	:26	.0072	.02								
			8-22-60			:38	.0072	.02								
			12:13a	.23	1.50	:48	.0037	.02								
			:16	1.80	1.59	1:18	.0011	.02								
			:57	.03	1.61	:48	0	.02								
			1:50	0	1.61											
			2:10	.09	1.64											
			:15	.84	1.71											
			:47	.19	1.81											
Notes: To convert runoff in in/hr to cfs, multiply by 1.9763. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.17-5. <sup>2/</sup> Rain ended about noon.																



SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 118					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 108			Event of April 25 to 27, 1961					
3-25-30-61	0	0	4-25-61	Raingage 108		4-25-61		
3-31	.32	0	2:40p	0	0	2:43p	0.0037	0
4-1	.48	.02	:47	1.03	.12	:49	.0072	T
4-2	.04 s	0	:50	2.20	.23	:53	.0176	T
4-3-4	0	0	:57	.43	.28	:55	.0388	T
4-5	T	0	3:01	2.25	.43	:57	.0789	T
4-6	.04	0	:06	.60	.48	:59	.105	.01
4-7-8	0	0	:08	1.50	.53	3:03	.105	.01
4-9	.72	.02	:25	.21	.59	:05	.119	.02
4-10	.10	0	:28	1.60	.67	:07	.150	.02
4-11	0	0	:35	1.71	.87	:11	.204	.03
4-12	.30	.01	:38	.60	.90	:15	.256	.05
4-13	.03	0	:43	2.28	1.09	:17	.278	.06
4-14	0	0	:47	.30	1.11	:23	.267	.09
4-15	.02	0	:49	4.20	1.25	:31	.267	.12
4-16	.75	.06	:53	1.05	1.32	:33	.301	.13
4-17	.35 rs	.03	4:07	.56	1.45	:35	.352	.14
4-18-20	0	T	:12	1.20	1.55	:37	.422	.15
4-21	.87	.12	:20	1.95	1.81	:41	.567	.19
4-22	.62	.13	7:03	.01	1.83	:43	.567	.21
4-23	0	.04				:45	.638	.23
4-24	.04	.02				:47	.734	.25
4-25	.58 <sub>1</sub> /	.07 <sub>2</sub> /				:51	.839	.30
						:55	1.02	.36
						4:01	1.02	.47
						:03	.972	.50
						:07	.815	.56
						:11	.693	.59
						:19	.653	.70
						:23	.754	.75
						:27	.815	.80
						:33	.673	.87
						:37	.567	.91
						:41	.567	.95
						:43	.482	.97
						:48	.379	1.00
						:53	.290	1.03
						:59	.224	1.06
						5:09	.150	1.09
						:21	.0916	1.11
						:37	.0572	1.13
						:53	.0388	1.15
						6:13	.0309	1.16
						7:03	.0176	1.18
						:53	.0118	1.19
						9:33	.0094	1.21
						12:00m	.0072	1.23
						4-26-61		
						12:00m	.0037	1.33
						4-27-61		
						1:00p	0	1.36

Watershed conditions: In first year meadow of a corn, wheat, meadow, meadow rotation (prevailing practice). Legumes, grass, and weeds 4" high; density of cover 98%.

Notes: To convert runoff in in/hr to cfs, multiply by 1.9763. <sub>1</sub>/ Rain ended about 12:30p. <sub>2</sub>/ Runoff prior to 2:43p.



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MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 111 (Area - 1.18 Acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	2.89	3.06	0.95	1.75	3.33	7.05	3.58	5.28	0.36	2.10	1.83
	Q	.10	.04	.11	T	.01	.32	0	.03	0	0	0	0	.61
1961	P	.82	4.10	3.56	6.59	2.16	3.13	5.53	1.72	1.31	2.29	3.16	2.67	37.04
	Q	0	.52	.80	2.05	0	0	0	0	0	0	0	0	3.37

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshooton, Ohio Watershed 111								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.34	6-14	0.18	6-14	0.22	6-14	0.26	6-14	0.26	6-14	0.32	6-14	0.32	6-14	0.32
1961	4-25	1.29	4-25	.97	4-25	1.37	4-25	1.45	4-25	1.47	4-25	1.47	4-25	1.47	4-21	1.81

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, wheat; 1961, 1st year meadow; improved practice plus mulch tillage.  
 1/ Precipitation from Raingage 109.

SELECTED RUNOFF EVENTS				Coshooton, Ohio Watershed 111				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960								
7-21-25-60	Raingage 109	0	8-21-60	Raingage 109	0	8-21-60		
7-26	.25	0	9:42p	0	0	9:50p	0	0
7-27	.01	0	:48	1.90	.19	:56	.0051	T
7-28-29	0	0	:53	3.84	.51	10:02	.0015	T
7-30	.33	0	:57	.75	.56	:10	.0003	T
7-31-8-2	0	0	10:06	.53	.64	:20	.0003	T
8-3	.25	0	:17	.38	.71	:30	.0032	T
8-4	1.49	.01	:27	2.10	1.06	:35	.0032	T
8-5-7	0	0	:33	2.00	1.26	:40	.0075	T
8-8	.06	0	:39	.10	1.27	:44	.0075	T
8-9-14	0	0	:55	.15	1.31	:54	.0003	T
8-15	.06	0	11:00	.36	1.34	11:26	.0003	T
8-16-19	0	0	:10	.06	1.35	:30	.0015	T
8-20	.10	0	:19	.20	1.38	12:00m	.0003	T
8-21	.50 2/	0	:29	1.08	1.56	8-22-60		
			12:00m	.02	1.57	12:16a	.0015	T
			8-22-60			:30	.0075	.01
			12:13a	.65	1.71	:46	.0075	.01
			:16	1.20	1.77	1:16	.0015	.01
			2:00	.02	1.81	:40	.0003	.01
			:08	.08	1.82	2:40	.0003	.01
			:13	.96	1.90	:54	.0051	.01
			:45	.21	2.01	3:10	.0133	.02
						:24	.0133	.02
						:50	.0051	.02
						4:30	.0015	.02
						5:00	.0003	.02
						6:00	0	.02

Notes: To convert runoff in in/hr to cfs, multiply by 1.4898. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.18-5. 2/ Rain ended about noon.

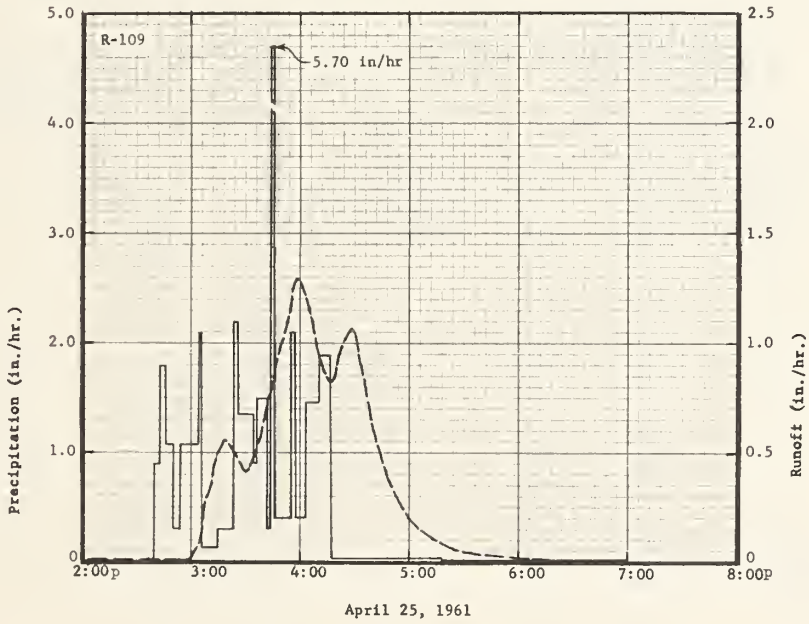
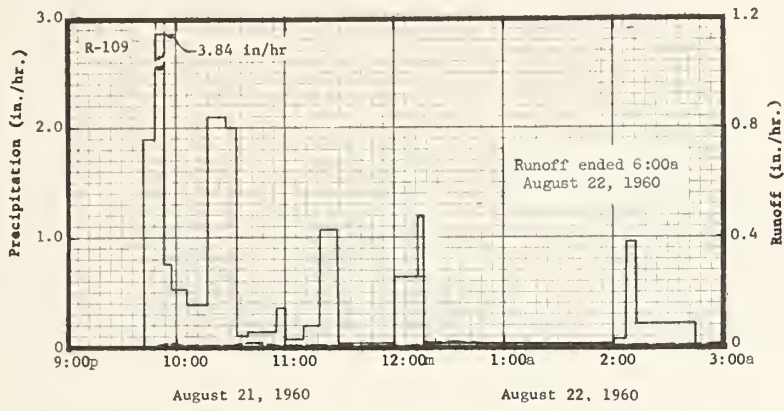
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SELECTED RUNOFF EVENTS					Coshocton, Ohio Watershed 111			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			<u>Event of April 25, 1961</u>					
3-25-30-61	Raingage 109	0	4-25-61	Raingage 109		4-25-61		
3-31	.33	0	2:39p	0	0	3:00p	0.0015	0
4-1	.57	.05	4:3	.90	.06	4:02	.0445	T
4-2	.03	0	4:5	1.80	.12	4:04	.0833	T
4-3-4	0	0	4:50	1.08	.21	4:06	.176	.01
4-5	T	0	4:54	.30	.23	4:08	.276	.01
4-6	.05	0	3:04	1.08	.41	4:10	.336	.03
4-7-8	0	0	4:06	2.10	.48	4:12	.403	.04
4-9	.66	.02	4:15	.13	.50	4:14	.476	.05
4-10	.05	0	4:23	.30	.54	4:18	.556	.09
4-11	0	0	4:26	2.20	.65	4:26	.476	.16
4-12	.25	0	4:34	1.35	.83	4:30	.403	.18
4-13	.04	0	4:36	.90	.86	4:32	.438	.20
4-14	0	0	4:42	1.50	1.01	4:38	.556	.25
4-15	.02	0	4:44	.30	1.02	4:40	.656	.27
4-16	.75	.17	4:46	5.70	1.21	4:44	.787	.32
4-17	.17	0	4:55	.40	1.27	4:48	.950	.37
4-18-20	0	0	4:57	2.10	1.34	4:52	1.07	.44
4-21	.84	.20	4:03	.40	1.38	4:58	1.29	.56
4-22	.62	.14	4:10	1.46	1.55	4:06	1.13	.72
4-23	.05	0	4:17	1.89	1.77	4:10	.950	.79
4-24	0	0	5:18	.02	1.79	4:16	.813	.88
4-25	.59 <u>1/</u>	.04 <u>2/</u>	7:00	.01	1.81	4:20	.866	.93
						4:24	1.01	1.00
						4:28	1.13	1.07
						4:32	.950	1.14
						4:36	.787	1.20
						4:40	.620	1.24
						4:46	.438	1.30
						4:52	.305	1.33
						5:00	.198	1.37
						4:10	.116	1.39
						4:30	.0501	1.42
						4:50	.0250	1.43
						6:04	.0102	1.44
						4:20	.0032	1.44
						4:50	0	1.44

Watershed conditions: In first-year meadow of a corn, wheat, meadow, meadow rotation (improved practice with mulch tillage). Legumes, grass, and weeds 4" high; density of cover 98%.

Notes: To convert runoff in in/hr to cfs, multiply by 1.1898. 1/ Rain ended about 12:30p. 2/ Runoff prior to 3:00p





COSHOCTON, OHIO WATERSHED 111

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MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 121 (Area - 1.42 Acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.88	3.13	0.93	1.58	3.10	6.51	3.11	4.90	0.41	1.97	1.66	1.34	31.52
Q	0	0	0	0	0	.62	0	.05	0	0	0	0	.67
1961 P	.56	3.73	3.28	6.40	1.92	3.26	5.15	1.81	1.22	2.00	3.04	2.43	34.80
Q	0	.32	.71	1.07	.02	T	T	0	0	0	0	0	2.12

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS  
Coshocton, Ohio Watershed 121

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	1.66	6-14	0.35	6-14	0.37	6-14	0.38	6-14	0.42	6-14	0.61	6-14	0.62	6-14	0.62
1961	4-25	.63	4-25	.42	4-25	.57	4-25	.63	4-25	.69	4-25	.80	4-25	.83	4-21	.97

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover, 1960, corn; 1961, wheat; improved practice.  
1/ Precipitation from Raingage 113.

SELECTED RUNOFF EVENTS  
Coshocton, Ohio Watershed 121

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 113			Event of August 21 and 22, 1960					
7-21-25-60	0	0	8-21-60	Raingage 113	0	8-21-60		0
7-26	.25	0	9:43p	0	0	10:34p	0	0
7-27	.02	0	:48	2.04	.17	:35	.0824	T
7-28-29	0	0	:51	3.20	.33	:37	.218	.01
7-30	.40	0	:54	1.00	.38	:39	.185	.01
7-31-8-2	0	0	10:05	.22	.42	:41	.120	.02
8-3	.22	0	:18	.42	.51	:44	.0692	.02
8-4	1.59	.02	:20	1.20	.55	:46	.0416	.03
8-5-7	0	0	:23	.20	.56	:48	.0208	.03
8-8	.07	0	:33	2.82	1.03	:51	.0085	.03
8-9-14	0	0	11:00	.09	1.07	:59	.0013	.03
8-15	.05	0	:23	.10	1.11	11:11	.0003	.03
8-16-19	0	0	:30	1.20	1.25	:24	.0003	.03
8-20	.10	0	12:00m	0	1.25	:26	.0013	.03
8-21	.50	0	8-22-60			:36	.0013	.03
Watershed conditions: In corn of a corn, wheat, meadow, meadow rotation (improved practice). Corn 68" high; weeds 12"			12:08a	.15	1.27	:46	.0003	.03
			:10	.90	1.30	12:00m	.0003	.03
			:13	.20	1.31	8-22-60		
			:16	1.00	1.36	2:56a	0	.03
			1:23	.04	1.40			
			2:10	0	1.40			
			:17	.86	1.50			
			:48	.21	1.61			

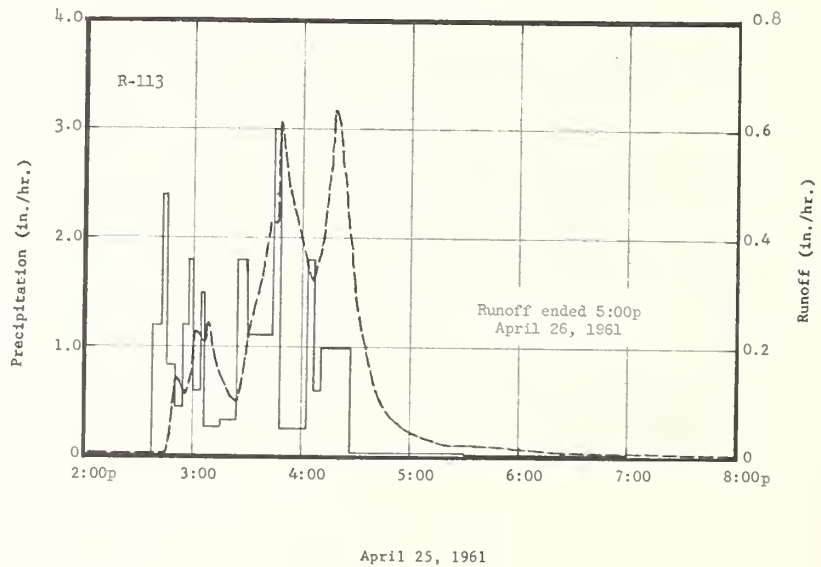
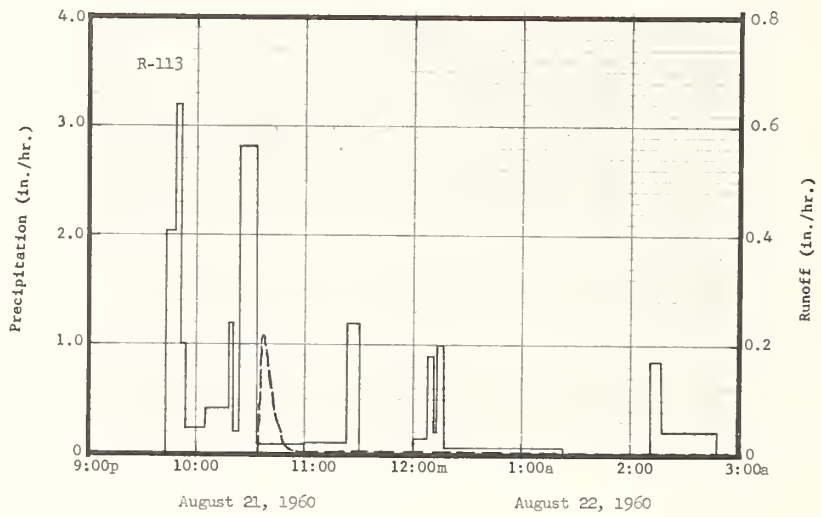
Notes: To convert runoff in in/hr to cfs, multiply by 1.4318. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.20-5. 2/ Rain ended about noon.

SELECTED RUNOFF EVENTS					Coshocton, Ohio Watershed 121			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25 and 26, 1961								
3-25-30-61	Raingage 113 0	0	4-25-61 2:38p	Raingage 113 0	0	4-25-61 2:45p		
3-31	.24	0						0
4-1	.39	.01	:43	1.20	.10	:48	0.0027	.0964
4-2	.04 s	0	:45	2.40	.18	:50	.146	.01
4-3-4	0	0	:50	.84	.25	:56	.112	.01
4-5	T	0	:54	.45	.28			
4-6	.05	0	:57	1.20	.34	:58	.146	.02
4-7-8	0	0	3:00	1.80	.43	3:00	.196	.03
4-9	.73	.02	:04	.60	.47	:02	.229	.03
4-10	.05	0	:06	1.50	.53	:06	.207	.05
						:08	.242	.05
4-11	0	0	:15	.27	.57			
4-12	.27	.01	:24	.33	.62	:12	.185	.07
4-13	.02	0	:30	1.80	.70	:15	.146	.08
4-14	0	0	:44	1.11	1.06	:20	.112	.09
4-15	.05	0	:47	3.00	1.21	:24	.0964	.09
						:28	.165	.10
4-16	.65	.05	4:03	.26	1.38			
4-17	.14 rs	.02	:07	1.80	1.50	:30	.218	.11
4-18-20	0	0	:10	.60	1.53	:36	.306	.14
4-21	.84	.08	:27	.99	1.81	:40	.379	.16
4-22	.62	.06	5:30	.02	1.83	:42	.427	.17
						:46	.427	.20
4-23	.04	0	7:00	.01	1.85			
4-24	0	0				:48	.613	.22
4-25	.57 <sub>1</sub> /	.05 <sub>2</sub> /				:52	.497	.25
						:56	.444	.29
						4:00	.395	.31
						:06	.320	.35
						:10	.379	.37
						:14	.462	.40
						:16	.534	.42
						:18	.633	.44
						:26	.395	.51
						:30	.279	.53
						:36	.185	.55
						:44	.0964	.57
						5:00	.0416	.59
						:20	.0208	.60
						:36	.0208	.60
						6:20	.0085	.62
						7:00	.0062	.62
						8:30	.0043	.63
						9:34	.0027	.63
						:40	.0085	.63
						11:00	.0140	.65
						12:00m	.0140	.66
						4-26-61		
						3:00a	.0110	.70
						4:30	.0085	.71
						7:00	.0062	.73
						8:50	.0062	.74
						9:10	.0085	.75
						10:40	.0085	.76
						11:10	.0062	.76
						12:00n	.0062	.77
						1:30p	.0043	.78
						2:30	.0027	.78
						3:30	.0013	.78
						4:40	.0013	.78
						5:00	0	.78

Watershed conditions: In wheat of a corn, wheat, meadow, meadow rotation (improved practice). Wheat 5" high; density of cover 90%.

Notes: To convert runoff in in/hr to cfs, multiply by 1.4318. <sub>1</sub>/ Rain ended about 12:30p. <sub>2</sub>/ Runoff prior to 2:45p.

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COSHOCTON, OHIO      WATERSHED 121



MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 106 (Area - 1.56 Acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.88	3.13	0.93	1.58	3.10	6.51	3.11	4.90	0.41	1.97	1.66	1.34	31.52
	Q	.30	.08	.10	0	0	1.29	.11	.93	0	0	0	0	2.81
1961	P	.56	3.73	3.28	6.40	1.92	3.26	5.15	1.81	1.22	2.00	3.04	2.43	34.80
	Q	0	.15	.20	.95	0	.08	.14	0	.01	0	0	.01	1.54

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Coshocton, Ohio Watershed 106									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	2.21	6-14	0.56	6-14	0.59	6-14	0.98	6-14	0.99	6-14	1.25	6-14	1.25	6-14	1.26
1961	4-25	.95	4-25	.54	4-25	.67	4-25	.70	4-25	.73	4-25	.73	4-25	.73	4-21	.87

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent, Cover 1960, corn; 1961, wheat; prevailing practice.  
 1/ Precipitation from Raingage 113.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 106					
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Raingage 113			<u>Event of August 21 and 22, 1960</u>								
7-21-25-60	0	0	8-21-60	Raingage 113	0	8-21-60	0	0			
7-26	.25	0	9:43p	0	0	9:49p	0	0			
7-27	.02	0	:48	2.04	.17	:52	.389	.01			
7-28-29	0	0	:51	3.20	.33	:54	.615	.02			
7-30	.40	T	:54	1.00	.38	:56	.485	.04			
7-31-8-2	0	0	10:05	.22	.42	:58	.331	.06			
8-3	.22	T	:18	.42	.51	10:01	.150	.07			
8-4	1.59	.43	:20	1.20	.55	:03	.0877	.07			
8-5-7	0	0	:23	.20	.56	:05	.0575	.07			
8-8	.07	0	:33	2.82	1.03	:09	.0336	.08			
8-9-14	0	0	11:00	.09	1.07	:12	.0296	.08			
8-15	.05	0	:23	.10	1.11	:15	.0296	.08			
8-16-19	0	0	:30	1.20	1.25	:19	.0424	.08			
8-20	.10	0	12:00m	0	1.25	:22	.0877	.09			
8-21	.50 2/	0	8-22-60			:24	.188	.09			
Watershed conditions: In corn of a corn, wheat, meadow, meadow rotation (prevailing practice). Corn 58" high; weeds 12" high.			12:08a	.15	1.27	:26	.521	.10			
			:10	.90	1.30	:28	1.23	.13			
			:13	.20	1.31	:30	1.28	.17			
			:16	1.00	1.36	:33	1.23	.24			
			1:23	.04	1.40	:35	.954	.27			
			2:10	0	1.40	:37	.595	.30			
			:17	.86	1.50	:40	.278	.32			
			:48	.21	1.61	:42	.169	.33			
						:45	.102	.33			
						:50	.0472	.34			
						:55	.0258	.34			
						11:00	.0127	.35			
						:10	.0039	.35			
						:20	.0011	.35			
			:25	.0011	.35						
			:27	.0189	.35						
			:29	.117	.35						
			:31	.209	.36						
			:34	.291	.37						
			:38	.169	.38						
			:40	.109	.39						
			:43	.0522	.39						
			:50	.0223	.40						
			12:00m	.0057	.40						

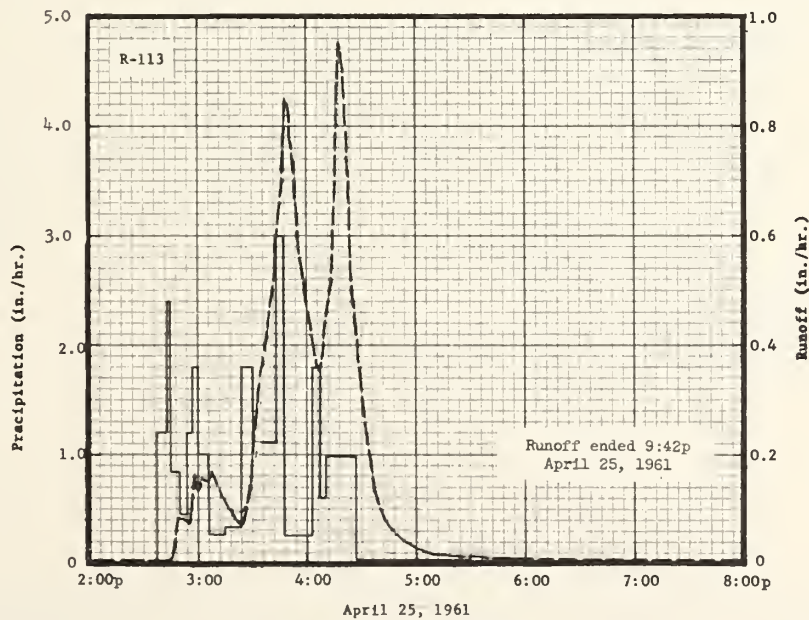
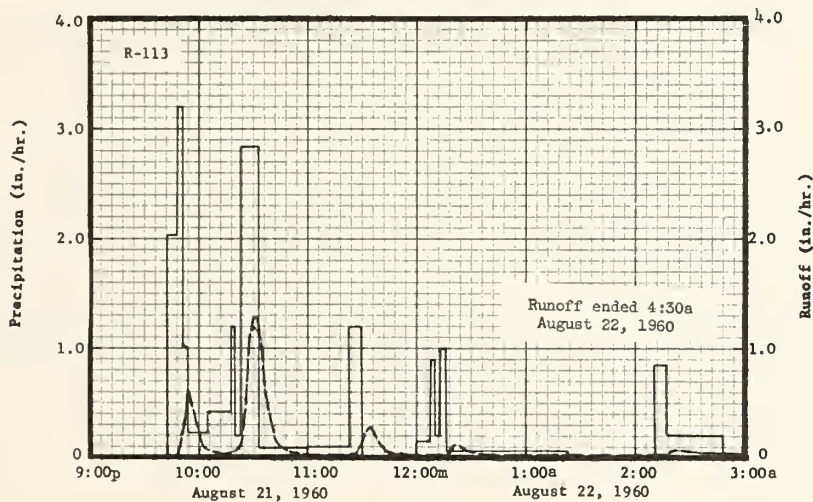
Notes: To convert runoff in in/hr to cfs, multiply by 1.5730. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.20-5. 2/ Rain ended about noon.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 106		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - Continued</u>						8-22-60		
						12:08a	0.0024	0.40
						:12	.0024	.40
						:15	.0057	.40
						:17	.0258	.40
						:20	.102	.40
						:24	.102	.41
						:28	.0630	.42
						:30	.0472	.42
						:37	.0189	.42
						:45	.0077	.42
						:55	.0024	.42
						1:10	.0011	.42
						:20	.0003	.42
						2:15	.0003	.42
						:18	.0189	.42
						:21	.0630	.43
						:25	.0522	.43
						:27	.0522	.43
						:30	.0424	.43
						:40	.0258	.44
						:43	.0223	.44
						:50	.0223	.44
						:59	.0127	.45
						3:10	.0039	.45
						:30	.0011	.45
						4:30	0	.45
<u>Event of April 25, 1961</u>								
3-25-30-61	Raingage 113 0	0	4-25-61	Raingage 113 0	0	4-25-61	0.0003	0
3-31	.24	0	2:38p			2:46p	.0630	0
4-1	.39	T	:43	1.20	.10	:48	.0630	T
4-2	.04 s	0	:45	2.40	.18	:50	.0877	T
4-3-4	0		:50	.84	.25	:56	.0750	.01
4-5	T	0	:54	.45	.28	:58	.162	.01
4-6	.05	0	:57	1.20	.34	3:00	.133	.02
4-7-8	0	0	3:00	1.80	.43	:02	.159	.02
4-9	.73	.01	:06	1.00	.53	:06	.150	.03
4-10	.05	0	:15	.27	.57	:08	.169	.04
4-11	0	0	:24	.33	.62	:12	.133	.05
4-12	.27	T	:30	1.80	.80	:16	.102	.06
4-13	.02	0	:44	1.11	1.06	:24	.0688	.07
4-14	0	0	:47	3.00	1.21	:28	.133	.07
4-15	.05	0	4:03	.26	1.38	:30	.198	.08
4-16	.65	.05	:07	1.80	1.50	:32	.291	.09
4-17	.14 rs	.02	:10	.60	1.53	:36	.360	.11
4-18-20	0	0	:27	.99	1.81	:40	.485	.14
4-21	.84	.08	5:30	.02	1.83	:43	.595	.17
4-22	.62	.06	7:00	.01	1.85	:46	.718	.20
4-23	.04	0				:48	.852	.22
4-24	0	0				:52	.737	.28
4-25	.57 <sup>1/</sup>	.03 <sup>2/</sup>				:56	.576	.32
						:58	.521	.34
						4:02	.420	.37
<u>Watershed conditions:</u> In wheat of a corn, wheat, meadow, meadow rotation (prevailing practice). Wheat 4" high; density of cover 90%.								
						:06	.360	.40
						:08	.360	.41
						:10	.436	.42
						:14	.521	.45
						:16	.718	.47
						:18	.954	.50
						:20	.852	.53
						:22	.737	.56
						:24	.595	.58
						:26	.485	.60

Notes: To convert runoff in in/hr to cfs, multiply by 1.5730. <sup>1/</sup> Rain ended about 12:30p. <sup>2/</sup> Runoff prior to 2:46p.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 106		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25, 1961 - Continued								
						4-25-61		
						:30	0.318	0.62
						:34	.209	.64
						:38	.133	.65
						:42	.0877	.66
						:52	.0424	.67
						5:14	.0189	.68
						:22	.0157	.69
						:32	.0157	.69
						6:02	.0077	.69
						:52	.0039	.70
						8:02	.0011	.70
						9:42	0	.70

Notes: To convert runoff in in/hr to cfs, multiply by 1.5730.



COSHOCTON, OHIO WATERSHED 106

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MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 188 (Area - 2.05 Acres)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.62	2.90	0.85	1.62	3.18	6.95	3.06	4.91	0.38	2.11	1.72	1.35	31.65
Q	0	0	.02	0	0	.32	T	.06	0	0	0	0	.40
1961 P	.64	3.87	3.40	6.62	2.10	2.95	5.25	1.74	1.25	2.16	3.09	2.53	35.60
Q	0	0	.03	.78	0	0	T	0	0	0	0	0	.81

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshooton, Ohio Watershed 188

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.49	6-14	0.15	6-14	0.17	6-14	0.19	6-14	0.21	6-14	0.31	6-14	0.32	6-14	0.32
1961	4-25	.80	4-25	.55	4-25	.69	4-25	.77	4-25	.78	4-25	.78	4-25	.78	4-22	.78

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, corn; 1961, wheat; improved practice plus minimum tillage. 1/ Precipitation from Raingage 115.

SELECTED RUNOFF EVENTS Coshooton, Ohio Watershed 188

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 115			Event of August 21 and 22, 1960					
7-21-25-60	0	0	8-21-60	Raingage 115		8-21-60		
7-26	.25	0	9:44p	0	0	9:54p	0	0
7-27-29	0	0	4:6	2.10	.07	5:6	.0113	T
7-30	.35	0	4:9	4.20	.28	5:8	.0197	T
7-31-8-2	0	0	5:1	4.80	.44	10:01	.0113	T
8-3	.19	0	5:4	.60	.47	6:05	.0035	T
8-4	1.59	.03	10:05	.16	.50	6:15	0	T
8-5-7	0	0	1:18	.32	.57	6:28	0	T
8-8	.10	0	1:20	.90	.60	6:31	.0168	T
8-9-14	0	0	1:23	4.0	.62	6:33	.1001	T
8-15	.07	0	1:26	2.20	.73	6:35	.186	.01
8-16-19	0	0	1:30	3.30	.95	6:38	.143	.02
8-20	.08	0	1:33	1.00	1.00	6:40	.0876	.02
8-21	.52 2/	0	1:45	.05	1.01	6:42	.0547	.02
			11:23	.06	1.05	6:46	.0228	.03
			1:30	.69	1.13	6:51	.0069	.03
			12:00m	0	1.13	6:56	.0022	.03
			8-22-60			11:11	0	.03
			12:15a	.12	1.16			
			1:18	.80	1.20			
			1:54	.02	1.21			
			1:00	.20	1.23			
			1:30	.04	1.25			
			2:07	0	1.25			
			1:14	.43	1.30			
			1:16	.90	1.33			
			1:25	.27	1.37			
			1:40	.12	1.40			
			1:50	.18	1.43			
			3:00	.12	1.45			

Notes: To convert runoff in in/hr to cfs, multiply by 2.0671. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26-21-4. 2/Rain ended about noon.

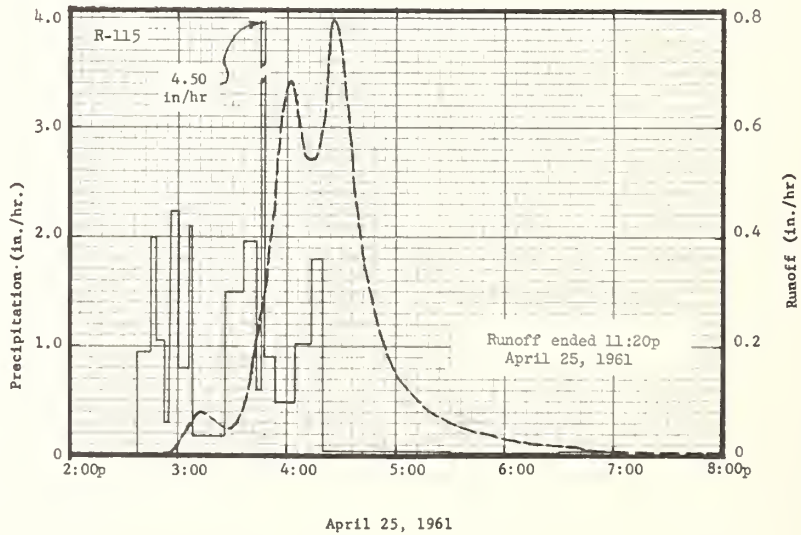
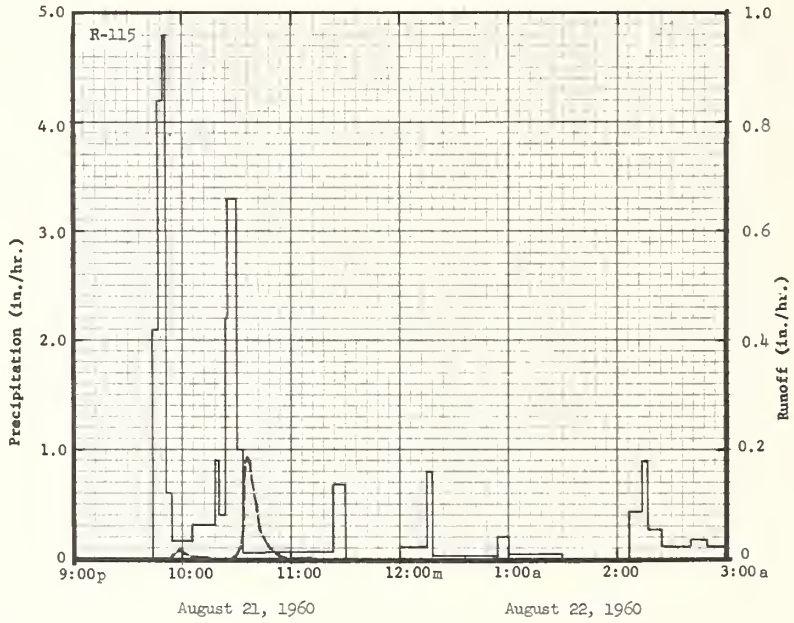


SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 188					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25, 1961								
	Raingage 115			Raingage 115				
3-25-30-61	0	0	4-25-61			4-25-61		
3-31	.26	0	2:38p	0	0	2:52p	0	0
4-1	.45	0	:45	.94	.11	:56	.0035	T
4-2	.03 s	0	:48	2.00	.21	3:00	.0168	T
4-3-4	0	0	:52	1.05	.28	:02	.0295	T
4-5	.02	0	:56	.30	.30	:05	.0547	T
4-6	.05	0	3:00	2.25	.45	:12	.0813	.01
4-7-8	0	0	:06	.80	.53	:20	.0648	.02
4-9	.74	0	:08	2.10	.60	:28	.0498	.03
4-10	.05	0	:26	.17	.65	:30	.0547	.03
4-11	0	0	:36	1.50	.90	:34	.0755	.04
4-12	.30	0	:43	1.97	1.13	:38	.114	.04
4-13	.03	0	:45	.60	1.15	:40	.151	.05
4-14	0	0	:47	4.50	1.30	:42	.195	.05
4-15	.03	0	:53	.90	1.39	:45	.255	.06
4-16	.70	0	4:04	.49	1.48	:48	.300	.08
4-17	.13 rs	0	:14	1.02	1.65	:50	.362	.09
4-18-20	0	0	:20	1.80	1.83	:52	.432	.10
4-21	.81	0	5:30	.02	1.85	:54	.508	.12
4-22	.75	T	6:30	.01	1.86	:56	.590	.14
4-23	.03	0	7:00	.02	1.87	4:02	.682	.20
4-24	0	0				:08	.590	.26
4-25	.60 1/	0				:10	.542	.28
						:16	.542	.34
						:19	.590	.36
						:22	.701	.40
						:26	.798	.45
						:30	.740	.50
						:34	.590	.54
						:38	.461	.58
						:42	.350	.60
						:50	.224	.64
						5:00	.143	.67
						:16	.0876	.70
						:34	.0547	.72
						6:06	.0295	.75
						:40	.0168	.76
						7:50	.0051	.77
						9:30	.0010	.78
						10:30	.0003	.78
						11:20	0	.78

Watershed conditions: In wheat of a corn, wheat, meadow, meadow rotation (improved practice with mulch tillage). Wheat 3" high; density of cover 95%.

Notes: To convert runoff in in/hr to cfs, multiply by 2.0671. 1/ Rain ended about 12:30p.

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COSHOCTON, OHIO      WATERSHED 188

MONTHLY PRECIPITATION AND RUNOFF (Inches)										Coshocton, Ohio Watershed 185 (Area - 7,40 Acres)				
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	2.66	3.15	0.91	1.58	3.03	6.43	2.89	4.84	0.44	2.04	1.63
	Q	.09	.04	.09	T	0	.58	T	.06	0	0	0	0	.86
1961	P	.65	3.69	3.45	6.40	2.03	2.94	5.16	1.73	1.15	1.98	3.07	2.59	34.84
	Q	0	.15	.18	1.06	.01	.02	.04	0	0	0	0	0	1.46

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Coshocton, Ohio Watershed 185						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	1.14	6-14	0.29	6-14	0.31	6-14	0.33	6-14	0.41	6-14	0.50	6-14	0.58	6-14	0.58
1961	4-25	.83	4-25	.53	4-25	.70	4-25	.76	4-25	.80	4-25	.81	4-25	.81	4-18	.96

Notes: Quality of records: Monthly P excellent; Q, good; annual maximum discharges and volumes, good. Cover 1960, corn and meadow; 1961, wheat and meadow; improved practice with strip cropping.  
 1/ Precipitation from Raingage 128.

SELECTED RUNOFF EVENTS										Coshocton, Ohio Watershed 185				
Antecedent conditions			Rainfall			Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)						
Raingage 128			Event of August 21 and 22, 1960											
7-21-25-60	0	0	8-21-60	Raingage 128		8-21-60								
7-26	.26	0	9:43p	0	0	9:46p	0	0						
7-27-29	0	0	:46	2.60	.13	:50	.0009	T						
7-30	.33	0	:50	3.90	.39	:54	.0089	T						
7-31-8-2	0	0	:54	.60	.43	10:00	.0045	T						
						:04	.0014	T						
8-3	.20	0	10:10	.26	.50									
8-4	1.55	.03	:22	.45	.59	:16	.0004	T						
8-5-7	0	0	:32	2.76	1.05	:22	.0004	T						
8-8	.08	0	11:23	.07	1.11	:26	.0014	T						
8-9-14	0	0	:30	.94	1.22	:28	.0143	T						
						:31	.0283	T						
8-15	.05	0	12:00m	.02	1.23									
8-16-19	0	0	8-22-60			:33	.0493	T						
8-20	.10	0	12:15a	.08	1.25	:36	.0730	.01						
8-21	.53 <sup>2/</sup>	0	:18	1.20	1.31	:42	.0548	.01						
			1:50	.02	1.34	:44	.0576	.02						
						:50	.0417	.02						
			2:10	.06	1.36									
			:20	.54	1.45	:52	.0283	.02						
			:50	.14	1.52	:56	.0208	.02						
Watershed conditions: In corn and meadow strips of a corn, wheat, meadow, meadow rotation (improved practice) since 1946. Corn 68" high. Weeds in corn 12" and in meadow strips, 5". Legumes and grass in meadow strips, 5" high; density of cover 90%.						11:02	.0102	.02						
						:12	.0028	.03						
						:20	.0009	.03						
						:26	.0009	.03						
						12:00m	.0001	.03						
						8-22-60								
						2:46a	.0001	.03						
						:54	.0009	.03						
						3:12	.0009	.03						
						:26	.0004	.03						
			:44	.0001	.03									
			4:24	0	.03									

Notes: To convert runoff in in/hr to cfs, multiply by 7,4616. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.23-5. 2/ Rain ended about noon.

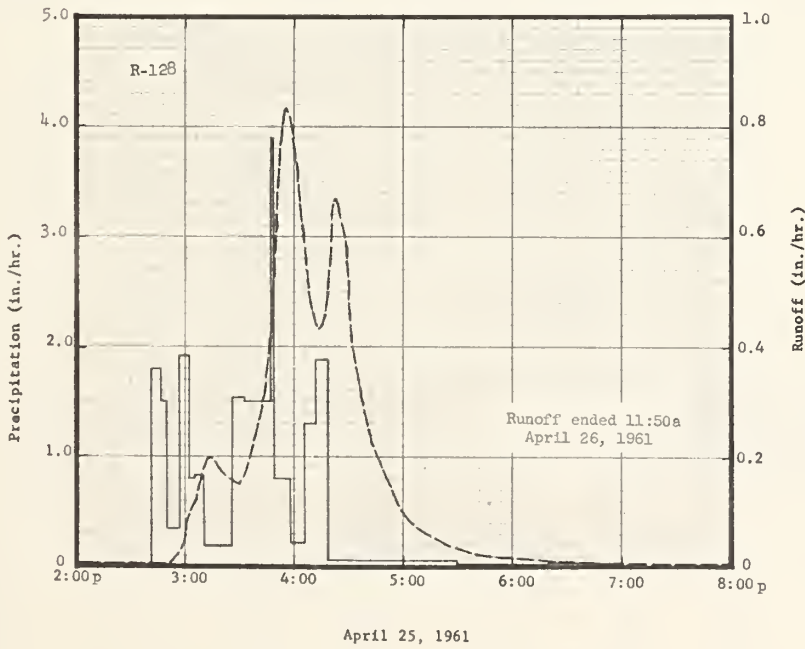
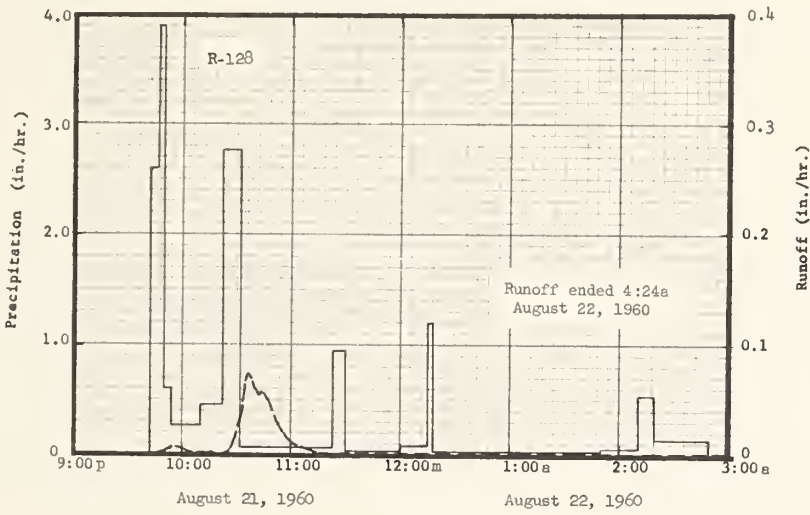
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SELECTED RUNOFF EVENTS						Coshocton, Chio, Watershed 185		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			Event of April 25 and 26, 1961					
3-25-30-61	Raingage 128 0	0	4-25-61	Raingage 128 0	0	4-25-61		
3-31	.35	0	2:41p			2:44p	0.0014	0
4-1	.30	.01	:46	1.80	.15	:48	.0028	T
4-2	.04s	T	:50	1.50	.25	:52	.0066	T
4-3-4	0	0	:57	.34	.29	:54	.0143	T
4-5	.02	0	3:02	1.92	.45	:56	.0208	T
4-6	.04	0	:05	.80	.49	:58	.0370	T
4-7-8	0	0	:10	.84	.59	3:00	.0635	T
4-9	.81	.02	:26	.19	.61	:02	.0903	.01
4-10	.05	T	:33	1.54	.79	:06	.122	.01
4-11	0	0	:47	1.50	1.14	:08	.149	.02
4-12	.30	T	:49	3.90	1.27	:14	.200	.04
4-13	.03	0	:58	.80	1.39	:20	.173	.05
4-14	0	0	4:06	.22	1.42	:30	.149	.08
4-15	.03	0	:12	1.30	1.55	:36	.200	.10
4-16	.67	.04	:19	1.89	1.77	:40	.260	.11
4-17	.15rs	.02	5:30	.05	1.78	:44	.328	.13
4-18-20	0	.03	6:20	.01	1.79	:46	.409	.15
4-21	.76	.05	7:00	.02	1.80	:48	.496	.16
4-22	.67	.07				:50	.594	.18
4-23	.03	.01				:52	.772	.20
4-24	0	T				:56	.834	.26
4-25	.60 <sup>1/</sup>	.03 <sup>2/</sup>				4:00	.749	.31
						:02	.702	.33
						:04	.615	.35
						:08	.515	.39
						:14	.433	.44
						:18	.477	.47
						:20	.554	.49
						:22	.669	.51
						:26	.635	.55
						:28	.574	.57
						:30	.496	.59
						:32	.409	.60
						:36	.328	.63
						:40	.260	.65
						:46	.200	.67
						:52	.149	.69
						5:00	.0977	.70
						:10	.0635	.72
						:22	.0417	.73
						:40	.0244	.74
						6:00	.0143	.75
						:30	.0089	.75
						7:30	.0045	.76
						8:30	.0028	.76
						10:30	.0021	.77
						12:00m	.0014	.77
						4-26-61		
						1:30a	.0014	.77
						3:30	.0009	.77
						7:30	.0004	.78
						10:40	.0004	.78
						11:20	.0001	.78
						:50	0	.78

Watershed conditions: In wheat and meadow strips of a corn, wheat, meadow, meadow rotation (improved practice). Wheat 3" high, density 90%. Legumes, grass and weeds 4" high; density of cover 98%.

Notes: To convert runoff in in/hr to cfs, multiply by 7.4616. <sup>1/</sup> Rain ended about 12:30p. <sup>2/</sup> Runoff prior to 2:44p.





COSHOCTON, OHIO      WATERSHED 185

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 187 (Area - 7.20 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	2.74	3.16	0.92	1.75	3.05	7.17	3.45	5.16	0.34	2.01	1.67
	Q	1.09	.88	.95	.43	.01	1.38	.04	.03	0	0	0	0	4.81
1961	P	0.67	3.75	3.33	6.45	2.11	5.31	5.31	1.67	1.22	2.26	2.95	2.53	35.29
	Q	0	1.00	2.87	4.06	.08	.09	.09	0	0	0	0	0	8.11

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshooton, Ohio Watershed 187								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.55	6-14	0.25	6-14	0.28	6-14	0.31	6-14	0.34	6-14	0.58	6-14	0.73	6-14	1.18
1961	4-25	1.03	4-25	.75	4-25	1.02	4-25	1.18	4-25	1.35	4-25	1.57	4-25	1.89	4-21	3.15

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes, excellent. Cover 1960, meadow-wheat; 1961, corn-meadow; improved practice with strip cropping.  
 1/ Precipitation from Raingage 116.

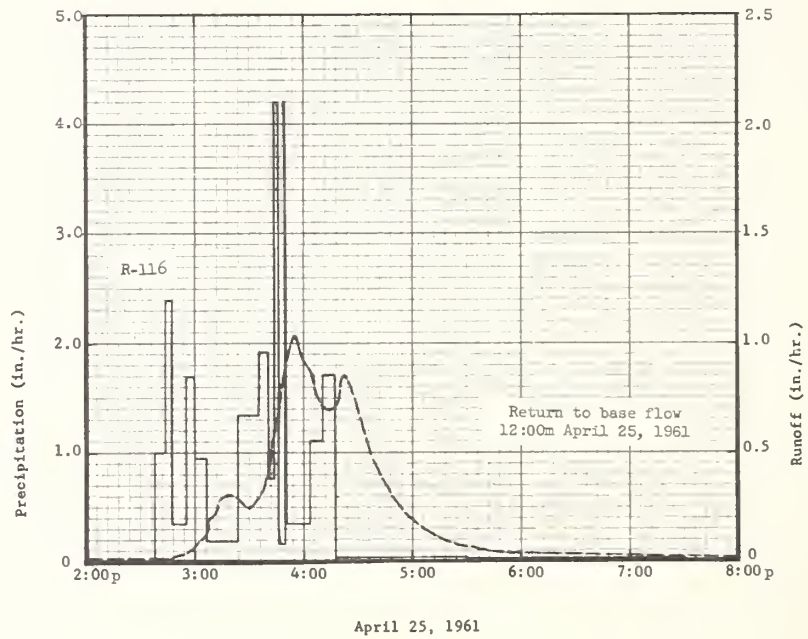
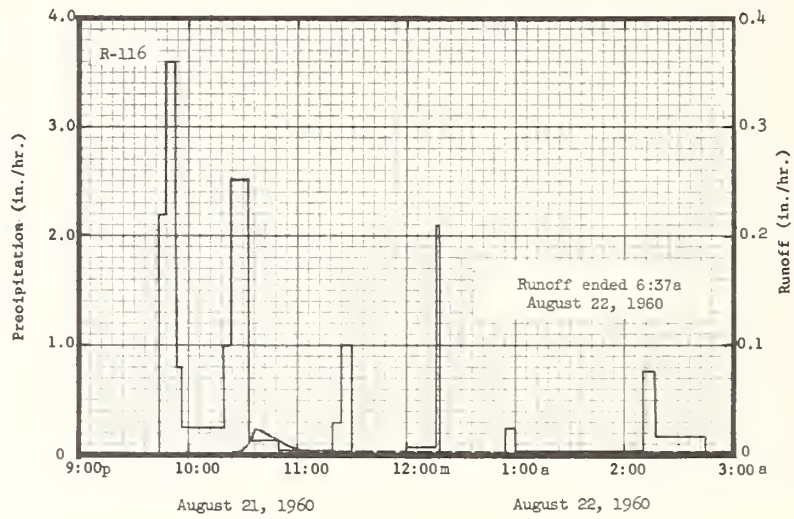
SELECTED RUNOFF EVENTS						Coshooton, Ohio Watershed 187		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960								
7-21-25-60	Raingage 116	0	8-21-60	Raingage 116	0	8-21-60	0	0
7-26	.25	0	9:44p	0	0	9:59p	0	0
7-27	.01	0	:47	2.20	.11	10:07	.0004	T
7-28-29	0	0	:53	3.60	.47	:25	.0004	T
7-30	.37	0	:56	.80	.51	:31	.0046	T
7-31-8-2	0	0	10:20	.25	.61	:35	.0147	T
8-3	.24	0	:23	1.00	.66	:37	.0231	T
8-4	1.59	.02	:33	2.52	1.08	:47	.0147	T
8-5-7	0	0	:50	.14	1.12	:57	.0080	.01
8-8	.07	0	11:20	.02	1.13	11:15	.0029	.01
8-9-14	0	0	:24	.30	1.15	:25	.0021	.01
8-15	.06	0	:30	1.00	1.25	12:00m	.0021	.01
8-16-19	0	0	12:00m	0	1.25	8-22-60		
8-20	.07	0	8-22-60			12:07a	.0015	.01
8-21	.51 <sup>2/</sup>	0	12:16a	.08	1.27	:47	.0015	.01
			:18	2.10	1.34	1:57	.0004	.01
			:55	0	1.34	2:17	.0004	.01
			1:00	.24	1.36	:47	.0015	.01
			2:10	.03	1.39	:57	.0021	.01
			:17	.77	1.48	3:27	.0021	.01
			:45	.17	1.56	4:07	.0009	.02
						:57	.0004	.02
						5:37	.0001	.02
						6:37	0	.02

Notes: To convert runoff in in/hr to cfs, multiply by 7.2601. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p.26.24-5. <sup>2/</sup> Rain ended about noon.

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 187					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25, 1961								
3-25-30-61	Raingage 116 0	0	4-25-61 2:38p	Raingage 116 0	0	4-25-61 2:42p	0.0092	0
3-31	.30	0	:44	1.00	.10	:46	.0118	T
4-1	.66	0	:47	2.40	.22	:50	.0196	T
4-2	.02 s	0	:54	.34	.26	:54	.0333	T
4-3-4	0	0						
4-5	.02	0	3:00	1.70	.43	:56	.0428	T
4-6	.04	0	:07	.94	.54	:58	.0592	.01
4-7-8	0	0	:23	.19	.59	3:02	.0855	.01
4-9	.69	0	:35	1.35	.86	:04	.108	.01
4-10	.05	0	:40	1.92	1.02	:06	.143	.02
4-11	0	0	:44	.75	1.07	:08	.183	.02
4-12	.29	0	:46	4.20	1.21	:10	.218	.03
4-13	.05	0	:50	.15	1.22	:12	.253	.04
4-14	0	0	:51	4.20	1.29	:14	.281	.05
4-15	.03	0	4:03	.35	1.36	:18	.309	.07
4-16	.67	0	:10	1.11	1.49	:24	.281	.10
4-17	.10 ra	0	:17	1.71	1.69	:30	.248	.12
4-18-20	0	0	5:30	.02	1.72	:32	.253	.13
4-21	.69	0	7:30	.01	1.74	:34	.281	.14
4-22	.66	0				:36	.309	.15
4-23	.03	0				:38	.337	.16
4-24	0	0				:40	.420	.17
4-25	.56 <sup>1/</sup>	0				:42	.510	.19
						:44	.610	.21
						:46	.722	.23
						:48	.818	.26
						:50	.909	.28
						:55	1.03	.37
						4:00	.903	.45
						:02	.895	.48
						:04	.844	.51
						:06	.770	.53
						:10	.711	.58
						:14	.700	.63
						:18	.722	.68
						:20	.806	.70
						:22	.857	.73
						:26	.818	.79
						:28	.745	.81
						:30	.675	.84
						:34	.569	.88
						:38	.472	.91
						:42	.402	.94
						:46	.337	.97
						:50	.281	.99
						:56	.218	1.01
						5:00	.183	1.03
						:10	.129	1.05
						:20	.0928	1.07
						:34	.0653	1.09
						:50	.0481	1.10
						6:20	.0291	1.12
						7:00	.0251	1.14
						:20	.0213	1.15
						8:00	.0196	1.16
						:50	.0196	1.18
						9:00	.0213	1.18
						11:00	.0231	1.23
						12:00m	.0231 <sup>2/</sup>	1.25

Watershed conditions: In first and second year meadow strips of a corn, wheat, meadow, meadow rotation, prior to tillage for corn (improved practices). Legumes, grass, and weeds 4" high; density of cover 95%.

Notes: To convert runoff in in/hr to cfs, multiply 7.2601. <sup>1/</sup> Rain ended about 12:30 p. <sup>2/</sup> Normal base flow.



COSHOCTON, OHIO WATERSHED 187



3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 192 (Area - 7.59 Acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	1960	P	2.66	3.15	0.91	1.58	3.03	6.43	2.89	4.84	0.44	2.04	1.63	1.45
	Q	.15	.05	.26	.01	0	.42	0	T	0	0	0	0	.89
1961	P	0.65	3.69	3.45	6.40	2.03	2.94	5.16	1.73	1.15	1.98	3.07	2.59	34.84
	Q	0	.28	.51	1.13	.01	.01	.04	0	0	0	0	0	1.98

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshooton, Ohio Watershed 192

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.52	6-14	0.23	6-14	0.25	6-14	0.28	6-14	0.30	6-14	0.38	6-14	0.42	6-14	0.42
1961	4-25	.57	4-25	.42	4-25	.60	4-25	.66	4-25	.73	4-25	.78	4-25	.79	4-21	1.00

Notes: Quality of records: Monthly P, excellent; Q, good; annual maximum discharges and volumes, excellent. Cover 1960, first year meadow; prevailing practice.  
1/ Precipitation from Raingage 128.

SELECTED RUNOFF EVENTS Coshooton, Ohio Watershed 192

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 128			Event of August 21 and 22, 1960 2/					
7-20-25-60	0	0	8-21-60	Raingage 128	0	8-21-60	0	0
7-26	.26	0	9:43p	0	0	10:18p	0	0
7-27-29	0	0	:50	3.34	.39	:32	T	T
7-30	.33	0	10:22	.37	.59	:58	0	T
7-31-8-2	0	0	:32	2.76	1.05			
8-3	.20	T	11:23	.07	1.11			
8-4	1.55	0	:30	.94	1.22			
8-5-7	0	0	8-22-60					
8-8	.08	0	12:15a	.04	1.25			
8-9-14	0	0	:18	1.20	1.31			
8-15	.05	0	2:10	.03	1.36			
8-16-19	0	0	:20	.54	1.45			
8-20	.10	0	:50	.14	1.52			
8-21	.53 3/	0						

Watershed conditions: In first year meadow of a corn, wheat, meadow, meadow rotation (prevailing practice). Grass and weeds 4" high; density of cover 75%.

Notes: For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 26.23-5. 2/ No graph shown for this event. 3/ Rain ended about noon.

3-64

SELECTED RUNOFF EVENTS					Coshocton, Ohio Watershed 192			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25 to 27, 1961								
3-25-30-61	Raingage 128 0	0	4-25-61 2:41p	Raingage 128 0	0	4-25-61 2:41p	0.0009	0
3-31	.35	0						T
4-1	.30	.02	4:46	1.80	.15	4:48	.0027	T
4-2	.04 s	0	5:0	1.50	.25	5:0	.0065	T
4-3-4	0	0	5:7	.34	.29	5:2	.0112	T
4-5	.02	0	3:02	1.92	.45	5:4	.0203	T
4-6	.04	0	5:05	.80	.49	5:6	.0881	T
4-7-8	0	0	5:10	.84	.59	5:8	.127	.01
4-9	.81	.03	5:26	.19	.61	3:00	.145	.01
4-10	.05	T	5:33	1.54	.79	5:03	.169	.02
4-11	0	0	4:47	1.50	1.14	5:06	.217	.03
4-12	.30	T	4:49	3.90	1.27	5:10	.247	.04
4-13	.03	0	5:58	.80	1.39	5:14	.260	.06
4-14	0	0	4:06	.22	1.42	5:18	.217	.08
4-15	.03	0	5:12	1.30	1.55	5:22	.174	.09
4-16	.67	.06	5:19	1.89	1.77	5:26	.140	.10
4-17	.15 rs	.02	5:30	.05	1.78	5:30	.127	.11
4-18-20	0	T	6:20	.01	1.79	5:32	.136	.11
4-21	.76	.10	7:00	.02	1.80	5:34	.163	.12
4-22	.67	.10				5:36	.206	.12
4-23	.03	T				5:38	.240	.13
4-24	0	0				4:40	.286	.14
4-25	.60 1/	.07 2/				4:42	.307	.15
						4:44	.336	.16
						4:46	.399	.17
						5:0	.448	.20
						5:02	.502	.22
						5:6	.540	.25
						4:00	.502	.28
						5:04	.448	.32
						5:06	.414	.33
						5:10	.366	.36
						5:12	.351	.37
						5:16	.382	.40
						5:18	.431	.41
						5:20	.465	.42
						5:22	.540	.44
						5:24	.568	.46
						5:28	.502	.49
						5:30	.448	.51
						5:32	.382	.52
						5:35	.307	.54
						5:38	.253	.56
						5:40	.217	.56
						5:44	.174	.58
						5:48	.127	.59
						5:54	.0953	.60
						5:00	.0745	.61
						5:10	.0456	.62
						5:30	.0276	.63
						5:50	.0186	.64
						6:20	.0125	.64
						7:00	.0087	.65
						5:30	.0065	.65
						8:30	.0044	.66

Watershed conditions: In second year meadow of a corn, wheat, meadow, meadow rotation (prevailing practice). Grass and weeds 4" high; density of cover 98%.

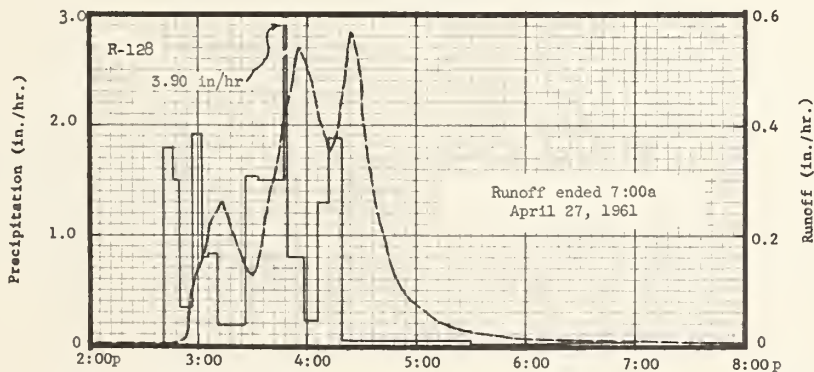
Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 7.6535. 1/ Rain ended about 12:30p. 2/ Runoff prior to 2:41p.

3-64

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 192					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25 to 27, 1961 - cont'd								
						4-25-61 12:00m	0.0014	0.68
						4-26-61 3:15a	.0035	.69
						4:30	.0035	.69
						6:30	.0027	.70
						8:30	.0027	.70
						9:30	.0020	.71
						12:00m	.0014	.71
						4:30p	.0009	.72
						12:00m	.0004	.72
						4-27-61 4:00a	.0001	.72
						7:00	0	.72

Notes: To convert runoff in in/hr to cfs, multiply by 7.6535.



April 25, 1961

COSHOCTON, OHIO      WATERSHED 192

3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 172 (Area - 43.6 Acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	2.77	3.41	0.94	1.51	3.09	6.44	2.89	5.58	0.41	1.97	1.61
	Q	1.79	1.34	1.71	1.02	.84	1.16	.07	.09	T	.02	.02	T	8.06
1961	P	0.80	3.92	3.52	6.35	2.11	2.91	4.99	1.96	0.93	2.09	3.06	2.30	34.94
	Q	.02	.65	2.44	5.32	.81	.37	.08	.01	T	.02	.02	.03	9.77

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshooton, Ohio Watershed 172

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.21	6-14	0.16	6-14	0.21	6-14	0.33	6-13	0.43	6-13	0.61	6-13	0.73	1-12	0.98
1961	4-25	.83	4-25	.56	4-25	.76	4-25	1.00	4-25	1.18	4-25	1.44	4-25	1.73	4-21	3.13

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good. Watershed conditions 1960 and 1961, 33% uneven age hardwoods, 67% pines planted in 1938.  
 1/ Precipitation from Raingage 103.

SELECTED RUNOFF EVENTS Coshooton, Ohio Watershed 172

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 103			Event of August 21 and 22, 1960					
7-21-25-60	0	0.01	8-21-60	Raingage 103		8-21-60		
7-26	.21	T	9:40p	0	0	10:17p	0.0020	0
7-27	.02	T	4:5	.96	.08	:27	.0102	.001
7-28-29	0	T	:50	6.70	.58	:35	.0198	.003
7-30	.38	T	10:05	.68	.75	:37	.0362	.004
7-31-8-2	0	T	:10	.12	.76	:39	.0409	.005
8-3	.24	T	:13	.80	.80	:41	.0544	.007
8-4	1.64	.02	:18	.72	.86	:43	.0573	.009
8-5-7	0	T	:26	2.92	1.25	:47	.0544	.012
8-8	.04	T	:33	2.31	1.52	:52	.0364	.016
8-9-11	0	T	:35	.30	1.53	:56	.0330	.019
8-15	.07	0	:37	1.50	1.58	11:04	.0209	.022
8-16-19	0	0	:54	.14	1.62	:20	.0127	.027
8-20	.15	0	11:00	.20	1.64	:26	.0118	.028
8-21	.51 2/	T	:10	.06	1.65	:32	.0139	.029
			:17	.43	1.70	:40	.0209	.032
			:27	1.38	1.93	:44	.0280	.033
			:58	.02	1.94	12:00m	.0177	.039
			12:00m	1.20	1.98	8-22-60		
			8-22-60			12:06a	.0132	.042
			12:03a	1.20	2.04	:14	.0143	.043
			:12	.07	2.05	:24	.0123	.045
			:17	.36	2.08	:32	.0109	.047
			2:00	.01	2.10	:44	.0086	.049
			:10	.24	2.14	1:04	.0058	.051
			:16	.50	2.19	2:04	.0022	.055
			:45	.17	2.29	:16	.0030	.055
						:36	.0030	.056
						:44	.0033	.057
						:54	.041	.057

Notes: To convert runoff in in/hr to cfs, multiply by 43.9038. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p.26.26-5. 2/ Rain ended about noon.

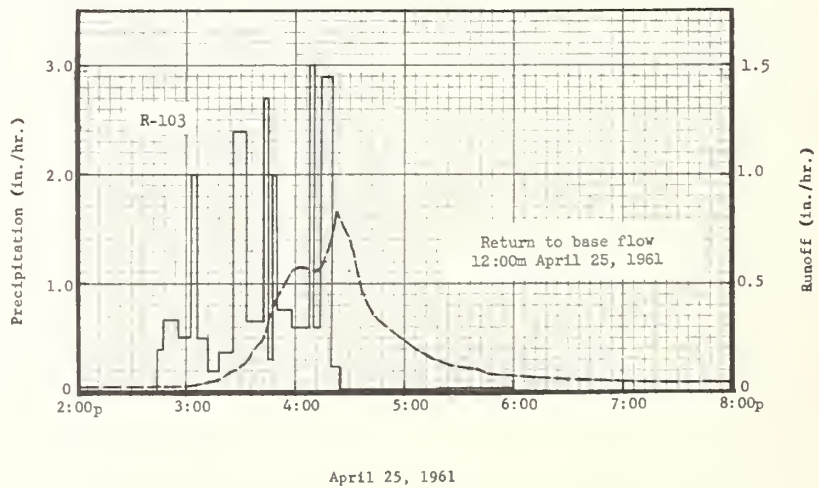
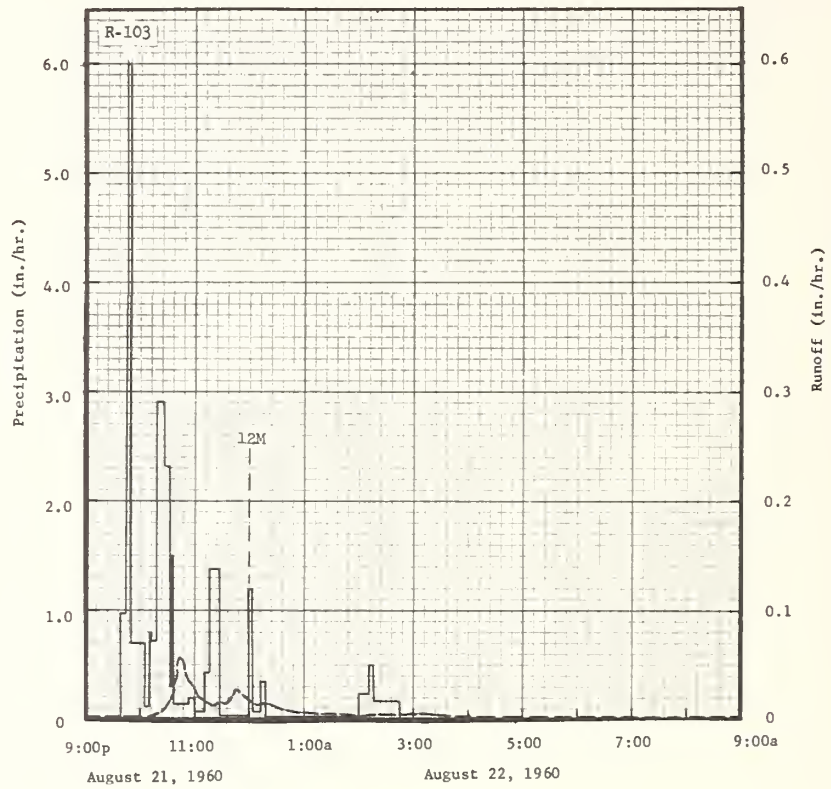


3-64

SELECTED RUNOFF EVENTS					Coshoccon, Ohio Watershed 172			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960 - Continued								
						8-22-60		
						3:04a	0.0044	0.058
						:28	.0038	.060
						4:04	.0025	.061
						5:04	.0015	.063
						8:24	T	.066
Event of April 25, 1961								
3-25-30-61	Raingage 103	0.21	4-25-61	Raingage 103		4-25-61		
3-31	0	.03	2:44p	0	0	2:42p	0.0173	0
4-1	.28	.12	:47	.40	.02	3:00	.0221	.006
4-2	.47	.09	:56	.67	.12	:06	.0309	.009
4-3-4	.02 s	.13	3:03	.51	.18	:09	.0362	.010
	0					:		
4-5	.02	.05	:06	2.00	.28	:12	.0409	.012
4-6	.04	.04	:12	.50	.33	:18	.0603	.017
4-7-8	0	.06	:18	.20	.35	:24	.0858	.024
4-9	.70	.12	:26	.38	.40	:32	.130	.038
4-10	.08	.14	:33	2.40	.68	:36	.184	.049
4-11	0	.09	:43	.66	.79	:42	.246	.070
4-12	.30	.11	:45	2.70	.88	:46	.364	.091
4-13	.04	.10	:47	.30	.89	:51	.448	.123
4-14	0	.08	:50	2.00	.99	:58	.557	.183
4-15	.03	.07	:58	.75	1.09	4:00	.571	.202
4-16	.66	.26	4:08	.60	1.19	:06	.571	.259
4-17	.28 rs	.19	:10	3.00	1.29	:10	.564	.297
4-16-20	0	.34	:14	.60	1.33	:16	.605	.354
4-21	.79	.32	:20	2.20	1.62	:20	.689	.397
4-22	.56	.36	:25	.24	1.64	:21	.764	.409
4-23	.04	.24	5:20	.01	1.65	:22	.833	.423
4-24	0	.17	6:00	.02	1.66	:26	.764	.476
4-25	.59 1/	.17 2/				:30	.689	.524
						:32	.632	.546
						:34	.550	.566
						:38	.448	.599
						:42	.364	.627
						:50	.309	.671
						5:00	.241	.716
						:10	.176	.750
						:20	.142	.777
						:40	.114	.819
						:46	.0926	.830
						6:30	.0664	.885
						7:26	.0489	.938
						8:30	.0425	.986
						9:40	.0396	1.034
						12:00m	.0309 3/	1.118

Watershed conditions: One-third of acres in hardwoods, two-thirds reforested to pines. Hardwoods were up to 80' high, shrubs 6", herbs 6", and litter 1" deep. Pines on reforested areas were 25-30' high, litter 1/2" deep.

Notes: To convert runoff in in/hr to cfs, multiply by 43.9638. 1/ Rain ended about 12:30p. 2/ Runoff prior to 2:42p. 3/ Normal base flow.



COSHOCTON, OHIO WATERSHED 172

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 169 (Area - 29.0 Acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.88	3.13	0.93	1.58	3.10	6.51	3.11	4.90	0.41	1.97	1.66	1.34	31.52
	Q	1.18	.44	.83	.31	.08	.96	.03	.10	0	T	0	0	3.93
1961	P	.56	3.73	3.28	6.40	1.92	3.26	5.15	1.81	1.22	2.00	3.04	2.43	34.80
	Q	.02	.69	1.44	3.15	.30	.14	.18	.02	T	0	.03	.04	6.01

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshocton, Ohio Watershed 169

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.85	6-14	0.35	6-14	0.38	6-14	0.41	6-13	0.45	6-13	0.72	6-13	0.75	6-13	0.87
1961	4-25	1.04	4-25	.79	4-25	1.07	4-25	1.24	4-25	1.35	4-25	1.47	4-25	1.48	4-21	2.29

Notes: Quality of records: P and Q, good; annual maximum discharges and volumes, good. Mixed cover 1960 and 1961; 6% hardwoods; 6% reforested; 48% grassland, 34% cultivated; 6% miscellaneous; contour strip cropped.  
 1/ Precipitation from Raingage 113.

SELECTED RUNOFF EVENTS Coshocton, Ohio Watershed 169

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 113			Event of August 21 and 22, 1960					
7-21-25-60	0	0	8-21-60	Raingage 113	0	8-21-60	0	0
7-26	.25	0	9:43p	0	0	9:54p	0	0
7-27	.02	0	:48	2.04	.17	:56	.0001	T
7-28-29	0	0	:51	3.20	.33	10:30	.0001	T
7-30	.40	0	:54	1.00	.38	:32	.0005	T
7-31-8-2	0	0	10:05	.22	.42	:36	.0084	T
8-3	.22	T	:18	.42	.51	:40	.0162	.001
8-4	1.59	.04	:20	1.20	.55	:44	.0142	.002
8-5	0	T	:23	.20	.56	:48	.0293	.004
8-6-7	0	0	:33	2.82	1.03	:50	.0424	.005
8-8	.07	0	11:00	.09	1.07	:52	.0499	.006
8-9-14	0	0	:23	.10	1.11	11:00	.0499	.013
8-15	.05	0	:30	1.20	1.25	:08	.0378	.019
8-16-19	0	00	12:00m	0	1.25	:12	.0313	.021
8-20	.10	0	8-22-60			:16	.0238	.023
8-21	.50 2/	0	12:08a	.15	1.27	:20	.0191	.024
Watershed conditions: Mixed cover under improved practice. 22.1% of the area was in corn 68" high. 15.5% was in wheat strips cut July 21; grass, legumes and weeds in wheat strips 3" high. 29.6% was in meadow strips. Second cutting made July 21; legumes, grass and weeds 4" high. 10% was in improved pasture 4" high. 2.8% was in orchards and 12.8% was reforested to pines. 7.2% was in miscellaneous cover, farmsteads, roads, etc.			:10	.90	1.30	:28	.0125	.027
			:13	.20	1.31	:40	.0088	.029
			:16	1.00	1.36	:52	.0059	.030
			1:23	.04	1.40	:56	.0059	.030
			2:10	0	1.40	:58	.0084	.031
			:17	.86	1.50	12:00m	.0114	.031
			:48	.21	1.61	8-22-60		
						12:12a	.0084	.033
						:24	.0067	.035
						:44	.0039	.036
			:56	.0063	.037			
			1:12	.0045	.039			
			:24	.0028	.039			
			2:12	.0011	.041			

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 29.241. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p.26-27-6. 2/ Rain ended about noon.

SELECTED RUNOFF EVENTS						Coshoooton, Ohio Watershed 169		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - continued</u>						8-22-60		
						2:48a	0.0020	0.042
						:52	.0045	.042
						:56	.0075	.043
						3:16	.0075	.045
						:32	.0059	.047
						:48	.0039	.048
						4:08	.0024	.049
						4:0	.0013	.050
						6:20	.0002	.051
						9:20	0	.051
<u>Event of April 25, 1961</u>								
3-25-30-61	Raingage 113		4-25-61	Raingage 113		4-25-61		
	0	0.07	2:38p	0	0	2:46p	0.0084	0
3-31	.24	.02	:43	1.20	.10	:54	.0176	.002
4-1	.39	.08	:45	2.40	.18	:56	.0206	.002
4-2	.04 s	.02	:50	.84	.25	:58	.0293	.003
4-3-4	0	.03						
4-5	T	.01	:54	.45	.28	3:01	.0571	.005
4-6	.05	.01	:57	1.20	.34	:03	.119	.006
4-7-8	0	.02	3:00p	1.80	.43	:06	.195	.017
4-9	.73	.09	:06	1.00	.53	:08	.245	.024
4-10	.05	.04	:15	.27	.57	:10	.284	.034
4-11	0	.02	:24	.33	.62	:12	.340	.043
4-12	.27	.04	:30	1.80	.80	:16	.349	.066
4-13	.02	.03	:44	1.11	1.06	:20	.326	.088
4-14	0	.02	:47	3.00	1.21	:22	.305	.099
4-15	.05	.02	4:03p	.26	1.38	:30	.251	.135
4-16	.65	.13	:07	1.80	1.50	:34	.271	.152
4-17	.14 rs	.09	:10	.60	1.53	:36	.312	.161
4-18-20	0	.13	:27	.99	1.61	:38	.400	.173
4-21	.34	.18	5:30p	.02	1.63	:40	.547	.189
4-22	.62	.22	7:00	.01	1.85	:42	.581	.208
4-23	.04	.09				:44	.653	.228
4-24	0	.07				:46	.691	.251
4-25	.57 1/	.12 2/				:48	.769	.275
						:50	.848	.302
						:52	.930	.332
						:54	.995	.364
						:58	1.04	.432
						4:00	.995	.466
						:02	.930	.498
						:04	.848	.527
						:06	.787	.555
						:09	.711	.592
						:12	.674	.627
						:16	.691	.672
						:19	.787	.709
						:22	.889	.751
						:26	.961	.813
						:28	.910	.844
						:30	.838	.873
						:34	.636	.923
						:38	.479	.970
						:40	.438	.975
						:48	.298	1.024
						5:00	.189	1.072
						:10	.134	1.099
Continued on next page								

Watershed conditions: Mixed cover under improved practice. 22% of the area was in wheat 5" high; 45% in meadow strips including those to be tilled for corn, 6" high; 10% in improved pasture 4" high; 2.8% in orchards; 12.8% reforested to pines; 7.4% in miscellaneous cover (farmsteads and roads).

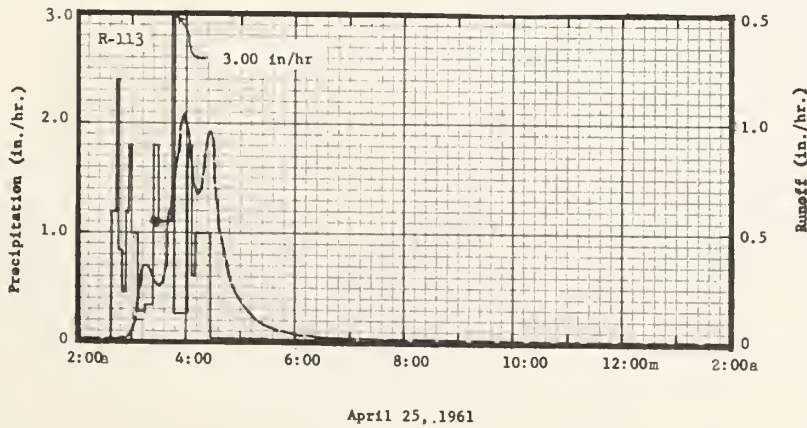
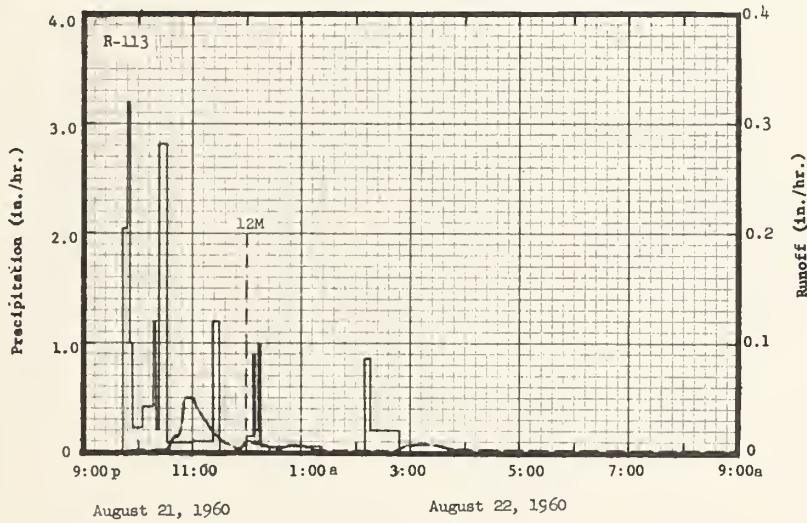
Notes: To convert runoff in in/hr to cfs, multiply by 29.241. 1/ Rain ended about 12:30p. 2/ Runoff prior to 2:46p.



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SELECTED RUNOFF EVENTS					Coshocton, Ohio Watershed 169			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of April 25, 1961 - Continued						4-25-61		
						5:20p	0.0999	1.118
						6:00	.0448	1.166
						:20	.0407	1.180
						:28	.0378	1.185
						7:20	.0247	1.212
						8:04	.0191	1.228
						444	.0162	1.240
						9:20	.0149	1.249
						10:32	.0137	1.267
						12:00m	.0125 1/	1.286

Notes: To convert runoff in in/hr to cfs, multiply by 29.241. 1/ Normal base flow.



COSHOCTON, OHIO WATERSHED 169

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 177		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of September 23, 1945 - Continued</u>								
Watershed conditions: Mixed cover under conservation practice. 16.0% of the area was in corn. Corn plants were 120" high; weeds 52" high. 30.5% of the area was in meadow. Grass and legumes 7" high; weeds 15" high. 31.1% of the area was in pasture. Alfalfa, grass and weeds were 8" high. 16.4% of the area was in woods and 6.0% in miscellaneous cover (farmsteads, roads, etc.).			9-23-45	Raingage 100				
			5:26p	0	0			
			10:50		2.12			
			9-23-45	Raingage Y102				
			5:27p	0	0			
			10:52		2.41			
			9-23-45	Raingage 107				
			5:25p	0	0			
			10:50		2.75			
<u>Event of June 12, 1957</u>								
5-12-57	0.26	0.01	6-12-57	Raingage 103		6-12-57		
5-13	0	T	3:07p	0	0	3:12p	0	0
5-14	1.12	.07	:12	1.20	.10	:46	.0963	.003
5-15	.04	.01	:19	1.11	.23	:48	.420	.011
5-16-17	0	.01	:22	.20	.24	:54	2.45	.171
5-18	e .18	.01	:24	2.10	.31	4:00	3.14	.459
5-19	e .20	.01	:30	4.90	.80	:06	2.72	.760
5-20	e .19	.01	:40	5.58	1.73	:12	1.76	.978
5-21	0	.01	:48	3.15	2.15	:18	1.04	1.107
5-22	.51	.04	:51	7.80	2.54	:24	.689	1.192
5-23-25	0	.02	4:12	1.77	3.16	:30	.447	1.249
5-26	.14	.01	:14	1.20	3.20	5:04	.147	1.393
5-27-31	0	T	:19	.24	3.22	:32	e .0606	1.438
6-1	.18	0	:22	0	3.22	:54	e .0396	1.457
6-2-7	0	0	:40	.33	3.32	7:22	.0109	1.485
6-8	.98	T	5:28	.05	3.36	9:02	.00597	1.498
6-9	0	T						
6-10	0	0	6-12-57	Raingage 100				
6-11	.30	0	3:02p	0				
6-12	0	0	8:58		3.32			
			6-12-57	Raingage Y102				
			3:08p	0				
			5:32		3.44			
			6-12-57	Raingage 107				
			3:07	0				
			5:50		3.53			
Watershed conditions: Mixed cover under conservation practice. 7.9% of the area was in corn. Corn plants were 20" high; weeds 12" high. 20.0% of the area was in corn-meadow strips and 15.9% in wheat-meadow strips. Corn plants were 20" high and weeds 12" high. Wheat plants were 30" high and legumes and grass 4" high. In meadow strips, legumes, grasses and weeds were 6" high. 7.9% of the area was in permanent meadow. Legumes and grass were 4" high; weeds 5" high. 25.9% of the area was in pasture. Legumes and grasses were 5" high; weeds 6" high. 16.4% of the area was in woods and 6.0% in miscellaneous cover (farmsteads, roads, etc.).								
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Notes: To convert runoff in in/hr to cfs, multiply by 76.231.								

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 177 (Area - 75.6 Acres)						
Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.77	3.41	0.94	1.51	3.09	6.44	2.89	5.58	0.41	1.97	1.81	1.52	32.34
Q	1.69	1.01	1.24	.51	.13	.99	.11	.32	.01	T	.01	0	6.02
1961 P	0.80	3.92	3.52	6.35	2.11	2.91	4.99	1.96	0.93	2.09	3.06	2.30	34.94
Q	.04	1.31	2.44	4.13	.35	.18	.16	.03	T	0	.03	.10	8.77

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS															Coshocton, Ohio Watershed 177	
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.55	6-14	0.29	6-14	0.34	6-14	0.38	6-13	0.47	6-13	0.60	6-13	0.67	1-12	0.95
1961	4-25	1.04	4-25	.81	4-25	1.05	4-25	1.18	4-25	1.32	4-25	1.46	4-25	1.68	4-21	2.71

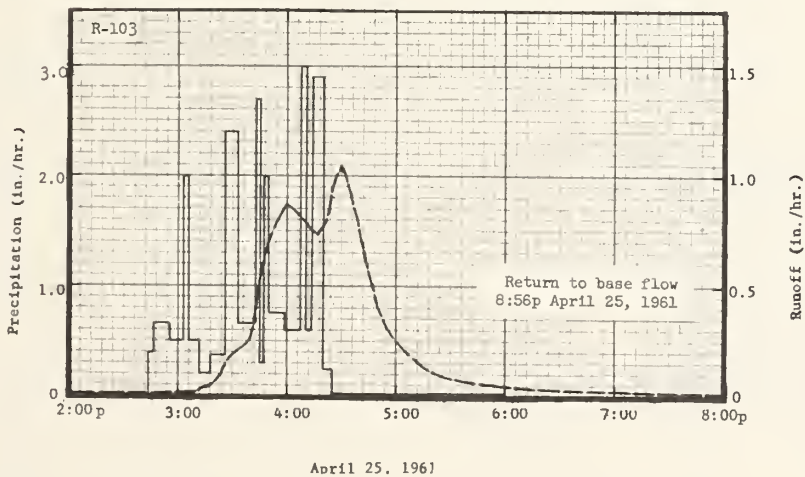
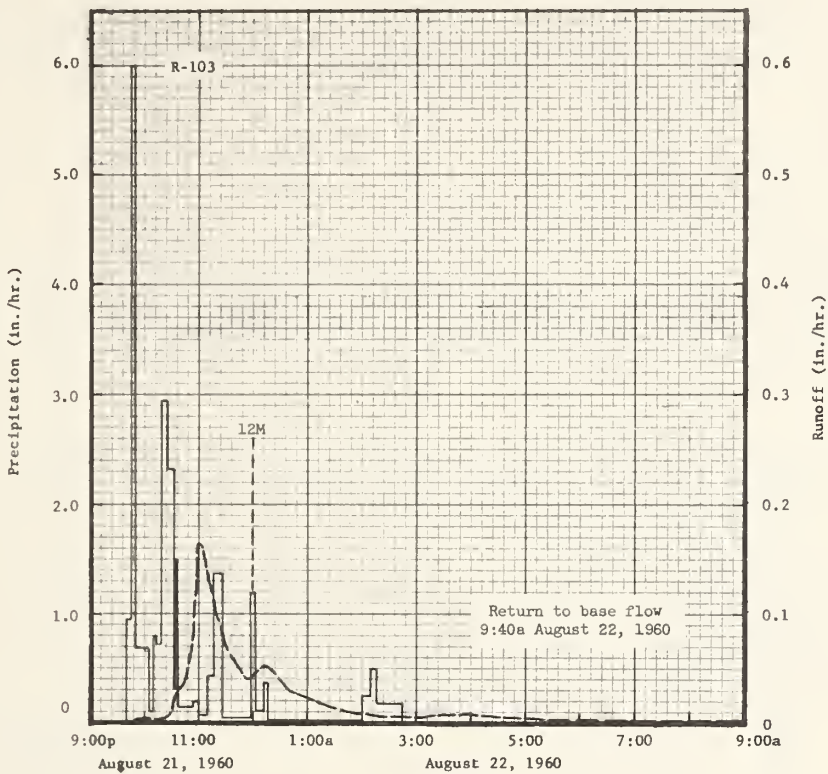
Notes: Quality of records: Monthly P, good; Q, excellent; annual maximum discharges and volumes, excellent. Mixed cover 1960 and 1961; 4% hardwoods, 6% reforested, 67% grassland, 17% cultivated, 6% miscellaneous; contour strip cropped. 1/ Monthly precipitation from raingage 103.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 177			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
Raingage 103			Event of August 21 and 22, 1960						
7-21-25-60	0	0.21	8-21-60	Raingage 103		8-21-60			
7-26	.21	T	9:40p	0	0	9:42p	T	0	
7-27	.02	T	:45	.96	.08	:44			
7-28-29	0	T	:50	6.00	.58	:50	.00005	T	
7-30	.38	T	10:05	.68	.75	10:00	.0014	T	
							.0037	T	
7-31-8-2	0	T	:10	.12	.76	:16	.0028	.001	
8-3	.24	T	:13	.80	.80	:20	.0030	.002	
8-4	1.64	.08	:18	.72	.86	:24	.0041	.002	
8-5-7	0	.01	:26	2.92	1.25	:28	.0095	.002	
8-8	.04	T	:33	2.31	1.52	:32	.0167	.003	
8-9-14	0	T	:35	.30	1.53	:36	.0277	.004	
8-15	.07	T	:37	1.50	1.58	:42	.0342	.008	
8-16-19	0	T	:54	.14	1.62	:50	.0575	.014	
8-20	.15	0	11:00	.20	1.64	:55	.104	.020	
8-21	.51 2/	T	:10	.06	1.65	:58	.147	.027	
			:17	.43	1.70	11:00	.165	.032	
			:27	1.38	1.93	:06	.156	.048	
			:58	.02	1.94	:10	.134	.058	
			12:00m	1.20	1.98	:16	.112	.070	
			8-22-60			:24	.0850	.083	
			12:03a	1.20	2.04	:30	.0673	.091	
			:12	.07	2.05	:50	.0424	.108	
			:17	.36	2.08	:54	.0396	.111	
			2:00	.01	2.10	12:00m	.0424	.115	
			:10	.24	2.14	8-22-60			
			:16	.50	2.19	12:10a	.0512	.123	
			:45	.17	2.29	:16	.0512	.128	
						:34	.0369	.141	
			8-21-60	Raingage 100		:41	.0290	.145	
			9:38p		0	1:00	.0235	.153	
			8-22-60						
			2:45a		2.42				

Notes: To convert runoff in in/hr to cfs, multiply by 76.231. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.28-7. 2/ Rain ended about noon.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 177		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - Continued</u>								
						8-22-60 1:16a	0.0186	0.154
						:40	.0105	.164
						2:20	.0060	.170
			8-21-60	Raingage Y102		3:12	.0065	.175
			9:42p		0	:32	.0092	.178
			8-22-60					
			3:00a		2.27	:40	.0092	.179
			8-21-60	Raingage 107		4:20	.0060	.184
			9:43p		0	5:12	.0030	.188
			8-22-60			6:20	.0018	.190
			2:45a		1.94	9:40	.0009 <u>1/</u>	.195
<u>Event of April 25, 1961</u>								
3-25-30-61	Raingage 103 0	0.18	4-26-61	Raingage 103		4-25-61		
3-31	.28	.02	2:44p	0	0	2:52p	0.0102	0
4-1	.47	.09	:47	.40	.02	3:04	.0140	.002
4-2	.02 s	.04	:56	.67	.12	:08	.0167	.003
4-3-4	0	.07	3:03	.51	.18	:12	.0218	.005
4-5	.02	.03	:06	2.00	.28	:14	.0342	.006
4-6	.04	.03	:12	.50	.33	:18	.0479	.008
4-7-8	0	.04	:18	.20	.35	:22	.0887	.013
4-9	.70	.09	:26	.38	.40	:25	.147	.018
4-10	.08	.06	:33	2.40	.68	:28	.185	.027
4-11	0	.05	:43	.66	.79	:36	.226	.054
4-12	.30	.08	:45	2.70	.88	:38	.247	.062
4-13	.04	.06	:47	.30	.89	:40	.294	.071
4-14	0	.05	:50	2.00	.99	:42	.394	.083
4-15	.03	.04	:58	.75	1.09	:44	.489	.097
4-16	.66	.18	4:08	.60	1.19	:48	.641	.135
4-17	.28 rs	.14	:10	3.00	1.29	:54	.788	.207
4-18-20	0	.25	:14	.60	1.33	4:00	.875	.290
4-21	.79	.26	:20	2.90	1.62	:06	.832	.375
4-22	.56	.25	:25	.24	1.64	:10	.771	.429
4-23	.04	.15	5:20	.01	1.65	:16	.729	.504
4-24	0	.12	6:00	.02	1.66	:20	.771	.554
4-25	.59 <u>2/</u>	.16 <u>3/</u>				:22	.822	.580
			4-25-61	Raingage 100		:26	.985	.641
			2:45p		0	:30	1.04	.708
			7:30		1.62			
			4-25-61	Raingage Y102		:32	1.00	.742
			2:26p		0	:36	.875	.805
			7:30		1.59	:40	.737	.859
			4-25-61	Raingage 107		:44	.577	.903
			2:12p		0	:48	.460	.938
			7:30		1.72			
						:52	.367	.966
						:58	.270	.997
						5:10	.156	1.039
						:20	.116	1.062
						:38	.0742	1.090
						6:10	.0479	1.121
						:40	.0281	1.139
						7:00	.0247	1.148
						:40	.0186	1.163
						8:56	.0147 <u>1/</u>	1.184
<p><u>Watershed conditions:</u> Mixed cover in improved practice. 8% of the area was in wheat, 5" high; 37% in meadow, 5" high; 28% in pasture, 4" high; 15% in protected woodland; 1.3% reforested to pines; 10.7 in miscellaneous cover (farmsteads and roads).</p>								
<p><b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 76.231. <u>1/</u> Normal base flow. <u>2/</u> Rain ended about 12:30p. <u>3/</u> Runoff prior to 2:52p.</p>								





COSHOCTON, OHIO WATERSHED 177

5-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)										Coshooton, Ohio Watershed 183 (Area - 74.2 Acres)				
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1960 P	3.11	3.44	0.99	1.82	3.05	6.69	3.53	5.02	0.37	2.01	1.76	1.51	33.30	
Q	2.06	1.39	1.37	.75	.44	1.63	.32	.23	T	T	.01	0	8.20	
1961 P	0.75	4.10	3.49	6.84	2.05	2.51	5.93	1.78	1.07	2.19	3.04	2.56	36.31	
Q	.08	1.49	2.77	4.93	.54	.29	.30	.07	T	0	.03	.13	10.63	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Coshooton, Ohio Watershed 183						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.52	6-14	0.29	6-14	0.35	6-14	0.44	6-14	0.65	6-13	0.96	6-13	1.18	6-13	1.40
1961	4-25	1.14	4-25	.86	4-25	1.18	4-25	1.38	4-25	1.57	4-25	1.75	4-25	1.91	4-21	3.10

Notes: Quality of records: Monthly P, good; Q, excellent; annual maximum discharges and volumes, excellent. Mixed cover 1960 and 1961: 14% woodlot, 57% grassland, 38% cultivated. Prevailing practice except for 9% of area which was strip cropped. 1/ Monthly precipitation from raingage 119.

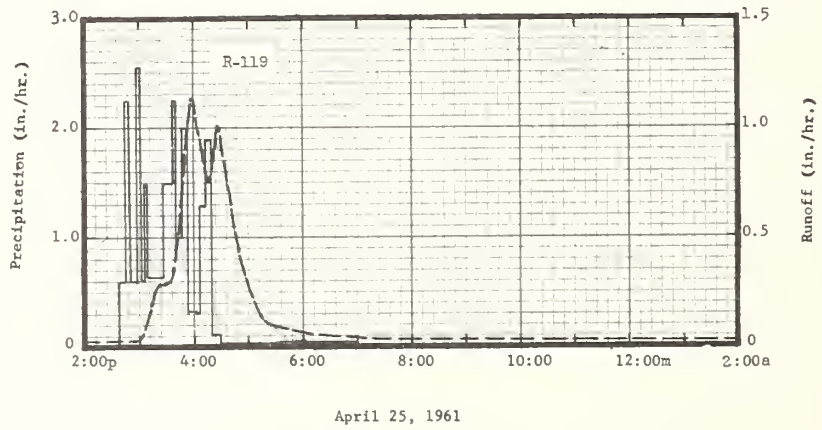
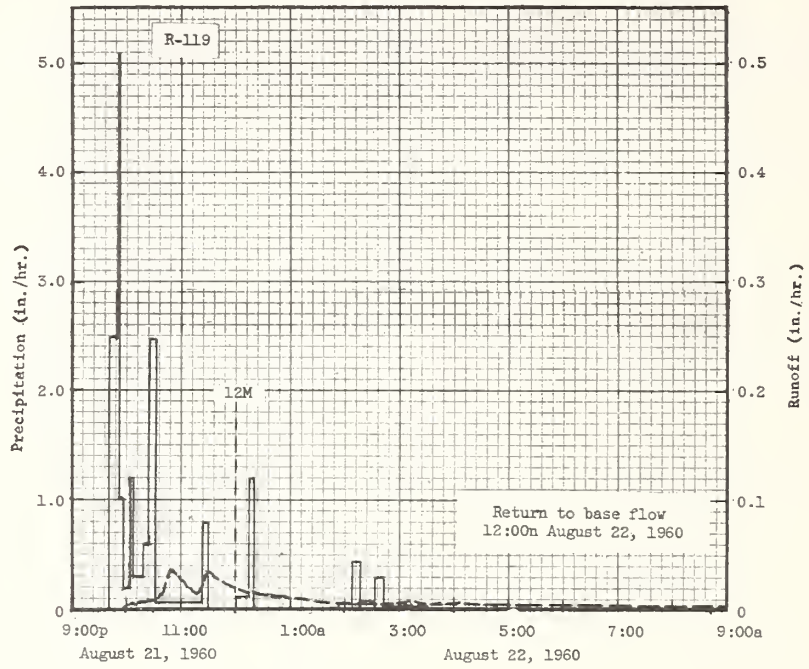
SELECTED RUNOFF EVENTS										Coshooton, Ohio Watershed 183				
Antecedent conditions				Rainfall				Runoff						
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)						
Event of August 21 and 22, 1960														
7-21-25-60	Raingage 119	0.0427	8-21-60	Raingage 119		8-21-60								
7-26	.21	.01	9:43p	0	0	9:52p	0	0						
7-27-29	0	.0151	:50	2.48	.29	10:00	.0035	T						
7-30	.28	.0078	:52	5.10	.46	:06	.0066	.001						
7-31-8-2	0	.0060	:55	1.00	.51	:12	.0040	.001						
8-3	.23	.0034	10:05	.18	.54	:14	.0083	.002						
8-4	1.54	.0455	:07	1.20	.58	:20	.0079	.002						
8-5-7	0	.0170	:20	.28	.64	:24	.0094	.003						
8-8	.08	.0054	:25	.60	.69	:32	.0086	.005						
8-9-14	0	.0128	:33	2.47	1.02	:38	.0134	.005						
8-15	.06	.0011	11:24	.06	1.07	:40	.0168	.006						
8-16-19	0	0	:30	.80	1.15	:42	.0218	.006						
8-20	.08	0	12:00m	0	1.15	:45	.0349	.008						
8-21	.54 2/	.013/	8-22-60			:48	.0373	.008						
			12:16a	.11	1.18	:56	.0326	.013						
Watershed conditions: Mixed cover under prevailing practice. 7.8% of the area was in corn 58" high. 8.4% was in oats cut July 29, legumes and grass 3" high. 6.7% of the area in wheat cut July 21, legumes grass, and weeds 3" high. 8.9% of the area was in barley combined on June 26, legumes, grass and weeds 10" high. 23.6% was in meadow cut July 26, 4" high. 25.3% was in pasture 4" high. 2.7% was in woodland, 9.2% in pastured woodland, and 5.3% in pines. 2.1% was in miscellaneous cover (farmsteads, roads, etc.).			:20	1.20	1.26	11:04	.0238	.018						
			:53	0	1.26	:08	.0198	.019						
			2:08	.04	1.31	:18	.0138	.022						
			:17	.44	1.39	:20	.0160	.023						
			:33	.08	1.41	:24	.0227	.024						
			:43	.30	1.46	:26	.0309	.025						
			3:30	.01	1.47	:28	.0337	.026						
						:36	.0303	.030						
			8-21-60	Raingage 108		:52	.0238	.037						
			9:42p	0		12:00m	.0207	.040						
8-22-60														
2:47a	1.81		8-22-60											
			12:12a	.0160	.044									
8-21-60	Raingage 109		:20	.0134	.046									
9:42p	0		:40	.0126	.050									
8-22-60			:52	.0126	.053									
2:45a	2.01													
			1:12	.0102	.057									
			:40	.0072	.061									
			2:16	.0059	.065									
			3:00	.0066	.070									
			:12	.0072	.070									
			:40	.0066	.074									
			4:04	.0072	.076									
			5:20	.0035	.083									
			12:00n	.0005 4/	.092									

Notes: To convert runoff in in/hr to cfs, multiply by 74,817. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.29-4. 2/ Rain ended about noon. 3/ Runoff prior to 9:52p. 4/ Normal base flow.

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 183					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			<u>Event of April 25, 1961</u>					
3-25-30-61	Raingage 119 0	2.18	4-25-61	Raingage 119		4-25-61		
3-31	.34	.03	2:38p	0	0	2:48p	0.0155	0
4-1	.53	.18	:46	.60	.08	:56	.0218	.002
4-2	.03 a	.07	:50	2.25	.23	3:00	.0326	.004
4-3-4	0	.09	:58	.60	.31	:02	.0461	.006
4-5	T	.04	3:02	2.55	.48	:06	.0981	.010
4-6	.05	.03	:06	.60	.52	:08	.123	.014
4-7-8	0	.05	:08	1.50	.57	:13	.219	.029
4-9	.75	.11	:27	.63	.63	:17	.263	.045
4-10	.05	.10	:37	1.50	.88	:23	.287	.073
4-11	0	.05	:41	2.25	1.03	:33	.281	.120
4-12	.35	.09	:47	1.00	1.13	:35	.299	.130
4-13	.03	.07	:53	2.00	1.33	:37	.361	.141
4-14	0	.05	4:02	.33	1.38	:39	.428	.154
4-15	.01	.04	:06	.30	1.40	:43	.499	.185
4-16	.74	.28	:13	1.29	1.55	:45	.573	.203
4-17	.28 rs	.19	:20	1.89	1.77	:48	.735	.236
4-18-20	0	.27	:30	.12	1.79	:54	1.004	.323
4-21	.80	.31	5:30	.01	1.80	:59	1.14	.412
4-22	.60	.36	7:00	.02	1.83	4:03	1.004	.483
4-23	.04	.17	4-25-61	Raingage 108		:07	.948	.548
4-24	0	.12	2:40p		0	:09	.855	.579
4-25	.57 1/	.19 2/	7:03		1.83	:13	.786	.633
			4-25-61	Raingage 109		:15	.751	.659
			2:39p		0	:23	.910	.669
			7:00		1.81	:27	1.013	.833
						:29	.966	.866
						:33	.838	.926
						:37	.735	.979
						:41	.620	1.025
						:45	.513	1.062
						:53	.361	1.125
						5:03	.241	1.173
						:13	.140	1.205
						:29	.0981	1.237
						:43	.0829	1.258
						6:03	.0652	1.283
						:40	.0453	1.317
						:48	.0424	1.323
						7:20	.0349	1.343
						8:20	.0265	1.373
						9:20	.0238	1.398
						11:20	.0218	1.421
						12:00m	.0198 3/	1.455

Watershed conditions: Mixed cover under prevailing practice. 16% of the area was in wheat 4" high, 39.7% in meadow 5" high, 25% in pasture 3" high, 2.7% in protected woodland, 9.2% in pastured woodland, 5.3% reforested to pines, 2.1% in miscellaneous cover (farmsteads and roads).

Notes: To convert runoff in in/hr to cf\*, multiply by 74.817. 1/ Rain ended about 12:30p. 2/ Runoff prior to 2:48p. 3/ Normal base flow.



COSHOCTON, OHIO      WATERSHED 183



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 196 (Area - 303 acres)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958 P	1.47	0.64	0.99	3.38	3.15	4.23	8.02	2.72	2.99	.32	2.18	.71	30.80
Q <u>2/</u>	1.07	.61	1.09	1.68	2.26	.32	1.72	.78	.25	.12	<u>.14</u>	.17	10.21
1960 P	2.72	3.17	.92	1.68	3.18	7.05	3.55	5.06	.35	2.12	1.87	1.16	32.83
Q	2.65	1.68	1.96	1.09	.74	2.20	.32	.39	.08	.09	.15	.08	11.43
1961 P	.67	4.15	3.56	6.83	2.10	3.12	5.41	1.69	1.23	2.21	3.14	2.64	36.75
Q	.25	1.82	3.41	6.76	.95	.55	.44	1.64	.06	.08	.18	.37	15.01

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 196								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.85	6-14	0.16	6-14	0.55	6-14	0.84	6-13	1.01	6-13	1.31	6-13	1.54	6-11	1.54
1961	4-25	1.11	4-25	.92	4-25	1.26	4-25	1.55	4-25	1.76	4-25	2.01	4-25	2.30	4-21	4.36

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good. Mixed cover, 1960 and 1961: 27% woodlot, 50% grassland, 19% cultivated, 4% miscellaneous; prevailing practice. 1/ Monthly precipitation from raingage 108. 2/ Revision of previously published runoff quantity underlined.

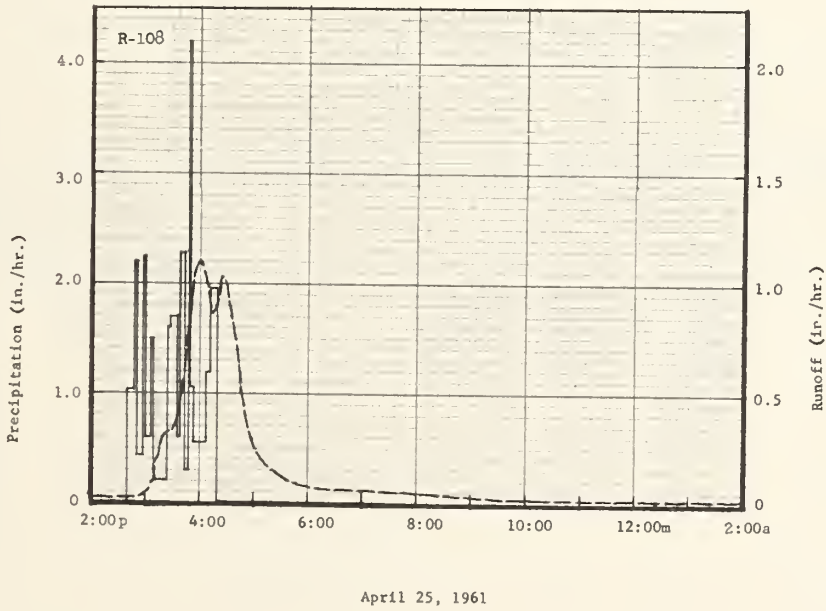
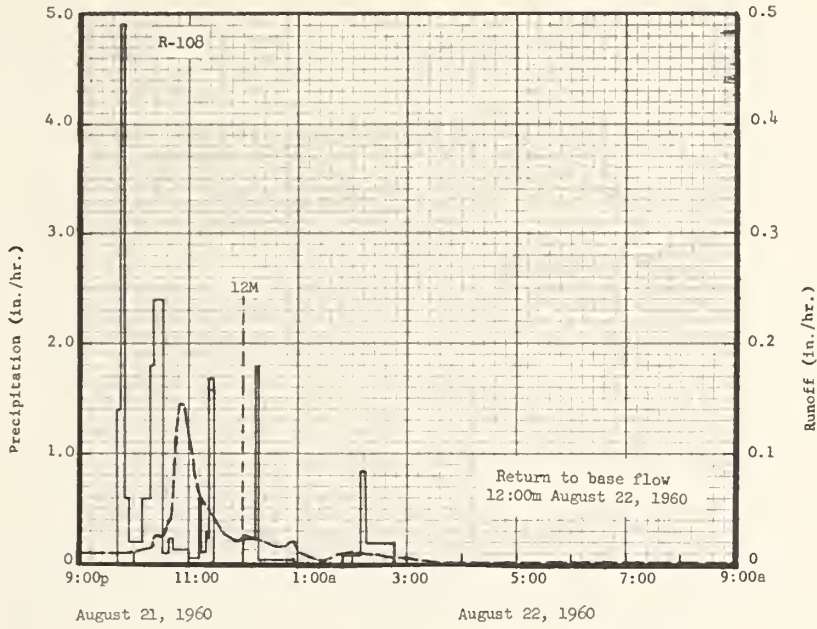
  

SELECTED RUNOFF EVENTS				Coshocton, Ohio Watershed 196				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 108			Event of August 21 and 22, 1960					
7-21-25-60	0	0.02	8-21-60	Raingage 108		8-21-60		
7-26	.23	T	9:42p	0	0	9:50p	0.0118	0
7-27	.03	T	:45	1.40	.07	10:20	.0164	.0070
7-28-29	0	.01	:50	4.92	.48	:22	.0245	.0077
7-30	.30	.01	:55	.60	.53	:24	.0262	.0085
7-31-8-2	0	.01	10:10	.20	.58	:30	.0245	.0111
8-3	.27	.01	:18	.60	.66	:34	.0315	.0129
8-4	1.44	.09	:22	1.80	.78	:40	.0406	.0165
8-5-7	0	.02	:32	2.40	1.18	:42	.0498	.0180
8-8	.07	T	:38	.10	1.19	:44	.0802	.0202
8-9-14	0	.02	:43	.24	1.21	:46	.116	.0235
8-15	.06	T	11:00	.14	1.25	:48	.127	.0275
8-16-19	0	.01	:12	.05	1.26	:50	.145	.0321
8-20	.07	T	:14	.60	1.28	:54	.145	.0416
8-21	.54 <u>3/</u>	.01 <u>4/</u>	:19	.12	1.29	:58	.121	.0505
			:23	.30	1.31	11:00	.116	.0544
			:28	1.68	1.45	:06	.0841	.0644
			12:00m	0	1.45	:10	.0700	.0696
			8-22-60			:14	.0583	.0739
			12:13a	.23	1.50	:26	.0445	.0841
			:16	1.80	1.59	:32	.0363	.0882
			:57	.03	1.61	:40	.0262	.0923
			1:50	0	1.61	:50	.0229	.0964
			2:10	.09	1.64	:56	.0222	.0987
			:15	.84	1.71	12:00m	.0270	1.003
			:47	.19	1.81	8-22-60		
						12:06a	.0254	.1029
						:14	.0208	.1060
			8-21-60	Raingage 107		:20	.0208	.1081
			9:43p		0	:30	.0183	.1113
			8-22-60					
			2:45a		1.94	:46	.0171	.1160
						:52	.0202	.1178
			8-21-60	Raingage 109		:56	.0202	.1192
			9:42p		0	1:00	.0108	.1202
			8-22-60			:30	.0061	.1244
			2:45a		2.01			

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 305.52. 3/ Rain ended about noon. 4/ Runoff prior to 9:50p.

SELECTED RUNOFF EVENTS						Coshocton, Ohio, Watershed 196		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - Continued</u>								
			8-21-60	Raingage 113		8-22-60	0.0103	0.1285
			9:43p		0	2:00a	.0046	.1394
			8-22-60			3:30	.0021	.1494
			2:48a		1.61	6:30	.0013	.1528
						8:40	.0007	.1562
			8-21-60	Raingage 116		12:00m		
			9:44p		0		.0003 <u>1/</u>	.1620
			8-22-60					
			2:45a		1.56			
<u>Event of April 25, 1961</u>								
	Raingage 108		4-25-61	Raingage 108		4-25-61		
3-25-30-61	0	0.29	2:40p	0	0	2:40p	0.0195	0
3-31	.32	.04	:47	1.03	.12	:48	.0222	.0028
4-1	.48	.20	:50	2.20	.23	:56	.0315	.0064
4-2	.04 s	.10	:57	.43	.28	3:02	.0553	.0105
4-3-4	0	.13						
4-5	T	.05	3:01	2.25	.43	:06	.0933	.0154
4-6	.04	.05	:06	.60	.48	:10	.151	.0235
4-7-8	0	.07	:08	1.50	.53	:14	.226	.0360
4-9	.72	.14	:25	.21	.59	:20	.312	.0629
4-10	.05	.13	:28	1.60	.67	:30	.327	.1161
4-11	0	.07	:35	1.71	.87	:38	.445	.1661
4-12	.30	.11	:38	.60	.90	:42	.563	.2004
4-13	.03	.09	:43	2.28	1.09	:45	.678	.2314
4-14	0	.07	:47	.30	1.11	:48	.835	.2688
4-15	.02	.06	:49	4.20	1.25	:50	.916	.2979
4-16	.75	.33	:53	1.05	1.32	:52	1.01	.3301
4-17	.35 rs	.23	4:07	.56	1.45	:54	1.06	.3646
4-18-20	0	.36	:12	1.20	1.55	4:00	1.11	.4731
4-21	.87	.45	:20	1.95	1.81	:02	1.08	.5147
4-22	.62	.53	7:03	.01	1.83	:06	1.01	.5793
4-23	0	.43	4-25-61	Raingage 107		:10	.923	.6437
4-24	.04	.34	2:12p		0	:14	.861	.7031
4-25	.58 <u>2/</u>	.30 <u>3/</u>	7:30		1.72	:18	.900	.7617
			4-25-61	Raingage 109		:22	.998	.8251
			2:39p		0	:24	1.03	.8590
			7:00		1.81	:30	.982	.9596
			4-25-61	Raingage 113		:34	.900	1.0222
			2:38p		0	:38	.769	1.0780
			7:00		1.85	:43	.638	1.1362
			4-25-61	Raingage 116		:46	.524	1.1645
			2:38p		0	:51	.380	1.2019
			7:30		1.74	5:00	.265	1.2495
						:20	.151	1.3147
						:50	.0933	1.3741
						6:30	.0717	1.4271
						8:00	.0498	1.5168
						9:30	.0363	1.5795
						11:00	.0296	1.6269
						12:00m	.0270 <u>1/</u>	1.6552
<p><u>Watershed conditions:</u> Mixed cover under prevailing practice. 11.8% of the area was in wheat 4" high; 28.4% in meadow 5" high; 25.2% in pasture 3" high; 17.2% in protected woodland; 10.2% in pastured woodland; 1.4% reforested to pines; 5.8% in miscellaneous cover (orchards, farmsteads and roads).</p>								
<p>Notes: To convert runoff in in/hr to cfs, multiply by 305.52.  <u>1/</u> Normal base flow. <u>2/</u> Rain ended about 12:30p. <u>3/</u> Runoff prior to 2:40p.</p>								



COSHOCTON, OHIO      WATERSHED 196





MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 10 (Area - 122 acres)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	3.00	3.42	1.06	1.68	3.30	5.66	3.24	7.17	0.35	1.81	1.82	1.60	34.11
1960 Q	1.89	1.16	1.52	.76	.49	.76	.14	.82	.09	.10	.08	.06	7.87
1961 P	0.91	3.91	3.54	6.37	2.65	2.97	5.64	2.17	0.95	2.27	3.31	2.51	37.20
1961 Q	.28	1.29	2.60	3.89	.98	.50	.26	.13	.08	.05	.12	.37	10.55

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 10								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-21	0.36	8-21	0.29	8-21	0.41	8-21	0.59	8-21	0.62	8-21	0.64	8-21	0.66	3-24	1.12
1961	4-25	.88	4-25	.52	4-25	.68	4-25	.84	4-25	.97	4-25	1.14	4-25	1.27	4-21	2.14

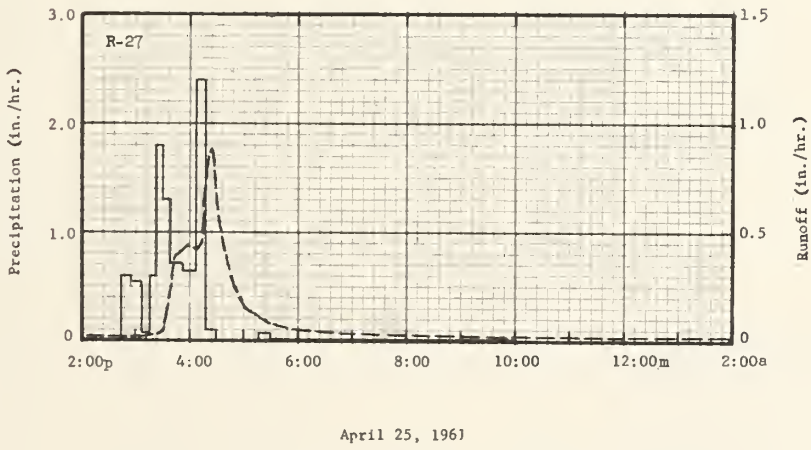
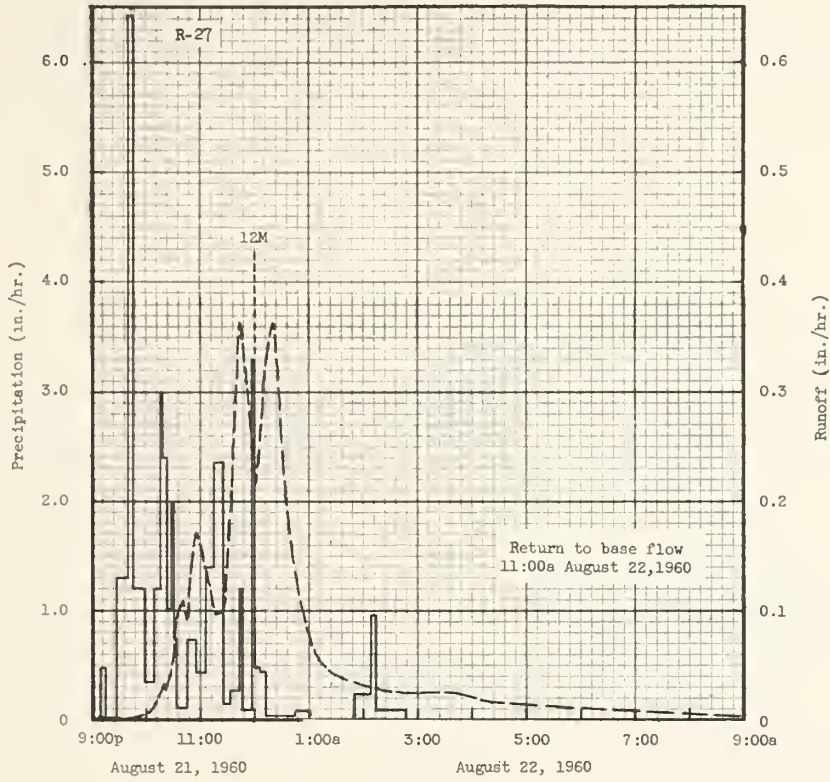
Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good. Mixed cover 1960 and 1961; 21% cropland, 48% grassland, 25% woodland, 6% miscellaneous; conservation practice.  
 1/ Precipitation from Raingage 27.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 10					
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Event of August 21 and 22, 1960											
7-21-25-60	Raingage 27 0	0.02	8-21-60	Raingage 27	0	8-21-60					
7-26	.40	T	9:10p	0	0	9:34p	0.0001	0			
7-27	.02	T	:15	.48	.04	:52	.0033	.0004			
7-28-29	0	T	:28	0	.04	10:04	.0087	.0016			
7-30	.30	T	:40	1.30	.30	:12	.0189	.0034			
7-31-8-2	0	.01	:47	6.43	1.05	:20	.0315	.0069			
8-3	.27	T	:59	1.20	1.29	:22	.0277	.0079			
8-4	1.83	.03	10:10	.33	1.35	:24	.0355	.0089			
8-5-14	0	.03	:15	1.20	1.45	:27	.0416	.0109			
8-15	.05	T	:18	3.00	1.60	:32	.0919	.0163			
8-16-19	0	.01	:23	2.40	1.80	:40	.109	.0230			
8-20	.20	T	:26	1.00	1.85	:44	.0919	.0364			
8-21	.50 2/	T	:30	1.95	1.98	:48	.127	.0437			
			:34	.75	2.03	:56	.171	.0636			
			:45	.11	2.05	11:02	.146	.0794			
Watershed conditions: Mixed cover under improved practice. 8% of the area was in wheat 5" high; 42% in meadow 6" high; 19% in pasture 4" high; 24% in protected woodland and 7% miscellaneous cover (farmsteads and roads).											
			:55	.72	2.17	:16	.0959	.1067			
			11:05	.42	2.24	:26	.109	.1237			
			:14	1.40	2.45	:34	.207	.1447			
			:25	2.36	2.85	:38	.290	.1612			
			:34	.13	2.87	:43	.363	.1884			
			:43	.27	2.91	:50	.303	.2273			
			:45	1.20	2.95	:56	.266	.2557			
			:58	.09	2.97	12:00m	.218	.2718			
			12:00m	3:30	3.08	8-22-60					
			8-22-60			12:08a	.266	.3041			
			12:05a	.48	3.12	:10	.303	.3135			
			:12	.43	3.17	:20	.363	.3691			
			:45	.02	3.18	:26	.290	.4017			
			1:00	.08	3.20	:34	.207	.4352			
			:49	0	3.20	:40	.156	.4533			
			2:08	.22	3.27	:50	.104	.4750			
			:13	.96	3.35	1:10	.0545	.4997			
			:47	.09	3.40	:40	.0386	.5224			
						:55	.0335	.5315			
						2:16	.0277	.5422			

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 123.02. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.31-4. 2/ Rain ended about noon.

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 10					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - Continued</u>								
						8-22-60		
						2:36a	0.0250	0.5509
						3:00	.0232	.5606
						:24	.0250	.5702
						:44	.0232	.5783
						4:20	.0165	.5900
						5:00	.0113	.5993
						8:00	.0047	.6208
						11:00	.0028 <sup>1/</sup>	.6321
<u>Event of April 25, 1961</u>								
	Raingage 27.		4-25-61	Raingage 27		4-25-61		
3-25-30-61	0	0.18	2:45p	0	0	2:48p	0.0124	0
3-31	.34	.03	:55	.60	.10	3:04	.0157	.0036
4-1	.51	.14	3:07	.55	.21	:12	.0214	.0061
4-2	.05 s	.07	:15	.08	.22	:20	.0277	.0094
4-3-4	0	.09						
4-5	.02	.03	:23	.60	.30	:28	.0355	.0135
4-6	.05	.04	:30	1.80	.51	:32	.0764	.0167
4-7-8	0	.05	:37	1.29	.66	:36	.156	.0245
4-9	.85	.15	:53	.71	.85	:40	.266	.0385
4-10	.05	.13	4:08	.64	1.01	:44	.390	.0604
4-11	0	.06	:18	2.40	1.41	:54	.425	.1283
4-12	.35	.09	:30	.10	1.43	:58	.433	.1569
4-13	.03	.08	5:15	0	1.43	4:06	.425	.2141
4-14	0	.06	:30	.08	1.45	:14	.471	.2739
4-15	.05	.05	10:00	.01	1.46	:16	.595	.2918
4-16	.66	.21				:18	.696	.3130
4-17	.39 rs	.16				:20	.824	.3386
4-18-20	0	.24				:24	.880	.3954
4-21	.81	.26				:26	.805	.4235
4-22	.39	.21				:28	.741	.4493
4-23	.05	.13				:30	.645	.4721
4-24	0	.09				:34	.547	.5113
4-25	.55 <sup>2/</sup>	.13 <sup>3/</sup>				:42	.383	.5716
						:48	.266	.6033
						5:02	.156	.6503
						:28	.0764	.6971
						:44	.0616	.7162
						6:30	.0496	.7588
						:52	.0419	.7754
						7:20	.0350	.7931
						8:12	.0277	.8199
						9:20	.0245	.8486
						10:08	.0232	.8677
						12:00m	.0189 <sup>1/</sup>	.9068
<p>Watershed conditions: Mixed cover under improved practice. 8% of the area was in corn 72" high. 15.0% was in wheat which was cut July 20, grass, legumes, and weeds 5" high. 26.8% was in meadow 4" high, second cutting made July 25. 19.1% was in pasture 4" high. 24.1% was in protected woodland and 7.0% in miscellaneous cover of farmsteads, roads, etc.</p>								
<p>Notes: To convert runoff in in/hr to cfs, multiply by 123.02.  <sup>1/</sup> Normal base flow. <sup>2/</sup> Rain ended about 12:30p. <sup>3/</sup> Runoff prior to 2:48p.</p>								



COSHOCTON, OHIO      WATERSHED 10

3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 5 (Area - 349 Acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.64	3.28	1.07	1.68	3.23	4.22	3.21	8.27	0.46	1.85	1.81	1.48	33.20
	Q	2.16	1.49	1.69	1.04	.62	.58	.10	1.62	.08	.04	.10	.04	9.56
1961	P	0.79	3.95	3.47	5.93	2.95	2.81	6.71	1.63	1.19	2.34	3.21	2.47	37.45
	Q	.23	1.39	2.85	3.52	1.05	.54	.99	.24	.09	.04	.21	.43	11.58

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS														Coshocton, Ohio Watershed 5		
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-22	0.960	6-22	0.62	6-21	0.92	6-21	1.18	6-21	1.23	6-21	1.27	6-21	1.28	6-21	1.41
1961	4-25	.28	4-25	.22	4-25	.31	4-25	.46	4-25	.56	4-25	.70	4-25	.86	4-21	1.77

Notes: Quality of records: Monthly P and Q, fair; annual maximum discharges and volumes, fair. Mixed cover 1960 and 1961; 20% cropland, 54% grassland, 23% woodland, 3% miscellaneous; improved practice.  
 1/ Precipitation from Raingage 91.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 5		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960								
7-21-25-60	Raingage 91	0.01	8-21-60	Raingage 91		8-21-60		
7-26	.57	T	9:11p	0	0	9:30p	0.0002	0
7-27-29	0	.01	:27	.49	.13	:58	.0124	.0019
7-30	.21	T	:38	1.20	.35	10:06	.0324	.0045
7-31-8-2	0	T	:48	3.00	.85	:12	.0472	.0088
8-3	.21	T	:50	1.20	.89	:20	.0511	.0153
8-4	2.36	.08	:53	.40	.91	:24	.0426	.0184
8-5-7	0	.03	:55	7.50	1.16	:34	.0523	.0262
8-8	.10	.01	10:05	.12	1.18	:40	.0824	.0327
8-9-14	0	.01	:08	1.60	1.26	:44	.135	.0402
8-15	.05	T	:17	.34	1.30	:48	.217	.0520
8-16-19	0	T	:23	3.00	1.60	:56	.234	.0821
8-20	.12	T	:28	2.40	1.80	11:06	.234	.1211
8-21	.57 2/	.01 3/	:33	1.80	1.95	:16	.280	.1631
			:47	.17	1.99	:22	.315	.1928
			:53	.90	2.08	:30	.315	.2348
			11:03	.12	2.10	:36	.327	.2669
			:10	2.14	2.35	:42	.344	.3005
			:18	1.35	2.53	:46	.332	.3230
			:20	5.40	2.71	:50	.332	.3451
			:27	.34	2.75	:56	.440	.3824
			:40	1.67	3.11	12:00m	.442	.4134
			:45	.24	3.13	8-22-60		
			:56	1.20	3.35	12:06a	.645	.4684
			12:00m	4.50	3.65	:08	.858	.4932
			8-22-60			:12	.960	.5538
			12:23a	.10	3.69	:16	.904	.6158
			:45	.03	3.70	:22	.833	.7027
			1:03	.10	3.73	:30	.645	.8015
			:53	.01	3.74	:42	.477	.9124

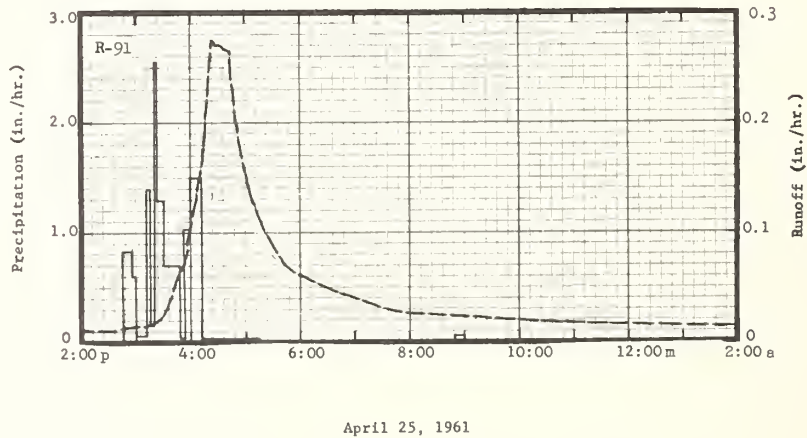
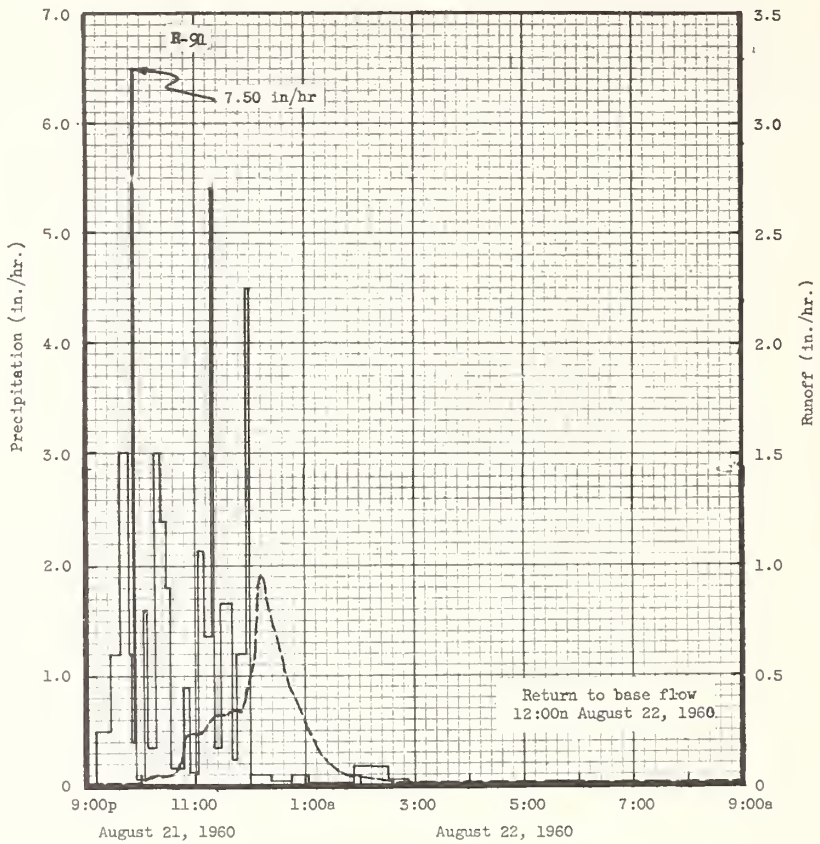
Notes: To convert runoff in in/hr to cfs, multiply by 351.91. For map of watershed, see Hydrologic Maps for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.32-5. 2/ Rain ended at out noon.  
 3/ Runoff prior to 9:30p.



3-64

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 5					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960 - Continued								
			8-22-60			8-22-60		
			2:13a	0.18	3.80	12:56a	0.344	1.0088
			:31	.17	3.85	1:06	.234	1.0565
			:53	.05	3.87	:18	.135	1.0932
			5:23	.01	3.89	:36	.0693	1.1230
			6:08	.03	3.91	:58	.0472	1.1440
						2:36	.0257	1.1660
						3:44	.0168	1.1908
						5:00	.0115	1.2085
						6:00	.0052	1.2322
						12:00m	.0031 <u>1/</u>	1.2482
Event of April 25, 1961								
3-25-30-61	Raingage 91 0	0.26	4-25-61	Raingage 91 0	0	4-25-61		
3-31	.35	.04	2:45p			2:30p	0.0115	0
4-1	.59	.12	:55	.84	.14	3:16	.0163	.0098
4-2	.03	.08	3:00	.60	.19	:30	.0235	.0145
4-3-4	0	.11	:12	.05	.20	:36	.0364	.0174
4-5	.02	.05	:15	1.40	.27	:46	.0608	.0257
4-6	.04	.04	:19	.15	.28	:52	.0710	.0324
4-7-8	0	.06	:23	2.55	.45	:58	.0995	.0408
4-9	.75	.09	:30	1.29	.60	4:06	.135	.0564
4-10	.06	.10	:48	.70	.81	:14	.180	.0771
4-11	0	.06	:53	.02	.83	:16	.201	.0835
4-12	.30	.08	4:00	1.03	.95	:20	.238	.0981
4-13	.03	.08	:12	1.50	1.25	:24	.275	.1152
4-14	0	.06	5:15	.01	1.26	:28	.270	.1333
4-15	.03	.06	8:50	0	1.26	:34	.270	.1603
4-16	.67	.17	9:00	.06	1.27	:40	.265	.1871
4-17	.27 <i>rs</i>	.15				:44	.265	.2047
4-18-20	0	.29				:48	.217	.2209
4-21	.84	.23				:56	.173	.2465
4-22	.32	.18				5:06	.135	.2721
4-23	.03	.14				:26	.0949	.3101
4-24	0	.11				:40	.0710	.3290
4-25	.55 <u>2/</u>	.11 <u>3/</u>				6:20	.0523	.3698
						7:20	.0344	.4122
						8:00	.0273	.4327
						9:54	.0201	.4770
						10:30	.0188	.4887
						12:00m	.0163 <u>1/</u>	.5147
<p>Watershed conditions: Mixed cover under improved practice. 10.7% of the area was in wheat 5" high; 27.9% in meadow 5" high; 35.8% in pasture 4" high; 23% in woodland; 2.6% in miscellaneous cover (farmsteads and roads).</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 351.91.  
1/ Normal base flow. 2/ Rain ended about 12:30p. 3/ Runoff prior to 2:30p.



COSHOCTON, OHIO

WATERSHED 5

3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 92 Area - 920 ac. (1.44 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	2.64	3.28	1.07	1.68	3.23	4.22	3.21	8.27	0.46	1.85	1.81
	Q	2.23	1.52	1.64	1.10	.64	.62	.11	1.35	.09	.06	.11	.05	9.52
1961	P	0.79	3.95	3.47	5.93	2.95	2.81	6.71	1.63	1.19	2.34	3.21	2.47	37.45
	Q	.29	1.78	3.29	4.32	1.25	.61	.95	.27	.08	.05	.27	.52	13.68

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS														Coshocton, Ohio Watershed 92		
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-22	0.54	8-21	0.44	8-21	0.66	8-21	0.91	8-21	0.97	8-21	1.01	8-21	1.03	3-24	1.24
1961	4-25	.47	4-25	.37	4-25	.54	4-25	.80	4-25	.96	4-25	1.16	4-25	1.34	4-25	2.40

Notes: Quality of records: Monthly P and Q, fair; annual maximum discharges and volumes, fair. Mixed cover 1960 and 1961: 16% cropland, 59% grassland, 21% woodland, 4% miscellaneous; improved practice.  
 1/ Precipitation from Raingage 91.

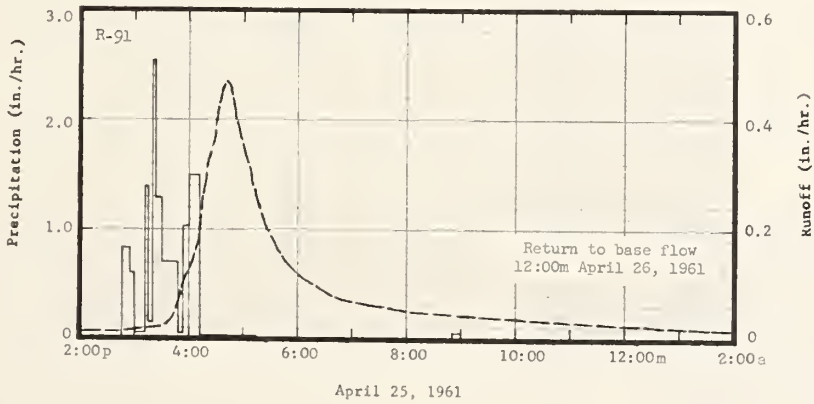
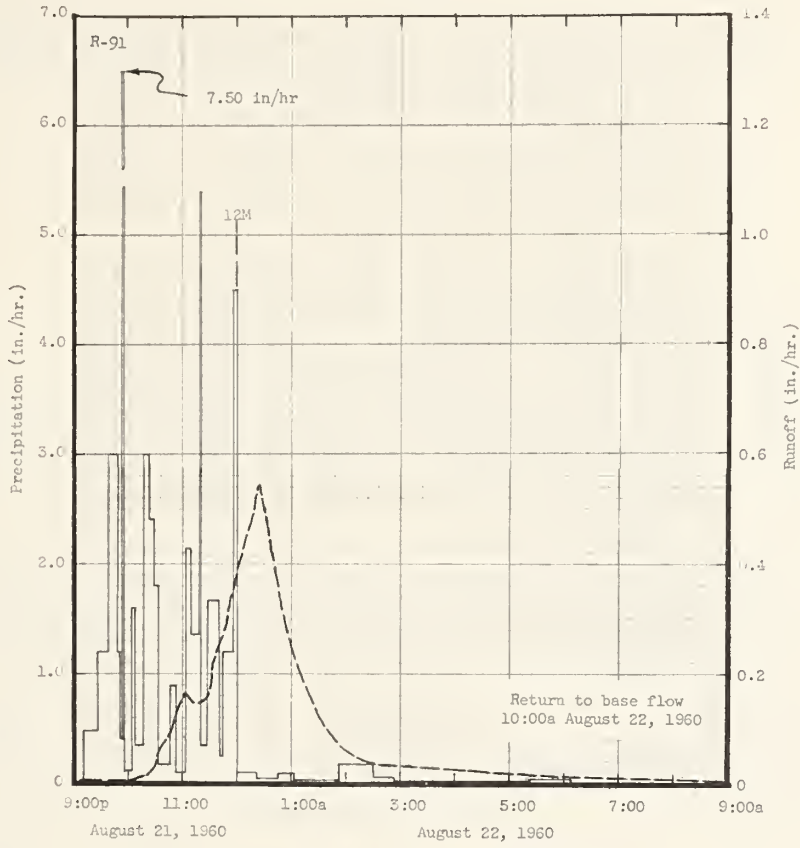
SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 92		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<b>Event of August 21 and 22, 1960</b>								
7-21-25-60	Raingage 91 0	0.01	8-21-60	Raingage 91		8-21-60		
7-26	.57	T	9:11p	0	0	10:00p	0.0033	0
7-27-29	0	.01	:27	.49	.13	:06	.0048	.0004
7-30	.21	T	:38	1.20	.35	:12	.0082	.0011
7-31-8-2	0	T	:48	3.00	.85	:20	.0141	.0025
8-3	.21	T	:50	1.20	.89	:24	.0212	.0037
8-4	2.36	.09	:53	.40	.91	:27	.0336	.0050
8-5-7	0	.03	:55	7.50	1.16	:30	.0505	.0071
8-8	.10	.01	10:05	.12	1.18	:36	.0655	.0129
8-9-14	0	.01	:08	1.60	1.26	:42	.0802	.0201
8-15	.05	T	:17	.34	1.30	:44	.0909	.0230
8-16-19	0	T	:23	3.00	1.60	:50	.118	.0333
8-20	.12	T	:28	2.40	1.80	:58	.150	.0511
8-21	.57 2/	.01 3/	:33	1.80	1.95	11:03	.164	.0641
			:47	.17	1.99	:06	.156	.0721
			:53	.90	2.08	:08	.156	.0774
			11:03	.12	2.10	:10	.150	.0825
			:10	2.14	2.35	:16	.147	.0973
			:18	1.35	2.53	:24	.153	.1173
			:20	5.40	2.71	:28	.179	.1285
			:27	.34	2.75	:31	.203	.1380
			:40	1.67	3.11	:34	.224	.1487
			:45	.24	3.13	:38	.246	.1643
			:56	1.20	3.35	:40	.259	.1728
			12:00m	4.50	3.65	:48	.292	.2092
			8-22-60			:54	.342	.2411
			12:23a	.10	3.69	:57	.360	.2586
			:45	.03	3.70	12:00m	.400	.2779
			1:03	.10	3.73	8-22-60		
			:53	.01	3.74	12:10a	.453	.3488
			2:13	.18	3.80	:18	.490	.4117
			:31	.17	3.85	:22	.528	.4456
			:53	.05	3.87	:24	.541	.4634
			5:23	.01	3.89	:28	.511	.4985
			6:08	.03	3.91	:32	.490	.5318

Notes: To convert runoff in in/hr to cfs, multiply by 927.64. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.32.5. 2/ Rain ended about noon.  
 3/ Runoff prior to 10:00p.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 92		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - Continued</u>								
						8-22-60 12:40a	0.411	0.5936
						:44	.376	.6198
						:48	.321	.6430
						1:02	.233	.7066
						:28	.133	.7846
						:40	.0965	.8075
						2:00	.0608	.8332
						:30	.0399	.8578
						5:40	.0134	.9334
						10:00	.0060 <u>1/</u>	.9715
<u>Event of April 25 and 26, 1961</u>								
3-25-30-61	Raingage 91 0	0.27	4-25-61	Raingage 91 0	0	4-25-61 2:50p	0.0134	0
3-31	.35	.04	2:45p	0	0	3:26	.0203	.0092
4-1	.59	.13	:55	.84	.14	3:26	.0336	.0143
4-2	.03 s	.09	3:00	.60	.19	:38	.0432	.0169
4-3-4	0	.13	:12	.05	.20	:42		
4-5	.02	.05	:15	1.40	.27	:46	.0608	.0203
4-6	.04	.04	:19	.15	.28	:50	.0869	.0253
4-7-8	0	.07	:23	2.55	.45	:54	.111	.0319
4-9	.75	.08	:30	1.29	.60	:58	.121	.0396
4-10	.06	.11	:48	.70	.81	4:00	.126	.0437
4-11	0	.07	:53	.02	.83	:04	.143	.0527
4-12	.30	.08	4:00	1.03	.95	:08	.168	.0630
4-13	.03	.08	:12	1.50	1.25	:10	.188	.0689
4-14	0	.06	5:15	.01	1.26	:12	.216	.0757
4-15	.03	.06	8:50	0	1.26	:16	.263	.0916
4-16	.67	.19	9:00	.06	1.27	:18	.292	.1008
4-17	.27 rs	.16				:22	.336	.1215
4-18-20	0	.32				:26	.356	.1445
4-21	.84	.26				:28	.376	.1568
4-22	.32	.21				:32	.409	.1826
4-23	.03	.16				:34	.436	.1976
4-24	0	.13				:36	.453	.2116
4-25	.55 <u>2/</u>	.13 <u>3/</u>				:42	.470	.2577
						:46	.453	.2885
						:50	.424	.3177
Watershed conditions: Mixed cover under improved practice. 13% of the area was in wheat 5" high; 26.5% in meadow 5" high; 26.1% in pasture 4" high; 12.1% in protected woodland; 16.5% in pastured woodland; 3.6% in miscellaneous cover (farmsteads and roads).						:54	.392	.3448
						:56	.367	.3575
						5:04	.327	.4037
						:10	.287	.4344
						:14	.259	.4526
						:22	.224	.4848
						:32	.183	.5183
						:42	.153	.5460
						:58	.121	.5825
						6:50	.0764	.6552
						7:10	.0667	.6891
						8:16	.0505	.7527
10:30	.0351	.8458						
12:00m	.0282	.8933						
4-26-61						6:00a	.0161	1.0232
						2:00p	.0101	1.1236
						12:00m	.0082 <u>1/</u>	1.2140

Notes: To convert runoff in in/hr to cfs, multiply by 927.64.  
1/ Normal base flow. 2/ Rain ended about 12:30p. 3/ Runoff prior to 2:50p.





COSHOCTON, OHIO      WATERSHED 92

1/ MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshooton, Ohio Watershed 94 Area - 1520 ac. (2.37 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958	P	1.62	0.71	1.00	3.80	3.06	4.19	10.08	2.68	2.79	0.38	2.15	0.76	33.22
	Q 2/	1.01	.52	.86	1.47	2.16	.30	2.43	.80	.23	.09	.12	.19	10.18
1960	P	2.64	3.28	1.07	1.68	3.23	4.22	3.21	8.27	.46	1.85	1.81	1.48	33.20
	Q	2.36	1.58	1.70	1.15	.76	.90	.18	1.74	.14	.08	.13	.08	10.80
1961	P	.79	3.95	3.47	5.93	2.95	2.81	6.71	1.63	1.19	2.34	3.21	2.47	37.45
	Q	.31	1.76	3.31	4.61	1.39	.68	.82	.33	.10	.07	.31	.53	14.22

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshooton, Ohio Watershed 94

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-22	0.62	8-21	0.54	8-21	0.87	8-21	1.18	8-21	1.30	8-21	1.34	8-21	1.35	8-21	1.49
1961	4-25	.50	4-25	.44	4-25	.69	4-25	.91	4-25	1.04	4-25	1.25	4-25	1.45	4-25	3.51

Notes: Quality of records: Monthly P and Q, fair; annual maximum discharges and volumes, fair. Mixed cover, 1960 and 1961: 15% cropland, 57% grassland, 24% woodland, 4% miscellaneous; improved practice. 1/ Monthly precipitation from Raingage 91. 2/ Revision of previously published runoff quantity underlined.

SELECTED RUNOFF EVENTS Coshooton, Ohio Watershed 94

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage 91			Event of August 21 and 22, 1960					
7-21-25-60	0	0.02	8-21-60	Raingage 91		8-21-60		
7-26	.57	T	9:11p	0	0	10:08p	0.0318	0
7-27-29	0	.01	:27	.49	.13	:12	.0361	.0023
7-30	.21	T	:38	1.20	.35	:16	.0458	.0050
7-31-8-2	0	.01	:48	3.00	.85	:24	.0652	.0126
8-3	.21	T	:50	1.20	.89	:30	.0771	.0197
8-4	2.36	.10	:53	.40	.91	:34	.0974	.0255
8-5-7	0	.04	:55	7.50	1.16	:40	.126	.0364
8-8	.10	.01	10:05	.12	1.18	:46	.155	.0507
8-9-11	0	.02	:08	1.60	1.26	:54	.192	.0738
8-15	.05	T	:17	.34	1.30	11:00	.215	.0948
8-16-19	0	.01	:23	3.00	1.60	:10	.223	.1310
8-20	.12	T	:28	2.40	1.80	:20	.239	.1695
8-21	.57 2/	.01 3/	:33	1.80	1.95	:27	.267	.1990
			:47	.17	1.99	:32	.294	.2224
			:53	.90	2.08	:38	.314	.2528
			11:03	.12	2.10	:46	.366	.2981
			:10	2.44	2.35	:52	.397	.3362
			:18	1.35	2.53	:56	.428	.3637
			:20	5.40	2.71	12:00m	.447	.3928
			:27	.34	2.75	8-22-60		
			:40	1.67	3.11	12:10a	.490	.4102
			:45	.24	3.13	:16	.562	.5735
			:56	1.20	3.35	:22	.601	.5806
			12:00m	4.50	3.65	:30	.625	.6624
			8-22-60			:36	.601	.7238
			12:23a	.10	3.69	:42	.562	.7824
			:45	.03	3.70	:48	.523	.8366
			1:03	.10	3.73	:56	.460	.9020
			:53	.01	3.74	1:02	.403	.9454

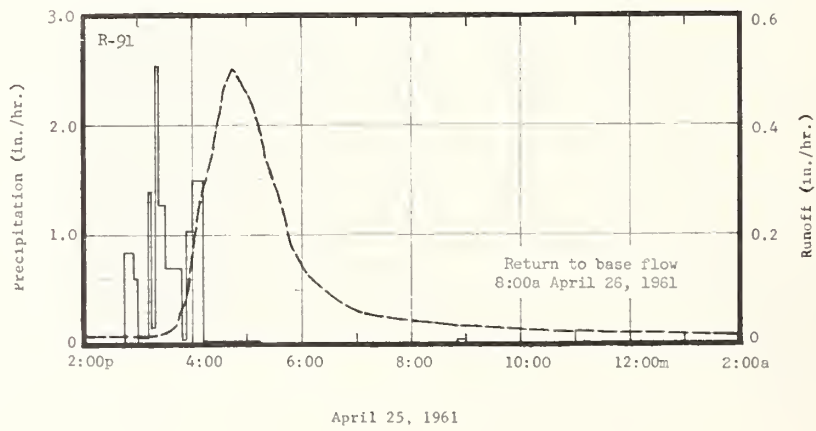
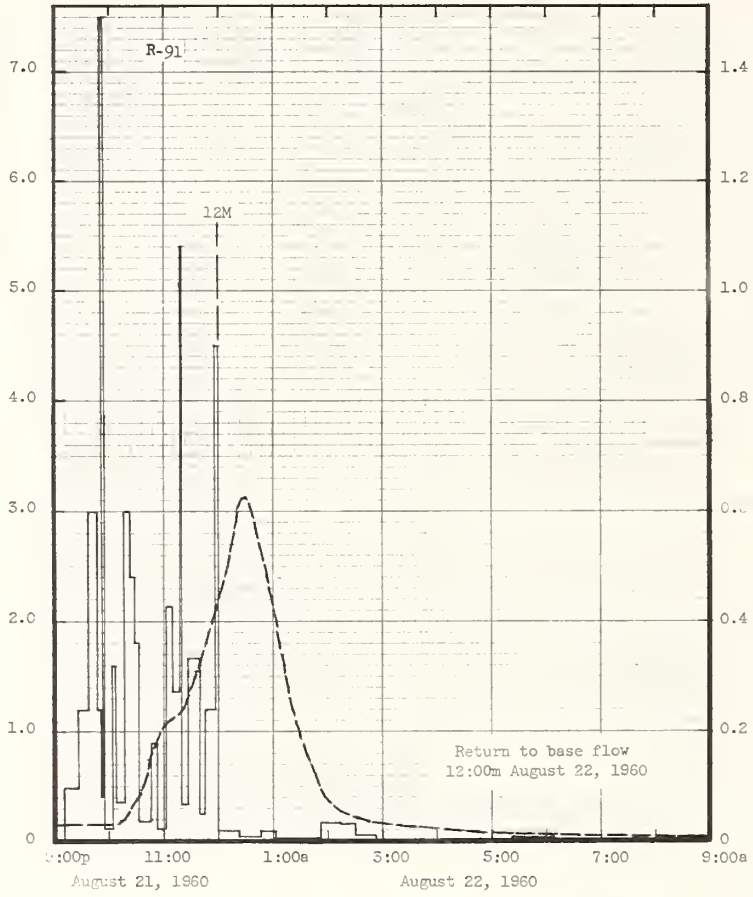
Notes: To convert runoff in in/hr to cfs, multiply by 1532.7. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26-34-5. 2/ Rain ended about noon. 3/ Prior to 10:08p.

3-61

SELECTED RUNOFF EVENTS			Coshooton, Ohio Watershed 94					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 21 and 22, 1960 - Continued</u>								
			8-22-60 2:13a	0.18	3.80	8-22-60 1:06a	0.366	0.9711
			:31	.17	3.85	:12	.309	1.0045
			:53	.05	3.87	:20	.247	1.0415
			5:23	.01	3.89	:30	.188	1.0779
			6:08	.03	3.91	:40	.141	1.1051
			8-21-60	Rainage 27		:50	.101	1.1248
			9:10p		0	:56	.0850	1.1342
			8-22-60			2:02	.0700	1.1419
			2:47a		3.40	:14	.0558	1.1543
						:30	.0432	1.1673
						:50	.0356	1.1803
						3:20	.0308	1.1969
						4:00	.0244	1.2151
						:44	.0184	1.2306
						6:00	.0127	1.2500
						8:00	.0086	1.2710
						10:00	.0065	1.2860
						12:00m	.0050	1.2975
						6:00p	.0031	1.3207
						12:00m	.0024 <sup>1/</sup>	1.3372
<u>Event of April 25 and 26, 1961</u>								
3-25-30-61	Rainage 91 0	0.29	4-25-61	Rainage 91	0	4-25-61	0.0140	0
3-31	.35	.04	2:45p	0	0	3:00p	0.0177	.0052
4-1	.59	.14	:55	.84	.14	:20	.0212	.0084
4-2	.03 a	.10	3:00	.60	.19	:30	.0279	.0109
4-3-4	0	.13	:12	.05	.20	:36	.0361	.0130
4-5	.02	.05	:15	1.40	.27	:40	.0486	.0158
4-6	.04	.05	:19	.15	.28	:44	.0686	.0196
4-7-8	0	.08	:23	2.55	.45	:48	.0909	.0250
4-9	.75	.10	:30	1.29	.60	:52	.113	.0300
4-10	.06	.13	:48	.70	.81	:55	.141	.0341
4-11	0	.08	:53	.02	.83	:57	.170	.0419
4-12	.30	.09	4:00	1.03	.95	4:00	.207	.0481
4-13	.03	.09	:12	1.50	1.25	:02	.247	.0633
4-14	0	.07	5:15	.01	1.26	:06	.289	.0904
4-15	.03	.06	8:50	0	1.26	:12	.340	1.1323
4-16	.67	.21	9:00	.06	1.27	:20	.397	1.1685
4-17	.27 rs	.18				:26	.460	1.2186
4-18-20	0	.34	4-25-61	Rainage 27	0	:33	.490	1.2740
4-21	.84	.27	2:45p			:40	.503	1.3070
4-22	.32	.23	10:00p		1.46	:44	.587	1.3664
4-23	.03	.17				:50	.6878	1.4350
4-24	0	.13				5:00	.7165	1.5207
4-25	.55 <sup>2/</sup>	.13 <sup>3/</sup>				:12	.7486	1.5696
						:20	.8224	1.6224
						:30	.8587	1.6678
						:38	.8909	1.7165
						4:46	.9090	1.7486
						4:56	.9261	1.7767
						6:10	.0719	.8038
						:26	.0558	.8355
						4:46	.0432	.8632
						7:16	.0329	.9008
						7:50	.0261	.9496
						8:50	.0220	.9857
						10:30	.0164	1.0582
						12:00m	.0135 <sup>1/</sup>	1.1199
						4-26-61		
						3:50a		
						8:00		

Watershed conditions: Mixed cover under improved practice. 10.6% of the area was in wheat 5" high; 26.7% in meadow 5" high; 26.5% in pasture 4" high; 19.2% in protected woodland; 12.6% in pastured woodland; 4.1% in miscellaneous cover (farmsteads and roads).

Notes: To convert runoff in in/hr to cfs, multiply by 1532.7. <sup>1/</sup> Normal base flow. <sup>2/</sup> Rain ended about 12:30p. <sup>3/</sup> Runoff prior to 3:00p.



COSHOCTON, OHIO WATERSHED 94



3-44

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 95 Area - 2570 ac. (4.02 sq. mi.)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	3.00	3.42	1.06	1.68	3.30	5.66	3.24	7.17	0.35	1.81	1.82	1.60	34.11
Q	2.65	1.69	1.98	1.06	.67	1.05	.18	1.47	.11	.07	.13	.08	11.14
1961 P	0.91	3.91	3.54	6.37	2.65	2.97	5.64	2.17	0.95	2.27	3.31	2.51	37.20
Q	.32	1.77	3.63	5.29	1.17	.62	.58	.19	.05	.05	.25	.47	14.39

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Coshocton, Ohio Watershed 95

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-22	0.41	8-22	0.37	8-21	0.67	8-21	1.03	8-21	1.10	8-21	1.14	8-21	1.15	1-13	1.39
1961	4-25	.46	4-25	.40	4-25	.67	4-25	.93	4-25	1.07	4-25	1.25	4-25	1.43	4-21	2.50

Notes: Quality of records: Monthly P, fair; Q, good; annual maximum discharges and volumes, good. Mixed cover, 1960 and 1961: 15% cropland, 55% grassland; 26% woodland, 4% miscellaneous; improved practice.  
1/ Monthly precipitation from raingage 27.

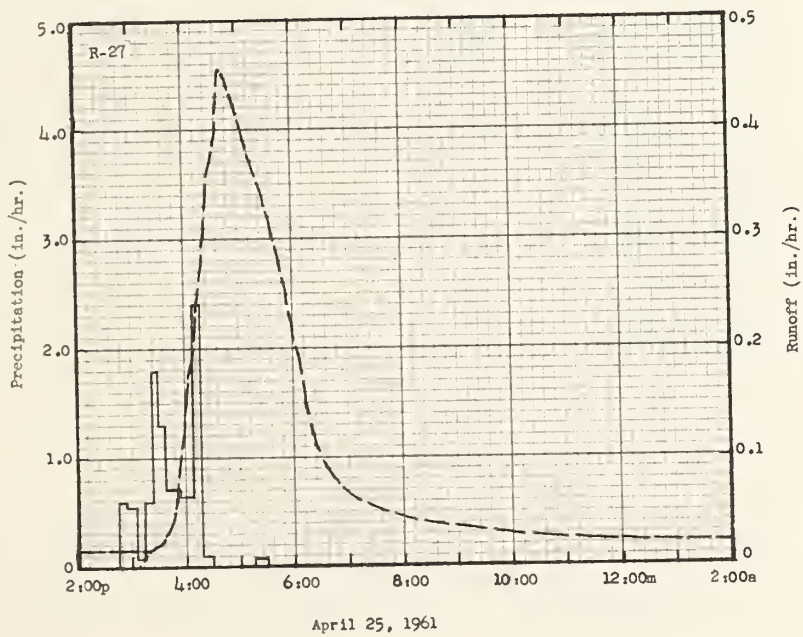
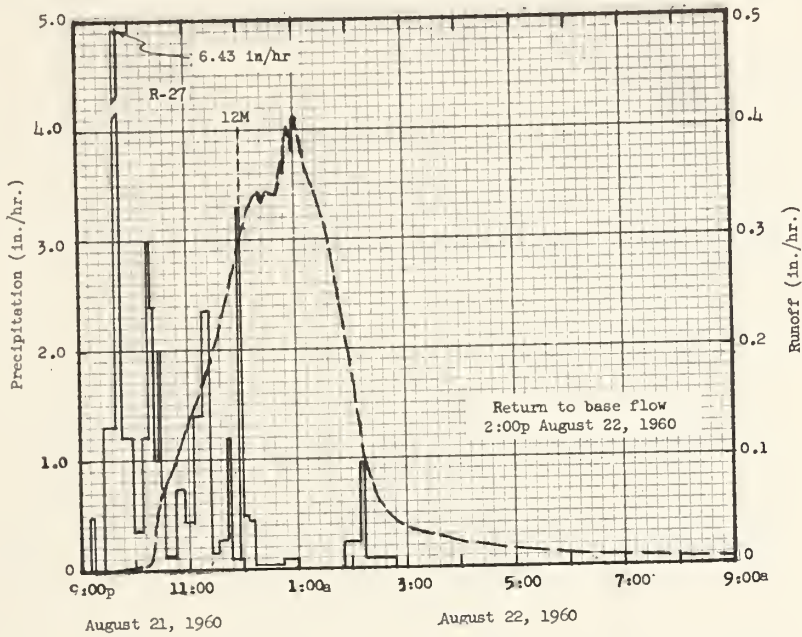
SELECTED RUNOFF EVENTS Coshocton, Ohio Watershed 95

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 end 22, 1960								
7-21-25-60	Raingage 27 0	0.02	8-21-60 9:10p	Raingage 27 0	0	8-21-60 9:30p	0.0003	0
7-26	.40	T	:15	.48	.04	10:00	.0017	.0005
7-27	.02		:28	0	.04	:06	.0041	.0008
7-28-29	0	T	:40	1.30	.30	:18	.0048	.0017
7-30	.30	T						
7-31-8-2	0	.01	:47	6.43	1.05	:20	.0089	.0019
8-3	.27	T	:59	1.20	1.29	:22	.0340	.0025
8-4	1.83	.09	10:10	.33	1.35	:24	.0479	.0039
8-15-14	0	.06	:15	1.20	1.45	:30	.0656	.0096
8-15	.05	T	:18	3.00	1.60	:42	.0857	.0247
8-16-19	0	.01	:23	2.40	1.80	:50	.107	.0375
8-20	.20	T	:26	1.00	1.85	11:06	.143	.0695
8-21	.50 2/	.01 3/	:30	1.95	1.98	:26	.189	.1242
			:34	.75	2.03	:40	.232	.1742
			:45	.11	2.05	:54	.274	.2333
			:55	.72	2.17	12:00m	.299	.2621
			11:05	.42	2.24	8-22-60		
			:14	1.40	2.45	12:10a	.331	.3148
			:25	2.36	2.85	:20	.344	.3709
			:34	.13	2.87	:24	.338	.3936
			:43	.27	2.91	:25	.333	.3992
			:45	1.20	2.95	:30	.344	.4274
			:58	.09	2.97	:40	.340	.4643
			12:00m	3.30	3.08	:46	.372	.5203
			8-22-60			:48	.360	.5325
			12:05a	.48	3.12	:53	.404	.5643
			:12	.43	3.17	:58	.382	.5971
			:45	.02	3.18	1:02	.411	.6235
			1:00	.08	3.20	:08	.382	.6532
			:49	0	3.20	:12	.367	.6881

Notes: To convert runoff in in/hr to cfs, multiply by 2591.4. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.34-5. 2/ Rain ended about noon. 3/ Runoff prior to 9:30p.

SELECTED RUNOFF EVENTS						Coshooton, Ohio Watershed 95		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960 - continued								
			8-22-60 2:08a	0.22	3.27	8-22-60 1:24a	0.338	0.7578
			:13	.96	3.35	:34	.303	.8107
			:47	.09	3.40	:48	.253	.8754
			8-21-60 9:26p	Raingage 39	0	2:02 :10	.189	.9277
			8-22-60 2:47a		2.91	:20	.0822	.9667
						:30	.0598	.9785
			8-21-60 9:11p	Raingage 91	0	:48	.0428	.9936
			8-22-60 6:08a		3.91	3:30 4:30	.0305	1.0182
						4:30	.0203	1.0432
						5:50	.0127	1.0644
						7:50	.0082	1.0848
						10:00	.0058	1.0999
						2:00p	.0031 1/	1.1186
Event of April 25, 1961								
	Raingage 27		4-25-61	Raingage 27		4-25-61		
3-25-30-61	0	0.39	2:45p	0	0	3:20p	0.0165	0
3-31	.34	.05	:55	.60	.10	:36	.0252	.0051
4-1	.51	.18	3:07	.55	.21	:42	.0357	.0081
4-2	.05 s	.16	:15	.08	.22	:46	.0502	.0109
4-3-4	0	.20						
4-5	.02	.07	:23	.60	.30	:49	.0618	.0137
4-6	.05	.06	:30	1.80	.51	:52	.0741	.0171
4-7-8	0	.11	:37	1.29	.66	:54	.0876	.0197
4-9	.85	.11	:53	.71	.85	:56	.109	.0230
4-10	.05	.21	4:08	.64	1.01	4:00	.140	.0313
4-11	0	.11	:18	2.40	1.41	:04	.178	.0417
4-12	.35	.11	:30	.10	1.43	:14	.235	.0753
4-13	.03	.12	5:15	0	1.43	:22	.314	.1119
4-14	0	.09	:30	.08	1.45	:28	.362	.1459
4-15	.05	.09	10:00	.01	1.46	:34	.388	.1834
4-16	.66	.28	4-25-61	Raingage 39		:38	.415	.2102
4-17	.39 rs	.23	2:45p	0	0	:40	.432	.2243
4-18-21	0	.49	6:10	1.50		:42	.456	.2392
4-21	.81	.27				:50	.448	.2995
4-22	.39	.23	4-25-61	Raingage 91		:54	.432	.3288
4-23	.05	.18	2:45p	0	0		.415	.3653
4-24	0	.13	9:00	1.27		:10	.382	.4384
4-25	.55 2/	.13 3/				:16	.372	.4766
						:26	.346	.5364
						:40	.303	.6133
						:54	.249	.6764
						6:06	.196	.7208
						:20	.130	.7583
						:38	.0899	.7906
						7:02	.0656	.8210
						:30	.0533	.8484
						8:10	.0425	.8799
						9:40	.0317	.9335
						11:10	.0265	.9770
						12:00m	.0239 1/	.9980
<p>Watershed conditions: Mixed cover under improved practice. 10% of the area was in wheat 5" high; 29% in meadow 5" high; 24.8% in pasture 4" high; 23.1% in protected woodland; 8.1% in pastured woodland; 5% in miscellaneous cover (farmsteads and roads).</p>								
<p>Notes: To convert runoff in in/hr to cfs, multiply by 2591.4. 1/ Normal base flow. 2/ Rain ended about 12:30p. 3/ Runoff prior to 3:20p.</p>								

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COSHOCTON, OHIO WATERSHED 95

SELECTED RUNOFF EVENTS			Coshocton, Ohio Watershed 97					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 12, 1957 - Continued</u>								
<p>Watershed conditions: Mixed cover under conservation practice. 8.0% of the area was in corn and 1.0% in potatoes and soybeans. Corn plants were 20" high and weeds 18" high. 8.0% of the area was in wheat and 1.0% in other small grain crops. Wheat plants were 30" high; legumes and grass in wheat were 4" high. 21.0% of the area was in meadow. Legumes and grass were 7" high. 22.0% of the area was in pasture. Legumes, grass and weeds were 5" high. 5.0% of the area was idle land, mostly in grass and weeds. 30.0% of the area was in woodland and 4.0% in miscellaneous cover (farmsteads, roads, etc.).</p>								
<u>Event of January 21, 1959</u>								
12-21-58	0	0.01	1-21-59	Raingage 39		1-21-59		
12-22	0	T	12:01a	0	0	12:01a	0.0095	0
12-23	T	.01	1:30	.06	.09	2:15	.0470	.0459
12-24	T <u>1/</u>	.01	2:35	.21	.31	3:45	.103	.1630
12-25-28	0	.02	4:02	.07	.41	5:00	.182	.3167
12-29-31	0	e .02	:15	.32	.48	:15	.284	.3761
1-1-59	.70	.08	:45	.24	.60	6:00	.369	.6285
1-2-3	0	.13	5:08	.73	.88	7:00	.275	.9607
1-4	.02 <u>1/</u>	.03	6:00	.24	1.09	8:00	.132	1.1564
1-5-8	0	.06	8:05	.05	1.19	9:05	.0942	1.2740
1-9-10	T <u>1/</u>	.02	:48	0	1.19	10:00	.112	1.3688
1-11-13	0	.02	10:33	.17	1.62	11:00	.245	1.5156
1-14	.22	.01	:51	.53	1.78	12:15p	.373	1.9178
1-15	.72 <u>2/</u>	.06	12:00m	.29	2.11	1:30	.171	2.2593
1-16-19	.30 <u>1/</u>	.09	1:25p	0	2.11	2:00	.109	2.3279
1-20	e .40	.04	:50	.14	2.17	4:30	.0585	2.5131
			4:05	.02	2.22	5:30	.0992	2.5913
			5:03	.21	2.42	7:00	.166	2.7888
			:25	.60	2.64	8:00	.118	2.9371
			6:49	.10	2.78	9:00	.0844	3.0356
			7:45	.01	2.79	12:00m	.0390	3.2098
			1-21-59	Raingage 54				
			12:01a		0			
			7:30p		2.88			
			1-21-59	Raingage 56				
			12:01a		0			
			7:36p		2.63			
			1-21-59	Raingage 91				
			12:01a		0			
			7:30p		2.65			
<p><b>REPRINT</b></p> <p>This page was not clearly reproduced in Reference 4: Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc.Pub.945. It has been re-typed and is hereby reprinted. For the rest of this series, see pages 26.36-1 &amp; 3 of USDA Misc. Pub. 945.</p>								
<p><b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 4618.1.  Events of September 23, 1945 and June 28, 1957 could not be presented because of faulty records. For map of watershed, see page 26.34-5. <u>1/</u> Snow. <u>2/</u> Rain and snow.</p>								



3-64

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Coshocton, Ohio Watershed 97 Area - 4580 ac. (7.16 sq. mi.)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	3.00	3.42	1.06	1.68	3.30	5.66	3.24	7.17	0.35	1.81	1.82	1.60	34.11
Q	2.29	1.40	1.57	.91	.63	1.02	.17	1.05	.08	.05	.11	.06	9.34
1961 P	0.91	3.91	3.54	6.37	2.65	2.97	5.64	2.17	0.95	2.27	3.31	2.51	37.20
Q	.30	1.70	3.14	4.93	.95	.51	.39	.14	.03	.04	.20	.40	12.73

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 97								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-22	0.27	8-22	0.25	8-22	0.42	8-22	0.64	8-22	0.69	8-21	0.78	6-21	0.79	1-12	1.24
1961	4-25	.55	4-25	.52	4-25	.90	4-25	1.27	4-25	1.45	4-25	1.65	4-25	1.83	4-21	2.95

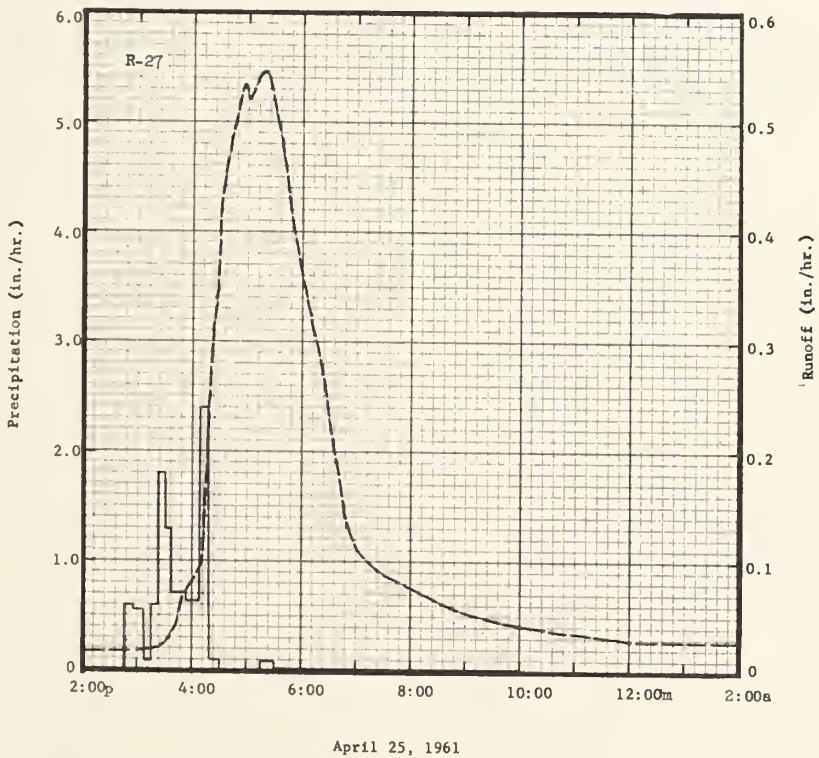
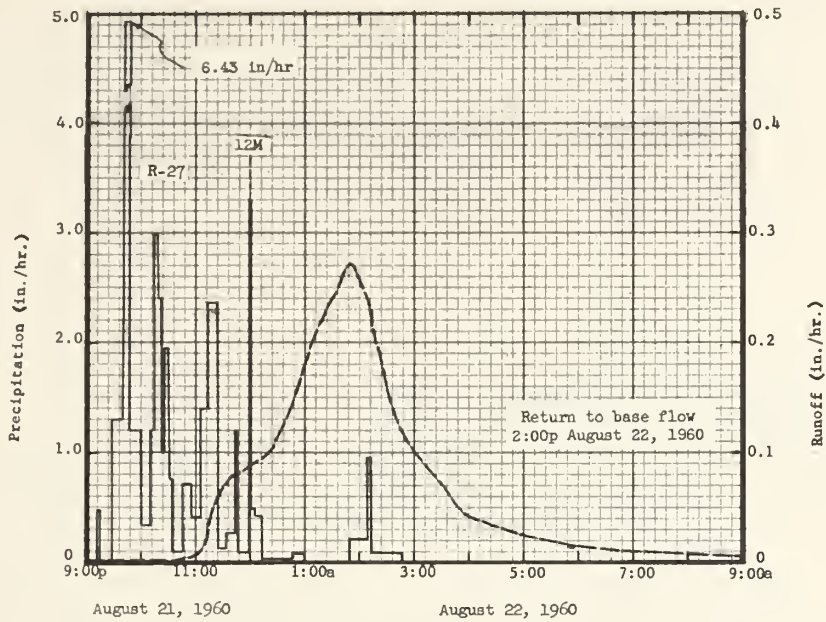
Notes: Quality of records: Monthly P, fair; Q, good; annual maximum discharges and volumes, good. Mixed cover, 1960 and 1961: 18% cropland, 50% grassland, 26% woodland, 4% miscellaneous; improved practice.  
 1/ Monthly precipitation from raingage 27.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 97			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
Event of August 21 and 22, 1960									
7-21-25-60	Raingage 27	0.02	8-21-60	Raingage 27		8-21-60			
7-26	.40	T	9:10p	0	0	9:30p	0.0004	0	
7-27	.02	.01	:15	.48	.04	10:34	.0010	.0006	
7-28-29	0	T	:28	0	.04	:42	.0019	.0008	
7-30	.30	T	:40	1.30	.30	:48	.0040	.0010	
7-31-8-2	0	T	:47	6.43	1.05	11:00	.0066	.0020	
8-3	.27	T	:59	1.20	1.29	:07	.0124	.0031	
8-4	1.83	.06	10:10	.33	1.35	:10	.0198	.0039	
8-5-14	0	.05	:15	1.20	1.45	:12	.0292	.0048	
8-15	.05	T	:18	3.00	1.60	:16	.0437	.0072	
8-16-19	0	T	:23	2.40	1.80	:20	.0563	.0106	
8-20	.20	T	:26	1.00	1.85	:36	.0756	.0287	
8-21	.50 2/	.01 3/	:30	1.95	1.98	12:00m	.0870	.0614	
			:34	.75	2.03	8-22-60			
			:45	.11	2.05	12:20a	.0992	.0919	
			:55	.72	2.17	:30	.116	.1099	
			11:05	.42	2.24	:44	.141	.1395	
			:14	1.40	2.45	:56	.171	.1705	
			:25	2.36	2.85	1:10	.206	.2139	
			:34	.13	2.87	:24	.232	.2652	
			:43	.27	2.91	:34	.245	.3049	
			:45	1.20	2.95	:40	.261	.3302	
			:58	.09	2.97	:50	.272	.3746	
			12:00m	3.30	3.08	:56	.263	.4016	
			8-22-60			2:00	.255	.4186	
			12:05a	.48	3.12	:10	.232	.4595	
			:12	.43	3.17	:16	.206	.4816	
			:45	.02	3.18	:28	.171	.5192	
			1:00	.08	3.20	:36	.141	.5398	
			:49	0	3.20	:46	.119	.5610	
			2:08	.22	3.27	3:00	.101	.5865	
			:13	.96	3.36	:16	.0851	.6114	
			:47	.09	3.40	:30	.0706	.6296	
						:54	.0437	.6519	
			8-21-60	Raingage 39		4:56	.0247	.6860	
			9:26p		0				
			8-22-60		2.91				
			2:47a						

Notes: To convert runoff in in/hr to cfs, multiply by 4618.1. For map of watershed, refer to Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 26.34-5. 2/ Prior to 9:10p.  
 3/ Runoff prior to 9:30p.

SELECTED RUNOFF EVENTS						Coshocton, Ohio, Watershed 97		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 21 and 22, 1960 - Continued								
						8-22-60 5:54a	0.0158	0.7054
						7:00	.0108	.7196
						8:40	.0075	.7346
			8-21-60 8:45p	Raingage 56	0	10:00	.0060	.7436
			8-22-60 2:40a		2.41	2:00p	.0035 <sup>1/</sup>	.7622
Event of April 25, 1961								
	Raingage 27							
3-25-30-61	0	0.24	4-25-61	Raingage 27	0	4-25-61		
3-31	.34	.03	2:45p	0	0	3:06p	0.0182	0
4-1	.51	.13	:55	.60	.10	:30	.0258	.0085
4-2	.05 s	.10	3:07	.55	.21	:42	.0437	.0151
4-3-4	0	.11	:15	.08	.22	:48	.0645	.0204
4-5	.02	.04	:23	.60	.30	4:00	.0823	.0356
4-6	.05	.04	:30	1.80	.51	:08	.0922	.0471
4-7-8	0	.06	:37	1.29	.66	:12	.119	.0540
4-9	.85	.11	:53	.71	.85	:15	.171	.0610
4-10	.05	.15	4:08	.64	1.01	:18	.245	.0713
4-11	0	.08	:18	2.40	1.41	:21	.290	.0847
4-12	.35	.09	:30	.10	1.43	:26	.346	.1120
4-13	.03	.09	5:15	0	1.43	:29	.424	.1307
4-14	0	.06	:30	.08	1.45	:40	.486	.2166
4-15	.05	.05	10:00	.01	1.46	:56	.535	.3475
4-16	.66	.22				5:00	.520	.3886
4-17	.39 rs	.18	4-25-61	Raingage 39		:08	.535	.4590
4-18-20	0	.32	2:45p	0	0	:14	.546	.5131
4-21	.81	.30	6:10		1.50	:16	.548	.5313
4-22	.39	.26				:20	.546	.5678
4-23	.05	.19	4-25-61	Raingage 56		:26	.530	.6216
4-24	0	.13	2:37p	0	0	:30	.509	.6562
4-25	.55 <sup>2/</sup>	.13 <sup>3/</sup>	7:00	1.73		:38	.470	.7213
						:46	.424	.7808
						:58	.369	.8600
<p><b>Watershed conditions:</b> Mixed cover under improved practice. 9% of the area was in wheat 5" high; 28.7% in meadow 5" high; 27.3% in pasture 4" high; 25.8% in protected woodland; 5% in pastured woodland; 4.2% in miscellaneous cover (farmsteads and roads).</p>						6:08	.325	.9177
						:20	.278	.9776
						:30	.232	1.0203
						:36	.200	1.0421
						:44	.154	1.0658
						:52	.124	1.0841
						7:06	.106	1.1106
						:30	.0881	1.1488
						8:10	.0727	1.2023
						9:10	.0502	1.2629
			11:00	.0355	1.3384			
			12:00m	.0292 <sup>1/</sup>	1.3709			

Notes: To convert runoff in in/hr to cfs, multiply by 4618.1.  
<sup>1/</sup> Normal base flow. <sup>2/</sup> Rain ended about 12:30p. <sup>3/</sup> Runoff prior to 3:06p.



COSHOCTON, OHIO      WATERSHED 97

5-62

MONTHLY PRECIPITATION AND RUNOFF <sup>1/2/</sup> (Inches)								Coshocton, Ohio Watershed 994 Area - 17,500 ac. (27.34 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	3.00	3.42	1.06	1.68	3.30	5.66	3.24	7.17	0.35	1.81	1.82
	Q	2.52	1.70	1.76	1.19	.78	.93	.19	1.13	.11	.07	.13	.08	10.59
1961	P	0.91	3.91	3.54	6.37	2.65	2.97	5.64	2.17	0.95	2.27	3.31	2.51	37.20
	Q	.23	2.01	3.46	4.86	1.37	.78	.94	.33	.08	.06	.36	.57	15.05

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Coshocton, Ohio Watershed 994								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	3/6-28	0.44	6-28	0.43	6-28	0.81	6-28	1.71	6-28	2.16	6-28	2.39	6-28	2.64	6-24	3.28
1958	3/7-14	.05	5-4	.05	5-4	.09	5-4	.25	5-4	.41	5-4	.59	5-4	.80	4-29	1.72
1959	3/1-21	.25	1-21	.25	1-21	.48	1-21	1.36	1-21	2.04	1-21	3.06	1-21	3.45	1-21	4.00
1960	8-22	.14	8-22	0.13	8-22	0.26	8-22	0.53	8-22	0.75	8-22	0.79	8-22	0.83	3-27	1.40
1961	4-25	.22	4-25	.17	4-25	.34	4-25	.75	4-25	1.04	4-25	1.27	4-25	1.49	4-21	2.57

Notes: Quality of records: Monthly P, fair; Q, good; annual maximum discharges and volumes, good. Cover - 15% cropland, 55% grassland, 26% woodland, 4% miscellaneous, generally under improved practice. 1/ Monthly precipitation from raingage 27. 2/ Runoff data furnished by the U. S. Geological Survey, Columbus, Ohio. 3/ Delayed data underlined.

SELECTED RUNOFF EVENTS								Coshocton, Ohio Watershed 994			
Antecedent conditions				Rainfall				Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Raingage 27		Event of August 21 and 22, 1960		Raingage 27		8-21-60		0			
7-21-25-60	0			T	8-21-60	9:10p	0	8-21-60	10:00p	T	0
7-26	.40			T	8-21-60	11:00	.60	0.30	11:00	.0063	.0037
7-27	.02			.01	8-21-60	12:00m	3.13	1.29	12:00m	.0180	.0160
7-28-29	0			T	8-21-60	1:00a	.60	1.89	1:00a	.0423	.0462
7-30	.30			T	8-21-60	2:00	.45	2.24	2:00	.0563	.0955
7-31-8-2	0			T	8-21-60	3:00	1.83	2.85	3:00	.1251	.1862
8-3	.27			T	8-21-60	4:00	.20	2.91	4:00	.1386	.2521
8-4	1.83			.05	8-21-60	5:00	.60	3.08	5:00	.1364	.3208
8-5	0			.05	8-21-60	6:00	.07	3.20	6:00	.1172	.4476
8-6-15	.05	.03	8-21-60	7:00	.38	3.35	7:00	.0845	.5485		
8-16-19	0	T	8-21-60	8:00	.09	3.40	8:00	.0671	.6243		
6-20	.20	T	8-21-60	9:00	.09	3.40	9:00	.0445	.6801		
8-21	.50 4/	.02 5/	8-21-60	10:00			10:00	.0283	.7165		
Watershed conditions: Mixed cover, mostly in improved practice. 8% of the area was in corn, 14% in small grain crops, mostly wheat, 21% meadow, 27% pasture, 5% idle land, 21.5% protected woodland, 1% pastured woodland and 2.5% miscellaneous cover.		8-21-60	8:50p	Raingage 39	0	10:00	.0171	.7392			
		8-22-60	2:47a		0	11:00	.0103	.7529			
		8-21-60	8:45p	Raingage 54	0	12:00n	.0070	.7615			
		8-22-60	2:39a		0	1:00p	.0041	.7830			
		8-21-60	8:45p		2.58	6:00	.0034	.7905			
		8-22-60	2:40a		0	9:00	T	.7995			
		8-21-60	8:45p	Raingage 56	0						
		8-22-60	2:40a		2.41						
		8-21-60	7:23p	Raingage 91	0						
		8-22-60	6:08a		4.48						

Notes: To convert runoff in in/hr to cfs, multiply by 17,646.  
For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 26.37-5.  
4/ Rain ended about noon. 5/ Runoff prior to 10:00p.



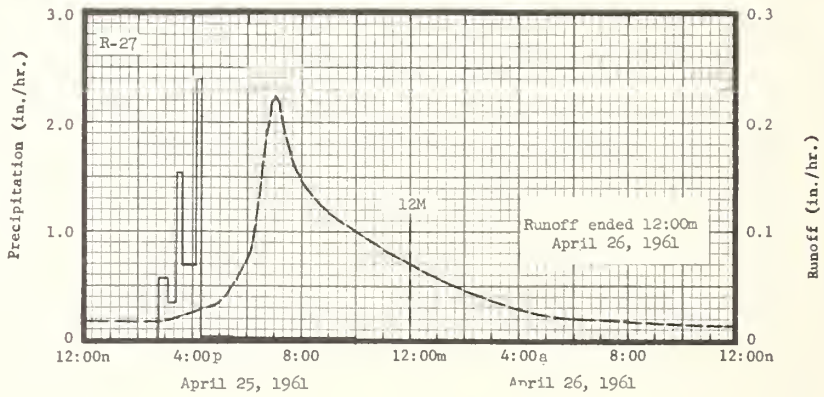
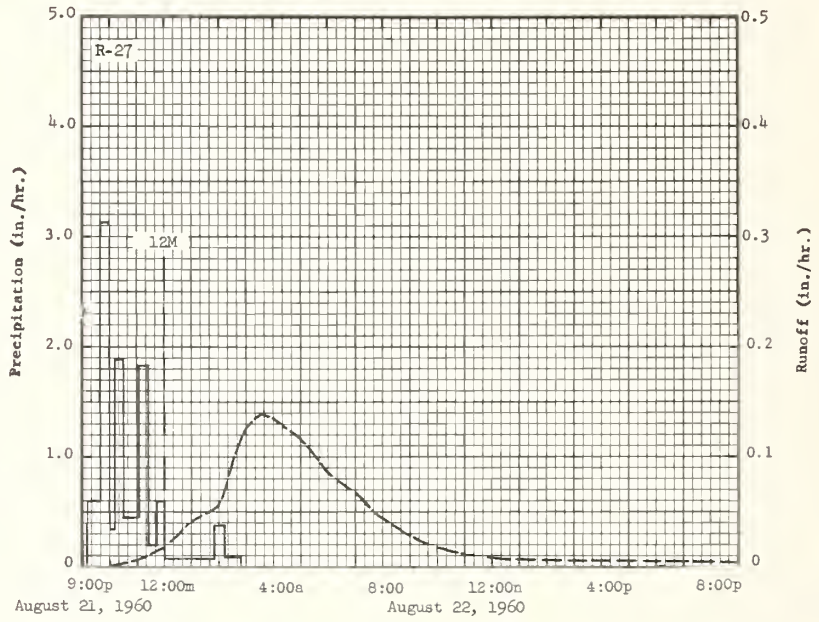
5-62

## SELECTED RUNOFF EVENTS

Coshooton, Ohio Watershed 994

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of April 25-26, 1961</u>								
3-25-30-61	Raingage 27 0	0.37	4-25-61	Raingage 27		4-25-61		
3-31	.34	.04	2:45p	0	0	3:00p	0.0191	0
4-1	.51	.09	3:07	.57	.21	5:00	.0351	.0486
4-2	.05 <sup>B</sup>	.13	:23	.34	.30	6:00	.0763	.1043
4-3-4	0	.18	:37	1.54	.66	7:00	.2216	.2533
4-5	.02	.06	4:08	.68	1.01	9:00	.1159	.5908
4-6	.05	.05	:18	2.40	1.41	12:00m	.0703	.8530
4-7-8	0	.09	5:30	.03	1.45	4-26-61		
4-9	.85	.06	10:00	.01	1.46	5:00a	.0229	1.0860
4-10	.05	.14				9:00	.0161	1.1620
4-11	0	.14	4-25-61	Raingage 39		1:00p	.0130	1.2199
4-12	.35	.10	2:45p		0	7:00	.0102	1.2895
4-13	.03	.10	6:10		1.50	12:00m	.0085 <sup>1/</sup>	1.3363
4-14	0	.09						
4-15	.05	.08	4-25-61	Raingage 54				
4-16	.66	.15	2:36p		0			
4-17	.39 <sup>rs</sup>	.22	6:00		1.63			
4-18-20	0	.43	4-25-61	Raingage 56				
4-21	.81	.19	2:37p		0			
4-22	.39	.27	7:00		1.73			
4-23	.05	.22	4-25-61	Raingage 91				
4-24	0	.16	2:45p		0			
4-25	.55 <sup>2/</sup>	.06 <sup>3/</sup>	9:00		1.27			
<p>Watershed conditions: Mixed cover mostly in improved practice. Approximately 10% of the area was in wheat 5" high; 33% in meadow 5" high; 27% in pasture 4" high; 5% in idle land, mostly grass and weeds; 21.5% in protected woodland; 1% in pastured woodland; 2.5% in miscellaneous cover (farmsteads and roads).</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 1.7646. <sup>1/</sup> Normal base flow. <sup>2/</sup> Rain ended about 12:30p. <sup>3/</sup> Runoff prior to 3:00p.



COSHOCTON, OHIO

WATERSHED 994

COSHOCTON, OHIO Watershed 174

LOCATION: Coshocton, Co., Ohio; 10 mi. NE of Coshocton; Tuscarawas River, Muskingum River Basin

AREA: 52.8 ac. SHAPE: Roughly rectangular, 1,100 ft. wide, 2,600 ft. long.

SLOPES:	Percent Slope	2-6%	6-12%	12-18%	18-25%	25-35%	Over 35%
	Percent of Area	8	30	33	16	13	0

SOILS: Medium acid; residual derived from sandstone and shale

Type	% of Area	Topsoil			Subsoil		Substratum		Internal Drainage
		Av. depth	Structure	Permeability	Structure	Permeability	Depth to	Permeability	
Keene silt loam (shallow phase)	16	7"	moderate fine granular	moderately rapid	moderate fine blocky	moderate	60"	moderate	medium
Keene silt loam	16	7"	moderate fine granular	moderate	moderate medium prismatic	slow	72"	slow	slow
Muskingum silt loam	35	7"	moderate medium granular	rapid	moderate fine blocky	rapid	60"	moderate	rapid
Muskingum loam	6	7"	weak fine granular	rapid	weak medium granular	rapid	60"	rapid	rapid
Mixed silt loams	27	7"	moderate medium granular	moderately rapid	moderate fine blocky	moderate	60"	moderate	medium

EROSION: Class 1 - 23%; 2 - 56%; 3 - 21%

LAND CAPABILITY:	Class	I	II	III	IV	V	VI	VII
	Percent of Area	0	8	63	16	0	13	0

GEOLOGY: Lies on eastern flank of Cambridge Arch with average dip of atrata not exceeding 2 degrees; no faults present. Strata comprised of thin beds of sandstone, shale, clay, coal and limestone of the Allegheny and Pottsville series of the Pennsylvanian system. Five clay formations which support perched water tables outcrop. The weir is bottomed in the Bedford clay formation (Pottsville series). The Allegheny series outcrops beneath the upper 88% of the watershed; the Pottsville series the lower 12% of the watershed. Source: J. B. Urban, Geologist, ARS.

SURFACE DRAINAGE: Good; length of principal waterway - 2,800 ft.; a natural watershed with surface flow to one main channel with 2 major tributaries; natural boundary except for 100-ft. diversion ditch near lower boundary.

CHARACTER OF FLOW: Spring-fed intermittent interrupted stream.

INSTRUMENTATION: Runoff - 16" broadcrested concrete weir with 2:1 side slopes, 5 ft. deep, FW-1 recorder; precipitation - recording gage.

WATERSHED CONDITIONS: Mixed cover; in 1960, woods - 14.9%; reforested - 1.8%; grassland - 53.6%; cultivated - 13.9%; miscellaneous 15.8%; a 13% area in the north part of this watershed has been in improved practice cropping since 1941; otherwise, prevailing practice throughout. Watershed 109 (1.69 ac., just to the west of raingage Y102) and Watershed 110 (1.27 ac., southeast of raingage 107) are included within the boundary of this watershed.

GENERALLY REPRESENTS: Generally prevailing practice on mixed cover areas of Muskingum, Keene, and associated silt loams with medium internal drainage, good surface drainage, moderate to severe erosion, found on rolling to steep topography in the Western and Central Allegheny Plateau land resource areas N-124 and N-126 in eastern Ohio, western Pennsylvania, and western West Virginia.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Coshocton, Ohio Watershed 174						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	1960 P						6.73	2.87	5.27	0.39	1.93	1.76	1.50
Q						1.61	.09	.33	.01	.01	.03	T	2.08
1961 P	0.62	3.83	3.40	6.34	2.09	3.11	5.35	1.80	1.19	2.04	3.07	2.52	35.36
Q	.10	1.46	2.31	4.33	.31	.27	.29	.06	.01	T	.11	.20	9.45

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS															Coshocton, Ohio Watershed 174				
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL																
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days				
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.			
1961	4-25	1.03	4-25	0.82	4-25	1.11	4-25	1.33	4-25	1.51	4-25	1.63	4-25	1.74	4-21	2.78			

Notes: Quality of records: monthly P and Q, good; annual maximum discharges and volumea, good. Mixed cover, 1960 and 1961: 15% hardwoods; 2% reforested; 67% grassland; 16% miscellaneous; prevailing practice on 86% of area. For map of watershed, see page 26.30-4. 1/ Precipitation from raingage R-107.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 174		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
7-21-25-60			Event of August 21 and 22, 1960					
	Raingage 107		8-21-60	Raingage 107			No runoff	
7-26	.21	T	9:43p	0	0			
7-27	.02	T	:46	1.40	.07			
7-28-29	0	.01	:51	5.16	.50			
7-30	.30	.01	:55	.75	.55			
7-31-8-2	0	.01	10:06p	.33	.61			
8-3	.26	.01	:18	.45	.70			
8-4	1.51	.08	:23	1.32	.81			
8-5-7	0	.02	:27	3.75	1.06			
8-8	.07	T	:33	1.90	1.25			
8-9-14	0	.01	:38	.12	1.26			
8-15	.06	.01	:42	.45	1.29			
8-16-19	0	.01	11:00p	.20	1.35			
8-20	.12	T	:21	.11	1.39			
8-21	.50 <u>1/</u>	.01	:30	1.13	1.56			
Watershed conditions: Mixed cover under prevailing practice. 13.9% of the area was in wheat cut July 22, grass, legumes and weeds 3" high; 30.7% was in meadow cut July 26 4" high; 22.9% in pasture 4" high; 14.9% in woodland; 1.8% reforested to pines; 15.8% miscellaneous cover (farmsteads, roads).			12:00m	0	1.56			
			8-22-60					
			12:03a	.60	1.59			
			:13	.18	1.62			
			:16	1.80	1.71			
			1:30a	.02	1.74			
3-25-30-61			Event of April 25, 1961					
	Raingage 107		4-25-61	Raingage 107		4-25-61		
3-31	.28	.02	2:12p	0	0	2:45p	0.0184	0
4-1	.47	.17	:16	1.35	.09	:50	.0265	.002
4-2	.04 s	.06	:25	.60	.18	:56	.0339	.005
4-3-4	0	.07	:28	.20	.19	3:00	.0522	.008
4-5	.01	.02	3:03p	.21	.31	:02	.0756	.010
4-6	.04	.02	:10	1.03	.43	:04	.0992	.013
4-7-8	0	.03	:17	.09	.44	:06	.1087	.016
4-9	.75	.13	:26	.33	.49	:08	.1336	.020
4-10	.05	.09	:34	1.80	.73	:12	.1806	.031
4-11	0	.04	:40	.80	.81	:20	.2433	.059
4-12	.30	.09	:48	1.20	.97	:26	.2562	.084
4-13	.03	.06	:50	2.60	1.10	:30	.2967	.103
4-14	0	.03	:57	.69	1.18	:34	.3704	.125
4-15	.03	.03	4:00p	.80	1.22	:36	.4368	.138
4-16	.67	.27	:06	.70	1.29	:40	.5234	.170
4-17	.17 rs	.18	:13	.94	1.40	:44	.6727	.210
4-18-20	0	.20	:20	2.14	1.65	:48	.8146	.260
4-21	.80	.35	:25	.36	1.68	:50	.9104	.289
4-22	.56	.35	5:30p	.02	1.70	:51	.9694	.304
4-23	.04	.12	7:30p	.01	1.72	:54	.9289	.352
4-24	0	.08				:56	.9602	.383
4-25	.56 <u>2/</u>	.19 <u>3/</u>				4:04	.8515	.504
						:06	.7962	.532
						:10	.7685	.584
						:16	.8330	.664
						:20	.9491	.723
						:22	1.034	.756
						:26	.9491	.822
						:30	.7962	.881
						:36	.5934	.951
						:40	.5234	.988
						:42	.4552	1.004
						:46	.3926	1.033
						:52	.3059	1.068
Watershed conditions: Mixed cover under prevailing practice. 44.6% of the area was in meadow 5" high; 22.9% in pasture 3" high; 14.9% in woodland; 1.8% reforested to pines; 15.8% miscellaneous cover (farmsteads, roads).								

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 53.240. 1/ Rain ended about noon. 2/ Rain ended about 12:30p. 3/ Runoff prior to 2:45p.

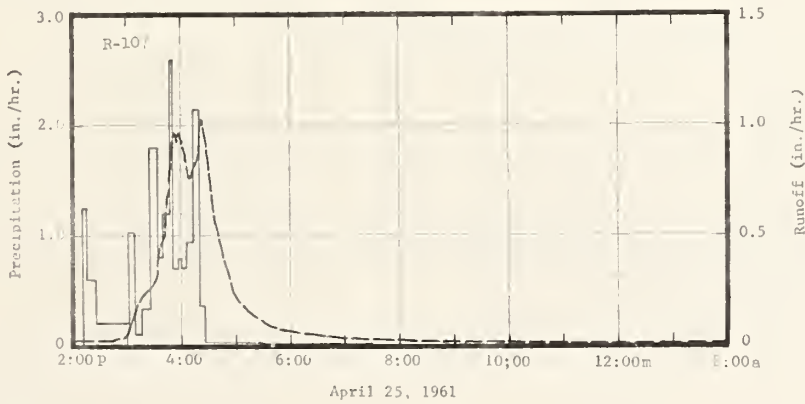


SELECTED RUNOFF EVENTS

Coshocton, Ohio Watershed 174

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			Event of April 25, 1961 - Continued			4-25-61		
						5:00p	0.2212	1.103
						:12	.1589	1.141
						:30	.1087	1.180
						:52	.0756	1.213
						6:40	.0457	1.260
						7:36	.0313	1.295
						8:50	.0221	1.328
						10:00	.0184	1.351
						12:00m	.0135 <sub>1/</sub>	1.383

Notes: To convert runoff in in/hr to cfs, multiply by 53.240. <sub>1/</sub> Normal base flow.



COSHOCTON, OHIO WATERSHED 174

**COSHOCTON, OHIO Watershed 194**

**LOCATION:** Coshocton Co., Ohio; 10 mi. NE of Coshocton; Tuscarawas River, Muskingum River Basin.

**AREA:** 187 ac. **SHAPE:** Roughly rectangular, 2,200 ft. long, 3,400 ft. wide

<b>SLOPES:</b>	Percent Slope	2-6%	6-12%	12-18%	18-25%	25-35%	Over 35%
	Percent of Area	1	20	42	19	18	0

**SOILS:** Medium acid; residual derived from sandstone and shale

Type	% of Area	Topsoil			Subsoil		Substratum		Internal Drainage
		Av. depth	Structure	Permeability	Structure	Permeability	Depth to	Permeability	
Keene silt loam (shallow phase)	19	7"	moderate fine granular	moderately rapid	moderate fine blocky	moderate	60"	moderate	medium
Keene silt loam	17	7"	moderate fine granular	moderate	moderate medium prismatic	slow	72"	slow	slow
Muskingum silt loam	33	7"	moderate medium granular	rapid	moderate fine blocky	rapid	60"	moderate	rapid
Muskingum stony loam	14	6"	weak fine granular	rapid	weak medium granular	rapid	36"	rapid	rapid
Mixed silt loams	17	7"	moderate fine granular	moderately rapid	moderate fine blocky	moderate	60"	moderate	medium

**EROSION:** Class 1 - 6%; 2 - 70%; 3 - 24%.

<b>LAND CAPABILITY:</b>	Class	I	II	III	IV	V	VI	VII
	Percent of Area	0	2	75	11	0	12	0

**GEOLOGY:** Lies on eastern flank of Cambridge Arch with average dip of strata not exceeding 2 degrees; no faults present. Strata comprised of sandstone, shale, clay, coal and limestone of the Allegheny and Pottsville series of the Pennsylvanian system. Six clay formations which support perched water tables outcrop. The weir is bottomed in the Middle Mercer clay of the Pottsville series. The Allegheny series outcrops beneath the middle and upper slopes of the watershed comprising 83% of the area; the Pottsville series outcrops exclusively in the lower slopes and creek beds (17% of the area). Source: J. B. Urban, Geologist, ARS.

**SURFACE DRAINAGE:** Good; length of principal waterway - 2,900 ft.; a natural watershed with surface flow to 3-branch system.

**CHARACTER OF FLOW:** Spring-fed intermittent, intermittent interrupted.

**INSTRUMENTATION:** Runoff - concrete 5:1 broad crested triangular weir, 2 FW-1 recorders; precipitation - 3 recording gages.

**WATERSHED CONDITIONS:** Mixed cover; in 1960, woods - 22%; reforested - 17%; grassland - 28%; cultivated - 41%; miscellaneous - 8%. Prevailing practice except for 6.3% of the area in conservation practice. Watersheds 109, 174, 110, 106, 192, and 128 are included within the boundary of this watershed.

**GENERALLY REPRESENTS:** Generally prevailing practice on mixed cover areas of Muskingum, Keene, and associated silt loams with medium internal drainage, good surface drainage, moderate to severe erosion, found on rolling to steep topography in the Western and Central Allegheny Plateau land resource areas N-124 and N-126 in eastern Ohio, western Pennsylvania and western West Virginia.

MONTHLY PRECIPITATION AND RUNOFF (Inches)														Coshocton, Ohio Watershed 194	
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
		1960	P	2.87	3.19	1.00	1.54	2.99	6.73	2.87	5.27	0.39	1.93	1.76	1.50
	Q	2.41	1.53	1.66	.96	.62	1.90	.27	.31	.07	.08	.13	.08	10.02	
1961	P	0.62	3.83	3.40	6.34	2.09	3.11	5.35	1.80	1.19	2.04	3.07	2.52	35.36	
	Q	.33	1.89	3.63	5.39	1.89	.97	.53	.15	.08	.09	.18	.44	14.10	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS														Coshocton, Ohio Watershed 194		
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
	Date	Rate	1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
			Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	0.74	6-14	0.40	6-14	0.49	6-13	0.72	6-13	0.89	6-13	1.15	6-13	1.36	6-11	1.59
1961	4-25	.87	4-25	.68	4-25	.93	4-25	1.12	4-25	1.29	4-25	1.49	4-25	1.68	4-21	3.00

Notes: Quality of records: monthly P and Q, good; annual maximum discharges and volumes, good. Mixed cover, 1960 and 1961: 21% hardwoods; 2% reforested; 58% grassland; 11% cultivated; 8% miscellaneous; prevailing practice. For map of watershed, see page 26.30-4. 1/ Monthly precipitation from raingage 107.

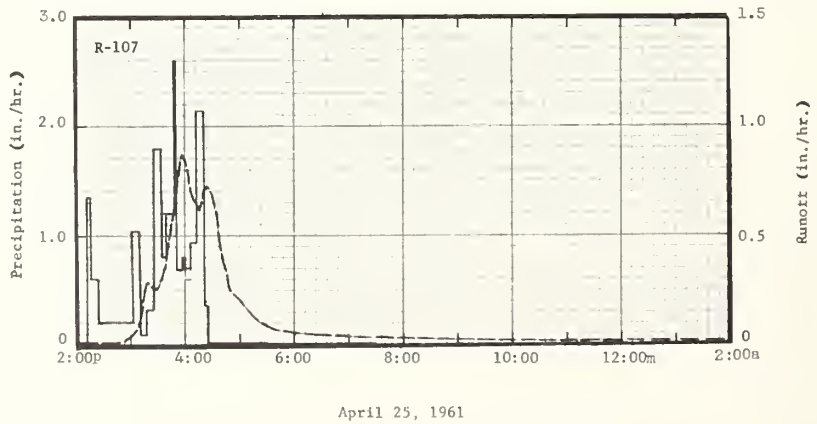
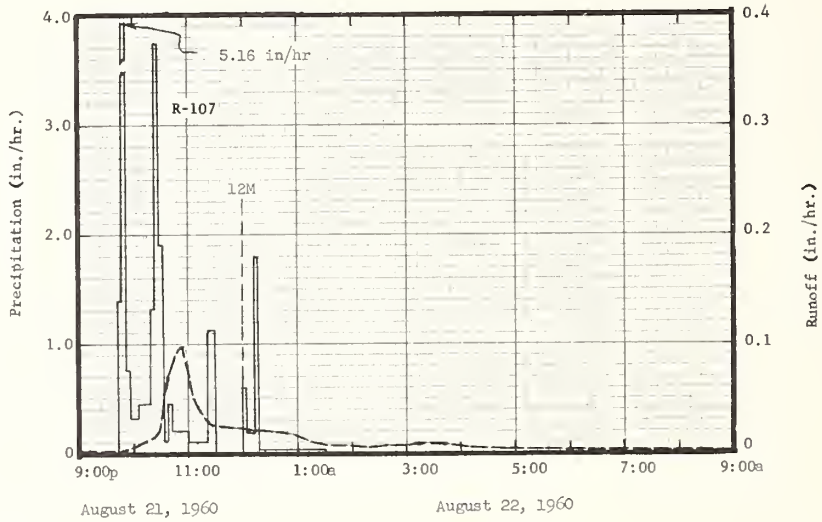
SELECTED RUNOFF EVENTS			Coshocton, Ohio, Watershed 194					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			<u>Event of August 21 and 22, 1960</u>					
7-21-25-60	Raingage 107 0	0.02	8-21-60	Raingage 107		8-21-60		
7-26	.21	T	9:43p	0	0	9:46p	0.0002	0
7-27	.02	T	:46	1.40	.07	:52	.0015	.0001
7-28-29	0	.01	:51	5.16	.50	10:00	.0074	.0007
7-30	.30	.01	:55	.75	.55	:26	.0183	.0057
7-31-8-2	0	.01	10:06	.33	.61	:34	.0546	.0103
8-3	.26	.01	:18	.45	.70	:40	.0721	.0166
8-4	1.51	.08	:23	1.32	.81	:44	.0880	.0220
8-5-7	0	.02	:27	3.75	1.06	:52	.0992	.0345
8-8	.07	T	:33	1.90	1.25	:56	.0923	.0408
8-9-14	0	.01	:38	.12	1.26	11:00	.0721	.0463
8-15	.06	.01	:42	.45	1.29	:04	.0546	.0502
8-16-19	0	.01	11:00	.20	1.35	:10	.0410	.0553
8-20	.12	T	:21	.11	1.39	:26	.0244	.0638
8-21	.50 <u>1/</u>	.01 <u>2/</u>	:30	1.13	1.56	:40	.0244	.0695
			12:00m	0		12:00m	.0216	.0772
<p><u>Watershed conditions:</u> Mixed cover under prevailing practice. 13.9% of the area was in wheat cut July 22; grass, legumes, and weeds 3" high; 30.7% in meadow cut July 26, grass, legumes, and weeds 4" high; 22.9% in pasture, grass 4" high and weeds 6"; 14.9% in woodland and 1.8% reforested; 15.8% in miscellaneous cover (orchards, buildings, roads, etc).</p>			8-22-60			8-22-60		
			12:03a	.60	1.59	12:52a	.0183	.0946
			:13	.18	1.62	1:30	.0088	.1029
			:16	1.80	1.71	2:16	.0061	.1086
			1:30	.02	1.74	:34	.0061	.1104
						:50	.0074	.1122
						3:02	.0082	.1138
						:14	.0093	.1155
						:30	.0093	.1180
						:50	.0078	.1208
			<u>Event of April 25, 1961</u>					
3-25-30-61	Raingage 107 0	0.33	4-25-61	Raingage 107		4-25-61		
3-31	.28	.04	2:12 p	0	0	2:46p	0.0167	0
4-1	.47	.27	:16	1.35	.09	:54	.0234	.0025
4-2	.04 s	.10	:25	.60	.18	3:00	.0335	.0054
4-3-4	0	.14	:28	.20	.19	:02	.0396	.0066
4-5	.01	.06	3:03	.21	.31	:07	.0721	.0112
4-6	.04	.05	:10	1.03	.43	:10	.1167	.0158
4-7-8	0	.08	:17	.09	.44	:13	.1952	.0233
4-9	.75	.14	:26	.33	.49	:16	.2195	.0337
4-10	.05	.13	:34	1.80	.73	:18	.2784	.0420
4-11	0	.08	:40	.80	.81	:28	.2567	.0866
4-12	.30	.10	:48	1.20	.97	:34	.2880	.1135
4-13	.03	.09	:50	2.60	1.10	:38	.3760	.1355
4-14	0	.07	:57	.69	1.18	:42	.5101	.1656
4-15	.03	.07	4:00	.80	1.22	:44	.5939	.1841
4-16	.67	.28	:06	.70	1.29	:46	.6364	.2046
4-17	.17 rs	.21	:13	.94	1.40	:52	.7636	.2751
4-18-20	0	.35	:20	2.14	1.65	:54	.8538	.3021
4-21	.80	.36	:25	.36	1.68	:56	.8697	.3209
4-22	.56	.38	5:30	.02	1.70	4:00	.8326	.3876
4-23	.04	.21	7:30	.01	1.72	:02	.7848	.4146
4-24	0	.15				:08	.6682	.4875
4-25	.56 <u>4/</u>	.20 <u>5/</u>				:16	.6151	.5719
						:20	.7159	.6164
						:24	.7265	.6645
<p><u>Watershed conditions:</u> Mixed cover under prevailing practice. 10.7% of the area was in wheat 4" high; 20.1% in meadow 5" high; 28.3% in pasture 3" high; 12.0% in protected woodland; 9.5% in pasture woodland; 1.4% reforested to pines; 8% in miscellaneous cover (orchards, farmsteads and roads).</p>						:28	.7000	.7120
						:32	.6258	.7557
						:36	.5229	.7947
						:40	.4089	.8256
						:44	.3468	.8508

Continued on next page

Notes: To convert runoff in in/hr. to cfs, multiply by 188.56. 1/ Rain ended about noon. 2/ Runoff prior to 9:46p. 3/ Normal base flow. 4/ Rain ended about 12:30p. 5/ Runoff prior to 2:40p.

SELECTED RUNOFF EVENTS						Coshocton, Ohio Watershed 194		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			Event of April 25, 1961 - Continued			4-25-61		
						4:46p	0.2975	0.8618
						:50	.2524	.8799
						5:00	.2026	.9167
						:20	.1092	.9652
						:40	.0721	.9946
						6:30	.0485	1.0434
						7:30	.0322	1.0839
						9:40	.0234	1.1435
						12:00m	.0191 <u>1/</u>	1.1929

Notes: To convert runoff in in/hr to cfs, multiply by 188.56. 1/ Normal base flow.





MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF <sup>2/</sup> (Inches)								Colby, Wisconsin Watershed W-1 (Area - 345 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	1.46	0.31	0.10	1.00	6.00	5.33	1.13	3.91	2.05	2.87	1.58	0.02	25.76
	Q	nr	nr	nr	nr	5.16	.46	T	.01	0	.11	nr	nr	
1961	P	.05	1.08	1.81	2.17	2.29	2.33	5.49	2.92	3.91	2.62	2.60	1.13	28.40
	Q	nr	nr	nr	nr	.24	T	.07	.03	.05	.17	nr	nr	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS  
Colby, Wisconsin, Watershed W-1

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-16	0.18	5-16	0.18	5-16	0.34	5-16	0.77	5-16	0.99	5-10	1.19	5-9	1.51	5-4	3.63
1961	4-17	.06	4-17	.06	4-17	.12	4-17	.28	4-17	.39	4-17	.45	4-17	.52	4-14	1.09

Notes: Quality of records: P - excellent; Q - excellent. Watershed conditions: 21.7% permanent pasture; 11% ungrazed woods; 2.8% roads and farmsteads; 64.5% 4-yr. rotation of corn, small grain, hay, hay. 1/ Precipitation values from raingage R-4 from November 1 to April 15; an average of raingages R-1, 2, 3 from April 15 to November 1. 2/ Runoff station not in operation during months showing "nr."

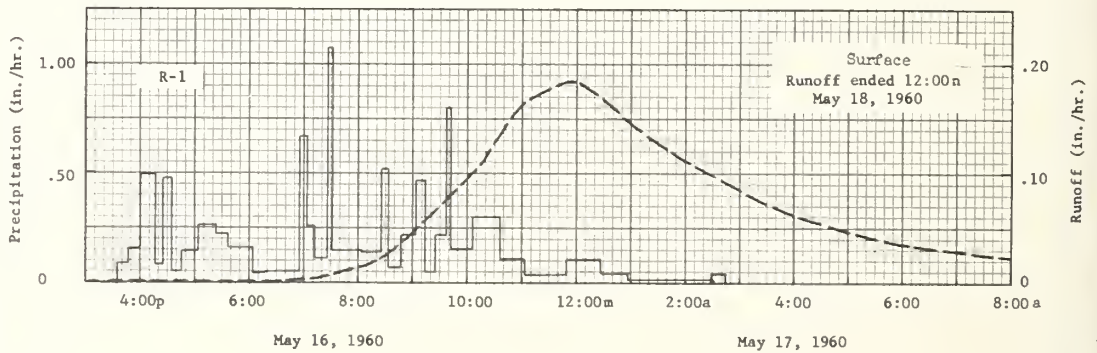
SELECTED RUNOFF EVENTS  
Colby, Wisconsin Watershed W-1

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>3/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 16-18, 1960								
4-16-60	0	0.1135	5-16-60	Raingage	R-1	5-16-60		
4-17	0	.0497	3:35p	0	0	12:00n	0.0001	0
4-18	0	.0245	:49	.09	.02	3:00p	.0001	.0003
4-19	0	.0168	4:00	.16	.05	5:00	.0003	.0007
4-20	0	.0247	:16	.49	.18	6:00	.0009	.0013
4-21	0	.0401	:24	.08	.19	:30	.0017	.0019
4-22	0	.0244	:34	.48	.27	7:00	.0036	.0033
4-23	.09	.0207	:45	.05	.28	:20	.0062	.0049
4-24	.03	.0269	5:02	.14	.32	:40	.0109	.0078
4-25	.26	.0204	:23	.26	.41	:50	.0138	.0098
4-26	.04	.0396	:36	.23	.46	8:10	.0166	.0149
4-27	0	.0106	6:02	.16	.53	:30	.0245	.0218
4-28	.01	.0072	:18	.04	.54	:50	.0393	.0324
4-29	.27	.0217	:55	.05	.57	9:10	.0537	.0479
4-30	.22	.0494	7:04	.67	.67	:30	.0695	.0685
5-1	0	.0142	:11	.26	.70	:50	.0863	.0945
5-2	0	.0064	:26	.12	.73	10:10	.1036	.1262
5-3	.46	.0530	:31	1.08	.82	:20	.1148	.1444
5-4	.24	.0391	8:04	.15	.90	:30	.1289	.1646
5-5	.81	e .2530	:25	.14	.95	:45	.1485	.1993
5-6	1.06	e 1.0744	:33	.53	1.02	11:00	.1625	.2382
5-7	.04 s	.3275	:48	.08	1.04	:30	.1771	.3231
5-8	.15 s	.2496	9:04	.23	1.10	:50	.1847	.3835
5-9	.35 s	.2705	:13	.47	1.17	12:00m	.1847	.4141
5-10	0	nr	:25	.05	1.18	5-17-60		
5-11	0	.2288	:38	.23	1.23	:30a	.1698	.5028
5-12	0	.0333	:40	.80	1.27	1:00	.1462	.5818
5-13	0	.0150	10:08	.16	1.34	:30	.1289	.6505
5-14	0	.0069	:36	.30	1.48	2:00	.1110	.7105
5-15	0	.0039	11:04	.11	1.53	:30	.0982	.7628
5-16	.17 <sup>4/</sup>	.0012 <sup>5/</sup>						

Notes: To convert runoff in in/hr to cfs, multiply by 347.86. For map of watershed, refer to Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 29.1-5. <sup>3/</sup> Antecedent rainfall taken from raingage R-1. <sup>4/</sup> Precipitation occurred between 12:55p and 2:50p. <sup>5/</sup> Runoff accumulated at a rate of .0001 in/hr prior to event shown.

SELECTED RUNOFF EVENTS						Colby, Wisconsin Watershed W-1				
Antecedent conditions			Rainfall			Runoff				
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)		
<b>Watershed Conditions:</b> 21.7% of area was in permanent pasture, 11% in ungrazed woods, 1.6% in roads, 1.2% in farmsteads, and 64.5% in 4 yr. rotation of corn, small grain, hay, bay.			Event of May 16-18, 1960 Cont'd.							
			5-16-60					5-17-60		
			11:50p	0.04	1.56			3:00a	0.0847	0.8085
			5-17-60					:30	.0709	.8474
			12:28a	.11	1.63			4:00	.0626	.8808
			:58	.04	1.65			:30	.0537	.9099
			2:28	.01	1.67			5:00	.0479	.9353
			:45	.04	1.68			6:00	.0354	.9769
								7:00	.0284	1.0088
								8:00	.0224	1.0342
								9:00	.0178	1.0543
								10:00	.0149	1.0707
								11:00	.0123	1.0843
								12:00n	.0100	1.0954
								1:00p	.0083	1.1046
								3:00	.0055	1.1184
								5:00	.0039	1.1278
								7:00	.0028	1.1345
								10:00	.0022	1.1420
								12:00m	.0019	1.1461
					5-18-60					
					3:00a	.0014	1.1510			
					6:00	.0011	1.1548			
					9:00	.0008	1.1576			
					12:00n	.0006	1.1597			

Notes: To convert runoff in in/hr to cfs, multiply by 347.86.  $\frac{1}{}$  Arithmetic average.



COLBY, WISCONSIN WATERSHED W-1

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Fennimore, Wisconsin Watershed W-1 (Area - 330 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958 <sup>2/</sup>	P	0.28	0.02	0.48	2.76	1.65	2.62	<u>3.48</u>	3.60	1.96	1.92	1.27	<u>0.35</u>	20.39
	Q	0	.26	.03	.02	0	T	.01	.01	T	0	0	0	.33
1960	P	1.51	0.53	0.52	4.56	5.46	1.97	2.56	4.42	4.12	2.96	1.20	0.54	30.35
	Q	.85	.17	1.45	.41	.84	.66	.55	.47	.43	.44	.31	.25	6.83
1961	P	.21	1.47	2.61	1.88	1.74	1.71	5.75	2.31	12.47	3.38	6.05	.88	40.46
	Q	.21	.94	1.98	.36	.31	.17	.18	.12	.38	.29	1.07	1.12	7.13

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Fennimore, Wisconsin Watershed W-1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	1-12	0.14	1-12	0.12	1-12	0.20	3-27	0.38	3-27	0.54	3-27	0.80	3-27	1.21	3-27	1.33
1961	2-22	.11	2-22	.10	2-22	.20	3-24	.34	3-24	.42	3-23	.49	3-23	.82	3-20	1.27

Notes: Quality of records: P - excellent; Q - excellent, except for periods of melting snow, which are fair. Watershed conditions: 16% permanent pasture; 5% roads and farmsteads; balance in corn, oats and hay. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, ARS, SWC, MP 945, p. 31.1-5.  
<sup>1/</sup> Precipitation values an average of raingages R-1, 6, 8 from Nov. 15 to May 1; an average of R-1, 2, 3, 4, 5, 6, 7, 8 from May 1 to Nov. 15. <sup>2/</sup> Previously published precipitation values revised. Revised amounts are underlined.

NO SELECTED RUNOFF EVENTS REPORTED.

Cooperative Research Project of USDA and Wisconsin Agricultural Experiment Station

31.1-1

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Fennimore, Wisconsin Watershed W-2 (Area - 22.8 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	1.45	0.56	0.53	4.78	5.80	2.12	2.83	4.63	4.11	3.09	1.21	0.47	31.58
	Q	.36	.01	1.01	0	0	0	T	0	0	0	0	0	1.38
1961	P	.19	1.50	2.33	2.01	1.89	1.62	5.80	2.50	12.47	3.06	5.91	.83	40.11
	Q	0	.50	1.08	0	0	0	0	0	T	0	.02	0	1.60

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Fennimore, Wisconsin Watershed W-2								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	1-12	0.10	3-27	0.06	3-27	0.12	3-27	0.29	3-27	0.43	3-27	0.57	3-27	0.95	3-27	1.01
1961	2-22	.09	3-24	.08	3-24	.15	3-24	.37	3-24	.44	3-23	.50	3-23	.90	3-22	1.08

Notes: Quality of records: P - excellent; Q - excellent, except for periods of melting snow, which are fair. Watershed conditions: 23% permanent pasture, 7% roads and farmsteads, balance in corn, oats and hay. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 31.1-5.  
<sup>1/</sup> Precipitation values obtained from raingage R-6.

NO SELECTED RUNOFF EVENTS REPORTED.

Cooperative Research Project of USDA and Wisconsin Agricultural Experiment Station

(See 31.1-1 above)

31.2-1

6-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Fennimore, Wisconsin Watershed W-3 (Area - 52.5 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1960 P	1.59	0.54	0.57	4.61	5.70	2.08	2.67	4.52	4.07	3.02	1.11	0.58	31.06			
Q	.15	0	1.13	0	0	0	0	0	0	0	0	0	1.28			
1961 P	.21	1.53	2.69	1.76	1.86	1.63	5.81	2.66	13.12	3.31	5.93	.82	41.33			
Q	0	.49	.86	0	0	0	0	0	0	0	0	0	1.35			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Fennimore, Wisconsin Watershed W-3								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-27	0.14	3-27	0.12	3-27	0.24	3-27	0.49	3-27	0.61	3-27	0.82	3-27	1.05	3-27	1.13
1961	2-22	.14	2-22	.09	3-24	.12	3-24	.27	3-24	.33	3-23	.34	3-24	.47	3-19	.86
Notes: Quality of records: P - excellent; Q - excellent, except for periods of melting snow, which are fair. Watershed conditions: 23% permanent pasture; 7% roads and farmsteads; remainder farmed as 3- or 4-yr. rotation of corn, oats and meadow. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 31.1-5. 1/ Precipitation values obtained from raingage R-8 from Nov. 15 to May 1; an average of R-7 and 8 from May 1 to Nov. 15.																
NO SELECTED RUNOFF EVENTS REPORTED.																

Cooperative Research Project of USDA and Wisconsin Agricultural Experiment Station

31.3-1

6-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Fennimore, Wisconsin Watershed W-4 (Area - 171 acres)								
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1960 P	1.48	0.45	0.45	4.33	5.50	1.93	2.71	4.39	4.22	2.98	1.17	0.57	30.18			
Q	.64	0	1.40	0	0	0	.01	0	0	0	0	0	2.05			
1961 P	.22	1.38	2.61	1.82	1.68	1.70	5.88	2.14	12.67	3.49	6.19	.97	40.75			
Q	0	.71	1.42	0	0	0	0	0	0	0	.02	0	2.15			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Fennimore, Wisconsin Watershed W-4								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	1-12	0.14	1-12	0.14	1-12	0.21	3-28	0.36	3-28	0.51	3-27	0.86	3-27	1.39	3-27	1.40
1961	2-22	.12	2-22	.11	2-22	.20	3-24	.35	3-24	.42	3-23	.53	3-23	.89	3-19	1.30
Notes: Quality of records: P - excellent; Q - excellent, except for periods of melting snow, which are fair. Watershed conditions: 13% permanent pasture; 6% roads and farmsteads; remainder farmed as 3-yr. rotation of corn, oats and hay. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U.S., 1956-59, USDA Misc. Pub. 945, p. 31.1-5. 1/ Precipitation values obtained from raingage R-7 from Nov. 15 to May 1; an average of R-1, 2, 3, 4 from May 1 to Nov. 15.																
NO SELECTED RUNOFF EVENTS REPORTED.																

Cooperative Research Project of USDA and Wisconsin Agricultural Experiment Station  
(See 31.3-1 above)

31.4-1



6-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								LaCrosse, Wisconsin Watershed CW (Area - 2.71 acres)								
Year \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1960	P 0.67	0.50	0.68	3.57	7.56	4.29	1.71	5.30	4.34	3.24	0.66	0.53	33.05			
	Q 0	0	.37	0	0	.01	0	.22	0	0	0	0	.60			
1961	P .21	1.26	2.74	2.32	2.95	3.35	3.03	1.37	5.11	2.93	2.65	.89	28.81			
	Q 0	0	2.25	0	0	0	0	0	0	0	0	0	2.25			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								LaCrosse, Wisconsin Watershed CW								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-27	1.85	8-27	0.22	8-27	0.22	8-27	0.22	3-27	0.23	3-27	0.23	3-27	0.35	3-27	0.37
1961	3-25	.17	3-25	.17	3-25	.34	3-25	.800	3-25	1.05	3-25	1.23	3-24	1.86	3-23	2.25
Notes: Quality of records: P - good; Q - good. Watershed conditions: 1960, hay - 1961, hay. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 32.3-6. $\frac{1}{2}$ Control Plot Rainage.																
NO SELECTED RUNOFF EVENTS REPORTED																

Cooperative Research Project of USDA and Wisconsin Agricultural Experiment Station

32.3-1

6-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								LaCrosse, Wisconsin Watershed CWA (Area - 3.06 acres)								
Year \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1960	P 0.67	0.50	0.68	3.57	7.56	4.29	1.71	5.30	4.34	3.24	0.66	0.53	33.05			
	Q 0	0	.26	0	0	.01	.01	.10	.01	0	T	0	.39			
1961	P .21	1.26	2.74	2.32	2.95	3.35	3.03	1.37	5.11	2.93	2.65	.89	28.81			
	Q 0	0	e 1.96	0	0	0	0	0	0	0	0	0	e 1.96			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								LaCrosse, Wisconsin Watershed CWA								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-28	0.37	8-28	0.10	8-28	0.10	3-26	0.16	3-26	0.19	3-26	0.26	3-26	0.26	3-26	0.26
1961	3-25	.14	3-25	.14	3-25	.28	3-25	.72	3-25	.96	3-25	1.20	3-24	1.70	3-23	1.96
Notes: Quality of records: P - good; Q - good except those estimated which are fair. Watershed conditions: 1960, hay - 1961, hay. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 32.3-6. $\frac{1}{2}$ Control Plot Rainage.																
NO SELECTED RUNOFF EVENTS REPORTED																

Cooperative Research Project of USDA and Wisconsin Agricultural Experiment Station

(See 32.3-1 above)

32.4-1

CHEROKEE, OKLAHOMA WATERSHED W-10

LOCATION: Alfalfa Co., Oklahoma; 2 mi. SW of Cherokee; Salt Fork of Arkansas River Basin.

AREA: 1.68 acres.

<u>SLOPES:</u>	Percent Slope	0-1%	1-3%	3-5%
	Percent of Area	0	70	30

SOILS: Well drained, moderately dark soils weakly developed from alluvial and possible aeolian deposits, deep (30-48") over gravelly substrata. B horizons vary from loam to light clay loam and generally contain a few small gravels. Source of information - Agronomy Department, Oklahoma State University.

Type	% of Area	Topsoil			Subsoil		Substratum		Internal Drainage
		Avg. Depth	Structure	Permeability	Structure	Permeability	Avg. Depth To	Permeability	
Grant-Albion Complex Silt Loam	100	22"	weak to medium granular	moderate	weak to moderate prismatic	moderate	40"	rapid	medium

<u>EROSION:</u>	Erosion Class	1	2	3	4
	Percent of Area	45	40	15	0

<u>LAND CAPABILITY:</u>	Class	I	II	III	IV	V	VI	VII	VIII
	Percent of Area	0	80	20	0	0	0	0	0

GEOLOGY: Surface material consists of high terrace deposits and dune sands derived from Permian red beds of Quaternary age and of unknown depth. Source of information - Geology Department, Oklahoma State University.

SURFACE DRAINAGE: Good; length of principal waterway 280 feet.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff: type H-3 flume, water level recorder with 12-hr. time scale. Precipitation: one weighing recorder with 12-hr. time scale and one standard raingage.

WATERSHED CONDITIONS: Continuous wheat annually, tillage during fallow period with chisel type field cultivator (Hoame) to 6-inch depth with crosses chiseling if necessary to obtain good tillage, final tillage before seeding wheat with a rod weeder. This watershed was established August 4, 1960, and is a portion of W-4 previously published and which was discontinued as of August 4, 1960.

GENERALLY REPRESENTS: Rolling areas primarily cropped to wheat in the Central Rolling Red Prairies land resource area (H-80) in Oklahoma, Kansas and Texas.

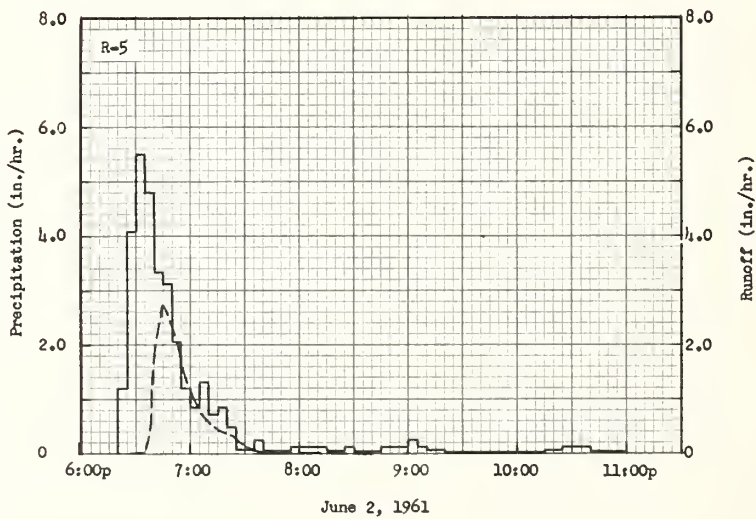
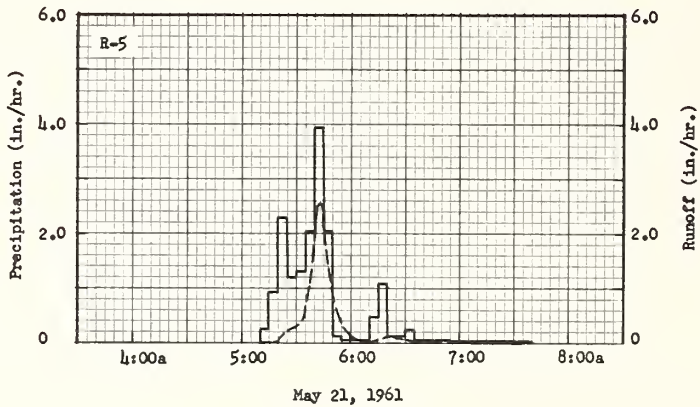
MONTHLY PRECIPITATION AND RUNOFF (Inches)												Cherokee, Oklahoma Watershed W-10 <sup>2/</sup>				
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P								2.72	2.39	3.53	0.35	1.34	10.33
Q									.01	.01	.26	.01	.05	.34		
1961	P	0.07	0.24	4.17	1.34	5.22	5.07	1.63	2.58	3.06	1.92	2.12	.90	28.32		
	Q	0	0	.50	.05	1.76	1.35	T	0	0	0	.07	0	3.73		
Normal	P <sup>3/</sup>	.80	.92	1.68	2.85	3.92	3.79	2.16	2.97	2.70	2.30	1.36	.97	26.42		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS												Cherokee, Oklahoma Watershed W-10				
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-18	0.04	10-18	0.03	10-18	0.04	10-18	0.05	12-10	0.05	12-10	0.05	12-10	0.05	10-18	0.05
1961	6-2	2.76	6-2	1.01	6-2	1.02	6-2	1.02	6-2	1.02	6-2	1.02	6-2	1.02	5-4	1.14

Notes: Quality of records: Monthly P and Q, excellent for 1960 and 1961, except Q for Oct. 1960 which is partially estimated due to the gaging device not operating for a short time while being repaired; annual maximum discharges and volumes, excellent. Watershed conditions: All of watershed area in continuous wheat annually. <sup>1/</sup> Precipitation from raingage R-5. <sup>2/</sup> This is a new watershed activated on August 4, 1960. Consists of a portion of old W-4. <sup>3/</sup> Normal P based on 47-year (1915-61) U. S. Weather Bureau record period at Cherokee, Okla. with 20 missing months between 1943 and 1959 estimated.

SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-10					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) <sup>1/</sup>	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 21, 1961</u>								
4-26-61	0.03	0	5-21-61	Raingage	R-5	5-21-61		
4-30	.24	0	5:10a	0	0	5:11a	0	0
5-4	1.18	.48	:15	.24	.02	:20	.0084	T
5-5	.50	0	:20	.96	.10	:23	.194	.01
5-7	1.19	.66	:25	2.28	.29	:31	.324	.04
5-8	.06	0	:30	1.20	.39	:33	.441	.05
5-16	.17	0	:35	1.32	.50	:35	.676	.07
5-21	.70 <sup>2/</sup>	T <sup>3/</sup>	:40	2.04	.67	:37	1.047	.10
			:45	3.96	1.00	:39	1.745	.15
			:50	2.04	1.17	:40	2.003	.18
Watershed Conditions: 100% of area in wheat 24 to 26 inches high, soil dry and hard on surface.			:55	.12	1.18	:41	2.32	.21
			6:10	.04	1.19	:42	2.49	.25
			:15	.48	1.23	:43	2.58	.30
			:20	1.08	1.32	:44	2.49	.34
			:25	.12	1.33	:45	2.32	.38
			:30	.12	1.34	:47	1.68	.44
			:35	.24	1.36	:49	1.13	.49
			:55	.03	1.37	:52	.717	.53
			7:40	.01	1.38	:54	.457	.55
						:56	.285	.56
						:59	.147	.57
						6:03	.050	.58
						:10	.0084	.58
						:20	.156	.60
						:38	.0084	.62
						7:34	0	.62
<u>Event of June 2, 1961</u>								
5-4-61	1.18	0.48	6-2-61	Raingage	R-5	6-2-61		
5-5	.50	0	6:20p	0	0	6:26p	0	0
5-7	1.19	.66	:25	1.20	.10	:33	.0110	T
5-8	.06	0	:30	4.08	.44	:37	.395	.01
5-16	.17	0	:35	5.52	.90	:38	.524	.01
5-21	2.08	.62	:40	4.80	1.30	:39	1.51	.03
5-25	.04	0	:45	3.36	1.58	:41	2.00	.09
			:50	3.12	1.84	:43	2.49	.17
			:55	2.04	2.01	:44	2.67	.21
			7:00	1.20	2.11	:45	2.76	.25
Watershed Conditions: 100% of area in wheat 26 to 30 inches high, soil dry and hard on surface.			:05	.84	2.18	:46	2.67	.30
			:10	1.32	2.29	:49	2.41	.43
			:15	.72	2.35	:53	1.93	.57
			:20	.84	2.42	:57	1.51	.68
			:25	.48	2.46	7:00	1.21	.75
			:35	.06	2.47	:02	.996	.79
			:40	.24	2.49	:04	.850	.82
			:55	.04	2.50	:08	.597	.87
			8:00	.12	2.51	:14	.457	.92
			:05	.12	2.52	:23	.324	.98
			:10	.12	2.53	:28	.194	1.00
			:15	.12	2.54	:32	.0990	1.01
			:25	.06	2.55	:34	.0501	1.02
			:30	.12	2.56	:37	.0204	1.02
			:45	.04	2.57	:38	.0110	1.02
			:50	.12	2.58	:49	.0062	1.02
			:55	.12	2.59	8:40	0	1.02
			9:00	.12	2.60			
			:05	.24	2.62			
			:10	.12	2.63			
			:20	.06	2.64			
			10:25	.02	2.66			
			:30	.12	2.67			
			:40	.12	2.69			
			11:00	.03	2.70			

Notes: To convert runoff in in/hr to cfs, multiply by 1.6940.

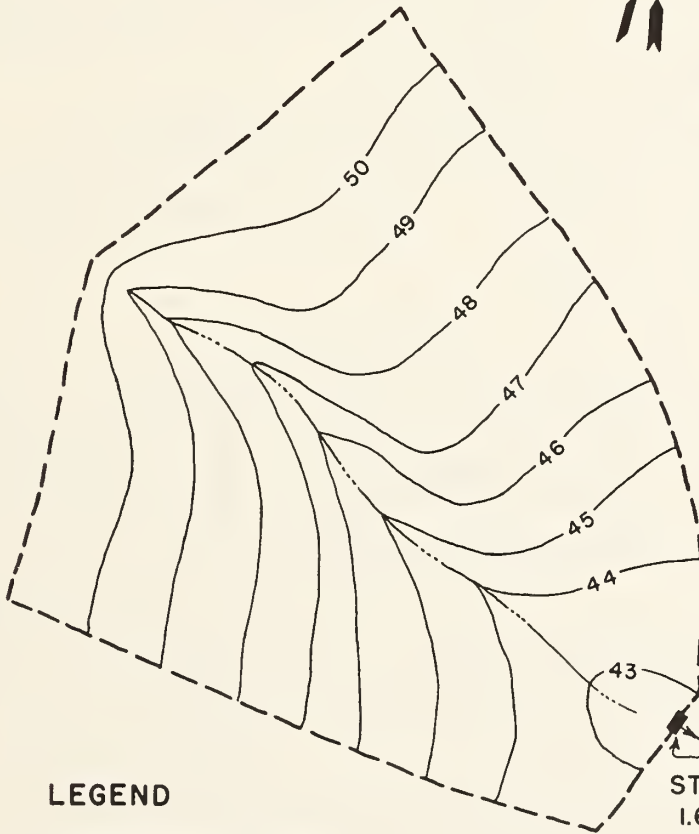
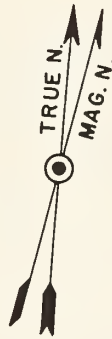
<sup>1/</sup> Raingage R-5. <sup>2/</sup> Rain ended at 2:10a. <sup>3/</sup> Runoff ended at 1:50a.



CHEROKKE, OKLAHOMA WATERSHED W-10



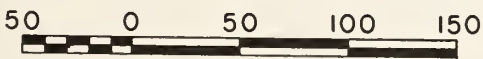
RAINGAGE  
R-5



LEGEND

- WATERSHED BOUNDARY
- WATERWAY
- 45 CONTOUR

GAGING  
STATION W-10  
1.68 ACRES



SCALE IN FEET

CONTOUR INTERVAL - 1 FOOT

CHEROKEE, OKLAHOMA  
WATERSHED W - 10

CHEROKEE, OKLAHOMA WATERSHED W-11

LOCATION: Alfalfa Co., Oklahoma; 2 mi. SW of Cherokee; Salt Fork of Arkansas River Basin.

AREA: 2.12 acres.

<u>SLOPES:</u>	Percent Slope	0-1%	1-3%	3-5%
	Percent of Area	0	70	30

SOILS: Well drained, moderately dark soils weakly developed from alluvial and aeolian deposits. B horizons are non-calcareous and vary from loam to light clay loam. Source of information - Agronomy Department, Oklahoma State University.

Type	% of Area	Topsoil			Subsoil		Substratum		Internal Drainage
		Avg. Depth	Structure	Permeability	Structure	Permeability	Avg. Depth	Permeability	
Grant Silt Loam	100	22"	fine granular	weak elow	moderate	medium prismatic	3 1/4"	moderate	medium

<u>EROSION:</u>	Erosion Class	1	2	3	4
	Percent of Area	60	40	0	0

<u>LAND CAPABILITY:</u>	Class	I	II	III	IV	V	VI	VII	VIII
	Percent of Area	0	70	30	0	0	0	0	0

GEOLOGY: Surface material consists of high terrace deposits and dune sands derived from Permian red beds of quaternary age and of unknown depth. Source of information - Geology Department, Oklahoma State University.

SURFACE DRAINAGE: Good, length of principal waterway 280 ft.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff: type H-4.5 flume, water level recorder with 12-hr. time scale. Precipitation: one weighing recorder with 12-hr. time scale and one standard raingage.

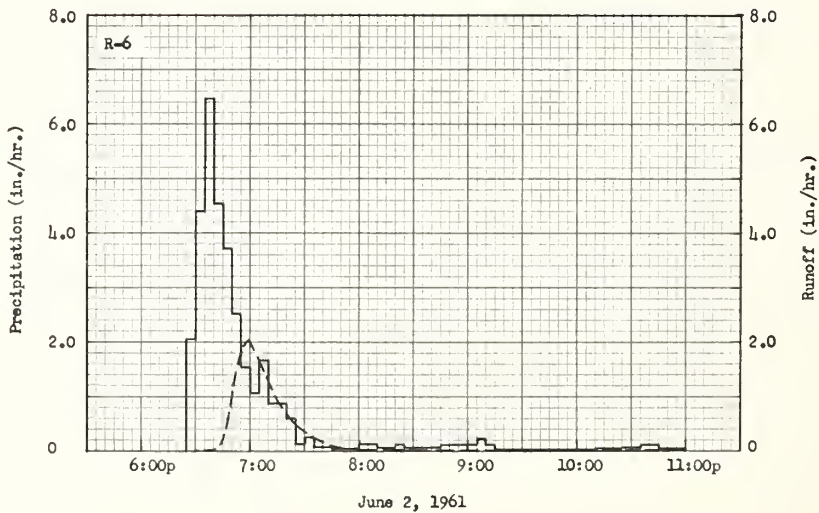
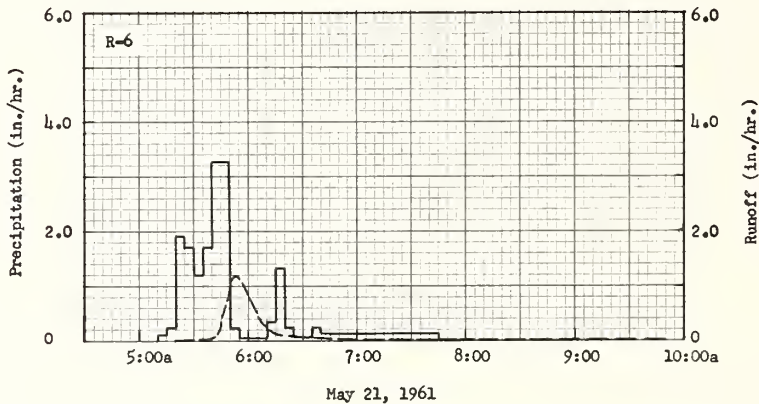
WATERSHED CONDITIONS: Continuous wheat annually, tillage during fallow period with large sweeps (8 ft.), final tillage before seeding wheat with a rod weeder. This watershed was established August 4, 1960, and is a portion of W-5 previously published and which was discontinued as of August 4, 1960.

GENERALLY REPRESENTS: Rolling areas primarily cropped to wheat in the Central Rolling Red Prairie land resource area (R-80) in Oklahoma, Kansas and Texas.

MONTHLY PRECIPITATION AND RUNOFF (Inches)													Cherokee, Oklahoma Watershed W-11 <sup>1/</sup>			
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
	1960	P								2.62	2.36	3.38	0.35	1.35	10.06	
Q									.09	0	.06	0	.02	.17		
1961	P	0.07	0.33	4.20	1.41	5.20	5.06	1.65	2.45	3.14	1.89	2.11	.92	28.43		
	Q	0	0	.46	.10	1.18	1.21	T	0	0	0	T	0	2.95		
Normal	P <sup>3/</sup>	.80	.92	1.68	2.85	3.92	3.79	2.16	2.97	2.70	2.30	1.36	.97	26.42		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													Cherokee, Oklahoma Watershed W-11			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-26	0.05	8-26	0.04	8-26	0.06	8-26	0.09	8-26	0.09	8-26	0.09	8-26	0.09	8-26	0.09
1961	6-2	2.03	6-2	.92	6-2	.94	6-2	.95	6-2	.95	6-2	.95	6-2	.95	6-2	.95
<p>Notes: Quality of records: Monthly P and Q excellent; annual maximum discharges and volumes - excellent. Watershed conditions: All of watershed area in continuous wheat annually.</p> <p><sup>1/</sup> Precipitation from Raingage R-6. <sup>2/</sup> This is a new watershed activated on August 4, 1960. Consists of a portion of old W-5. <sup>3/</sup> Normal P based on 47-year (1915-61) U. S. Weather Bureau record period at Cherokee, Okla. with 20 missing months between 1943 and 1959 estimated.</p>																

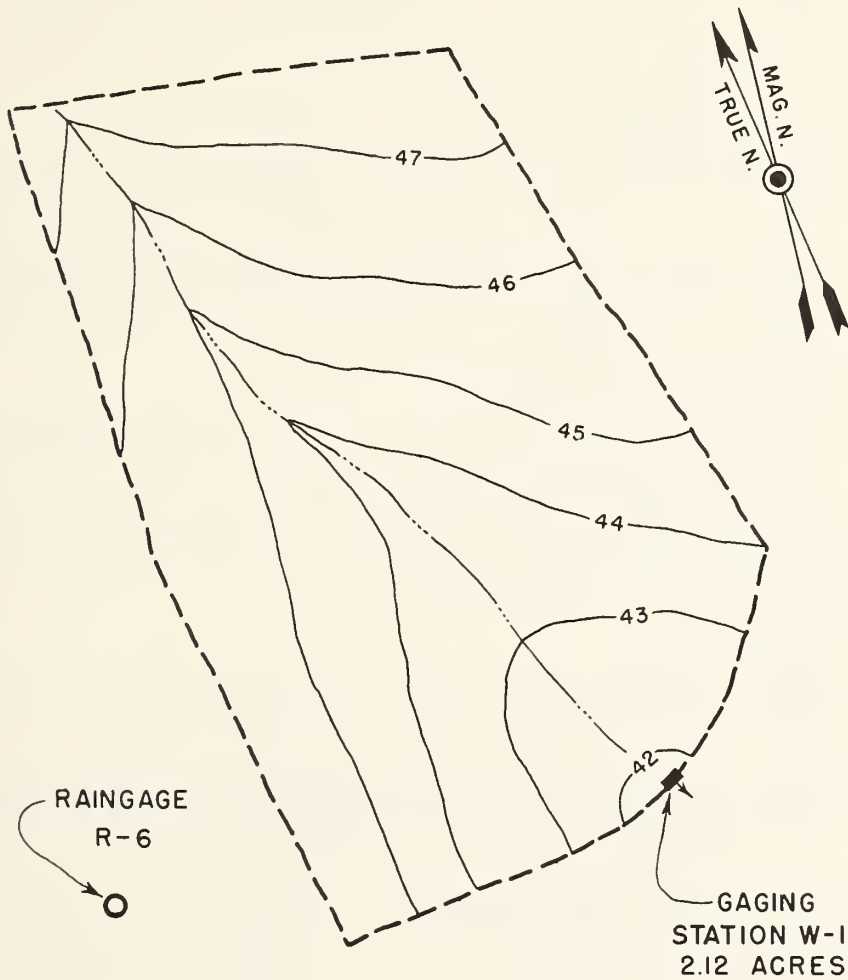
SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-11					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) 1/	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 21, 1961</u>								
4-26-61	0.03	0	5-21-61	Raingage	R-6	5-21-61		
4-30	.26	0	5:10a	0	0	5:19a	0	0
5-4	1.20	.15	:15	.12	.01	:39	.0231	T
5-5	.48	.06	:20	.24	.03	:43	.137	.01
5-7	1.23	.55	:25	1.92	.19	:45	.340	.01
5-8	.06	.01	:30	1.68	.33	:47	.552	.03
5-16	.16	0	:35	1.20	.43	:49	.819	.05
5-21	.70 2/	0	:40	1.68	.57	:51	1.05	.08
			:45	3.24	.84	:52	1.14	.10
			:50	3.24	1.11	:54	1.20	.14
Watershed Conditions: 100% of area in wheat 24 to 26 inches high, soil dry and hard on surface.			:55	.24	1.13	:56	1.14	.18
			6:10	.04	1.14	6:02	.778	.27
			:15	.36	1.17	:05	.518	.31
			:20	1.32	1.28	:07	.353	.32
			:25	.24	1.30	:10	.243	.34
			:35	.06	1.31	:13	.163	.35
			:40	.24	1.33	:16	.113	.35
			7:45	.12	1.34	:26	.0851	.37
						:39	.0725	.39
						:46	.0498	.39
						:53	.0311	.40
						7:12	.0097	.40
			8:10	.0004	.41			
			9:50	0	.41			
<u>Event of June 2, 1961</u>								
5-4-61	1.20	0.15	6-2-61	Raingage	R-6	6-2-61		
5-5	.48	.06	6:25p	0	0	6:28p	0	0
5-7	1.23	.55	:30	2.04	.17	:37	.0050	T
5-8	.06	.01	:35	4.20	.52	:40	.0193	T
5-16	.16	0	:40	6.48	1.06	:44	.154	.01
5-21	2.04	.41	:45	4.56	1.44	:46	.314	.01
5-25	.03	0	:50	3.72	1.75	:47	.502	.02
			:55	2.52	1.96	:49	.841	.04
			7:00	1.56	2.09	:51	1.17	.08
			:05	1.08	2.18	:52	1.36	.10
Watershed Conditions: 100% of area in wheat 26 to 30 inches high, soil dry and hard on surface.			:10	1.68	2.32	:54	1.60	.15
			:15	.84	2.39	:55	1.86	.18
			:20	.84	2.46	:57	1.96	.24
			:25	.60	2.51	:59	2.03	.31
			:30	.12	2.52	7:01	1.96	.37
			:35	.24	2.54	:05	1.69	.49
			:45	.06	2.55	:08	1.45	.57
			8:00	.04	2.56	:11	1.22	.64
			:05	.12	2.57	:17	.841	.74
			:10	.12	2.58	:24	.569	.82
			:20	.06	2.59	:30	.381	.87
			:25	.12	2.60	:34	.314	.89
:35	.06	2.61	:40	.172	.92			
:45	.06	2.62	:43	.121	.92			
:50	.12	2.63	:47	.0787	.93			
:55	.12	2.64	:50	.0551	.93			
9:00	.12	2.65	:57	.0270	.94			
:05	.12	2.66	8:14	.0072	.94			
:10	.24	2.68	9:46	.0004	.95			
:15	.12	2.69	11:00	0	.95			
10:10	.01	2.70						
:25	.04	2.71						
:35	.06	2.72						
:40	.12	2.73						
:45	.12	2.74						
11:00	.04	2.75						

Notes: To convert runoff in in/hr to cfs, multiply by 2.3377 .  
 1/ Raingage R-6. 2/ Rain ended at 2:15a.



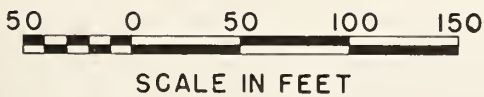
CHEROKEE, OKLAHOMA WATERSHED W-11





**LEGEND**

- WATERSHED BOUNDARY
- - - WATERWAY
- 43— CONTOUR



CONTOUR INTERVAL - 1 FOOT

**CHEROKEE, OKLAHOMA  
WATERSHED W - 11**

CHEROKEE, OKLAHOMA WATERSHED W- 12

**LOCATION:** Alfalfa, Co., Oklahoma; 2 mi. SW of Cherokee; Salt Fork of Arkansas River Basin.

**AREA:** 1.68 acres.

<b>SLOPES:</b>	Percent Slope	0-1%	1-3%	3-5%
	Percent of Area	0	98	2

**SOILS:** Well drained, moderately dark soils weakly developed from alluvial and aeolian deposits. B horizons are non-calcareous and vary from loam to light clay loam. Source of information - Agronomy Department, Oklahoma State University.

Type	% of Area	Topsoil			Subsoil		Substratum		Internal Drainage
		Avg. Depth	Structure	Permeability	Structure	Permeability	Avg. Depth	Permeability	
Grant Silt Loam	100	22"	weak : fine : granular	slow	moderate : medium : prismatic	moderate : moderate	3 1/2"	moderate	medium

<b>EROSION:</b>	Erosion Class	1	2	3	4
	Percent of Area	20	75	5	0

<b>LAND CAPABILITY:</b>	Class	I	II	III	IV	V	VI	VII	VIII
	Percent of Area	0	90	10	0	0	0	0	0

**GEOLOGY:** Surface material consists of high terrace deposits and duns sands derived from Permian red beds of Quaternary age and of unknown depth. Source of information - Geology Department, Oklahoma State University.

**SURFACE DRAINAGE:** Good, length of principal waterway 320 ft.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff: type H-3 flume, water level recorder with 12-hr. time scale. Precipitation: one weighing recorder with 12-hr. time scale and one standard raingage.

**WATERSHED CONDITIONS:** Continuous wheat annually, first tillage during fallow period with one-way disc harrow shallow (2 in. to 2 1/2 in.), succeeding tillages with chisel type field cultivator (Hoeme) to maximum depth of 6 inches and final tillage before seeding wheat with same tool with sweeps on shanks. This watershed was established July 1, 1960, and is a portion of W-6 previously published and which was discontinued as of July 1, 1960.

**GENERALLY REPRESENTS:** Rolling areas primarily cropped to wheat in the Central Rolling Red Prairies land resource area (H-80) in Oklahoma, Kansas and Texas.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Cherokee, Oklahoma Watershed W-12									
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year			
1960 P							5.74	2.68	2.24	3.67	0.35	1.37	16.05			
Q							1.00	0	0	.06	0	.01	1.07			
1961 P	0.10	0.31	4.00	1.38	5.29	5.23	1.61	2.51	3.05	1.96	2.08	.88	28.40			
Q	0	0	.33	.02	1.60	1.55	T	0	0	0	.02	0	3.52			
Normal P <sup>3/</sup>	.80	.92	1.68	2.85	3.92	3.79	2.16	2.97	2.70	2.30	1.36	.97	26.42			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Cherokee, Oklahoma Watershed W-12									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	7-4	2.86	7-4	0.89	7-4	0.96	7-3	0.98	7-3	0.98	7-3	0.98	7-3	0.98	7-3	0.98
1961	6-2	2.96	6-2	1.28	6-2	1.29	6-2	1.29	6-2	1.29	6-2	1.29	6-2	1.29	6-2	1.29

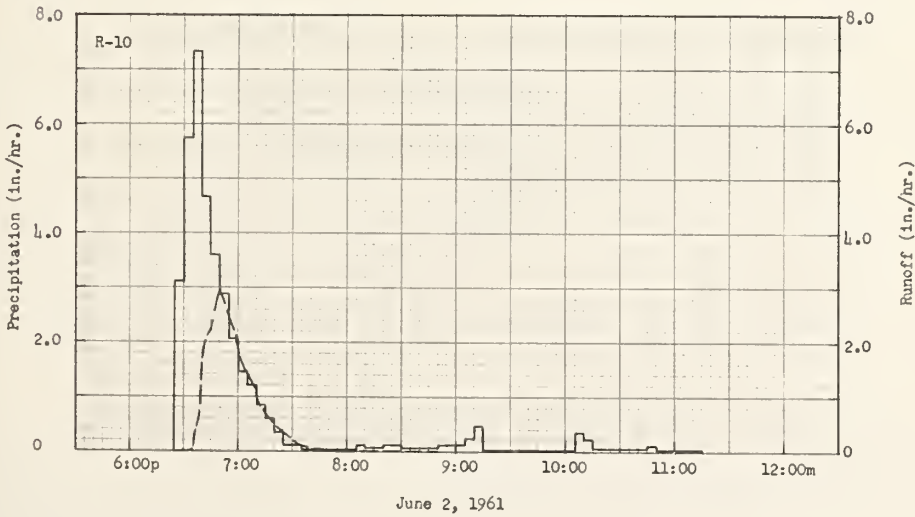
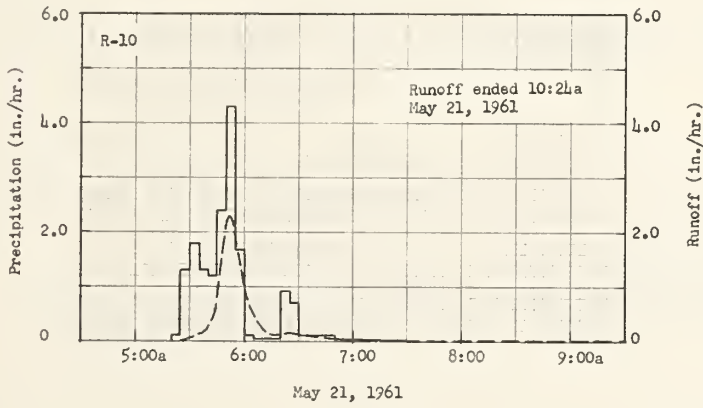
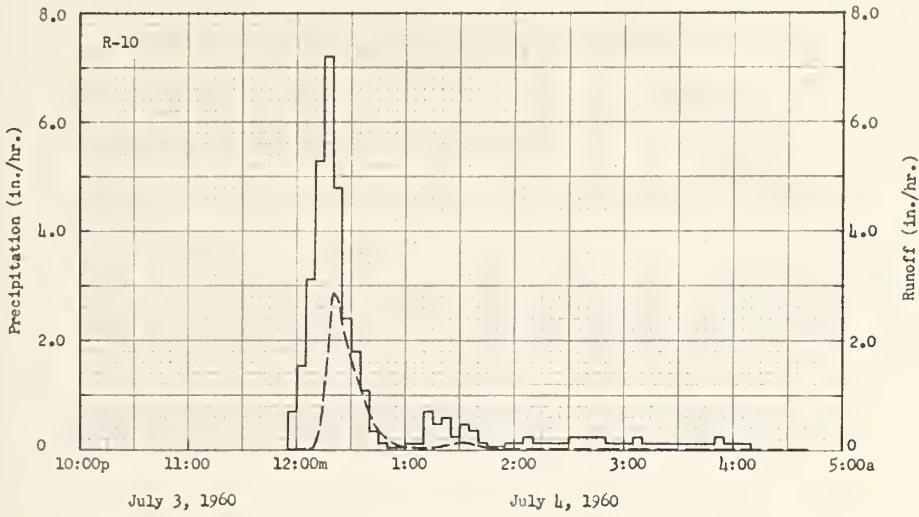
Notes: Quality of records: Monthly P and Q - excellent; annual maximum discharges and volumes - excellent. Watershed conditions: All of watershed area in continuous wheat annually.  
<sup>1/</sup> Precipitation from Raingage R-10. <sup>2/</sup> This is a new watershed activated on July 1, 1960. Consists of a large portion of old W-6. <sup>3/</sup> Normal P based on 47-year (1915-61) U. S. Weather Bureau record period at Cherokee, Okla. with 20 missing months between 1943 and 1959 estimated.

SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-12					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) <sup>1/</sup>	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<b>Event of July 3 and 4, 1960</b>								
6-5-60	1.78	0.47	7-3-60	Raingage	R-10	7-3-60		
6-6	.13	0	11:55p	0	0	11:55p	0	0
6-7	.27	0	12:00m	.72	.06	12:00m	.0003	T
6-8	.15	0	7-4-60			7-4-60		
6-10	.60	.03	12:05a	1.56	.19	12:06a	.0043	T
6-11	.05	0	:10	3.12	.45	:12	.312	.01
6-12	.17	0	:15	5.28	.89	:13	.562	.02
6-13	.04	0	:20	7.20	1.49	:16	1.33	.06
6-15	.04	0	:25	4.80	1.89	:18	2.29	.12
7-3	.41 <sup>2/</sup>	0	:30	2.40	2.09	:19	2.63	.16
Watershed Conditions: 100% of area in standing wheat stubble, soil moist but hard on surface.			:35	1.80	2.24	:20	2.77	.21
			:40	1.08	2.33	:21	2.86	.25
			:45	.36	2.36	:23	2.77	.35
			:50	.12	2.37	:24	2.50	.39
			1:00	.06	2.38	:26	2.17	.47
			:05	.12	2.39	:32	1.58	.66
			:10	.12	2.40	:36	1.10	.75
			:15	.72	2.46	:38	.9007	.78
			:20	.48	2.50	:42	.5803	.83
			:25	.60	2.55	:45	.381	.85
			:30	.24	2.57	:49	.205	.87
			:35	.48	2.61	:54	.114	.88
			:40	.36	2.64	1:00	.0610	.89
			:45	.12	2.65	:04	.0362	.89
			:55	.06	2.66	:15	.0362	.90
			2:00	.12	2.67	:19	.0556	.90
			:05	.12	2.68	:26	.1067	.91
			:10	.24	2.70	:28	.1302	.92
			:15	.12	2.71	:32	.1386	.93
			:20	.12	2.72	:36	.1302	.94
			:25	.12	2.73	:38	.1067	.94
			:30	.12	2.74	:42	.0855	.95
			:35	.24	2.76	:48	.0454	.95
			:40	.24	2.78	:58	.0205	.96
			:45	.24	2.80	2:20	.0085	.96
:50	.24	2.82	3:26	.0085	.97			
:55	.12	2.83	:52	.0062	.97			
3:00	.12	2.84	4:00	.0062	.97			
:05	.12	2.85	:42	0	.98			
:10	.24	2.87						
:15	.12	2.88						
:45	.12	2.94						
:50	.12	2.95						
:55	.24	2.97						
4:00	.12	2.98						
:10	.12	3.00						
<b>Event of May 21, 1961</b>								
4-26-61	0.03	0	5-21-61	Raingage	R-10	5-21-61		
4-30	.25	0	5:20a	0	0	5:20a	0	0
5-4	1.19	.25	:25	.12	.01	:25	.0043	T
5-5	.50	.08	:30	1.32	.12	:28	.0362	T
5-7	1.20	.62	:35	1.80	.27	:33	.1067	.01
5-8	.04	T	:40	1.32	.38	:38	.195	.02
5-16	.16	0	:45	1.20	.48	:41	.299	.03
5-21	.78 <sup>3/</sup>	0	:50	2.40	.68	:43	.459	.05
Watershed Conditions: 100% of area in wheat 2 1/2 to 26 inches high, soil dry and hard on surface.			:55	4.32	1.04	:45	.699	.06
			6:00	1.68	1.18	:46	.853	.08
			:05	.12	1.19	:48	1.72	.12
			:20	.04	1.20	:50	2.01	.18
			:25	.96	1.28	:51	2.25	.22
:30	.72	1.34	:52	2.29	.26			
:35	.12	1.35	:53	2.25	.29			

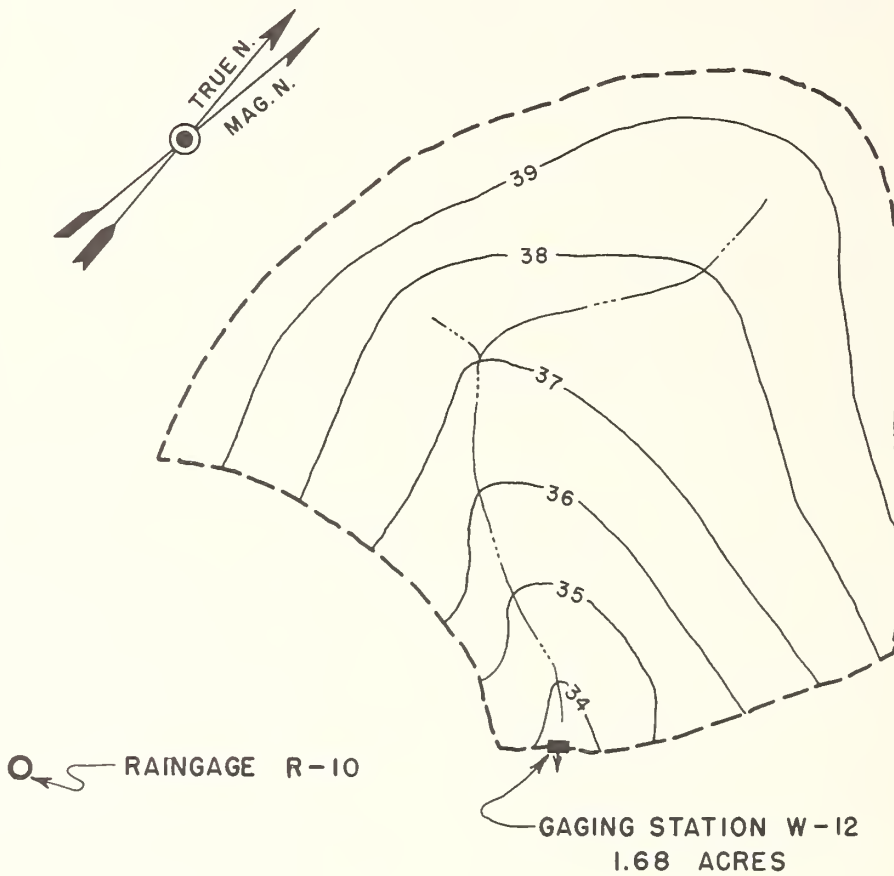
Notes: To convert runoff in in/hr to cfs, multiply by 1.6940.  
<sup>1/</sup> Raingage R-10. <sup>2/</sup> Rain ended at 4:26p. <sup>3/</sup> Rain ended at 2:25a.

SELECTED RUNOFF EVENTS						Cherokee, Oklahoma Watershed W-12		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) $\frac{1}{2}$	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 21, 1961 (continued)								
			5-21-61 6:50a 7:30	0.12 .02	1.38 1.39	5-21-61 5:56a :59 6:01 :04 :07  :09 :13 :15 :18 :21  :23 :25 :27 :31 :43  :56 7:10 10:24a	1.72 1.22 .808 .526 .353  .238 .156 .130 .114 .130  .147 .156 .147 .122 .0556  .0279 .0139 0	0.39 .46 .50 .53 .55  .56 .57 .58 .59  .60 .60 .61 .62 .63  .64 .65 .65
Event of June 2, 1961								
5-4-61	1.19	0.25	6-2-61	Raingage	R-10	6-2-61		
5-5	.50	.08	6:25p	0	0	6:25p	0	0
5-7	1.20	.62	:30	3.12	.26	:34	.0241	T
5-8	.04	T	:35	5.76	.74	:36	.185	T
5-16	.16	0	:40	7.32	1.35	:37	.459	.01
5-21	2.17	.65	:45	4.68	1.74	:38	.638	.02
5-25	.03	0	:50	3.60	2.04	:39	.950	.03
			:55	2.88	2.28	:40	1.52	.05
			7:00	2.04	2.45	:41	1.75	.08
			:05	1.44	2.57	:42	1.90	.11
			:10	1.20	2.67	:45	2.21	.21
			:15	.84	2.74	:49	2.86	.38
			:20	.60	2.79	:50	2.96	.43
			:25	.36	2.82	:51	2.86	.48
			:30	.12	2.83	:54	2.55	.61
			:35	.12	2.84	:58	2.21	.77
			8:05	.02	2.85	7:00	1.90	.84
			:10	.12	2.86	:02	1.62	.90
			:20	.06	2.87	:05	1.36	.97
			:25	.12	2.88	:09	1.13	1.06
			:30	.12	2.89	:15	.741	1.15
			:40	.06	2.90	:21	.492	1.21
			:50	.06	2.91	:27	.325	1.25
			:55	.12	2.92	:30	.216	1.26
			9:00	.12	2.93	:32	.139	1.27
			:05	.12	2.94	:35	.0923	1.28
			:10	.24	2.96	:38	.0610	1.28
			:15	.48	3.00	:41	.0406	1.28
			10:05	.01	3.01	:44	.0241	1.28
			:10	.36	3.04	:53	.0110	1.29
			:15	.24	3.06	8:05	.0027	1.29
			:45	.02	3.07	:50	0	1.29
			:50	.12	3.08			
			11:15	.02	3.09			
<p>Watershed Conditions: 100% of area in wheat 26 to 30 inches high, soil dry and hard on surface.</p>								
<p>Notes: To convert runoff in in/hr to cfs, multiply by 1.6940 .  <math>\frac{1}{2}</math> Raingage R-10.</p>								



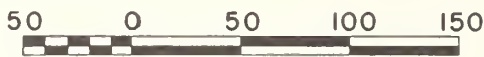


CHEROKEE, OKLAHOMA WATERSHED W-12



**LEGEND**

- WATERSHED BOUNDARY
- 37 — CONTOUR
- ..... WATERWAY



SCALE IN FEET

CONTOUR INTERVAL - 1 FOOT

**CHEROKEE, OKLAHOMA  
WATERSHED W - 12**

CHEROKEE, OKLAHOMA WATERSHED W-13

LOCATION: Alfalfa Co., Oklahoma; 2 mi. SW of Cherokee; Salt Fork of Arkansas River Basin.

AREA: 1.99 acres.

<u>SLOPES:</u>	Percent Slope	0-1%	1-3%	3-5%
	Percent of Area	0	95	5

SOILS: Well drained, moderately dark soils weakly developed from alluvial and aeolian deposits. B horizons are non-calcareous and vary from loam to light clay loam. Source of information - Agronomy Department, Oklahoma State University.

Type	% of Area	Topsoil			Subsoil			Substratum		Internal Drainage
		Avg. Depth	Structure	Permeability	Structure	Permeability	Avg. Depth	Permeability		
Orant Silt Loam	100	22"	weak fine granular	slow	moderate medium prismatic	moderate	34"	moderate	medium	

<u>EROSION:</u>	Erosion Class	1	2	3	4
	Percent of Area	85	15	0	0

<u>LAND CAPABILITY:</u>	Class	I	II	III	IV	V	VI	VII	VIII
	Percent of Area	0	100	0	0	0	0	0	0

GEOLOGY: Surface material consists of high terrace deposits and dune sands derived from Parnian red beds of Quaternary age and of unknown depth. Source of information - Geology Department, Oklahoma State University.

SURFACE DRAINAGE: Good, length of principal waterway 380 ft.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff: type H-3 flume, water level recorder with 12-hr. time scale. Precipitation: one waighing recorder with 12-hr. time scale and one standard raingaga.

WATERSHED CONDITIONS: Continuous wheat annually, tillage during fallow period with chisel type field cultivator (Hoama) to 6 inch depth with cross chiseling if necessary to obtain good tillage, final tillage before seeding wheat with a rod weeder. This watershed was established July 1, 1960, and is the same area as W-7 previously published but with different tillage practices. Watershed W-7 was discontinued as of July 1, 1960.

GENERALLY REPRESENTS: Rolling areas primarily cropped to wheat in the Central Rolling Red Prairies Land resource area (H-80) in Oklahoma, Kansas and Texas.

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)												Cherokee, Oklahoma Watershed W-13 <sup>2/</sup>	
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P							5.57	2.71	2.20	3.63	0.33	1.33	15.77
Q							.52	0	0	.01	0	.01	.54
1961 P	0.09	0.24	4.15	1.50	5.40	5.45	1.67	2.55	3.35	1.94	2.17	.95	29.46
Q	0	0	.41	.05	1.59	1.46	0	0	0	0	0	0	3.51
Normal P <sup>3/</sup>	.80	.92	1.68	2.85	3.92	3.79	2.16	2.97	2.70	2.30	1.36	.97	26.42

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS												Cherokee, Oklahoma Watershed W-13				
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	7-4	1.17	7-4	0.48	7-4	0.51	7-4	0.52	7-4	0.52	7-4	0.52	7-4	0.52	7-4	0.52
1961	6-2	2.83	6-2	1.16	6-2	1.20	6-2	1.20	6-2	1.20	6-2	1.20	6-2	1.20	6-2	1.20

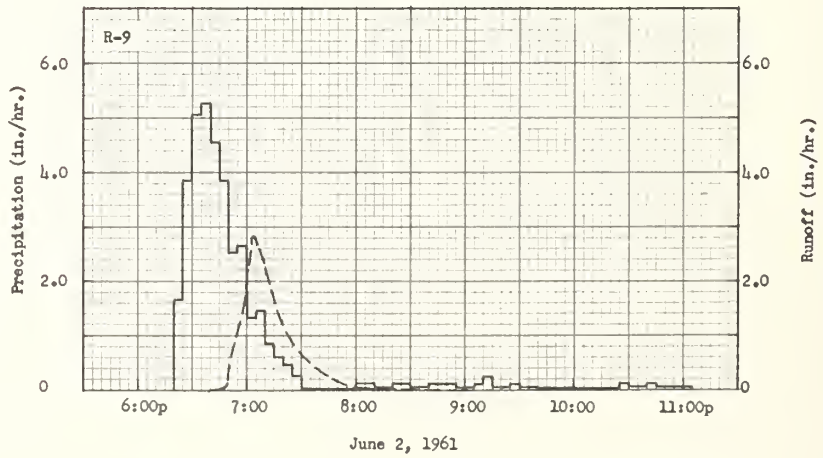
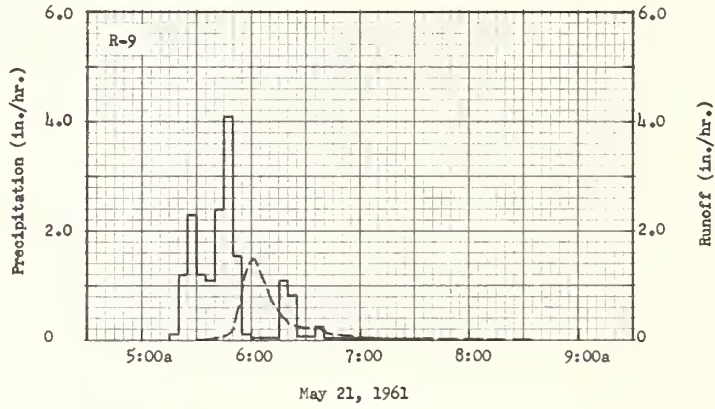
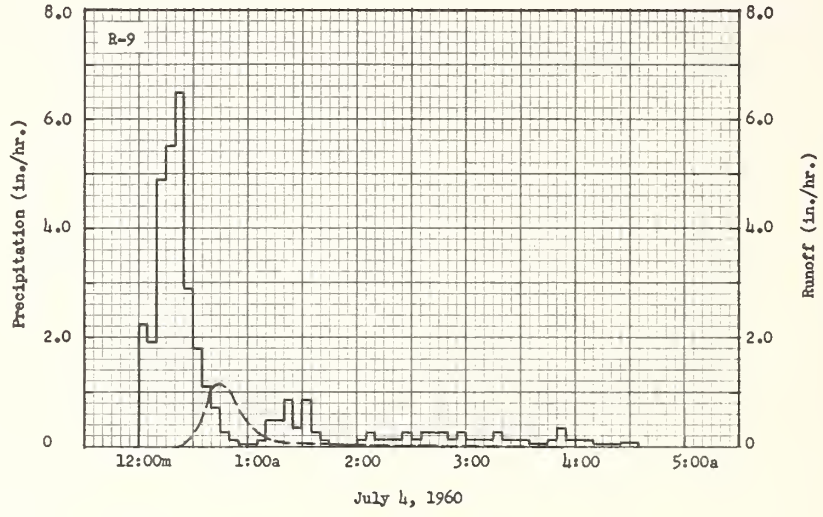
Notes: Quality of records: Monthly P and Q - excellent; annual maximum discharges and volumes - excellent. Watershed conditions: All of watershed area in continuous wheat annually.  
<sup>1/</sup> Precipitation from Raingage R-9. <sup>2/</sup> This is a new watershed activated on July 1, 1960. Consists of same area as old W-7, but tillage procedure has been changed. <sup>3/</sup> Normal P based on 47-year (1915-61) U. S. Weather Bureau record period at Cherokee, Okla. with 20 missing months between 1943 and 1959 estimated.

SELECTED RUNOFF EVENTS				Cherokee, Oklahoma Watershed W-13				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) <sup>1/</sup>	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 4, 1960</u>								
6-5-60	1.80	0.58	7-4-60	Raingage	R-9	7-4-60		
6-6	.10	0	12:00	0	0	12:20a	0	0
6-7	.26	0	:05a	2.28	.19	:21	.0022	T
6-8	.16	.01	:10	1.92	.35	:24	.0173	T
6-10	.62	.05	:15	4.92	.76	:27	.0963	T
6-11	.05	0	:20	5.52	1.22	:30	.2105	.01
6-12	.17	0	:25	6.48	1.76	:33	.4006	.02
6-13	.05	0	:30	2.88	2.00	:35	.589	.04
6-15	.03	0	:35	1.80	2.15	:38	.843	.08
7-3	.41	0	:40	1.08	2.24	:42	1.12	.14
			:45	.72	2.30	:44	1.17	.18
			:50	.24	2.32	:47	1.12	.24
			:55	.12	2.33	:50	1.02	.29
			1:05	.06	2.34	:52	.886	.32
			:10	.12	2.35	:56	.643	.37
			:15	.48	2.39	1:00	1.44	.41
			:20	.48	2.43	:04	.309	.43
			:25	.84	2.50	:07	.210	.45
			:30	.36	2.53	:10	.148	.46
			:35	.84	2.60	:15	.0963	.47
			:40	.24	2.62	:20	.0721	.47
			:45	.12	2.63	:50	.0424	.50
			2:00	.04	2.64	2:13	.0203	.51
			:05	.12	2.65	:40	.0053	.51
			:10	.24	2.67	3:53	0	.52
			:15	.12	2.68			
			:20	.12	2.69			
			:25	.12	2.70			
			:30	.24	2.72			
			:35	.12	2.73			
			:40	.24	2.75			
			:50	.24	2.79			
			:55	.12	2.80			
			3:00	.24	2.82			
			:05	.12	2.83			
			:15	.12	2.85			
			:20	.24	2.87			
			:25	.12	2.88			
			:35	.12	2.90			
			:45	.06	2.91			
			:50	.12	2.92			
			:55	.36	2.95			
			4:00	.12	2.96			
			:10	.12	2.98			
			:25	.04	2.99			
			:35	.06	3.00			
<u>Event of May 21, 1961</u>								
4-26-61	0.03	0	5-21-61	Raingage	R-9	5-21-61		
4-30	.27	0	5:15a	0	0	5:30a	0	0
5-4	1.18	.19	:20	.12	.01	:36	.0071	T
5-5	.54	.09	:25	1.20	.11	:40	.0235	T
5-7	1.34	.71	:30	2.28	.30	:46	.103	.01
5-8	.04	.01	:35	1.20	.40	:50	.191	.02
5-16	.17	0	:40	1.08	.49	:52	.415	.03
5-21	.71 <sup>2/</sup>	0	:45	2.40	.69	:54	.760	.05
			:50	4.08	1.03	:55	.954	.06
			:55	1.56	1.16	:56	1.17	.08
			6:00	.12	1.17	:57	1.23	.10
			:15	.04	1.18	:59	1.42	.14
			:20	1.08	1.27	6:01	1.51	.19
			:25	.84	1.34	:04	1.28	.26
			:35	.06	1.35	:07	1.07	.32
			Watershed Conditions: 100% of area in wheat 24 to 26 inches high, soil dry and hard on surface.					

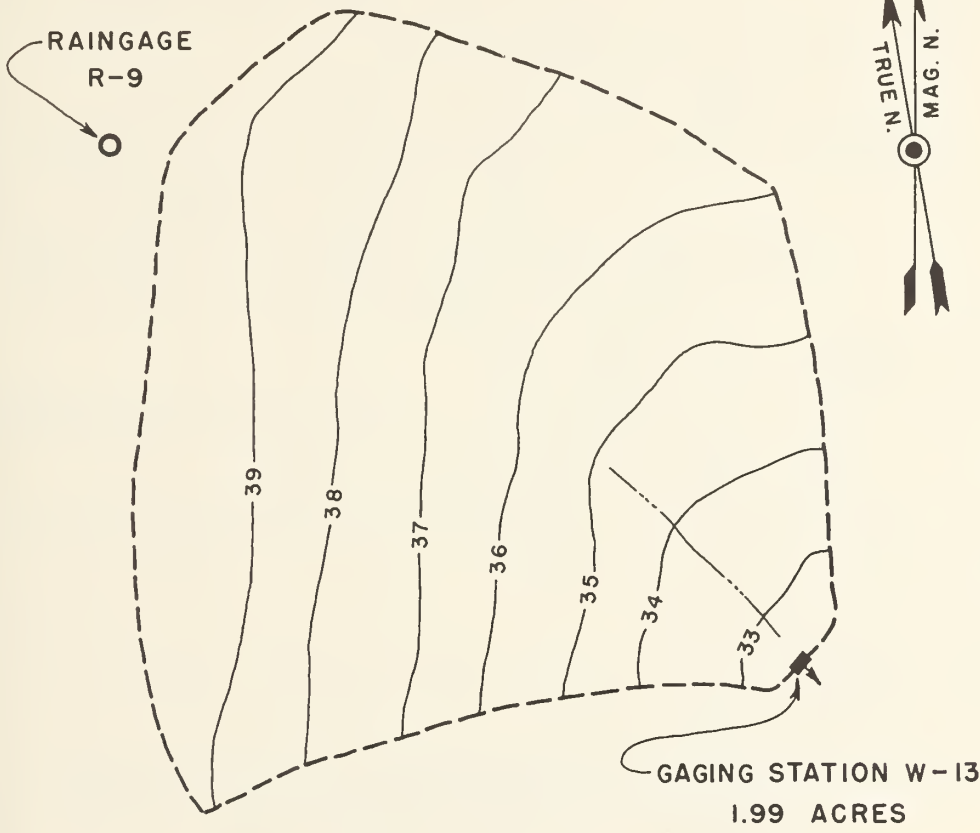
Notes: To convert runoff in in/hr to cfs, multiply by 2.0066 .  
<sup>1/</sup> Raingage R-9. <sup>2/</sup> Rainfall ended at 2:25a.



SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-13					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) $\frac{1}{2}$	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 21, 1961 (continued)</u>								
			5-21-61			5-21-61		
			6:40a	0.24	1.37	6:09a	0.886	0.35
			7:00	.03	1.38	:11	.720	.38
			:40	.02	1.39	:16	.474	.43
						:21	.309	.46
						:27	.252	.49
						:32	.252	.51
						:38	.201	.53
						:41	.164	.54
						:49	.110	.56
						:59	.0721	.57
						7:05	.0468	.58
						:15	.0235	.58
						:20	.0117	.59
						:40	.0036	.59
						8:34	0	.59
<u>Event of June 2, 1961</u>								
5-4-61	1.18	0.19	6-2-61	Raingage	R-9	6-2-61		
5-5	.54	.09	6:20p	0	0	6:39p	0	0
5-7	1.34	.71	:25	1.68	.14	:45	.0071	T
5-8	.04	.01	:30	3.84	.46	:48	.0899	T
5-16	.17	0	:35	5.04	.88	:50	.286	.01
5-21	2.10	.59	:40	5.28	1.32	:52	.720	.02
5-25	.03	0	:45	4.56	1.70	:55	1.07	.07
			:50	3.84	2.02	:58	1.51	.14
			:55	2.52	2.23	7:00	1.97	.19
			7:00	2.64	2.45	:01	2.26	.23
			:05	1.32	2.56	:02	2.58	.27
			:10	1.44	2.68	:03	2.83	.31
			:15	.84	2.75	:08	2.50	.54
			:20	.60	2.80	:11	2.18	.65
			:25	.48	2.84	:13	1.90	.72
			:30	.24	2.86	:16	1.63	.81
			8:00	.02	2.87	:20	1.17	.90
			:05	.12	2.88	:23	.977	.95
			:10	.12	2.89	:31	.643	1.06
			:20	.06	2.90	:40	.347	1.13
			:25	.12	2.91	:45	.231	1.16
			:30	.12	2.92	:49	.156	1.17
			:40	.06	2.93	:53	.103	1.18
			:45	.12	2.94	8:00	.0563	1.19
			:50	.12	2.95	:08	.0235	1.19
			:55	.12	2.96	:22	.0071	1.19
			9:05	.06	2.97	:55	.0003	1.20
			:10	.12	2.98	9:02	0	1.20
			:15	.24	3.00			
			:25	.06	3.01			
			:30	.12	3.02			
			:40	.06	3.03			
			10:00	.03	3.04			
			:25	.02	3.05			
			:30	.12	3.06			
			:40	.06	3.07			
			:45	.12	3.08			
			:55	.06	3.09			
			11:05	.06	3.10			
<p>Notes: To convert runoff in in/hr to cfs, multiply by 2.0066 .  <math>\frac{1}{2}</math> Raingage R-9.</p>								



CHEROKEE, OKLAHOMA WATERSHED W-13



**LEGEND**

- WATERSHED BOUNDARY
- ~35~ CONTOUR
- - - WATERWAY



SCALE IN FEET

CONTOUR INTERVAL - 1 FOOT

**CHEROKEE, OKLAHOMA  
WATERSHED W - 13**

## CHEROKEE, OKLAHOMA WATERSHED W-11

LOCATION: Alfalfa Co., Oklahoma; 2 mi. SW of Cherokee; Salt Fork of Arkansas River Basin.

AREA: 2.16 acres.

<u>SLOPES:</u>	Percent Slope	0-1%	1-3%	3-5%
	Percent of Area	0	40	60

SOILS: Well drained, moderately dark soils weakly developed from alluvial and aeolian deposits. B horizons are non-calcareous and vary from loam to light clay loam. Source of information - Agronomy Department, Oklahoma State University.

Type	% of Area	Topsoil			Subsoil		Substratum		Internal Drainage
		Avg. Depth	Structure	Permeability	Structure	Permeability	Avg. Depth To	Permeability	
Grant Silt Loam	100	22"	fine granular	slow	moderate medium	moderate	3 1/4"	moderate	medium

<u>EROSION:</u>	Erosion Class	1	2	3	4
	Percent of Area	57	40	3	0

<u>LAND CAPABILITY:</u>	Class	I	II	III	IV	V	VI	VII	VIII
	Percent of Area	0	85	15	0	0	0	0	0

GEOLOGY: Surface material consists of high terrace deposits and dune sands derived from Permian red beds of Quaternary age and of unknown depth. Source of information - Geology Department, Oklahoma State University.

SURFACE DRAINAGE: Good, length of principal waterway 210 ft.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff: type H-3 flume, water level recorder with 12-hr. time scale. Precipitation: one weighing recorder with 12-hr. time scale and one standard raingage.

WATERSHED CONDITIONS: Continuous wheat annually, first tillage during fallow period with one-way disc harrow shallow (2 in. to 2 1/2 in.), succeeding tillages with chisel type field cultivator (Hoeme) to maximum depth of 6 inches and final tillage before seeding wheat with same tool with sweeps on shanks. This watershed was established September 1, 1960, and is a portion of W-8 previously published and which was discontinued as of September 1, 1960.

GENERALLY REPRESENTS: Rolling areas primarily cropped to wheat in the Central Rolling Red Prairies Land resource area (H-80) in Oklahoma, Kansas and Texas.

MONTHLY PRECIPITATION AND RUNOFF (Inches)												Cherokee, Oklahoma Watershed W-11				
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P									2.20	3.63	0.33	1.33	7.49
Q										0	.04	0	.02	.06		
1961	P	0.09	0.24	4.15	1.50	5.40	5.45	1.67	2.55	3.35	1.94	2.17	.95	29.46		
	Q	0	0	.18	.01	1.33	1.24	0	0	0	0	0	0	2.76		
Normal	P <sup>3/</sup>	.80	.92	1.68	2.85	3.92	3.79	2.16	2.97	2.70	2.30	1.36	.97	26.42		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS												Cherokee, Oklahoma Watershed W-11				
YEAR	MAXIMUM DISCHARGE	MAXIMUM VOLUME FOR SELECTED TIME INTERVAL														
		1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days		
		Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	
1960	10-25	0.07	10-25	0.01	10-25	0.01	12-10	0.02	10-30	0.02	10-30	0.03	10-30	0.03	10-25	0.04
1961	6-2	2.29	6-2	1.07	6-2	1.08	6-2	1.08	6-2	1.08	6-2	1.08	6-2	1.08	6-2	1.08
Notes: Quality of records: Monthly P and Q - excellent; annual maximum discharges and volumes - excellent. Watershed conditions: All of watershed area in continuous wheat annually.																
<sup>1/</sup> Precipitation from Raingage R-9. <sup>2/</sup> This is a new watershed activated on Sept. 1, 1960. Consists of a portion of old W-8. <sup>3/</sup> Normal P based on 47-year (1915-61) U. S. Weather Bureau record period at Cherokee, Okla. with 20 missing months between 1943 and 1959 estimated.																

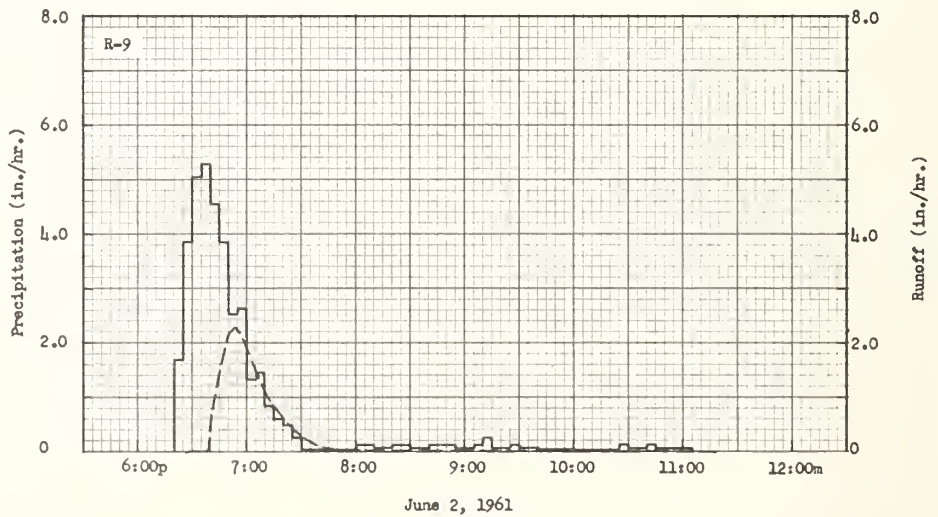
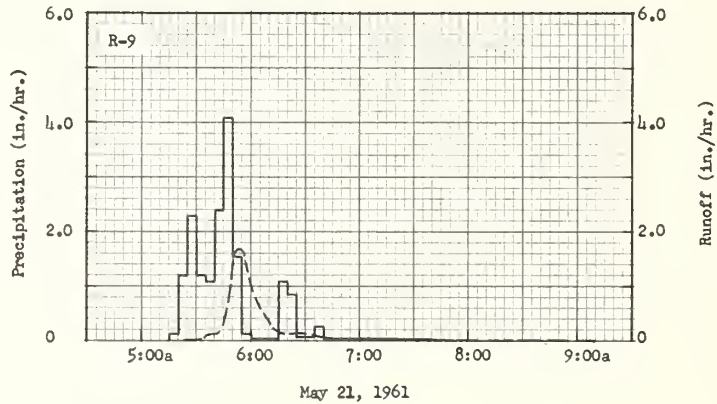


SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-14					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) <u>1/</u>	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 21, 1961</u>								
4-26-61	0.03	0	5-21-61	Raingage	R-9	5-21-61		
4-30	.27	0	5:15a	0	0	5:23a	0	0
5-4	1.18	.15	:20	.12	.01	:33	.0159	T
5-5	.54	.06	:25	1.20	.11	:35	.0715	T
5-7	1.34	.60	:30	2.28	.30	:40	.128	.01
5-8	.04	T	:35	1.20	.40	:43	.193	.02
5-16	.17	0	:40	1.08	.49	:45	.307	.03
5-21	.71 <u>2/</u>	0	:45	2.40	.69	:47	.525	.04
			:50	4.08	1.03	:49	.985	.07
			:55	1.56	1.16	:51	1.50	.11
			6:00	.12	1.17	:52	1.62	.13
			:15	.04	1.18	:54	1.68	.19
			:20	1.08	1.27	:56	1.62	.24
			:25	.84	1.34	:57	1.44	.27
			:35	.06	1.35	:58	1.28	.29
			:40	.24	1.37	6:01	.941	.35
			7:00	.03	1.38	:04	.625	.39
			:40	.02	1.39	:08	.408	.42
						:11	.273	.44
						:13	.184	.44
						:18	.128	.46
						:20	.121	.46
						:23	.128	.47
						:27	.136	.48
						:30	.121	.48
						:33	.101	.49
						:36	.0826	.49
						:40	.0517	.50
						:45	.0351	.50
						:48	.0216	.50
						:53	.0107	.50
						9:10	0	.51
<u>Event of June 2, 1961</u>								
5-4-61	1.18	0.15	6-2-61	Raingage	R-9	6-2-61		
5-5	.54	.06	6:20p	0	0	6:27p	0	0
5-7	1.34	.60	:25	1.68	.14	:38	.0351	T
5-8	.04	T	:30	3.84	.46	:40	.355	.01
5-16	.17	0	:35	5.04	.88	:42	.814	.03
5-21	2.10	.51	:40	5.28	1.32	:43	1.03	.04
5-25	.03	0	:45	4.56	1.70	:45	1.38	.08
			:50	3.84	2.02	:47	1.68	.13
			:55	2.52	2.23	:49	2.04	.19
			7:00	2.54	2.45	:50	2.15	.23
			:05	1.32	2.56	:53	2.29	.34
			:10	1.44	2.68	:56	2.13	.45
			:15	.84	2.75	7:00	1.90	.59
			:20	.60	2.80	:03	1.65	.68
			:25	.48	2.84	:05	1.41	.73
			:30	.24	2.86	:08	1.20	.79
			8:00	.02	2.87	:11	1.01	.85
			:05	.12	2.88	:15	.834	.91
			:10	.12	2.89	:18	.679	.95
			:20	.06	2.90	:25	.449	1.01
			:25	.12	2.91	:29	.295	1.04
			:30	.12	2.92	:35	.193	1.06
			:40	.06	2.93	:37	.128	1.07
			:45	.12	2.94	:41	.0885	1.07
			:50	.12	2.95	:45	.0473	1.08
			:55	.12	2.96	:50	.0187	1.08
			9:05	.06	2.97	8:07	.0021	1.08
			:10	.12	2.98	11:18	0	1.08
			:15	.24	3.00			
Notes: To convert runoff in in/hr to cfs, multiply by 2.1780 .								
<u>1/</u> Raingage R-9. <u>2/</u> Rainfall ended at 2:25a.								

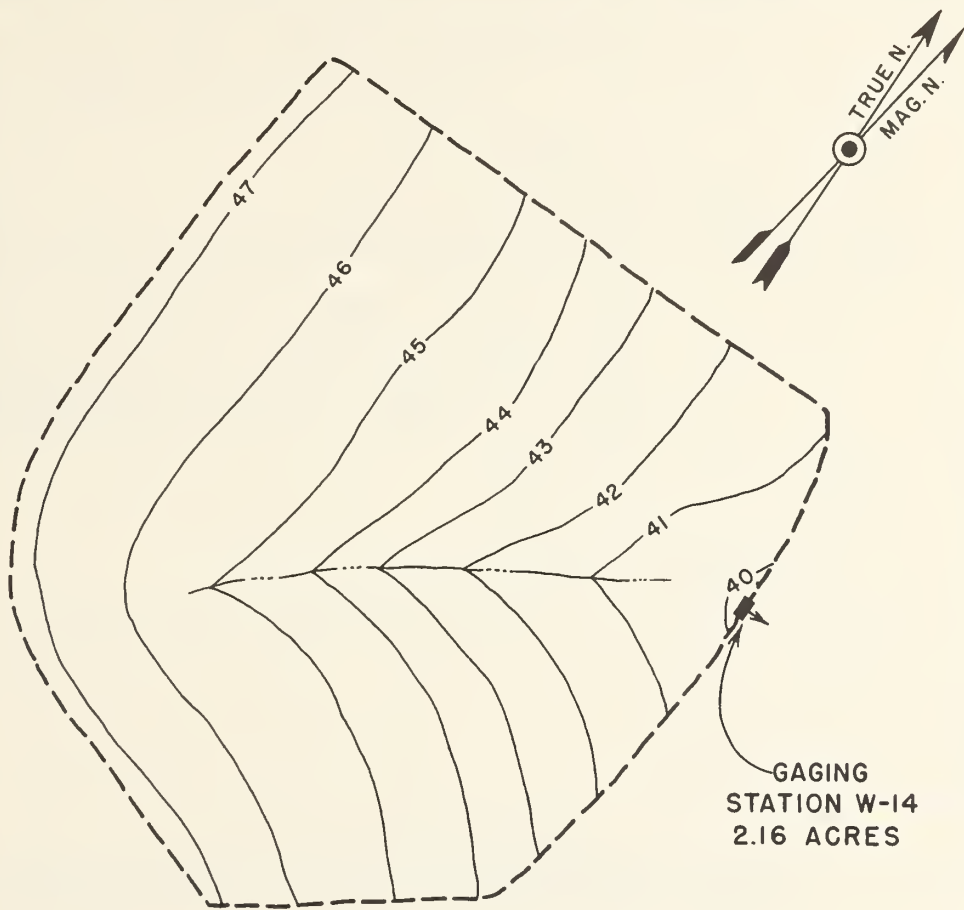
9-62

SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-11					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 2, 1961 (continued)								
6-2-61								
			9:25p	0.06	3.01			
			9:30	.12	3.02			
			9:40	.06	3.03			
			10:00	.03	3.04			
			9:25	.02	3.05			
			9:30	.12	3.06			
			9:40	.06	3.07			
			9:45	.12	3.08			
			9:55	.06	3.09			
			11:05	.06	3.10			

Notes:



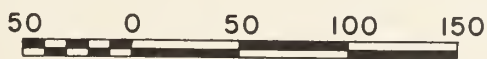
CHEROKEE, OKLAHOMA      WATERSHED W-11



**LEGEND**

- WATERSHED BOUNDARY
- ..... WATERWAY
- 42 — CONTOUR

RAINGAGE  
R - 9



SCALE IN FEET

CONTOUR INTERVAL - 1 FOOT

**CHEROKEE, OKLAHOMA  
WATERSHED W-14**

## CHEROKEE, OKLAHOMA WATERSHED W-15

**LOCATION:** Alfalfa Co., Oklahoma; 2 mi. SW of Cherokee; Salt Fork of Arkansas River Basin.

**AREA:** 2.15 acres.

SLOPES:	Percent Slope	0-1%	1-3%	3-5%
	Percent of Area	0	100	0

**SOILS:** Well drained, moderately dark soils weakly developed from alluvial and aeolian deposits. B horizons are non-calcareous and vary from loam to light clay loam. Source of information - Agronomy Department, Oklahoma State University.

Type	% of Area	Topsoil			Subsoil			Substratum			Internal Drainage
		Avg. Depth	Structure	Permeability	Structure	Permeability	Avg. Depth	Permeability	Permeability		
Grant Silt Loam	100	22"	weak granular	slow	moderate	medium prismatic	3 1/4"	moderate		medium	

EROSION:	Erosion Class	1	2	3	4
	Percent of Area	20	65	15	0

LAND CAPABILITY:	Class	I	II	III	IV	V	VI	VII	VIII
	Percent of Area	0	85	15	0	0	0	0	0

**GEOLOGY:** Surface material consists of high terrace deposits and dune sands derived from Permian red beds of quaternary age and of unknown depth. Source of information - Geology Department, Oklahoma State University.

**SURFACE DRAINAGE:** Good, length of principal waterway 380 ft.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff: type H-4.5 flume, water level recorder with 12-hr. time scale. Precipitation: one weighing recorder with 12-hr. time scale and one standard raingage.

**WATERSHED CONDITIONS:** Continuous wheat annually, tillage during fallow period with large sweeps (8 ft.), final tillage before seeding wheat with a rod weeder. This watershed was established September 1, 1960, and is a portion of W-9 previously published and which was discontinued as of September 1, 1960.

**GENERALLY REPRESENTS:** Rolling areas primarily cropped to wheat in the Central Rolling Red Prairies land resource area (H-80) in Oklahoma, Kansas and Texas.

MONTHLY PRECIPITATION AND RUNOFF (Inches)												Cherokee, Oklahoma		Watershed W-15 <sup>2/</sup>		
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1960	P									2.23	3.52	0.35	1.43	7.53		
	Q									0	.01	0	.03	.04		
1961	P	0.10	0.26	4.07	1.41	5.22	5.37	1.73	2.36	3.16	1.89	2.14	.93	28.64		
	Q	0	0	.54	.07	2.48	1.31	T	0	0	0	.05	0	4.45		
Normal	P <sup>3/</sup>	.80	.92	1.68	2.85	3.92	3.79	2.16	2.97	2.70	2.30	1.36	.97	26.42		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS									Cherokee, Oklahoma						Watershed W-15	
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-10	0.01	12-10	0.01	12-10	0.02	12-10	0.03	12-10	0.03	12-10	0.03	12-10	0.03	12-10	0.03
1961	6-2	2.64	6-2	1.11	5-7	1.16	5-7	1.19	5-7	1.19	5-7	1.19	5-7	1.19	5-4	1.50

Notes: Quality of records: Monthly P and Q - excellent; annual maximum discharges and volumes - excellent. Watershed conditions: all of watershed area in continuous wheat annually.  
<sup>1/</sup> Precipitation from Raingage R-8. <sup>2/</sup> This is a new watershed activated on Sept. 1, 1960. Consists of a portion of old W-9. <sup>3/</sup> Normal P based on 47-year (1915-61) U. S. Weather Bureau record period at Cherokee, Okla. with 20 missing months between 1943 and 1959 estimated.



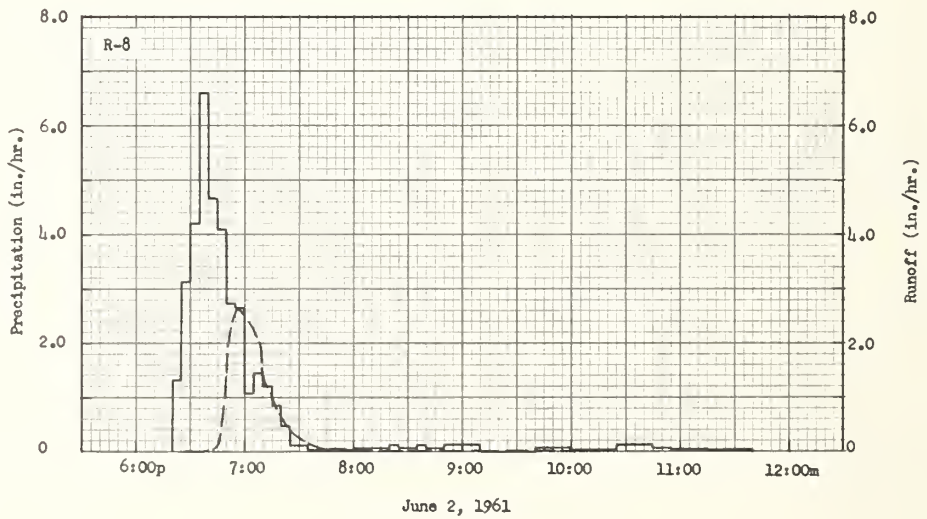
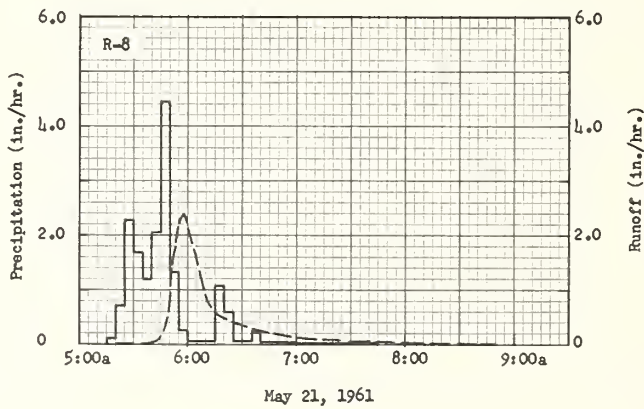
SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-15					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) 1/	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 21, 1961</u>								
4-26-61	0.03	0	5-21-61	Raingage	R-8	5-21-61		
4-30	.27	0	5:15a	0	0	5:20a	0	0
5-4	1.07	.24	:20	.12	.01	:36	.0096	T
5-5	.49	.08	:25	.72	.07	:42	.0597	T
5-7	1.34	1.13	:30	2.28	.26	:44	.0904	.01
5-8	.06	.06	:35	1.68	.40	:46	.218	.01
5-16	.16	0	:40	1.20	.50	:48	.478	.02
5-21	.70 2/	0	:45	2.04	.67	:50	.893	.04
			:50	4.44	1.04	:52	1.48	.09
			:55	1.32	1.15	:53	1.73	.11
Watershed Conditions: 100% of area in wheat 24 to 26 inches high, soil dry and hard on surface.			6:00	.24	1.17	:54	2.00	.14
			:15	.04	1.18	:56	2.29	.21
			:20	1.08	1.27	:58	2.41	.29
			:25	.60	1.32	:59	2.29	.33
			:35	.06	1.33	6:01	2.00	.40
			:40	.24	1.35	:04	1.73	.50
			7:00	.03	1.36	:07	1.26	.57
			:45	.01	1.37	:11	.871	.64
						:16	.578	.70
						:20	.478	.74
						:27	.389	.79
						:34	.322	.83
						:41	.262	.87
						:53	.179	.90
						7:01	.119	.93
						:13	.0775	.94
						:23	.0543	.96
						:52	.0190	.97
						8:11	.0071	.98
						:50	0	.98
<u>Event of June 2, 1961</u>								
5-4-61	1.07	0.24	6-2-61	Raingage	R-8	6-2-61		
5-5	.49	.08	6:20p	0	0	6:26p	0	0
5-7	1.34	1.13	:25	1.32	.11	:40	.0228	T
5-8	.06	.06	:30	3.12	.37	:45	.1115	.01
5-16	.16	0	:35	4.20	.72	:46	.208	.01
5-21	2.07	.98	:40	6.60	1.27	:47	.578	.01
5-25	.03	0	:45	4.68	1.66	:48	.849	.03
			:50	4.08	2.00	:49	1.28	.04
			:55	2.76	2.23	:50	1.64	.07
			7:00	2.64	2.45	:51	1.90	.10
Watershed Conditions: 100% of area in wheat 26 to 30 inches high, soil dry and hard on surface.			:05	1.08	2.54	:52	2.18	.13
			:10	1.44	2.66	:54	2.48	.21
			:15	1.20	2.76	:55	2.56	.25
			:20	.84	2.83	:57	2.64	.34
			:25	.48	2.87	:59	2.56	.43
			:30	.12	2.88	7:05	2.25	.67
			:35	.12	2.89	:08	1.96	.77
			8:00	.02	2.90	:09	1.70	.80
			:10	.06	2.91	:10	1.45	.83
			:20	.06	2.92	:12	1.23	.87
			:25	.12	2.93	:15	1.03	.93
			:35	.06	2.94	:18	.849	.98
			:40	.12	2.95	:20	.687	1.00
			:50	.06	2.96	:22	.560	1.02
			:55	.12	2.97	:26	.375	1.05
			9:10	.12	3.00	:37	.119	1.10
			:40	0	3.00	:44	.0775	1.11
			10:00	.06	3.02	:52	.0441	1.12
			:25	.02	3.03	8:07	.0071	1.12
			:30	.12	3.04	:21	.0049	1.12

Notes: To convert runoff in in/hr to cfs, multiply by 2.1679 .  
 1/ Raingage R-8. 2/ Rain ended at 2:15a.

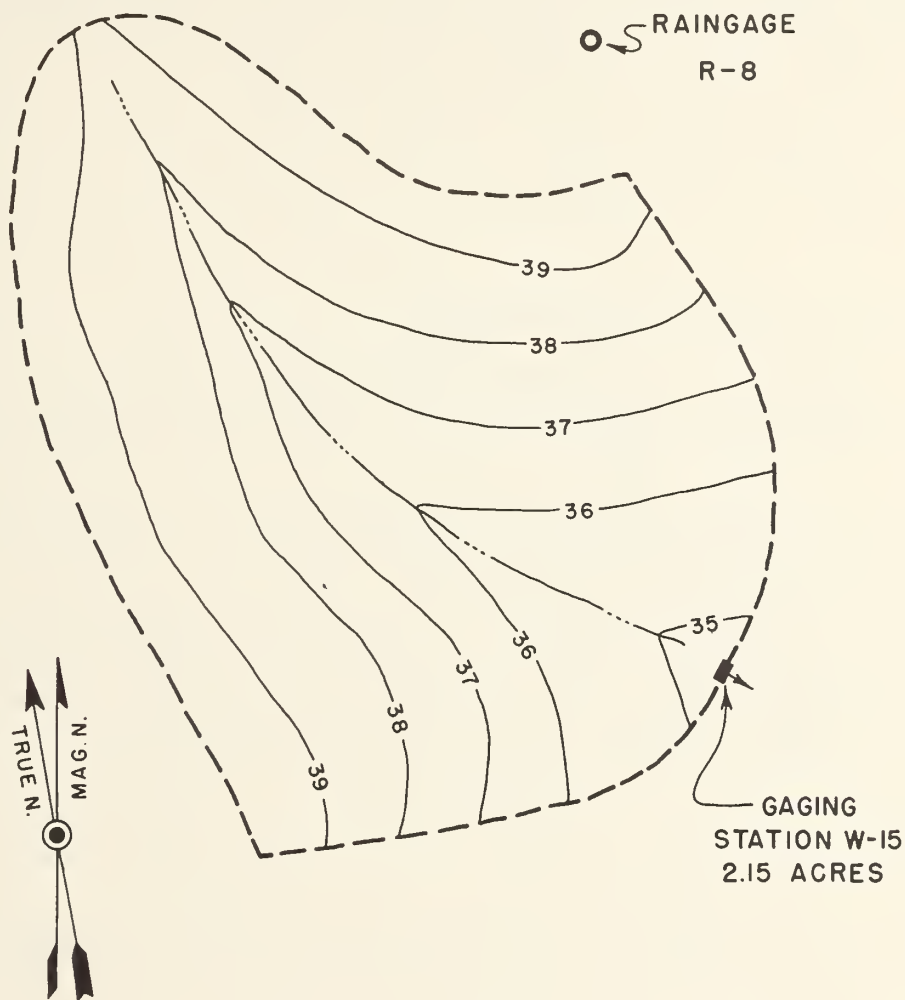
9-62

SELECTED RUNOFF EVENTS			Cherokee, Oklahoma Watershed W-15					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 2, 1961 (continued)</u>								
			6-2-61 10:15p	0.12	3.07	6-2-61 10:02p	0	1.13
			:55	.06	3.08			
			11:40	.03	3.10			

Notes: To convert runoff in in/hr to cfs, multiply by 2.1679 .



CHEROKEE, OKLAHOMA    WATERSHED W-15



**LEGEND**

- WATERSHED BOUNDARY
- ... WATERWAY
- 37— CONTOUR



SCALE IN FEET

CONTOUR INTERVAL - 1 FOOT

CHEROKEE, OKLAHOMA  
WATERSHED W-15

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Stillwater, Oklahoma Watershed W-1 (Area - 16.7 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1956	P	0.50	0.81	0.52	1.24	2.28	1.98	3.32	0.73	0.15	1.52	1.55	1.46	16.06
	Q 1/	0	0	0	0	0	0	0	0	0	0	0	0	0
1957	P	.60	1.96	2.54	8.11	9.94	11.30	1.60	1.02	4.48	1.38	2.40	.66	45.99
	Q	0	0	0	5.24	4.55	6.05	.59	0	0	0	.03	0	16.46
1958	P	1.13	1.05	4.40	1.50	1.71	3.97	6.23	3.40	3.30	.20	.67	.79	28.35
	Q	.07	.15	3.54	.27	0	0	.07	0	.02	0	0	0	4.12
1959	P	.27	.84	1.73	3.38	5.08	3.76	10.47	2.41	8.24	10.00	.15	1.87	48.20
	Q	0	0	.16	.49	1.24	.01	3.87	0	1.82	7.85	0	.64	16.08

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Stillwater, Oklahoma Watershed W-1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	4-18	6.99	4-18	2.51	4-18	2.89	4-18	3.04	4-18	3.05	4-18	3.13	4-18	3.23	4-18	4.95
1958	3-28	.54	3-28	.40	3-28	.57	3-28	.69	3-28	.77	3-28	.81	3-28	.84	3-23	1.48
1959	10-2	2.67	10-2	1.23	10-2	1.98	10-2	2.66	10-2	4.52	10-1	4.78	10-1	5.68	9-29	7.62

Notes: Quality of records: Precipitation and runoff, good. Watershed conditions: 1956 - poor cover; 1957-59 - good to excellent cover. 1/ No significant runoff in 1956.

SELECTED RUNOFF EVENTS						Stillwater, Oklahoma Watershed W-1			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of April 18, 1957</u>									
3-20-57	0.61	0	4-18-57	Raingage R-3		4-18-57			
3-23	.50	0	12:20a	0	0	2:26a	0.0032	0	
3-26	.05	0	:25	.60	.05	:38	.0047	.001	
3-30	.45	0	:30	.84	.12	:46	.0060	.002	
4-3	.93	.254	:35	0	.12	3:02	.0214	.005	
4-4	0	.032	:40	0	.12	:09	.0425	.009	
4-7	.27	0	:45	.12	.13	:16	.112	.018	
4-12	.16	0	:50	.24	.15	:23	.245	.039	
			:55	.36	.18	:29	.662	.084	
			1:00	1.20	.28	:33	.985	.139	
Watershed conditions: All of the area was in native grass pasture, generally dormant, in very good condition because of very light grazing for the past year.			:05	1.92	.44	:42	1.35	.314	
			:10	.84	.51	:50	2.10	.544	
			:15	.12	.52	:58	3.35	.908	
			:20	0	.52	4:02	4.15	1.157	
			:50	.02	.53	:04	5.55	1.319	
			:55	0	.53	:08	6.99	1.737	
			2:00	.12	.54	:11	3.88	2.009	
			:10	0	.54	:15	2.63	2.226	
			:15	.24	.56	:21	1.55	2.435	
			:20	.24	.58	:28	1.01	2.584	
			:25	.12	.59	:33	.600	2.651	
			:30	0	.59	:36	.560	2.680	
			:35	.36	.62	:40	.510	2.716	
			:40	.12	.63	:48	.513	2.784	
			:45	.96	.71	:57	.307	2.845	
			:50	.48	.75	5:10	.168	2.897	
			:55	.12	.76	:45	.0726	2.967	
			3:00	.36	.79	6:27	.0310	3.003	
			:05	.84	.86	7:12	.0167	3.021	
			:10	1.32	.97	8:12	.0089	3.034	

REPRINT

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Notes: To convert runoff in in/hr to cfs, multiply by 16.839.  
2/ All antecedent rainfall measured using Raingage R-3.





5-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Stillwater, Oklahoma Watershed W-1 (Area - 16.7 acres)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	0.75	2.31	1.33	1.05	7.43	2.01	6.76	2.33	0.54	4.06	0.10	1.76	30.43
1960 Q	.12	.83	.68	.04	2.08	.01	.54	0	0	.10	.07	.24	4.71
1961 P	1.08	2.55	0.24	8.27	4.73	4.60	2.60	8.62	2.34	3.30	1.08	39.41	
1961 Q	.09	.46	.03	4.20	1.50	.10	.02	1.66	1.05	2.11	1.19	12.41	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Stillwater, Oklahoma Watershed W-1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-28	3.02	5-28	0.87	5-28	1.08	5-28	1.39	5-28	1.41	5-28	1.41	5-28	1.41	5-25	1.60
1961	5-21	2.92	5-21	1.05	5-21	1.24	5-21	1.34	5-21	2.50	5-21	2.56	5-21	2.57	5-21	2.58

Notes: Quality of Records: 1960-61 Monthly P, excellent; 1960 Monthly Q, good to excellent except during Jan., Feb. and March which are fair due to more than normal freezing and thawing; 1961 Monthly Q, good to excellent except Dec. which is fair due to freezing and thawing. All of watershed area in native grass pasture. Newly constructed gage well and instrument house installed on Nov. 14, 1960. 1/ Precipitation from Raingage R-3.

SELECTED RUNOFF EVENTS				Stillwater, Oklahoma Watershed W-1				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 28 and 29, 1960</u>								
4-27-60	Raingage R-3	0	5-28-60	Raingage	R-3	5-28-60		
4-28	0.06	0	9:20p	0	0	9:28p	0	0
5-3	.11	0	:25	2.52	.21	:29	.0004	0
5-4	.41	0	:30	4.32	.57	:32	.0008	0
5-5	1.08	.130	:35	4.92	.98	:38	.0310	.001
5-6	.14	.033	:40	4.56	1.36	:40	.2250	.005
5-17	.85	0	:45	2.64	1.58	:43	.9430	.028
5-18	.19	0	:50	.48	1.62	:45	1.8132	.075
5-19	.08	0	:55	.60	1.67	:48	3.0210	.198
5-20	.93	.316	10:00	1.56	1.80	:52	1.8731	.348
5-24	.55	0	:05	1.08	1.89	:56	1.3606	.453
5-25	.50	.185	:10	.84	1.96	10:00	1.0890	.529
5-27	.07	0	:15	.24	1.98	:05	.7489	.598
5-28	.02 2/	0	:20	.12	1.99	:07	.6902	.622
			:25	.36	2.02	:16	.5359	.716
			:30	.12	2.03	:28	.4010	.810
			:35	.48	2.07	:54	.2250	.940
			:40	.24	2.09	11:12	.1910	1.001
			11:05	.22	2.18	:29	.2250	1.059
			:15	.42	2.25	:52	.2450	1.151
			:20	.60	2.30	12:00m	.2320	1.183
			:30	.48	2.38	5-29-60		
			:55	.22	2.47	12:36a	.1290	1.291
			5-29-60			1:07	.0637	1.341
			12:15a	.09	2.50	:39	.0330	1.365
			ceased			2:13	.0190	1.380
			2:00	0	2.50	7:10	.0008	1.407
			3:00	.01	2.51	11:59p	0	1.413
			ceased					
<u>Event of May 21, 1961</u>								
4-26-61	Raingage R-3	0	5-21-61	Raingage R-3	0	5-21-61		
5-3	.24	0	9:15a	0	0	9:25a	0	0
5-4	1.59	.168	:20	.84	.07	:26	.0013	0
5-5	.11	.046	:25	4.44	.44	:30	.0036	0
5-6	.03	.019	:30	5.40	.89	:33	.0512	.001

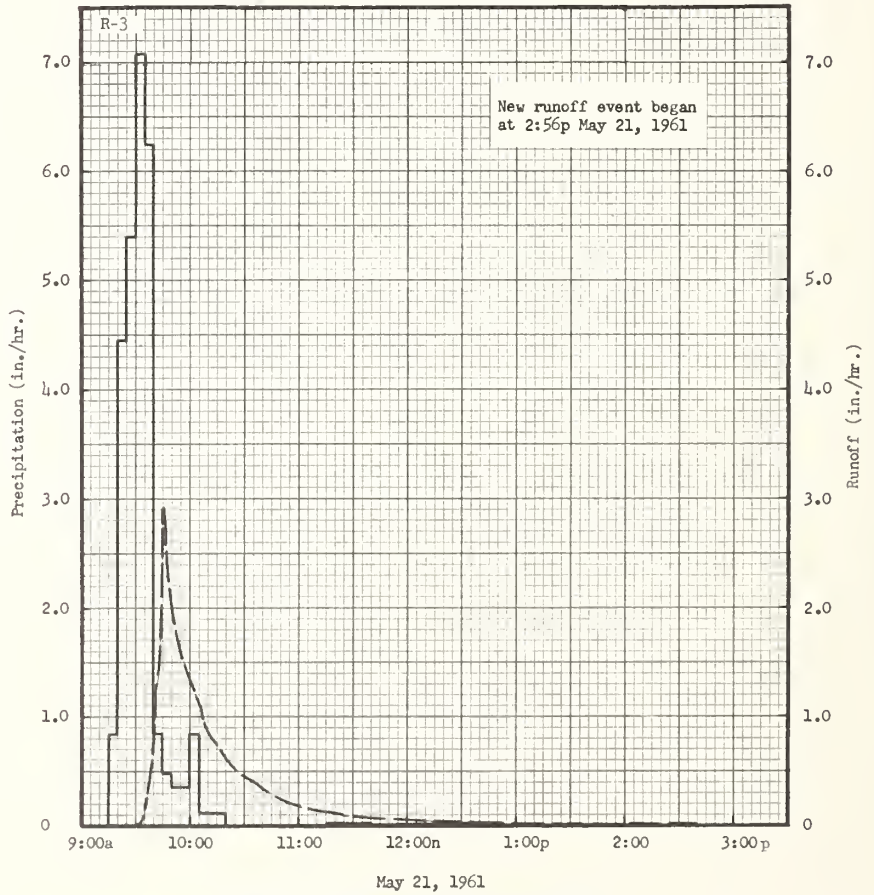
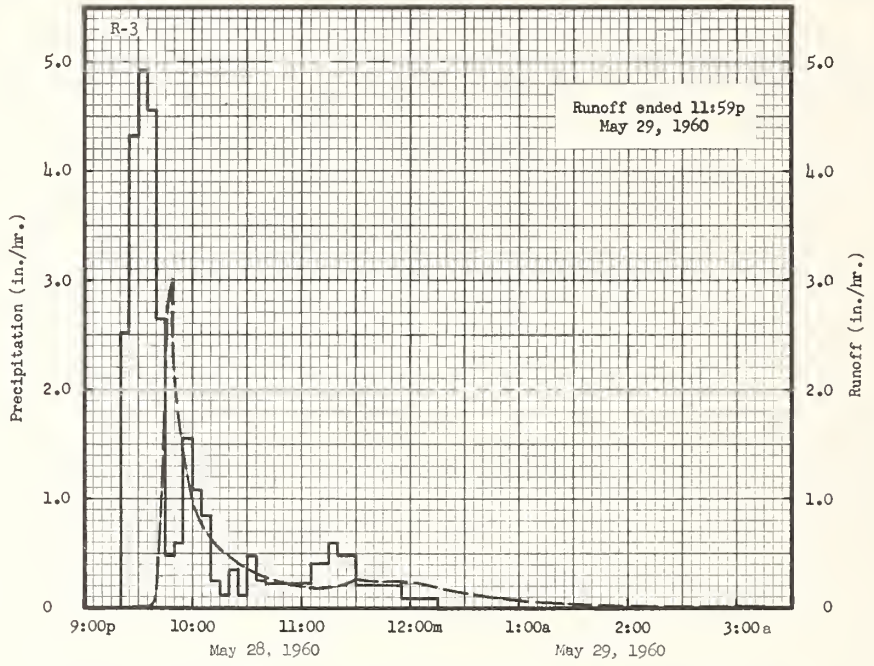
  

Notes: To convert runoff in in/hr to cfs, multiply by 16.839. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 37.1-7. 2/ Rain 2:55a to 3:55a.

SELECTED RUNOFF EVENTS			Stillwater, Oklahoma Watershed W-1					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 21, 1961 Cont'd.</u>								
5-7	.30	.03 <sup>1</sup>	5-21-61 9:35a	7.08	1.48	5-21-61 9:35 <sup>a</sup>	.1980	.005
5-8	1.57	1.321	:40	6.2 <sup>1</sup>	2.00	:39	.732 <sup>1</sup>	.031
5-9	0	.022	:45	.8 <sup>1</sup>	2.07	:40	.885 <sup>1</sup>	.04 <sup>1</sup>
5-10	0	.008	:50	.48	2.11	:42	1.2196	.079
5-16	.29	0	:55	.36	2.1 <sup>1</sup>	:43	1.5096	.102
5-17	.02 <sup>1</sup>	0	10:00	.36	2.17	:44	2.1286	.132
5-21	.17 <sup>2</sup>	0	:05	.8 <sup>1</sup>	2.2 <sup>1</sup>	:45	2.9243	.174
			:10	.12	2.25	:46	2.7105	.221
			:15	.12	2.26	:48	2.1842	.300
			:20	.12	2.27	:52	1.7898	.429
			11:15	0	2.27	:55	1.5648	.512
			:40	.02	2.28	10:00	1.3389	.632
			12:40p	.01	2.29	:06	1.0768	.751
						:10	.8465	.811
						:15	.7406	.876
						:28	.4720	1.005
						:36	.4010	1.064
						:40	.3400	1.089
						:47	.2750	1.125
						11:05	.1680	1.191
						:17	.1230	1.220
						:30	.0917	1.243
						12:19p	.0310	1.289
						1:22	.0105	1.308
						2:40	.0047	1.317
						2:56	.0047 <sup>2</sup>	1.319

Watershed Conditions: 100% of area was in native grass pasture in fair to good condition.

Notes: To convert runoff in in/hr to cfs, multiply by 16.839.  
<sup>1</sup>/ Rain 3:20a to 5:30a. <sup>2</sup>/Beginning of new runoff event.



Stillwater, Oklahoma Watershed W-1



5-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Stillwater, Oklahoma Watershed W-3 (Area - 92.0 acra)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.75	2.31	1.33	1.05	7.43	2.01	6.76	2.33	.54	4.06	.10	1.76	30.43
1960 Q	.07	.85	.93	.09	2.54	.04	.21	0	0	T	0	.07	4.80
1961 P	T	1.08	2.55	0.24	8.27	4.73	4.60	2.60	8.62	2.34	3.30	1.08	39.41
1961 Q	0	0	.15	.01	3.27	1.34	.05	T	1.55	.77	1.30	.44	8.88

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Stillwater, Oklahoma Watershed W-3									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-28	1.42	5-28	0.90	5-28	1.20	5-28	1.58	5-28	1.61	5-28	1.63	5-28	1.63	5-24	1.90
1961	5-21	1.86	5-21	0.89	5-21	1.10	5-21	1.22	5-21	2.18	5-21	2.21	5-21	2.22	5-21	2.22

Notes: Quality of records: 1960-61 Monthly P, excellent; 1960 Monthly Q, good to excellent except during Jan., Feb., and Mar. which are fair due to more than normal freezing and thawing; 1961 Monthly Q, good to excellent except Dec. which is fair due to freezing and thawing. All of watershed area in native grass pasture. New gage well and instrument house installed on Nov. 14, 1960. Low flow equipment added at outlet of culvert in 1960. 1/ From Raingage R-3.

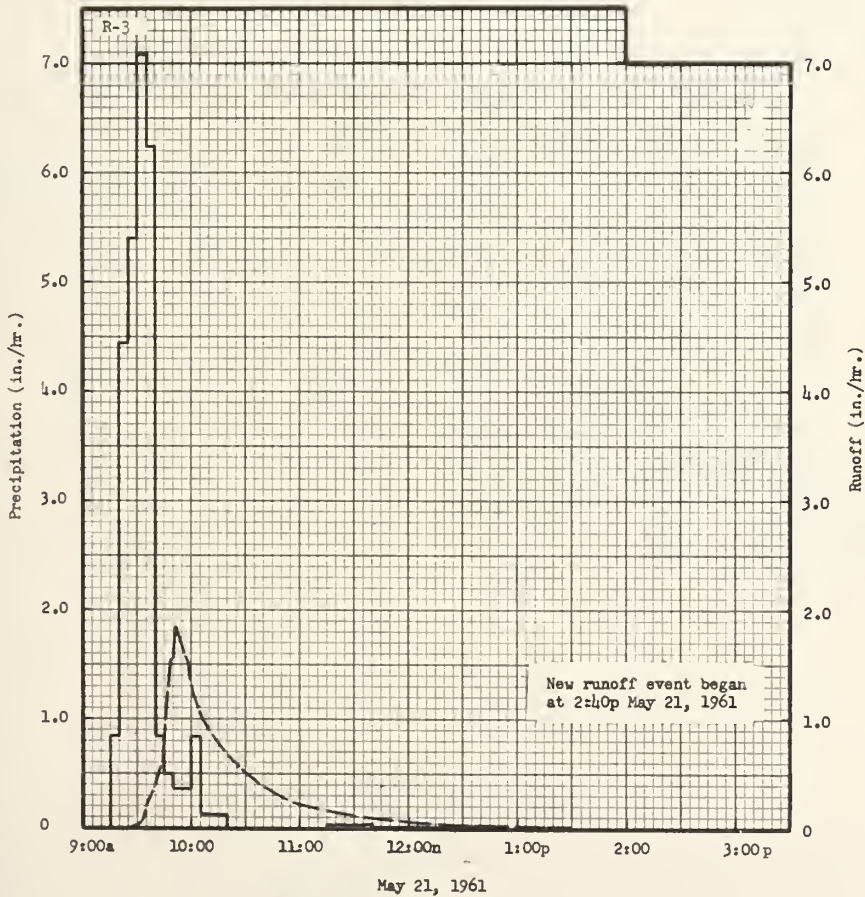
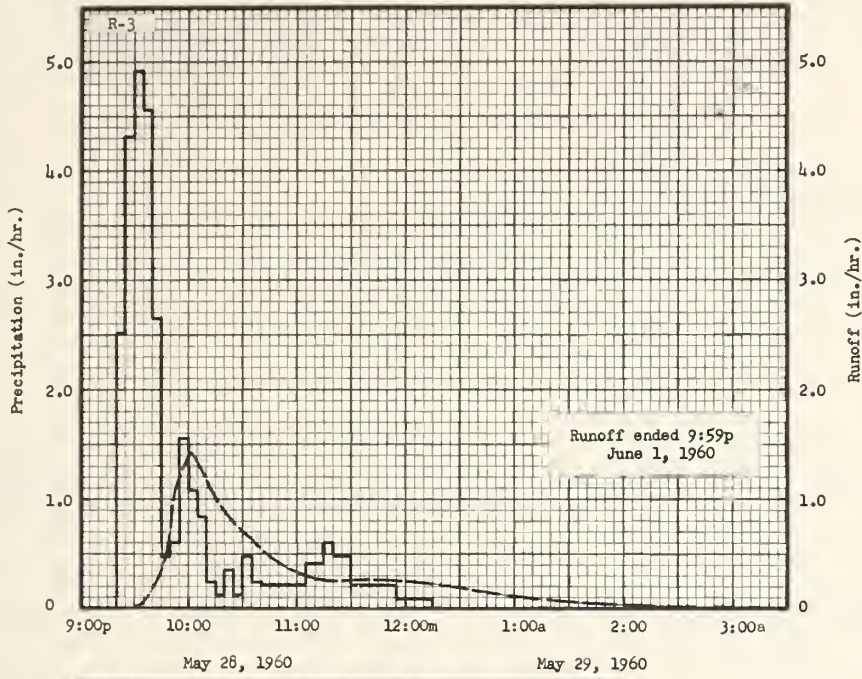
SELECTED RUNOFF EVENTS				Stillwater, Oklahoma Watershad W-3				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 28 - June 1, 1960</u>								
4-27-60	Raingage R-3	0	5-28-60	Raingage	R-3	5-28-60		
4-28	0.06	0	9:20p	0	0	9:21p	0	0
5-3	.11	0	:25	2.52	.21	:22	.0017	.009
5-4	.41	0	:30	4.32	.57	:31	.0134	.010
5-5	1.08	.108	:35	4.92	.98	:35	.0442	.011
5-6	.14	.045	:40	4.56	1.36	:38	.1697	.017
5-7	0	.011	:45	2.64	1.58	:42	.2306	.030
5-8	0	.008	:50	.48	1.62	:44	.2990	.038
5-9	0	.002	:55	.60	1.67	:45	.3358	.044
5-17	.85	.053	10:00	1.56	1.80	:48	.5603	.065
5-18	.19	.009	:05	1.08	1.89	:49	.6423	.075
5-19	.08	.006	:10	.84	1.96	:51	.8072	.099
5-20	.93	.360	:15	.24	1.98	:52	.9646	.114
5-21	0	.009	:20	.12	1.99	:53	1.1174	.131
5-22	0	.007	:25	.36	2.02	:55	1.2076	.169
5-23	0	.001	:30	.12	2.03	:57	1.2666	.210
5-24	.55	.013	:35	.48	2.07	10:00	1.3403	.276
5-25	.50	.231	:40	.24	2.09	:02	1.4168	.322
5-26	0	.009	11:05	.22	2.18	:03	1.4025	.346
5-27	.07	.004	:15	.42	2.25	:06	1.3000	.413
5-28	.02 <sup>2/</sup>	.001 <sup>3/</sup>	:20	.60	2.30	:09	1.2074	.476
			:30	.48	2.38	:12	1.0920	.533
			:55	.22	2.47	:16	.9814	.603
			5-29-60			:21	.8772	.681
			12:15a	.09	2.50	:27	.7717	.763
Watershad Conditions: 100% of area was in native grass pastura in fair to good condition.			ceased			:34	.6376	.844
			2:00	0	2.50	:39	.5451	.893
			3:00	.01	2.51	:50	.4236	.982
			ceased			:59	.3409	1.039
						11:06	.2992	1.076
						:14	.2634	1.114
						:22	.2542	1.148
						:40	.2594	1.225
						12:00m	.2539	1.311
						5-29-60		
			00:23a			:47	.2087	1.401
							.1476	1.472

Notes: To convert runoff in in/hr to cfs, multiply by 92.766. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the U. S., USDA, ARS, January 1960, page 37.2-6. 2/ Rain 2:55a to 3:55a. 3/ Runoff stopped at 11:54a.

SELECTED RUNOFF EVENTS						Stillwater, Oklahoma	Watershed W-3	
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 28 - June 1, 1960 Cont'd.								
						5-29-60		
						1:06a	.0959	1.510
						:27	.0652	1.538
						2:12	.0298	1.572
						3:20	.0118	1.594
						11:06	.0010	1.623
						12:00m	.0004	1.631
						5-30-60		
						12:00m	.0004	1.640
						5-31-60		
						12:00m	.0002	1.649
						6-1-60		
						9:59p	0	1.651
Event of May 21, 1961								
	Raingage R-3		5-21-61	Raingage R-3		5-21-61		
4-26-61	T	0	9:15a	0	0	9:27a	0	0
5-3	.24	0	:20	.84	.07	:28	.0204	0
5-4	1.59	.054	:25	4.44	.44	:31	.0306	.001
5-5	.11	.013	:30	5.40	.89	:33	.1055	.004
5-6	.03	.004	:35	7.08	1.48	:35	.2042	.009
5-7	.30	.016	:40	6.24	2.00	:38	.3298	.021
5-8	1.57	.941	:45	.84	2.07	:40	.4104	.033
5-9	0	.007	:50	.48	2.11	:44	.6132	.066
5-10	0	.001	:55	.36	2.14	:45	.7470	.077
5-16	.29	0	10:00	.36	2.17	:46	.9598	.091
5-17	.02 <sub>1</sub>	0	:05	.84	2.24	:47	1.2623	.110
5-21	.17 <sub>2</sub>	0	:10	.12	2.25	:48	1.4200	.132
			:15	.12	2.26	:49	1.5581	.157
			:20	.12	2.27	:51	1.7364	.210
			11:15	0	2.27	:52	1.8575	.240
			:40	.02	2.28	:53	1.7317	.270
			12:40p	.01	2.29	:58	1.5057	.405
						10:00	1.2962	.452
						:04	1.0557	.530
						:09	.9029	.610
						:10	.8656	.625
						:14	.8097	.681
						:20	.6829	.755
						:26	.5690	.817
						:32	.4779	.869
						:43	.3569	.945
						:53	.2729	.997
						11:04	.2040	1.041
						:19	.1461	1.085
						:36	.0954	1.118
						12:05p	.0528	1.152
						:47	.0234	1.177
						1:29	.0115	1.189
						2:05	.0074	1.194
						2:40	.0051 <sub>2</sub>	1.198

Watershed conditions: 100% of area was in native grass pasture in fair condition prior to May 21, 1961. After this date the condition became good to excellent during growing season.

Notes: To convert runoff in in/hr to cfs, multiply by 92.766.  
 1/ Rain 3:20a to 5:30a. 2/ Beginning of new runoff event.



Stillwater, Oklahoma Watershed W-3



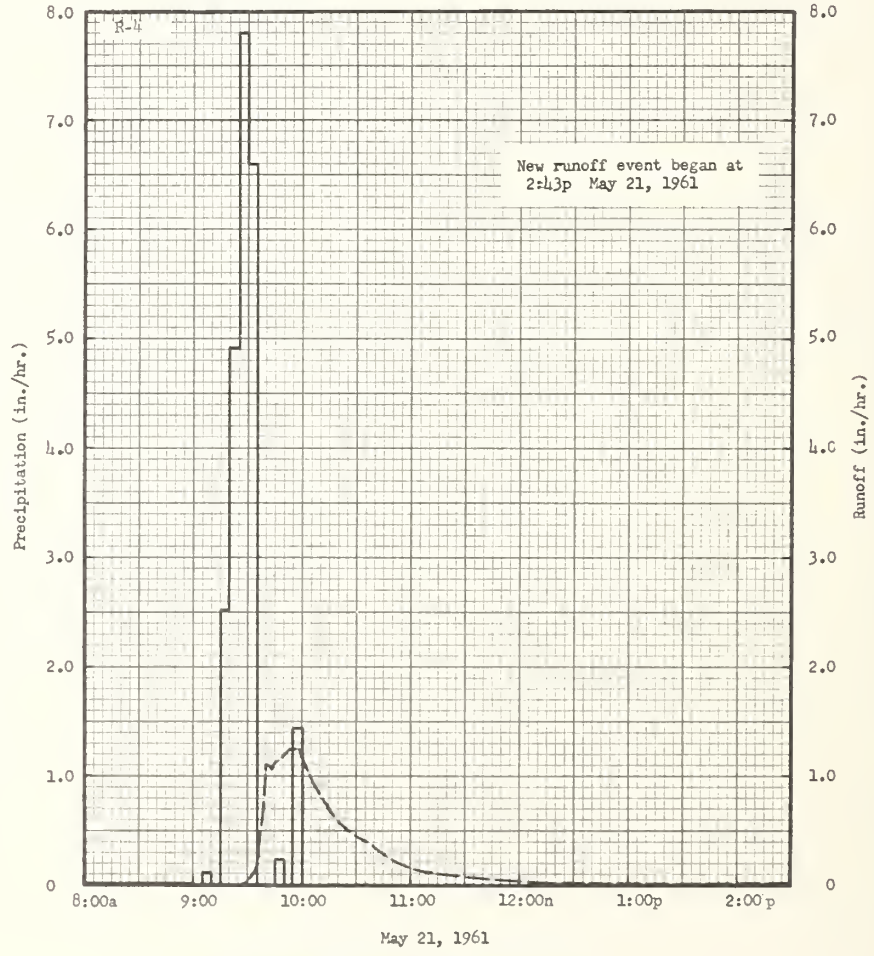
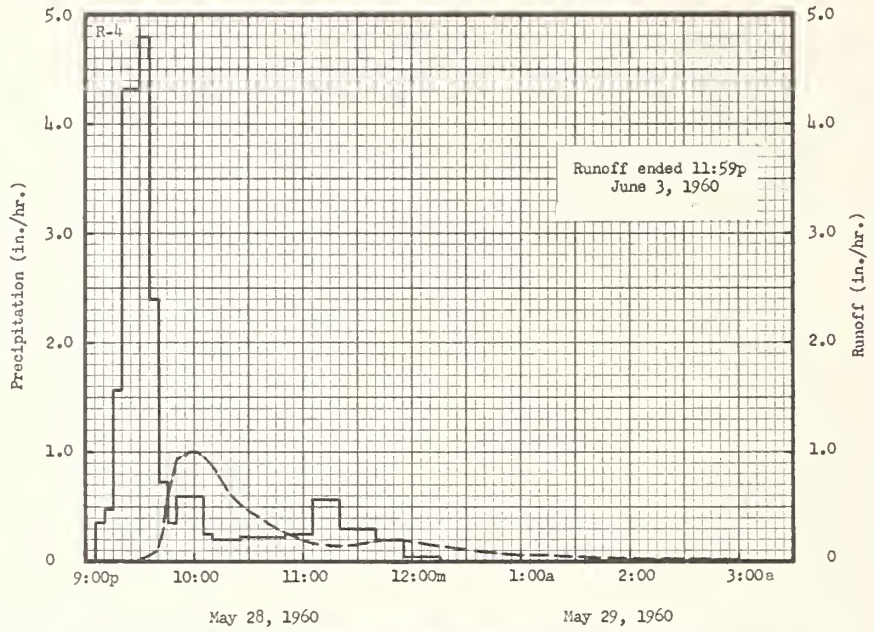
5-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Stillwater, Oklahoma Watershed W-4 (Area - 206.0 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1960	P	.64	2.16	1.24	1.12	6.66	1.89	6.38	2.72	.61	4.20	.10	1.69	29.41		
	Q	.38	.58	.60	.09	1.60	.11	.37	0	0	.06	0	.02	3.81		
1961	P	T	1.03	2.48	0.30	7.83	5.14	5.02	3.12	8.41	2.45	3.42	1.09	40.29		
	Q	0	0	.12	.01	2.89	1.33	.26	.06	1.85	.74	1.14	.46	8.86		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Stillwater, Oklahoma Watershed W-4								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-28	1.00	5-28	0.70	5-28	0.88	5-28	1.14	5-28	1.16	5-28	1.18	5-28	1.19	5-24	1.29
1961	5-21	1.26	5-21	0.84	5-21	1.01	5-21	1.09	5-21	1.61	5-21	1.65	5-21	1.66	5-21	1.68
Notes: Quality of Records: 1960-61 Monthly P, is good; 1960 Monthly Q, good to excellent except during Jan., Feb. and March which are fair due to more than normal freezing and thawing; 1961 Monthly Q good to excellent except Dec. which is fair due to freezing and thawing. All of watershed in native grass. New gage well end instrument house installed on Nov. 14, 1960. Low flow equipment added at outlet of culvert in 1960. 1/ From Raingage R-4.																
SELECTED RUNOFF EVENTS								Stillwater, Oklahoma Watershed W-4								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
<u>Event of May 28 - June 3, 1960</u>																
4-27-60	Raingage R-4 0.05	0	5-28-60	Raingage	R-4	5-28-60										
5-3	.11	0	9:05p	0	0	9:21p	0	0								
5-4	.41	0	:10	.36	.03	:22	.0002	0								
5-5	1.00	.0834	:15	.46	.07	:28	.0021	.0001								
5-6	.10	.0159	:20	1.56	.20	:32	.0102	.0005								
5-7	0	.0046	:25	4.32	.56	:36	.0575	.0021								
5-17	.72	.0007	:30	4.32	.92	:39	.0961	.0062								
5-18	.23	.0203	:35	4.80	1.32	:41	.1636	.0104								
5-19	.00	.0036	:40	2.40	1.52	:43	.3681	.0188								
5-20	.73	.1533	:45	.72	1.58	:46	.6910	.0455								
5-21	0	.0114	:50	.36	1.61	:48	.8223	.0706								
5-22	0	.0072	:55	.60	1.66	:51	.9446	.1149								
5-23	0	.0032	10:00	.60	1.71	:55	.9788	.1792								
5-24	.54	.0076	:05	.60	1.76	:56	.9933	.1955								
5-25	.36	.0841	:10	.24	1.78	10:02	.9980	.2951								
5-27	.10	0	:25	.20	1.83	:08	.9069	.3904								
			:50	.22	1.92	:13	.7910	.4608								
			11:05	.24	1.98	:17	.6811	.5090								
			:20	.56	2.12	:21	.5970	.5509								
			:40	.30	2.22	:27	.4977	.6053								
			:55	.20	2.27	:36	.4054	.6734								
			5-29-60			:43	.3182	.7151								
			12:15a	.03	2.28	:54	.2272	.7635								
						11:08	.1650	.8090								
						:20	.1549	.8407								
						:26	.1595	.8564								
						:45	.1972	.9123								
						:50	.2001	.9288								
						:56	.1930	.9485								
						12:00m	.1830	.9610								
						5-29-60										
						12:15a	.1517	1.0028								
						:35	.1006	1.0454								
						:53	.0741	1.0711								
						1:16	.0484	1.0934								
Notes. To convert runoff in in/hr to cfs, multiply by 207.72. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 37.3-6.																



SELECTED RUNOFF EVENTS			Stillwater, Oklahoma Watershed W-4					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 28 - June 3, 1960 Cont'd.								
						5-29-60		
						1:43a	.0315	1.1111
						3:00	.0107	1.1348
						5:26	.0042	1.1504
						12:00m	.0005	1.1776
						5-30-60		
						12:00m	.0004	1.1890
						5-31-60		
						12:00m	.0002	1.1970
						6-1-60		
						12:00m	.0002	1.2018
						6-2-60		
						12:00m	.0002	1.2066
						6-3-60		
						11:59p	0	1.2102
Event of May 21, 1961								
	Raingage R-4		5-21-61	Raingage	R-4	5-21-61		
4-26-61	T	0	8:00a	0	0	9:26a	0	0
5-3	.19	0	9:00	.01	.01	:27	.0075	.0001
5-4	1.43	.1186	:05	0	0	:28	.0140	.0002
5-5	.49	.1283	:10	.12	.02	:30	.0404	.0011
5-6	0	.0073	:15	0	.02	:33	.1094	.0052
5-7	.48	.0249	:20	2.52	.23	:35	.1864	.0099
5-8	1.69	.8555	:25	4.92	.64	:37	.4472	.0197
5-9	0	.0190	:30	7.80	1.29	:39	.7970	.0419
5-10	0	.0114	:35	6.60	1.84	:41	1.1054	.0736
5-11	0	.0050						
5-16	.24	0	:40	0	1.84	:43	1.0473	.1097
5-17	.03	0	:45	0	1.84	:44	1.0917	.1274
5-21	.171/	0	:50	.24	1.86	:47	1.1391	.1835
			:55	0	1.86	:53	1.2552	.3021
			10:00	1.44	1.98	:56	1.2522	.3648
						:58	1.2400	.4064
						10:00	1.1716	.4466
						:04	1.0356	.5201
						:10	.8338	.6131
						:14	.7274	.6639
						:17	.6385	.6978
						:21	.5737	.7384
						:27	.4881	.7914
						:36	.3917	.8582
						:44	.2911	.9040
						:53	.2031	.9404
						11:04	.1418	.9715
						:12	.1167	.9888
						:28	.0771	1.0140
						:47	.0506	1.0339
						12:08p	.0329	1.0483
						:35	.0200	1.0599
						1:12	.0110	1.0693
						:57	.0069	1.0758
						2:43	.00502/	1.0803
<p>Watershed Conditions: 100% of area was in native grass, most in pasture except for a small part in meadow. Good rains for past four years have helped recovery of range from effects of 1956 drought but heavy stocking each year has kept it down to fair condition.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 207.72.  
 1/ Rain from 3:15a to 5:00a. 2/ Beginning of new runoff event.



Stillwater, Oklahoma Watershed W-4

6-60

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Riesel (Waco), Texas Watershed C (Area - 579 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1956	P	2.53	2.21	0.18	0.65	4.72	1.25	0.64	2.25	0	0.81	4.35	1.95	21.54
	Q	0	.16	0	0	.46	0	0	0	0	0	.61	0	1.23
1957	P	1.40	2.98	5.66	15.72	6.85	1.72	.04	.30	4.22	8.02	4.23	.79	51.93
	Q	0	.15	1.62	10.04	3.70	T	0	0	0	1.75	.55	T	17.81
1958	P	2.05	3.22	1.35	3.08	2.04	1.78	1.08	5.72	6.48	2.38	1.44	1.28	31.90
	Q	.05	.72	.01	.03	.41	0	0	.26	1.75	.01	T	T	3.24
1959	P	.36	3.56	.91	3.76	3.10	8.06	3.66	3.85	2.61	6.91	1.72	3.69	42.19
	Q	T	.36	T	.22	T	1.73	T	0	0	2.05	.28	.70	5.34

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Riesel (Waco), Texas Watershed C

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957	4-19	1.33	4-19	1.33	4-19	2.02	4-23	2.80	4-23	3.04	4-23	3.10	4-23	4.54	4-19	8.76
1958	9-19	.80	9-19	.67	9-19	.98	9-19	1.27	9-19	1.58	9-19	1.63	9-19	1.64	9-19	1.75
1959	6-23	.62	6-23	.59	6-23	1.00	6-23	1.39	10-4	1.73	10-4	1.86	10-4	1.88	10-4	1.89

Notes: Quality of records: monthly P and Q, good; Annual Max. discharges and volumes, good. Watershed conditions: no appreciable change in land use or conservation practices since 1955. See page 42.2-1, Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States, USDA, ARS, June 1957 (reprinted 1961).

SELECTED RUNOFF EVENTS Riesel (Waco), Texas Watershed C

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<b>Event of April 24, 25, 1957</b>								
3-24, 26-57	0	0.0017	4-24-57	Raingage	5	4-24-57		
3-27	1.18	.4182	2:35p	0	0	2:38p	0.0007	0
3-28, 30	0	.0633	:38	.80	.04	:50	.0044	.0003
3-31	1.24	.5282	:42	2.40	.20	:52	.0236	.0007
4-1, 2	0	.0725	:46	4.35	.49	:53	.0603	.0014
4-3	.13	.0019	:49	2.80	.63	:54	.100	.0027
4-4	.13	.0011	:54	3.24	.90	:58	.197	.0130
4-5, 7	0	.0137	:59	3.12	1.16	3:04	.252	.0363
4-8	.02	.0001	3:04	1.44	1.28	:07	.252	.0486
4-9, 12	0	T	:08	1.65	1.39	:14	.244	.0779
4-13	.05	T	:14	1.00	1.49	:16	.244	.0860
4-14	0	T	:24	.24	1.53	:22	.276	.1120
4-15	.06	T	:40	.23	1.59	:26	.385	.1337
4-16, 18	0	T	Raingage	14	1.79	:28	.468	.1479
4-19	5.68	2.2388	Raingage	20	1.62	:32	.668	.1858
4-20	.34	.7588	Weighted	Average <sup>2/</sup>	1.64	:36	.791	.2344
4-21	.36	.1147				:43	.863	.3280
4-22	.33	.1145				:46	.868	.3713
4-23	3.71	3.0894				:51	.844	.4427
4-24 <sup>1/</sup>	.04	.0199				4:02	.728	.5878
<p>Watershed Conditions: 41% of area in corn generally planted first of March; 12% bedded for cotton, no crop; 3% row grain sorghum planted first of April; 3% sorghum hay, broadcast first of April; 5% oats and oats-clover, oats in bloom stage; 5% broadcast sweet clover; 28% of pasture, including brushy and open; 3% farmsteads and gravel and paved roads.</p>								
<p style="text-align: center;"><b>REPRINT</b></p> <p>This page was not clearly reproduced in Reference 4: Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945. It is hereby reprinted. For the rest of this series, see pp. 42.2-2, 3 &amp; 4 of USDA Misc. Pub. 945.</p>								
						:14	.590	.7196
						:25	.474	.8168
						:38	.365	.9075
						:52	.276	.9817
						5:07	.211	1.0426
						:17	.183	1.0755
						6:02	.102	1.1779
						7:02	.0521	1.2512
						8:26	.0247	1.3017
						11:00	.0098	1.3424

Notes: To convert runoff in in/hr to cfs, multiply by 583.82. For map of watershed, see page 42.4-6. <sup>1/</sup> Prior to event beginning 2:35p. <sup>2/</sup> Thiessen method.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed C (Area - 579 acres)							
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1960	P	2.46	2.37	1.39	0.98	1.43	5.32	0.63	3.82	0.45	6.22	2.47	7.79	35.33
	Q	1.22	.24	.11	T	0	.31	T	.05	0	.48	.21	4.24	6.86
1961	P	5.36	5.35	2.21	.52	2.25	7.75	5.17	.05	4.70	3.58	2.11	1.88	40.93
	Q	3.77	3.16	.05	T	0	1.58	.77	0	.43	.69	T	.17	10.62

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							RIESEL (WACO), TEXAS Watershed C					
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YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.26	12-7	0.25	12-7	0.47	12-7	1.08	12-7	1.72	12-7	2.92	12-6	3.37	12-6	4.14
1961	2-16	.35	2-16	.33	2-16	.57	2-16	.97	2-16	1.06	1-12	1.81	1-12	1.90	1-6	3.73

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
Watershed conditions: No appreciable change in land use or conservation practices since 1955.

SELECTED RUNOFF EVENTS				RIESEL (WACO), TEXAS Watershed C				
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Antecedent conditions			Rainfall			Runoff		
Date	Rainfall $\frac{1}{2}$ (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 9-10, 1961</u>								
6-14-61	0.51	0	7-9-61	Raingage 5		7-9-61		
6-15	2.48	.0754	10:26a	0	0	10:51a	0	0
6-16	.73	.2040	:31	1.20	.10	:59	T	T
6-17	.89	.0803	:34	4.20	.31	11:18	.0002	T
6-18	1.78	1.1056	:38	3.00	.51	1:27p	T	.0003
6-19, 22	0	.0393	:41	4.00	.71	:30	.0007	.0003
6-23, 24	0	T	:46	3.72	1.02	:31	.0041	.0003
6-25	1.02	.0569	:48	3.00	1.12	:34	.0202	.0010
6-26, 28	0	.0156	:52	1.65	1.23	:37	.0298	.0022
6-29, 7-1	0	T	11:00	1.50	1.43	:39	.0361	.0033
7-2	.04	T	:13	.46	1.53	:45	.0435	.0073
7-3	.30	.0001	1:31p	.03	1.59	2:00	.0498	.0190
7-4, 6	0	T	6:15	0	1.59	:27	.0435	.0400
7-8	.33	0	9:35	.06	1.72	:47	.0361	.0533
			10:33	.10	1.82	3:10	.0298	.0659
			12:00m	0	1.82	:35	.0247	.0773
			Raingage 14	.80		4:05	.0202	.0885
			Raingage 20	.83		5:21	.0130	.1092
			Weighted average $\frac{1}{2}$	1.48		7:30	.0074	.1304
						12:00m	.0037	.1540
						7-10-61		
						4:05a	.0026 $\frac{2}{2}$	.1669
<u>Event of July 16-17, 1961</u>								
6-16-61	0.73	0.2040	7-16-61	Raingage 5		7-16-61		
6-17	.89	.0803	9:33p	0	0	9:37p	T	0
6-18	1.78	1.1056	:38	1.32	.11	:53	.0004	.0001
6-19, 22	0	.0393	:42	3.15	.32	:59	.0016	.0001
6-23, 24	0	T	:48	2.10	.53	10:03	.0023	.0002

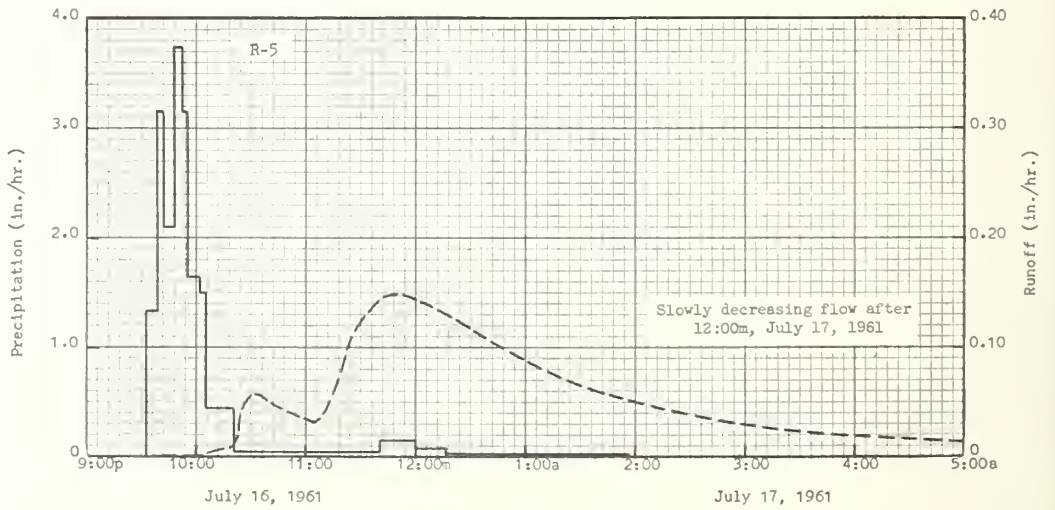
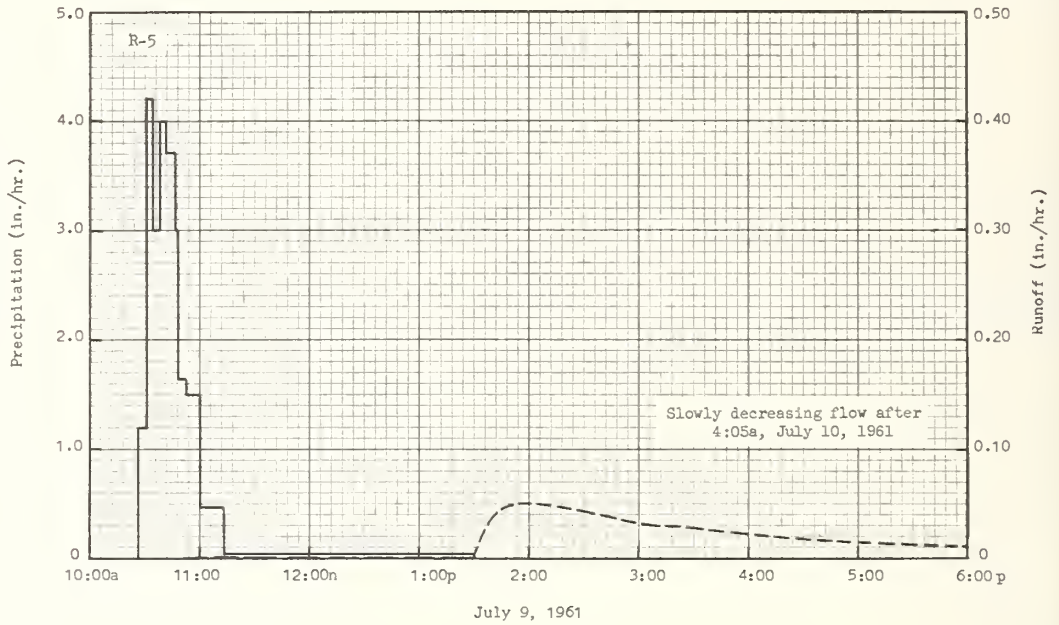
Notes: To convert runoff in in/hr to cfs, multiply by 583.63. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 42.4-6.  $\frac{1}{2}$ / Thiessen weighted, using 3 raingages.  $\frac{2}{2}$ / Slowly decreasing flow after 4:05a.



SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS			Watershed C				
Antecedent conditions			Rainfall			Runoff				
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)		
Event of July 16-17, 1961 - Continued										
6-25-61	1.02	0.0569	7-16-61			7-16-61				
6-26, 28	0	.0157	9:53p	3.72	0.85	10:09p	0.0047	0.0006		
6-29, 7-1	0	T	:57	3.15	1.06	:19	.0089	.0016		
7-2	.04	T	10:01	1.65	1.17	:21	.0118	.0020		
7-3	.30	.0001	:05	1.50	1.27	:24	.0291	.0030		
			:20	.44	1.38	:26	.0445	.0042		
7-4, 6	0	T	11:40	.03	1.42	:29	.0531	.0066		
7-8	.33	0	12:00m	.15	1.47	:33	.0572	.0103		
7 9	1.48	.1540	7-17-61			:43	.0486	.0191		
7 10	.37	.0983	12:16a	.08	1.49	:59	.0336	.0300		
7-11	0	.0109	1:58	.02	1.53	11:04	.0317	.0328		
7-12	.09	.0019	Raingage 14		1.68	:09	.0370	.0356		
7-13, 14	0	.0006	Raingage 20		1.71	:14	.0531	.0393		
7-15	0	T	Weighted average <sup>1/</sup>		1.58	:19	.0748	.0444		
Watershed Conditions: Same as for event of July 9, 1961 with little or no tillage practices.						:24	.104	.0520		
						:29	.121	.0614		
								:37	.139	.0787
								:50	.149	.1098
								12:00m	.143	.1342
								7-17-61		
								12:23a	.125	.1855
								:57	.0923	.2467
								1:31	.0658	.2910
								2:12	.0466	.3294
								:57	.0320	.3586
								3:25	.0264	.3723
								4:29	.0178	.3955
								5:12	.0143	.4070
								7:24	.0083	.4312
					10:53	.0042	.4521			
					6:12p	.0015	.4711			
					12:00m	.0007 <sup>2/</sup>	.4773			

Notes: To convert runoff in in/hr to cfs, multiply by 583.63. <sup>1/</sup> Thiessen method, using 3 raingages.  
<sup>2/</sup> Slowly decreasing flow after 12:00m.

6-62



RIESEL (WACO), TEXAS WATERSHED C

MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed D Area - 1110 acres (1.734 sq. mi.)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.38	2.36	1.43	1.05	1.41	5.04	0.76	4.05	0.47	6.05	2.36	7.77	35.13
	Q	1.21	.26	.13	T	o	.26	0	.14	0	.40	.14	4.34	6.88
1961	P	5.29	5.36	2.24	.57	2.17	7.76	5.09	.06	4.59	3.35	2.06	1.86	40.40
	Q	4.13	3.69	.08	T	o	1.82	.86	0	.45	.51	T	.14	11.68

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS RIESEL (WACO), TEXAS Watershed D

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.24	12-7	0.24	12-7	0.44	12-7	1.20	12-7	1.88	12-7	3.12	12-6	3.50	12-6	4.25
1961	2-16	.36	2-16	.36	2-16	.67	2-5	1.47	2-5	1.86	1-12	2.01	2-5	2.23	1-6	4.09

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
Watershed conditions: No appreciable change in land use or conservation practices since 1955.

SELECTED RUNOFF EVENTS RIESEL (WACO), TEXAS Watershed D

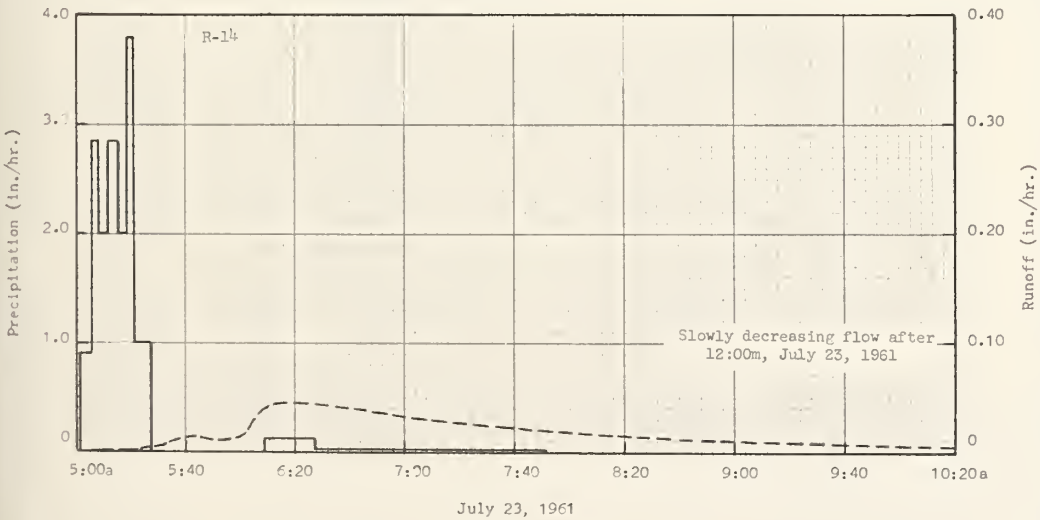
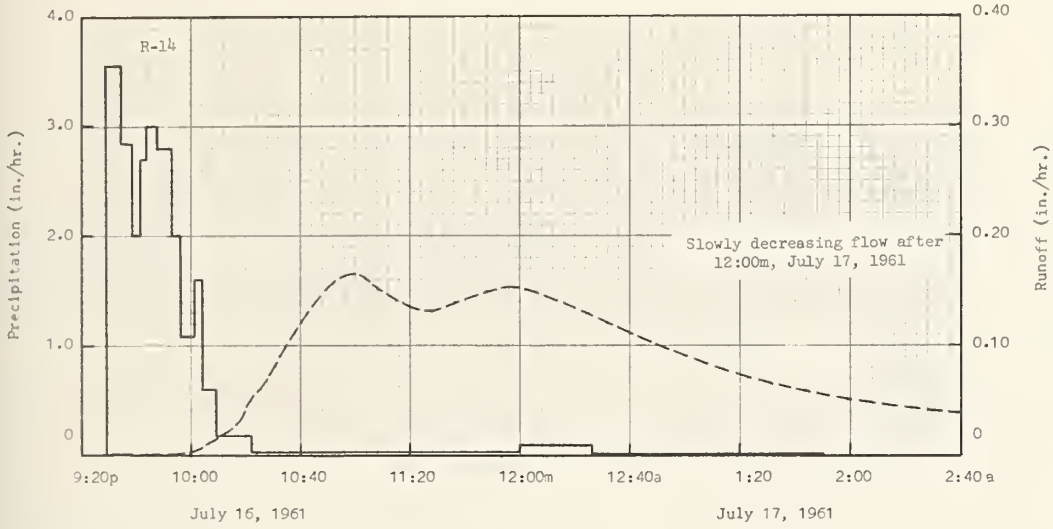
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 16-17, 1961								
6-16-61	0.68	0.1926	7-16-61	Raingage 14		7-16-61		
6-17	.86	.1011	9:29p	0	0	9:33p	0	0
6-18	1.74	1.2513	:34	3.56	.28	:37	T	T
6-19, 21	0	.0345	:38	2.85	.47	:49	.0002	T
6 22, 23	0	T	:41	2.00	.57	:55	.0010	.0001
6-25	1.04	.0806	:43	2.70	.66	10:04	.0064	.0005
6-26, 28	0	.0112	:47	3.00	.86	:08	.0127	.0011
6-29	0	T	:53	2.80	1.14	:11	.0194	.0019
7-2	.12	0	:56	2.00	1.24	:15	.0241	.0034
7-3	.32	0	10:01	1.08	1.33	:19	.0367	.0053
7-8	.33	0	:04	1.60	1.41	:29	.0701	.0143
7-9	1.17	.0741	:09	.60	1.48	:34	.0978	.0214
7-10	.39	.0793	:22	.18	1.52	:45	.136	.0421
7-11	0	.0075	12:00m	.02	1.56	:52	.159	.0592
7-12	.09	.0012	7-17-61			:59	.164	.0780
7-13	0	.0003	12:26a	.09	1.60	11:11	.147	.1090
7-14	0	T	1:50	.01	1.62	:27	.130	.1458
7-16	.03 <u>2/</u>	0	Raingage 5		1.53	:47	.147	.1918
			Raingage 20		1.67	12:00m	.153	.2241
			Raingage 26A		1.63	7-17-61		
Watershed Conditions: 9% of the area in cotton in fruiting stage; 7% in corn in dough stage; 5% in wheat and oats stubble; 2% in row grain sorghum in dough stage; 20% in pasture; 26% in Johnson grass, headed; 23% in idle crop land (weeds); 3% in broadcast grain sorghum in dough stage; 3% in farmsteads and roads, and 2% in miscellaneous crops.								
			Weighted average <u>1/</u>		1.60	12:21a	.136	.2743
						:53	.0978	.3360
						1:25	.0701	.3809
						2:25	.0440	.4364
						3:44	.0241	.4798
						4:37	.0155	.4973
						6:59	.0083	.5247
						9:14	.0049	.5391
						12:22p	.0027	.5505
						5:04	.0013	.5596
						12:00m	.0006 <u>3/</u>	.5659

Notes: To convert runoff in in/hr to cfs, multiply by 1,119.25. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 42.4-6.  
1/ Thiessen method, using 4 rain gages. 2/ Prior to event beginning 9:33p. 3/ Slowly decreasing flow after 12:00m.

SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS			Watershed D		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <u>1/</u> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 23, 1961								
6-23-61	0	T	7-23-61	Raingage 14		7-23-61		
6-25	1.04	.0806	5:01a	0	0	5:05a	0	0
6-26, 28	0	.0112	:05	.90	.06	:09	I	I
6-29	0	T	:08	2.85	.25	:16	.0004	T
7-2	.12	0	:11	2.00	.35	:23	.0016	.0001
7-3	.32	0	:15	2.85	.54	:25	.0023	.0002
7-8	.33	0	:18	2.00	.64	:35	.0093	.0010
7-9	1.17	.074	:21	3.80	.83	:38	.0116	.0016
7-10	.39	.0793	:27	1.00	.93	:43	.0135	.0026
7-11	0	.0075	6:09	0	.93	:55	.0121	.0051
7-12	.09	.0012	:27	.13	.97	:59	.0141	.0060
7-13	0	.0003	7:51	.01	.98	6:03	.0216	.0072
7-14	0	T	10:50	I	.99	:06	.0333	.0086
7-16	1.58	.2241	Raingage 5		.78	:09	.0403	.0104
7-17	.06	.3418	Raingage 20		1.08	:19	.0459	.0176
7-18, 20	0	.0066	Raingage 26A		1.09	:40	.0403	.0326
7 21	0	T	Weighted average <u>1/</u>		.94	7:00	.0333	.0448
7-22	.10	0				:29	.0268	.0593
						8:12	.0173	.0748
						:59	.0116	.0859
						9:59	.0073	.0951
						11:26	.0042	.1034
						3:10p	.0016	.1132
						7:04	.0008	.1177
						12:00m	.0004 <u>2/</u>	.1205
Watershed Conditions: Same as for event of July 16-17, 1961 with little if any tillage between dates.								

Notes: To convert runoff in in/hr to cfs, multiply by 1119.25. 1/ Thiessen method, using 4 raingages.  
2/ slowly decreasing flow after 12:00m.





RIESEL (WACO), TEXAS WATERSHED D

MONTHLY PRECIPITATION AND RUNOFF (Inches)										RIESEL (WACO), TEXAS Watershed G Area - 4380 ac. (6.84 sq. mi.)				
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.14	2.21	1.62	1.50	1.56	4.88	0.94	3.74	0.52	5.82	2.25	7.33	34.51
	Q	1.17	.29	.23	T	.27	0	0	.09	0	.28	.11	3.88	6.32
1961	P	5.15	5.00	2.21	.63	2.04	7.89	4.69	.23	4.72	2.50	2.00	1.90	38.96
	Q	3.67	3.07	.10	T	T	1.86	.69	0	.48	.12	0	.10	10.09

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										RIESEL (WACO), TEXAS Watershed G						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
	Date	Rate	1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
			Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.15 <sup>2/</sup>	12-7	0.15 <sup>2/</sup>	12-7	0.31 <sup>2/</sup>	12-7	0.84	12-7	1.50	12-7	2.64	12-7	3.05	12-6	3.80
1961	2-5	.23	2-5	.23	2-5	.44	2-5	1.09	2-5	1.53	2-5	1.72	2-5	2.01	1-6	3.61

Notes: Quality of records: monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
Watershed conditions: No appreciable change in land use since 1957.

SELECTED RUNOFF EVENTS										RIESEL (WACO), TEXAS Watershed G			
Antecedent conditions				Rainfall				Runoff					
Date	Rainfall (inches)	Runoff (inches)		Date and time	Intensity (in/hr)	Acc. (inches)		Date and time	Rate (in/hr)	Acc. (inches)			
Event of July 16-17, 1961													
6-16-61	0.56	0.2137		7-16-61	Raingage 65A			7-16-61					
6-17	.77	.0839		9:41p	0	0		9:41p	0	0			
6-18	1.74	1.0655		:43	4.20	.14		:57	T	T			
6-19, 22	0	.0628		:49	4.00	.54		10:16		.0005			.0001
6-23	0	T		:55	3.00	.84		:24		.0012			.0002
6-25	1.23	.2149		10:00	3.60	1.14		:30		.0020			.0003
6-26, 29	0	.0181		:03	2.00	1.24		:32		.0025			.0004
7-2	.07	0		:10	.60	1.31		:45		.0050			.0013
7-3	.34	0		:24	.21	1.36		:59		.0094			.0029
7-4	.01	.0001		12:00m	.01	1.38		11:04		.0115			.0037
7-5	0	T		7-17-61				:08		.0136			.0046
7-8	.18	0		12:16a	.08	1.40		:12		.0159			.0055
7-9	.84	.0143		:30	.09	1.42		:32		.0220			.0121
7-10	.47	.0696		7:58	T	1.44		12:00m		.0276			.0237
7-11	0	.0084		Raingage	5	1.53		7-17-61					
7-12	.15	.0012		Raingage	14	1.62		12:29a		.0328			.0383
7-13	T	.0004		Raingage	20	1.67		:42		.0358			.0457
7-14, 15	0	T		Raingage	26A	1.63		1:03		.0437			.0595
7-16	.04 <sup>3/</sup>	0		Raingage	30A	1.70		:28		.0562			.0805
				Raingage	48A	1.50		:35		.0603			.0873
				Raingage	56A	1.41		:48		.0648			.1008
				Raingage	70	1.34		2:05		.0671			.1195
				Raingage	84A	1.13		:37		.0673			.1554
				Raingage	89	1.24		:52		.0675			.1723
				Raingage	43A	1.14		3:44		.0598			.2273
				Raingage	74A	1.11		4:35		.0494			.2738
				Weighted Average <sup>1/</sup>		1.50		:57		.0442			.2910
								5:41		.0365			.3205
								6:26		.0297			.3453
								7:41		.0191			.3760

Notes: To convert runoff in in/hr to cfs, multiply by 4416.48. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p.42.4-6. <sup>1/</sup> Thiessen weighted, using 15 raingages. <sup>2/</sup> Runoff rate varied from 0.1527 to 0.1540 in/hr for 2 hours, and rounding off causes larger volume for second hour. <sup>3/</sup> Prior to event beginning 9:41p.

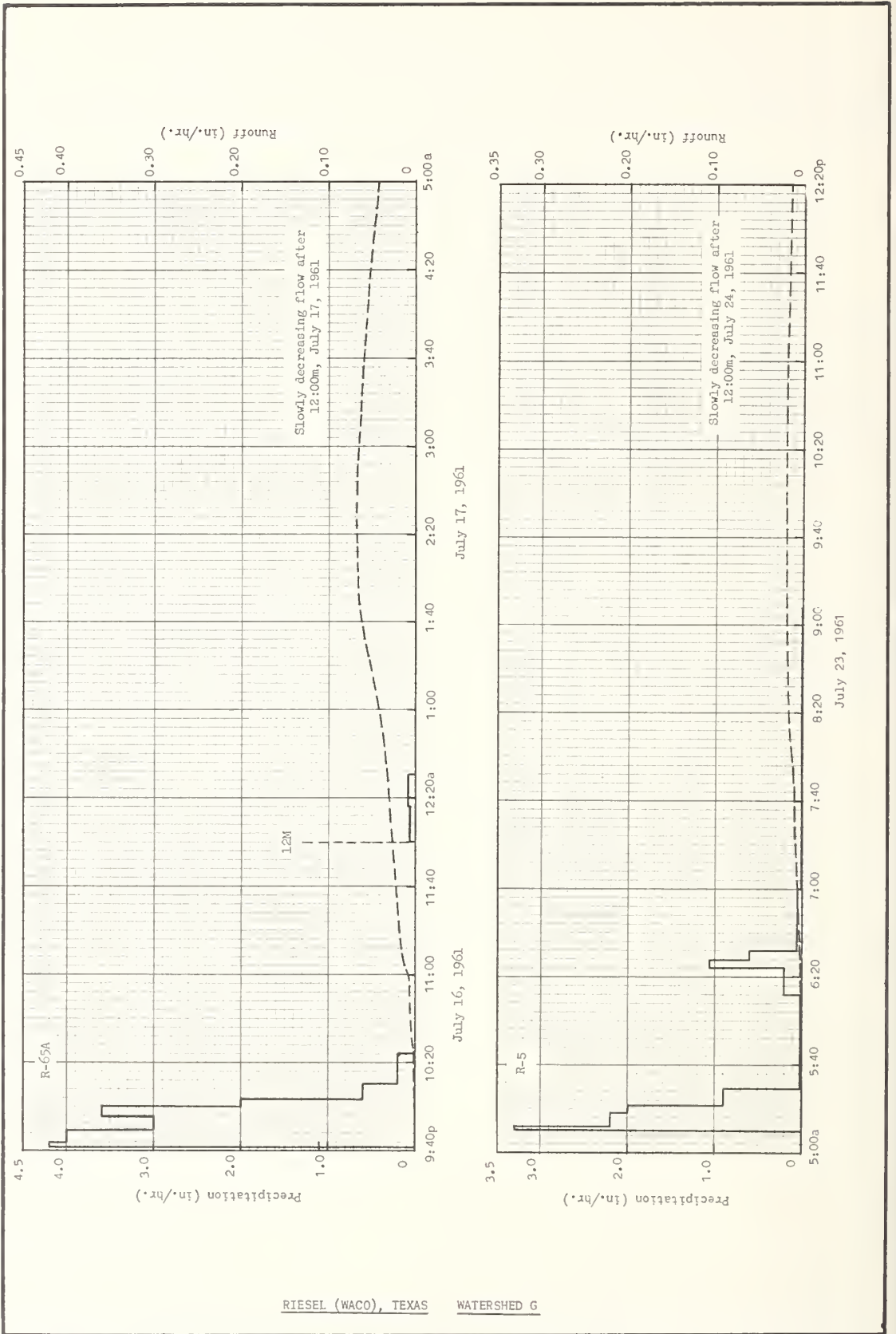
SELECTED RUNOFF EVENTS

RIESEL (WACO), TEXAS

Watershed G

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <u>1/</u> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 16-17, 1961 - Continued								
						7-17-61		
						8:59a	0.0107	0.3949
						11:43	.0050	.4140
						2:05p	.0031	.4236
						6:08	.0016	.4329
						12:00m	.0008 <u>2/</u>	.4394
Event of July 23-24, 1961								
6-23-61	0	T	7-23-61	Raingage 65A		7-23-61		
6-25	1.23	.2149	5:05a	0	0	5:15a	0	0
6-26, 29	0	.0181	:09	3.15	.21	:37	T	T
7-2	.07	0	:12	6.20	.52	6:13	.0006	.0001
7-3	.34	0	:15	2.00	.63	:20	.0014	.0002
7-4	.01	.0001	:17	3.00	.73	:28	.0028	.0005
7-5	0	T	:22	1.20	.83	7:00	.0065	.0032
7-8	.18	0	:30	.44	.94	:10	.0071	.0044
7-9	.84	.0143	:44	0	.94	:30	.0091	.0070
7-10	.47	.0696	7:39	.01	.96	:42	.0104	.0090
7-11	0	.0084	:42	1.60	1.04	:50	.0118	.0105
7-12	.15	.0012	9:30	.03	1.10	8:20	.0155	.0172
7-13	T	.0004	7-23-61	Raingage 5		9:00	.0187	.0286
7-14, 15	0	T	5:10a	0	0	:20	.0196	.0350
7-16	1.48	.0237	:12	3.30	.11	:50	.0205	.0450
7-17	.07	.4157	:18	2.20	.33	10:30	.0211	.0589
7-18, 20	0	.0094	:21	2.00	.43	11:05	.0202	.0710
7-21	0	T	:29	.90	.55	12:10p	.0169	.0913
7-22	.11	T	6:12	.03	.57	1:05	.0124	.1047
			:24	.20	.61	2:23	.0063	.1163
Watershed Conditions: Same as for event of July 16-17, 1961 with little if any tillage between dates.								
			:28	1.05	.68	5:35	.0027	.1298
			:32	.60	.72	9:15	.0013	.1368
			7:00	.06	.75	12:00m	.0009	.1395
			9:08	.01	.78	7-24-61		
			Raingage	14	.99	5:45a	.0005	.1433
			Raingage	20	1.08	3:00p	.0002 <u>2/</u>	.1466
			Raingage	26A	1.09	12:00m	.0001 <u>2/</u>	.1482
			Raingage	30A	1.02			
			Raingage	48A	1.09			
			Raingage	56A	1.01			
			Raingage	70	.76			
			Raingage	84A	.64			
			Raingage	89	.61			
			Raingage	43A	1.14			
			Raingage	74A	.59			
			Weighted	Average <u>1/</u>	.97			

Notes: To convert runoff in in/hr to cfs, multiply by 4416.48. 1/ Thiessen method, using 13 raingages. 2/ Slowly decreasing flow after 12:00m.





MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed W-1 (Area - 176 acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.19	2.14	1.54	2.19	1.96	5.08	0.35	3.20	0.62	5.78	2.24	7.45	34.74
	Q	1.22	.39	.36	.06	.02	.40	T	T	0	.37	.10	3.71	6.63
1961	P	4.91	4.61	2.12	.46	2.39	8.04	3.98	.30	4.61	2.17	2.24	2.02	37.85
	Q	3.04	2.33	.11	.01	.13	2.37	.24	T	.46	.02	.03	.20	8.94

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							RIESEL (WACO), TEXAS Watershed W-1									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-18	0.20	12-7	0.18	12-7	0.31	12-7	0.74	12-7	1.36	12-7	2.65	12-7	2.84	12-6	3.64
1961	6-25	.45	6-15	.31	6-18	.58	2-5	1.08	2-5	1.32	2-5	1.43	2-5	1.70	1-6	2.98

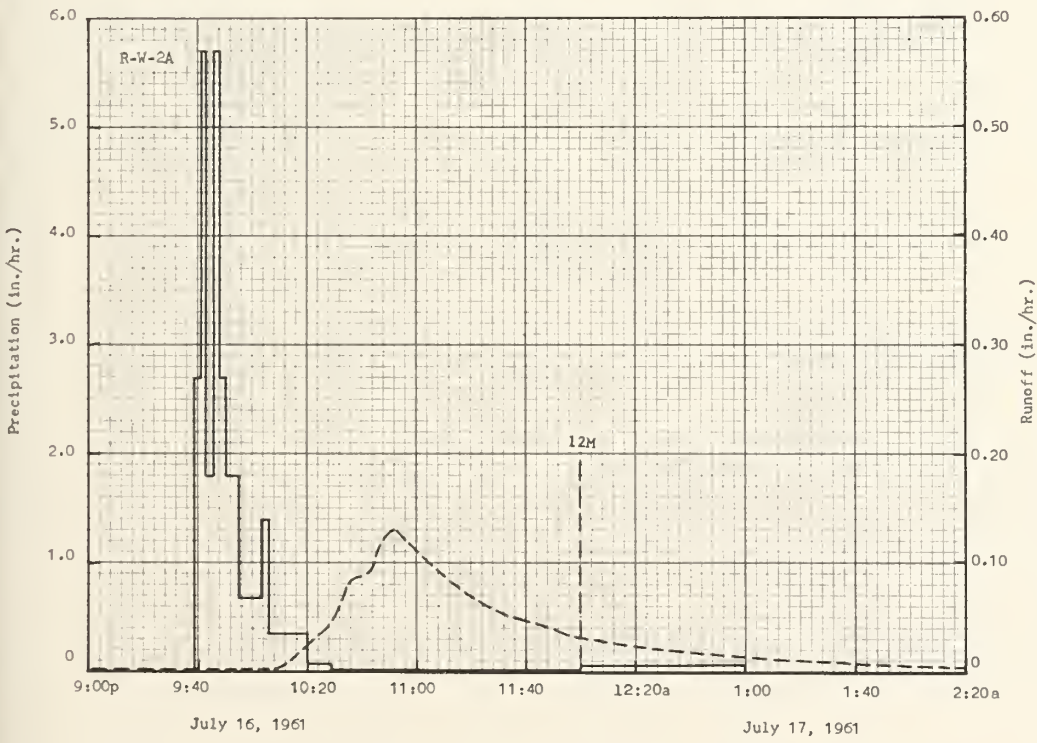
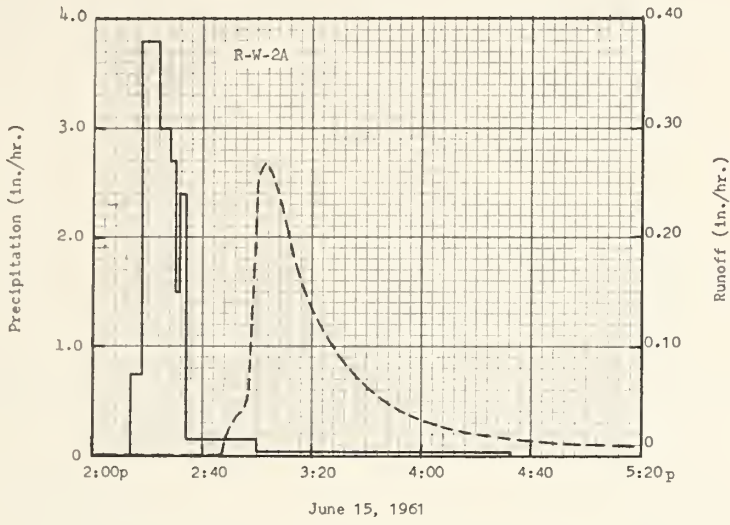
Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
Watershed conditions: No appreciable change in land use since 1957.

SELECTED RUNOFF EVENTS				RIESEL (WACO), TEXAS Watershed W-1				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 15, 1961</u>								
5-22-61	1.77	0.1114	6-15-61	Raingage W-2A		6-15-61		
5-23	.05	.0097	2:14p	0	0	2:47p	0.0008	0
5-24	0	.0004	:18	.75	.05	:49	.0164	.0002
5-25	.20	.0017	:24	3.80	.43	:50	.0247	.0005
5-26	.05	.0021	:28	3.00	.63	:51	.0329	.0010
5-27	0	.0002	:30	2.70	.72	:55	.0435	.0035
5-28, 30	0	T	:32	1.50	.77	:57	.0610	.0053
6-5	.09	.0002	:34	2.40	.85	:58	.102	.0066
6-6	.25	T	3:00	.16	.92	3:00	.248	.0124
6-8	.11	T	4:33	.03	.97	:03	.270	.0254
6-9, 11	0	T	Raingage	75A	1.07	:07	.244	.0425
6-12	.03	T	Raingage	9	1.04	:13	.184	.0637
6-13	0	T	Raingage	W-2	1.20	:19	.138	.0796
6-14	.89	.0010	Raingage	W-5A	.65	:26	.105	.0937
6-15	0	.0004 <sup>2/</sup>	Weighted Average <sup>1/</sup>		.99	:33	.0807	.1045
Watershed Conditions: Straight row cultivation, no terraces. 36% of the area in cotton in early fruiting stage cultivated June 13; 23% in corn in dough stage; 19% in oats stubble bedded June 8, 14% in Bermudagrass pasture moderately to heavily grazed; 3% in native grass meadow with dense growth 18 ins. high; 5% in farmsteads and gravel roads.								
<u>Event of July 16-17, 1961</u>								
6-16-61	0.47	0.1145	7-16-61	Raingage W-2A		7-16-61		
6-17	.77	.1139	9:39p	0	0	9:50p	0.0014	0
6-18	1.69	1.0480	:41	2.70	.09	10:09	.0027	.0007
6-19, 24	0	.0530	:43	5.70	.28	:11	.0035	.0008
6-25	1.38	.3294	:46	1.80	.37	:13	.0088	.0011
						:40	.0627	.1128
						:47	.0486	.1192
						4:00	.0336	.1282
						:12	.0247	.1339
						:28	.0171	.1394
						:58	.0120 <sup>3/</sup>	.1465

Notes: To convert runoff in in/hr to cfs, multiply by 177.41. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 42.6-6. <sup>1/</sup> Thiessen weighted, using 5 raingages. <sup>2/</sup> Runoff prior to 2:47p. <sup>3/</sup> Slowly decreasing flow after 4:58p.

SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS			Watershed W-1				
Antecedent conditions			Rainfall			Runoff				
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)		
Event of July 16-17, 1961 - Continued										
6-26, 7-1	0	0.0070	7-16-61 9:48p	5.70	0.56	7-16-61 10:20p	0.0247	0.0030		
7-2	.03	.0004	:50	2.70	.65	:23	.0329	.0044		
7-3	.28	.0019	:55	1.80	.80	:29	.0435	.0082		
7-4, 7	0	.0018	10:03	.68	.89	:32	.0559	.0107		
7-8	.02	.0003	:06	1.40	.96	:34	.0711	.0128		
7-9	.37	.0015	:20	.34	1.04	:36	.0852	.0154		
7-10	.62	.0056	:29	.07	1.05	:43	.0903	.0256		
7-11	0	.0010	12:00m	.02	1.08	:46	.113	.0307		
7-12	.59	.0212	7-17-61			:52	.132	.0428		
7-13, 15	0	.0048	1:00a	.05	1.13	:57	.120	.0535		
7-16	.05 <sup>2/</sup>	.0011 <sup>3/</sup>	Raingage	75A	1.26	11:07	.0960	.0714		
			Raingage	89	1.24	:17	.0756	.0857		
			Raingage	W-2	1.16	:28	.0593	.0980		
			Raingage	W-5A	1.10	:42	.0464	.1103		
			Weighted	Average <sup>1/</sup>	1.16	:55	.0353	.1192		
Watershed Conditions: Straight row cultivation, no terraces. 36% of the area in cotton in fruiting stage cultivated July 5; 23% in corn in hard dough stage; 19% in oats stubble bedded June 8; 14% in Bermudagrass pasture moderately to heavily grazed, 3% in native grass meadow cut for hay June 29, 5% in farmsteads and gravel roads.							12:00m	.0329	.1220	
							7 17-61			
							12:16a	.0247	.1297	
							1:06	.0126	.1450	
			2:18	.0062 <sup>4/</sup>	.1558					

Notes: To convert runoff in in/hr to cfs, multiply by 177.41. <sup>1/</sup> Thiessen weighted, using 5 raingages.  
<sup>2/</sup> Prior to event beginning 9:39p. <sup>3/</sup> Runoff prior to 9:50p. <sup>4/</sup> Slowly decreasing flow after 2:18a.



RIESEL (WACO), TEXAS      WATERSHED W-1

MONTHLY PRECIPITATION AND RUNOFF (Inches)								RIESEL (WACO), TEXAS Watershed W-2 (Area - 130 acres)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.18	2.10	1.46	2.04	1.90	5.15	0.54	3.12	0.72	5.90	2.20	7.33	34.64
Q	1.76	.82	.66	.23	.14	.17	.02	T	0	.15	.17	3.99	8.11
1961 P	4.71	4.56	2.20	.39	2.39	8.14	3.78	.35	4.50	2.14	2.23	2.02	37.41
Q	3.70	2.81	.39	.15	.12	1.57	.28	.05	.49	.12	.37		10.17

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								RIESEL (WACO), TEXAS Watershed W-2								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
	Date	Rate	1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.21	12-7	0.19	12-7	0.34	12-7	0.74	12-7	1.34	12-7	2.60	12-7	2.83	12-6	3.69
1961	2-5	.21 <sup>2</sup>	2-5	.20	2-5	.39	2-5	1.10	2-5	1.37	1-11	1.54	2-5	1.80	1-6	3.35

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
Watershed conditions: No appreciable change in land use or conservation practices since September 1957.

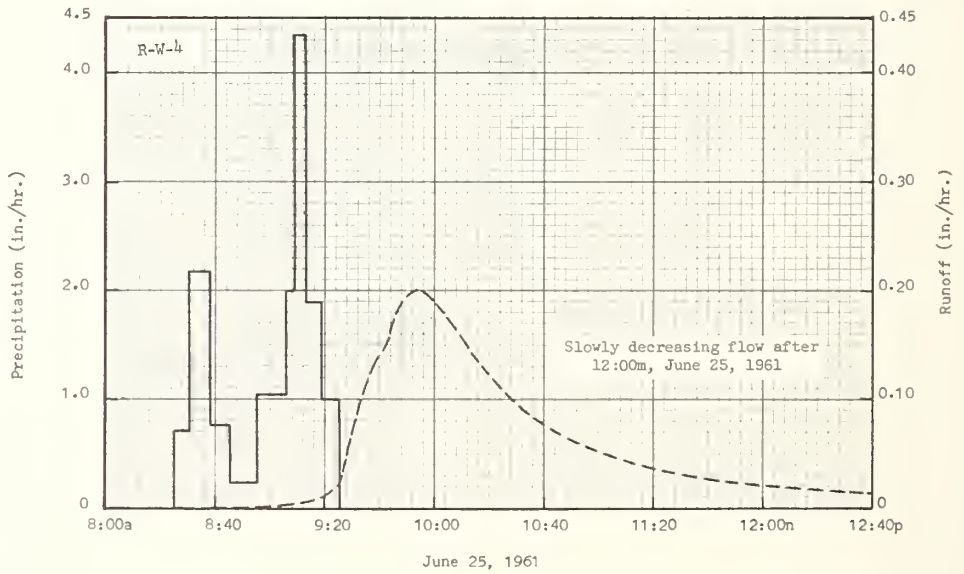
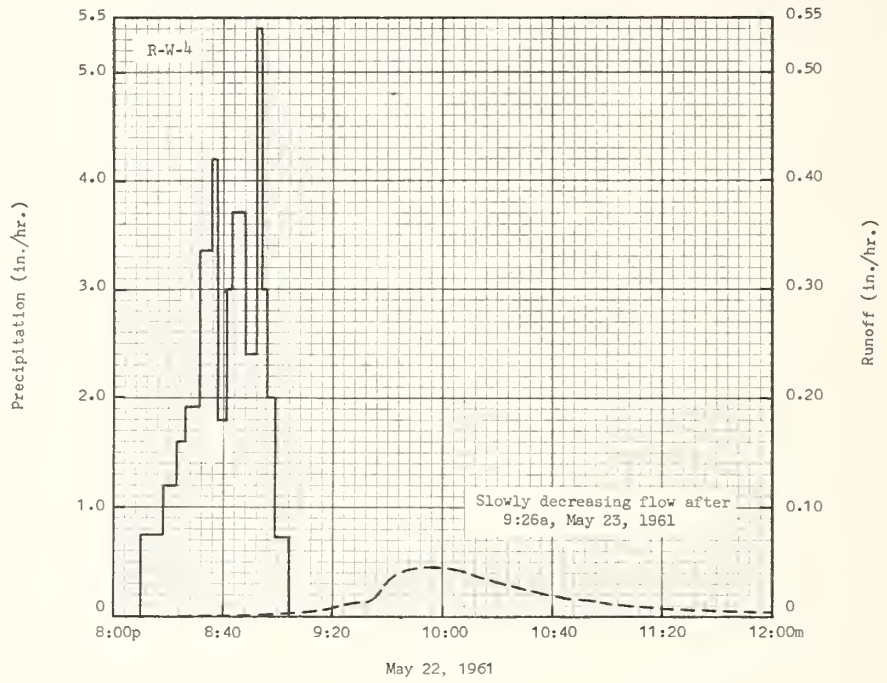
SELECTED RUNOFF EVENTS					RIESEL (WACO), TEXAS Watershed W-2				
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
Event of May 22-23, 1951									
4-22, 27-61	0	0.0164	5-22-61	Raingage W-4		5-22-61			
4-28	.13	.0029	8:10p	0	0	8:23p	T	0	
4-29	.03	.0037	:18	.75	.10	:52	.0013	.0002	
4-30	0	.0033	:23	1.20	.20	9:12	.0034	.0009	
5-1	.04	.0034	:26	1.60	.28	:22	.0092	.0020	
5-2, 7	0	.0148	:31	1.92	.44	:30	.0129	.0035	
5-8	.32	.0032	:36	3.36	.72	:36	.0170	.0050	
5-9, 10	0	.0018	:38	4.20	.86	:41	.0333	.0071	
5-11, 12	0	T	:41	1.80	.95	:45	.0412	.0096	
5-13, 21	0	0	:43	3.00	1.05	:57	.0459	.0183	
Watershed Conditions: 7% of the area in cotton 3" high, cultivated May 8, contour rows, unterraced; 10% in cotton 3" high planted last of April, terraced, contour rows; 7% grain sorghum 18" high, cultivated May 12, unterraced, contour rows; 3% grain sorghum 18" high, cultivated May 15, terraced, contour rows; 4% broadcast grain sorghum 18" high; 18% oats-clover drilled on contour, unterraced, oats windrowed prior to storm, dense clover growing; 11% oats-clover drilled on contour, terraced, oats 2' high, dense growth with clover, ready for harvest; 25% Bermudagrass pasture, moderately grazed; 7% native grass meadow, dense growth, 12" high; 3% Johnsongrass, dense growth, 18" high; and 5% farmsteads and gravel roads.			:48	3.72	1.36	10:12	.0386	.0289	
			:52	2.40	1.52	:40	.0203	.0423	
			:54	5.40	1.70	:57	.0142	.0472	
			:56	3.00	1.80	11:38	.0067	.0541	
			:59	2.00	1.90	12:00m	.0050	.0562	
			9:04	.72	1.96	5-23-61			
			Raingage W-2		1.86	1:17a	.0021	.0604	
			Raingage W-5A		1.84	3:22	.0010	.0634	
			Raingage W-6		1.87	6:55	.0005	.0659	
			Weighted average 1/		1.90	9:26	.0004 <sup>2</sup>	.0670	

Notes: To convert runoff in in/hr to cfs, multiply by 131.04. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 42.7-5. 1/ Thiessen weighted, using 4 raingages. 2/ Peak rate equalcd on 6-18-61. 3/ Slowly decreasing flow after 9:26a.



SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS			Watershed W-2		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 25, 1961								
5-26-61	0.04	0.0076	6-25-61	Raingage W-4		6-25-61		
5-27, 6-1	0	.0068	8:25a	0	0	8:25a	0.0004	0
6-2	0	T	:30	.72	.6	:35	.0008	.0001
6-5	.09	T	:38	2.18	.35	9:01	.0024	.0008
6-6	.25	.0022	:45	.77	.44	:10	.0040	.0013
6-7	0	.0005	:55	.24	.48	:20	.0118	.0024
6-8	.12	.0002	9:06	1.04	.67	:26	.0240	.0041
6-9, 11	0	.0007	:09	2.00	.77	:29	.0566	.0061
6-12	.04	.0002	:13	4.35	1.06	:32	.0929	.0096
6-13	0	.0001	:19	1.90	1.75	:36	.118	.0167
6-14	1.03	.0066	:25	1.00	1.35	:42	.148	.0301
6-15	2.36	.2983	Raingage W-2		1.36	:47	.182	.0439
6-16	.42	.0535	Raingage W-5A		1.39	:54	.201	.0663
6-17	.75	.0684	Raingage W-6		1.44	10:05	.173	.1007
6-18	1.66	.7370	Weighted average <sup>1/</sup>		1.39	:14	.141	.1244
6-19, 24	0	.0805				:34	.0875	.1612
6-25	.04 <sup>2/</sup>	.0030 <sup>3/</sup>				:48	.0686	.1795
						11:16	.0397	.2048
						:37	.0296	.2170
						12:04p	.0211	.2285
						:34	.0148	.2375
						1:48	.0071	.2505
						3:07	.0038	.2575
						5:46	.0017	.2643
						12:00m	<sup>4/</sup> .0008	.2710
<p>Watershed Conditions: 7% of the area in cotton in fruiting stage, cultivated June 24, contour rows, unterraced; 10% in cotton cultivated third week of June, terraced, contour rows; 7% grain sorghum, grain in bloom stage, unterraced, contour rows; 3% grain sorghum in bloom stage, terraced contour rows; 4% broadcast grain sorghum in bloom stage, unterraced; 18% oats-clover, unterraced, drilled on contour, oats harvested mid-May, dense growth, clover growing; 11% oats clover, terraced, drilled on contour, oats harvested mid-May, dense growth, clover growing; 25% Bermudagrass pasture, moderately grazed; 7% native grass meadow, dense growth, 18" high; 3% Johnson grass, dense growth, 2' high; and 5% farmsteads and gravel roads.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 131.04.- <sup>1/</sup> Thiessen method, using <sup>4</sup> raingages. <sup>2/</sup> Prior to 8:25a. <sup>3/</sup> Runoff prior to 8:25a. <sup>4/</sup> Slowly decreasing flow after 12:00m.



RIESEL (WACO), TEXAS WATERSHED W-2

MONTHLY PRECIPITATION AND RUNOFF (Inches)								RIESEL (WACO), TEXAS Watershed W-6 (Area - 42.3 acres)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.20	2.11	1.43	2.01	1.92	5.25	0.55	3.31	0.58	5.81	2.17	7.33	34.67
1960 Q	.80	.27	.19	.02	.01	.06	0	0	0	.07	.07	3.68	5.17
1961 P	4.76	4.57	2.13	.42	2.47	8.03	3.83	.32	4.47	2.20	2.26	1.98	37.44
1961 Q	3.26	2.43	.09	.03	.02	1.06	.10	T	.30	0	T	.11	7.40

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS RIESEL (WACO), TEXAS Watershed W-6

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.26	12-7	0.25	12-7	0.41	12-7	0.79	12-7	1.51	12-7	2.74	12-6	3.04	12-6	3.64
1961	2-5	.26	2-5	.24	2-5	.47	2-5	1.18	2-5	1.45	1-11	1.69	2-5	1.80	1-6	3.18

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent. Watershed conditions: No appreciable change in conservation practices or land use since 1956.

SELECTED RUNOFF EVENTS RIESEL (WACO), TEXAS Watershed W-6

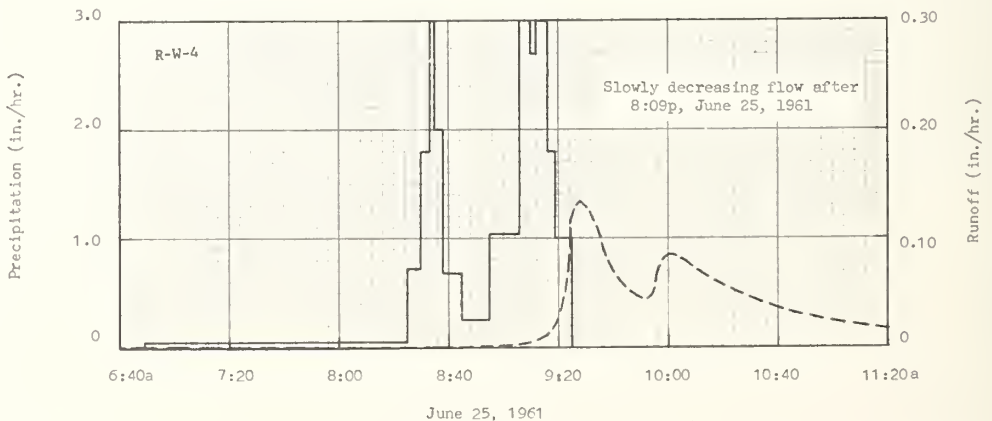
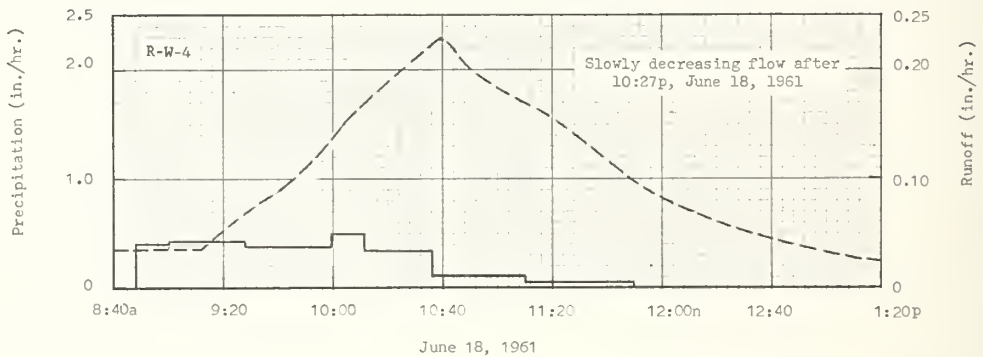
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall 1/ (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 18, 1961								
5-22-61	1.95	0.015	6-18-61	Raingage W-4		6-18-61		
5-23	.05	T	8:48a	0	0	8:47a	0.0356	0
5-25	.06	0	9:00	.40	.08	9:12	.0356	.015
5-26	.04	0	:28	.43	.28	:17	.0467	.018
6-5	.12	0	:59	.39	.48	:32	.0750	.034
6-6	.17	0	10:11	.50	.58	:52	.116	.064
6-8	.12	0	:36	.34	.72	10:06	.157	.096
6-12	.07	0	11:10	.11	.78	:29	.206	.165
6-14	1.03	0	:50	.06	.82	:39	.230	.202
6-15	2.39	.163				:48	.206	.234
6-16	.40	.026				11:19	.157	.328
6-17	.72	.028				:40	.116	.376
6-18	.70 2/	.134 3/				:52	.0931	.397
						12:23p	.0596	.436
						:38	.0467	.449
						:56	.0356	.461
						1:18	.0260	.472
						:55	.0154	.485
						2:29	.0102	.492
						3:13	.0064	.498
						4:07	.0038	.503
						7:22	.0013	.510
						10:27	.0010 4/	.514
Event of June 25, 1961								
5-26-61	0.04	0	6-25-61	Raingage W-4		6-25-61		
6-5	.12	0	6:49a	0	0	8:24a	0.0001	0
6-6	.17	0	8:25	.03	.04	:37	.0008	T
6-8	.12	0	:30	.72	.10	:41	.0013	T
6-9, 11	0	0	:33	1.80	.19	9:06	.0028	.001

Notes: To convert runoff in in/hr to cfs, multiply by 42.64. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 42.7-5. 1/ Raingage W-4. 2/ Prior to 8:48a. 3/ Runoff prior to 8:47a. 4/ Slowly decreasing flow after 10:27p.

6-62

SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS Watershed W-6					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 25, 1961 - Continued								
6-12-61	0.07	0	6-25-61 8:35a	3.00	0.29	6-25-61 9:12a	0.0064	0.002
6-14	1.03	0	:38	2.00	.39	:15	.0102	.002
6-15	2.39	.163	:45	.68	.48	:18	.0185	.003
6-16	.40	.026	:55	.24	.52	:20	.0260	.003
6-17	.72	.028	9:06	1.04	.71	:22	.0410	.004
6-18	1.60	.649	:10	3.00	.91	:25	.116	.008
6-19, 24	0	.023	:12	2.70	1.00	:28	.135	.014
Watershed Conditions: 14% of the area in cotton in early fruiting stage, cultivated June 24; 41% oats-clover, oats harvested June 1, dense growth clover 12" high, growing; 11% row grain sorghum 3' high in bloom stage, cultivated mid-May; 16% Bermudagrass pasture, moderately grazed; 2% native grass meadow, dense growth 18" high, 9% Johnsongrass, dense growth 24" high; 7% gravel roads. Cropland unterraced, contour tilled.			:16	3.00	1.20	:33	.116	.025
			:19	1.80	1.29	:37	.0886	.031
			:25	1.00	1.39	:46	.0525	.041
			:52			:52	.0438	.046
			:55			:55	.0596	.049
			:57			:57	.0750	.052
			10:01			10:01	.0863	.057
			:13			:13	.0668	.072
			:27			:27	.0495	.086
			:49			:49	.0305	.100
11:14			11:14	.0185	.110			
:54			:54	.0092	.119			
12:29p			12:29p	.0057	.123			
1:54			1:54	.0023	.128			
4:54			4:54	.0007	.132			
8:09			8:09	.0003 <u>1/</u>	.134			

Notes: To convert runoff in in/hr to cfs, multiply by 42.64. 1/ Slowly decreasing flow after 8:09p.



RIESEL (WACO), TEXAS WATERSHED W-6



MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed W-10 (Area - 19.7 acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.15	2.08	1.49	2.07	1.89	5.03	0.54	2.91	0.87	6.12	2.28	7.24	34.67
	Q	1.44	.31	.18	.03	T	.30	0	0	0	.50	.04	4.39	7.19
1961	P	4.68	4.56	2.25	.37	2.29	8.31	3.71	.39	4.59	2.06	2.15	2.08	37.44
	Q	3.46	2.61	.04	T	.18	1.95	.03	T	1.03	0	0	.08	9.38

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS RIESEL (WACO), TEXAS Watershed W-10

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-18	0.41	10-18	0.28	12-7	0.42	12-7	0.87	12-7	1.62	12-7	3.16	12-6	3.54	12-6	4.35
1961	6-15	.48	6-15	.36	6-18	.49	2-5	1.18	2-5	1.44	2-5	1.59	2-5	1.89	1-6	3.47

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
Watershed conditions: No appreciable change in conservation practices or land use since September 1957.

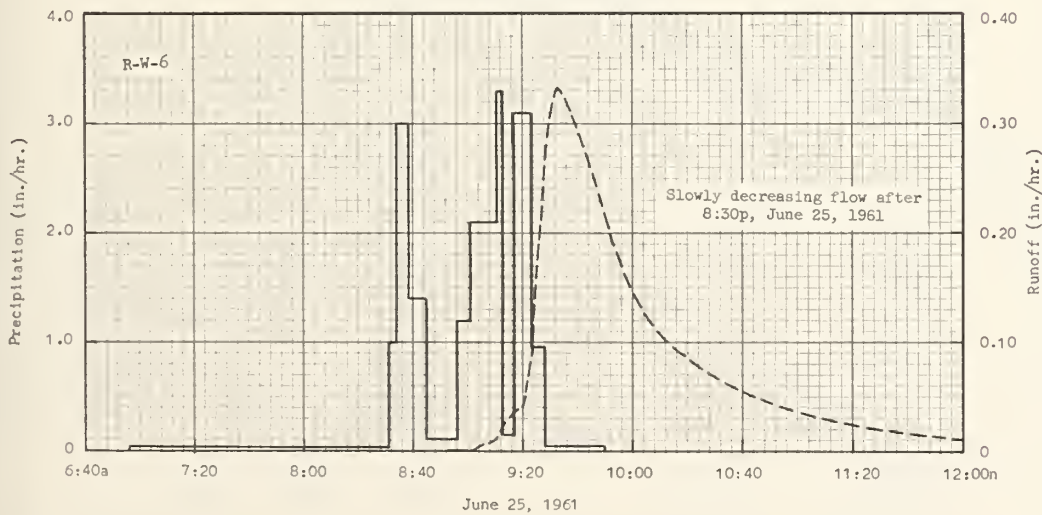
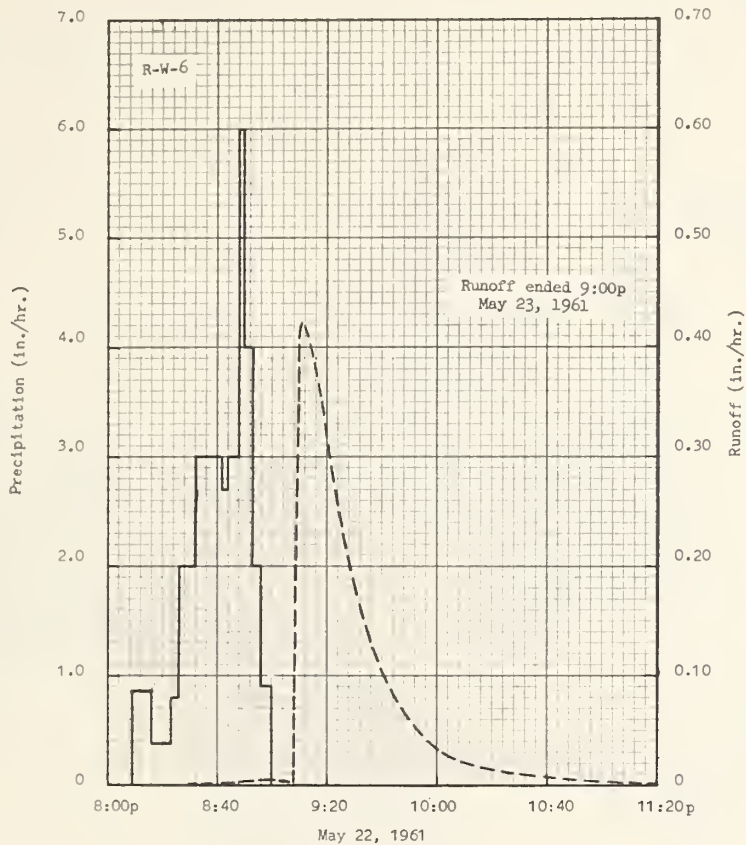
SELECTED RUNOFF EVENTS RIESEL (WACO), TEXAS Watershed W-10

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall $\frac{1}{2}$ (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 22-23, 1961</u>								
4-20-61	C..	0	5-22-61	Raingage W-6		5-22-61		
4-29	.03	0	8:09p	0	0	8:30p	0	0
5-1	.01	0	:16	.86	.10	:53	.0018	T
8	.31	0	:23	.38	.26	:59	.0034	.001
			:26	.80	.30	9:02	.0028	.001
Watershed Conditions: All cultivated land terraced and contour tilled, 23% of the area in cotton 3" high, cultivated May 8; 23% grain sorghum 18" high, cultivated May 15; 51% oats-clover, oats harvested prior to storm, clover growing, 6" high, good cover; 3% Bermudagrass pasture, moderately grazed. Average available soil moisture over the watershed on May 16 was 5.11" in the 0-60" profile.			:32	2.00	.50	:05	.0018	.001
			:42	3.00	1.00	:08	.0014	.001
			:44	2.70	1.09	:10	.409	.008
			:48	3.00	1.29	:11	.422	.014
			:50	6.00	1.49	:16	.383	.049
			:53	4.00	1.69	:19	.334	.067
			:56	2.00	1.79	:25	.255	.097
			9:00	.90	1.85	:32	.164	.122
						:36	.129	.132
						:50	.0595	.155
						:59	.0358	.162
						10:05	.0267	.165
						:15	.0173	.169
			11:03	.0028	.175			
			12:00m	.0007	.176			
			5-23-61			1:00a	.0001	.176
						9:00p	0	.177
<u>Event of June 25, 1961</u>								
5-26-61	0.03	0	6-25-61	Raingage W-6		6-25-61		
6-5	.05	0	6:56a	0	0	8:52a	0	0
6-6	.32	0	8:31	.02	.02	9:02	.0018	T
6-8	.12	0	:34	1.00	.08	:03	.0028	T
6-12	.01	0	:39	3.00	.33	:08	.0079	.001

Notes: To convert runoff in in/hr to cfs, multiply by 19.86. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 42.7-5.  
 $\frac{1}{2}$  Raingage W-6.

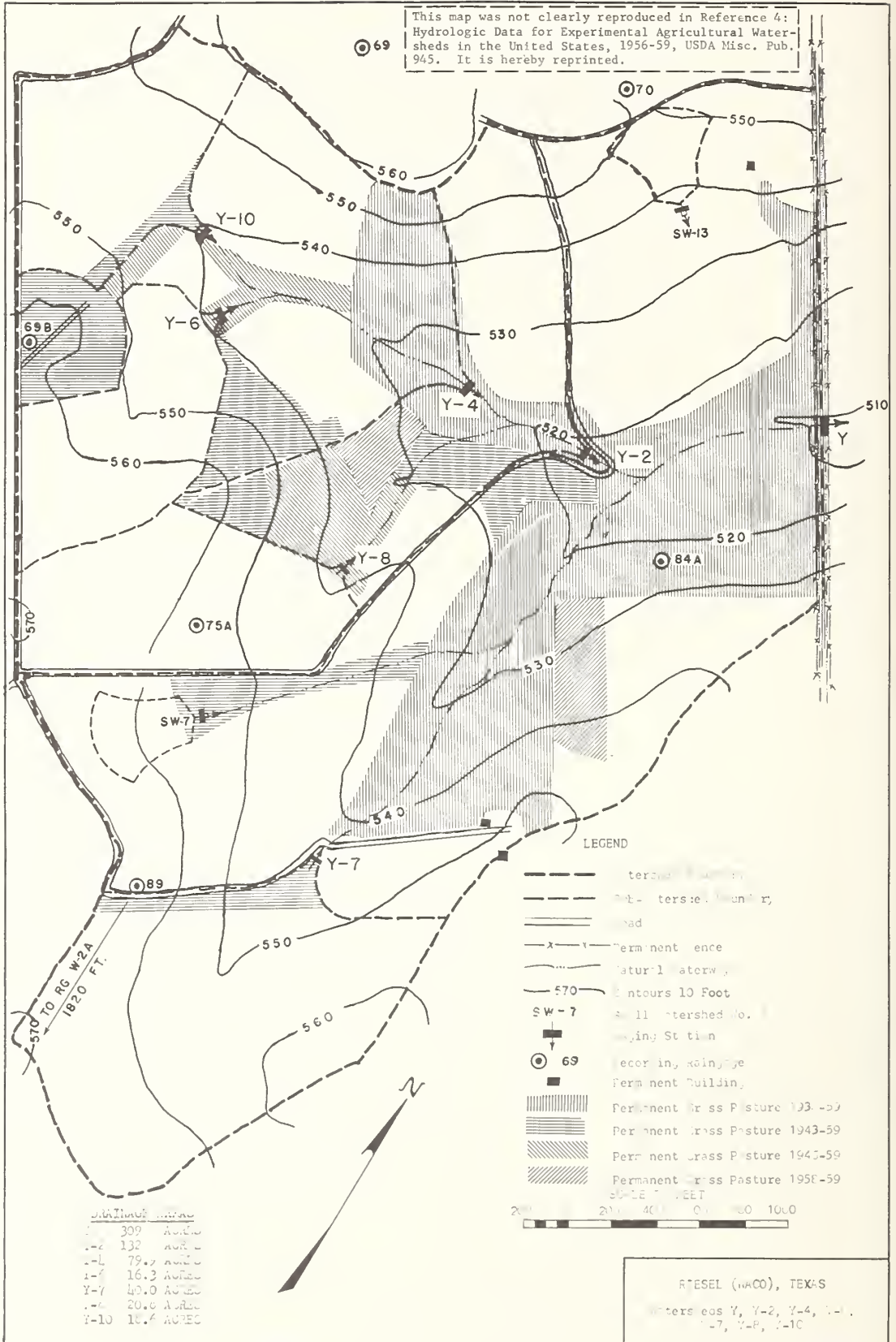
SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS Watershed W-10						
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of June 25, 1961 - Continued</u>									
6-14-61	1.03	0	6-25-61 8:45a	1.40	0.47	6-25-61 9:10a	0.0105	0.001	
6-15	2.38	.5666	:56	.11	.49	:12	.0173	.001	
6-16	.43	.0487	9:01	1.20	.59	:14	.0267	.002	
6-17	.76	.0765	:11	2.10	.94	:20	.0428	.006	
6-18	1.74	.9437	:13	3.30	1.05	:21	.0550	.006	
6-19, 20	0	.0332	:17	.15	1.06	:23	.0868	.009	
6-21	0	T	:23	3.10	1.37	:27	.223	.019	
			:28	.96	1.45	:33	.334	.048	
			:50	.05	1.47	:38	.310	.076	
Watershed Conditions: Cultivated land terraced and contour tilled. 23% of area in cotton in early fruiting stage, cultivated June 10; 23% grain sorghum 3' high in bloom stage, cultivated May 15; 51% oats-clover, oats harvested, oats stubble and clover shredded June 18; 3% Bermudagrass pasture, moderately grazed. Average available soil moisture over the watershed on June 2 was 5.40" in the 0-60" profile.							:47	.244	.118
							:54	.183	.143
							10:00	.146	.160
							:08	.112	.177
							:30	.0694	.211
							:51	.0428	.231
							11:13	.0267	.243
							:50	.0136	.256
							1:00p	.0059	.266
							3:30	.0018	.275
8:30	.0001 <u>1/</u>	.278							

Notes: To convert runoff in in/hr to cfs, multiply by 19.86. 1/ Slowly decreasing flow after 8:30p.



RIESEL (WACO), TEXAS WATERSHED W-10

This map was not clearly reproduced in Reference 4: Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945. It is hereby reprinted.





6-72

MONTHLY PRECIPITATION AND RUNOFF (Inches)								RIESEL (WACO), TEXAS Watershed Y (Area - 309 acres)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.08	2.10	1.62	2.12	1.91	4.68	0.35	3.12	0.52	5.58	2.28	7.16	33.52
Q	1.19	.35	.34	.03	.01	.15	0	0	0	.04	T	e 3.26	e 5.37
1961 P	4.89	4.51	2.06	.50	2.40	7.87	3.98	.28	4.61	2.10	2.13	1.93	37.26
Q	3.97	2.94	.10	T	.02	1.67	.16	T	.16	T	.01	.11	9.14

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS RIESEL (WACO), TEXAS Watershed Y

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.15	12-8	0.15	12-8	0.26	12-8	0.66	12-8	1.07	12-7	1.95	12-6	2.17	12-6	2.76
1961	6-18	.28	6-18	.25	2-5	.46	2-5	1.18	2-5	1.55	1-12	1.81	2-5	2.06	1-6	3.88

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
Watershed conditions: No appreciable change in land use or conservation practices since 1955.

SELECTED RUNOFF EVENTS RIESEL (WACO), TEXAS Watershed Y

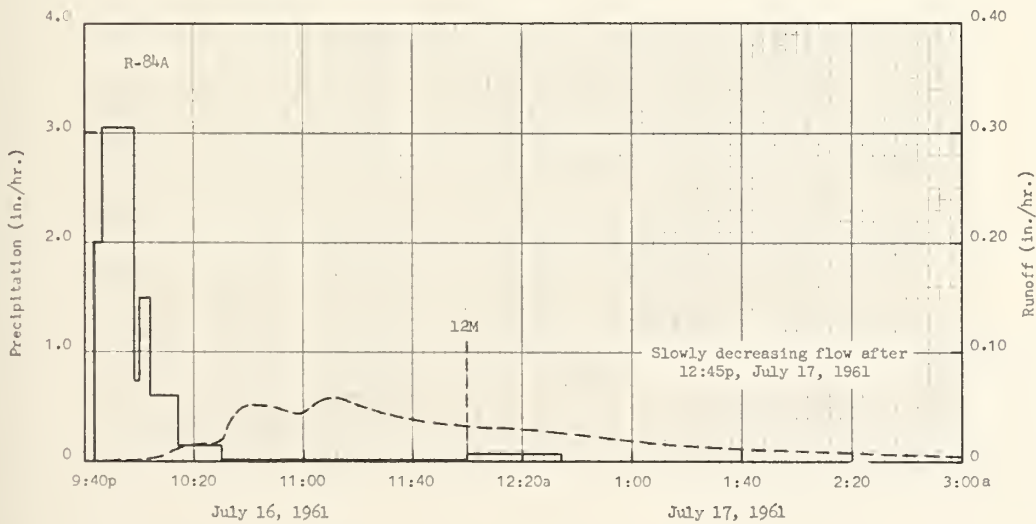
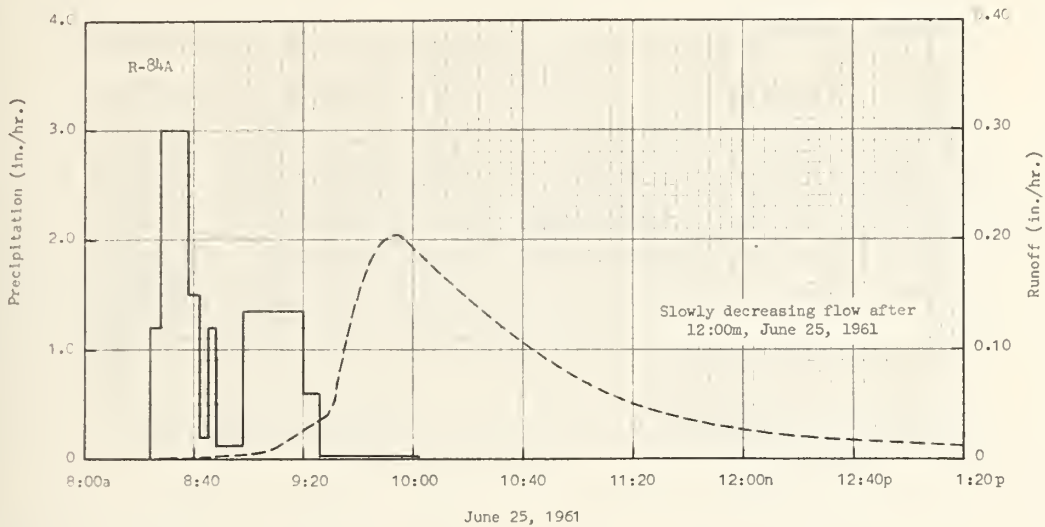
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 25, 1961								
5-26-61	0.05	0.0023	6-25-61	Raingage 84A		6-25-61		
5-27	0	.0001	8:24a	0	0	8:24a	T	0
5-28, 6-2	0	T	:28	1.20	.08	:31	.0003	.0001
6-5	.06	0	:38	3.00	.58	:40	.0014	.0002
6-6	.17	0	:42	1.50	.68	:45	.0027	.0003
6-8	.10	0	:45	.20	.69	9:03	.0054	.0016
6-12	.03	0	:48	1.20	.75	:08	.0098	.0023
6-14	.89	0	:58	.12	.77	:16	.0196	.0042
6-15	2.23	.2682	9:20	1.35	1.27	:19	.0256	.0054
6-16	.47	.0597	:26	.60	1.33	:24	.0326	.0079
6-17	.70	.0565	10:02	.03	1.35	:29	.0417	.0110
6-18	1.74	.9126	Raingage 69		1.58	:31	.0534	.0126
6-16, 24	0	.0412	Raingage 69B		1.46	:35	.104	.0182
6-25	.02 <sup>2/</sup>	T	Raingage 700		1.57	:43	.168	.0372
			Raingage 75A		1.44	:47	.192	.0494
Watershed Conditions: 14% of area in cotton in early fruiting stage cultivated mid-June; 4% corn in hard dough stage; 27% oats-clover, oats harvested mid-May, clover growing, dense cover; 12% row grain sorghum 3' high in bloom stage, cultivated mid-May; 36% Bermuda and native grass pasture, good growth, moderately grazed; 5% row sudan 3' high; 1% fallow, clean tilled; and 1% farmsteads and gravel roads. All cropland terraced and contour tilled.			Raingage 89		1.44	:54	.205	.0729
			Raingage W-2 <sup>1/</sup>		1.26	10:05	.180	.1088
			Weighted average <sup>1/</sup>		1.46	:25	.134	.1606
						:47	.0949	.2030
						11:08	.0632	.2309
						:21	.0504	.2434
						:37	.0392	.2555
						:55	.0310	.2662
						12:15p	.0237	.2755
						:41	.0185	.2847
						1:15	.0130	.2938
						2:35	.0049	.3055
			4:27	.0024	.3122			
			6:28	.0013	.3160			
			9:55	.0006	.3192			
			12:00m	.0004 <sup>3/</sup>	.3203			

Notes: To convert runoff in in/hr to cfs, multiply by 311.57. For map of watershed, see reprint on preceding page, 42.11-5 (Reprinted).  
<sup>1/</sup> Thiessen weighted, using 7 raingages. <sup>2/</sup> Prior to 8:24a. <sup>3/</sup> Slowly decreasing flow after 12:00m.

SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS			Watershed Y		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 16-17, 1961								
6-16-61	0.47	0.0597	7-16-61	Raingage 84A		7-16-61		
6-17	.70	.0565	9:43p	0	0	9:47p	T	0
6-18	1.74	.9126	:46	2.00	.10	:55	.0003	T
6-19, 24	0	.0412	:58	3.05	.71	10:00	.0019	.0001
6-25	1.47	.3203	10:00	.75	.81	:08	.0054	.0005
6-26, 7-1	0	.0086	:04	1.50	.91	:12	.0098	.0011
7-2	.02	.0001	:14	.60	1.01	:20	.0144	.0027
7-3	.36	.0026	:30	.15	1.05	:26	.0152	.0042
7-4, 5	0	.0012	12:00m	.01	1.06	:29	.0170	.0050
7-6	0	T	7-17-61			:31	.0224	.0057
7-8	.04	T	12:34a	.07	1.10	:33	.0367	.0067
7-9	.54	.0007	8:03	T	1.13	:37	.0473	.0095
7-10	.57	.0092	Raingage	69	1.36	:40	.0519	.0120
7-11	0	.0006	Raingage	69B	1.14	11:00	.0443	.0283
7-12	.37	.0012	Raingage	70	1.34	:05	.0534	.0324
7-13, 15	0	.0024	Raingage	75A	1.26	:10	.0598	.0372
7-16	.05 <sup>2/</sup>	.0001 <sup>3/</sup>	Raingage	89	1.24	:28	.0473	.0535
			Raingage	W-2A	1.13	:45	.0367	.0656
			Weighted	Average <sup>1/</sup>	1.23	12:00m	.0345	.0746
Watershed Conditions: 14% of area in cotton in heavy fruiting stage first of July; 4% corn, grain hard; 27% oats stubble and clover, clover growing, dense cover, 18" high; 12% row grain sorghum 4' high, grain in hard dough stage; 36% Bermuda and native grass pasture, good growth, moderately grazed; 5% row sudan 5' high, moderately grazed; 1% fallow, clean tilled and 1% farmsteads and gravel roads. All cropland terraced and contour tilled.						7-17-61		
						12:20a	.0291	.0954
						:45	.0224	.0963
						1:18	.0171	.1073
						2:30	.0073	.1218
						3:10	.0044	.1258
6:30	.0016	.1347						
9:25	.0007	.1379						
12:45p	.0003 <sup>4/</sup>	.1396						

Notes: To convert runoff in in/hr to cfs, multiply by 311.57. <sup>1/</sup> Thiessen weighted, using 7 raingages. <sup>2/</sup> Prior to event beginning 9:43p. <sup>3/</sup> Runoff prior to 9:47p. <sup>4/</sup> Slowly decreasing flow after 12:45p.

6-62



RIESEL (WACO), TEXAS WATERSHED Y

6-62

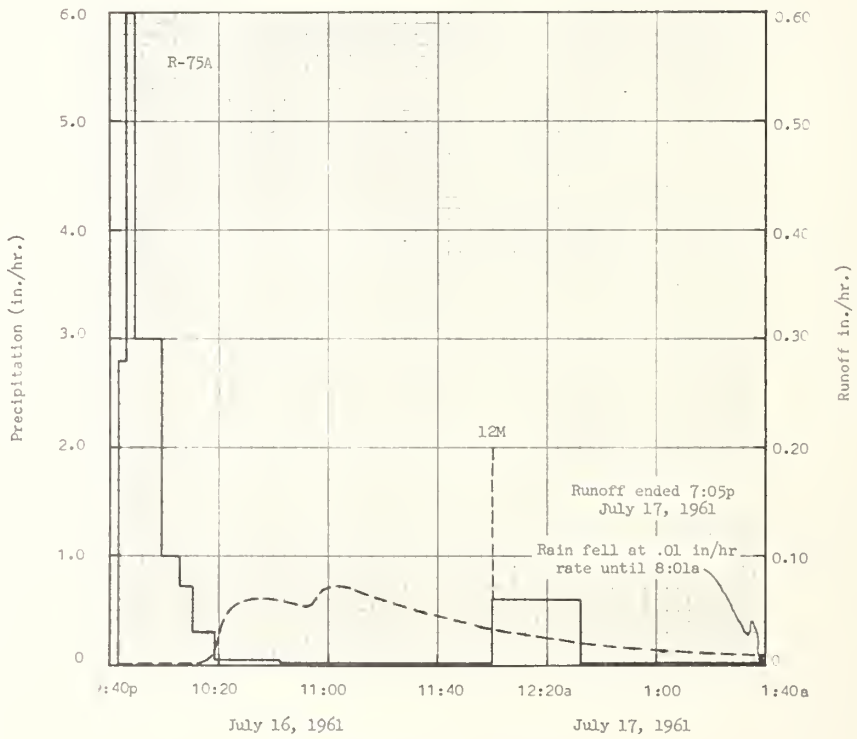
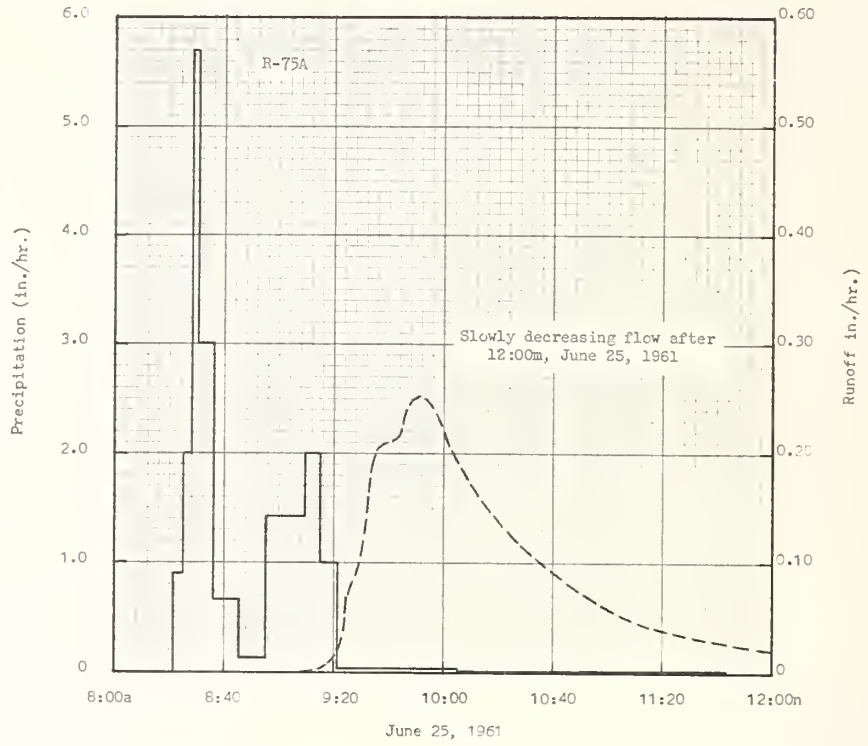
MONTHLY PRECIPITATION AND RUNOFF (Inches)								RIESEL (WACO), TEXAS Watershed Y-2 (Area - 132 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1960	P	2.08	2.07	1.61	2.03	1.92	4.78	0.41	3.11	0.48	5.52	2.28	7.15	33.44		
	Q	1.19	.31	.28	.01	.01	.16	0	0	0	0	.03	3.48	5.47		
1961	P	4.92	4.49	2.02	.51	2.45	8.01	4.04	.24	4.66	2.03	2.16	1.86	37.39		
	Q	3.58	2.66	.07	T	.02	1.57	.16	0	.14	0	.01	.08	8.29		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								RIESEL (WACO), TEXAS Watershed Y-2								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
	Date	Rate	1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
			Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.17	12-8	0.16	12-8	0.30	12-8	0.71	12-7	1.37	12-7	2.48	12-7	2.74	12-6	3.35
1961	6-18	.26	6-18	.23	2-5	.41	2-5	1.09	2-5	1.40	1-12	1.65	2-5	1.86	1-6	3.44
Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent. Watershed conditions: No appreciable change in land use or conservation practice since 1955.																
SELECTED RUNOFF EVENTS								RIESEL (WACO), TEXAS Watershed Y-2								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of June 25, 1961																
5-26-61	0.05	0.0016	6-25-61	Raingage 75A		6-25-61										
5-27	0	.0002	8:21a	0	0	8:27a	0	0								
5-28	0	T	:25	.90	.06	:40	.0005	T								
6-5	.08	0	:28	2.00	.16	:57	.0001	.0001								
6-6	.17	0	:30	5.70	.35	9:07	.0012	.0002								
6-8	.09	0	:36	3.00	.65	:14	.0031	.0005								
6-12	.04	0	:45	.67	.75	:17	.0060	.0007								
6-14	.94	.0001	:55	.12	.77	:19	.0104	.0010								
6-15	2.29	.2717	9:09	1.42	1.10	:22	.0292	.0018								
6-16	.47	.0441	:15	2.00	1.30	:24	.0556	.0033								
6-17	.71	.0446	:21	1.00	1.40	:27	.0857	.0069								
6-18	1.73	.8505	10:05	.03	1.42	:32	.149	.0161								
6-19, 20	0	.0372	11:43	.01	1.44	:36	.205	.0280								
6-21	0	T	Raingage	69	1.58	:44	.216	.0561								
6-25	.03 <sup>2/</sup>	0	Raingage	698	1.42	:46	.238	.0637								
			Raingage	84A	1.35	:49	.250	.0759								
			Raingage	70	1.57	:51	.253	.0843								
			Weighted	Average <sup>1/</sup>	1.46	:55	.244	.1008								
Watershed Conditions: 19% of area in cotton in early fruiting stage, cultivated mid-June; 18% row grain sorghum 3' high in bloom stage, cultivated in mid-May; 21% oats stubble and clover, oats harvested last week of May, clover growing, dense cover; 33% Bermuda grass pasture, good growth, moderately grazed; 8% row sudan 3' high; 1% gravel roads. All cropland terraced and contour tilled.																
														10:01	.210	.1236
														:10	.172	.1520
														:20	.140	.1777
														:30	.113	.1984
														:40	.0924	.2155
														11:00	.0578	.2405
														:11	.0455	.2499
														:26	.0355	.2601
														:58	.0225	.2753
					12:54p	.0116	.2907									
					2:05	.0060	.3008									
					3:40	.0031	.3076									
Notes: To convert runoff in in/hr to cfs, multiply by 183.06. For map of watershed, see reprint on page 42.11-5 (Reprinted). <sup>1/</sup> Thiessen weighted, using 5 raingages. <sup>2/</sup> Prior to 8:21a.																



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SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS Watershed Y-2					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 25, 1961 - Continued</u>								
						6-25-61		
						5:35p	0.0016	0.3118
						8:10	.0006	.3144
						12:00m	.0003 <sup>2/</sup>	.3161
<u>Event of July 16-17, 1961</u>								
6-16-61	0.47	0.0441	7-16-61	Raingage 75A		7-16-61		
6-17	.71	.0446	9:43p	0	0	9:43p	0	0
6-18	1.73	.8505	:46	2.80	.14	:47	.0004	T
6-19, 20	0	.0372	:49	6.00	.44	:52	.0004	T
6-21	0	T	:59	3.00	.94	10:00	.0009	.0001
6-25	1.51	.3161	10:05	1.00	1.04	:05	.0009	.0002
6-26, 29	0	.0064	:10	.72	1.10	:09	.0020	.0003
7-2	.04	0	:18	.30	1.14	:15	.0037	.0006
7-3	.36	.0019	:42	.05	1.16	:17	.0065	.0007
7-4	0	.0009	12:00m	.02	1.18	:19	.0216	.0012
7-8	.05	0	7-17-61			:21	.0386	.0022
7-9	.61	.0001	12:32a	.60	1.22	:23	.0493	.0036
7-10	.54	.0104	8:01	.01	1.26	:38	.0600	.0173
7-11	0	.0001	Raingage	69	1.36	:52	.0534	.0305
7-12	.32	.0007	Raingage	698	1.12	11:02	.0721	.0410
7-13	0	.0011	Raingage	70	1.34	:22	.0578	.0626
7-14	0	T	Raingage	84A	1.13	:40	.0437	.0778
7-16	.06 <sup>3/</sup>	0	Weighted	Average <sup>1/</sup>	1.23	12:00m	.0322	.0905
7-17-61								
12:17a							.0257	.0987
:55							.0162	.1119
1:50							.0086	.1227
3:04							.0044	.1303
4:26							.0025	.1348
6:39							.0012	.1388
8:21							.0006	.1402
11:21							.0003	.1415
2:30p							.0001	.1420
7:05							T	.1422
<p>Watershed Conditions: 19% of area in cotton in heavy fruiting stage, cultivated first of July; 18% row grain sorghum 4' high, grain in hard dough stage; 21% oats stubble and clover, clover growing, dense, 18" high; 33% Bermudagrass pasture, good growth, moderately grazed; 8% row sudan 5' high, moderately grazed; 1% gravel roads. All cropland terraced and no-tour tilled.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 133.06. <sup>1/</sup> Thiessen weighted, using 5 raingages.  
<sup>2/</sup> Slowly decreasing flow after 12:00m. <sup>3/</sup> Prior to 2:45p.



RIESEL (WACO), TEXAS WATERSHED Y-2

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MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed Y-4 (Area - 79.9 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.09	2.08	1.58	1.96	1.90	4.84	0.44	3.14	0.48	5.53	2.28	7.18	33.50
Q	1.41	.35	.33	T	.03	.23	0	0	0	0	.03	3.29	5.67
1961 P	5.01	4.52	1.99	.51	2.46	8.16	4.05	.22	4.76	1.99	2.18	1.83	37.68
Q	3.08	2.43	.07	0	.04	1.82	.13	0	.18	0	T	.07	7.82

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							RIESEL (WACO), TEXAS Watershed Y-4						
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YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.18	12-7	0.17	12-8	0.31	12-8	0.67	12-7	1.30	12-7	2.52	12-7	2.61	12-6	3.20
1961	6-25	.33	6-18	.26	6-18	.42	2-5	.94	2-5	1.21	2-5	1.42	2-5	1.75	1-6	2.96

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
Watershed conditions: No appreciable change in land use or conservation practices since 1955.

SELECTED RUNOFF EVENTS							RIESEL (WACO), TEXAS Watershed Y-4						
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Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 25, 1961								
5-26 61	0.04	0.001	6-25 61	Raingage 69		6-25-61		
6-5	.08	0	8:21a	0	0	8:24a	0	0
6-6	.18	0	:27	.60	.06	:36	.0006	T
6-8	.09	0	:31	3.15	.27	:39	.0010	T
6-12	.04	0	:33	6.00	.47	9:00	.0038	.001
6-14	1.01	T	:41	2.66	.78	:14	.0161	.003
6-15	2.33	.359	:45	1.50	.88	:20	.0207	.005
6-16	.47	.067	:57	.50	.98	:25	.0233	.007
6-17	.72	.070	9:11	1.33	1.29	:29	.0525	.009
6-18	1.72	.930	:14	2.20	1.40	:31	.189	.014
6-19, 23	0	.047	:18	1.50	1.50	:34	.241	.025
6-25	.03 <sup>2/</sup>	0	:22	.90	1.56	:38	.262	.041
			:34	.10	1.58	:41	.278	.055
			Raingage	698	1.42	:44	.312	.070
			Raingage	75A	1.44	:46	.325	.080
			Raingage	84A	1.35	:48	.325	.091
			Weighted	Average <sup>1/</sup>	1.47	:52	.298	.112
						:57	.262	.135
						10:06	.205	.170
						:14	.161	.195
						:28	.102	.225
						:35	.0849	.235
						:45	.0690	.248
						:58	.0544	.262
						11:20	.0384	.279
						:52	.0261	.296
						12:15p	.0201	.305
						1:00	.0130	.317
						:50	.0078	.326
						2:53	.0040	.332

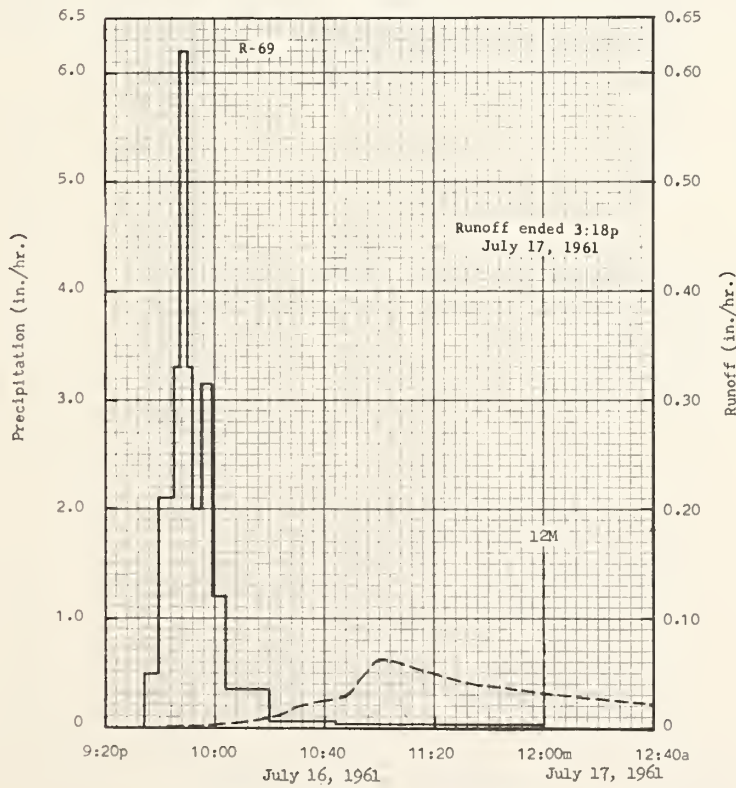
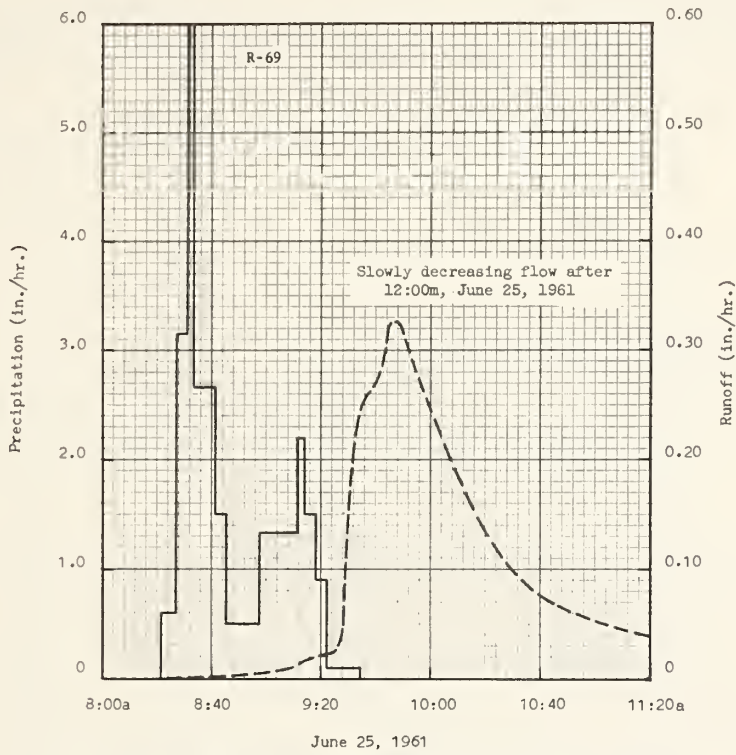
Notes: To convert runoff in in/hr to cfs, multiply by 80.54. For map of watershed, see reprint on page 42.11-5 (Reprinted).

<sup>1/</sup> Thiessen weighted, using 4 raingages. <sup>2/</sup> Prior to 8:21a.

SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS			Watershed Y-4										
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
<u>Event of June 25, 1961 - Continued</u>																
						6-25-61										
						4:23	0.0020	0.336								
						5:55	.0010	.338								
						8:45	.0004	.340								
						12:00m	.0002 <sup>2/</sup>	.341								
<u>Event of July 16-17, 1961</u>																
6-16-61	0.47	0.067	7-16-61	Raingage 69		7-16-61										
6-17	.72	.070	9:34p	0	0	9:42p	0	0								
6-18	1.72	.930	:39	.48	.04	:50	.0004	T								
6-19, 23	0	.047	:45	2.10	.25	:57	.0004	T								
6-25	1.52	.341	:47	3.30	.36	10:04	.0019	T								
6-26, 7-1	0	.007	:50	6.20	.67	:15	.0040	.001								
7-2	.05	T	:52	3.30	.78	:29	.0184	.003								
7-3	.35	.003	:55	2.00	.88	:35	.0226	.005								
7-4	0	T	:59	3.15	1.09	:45	.0268	.009								
7-8	.05	0	10:04	1.20	1.19	:48	.0290	.011								
7-9	.65	.002	:20	.34	1.28	:51	.0392	.013								
7-10	.51	.005	:44	.05	1.30	:56	.0514	.016								
7-11	0	T	12:00m	.02	1.32	11:00	.0622	.020								
7-12	.30	.001	Raingage	698	1.06	:05	.0609	.025								
7-13	0	T	Raingage	75A	1.18	:11	.0561	.031								
7-16	.06 <sup>3/</sup>	0	Raingage	84A	1.06	:21	.0472	.040								
			Weighted	Average <u>1/</u>	1.16	:37	.0392	.051								
						12:00m	.0314	.065								
<p>Watershed Conditions: 28% of area in cotton in heavy fruiting stage, cultivated first of July; 30% row grain sorghum 4' high, grain in hard dough stage; 10% oats stubble and clover, clover growing, dense, 18" high; 31% Bermudagrass pasture, good growth, moderately grazed; 1% gravel roads. All cropland terraced and contour tilled.</p>																
														7-17-61		
														12:16a	.0268	.066
														:40	.0213	.082
														1:36	.0108	.097
														2:12	.0078	.102
														3:18	.0040	.109
														4:55	.0020	.114
														6:35	.0010	.116
														9:05	.0004	.118
					3:18p	T	.119									

Notes: To convert runoff in in/hr to cfs, multiply by 80.54. <sup>1/</sup> Thiessen weighted, using <sup>4</sup> raingages.  
<sup>2/</sup> Slowly decreasing flow after 12:00m. <sup>3/</sup> Prior to 9:34p.





RIESEL (WACO), TEXAS WATERSHED Y-4

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MONTHLY PRECIPITATION AND RUNOFF (Inches)								RIESEL (WACO), TEXAS Watershed Y-6 (Area - 16.3 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	2.11	2.06	1.56	2.00	1.91	4.92	0.42	3.11	0.48	5.54	2.29
	Q	.98	.21	.22	0	0	0	0	0	0	0	0	3.46	4.87
1961	P	5.00	4.51	1.95	.51	2.44	8.16	4.08	.20	4.75	2.03	2.19	1.82	37.64
	Q	2.91	2.09	.03	0	.35	2.77	.05	0	0	0	T	0	8.20

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								RIESEL (WACO), TEXAS Watershed Y-6								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-8	0.20	12-8	0.18	12-8	0.34	12-8	0.71	12-7	1.42	12-7	2.51	12-7	2.76	12-6	3.40
1961	6-15	.82	6-15	.39	6-15	.59	2-5	.96	2-5	1.15	1-11	1.43	1-11	1.60	1-6	2.83

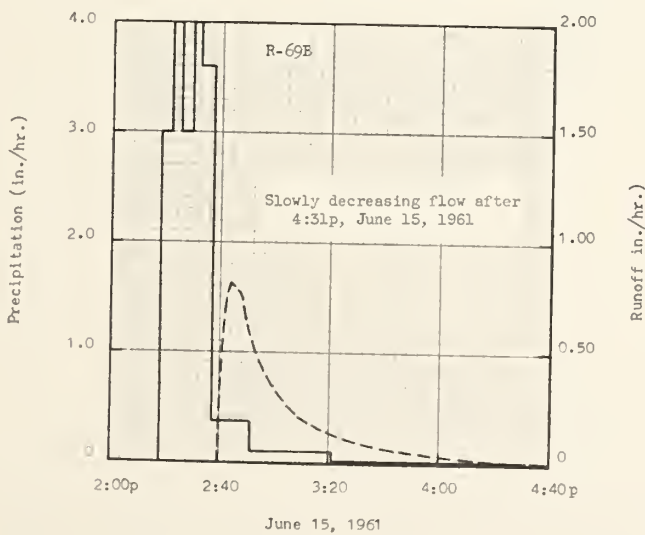
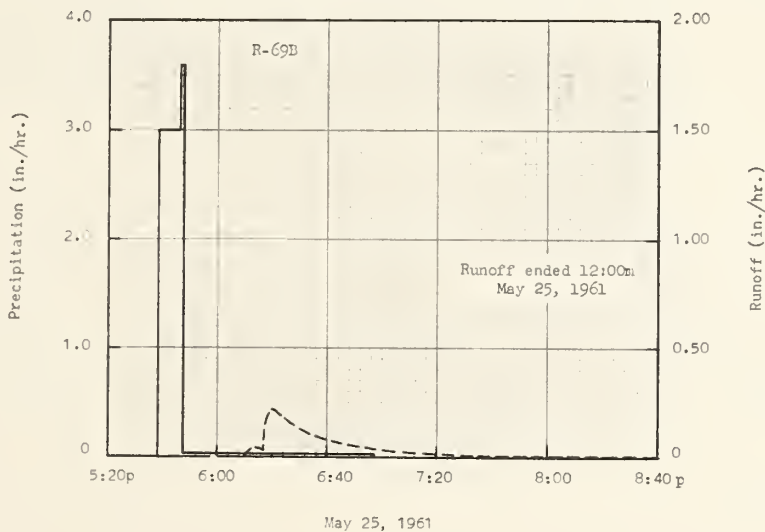
Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent. Watershed conditions: 95% in oats and clover 1960 and 93% in cotton 1961. 7% in pasture and gravel roads both years.

SELECTED RUNOFF EVENTS						RIESEL (WACO), TEXAS Watershed Y-6					
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
<u>Event of May 25, 1961</u>											
4-28-61	.19	0	5-25-61	Raingage 69B		5-25-61					
4-29	.03	0	5:39p	0	0	5:57p	0	0			
5-1	.01	0	:46	3.00	.40	6:10	T	T			
5-8	.24	0	:47	3.60	.46	:12	.040	.001			
5-22	1.64	0	6:57	.02	.48	:14	.044	.002			
5-23	.05	.248		Raingage 75A	.42	:17	.038	.004			
5-24		.001		Weighted average 1/	.47	:18	.176	.006			
Watershed Conditions: 93% of area in cotton 3" high in 6-leaf stage, cultivated May 11, 5% Bermudagrass pasture, good growth, lightly grazed; 2% gravel roads. Cropland terraced and contour tilled. 11.18" available soil moisture in 0-60" profile prior to storm of May 25.											
									:20	.211	.012
									:27	.157	.034
									:32	.124	.045
									:39	.097	.058
									:48	.059	.070
									7:00	.037	.079
									:19	.019	.088
									:44	.009	.093
									8:11	.005	.096
:55	.002	.099									
9:30	.001	.100									
12:00m	T	.101									
<u>Event of June 15, 1961</u>											
5-22-61	1.64	0	6-15-61	Raingage 69B		6-15-61					
5-23	.05	.248	2:18p	0	0	2:39p	0	0			
5-24	0	.001	:22	3.00	.20	:41	.600	.007			
5-25	.47	.101	:25	4.00	.40	:43	.779	.030			
5-26	.04	.001	:29	3.00	.60	:44	.815	.043			
6-5	.09	0	:32	4.00	.80	:47	.761	.082			
6-6	.18	0	:37	3.60	1.10	:51	.583	.127			
6-8	.10	0	:51	.37	1.18	:55	.455	.161			
6-12	.04	0	3:21	.10	1.23	3:01	.313	.200			
6-14	.91	0	4:32	.01	1.24	:06	.242	.223			

Notes: To convert runoff in in/hr to cfs, multiply by 16.43. For map of watershed, see reprint on page 42.11-5 (Reprinted).  
1/ Thiessen weighted, using 2 raingages.

SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS Watershed Y-6					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 15, 1961 - Continued								
Watershed Conditions: 93% of area in cotton 6" high, squaring, cultivated June 14; 5% Bermudagrass pasture, good growth, lightly grazed; 2% gravel roads. Cropland terraced, contour tilled. 10.59" available soil moisture in 0-60" profile June 14.			Raingage 75A		1.10	6-15-61		
			Weighted average <u>1</u> /		1.20	3:11p	0.190	0.241
						:28	.100	.280
						:43	.057	.299
						4:02	.029	.312
						:31	.012 <u>2</u> /	.322
Notes: To convert runoff in in/hr to cfs, multiply by 16.43. <u>1</u> / Theissen weighted, using 2 raingages. <u>2</u> / Slowly decreasing flow after 4:31p.								



RIESEL (WACO), TEXAS Watershed Y-6

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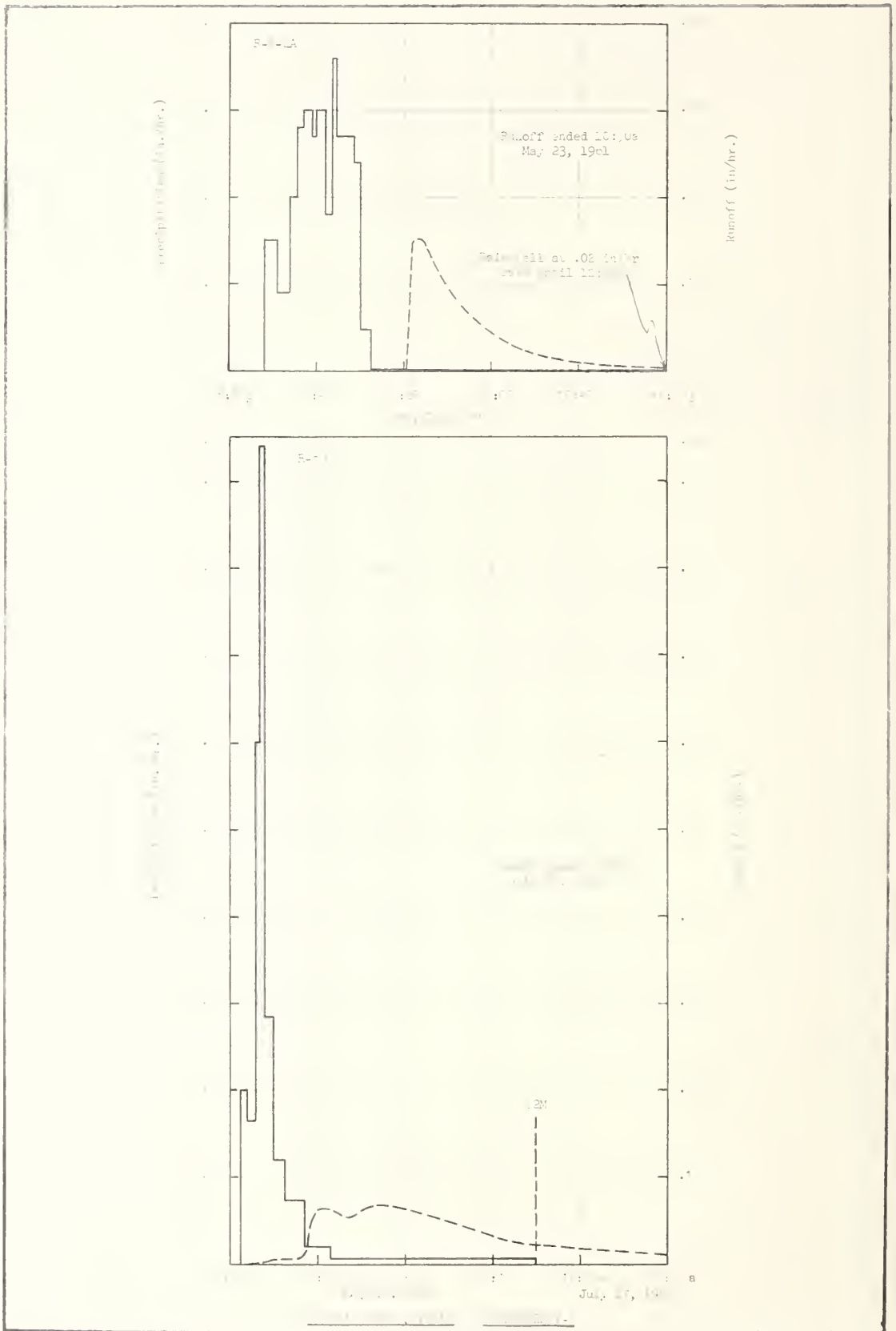
MONTHLY PRECIPITATION AND RUNOFF (Inches)								RIESEL (WACO), TEXAS Watershed Y-7 (Area - 40.0 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P	2.16	2.22	1.53	2.35	2.01	4.74	0.31	3.26	0.58	5.73	2.30	7.43	34.62
	Q	1.18	.17	.21	.07	T	.56	0	0	0	.37	.16	3.88	6.60		
1961	P	4.82	4.58	2.10	.47	2.29	7.97	4.15	.24	4.35	2.28	2.16	2.03	37.44		
	Q	3.11	2.17	.02	0	.09	2.11	.14	0	.57	.01	T	.08	8.30		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								RIESEL (WACO), TEXAS Watershed Y-7								
YEAR	MAXIMUM DISCHARGE	MAXIMUM VOLUME FOR SELECTED TIME INTERVAL														
		1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days		
		Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	
1960	1-13	0.26	1-13	0.21	12-7	0.35	12-7	0.71	12-7	1.45	12-7	2.77	12-6	3.18	12-6	3.87
1961	6-18	.32	6-15	.27	6-18	.48	2-5	1.08	2-5	1.28	1-11	1.44	2-5	1.65	1-6	3.10
Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent. Watershed conditions: No appreciable change in land use or conservation practices since 1955.																
SELECTED RUNOFF EVENTS								RIESEL (WACO), TEXAS Watershed Y-7								
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
<u>Event of May 22-23, 1961</u>																
4-28 61	0.12	0	5-22-61	Raingage W-2A		5-22-61										
4-29	.06	0	8:16p	0	0	9:21p	0	0								
5-1	.01	0	:22	1.50	.15	:23	.111	.002								
5-8	.29	0	:28	.90	.24	:24	.144	.004								
			:31	2.00	.34	:27	.152	.015								
Watershed Conditions: 82% of area in oats stubble and clover, oats harvested mid-May, clover growing, fair cover, 6" high; 1% corn, tassel stage; 9% row sudan, 2' high; 8% Bermudagrass past- ure, good growth, lightly grazed. All cropland terraced, contour tilled.																
			:34	2.80	.48	:30	.144	.019								
			:38	3.00	.68	:36	.111	.032								
			:40	2.70	.77	:43	.0821	.043								
			:44	3.00	.97	:51	.0630	.053								
			:47	1.80	1.06	10:05	.0377	.065								
			:49	3.60	1.18	:17	.0233	.071								
			:55	2.70	1.45	:27	.0179	.074								
			9:00	2.40	1.65	:46	.0108	.079								
			:05	.48	1.69	11:19	.0052	.083								
			12:00m	.02	1.76	12:00m	.0027	.085								
				Raingage 89	1.65	5-23-61										
				Weighted average <sup>1/</sup>	1.65	12:49a	.0014	.087								
						1:20	.0009	.088								
						:51	.0005	.088								
						2:46	.0002	.088								
						4:08	.0001	.088								
						10:50	Q	.089								
<u>Event of July 16-17, 1961</u>																
6-16-61	0.47	0.103	7-16-61	Raingage 89		7-16-61										
6-17	.71	.138	9:45p	0	0	9:47p	0	0								
6-18	1.75	1.067	:48	2.00	.10	:55	.0005	T								
6-19, 20	0	.051	:52	1.65	.21	:56	.0029	T								
6-25	1.45	.232	:54	6.00	.41	:59	.0068	T								
Notes: To convert runoff in in/hr to cfs, multiply by 40.32. For map of watershed, see reprint on page 42.11-5 (Reprinted). <sup>1/</sup> Thicsacn weighted, using 2 raingages.																



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SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS Watershed Y-7					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 16-17, 1961 - Continued</u>								
6-26-61	0	0.001	7-16-61			7-16-61		
7-2	.01	0	9:56p	9.40	0.70	10:11p	0.0068	0.002
7-3	.34	0	10:00	2.85	.89	:13	.0087	.002
7-8	.02	0	:05	1.20	.99	:15	.0179	.002
7-9	.45	0	:14	.73	1.10	:17	.0464	.003
			:26	.20	1.14	:20	.0630	.006
7-10	.75	0	12:00m	.07	1.18	:25	.0630	.011
7-12	.57	.006	Raingage W-2A		1.13	:33	.0555	.019
7-13	0	I	Weighted average <u>1/</u>		1.18	:41	.0630	.027
7-16	.04 <u>2/</u>	0				:49	.0687	.036
Watershed Conditions: 82% of area in oats stubble and clover, clover grow- ing, fair cover, 18" high; 1% corn, grain hard; 9% row sudan 4' high, moderately grazed; 8% Bermudagrass pasture, good growth, moderately grazed. All cropland terraced, contour tilled.						:52	.0687	.039
						11:01	.0630	.049
						:20	.0493	.067
						:44	.0298	.083
						:54	.0253	.088
						12:00m	.0224	.090
						7-17-61		
						12:27a	.0163	.098
						1:02	.0108	.106
						2:32	.0052	.119
4:56	.0021	.127						
7:32	.0009	.131						
9:47	.0005	.132						
11:54	.0002	.133						
1:24p	.0001	.133						
12:00m	0	.134						

Notes: To convert runoff in in/hr to cfs, multiply by 40.32. 1/ Thiessen weighted, using 2 raingages. 2/ Prior to 9:45p.



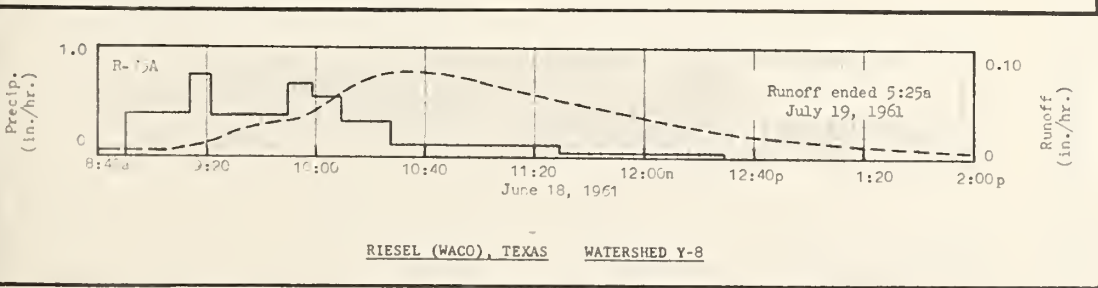
MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed Y-8 (Area - 20.8 acres)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.10	2.04	1.63	2.20	2.01	4.82	0.37	3.06	0.47	5.50	2.28	7.13	33.61
1960 Q	1.01	.14	.15	.02	.01	.09	0	0	0	.05	.01	3.52	5.00
1961 P	4.75	4.38	2.08	.51	2.45	7.83	4.18	.25	4.33	2.10	2.16	1.89	36.91
1961 Q	3.17	2.29	.01	0	0	.25	.01	0	.03	0	0	.01	5.77

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS														RIESEL (WACO), TEXAS Watershed Y-8		
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	12-7	0.24	12-7	0.22	12-7	0.38	12-7	0.80	12-7	1.48	12-7	2.82	12-7	2.95	12-6	3.49
1961	2-5	.24	2-5	.21	2-5	.42	2-5	1.07	2-5	1.37	1-11	1.57	1-11	1.74	1-6	3.20

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
 Watershed conditions: 95% in sorghum in 1960 and 95% in oats and clover in 1961. 5% in sodded waterway and gravel roads both years.

SELECTED RUNOFF EVENTS						RIESEL (WACO), TEXAS Watershed Y-8				
Antecedent conditions			Rainfall			Runoff				
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)		
Event of June 18-19, 1961										
5-22-61	1.63	0	6-18-61	Raingage 75A		6-18-61				
5-23	.05	0	8:52a	0	0	8:54a	0.0033	0		
5-25	.42	0	9:13	.40	.14	9:06	.0056	.001		
5-26	.05	0	:21	.75	.24	:16	.0101	.001		
6-5	.08	0	:49	.38	.43	:27	.0208	.005		
6-6	.17	0	:58	.67	.52	:35	.0257	.008		
6-7	0	0	10:09	.55	.62	:47	.0313	.014		
6-8	.09	0	:27	.33	.72	:57	.0377	.020		
6-12	.03	0	11:29	.12	.84	10:03	.0486	.024		
6-14	.78	0	12:29p	.04	.88	:12	.0620	.032		
6-15	2.33	.005				:21	.0725	.042		
6-16	.47	0				:34	.0782	.059		
6-17	.67	0				:50	.0725	.079		
6-18	.77 <sup>2/</sup>	.015 <sup>3/</sup>				11:24	.0572	.115		
Watershed Conditions: 95% of area in oats stubble and clover, oats harvested May 18, clover growing, good cover 8" high; 4% Bermudagrass pasture, good growth, lightly grazed; 1% gravel roads. Cropland terraced. 4.31" available soil moisture in the 0-60" profile May 31.							12:00n	.0344	.143	
							:22p	.0257	.154	
							:59	.0166	.167	
							2:17	.0056	.180	
							3:16	.0027	.184	
							5:39	.0005	.187	
							9:01	.0001	.188	
							12:00	.0001	.188	
							6-19-61			
							5:25a	0	.189	

Notes: To convert runoff in in/hr to cfs, multiply by 20.97. For map of watershed, see reprint on page 42.11-5 (Reprinted).  
<sup>1/</sup> Raingage 75A. <sup>2/</sup> Prior to 8:52a. <sup>3/</sup> Runoff prior to 8:54a.



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MONTHLY PRECIPITATION AND RUNOFF (Inches)								RIESEL (WACO), TEXAS Watershed Y-10 (Area - 18.6 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.09	2.08	1.56	1.91	1.88	4.87	0.46	3.16	0.49	5.54	2.28	7.21	33.53
	Q	1.00	.02	.04	0	.22	.56	0	0	0	.11	.08	4.41	6.44
1961	P	5.07	4.55	1.96	.51	2.46	8.24	4.03	.20	4.85	1.98	2.19	1.81	37.85
	Q	3.57	2.30	.01	0	.15	2.54	.20	0	1.15	T	T	.05	9.97

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								RIESEL (WACO), TEXAS Watershed Y-10								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-26	0.39	6-26	0.26	12-7	0.43	12-7	0.86	12-7	1.71	12-7	3.21	12-7	3.54	12-6	4.40
1961	6-25	.58	6-18	.37	6-18	.59	2-5	1.26	2-5	1.43	1-11	1.77	1-11	1.94	1-6	3.60

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent. 93% in cotton in 1960 and 93% in row grain sorghum in 1961. 7% in pasture and gravel roads both years.

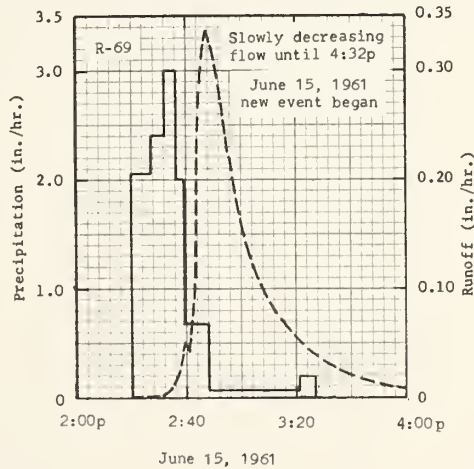
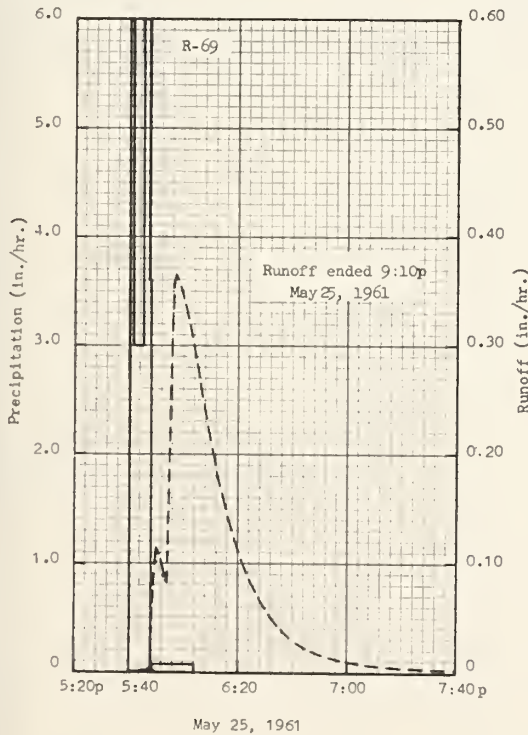
SELECTED RUNOFF EVENTS				RIESEL (WACO), TEXAS Watershed Y-10					
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of May 25, 1961</u>									
4-28-61	0.20	0	5-25-61	Raingage 69		5-25-61			
4-29	.03	0	5:40p	0	0	5:40p	0	0	
5-1	.01	0	:41	6.00	.10	:48	.001	T	
5-8	.29	0	:45	3.00	.30	:50	.116	.002	
5-22	1.61	.011	:47	6.00	.50	:53	.093	.007	
5-23	.05	T	:48	3.60	.56	:54	.081	.009	
			6:04	.08	.58	:56	.334	.015	
			Raingage 69B		.48	:57	.366	.021	
			Weighted average <sup>1/</sup>		.51	6:01	.334	.044	
						:04	.297	.060	
						:06	.262	.069	
						:11	.197	.088	
						:15	.152	.099	
						:19	.119	.108	
						:26	.075	.120	
						:32	.046	.126	
						:38	.035	.130	
						:49	.019	.134	
						7:04	.009	.138	
						:19	.004	.139	
						:45	.002	.140	
						8:30	.001	.141	
						9:10	T	.142	
<u>Event of June 15, 1961</u>									
5-17, 21-61	0	0	6-15-61	Raingage 69		6-15-61			
5-22	1.61	.0105	2:20p	0	0	2:21p	0	0	
5-23	.05	T	:27	2.04	.24	:29	T	T	
5-24	0	0	:32	2.40	.44	:33	.005	T	
5-25	.51	.1417	:36	3.00	.64	:35	.015	.001	

Notes: To convert runoff in in/hr to cfs, multiply by 18.75. For map of watershed, see reprint on page 42.11-5 (Reprinted).  
<sup>1/</sup> Thiessen weighted, using 2 raingages.



SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS Watershed Y-10					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <u>1/</u> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 15, 1961 - Continued								
5-26-61	0.04	T	6-15-61			6-15-61		
5-27, 6-4	0	0	2:39p	2.00	0.74	2:39p	0.050	0.002
6-5	.08	0	:48	.67	.84	:41	.042	.004
6-6	.18	0	3:21	.07	.88	:43	.100	.006
6-7	0	0	:27	.20	.90	:45	.291	.013
						:47	.338	.023
6-8	.09	0			1.23	:51	.291	.044
6-9, 11	0	0	Raingage 69B		1.11	:57	.191	.069
6-12	.04	0	Weighted average <u>1/</u>			3:01	.143	.080
6-13	0	0				:05	.112	.088
6-14	1.04	0				:16	.064	.104
Watershed Conditions: 93% of area in row grain sorghum 4' high in bloom stage; 4% Bermudagrass pasture, good growth, lightly grazed; 3% gravel roads. Cropland terraced, contour tilled. 8.32" available soil moisture in the 0-60" profile prior to storm of June 14.						:30	.032	.115
						:42	.017	.120
						:53	.010	.122
						4:09	.005	.124
						:20	.004	.125
						:32	.002 <u>2/</u>	.125

Notes: To convert runoff in in/hr to cfs, multiply by 18.75. 1/ Thiessen weighted, using 2 raingages.  
2/ Slowly decreasing flow after 4:32p.



RIESEL (WACO), TEXAS WATERSHED Y-10

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MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed SW-12 (Area - 2.97 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P 2.07	2.12	1.71	1.90	1.85	4.32	0.44	3.21	0.47	5.44	2.27	7.26	33.06
	Q 1.25	.81	.63	T	T	T	0	0	0	T	T	2.80	5.49
1961	P 5.02	4.45	2.10	.47	2.48	7.81	3.89	.33	4.65	1.94	2.18	1.85	37.17
	Q 3.61	3.09	.09	0	0	.10	.01	0	0	0	0	0	6.90

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							RIESEL (WACO), TEXAS Watershed SW-12						
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YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	1-13	0.45	1-13	0.29	1-13	0.38	12-8	0.68	12-7	1.31	12-7	2.27	12-7	2.33	12-6	2.79
1961	2-16	.42	2-5	.34	2-5	.61	2-5	1.49	2-5	1.94	2-5	2.05	2-5	2.33	1-6	3.61

Notes: Quality of records: Monthly P and Q, excellent; annual max. discharges and volumes, excellent.  
 Watershed conditions: No appreciable change in land use or conservation practices since 1955.  
<sup>1/</sup> Raingage 70.

SELECTED RUNOFF EVENTS <sup>2/</sup>						RIESEL (WACO), TEXAS Watershed SW-12					
--------------------------------------	--	--	--	--	--	--------------------------------------	--	--	--	--	--

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)

Notes:  
 For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 42.24-4. <sup>2/</sup> No suitable selected event available.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed SW-17 (Area - 2.99 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	2.20	2.12	1.40	2.09	2.02	5.17	0.43	3.28	0.50	5.93	2.32	7.28	34.74
1960 Q	1.60	.85	1.48 <sup>2/</sup>	.03	.10	.33	0	0	0	.16	.42	4.32	9.29
1961 P	4.83	4.62	2.00	.47	2.52	7.97	4.01	.26	4.71	2.12	2.29	1.97	37.77
1961 Q	3.62	3.21	.10	T	T	2.38	.59	0	.26	.01	.04	.52	10.73

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							RIESEL (WACO), TEXAS Watershed SW-17						
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YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	1-13	0.40	1-13	0.27	12-7	0.50	12-7	0.83	12-7	1.65	12-7	3.00	12-7	3.23	12-6	4.22
1961	6-25	.60	6-18	.34	6-18	.59	2-5	1.37	2-5	1.81	2-5	1.93	2-5	2.22	1-6	3.35

Notes: Quality of records: Monthly P and Q, excellent; annual maximum discharges and volumes; excellent. Watershed conditions: No appreciable change in land use or conservation practices since 1955.  
 1/ Reingage W-2. 2/ Winter rains caused heavy seepage from perched water table during March, thus, Q is greater than P for the month.

SELECTED RUNOFF EVENTS				RIESEL (WACO), TEXAS Watershed SW-17			
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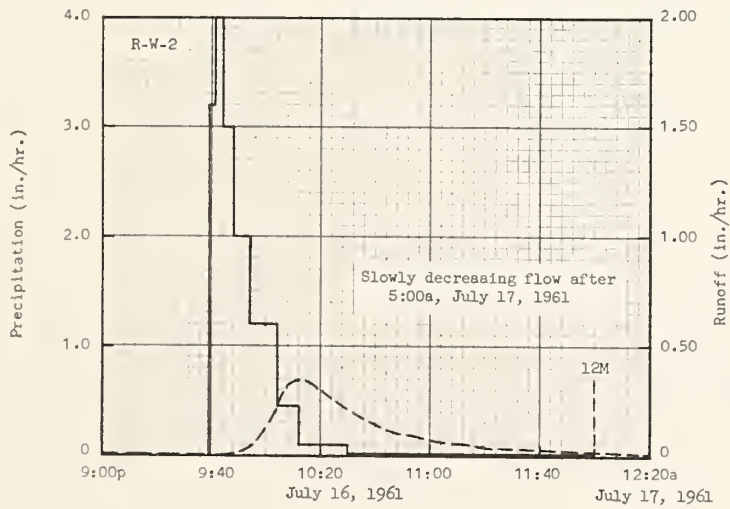
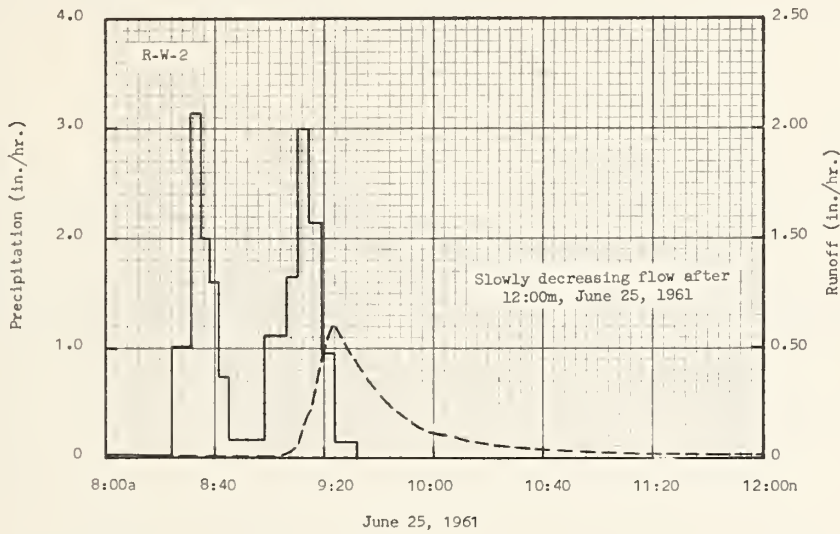
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 25, 1961								
5-26-61	Raingage W-2 0.05	0	6-25-61	Raingage W-2	0	6-25-61		
5-5	.11	0	6:45a	0	0	8:26a	T	0
5-6	.19	0	8:24	.01	.02	:38		T
6-1	.12	0	:31	1.02	.14	:45	.0086	T
6-1	.05	0	:35	3.15	.35	:48	.0033	T
6-14	.7	0	:38	2.00	.45	:54	.0023	T
6-15	2.55	.44	:41	1.60	.53	:57	.0023	T
6-16	.48	.05	:45	.75	.58	9:03	.0076	T
6-17	.71	.09	:58	.18	.62	:09	.0312	T
6-18	1.61	1.34	9:06	1.12	.77	:11	.0597	.01
6-19, 22	0	.10	:10	1.65	.88	:13	.133	.01
6-23, 24	0	T	:14	3.00	1.08	:15	.231	.02
			:19	2.16	1.26	:18	.381	.03
			:24	.96	1.34	:22	.561	.06
			:32	.15	1.36	:24	.604	.08
Watershed Conditions: 100% Bermuda-grass pasture, good cover, grass 6" high. 9.86" available soil moisture in the 0-60" profile June 23.			1:56p	T	1.38	:29	.517	.13
						:36	.358	.18
						:43	.248	.21
						:50	.174	.24
						:55	.146	.25
						:58	.127	.26
						10:03	.109	.27
						:09	.0929	.28
						:18	.0687	.29
						:41	.0375	.31
						11:18	.0202	.33
						:48	.0116	.33
			12:08p	.0076	.34			
			1:43	.0023	.34			
			4:00	.0007	.35			
			12:00m	.0003 <sup>3/</sup>	.35			

Notes: To convert runoff in in/hr to cfs, multiply by 3.014. -  
 For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p.42.28-5.  
 3/ Slowly decreasing flow after 12:00m.

SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS Watershed SW-17						
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
			Event of July 16-17, 1961						
	Raingage W-2			Raingage W-2					
6-16-61	0.48	0.06	7-16-61			7-16-61			
6-17	.71	.09	9:39p	0	0	9:43p	0.0007	0	
6-18	1.61	1.34	:41	3.20	.16	:47	.0156	I	
6-19, 22	0	.10	:44	4.00	.36	:50	.0202	I	
6-23, 24	0	T	:48	3.00	.56	:56	.0597	T	
6-25	1.38	.35	:54	2.00	.76	:58	.103	.01	
6-26, 27	0	T	10:04	1.20	.96	10:03	.198	.02	
7-2	.01	0	:12	.45	1.02	:06	.276	.03	
7-3	.28	0	:30	.10	1.05	:09	.335	.05	
7-8	.08	0	12:00m	.02	1.08	:12	.348	.06	
7-9	.36	0				:16	.335	.09	
7-10	.62	T				:21	.295	.11	
7-12	.65	.01				:31	.214	.15	
7-13	0	T				:45	.121	.19	
7-16	.04 <u>1/</u>	.014 <u>2/</u>				:53	.0929	.21	
Watershed Conditions: 100% Bermuda-grass pasture, good cover, grass 6" high. 11.02" available soil moisture in the 0-60" profile July 12.						:58	.0776	.21	
						11:02	.0687	.22	
						:13	.0517	.23	
						:17	.0444	.23	
						:45	.0255	.25	
						12:00m		.0202	.26
						7-17-61			
						12:13a	.0179	.26	
						:49	.0116	.27	
						2:39	.0023	.28	
						5:00	.0007 <u>3/</u>	.28	

Notes: To convert runoff in in/hr to cfs, multiply by 3.014. 1/ Prior to event beginning 9:39p. 2/ Runoff prior to 9:43p. 3/ Slowly decreasing flow after 5:00a.





RIESEL (WACO), TEXAS - WATERSHED SW-17

RIESEL (WACO), TEXAS Watershed P-1

**LOCATION:** Falls County, Texas; 19 miles S. E. of Waco; Brazos River Basin.

**AREA:** 0.243 acre **SHAPE:** Rectangular, 168' long, 63' wide.

**SLOPE:** 2.82%. **Aspect** S. W.

**SOILS:** Houston Black clay - 100%. Residual, derived from highly calcareous Taylor marl. Topsoil: Depth - 5 ft.; structure - moderate, fine to medium, granular; permeability - slow; internal drainage - very slow. Subsoil: Structure - weak, fine, granular; permeability - very slow.

**EROSION:** 2 - 100%.

**LAND CAPABILITY:** II - 100%.

**SURFACE DRAINAGE:** Good; no well defined drainageways.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff - type H-1 flume near center of covered concrete gutter 63 feet long across slope to intercept and concentrate runoff, FW-1 recorder with 6 hour chart; Precipitation -- W-9 weighing recording rain gauge, 6 hour chart; Soil Loss -- Ramser Silt Sampler with 5-by-16-by-1 1/2 ft. silt box.

**WATERSHED CONDITIONS:** 1938-43, 100% cultivated to one crop each year, straight rows transverse to the general direction of slope. Four-year rotation of cotton - corn - cotton - oats; oats - 1938; cotton - 1939, 41, 43; corn - 1940. Sprig sodded with Bermudagrass in spring of 1944. Continuously in grass used for pasture, 1944-59, heavily grazed. Grazing discontinued 1960-61, with application of 200 pounds per acre 16-20-0 fertilizer in spring of 1960; sprayed with 2-4-D 1960 and 1961 for weed control. This period used for improvement prior to grazing management.

**GENERALLY REPRESENTS:** Small areas of cultivated land in the Texas Blackland Prairies land resource area in Texas and Arkansas, (J-86) on deep, fine textured, slowly permeable soils, 1938-43; areas in grass on same soils, 1960-61.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed P-1 Area - 0.243 acre							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1938	P	4.25	2.97	2.17	4.03	2.64	3.54	2.02	1.14	1.12	0.17	0.68	2.78	27.51
	Q	0	0	0	0	0	.27	0	0	0	0	0	0	
1939	P	3.93	3.05	1.19	1.37	4.90	2.29	.40	2.68	.33	2.11	2.49	1.21	25.95
	Q	0	0	0	0	.88	0	0	0	0	0	0	0	
1940	P	.98	2.87	.58	4.45	1.83	6.56	2.21	1.87	1.35	4.62	10.30	3.85	41.47
	Q	0	T	0	.28	T	T	.36	0	0	.11	4.39	.76	
1941	P	3.10	5.60	4.56	4.17	4.82	6.55	2.91	1.38	.73	4.03	2.40	2.46	42.71
	Q	1.61	2.52	1.11	.08	1.22	2.33	T	0	0	0	0	.01	
1942	P	.72	1.69	.98	6.46	4.66	7.13	1.09	.92	7.41	2.73	3.43	3.97	41.19
	Q	0	0	0	e .65	e .31	3.14	0	0	1.39	0	.15	.76	
1943 <sup>1/</sup>	P	.91	.14	2.04	1.22	4.16	1.88							10.35
	Q	0	0	T	.01	.02	.14							
Av. rate	P	2.32	2.72	1.92	3.62	3.84	4.66	1.73	1.60	2.19	2.73	3.86	2.85	35.77 <sup>2/</sup>
	Q	.27	.42	.18	.17	1.00	.98	.07	0	.28	.02	.91	.31	
Normal P <sup>3/</sup>		2.38	2.63	2.94	3.97	4.15	3.19	1.94	1.38	2.97	2.41	2.25	2.74	32.95

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS												RIESEL (WACO), TEXAS Watershed P-1						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL															
	Date	Rate	1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days			
			Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.		
1938	6-21	1.60	6-21	0.27	6-21	0.27	6-21	0.27	6-21	0.27	6-21	0.27	6-21	0.27	6-21	0.27		
1939	5-18	1.05	5-20	.50	5-20	.53	5-20	.54	5-20	.54	5-20	.54	5-13	.72	5-17	.88		
1940	11-22	4.05	11-22	2.04	11-22	2.20	11-22	2.30	11-22	2.33	11-22	2.66	11-22	4.23	11-22	4.39		
1941	6-10	7.18	6-10	1.88	6-10	1.94	6-10	1.95	6-10	1.95	6-10	1.95	6-10	1.95	6-2	2.17		
1942	6-6	3.74	9-8	.85	9-8	.96	6-11	1.31	6-11	1.32	9-8	1.33	9-3	1.35	6-10	2.24		
1943 <sup>4/</sup>	6-5	.62	6-5	.13	6-5	.14	6-5	.14	6-5	.14	6-5	.14	6-5	.14	5-30	.15		

**Notes:** Quality of records: Monthly P, excellent; monthly Q and Annual Max. discharges and volumes, good. <sup>1/</sup> Station not in operation from July 21, 1943 to January 1, 1960. <sup>2/</sup> Part year amount for 1943 not used in average yearly P and Q. <sup>3/</sup> Normal P based on Waco Weather Bureau record computed from several stations in the vicinity of Waco with length of records from 10 to 65 years. <sup>4/</sup> Maximums for all stations in 1943 occurred before July 1.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed P-1							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.02	2.02	1.55	2.01	1.72	4.90	0.36	2.83	0.96	6.07	2.38	7.71	34.53
	Q	.90	.28	.08	0	0	T	0	0	0	0	0	2.18	3.44
1961	P	4.97	4.74	2.16	.41	2.18	8.51	3.86	.43	4.70	2.04	2.10	2.24	38.34
	Q	2.37	2.24	0	0	0	1.42	.04	0	T	0	0	.12	6.19

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS RIESEL (WACO), TEXAS Watershed P-1

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	1-13	0.60	1-13	0.32	12-7	0.40	12-7	0.65	12-7	1.23	12-7	2.14	12-7	2.15	12-7	2.18
1961	6-25	1.67	6-25	.44	2-5	.58	2-5	1.35	2-5	1.62	2-5	1.64	2-5	1.75	1-6	2.37

Notes: Quality of records: Monthly P, excellent; monthly Q and annual max. discharges and volumes, good.  
 1/ Raingage W-9.

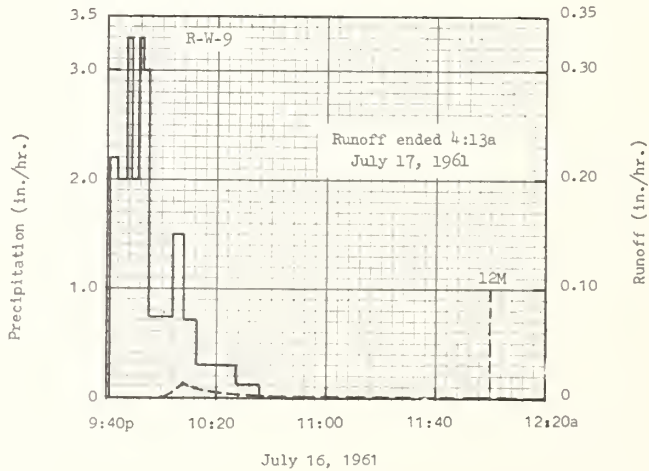
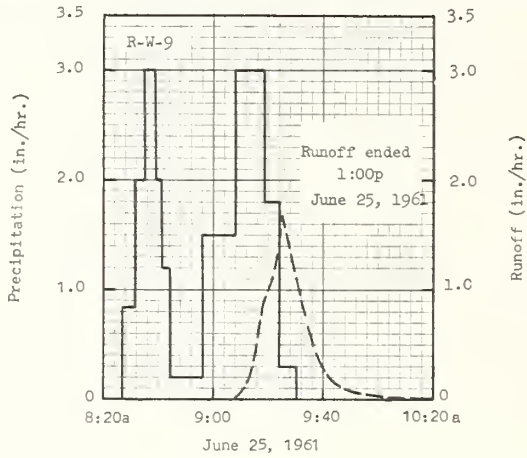
SELECTED RUNOFF EVENTS RIESEL (WACO), TEXAS Watershed P-1

Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Event of June 25, 1961											
5-26-61	Raingage W-9 0.05	0	6 25-61	Raingage W-9		6-25-61					
6-5	.07	0	8:26a	0	0	9:08a	0	0			
6-6	.30	0	:31	.84	.07	:10	.0612	T			
6-8	.11	0	:34	2.00	.17	:12	.131	T			
6-12	.01	0	:38	3.00	.37	:15	.465	.02			
6-14	.94	0	:41	2.00	.47	:18	.845	.05			
6-15	2.46	.0604	:44	1.20	.53	:20	1.00	.08			
6-16	.39	.0032	:56	.20	.57	:22	1.17	.12			
6-17	.80	.0279	9:08	1.50	.87	:25	1.67	.19			
6-18	1.92	.8728	:18	3.00	1.27	:29	1.23	.29			
6-19	0	T	:24	1.80	1.45	:31	.947	.32			
6-25	.03 2/	0	:30	.30	1.48	:35	.539	.37			
Watershed Conditions: 100% Bermuda-grass pasture, good cover, grass 6" high. 9.54 inches available soil moisture in 0-60" profile June 23.											
									:39	.310	.40
									:44	.151	.42
									:48	.100	.43
									:58	.0396	.44
	10:05	.0229	.44								
	:18	.0110	.45								
	11:30	.0012	.45								
	0	0	.45								
	1:00p										
Event of July 16-17, 1961											
6-16-61	Raingage W-9 0.39	0.0032	7-16-61	Raingage W-9		7-16-61					
6-17	.80	.0279	9:41p	0	0	9:59p	0	0			
6-18	1.92	.8728	:44	2.20	.11	10:02	.0163	T			
6-19	0	T	:47	2.00	.21	:04	.0396	T			
6-25	1.51	.4519	:49	3.30	.32	:06	.100	T			
7-2	.01	0	:51	2.00	.42	:08	.131	.01			
7-3	.26	0	:53	3.30	.53	:13	.0735	.02			
7-8	.02	0	:55	3.00	.63	:23	.0306	.03			
7-9	.25	0	10:04	.74	.74	:43	.0069	.03			
7-10	.46	0	:08	1.50	.84	:58	.0028	.03			

Notes: To convert runoff in in/hr to cfs, multiply by 0.245. 2/ Prior to 8:26a.

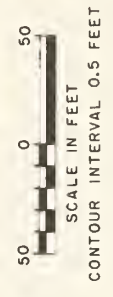
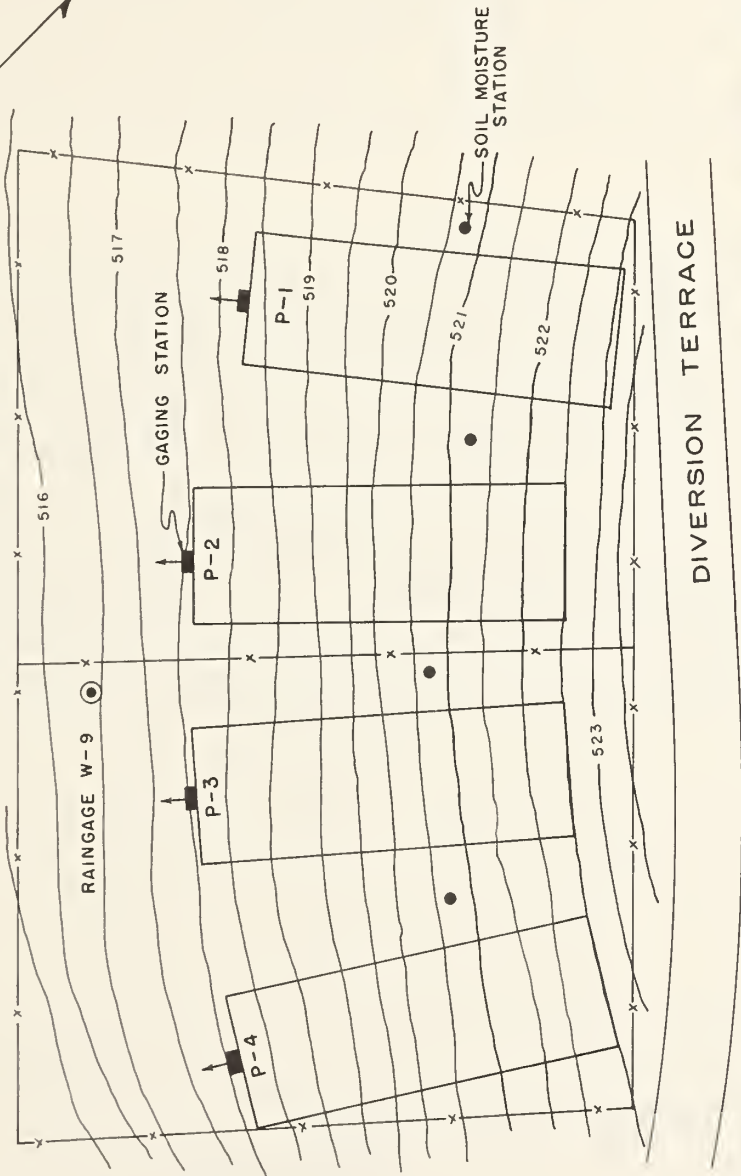
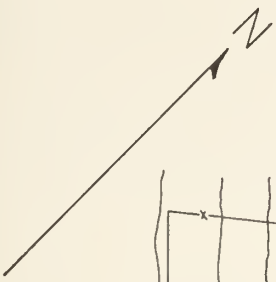
6-62

SELECTED RUNOFF EVENTS						RIESEL (WACO), TEXAS		Watershed P-1	
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of July 16-17, 1961 - continued</u>									
7-12-61	0.65	0.0012	7-16-61			7-16-61			
7-13	.05	0	10:13p	0.72	0.90	11:08	0.0028	0.03	
7-16	.04 <u>1/</u>	0	:27	.30	.97	12:00m	.0012	.04	
			:36	.13	.99	7-17-61			
						4:13a	0	.04	
Watershed Conditions: 100% Bermuda-grass pasture, good cover, grass 6" high. 8.46 inches available soil moisture in 0-60" profile July 12.									
Notes: To convert runoff in in/hr to cfs, multiply by 0.245. <u>1/</u> Prior to event beginning 9:41p.									



RIESEL (WACO), TEXAS WATERSHED P-1





NOTE: EACH WATERSHED AREA IS 0.243 ACRES.

RIESEL (WACO), TEXAS

WATERSHEDS

- P-1
- P-2
- P-3
- P-4

6-62

## RIESEL (WACO), TEXAS Watershed P-2

**LOCATION:** Falls County, Texas; 19 miles S. E. of Waco; Brazos River Basin.**AREA:** 0.243 acre**SHAPE:** Rectangular, 168' long, 63' wide.**SLOPE:** 2.98%.

Aspect S. W.

**SOILS:** Houston Black clay - 100%. Residual, derived from highly calcareous Taylor marl. Topsoil: Depth - 5 ft.; structure - moderate, fine to medium, granular; permeability - slow; internal drainage - very slow. Subsoil: Structure - weak, fine, granular; permeability - very slow.**EROSION:** 2 - 100%.**LAND CAPABILITY:** II - 100%.**SURFACE DRAINAGE:** Good; no well defined drainageways.**CHARACTER OF FLOW:** Ephemeral, continuous.**INSTRUMENTATION:** Runoff - type H-1 flume near center of covered concrete gutter 63 feet long across slope to intercept and concentrate runoff, FW-1 recorder with 6 hour chart; Precipitation -- W-9 weighing recording rain gauge, 6 hour chart; Soil Loss -- Ramser Silt Sampler with 5-by-16-by-1 1/2 ft. silt box.**WATERSHED CONDITIONS:** 1938-43, 100% cultivated to one crop each year, straight rows transverse to the general direction of slope. Four-year rotation of cotton - corn - cotton - oats; oats - 1938, 41; corn - 1939, 43; cotton - 1940, 42. Sprig sodded with Bermudagrass in spring of 1944. Continuously in grass used for pasture, 1944-59, heavily grazed. Grazing discontinued 1960-61, with application of 200 pounds per acre 16-20-0 fertilizer in spring of 1960; sprayed with 2-4-D 1960 and 1961 for weed control. This period used for improvement prior to grazing management.**GENERALLY REPRESENTS:** Small areas of cultivated land in the Texas Blackland Prairies land resource area in Texas and Arkansas, (J-86) on deep, fine textured, slowly permeable soils, 1938-43; areas in grass on same soils, 1960-61.

MONTHLY PRECIPITATION AND RUNOFF (Inches)													RIESEL (WACO), TEXAS Watershed P-2	
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1938	P	4.25	2.97	2.17	4.03	2.64	3.54	2.02	1.14	1.12	0.17	0.68	2.78	27.51
	Q	0	0	0	0	0	.34	0	0	0	0	0	0	.34
1939	P	3.93	3.05	1.19	1.37	4.90	2.29	.40	2.68	.33	2.11	2.49	1.21	25.95
	Q	0	0	0	0	0	nr	0	0	0	0	0	0	nr
1940	P	.98	2.87	.58	4.45	1.83	6.56	2.21	1.87	1.35	4.62	10.30	3.85	41.47
	Q	0	0	0	.02	T	.16	.46	0	0	.45	5.83	.99	7.91
1941	P	3.10	5.60	4.56	4.17	4.82	6.55	2.91	1.38	.73	4.03	2.40	2.46	42.71
	Q	1.77	2.92	1.64	.65	1.19	3.37	.30	0	0	0	0	0	11.84
1942	P	.72	1.69	.98	6.46	4.66	7.13	1.09	.92	7.41	2.73	3.43	3.97	41.19
	Q	0	0	0	.77	.66	4.11	0	0	1.95	.03	1.01	1.84	10.37
1943 <sup>1/</sup>	P	.91	.14	2.04	1.22	4.16	1.88							10.35
	Q	0	0	.05	.01	.04	.09							.19
Av. <sup>2/</sup> Av. <sub>2/</sub>	P	2.32	2.72	1.92	3.62	3.84	4.66	1.73	1.60	2.19	2.73	3.86	2.85	35.77 <sup>2/</sup>
	Q	.30	.49	.28	.24	.38	1.34	.15	0	.39	.10	1.37	.57	7.62 <sub>2/</sub>
Normal P <sub>3/</sub>		2.38	2.63	2.94	3.97	4.15	3.19	1.94	1.38	2.97	2.41	2.25	2.74	32.95

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													RIESEL (WACO), TEXAS Watershed P-2			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1938	6-21	1.65	6-21	0.31	6-21	0.31	6-21	0.31	6-21	0.31	6-21	0.31	6-21	0.31	6-17	0.34
1939		nr		nr		nr		nr		nr		nr		nr		nr
1940	11-22	4.18	11-22	2.01	11-22	2.08	11-22	2.34	11-22	2.45	11-22	3.04	11-22	5.36	11-22	5.83
1941	6-10	6.65	6-10	2.09	6-10	2.14	6-10	2.14	6-10	2.14	6-10	2.14	6-9	2.15	6-2	3.10
1942	6-6	4.94	12-26	1.34	12-26	1.51	12-26	1.76	12-26	1.78	12-26	1.82	9-8	1.93	6-5	2.98
1943 <sup>4/</sup>	6-5	.10	6-5	.05	6-5	.07	6-5	.08	6-5	.09	6-5	.09	6-5	.09	6-5	.09

**Notes:** Quality of records: Monthly P, excellent; monthly Q and Annual Max. discharges and volumes, good. <sup>1/</sup> Station not in operation from July 21, 1943 to January 1, 1960. <sub>2/</sub> Part year amount for 1943 not used in average yearly P and Q. <sub>3/</sub> Normal P based on Waco Weather Bureau record computed from several stations in the vicinity of Waco with length of records from 10 to 65 years. <sup>4/</sup> Maximums for all stations in 1943 occurred before July 1.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed P-2							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	2.02	2.02	1.55	2.01	1.72	4.90	0.36	2.83	0.96	6.07	2.38
	Q	.87	.35	.10	0	T	T	0	0	0	0	0	2.65	3.97
1961	P	4.97	4.74	2.16	.41	2.18	8.51	3.86	.43	4.70	2.04	2.10	2.24	38.34
	Q	2.58	2.41	T	0	0	1.56	.10	0	.29	.01	T	.18	7.13

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS RIESEL (WACO), TEXAS Watershed P-2

YEAR	MAXIMUM DISCHARGE	MAXIMUM VOLUME FOR SELECTED TIME INTERVAL														
		1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days		
		Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	
1960	1-13	0.66	1-13	0.32	1-13	0.40	12-7	0.65	12-7	1.25	12-7	2.10	12-7	2.31	12-6	2.65
1961	6-25	1.67	6-25	.48	2-5	.52	2-5	1.23	2-5	1.51	2-5	1.59	2-5	1.98	1-6	2.57

Notes: Quality of records: Monthly P, excellent; monthly Q and annual max. discharges and volumes, good  
 1/ Raingage W-9.

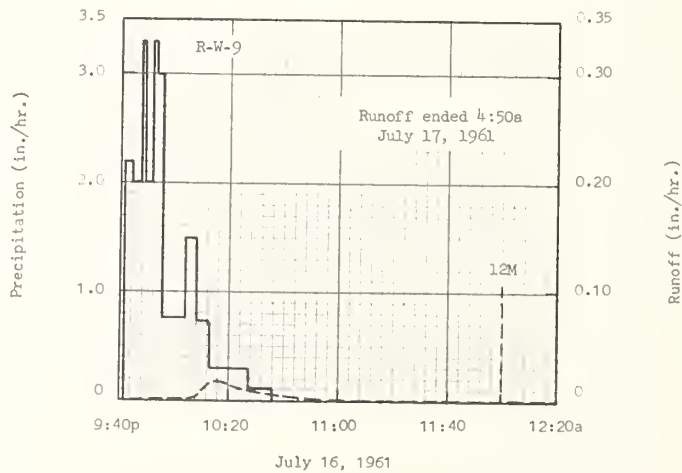
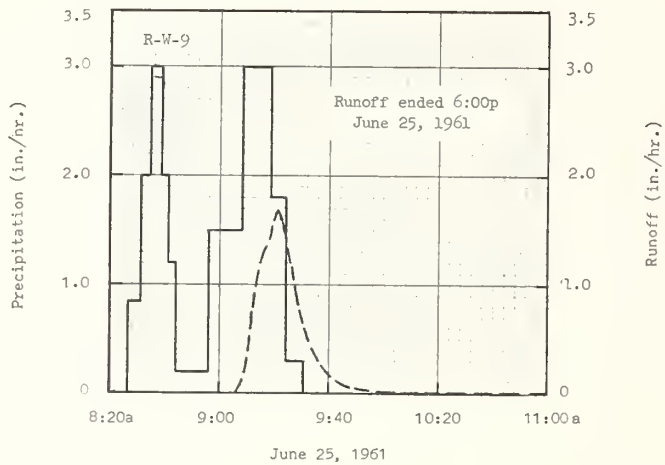
SELECTED RUNOFF EVENTS RIESEL (WACO), TEXAS Watershed P-2

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 25, 1961								
5-26-61	Raingage W-9 0.05	0	6-25-61	Raingage W-9		6-25-61		
6-5	.07	0	8:26a	0	0	9:06a	0	0
6-6	.30	0	:31	.84	.07	:08	.0800	T
6-8	.11	0	:34	2.00	.17	:10	.294	.01
6-12	.01	0	:38	3.00	.37	:13	.869	.04
6-14	.94	0	:41	2.00	.47	:15	1.20	.07
6-15	2.46	.0604	:44	1.20	.53	:18	1.39	.14
6-16	.39	.0032	:56	.20	.57	:21	1.67	.21
6-17	.90	.0279	9:08	1.50	.87	:24	1.46	.29
6-18	1.92	.8728	:18	3.00	1.27	:28	.869	.37
6-19	0	T	:24	1.80	1.45	:33	.449	.42
6-25	.03 2/	0	:30	.30	1.48	:39	.180	.45
						:47	.0673	.47
						:58	.0196	.48
						10:10	.0090	.48
						:45	.0020	.48
						6:00p	0	.48
Event of July 16-17, 1961								
6-16-61	Raingage W-9 0.39	0.0032	7-16 61	Raingage W-9		7-16-61		
6-17	.80	.0279	9:41p	0	0	9:44p	0	0
6-18	1.92	.8728	:44	2.20	.11	:47	.0028	T
6-19	0	T	:47	2.00	.21	10:05	.0028	T
6-25	1.51	.4519	:49	3.30	.32	:08	.0163	T
7-2	.01	0	:51	2.00	.42	:10	.0861	T
7-3	.26	0	:53	3.30	.53	:14	.188	.01
7-8	.02	0	:55	3.00	.63	:19	.151	.03
7-9	.25	0	10:04	.74	.74	:27	.0861	.04
7-10	.46	0	:08	1.50	.84	:35	.0396	.05

Notes: To convert runoff in in/hr to cfs, multiply by 0.245. For map of watershed, see page 42.31-4. 2/ Prior to event beginning 8:26a.

SELECTED RUNOFF EVENTS			RIESEL (WACO), TEXAS			Watershed P-2		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 16-17, 1961 - continued								
7-12-61	0.65	0.0012	7-16-61 10:13p	0.72	0.90	7-16-61 10:58p	0.0028	0.06
7-13	.05	0	:27	.30	.97	12:00m	.0012	.06
7-16	.04 $\frac{1}{2}$	0	:36	.13	.99	7-17-61 4:50a	0	.06
Watershed Conditions: 100% Bermuda-grass pasture, good cover, grass 6" high. 8.46 inches available soil moisture in 0-60" profile July 12.								

Notes: To convert runoff in in/hr to cfs, multiply by 0.245.  $\frac{1}{2}$  Prior to event beginning 9:41p.



RIESEL (WACO), TEXAS WATERSHED P-2



## RIESEL (WACO), TEXAS Watershed P-3

LOCATION: Falls County, Texas; 19 miles S. E. of Waco; Brazos River Basin.

AREA: 0.243 acre SHAPE: Rectangular, 168' long, 63' wide.

SLOPE: 2.98%. Aspect S. W.

SOILS: Houston Black clay - 100%. Residual, derived from highly calcareous Taylor marl. Topsoil: Depth - 5 ft.; structure - moderate, fine to medium, granular; permeability - slow; internal drainage - very slow. Subsoil: Structure - weak, fine, granular; permeability - very slow.

EROSION: 2 - 100%.

LAND CAPABILITY: II - 100%.

SURFACE DRAINAGE: Good; no well defined drainageways.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff - type H-1 flume near center of covered concrete gutter 63 feet long across slope to intercept and concentrate runoff, FW-1 recorder with 6 hour chart; Precipitation -- W-9 weighing recording raingage, 6 hour chart; Soil Loss -- Ramser Silt Sampler with 5-by-16-by-1 1/2 ft. silt box.

WATERSHED CONDITIONS: 1938-43, 100% cultivated to one crop each year, straight rows transverse to the general direction of slope. Four-year rotation of cotton - corn - cotton - oats; oats - 1938, 40; cotton - 1939, 41, 43; corn - 1942. Sprig sodded with Bermudagrass in spring of 1944. Continuously in grass used for pasture, 1944-59, heavily grazed. Grazing discontinued 1960-61, with application of 200 pounds per acre 16-20-0 fertilizer in spring of 1960; sprayed with 2-4-D 1960 and 1961 for weed control. This period used for improvement prior to grazing management.

GENERALLY REPRESENTS: Small areas of cultivated land in the Texas Blackland Prairies land resource area in Texas and Arkansas, (J-86) on deep, fine textured, slowly permeable soils, 1938-43; areas in grass on same soils, 1960-61.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed P-3						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1938 P	4.25	2.97	2.17	4.03	2.64	3.54	2.02	1.14	1.12	0.17	0.68	2.78	27.51
Q	0	0	0	0	0	.27	0	0	0	0	0	0	.27
1939 P	3.93	3.05	1.19	1.37	4.90	2.29	.40	2.68	.33	2.11	2.49	1.21	25.95
Q	0	0	0	0	1.16	0	0	0	0	0	0	0	1.16
1940 P	.98	2.87	.58	4.45	1.83	6.56	2.21	1.87	1.35	4.62	10.30	3.85	41.47
Q	0	0	0	.02	.01	.08	.49	0	0	1.04	5.93	.92	8.49
1941 P	3.10	5.60	4.56	4.17	4.82	6.55	2.91	1.38	.73	4.03	2.40	2.46	42.71
Q	1.67	2.92	1.39	.30	1.60	2.88	.10	0	0	0	0	0	10.86
1942 P	.72	1.69	.98	6.46	4.66	7.13	1.09	.92	7.41	2.73	3.43	3.97	41.19
Q	0	0	0	1.37	.71	4.25	0	0	2.09	0	.14	1.39	9.95
1943 1/ P	.91	.14	2.04	1.22	4.16	1.88							10.35
Q	0	0	.06	.02	.09	.30							.47
Av. 2/ P	2.32	2.72	1.92	3.62	3.84	4.66	1.73	1.60	2.19	2.73	3.86	2.85	35.77 2/
Av. 2/ Q	.28	.49	.24	.54	.60	1.30	.12	0	.42	.21	1.21	.46	6.15 2/
Normal P 3/	2.38	2.63	2.94	3.97	4.15	3.19	1.94	1.38	2.97	2.41	2.25	2.74	32.95

## ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

## RIESEL (WACO), TEXAS Watershed P-3

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1938	6-21	1.51	6-21	0.24	6-21	0.24	6-21	0.24	6-21	0.24	6-21	0.24	6-21	0.24	6-17	0.27
1939	5-18	1.62	5-20	.53	5-20	.62	5-20	.64	5-20	.64	5-20	.64	5-18	.83	5-17	1.16
1940	11-22	4.18	11-22	1.97	11-22	2.06	11-22	2.32	11-22	2.46	11-22	3.02	11-22	5.34	11-22	5.93
1941	6-10	7.63	6-10	2.13	6-10	2.23	6-10	2.24	6-10	2.24	6-10	2.24	6-10	2.24	6-2	2.66
1942	6-6	5.35	9-8	1.37	9-8	1.40	6-11	1.73	6-11	1.89	6-10	1.89	9-8	2.01	6-10	3.26
1943 4/	6-5	2.02	6-5	.26	6-5	.27	6-5	.28	6-5	.29	6-5	.30	6-5	.30	6-5	.30

Notes: Quality of records: Monthly P, excellent; monthly Q and Annual Max. discharges and volumes, good. 1/ Station not in operation from July 21, 1943 to January 1, 1960. 2/ Part year amount for 1943 not used in average yearly P and Q. 3/ Normal P based on Waco Weather Bureau record computed from several stations in the vicinity of Waco with length of records from 10 to 65 years. 4/ Maximums for all stations in 1943 occurred before July 1.

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MONTHLY PRECIPITATION AND RUNOFF (Inches)							RIESEL (WACO), TEXAS Watershed P-3							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.02	2.02	1.55	2.01	1.72	4.90	0.36	2.83	0.96	6.07	2.38	7.71	34.53
	Q	1.67	.49	.30	0	0	T	0	0	0	0	0	2.39	4.85
1961	P	4.97	4.74	2.16	.41	2.18	8.51	3.86	.43	4.70	2.04	2.10	2.24	38.34
	Q	2.26	2.16	.04	0	0	2.14	.18	0	T	T	.01	.37	7.16

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							RIESEL (WACO), TEXAS Watershed P-3									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	1-13	0.73	1-13	0.39	1-13	0.52	1-13	0.66	12-7	1.08	12-7	2.10	12-6	2.17	12-6	2.39
1961	6-25	1.53	6-25	.49	6-18	.53	2-5	1.06	2-5	1.35	2-5	1.42	2-5	1.62	1-6	2.26

Notes: Quality of records: Monthly P, excellent; monthly Q and annual max. discharges and volumes, good.  
1/ Raingage W-9.

SELECTED RUNOFF EVENTS				RIESEL (WACO), TEXAS Watershed P-3				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 25, 1961</u>								
5-26-61	Raingage W-9 0.05	0	6-25-61	Raingage W-9		6-25-61		
6-5	.07	0	8:26a	0	0	8:59a	0	0
6-6	.30	0	:31	.84	.07	9:04	.0110	T
6-8	.11	0	:34	2.00	.17	:07	.0861	T
6-12	.01	0	:38	3.00	.37	:10	.188	.01
6-14	.94	0	:41	2.00	.47	:12	.465	.02
6-15	2.46	.0604	:44	1.20	.53	:14	.747	.04
6-16	.39	.0032	:56	.20	.57	:15	.894	.05
6-17	.80	.0279	9:08	1.50	.87	:17	1.11	.09
6-18	1.92	.8728	:18	3.00	1.27	:20	1.36	.15
6-19	0	T	:24	1.80	1.45	:23	1.53	.22
6-25	.03 <u>2/</u>	0	:30	.30	1.48	:25	1.36	.27
						:27	1.11	.31
						:29	.894	.34
						:33	.616	.39
						:42	.233	.45
						:49	.151	.47
						:56	.0861	.49
						10:07	.0396	.50
						:21	.0229	.50
						:45	.0110	.51
						12:00n	.0028	.52
						1:00p	.0017	.52
						4:00	0	.52
<u>Event of July 16-17, 1961</u>								
6-16-61	Raingage W-9 0.39	0.0032	7-16-61	Raingage W-9		7-16-61		
6-17	.80	.0279	9:41p	0	0	9:45p	0	0
6-18	1.92	.8728	:44	2.20	.11	10:00	.0012	T
6-19	0	T	:47	2.00	.21	:02	.0396	T
6-25	1.51	.4519	:49	3.30	.32	:05	.0861	T
7-2	.71	0	:51	2.00	.42	:09	.188	.01
7-3	.26	0	:53	3.30	.53	:10	.233	.02
7-8	.02	0	:55	3.00	.63	:15	.310	.04
7-9	.25	0	10:04	.74	.74	:20	.310	.07
7-10	.46	0	:08	1.50	.84	:23	.282	.08

Notes: To convert runoff in in/hr to cfs, multiply by 0.245. For map of watershed, see page 42.31-4.  
2/ Prior to event beginning 8:26a.

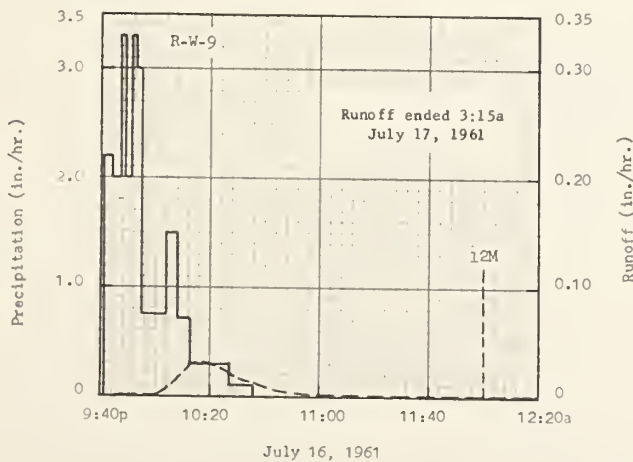
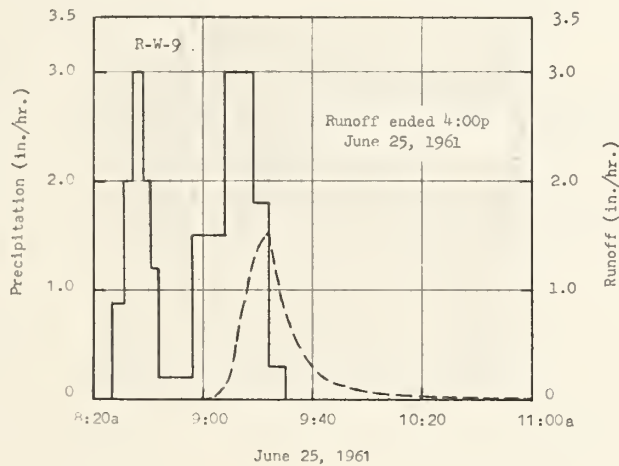
**SELECTED RUNOFF EVENTS**

RIESEL (WACO), TEXAS Watershed P-3

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 16-17, 1961 - continued</u>								
7-12-61	0.65	0.0012	7-16-61 10:13p	0.72	0.90	7-16-61 10:27p	0.233	0.10
7-13	.05	0	:27	.30	.97	:30	.188	.11
7-16	.04 <u>1/</u>	0	:36	.13	.99	:34	.151	.12
						:37	.114	.13
						:41	.0861	.13
						:44	.0612	.14
						:56	.0229	.14
						11:30	.0028	.15
						12:00m	.0020	.15
						7-17-61		
						3:15a	0	.15

Watershed Conditions: 100% Bermuda-grass pasture, good cover, grass 6" high. 8.46 inches available soil moisture in 0-60" profile July 12.

Notes: To convert runoff in in/hr to cfs, multiply by 0.245. 1/ Prior to event beginning 9:41p.



RIESEL (WACO), TEXAS WATERSHED P-3

6-62

## RIESEL (WACO), TEXAS Watershed P-4

LOCATION: Falls County, Texas; 19 miles S. E. of Waco; Brazos River Basin.

AREA: 0.243 acre

SHAPE: Rectangular, 168' long, 63' wide.

SLOPE: 2.9%.

Aspect S.W.

SOILS: Houston Black clay - 100%. Residual, derived from highly calcareous Taylor marl. Topsoil: Depth - 5 ft.; structure - moderate, fine to medium, granular; permeability - slow; internal drainage - very slow. Subsoil: Structure - weak, fine, granular; permeability - very slow.

EROSION: 2 - 100%.

LAND CAPABILITY: II - 100%.

SURFACE DRAINAGE: Good; no well defined drainageways.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff - type H-1 flume near center of covered concrete gutter 63 feet long across slope to Intercept and concentrate runoff, FW-1 recorder with 6 hour chart; Precipitation -- W-9 weighing recording raingage, 6 hour chart; Soil Loss -- Ramser Silt Sampler with 5-by-16-by-1 1/2 ft. silt box.

WATERSHED CONDITIONS: 1938-43, 100% cultivated to one crop each year, straight rows transverse to the general direction of slope. Four-year rotation of cotton - corn - cotton - oats; oats - 1938, 39, 43; cotton - 1940, 42; corn - 1941. Sprig sodded with Bermudagrass in spring of 1944. Continuously in grass used for pasture, 1944-59, heavily grazed. Grazing discontinued 1960-61, with application of 200 pounds per acre 16-20-0 fertilizer in spring of 1960; sprayed with 2-4-D 1960 and 1961 for weed control. This period used for improvement prior to grazing management.

GENERALLY REPRESENTS: Small areas of cultivated land in the Texas Blackland Prairies land resource area in Texas and Arkansas, (J-86) on deep, fine textured, slowly permeable soils, 1938-43; areas in grass on same soils. 1960-61.

## MONTHLY PRECIPITATION AND RUNOFF (Inches)

RIESEL (WACO), TEXAS Watershed P-4

Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1938	P Q	4.25 0	2.07 0	2.17 0	4.03 0	2.64 0	3.54 .20	2.02 0	1.14 0	1.12 0	0.17 0	
1939	P Q	3.93 0	3.05 0	1.19 0	1.37 0	4.90 0	2.29 0	.40 0	2.68 0	.33 0	2.11 0	2.49 0	1.21 0	25.95 0
1940	P Q	.98 0	2.87 0	.58 0	4.45 .02	1.83 T	6.56 .15	2.21 .48	1.87 0	1.35 0	4.62 .44	10.30 6.21	3.85 1.19	41.47 8.49
1941	P Q	3.10 2.03	5.60 3.27	4.56 1.58	4.17 .26	4.82 1.88	6.55 2.08	2.91 .21	1.38 0	.37 0	4.03 0	2.40 0	2.46 T	42.71 11.31
1942	P Q	.72 0	1.69 0	.98 0	6.46 .99	4.66 .35	7.13 3.81	1.09 0	.92 0	7.41 1.81	2.73 .01	3.43 1.01	3.97 1.82	41.19 9.80
1943 <sup>1/</sup>	P Q	.91 0	.14 0	2.04 .14	1.22 .06	4.16 T	1.88 .13							10.35 .33
Av. <sup>2/</sup>	P Q	2.32 .34	2.72 .54	1.92 .29	3.62 .22	3.84 .37	4.66 1.06	1.73 .14	1.60 0	2.19 .36	2.73 .09	3.86 1.44	2.85 .60	35.77 <sup>2/</sup> 5.96 <sup>2/</sup>
Normal P <sup>3/</sup>		2.38	2.63	2.94	3.97	4.15	3.19	1.94	1.38	2.97	2.41	2.25	2.74	32.95

## ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

RIESEL (WACO), TEXAS Watershed P-4

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1938	6-21	1.46	6-21	0.20	6-21	0.20	6-21	0.20	6-21	0.20	6-21	0.20	6-21	0.20	6-21	0.20
1939		0		0		0		0		0		0		0		0
1940	11-22	4.33	11-22	2.15	11-22	2.25	11-22	2.51	11-22	2.65	11-22	3.01	11-22	5.69	11-22	6.26
1941	6-10	7.79	6-10	1.90	6-10	1.97	6-10	1.99	1-13	2.00	1-13	2.03	1-13	2.03	6-10	2.07
1942	6-6	6.24	12-26	1.41	12-26	1.55	12-26	1.58	12-26	1.80	12-26	1.80	9-8	1.80	6-9	2.73
1943 <sup>4/</sup>	6-5	.75	6-5	.13	6-5	.13	3-24	.14	3-24	.14	3-24	.14	3-24	.14	3-24	.14

Notes: Quality of records: Monthly P, excellent; monthly Q and Annual Max. discharges and volumes, good. <sup>1/</sup> Station not in operation from July 21, 1943 to January 1, 1960. <sup>2/</sup> Part year amount for 1943 not used in average yearly P and Q. <sup>3/</sup> Normal P based on Waco Weather Bureau record computed from several stations in the vicinity of Waco with length of records from 10 to 65 years. <sup>4/</sup> Maximums for all stations in 1943 occurred before July 1.



MONTHLY PRECIPITATION AND RUNOFF (Inches)								RIESEL (WACO), TEXAS Watershed P-4						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P*	2.02	2.02	1.55	2.01	1.72	4.90	0.36	2.83	0.96	6.07	2.38	7.71	34.53
	Q	1.43	.27	.10	0	0	T	0	0	0	.01	T	3.93	5.74
1961	P	4.97	4.74	2.16	.41	2.18	8.51	3.86	.43	4.70	2.04	2.10	2.24	38.34
	Q	2.93	2.76	.06	0	0	3.41	.11	0	.04	T	.06	.32	9.69

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								RIESEL (WACO), TEXAS Watershed P-4								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	1-13	0.52	12-7	0.33	12-7	0.48	12-7	0.86	12-7	1.54	12-7	2.97	12-6	3.30	12-6	3.93
1961	6-25	1.86	6-25	.57	6-18	.69	2-5	1.34	6-18	1.70	6-17	2.25	6-17	2.36	1-6	2.93

Notes: Quality of records: Monthly P, excellent; monthly Q and annual max. discharges and volumes, good.  
 1/ Raingage W-9.

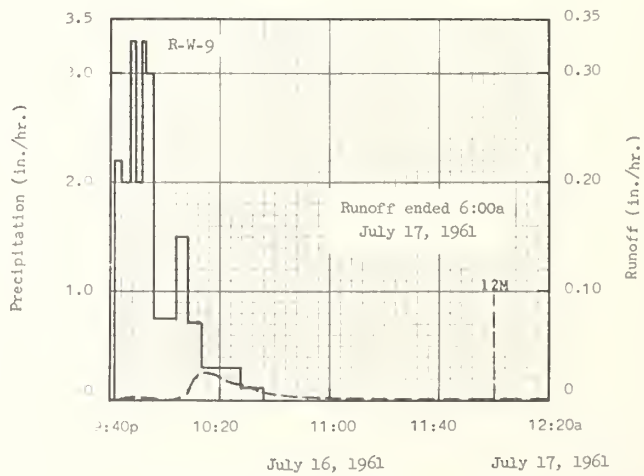
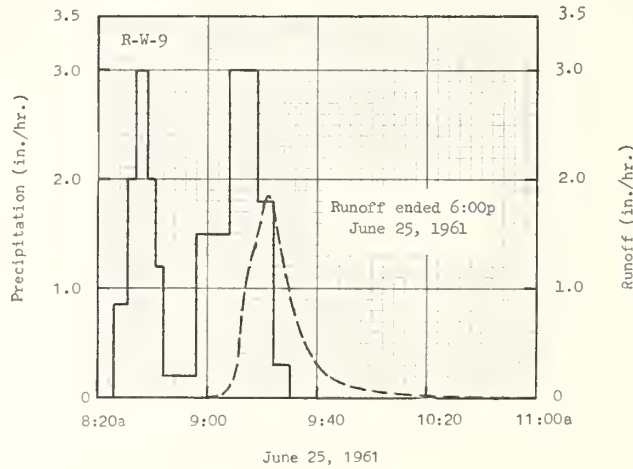
SELECTED RUNOFF EVENTS						RIESEL (WACO), TEXAS Watershed P-4			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of June 25, 1961</u>									
Raingage W-9									
5-26-61	0.05	0	6-25-61	Raingage W-9		6-25-61			
6-5	.07	0	8:26a	0	0	8:58a	0	0	
6-6	.30	0	:31	.84	.07	9:05	.0069	T	
6-8	.11	0	:34	2.00	.17	:07	.0396	T	
6-12	.01	0	:38	3.00	.37	:09	.0735	.01	
6-14	.94	0	:41	2.00	.47	:10	.151	.01	
6-15	2.46	.0604	:44	1.20	.53	:12	.539	.02	
6-16	.39	.0032	:56	.20	.57	:14	.947	.04	
6-17	.80	.0279	9:08	1.50	.87	:15	1.17	.06	
6-18	1.92	.8728	:18	3.00	1.27	:17	1.36	.10	
6-19	0	T	:24	1.80	1.45	:20	1.63	.12	
6-25	.03 2/	T 3/	:30	.30	1.48	:22	1.86	.24	
						:25	1.63	.32	
						:27	1.29	.37	
						:30	.894	.43	
						:33	.661	.47	
						:36	.449	.49	
						:39	.339	.51	
						:43	.220	.53	
						:48	.139	.55	
						:55	.0800	.56	
						10:08	.0351	.57	
						:34	.0090	.58	
						11:15	.0028	.58	
						2:35p	.0008	.59	
						6:00	0	.59	
<u>Event of July 16-17, 1961</u>									
Raingage W-9									
6-16-61	0.39	0.0032	7-16-61	Raingage W-9		7-16-61			
6-17	.80	.0279	9:41p	0	0	9:41p	0	0	
6-18	1.92	.8728	:44	2.20	.11	:42	.0012	T	
6-19	0	T	:47	2.00	.21	:55	.0069	T	
6-25	1.51	.4519	:49	3.30	.32	:57	.0049	T	
7-2	.01	0	:51	2.00	.42	10:03	.0049	T	
7-3	.26	0	:53	3.30	.53	:07	.0306	T	
7-8	.02	0	:55	3.00	.63	:10	.212	.01	
7-9	.25	0	10:04	.74	.74	:13	.245	.02	

Notes: To convert runoff in in/hr to cfa, multiply by 0.245. For map of watershed, see page 42.31-4. 2/ Prior to event beginning 8:26a. 3/ Runoff prior to 8:58a.

SELECTED RUNOFF EVENTS						RIESEL (WACO), TEXAS Watershed P-4		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 16-17, 1961 - continued</u>								
7-10-61	0.46	0	7-16-61	1.50	0.84	7-16-61	0.245	0.03
7-12	.65	.0012	10:08p	.72	.90	10:16p	.188	.06
7-13	.05	0	:13	.30	.97	:23	.151	.07
7-16	.04 <sup>1/</sup>	0	:27	.13	.99	:28	.114	.08
			:36			:31	.0861	.08
						:34		
						:39	.0612	.09
						:49	.0229	.10
						11:05	.0049	.10
						12:00m	.0020	.10
						7-17-61		
						2:30a	.0008	.10
						6:00	0	.10

Watershed Conditions: 100% Bermuda-grass pasture, good cover, grass 6" high. 8.46 inches available soil moisture in 0-60" profile July 12.

Notes: To convert runoff in in/hr to cfs, multiply by 0.245. <sup>1/</sup> Prior to event beginning 9:41p.



RIESEL (WACO), TEXAS WATERSHED P-4

5-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Hastings, Nebraska Watershed W-3 (Area - 481 acres)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	0.73	0.67	1.25	2.10	5.80	5.54	2.34	1.23	3.25	1.04	0.41	0.02	24.38
Q	0	T	e 1.87	.60	1.74	1.21	.03	T	.36	0	T	0	5.81
1961 P	.08	.21	2.07	1.43	7.06	3.97	2.61	3.43	3.60	.48	1.10	.59	26.63
Q	0	0	.02	.03	1.26	.72	.02	.49	.19	0	.01	0	2.74

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Hastings, Nebraska Watershed W-3								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-15	0.93	5-15	0.63	5-15	0.81	5-15	0.85	5-15	0.85	3-26	0.92	3-26	1.61	3-26	2.45
1961	6-15	.22	6-15	.20	6-15	.35	6-15	.52	6-15	.53	5-21	.80	5-20	1.05	5-17	1.21

Notes: Quality of records; monthly P excellent; monthly Q good to excellent except Dec. 1 to April 1 which are fair. Crop conditions: 1960 - wheat was excellent; other crops and meadow were good. Pasture was fair. 1961 - wheat was excellent; other crops including meadow and pasture were good. The general crop rotation was corn or sorghum, fallow and wheat, predominantly straight-row farmed.

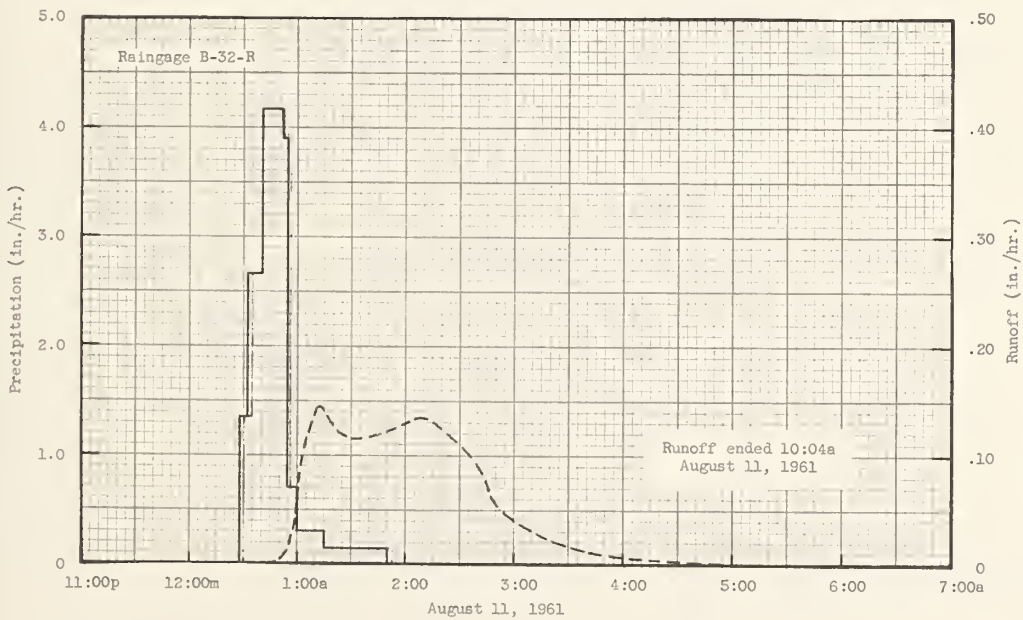
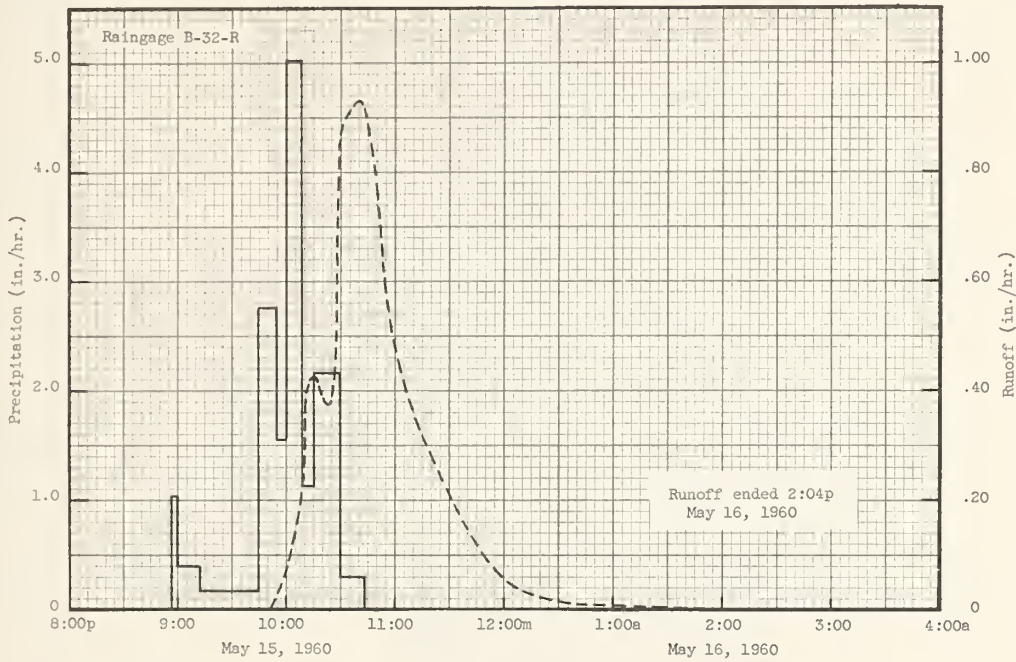
SELECTED RUNOFF EVENTS				Hastings, Nebraska Watershed W-3				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 15-16, 1960</u>								
4-16-60	0.21	0	5-15-60	Raingage B-32-R		5-15-60		
4-25	.08	0	8:57p	0	0	9:52p	0	0
4-27	.06	0	9:01	1.05	.07	10:01	.0695	.0033
4-28	.11	0	:13	.40	.15	:09	.270	.0211
4-29	.30	0	:45	.19	.25	:15	.425	.0589
5-3	.15	0	:55	2.76	.71	:23	.375	.1161
5-5	1.61	.19	10:00	1.56	.84	:27	.555	.1426
5-6	.13	T	:08	5.03	1.51	:31	.880	.1904
			:15	1.12	1.64	:34	.913	.2352
			:29	2.18	2.15	:39	.932	.3117
			:43	.30	2.22	:43	.932	.3743
						:47	.829	.4322
						:53	.680	.5077
			5-15-60	Raingage A-31-R		5-16-60		
			8:56p	0	0	11:03	.466	.6034
			9:06	.36	.10	:13	.346	.6711
			:14	.60	.14	:33	.205	.7633
			:42	.40	.19	:43	.137	.7918
			:56	2.14	.69	5-16-60		
			10:10	3.81	1.58	12:03a	.054	.8203
			:20	.84	1.72	:33	.019	.8371
			:32	2.70	2.26	:53	.0107	.8422
			:38	.01	2.28	1:53	.0033	.8483
			5-15-60	Raingage B-10-R		2:04p	0	.8537
			8:56p	0	0			
			9:04	1.13	.15			
			:42	.11	.22			
			:52	1.80	.52			
			:56	4.80	.84			
			10:10	3.42	1.64			
			:16	.40	1.68			
			:29	2.40	2.20			
			:38	.53	2.28			
			5-15-60	Raingage Met.				
			8:58p	0				
			10:58		2.28			

Notes: To convert runoff in in/hr to cfs, multiply by 485.0. <sup>1/</sup> Thiessen weighted, using the same gages as shown for the selected event.

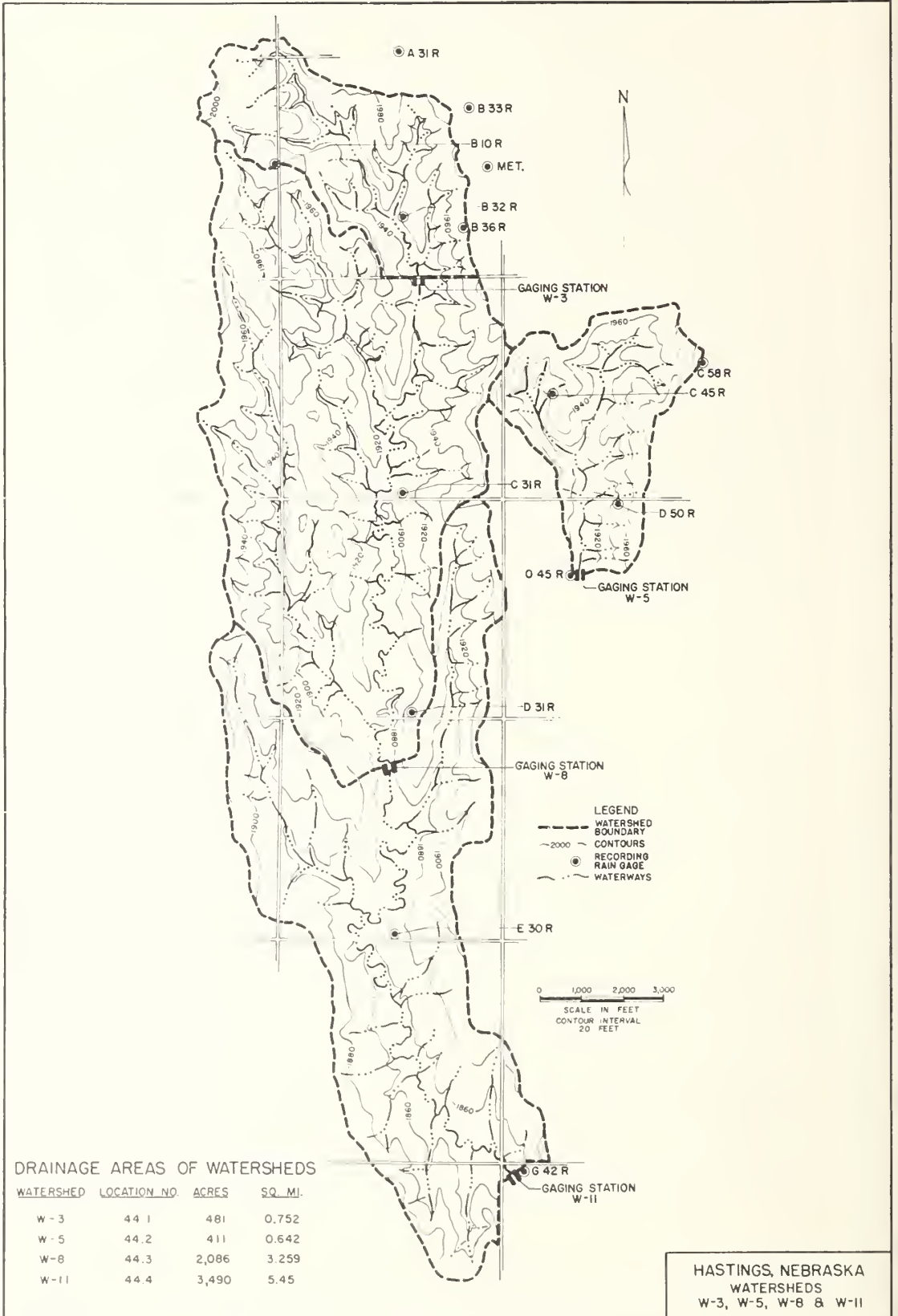
SELECTED RUNOFF EVENTS			Hastings, Nebraska Watershed W-3					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall $\frac{1}{2}$ (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 15-16, 1960 (Continued)								
			5-15-60	Raingage B-33-R				
			8:55p	0				
			10:43		2.26			
			5-15-60	Raingage B-36-R				
			8:54p	0				
			10:52		2.33			
			Thiessen weighted average $\frac{1}{2}$		2.26			
Event of August 11, 1961								
7-13-61	0.29	0	8-11-61	Raingage B-32-R		8-11-61		
7-18	.17	0	12:28a	0	0	12:14a	0	0
7-20	.19	0	:32	1.35	.09	:52	.0020	.0002
7-21	.03	0	:39	2.66	.40	1:00	.0612	.0028
7-22	.18	0	:52	4.15	1.30	:04	.109	.0084
7-26	.14	0	:54	3.90	1.43	:12	.144	.0261
8-1	.22	0	1:00	.70	1.50	:24	.121	.0530
8-4	.08	0	:14	.30	1.57	:30	.115	.0648
			:50	.12	1.64	:50	.121	.1038
			8-11-61	Raingage A-31-R		2:08	.134	.1421
Watershed Conditions: Crops in following condition:			12:28a	0	0	:34	.109	.1967
Corn - about 7' tall, ears forming			:30	3.00	.10	:54	.0520	.2219
Wheat - harvested, stubble fields cultivated			:40	3.72	.72	3:14	.0276	.2340
Oats - harvested, stubble fields cultivated			:45	4.44	1.09	:44	.0104	.2437
Sorghum - about 3 1/2' tall, heading and in good condition			:52	3.86	1.54	4:14	.0055	.2473
Alfalfa - 4", poor stand			:58	.90	1.63	5:04	.002	.2504
Meadow - 15" high, good			1:28	.20	1.73	10:04	T	.2544
Pasture - 5" h. gr., good			:58	.08	1.77			
All fields were very dry; watershed was predominantly straight-row farmed.			8-11-61	Raingage B-10-R				
Land use in percentage of the watershed area was as follows:			12:26a	0	0			
Fallow . . . . . 27.4%			:30	1.50	.10			
Sorghum . . . . . 20.0%			:50	4.11	1.47			
Pasture . . . . . 17.6%			1:00	.60	1.57			
Wheat . . . . . 16.4%			:26	.23	1.67			
Corn . . . . . 9.8%			:50	.02	1.68			
Sudan . . . . . 2.5%			8-11-61	Raingage Met.				
Meadow . . . . . 2.2%			12:29a	0				
Roads . . . . . 2.1%			1:49		1.78			
Farmsteads . . . . . 1.5%			8-11-61	Raingage B-33-R				
Alfalfa . . . . . .5%			12:29a	0				
			1:47		1.94			
			8-11-61	Raingage B-36-R				
			12:26a	0				
			1:50		1.71			
			Thiessen weighted average $\frac{1}{2}$		1.70			

Notes: To convert runoff in in/hr to cfs, multiply by 465.0.  $\frac{1}{2}$  Thiessen weighted, using the same raingages as shown for the selected event.





HASTINGS, NEBRASKA WATERSHED W-3



5-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Hastings, Nebraska Watershed W-5 (Area - 411 acres)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	0.72	0.81	1.40	2.18	5.99	5.77	2.19	2.03	3.40	1.09	0.59	0.03	26.20
1960 Q	0	T	e 1.63	.55	1.41	e .94	T	T	.07	0	.01	0	4.61
1961 P	0.06	.25	2.72	1.38	7.24	4.80	2.70	3.64	3.82	.53	1.36	.67	29.17
1961 Q	0	0	.01	.01	e .51	.68	.01	.12	.06	0	.01	0	e 1.41

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Hastings, Nebraska Watershed W-5									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
	Date	Rate	1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-15	0.64	5-15	0.52	5-15	0.69	5-15	0.79	5-15	0.80	5-15	0.80	3-25	e 1.41	3-25	e 2.09
1961	6-15	.24	6-15	.23	6-15	.40	6-15	.64	6-15	.66	6-15	.67	6-15	.67	6-15	.67

Notes: Quality of records: monthly P excellent; monthly Q good to excellent except Dec. 1 to April 1 which are fair. Crop conditions: 1960 - wheat was excellent; other crops and meadow were good; pasture was fair. 1961 - wheat was excellent; other crops including meadow and pasture were good. The general crop rotation was corn or sorghum, fallow and wheat, predominantly terraced and contour farmed.

SELECTED RUNOFF EVENTS				Hastings, Nebraska Watershed W-5				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 15-17, 1960</u>								
4-16-60	0.20	0	5-15-60	Rainage C-45-R		5-15-60		
4-25	.17	0	8:52p	0	0	9:54p	0	0
4-27	.04	0	:56	2.40	.16	10:02	.0487	.0013
4-28	.13	0	9:38	.14	.26	:08	.0705	.0079
4-29	.37	0	:55	1.97	.82	:11	.241	.0165
5-3	.10	0	10:04	4.13	1.44	:14	.229	.0283
5-5	1.90	.18	:24	1.95	2.09	:20	.201	.0494
5-6	.17	T	:36	.35	2.16	:28	.270	.0775
						:32	.323	.0972
						:36	.562	.1285
Watershed Conditions: Crops in following condition:			5-15-60	Rainage D-45-R		:38	.615	.1481
Corn - some planted			8:54p	0	0	:43	.630	.2005
Wheat - some 12" tall, excellent			9:00	1.50	.15	:48	.644	.2530
Oats - 4" tall, good condition			:38	.08	.20	:58	.644	.3603
Sorghum - just planted			:44	.90	.29	11:03	.630	.4115
Alfalfa - about 10" tall, good			10:07	2.84	1.38	:08	.586	.4627
Meadow - 4" tall, good			:28	1.88	2.04	:13	.524	.5090
Pasture - 2" tall, fair			:42	.43	2.14	:22	.323	.5724
Ground was too wet for good tillage.			5-15-60	Rainage D-50-R		:28	.253	.6012
Pasture and meadow with fair ground cover. Watershed predominantly in terraced and contour farming. The land use in percentage of the watershed area was as follows:			8:52p	0	0	:38	.185	.6377
Sorghum . . . . . 22.4%			9:02	.96	.16	:48	.143	.6650
Wheat . . . . . 18.4%			:38	.07	.20	12:00m	.0980	.6891
Meadow . . . . . 16.7%			:50	1.10	.42	5-16-60		
Pasture . . . . . 12.2%			:54	4.20	.70	12:18a	.0680	.7139
Alfalfa . . . . . 9.4%			10:00	1.70	.87	:38	.0468	.7330
Fallow . . . . . 8.9%								
Corn . . . . . 7.3%			:08	4.35	1.45	1:08	.0292	.7526
Farmsteads . . . . . 2.7%			:20	1.15	1.68	:38	.0193	.7641
Roads . . . . . 1.2%			:28	3.08	2.09	5-17-60		
Sudan . . . . . .8%			:40	.45	2.18	6:00a	0	.8045
			11:00	.09	2.21			
					Thiessen weighted average <sup>1/</sup>	2.17		

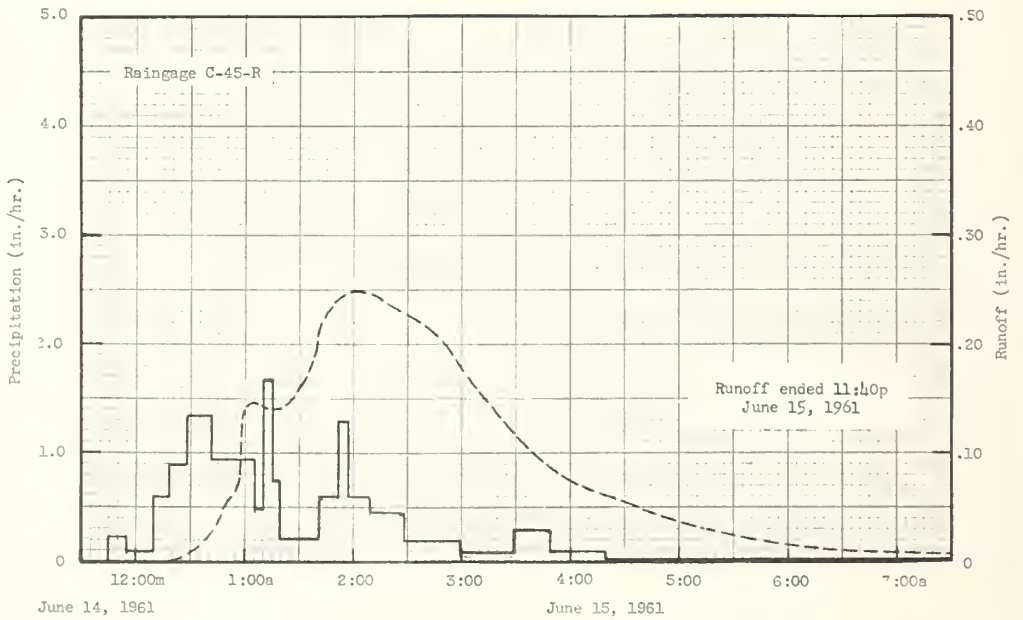
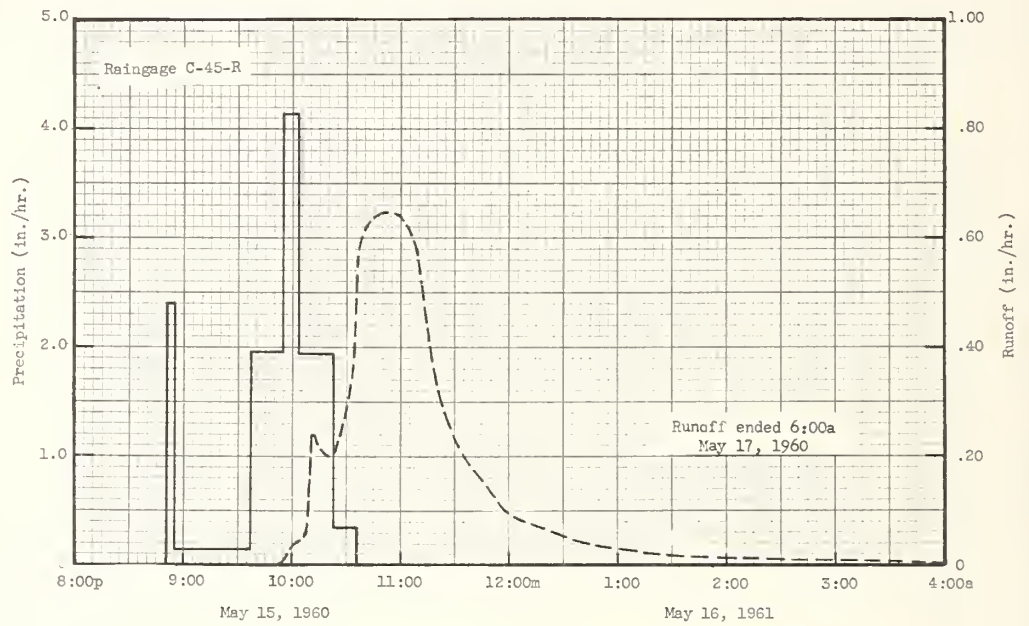
Notes: To convert runoff in in/hr to cfs, multiply by 44.4. For map of watershed, see page 44.1-4. <sup>1/</sup> Thiessen weighted, using the same rainages as shown for the selected event.

SELECTED RUNOFF EVENTS			Hastings, Nebraska Watershed W-5					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 14-15, 1961</u>								
5-16-61	0.15	0	6-14-61	Raingage C-45-R		6-15-61		
5-17	.69	T	11:45p	0	0	12:20a	0	0
5-19	.55	.01	:55	.24	.04	:36	.0136	.0011
5-20	.27	T	6-15-61			:45	.0381	.0056
5-21	2.04	.13	12:10a	.08	.06	:50	.0569	.0089
5-22	1.11	.10	:19	.60	.15	:56	.0680	.0153
5-23	0	.24	:29	.90	.30	:58	.135	.0187
5-30	.04	0	:41	1.35	.57	1:04	.147	.0328
5-31	.27	0	1:05	.95	.95	:10	.141	.0472
6-2	.09	0	:10	.48	.99	:20	.141	.0707
6-4	.04	0	:15	1.68	1.13	:28	.159	.0899
6-5	.53	T	:19	.75	1.18	:32	.163	.1006
6-6	.96	T	:41	.22	1.26	:38	.189	.1182
6-7	0	.01	:51	.60	1.36	:44	.223	.1388
6-13	.19	0	:57	1.30	1.49	:54	.244	.1780
			2:09	.60	1.61	2:02	.249	.2100
			:29	.45	1.76	:14	.244	.2594
			:59	.20	1.86	:20	.239	.2835
			3:29	.08	1.90	:40	.218	.3597
			:49	.30	2.00	3:00	.178	.4257
			4:19	.10	2.05	:30	.117	.4994
			10:52	.01	2.14	4:00	.0755	.5476
						:30	.0569	.5807
			6-14-61	Raingage D-45-R		5:30	.0251	.6217
			11:53p	0	0	6:30	.0111	.6398
			6-15-61			12:00n	.0011	.6595
			12:08a	.28	.07	11:40p	T	.6669
			:16	1.88	.32			
			:34	.84	.57			
			:46	1.35	.84			
			:55	3.27	1.33			
			:58	2.60	1.46			
			1:04	1.10	1.57			
			:20	.60	1.73			
			:32	1.00	1.93			
			:50	.23	2.00			
			2:00	.60	2.10			
			:20	.90	2.40			
			:35	.48	2.52			
			3:01	.09	2.56			
			:07	.40	2.60			
			:40	.20	2.71			
			4:00	.33	2.82			
			5:30	.04	2.88			
			6-14-61	Raingage D-50-R				
			11:48p	0	0			
			:52	1.05	.07			
			6-15-61					
			12:04a	.10	.09			
			:13	2.13	.41			
			:30	1.20	.75			
			:47	1.83	1.27			
			:54	3.34	1.66			
			1:03	1.46	1.88			
			:18	.76	2.07			
			:21	1.60	2.15			
			:31	.54	2.24			
			:47	.30	2.32			
			2:03	1.32	2.67			
			:18	.88	2.89			
			:30	.35	2.96			
			:50	.15	3.01			
			4:00	.13	e 3.16			
			:20	.15	e 3.21			
<p>Notes: To convert runoff in in/hr to cfs, multiply by 414.4. <sup>1/</sup> Thiessen weighted, using the same raingages as shown for selected event.</p>								



5-62

SELECTED RUNOFF EVENTS			Hastings, Nebraska Watershed W-5					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 14-15, 1961 (continued)</u>								
			6-15-61 5:30a	0.03	e 3.24			
			6-15-61 12:01a		Raingage C-58-R 0			
			:07	1.60	.16			
			:14	2.40	.44			
			:21	.86	.54			
			:27	1.50	.69			
			:35	.98	.82			
			:50	2.24	1.38			
			1:02	1.00	1.58			
			:05	2.00	1.68			
			:24	.98	1.99			
			:57	.20	2.10			
			2:13	.68	2.28			
			:56	.27	2.47			
			3:36	.05	2.50			
			:54	.30	2.59			
			4:30	.07	2.63			
			5:00	.02	2.64			
			Thiessen weighted average $\frac{1}{2}$		2.61			
Notes:								



HASTINGS, NEBRASKA WATERSHED W-5

MONTHLY PRECIPITATION AND RUNOFF (Inches)													Hastings, Nebraska Watershed W-8 Area - 2086 ac. (3.259 sq. mi.)		
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
		1960	P	0.76	0.78	1.45	2.11	5.78	5.44	2.14	1.68	3.14	1.03		0.43
	Q	0	T	1.64	.72	1.47	1.10	.01	T	.11	0	0	0	5.05	
1961	P	.06	.22	2.34	1.43	7.07	4.26	2.68	3.47	3.70	.50	1.14	.60	27.47	
	Q	0	0	.01	T	1.05	.53	.01	.30	.10	0	0	0	2.00	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													Hastings, Nebraska Watershed W-8			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-15	0.27	5-15	0.22	5-15	0.41	5-15	0.71	3-27	0.83	3-26	1.28	3-26	1.48	3-26	2.36
1961	6-15	.10	6-15	.09	5-22	.17	5-22	.44	5-21	.57	5-21	.80	5-21	.98	5-16	1.04

Notes: Quality of records: monthly P excellent; monthly Q good to excellent except Dec. 1 to April 1 which are fair. Crop conditions: 1960 - wheat was excellent; other crops and meadow were good; pasture was fair. 1961 - wheat was excellent; other crops including meadow and pasture were good. The general crop rotation was corn or sorghum, fallow and wheat, predominantly straight-row farmed.

SELECTED RUNOFF EVENTS													Hastings, Nebraska Watershed W-8		
Antecedent conditions			Rainfall			Runoff									
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)							
Event of May 15-17, 1960															
4-17-60	0.20	0	5-15-60	Raingage C-31-R		5-15-60									
4-25	.10	0	8:53p	0	0	10:00p	0	0							
4-27	.05	0	:59	1.50	.15	:12	.0428	.0024							
4-28	.10	0	9:40	.13	.24	:20	.0998	.0126							
4-29	.33	0	:55	2.24	.80	:36	.178	.0460							
5-3	.13	0	10:07	3.85	1.57	:48	.222	.0871							
5-5	1.55	.09	:13	.50	1.62	11:04	.188	.1425							
5-6	.11	T	:27	2.83	2.28	:20	.160	.1883							
			:47	.15	2.33	:32	.204	.2229							
			5-15-60	Raingage A-31-R		:44	.266	.2723							
Watershed Conditions: Crops in following condition:															
			8:56p	0	0	12:00	.227	.3304							
			9:06	.36	.10	5-15-60									
			:14	.60	.14	12:20a	.183	.4066							
			:42	.40	.19	:40	.157	.4633							
			:56	2.14	.69	1:00	.136	.5121							
			10:10	3.81	1.58										
			:20	.84	1.72	:40	.111	.5946							
			:32	2.70	2.26	2:08	.0898	.6414							
			:38	.01	2.28	:24	.0651	.6622							
			5-15-60	Raingage A-32-R		:32	.0548	.6702							
			8:57p	0	0	:48	.0407	.6829							
			9:01	1.05	.07	3:00	.0302	.6902							
			:13	.40	.15	:48	.0135	.7075							
			:45	.19	.25	4:18	.0053	.7160							
			:55	2.76	.71	6:40	.0019	.7217							
			10:00	1.56	.84	5-17-60									
			:08	5.03	1.51										
			:15	1.12	1.64	6:00a	0	.7287							
			:29	2.18	2.15										
			:43	.30	2.22										
			5-15-60	Raingage D-31-R											
			8:50p	0	0										
			9:02	.50	.10										
			:37	.07	.14										
			:49	1.80	.50										
			10:05	5.22	1.89										
			:14	1.27	2.08										
			:24	3.30	2.63										
			:50	.23	2.73										
			Thiessen weighted average $\frac{1}{2}$		2.35										

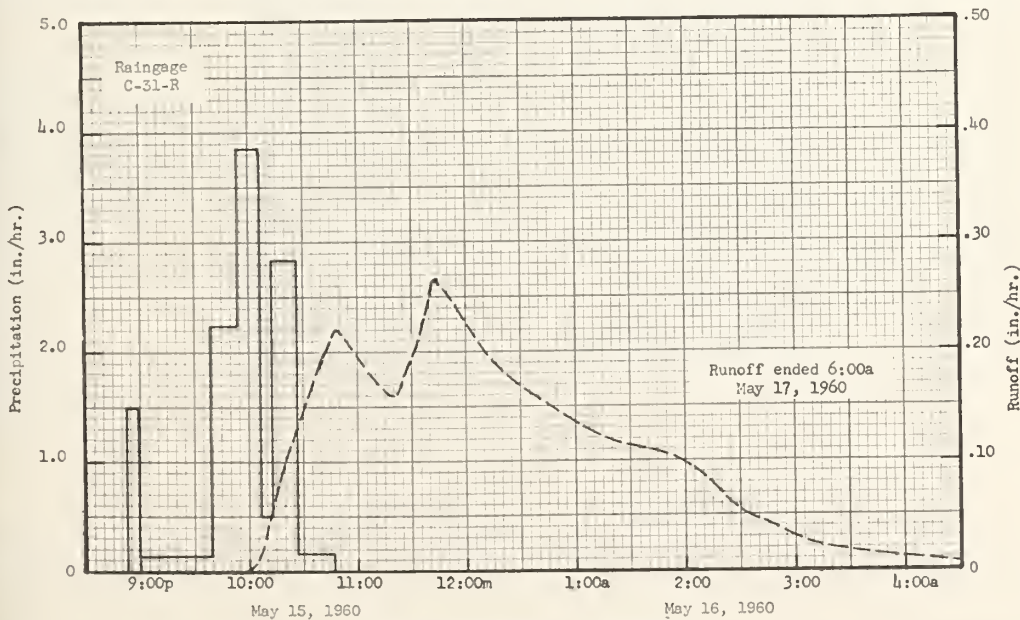
Notes: To convert runoff in in/hr to cfs, multiply by 2103.46. For map of watershed, see page 44.1-4.  $\frac{1}{2}$  Thiessen weighted, using the same gages as shown for selected event.



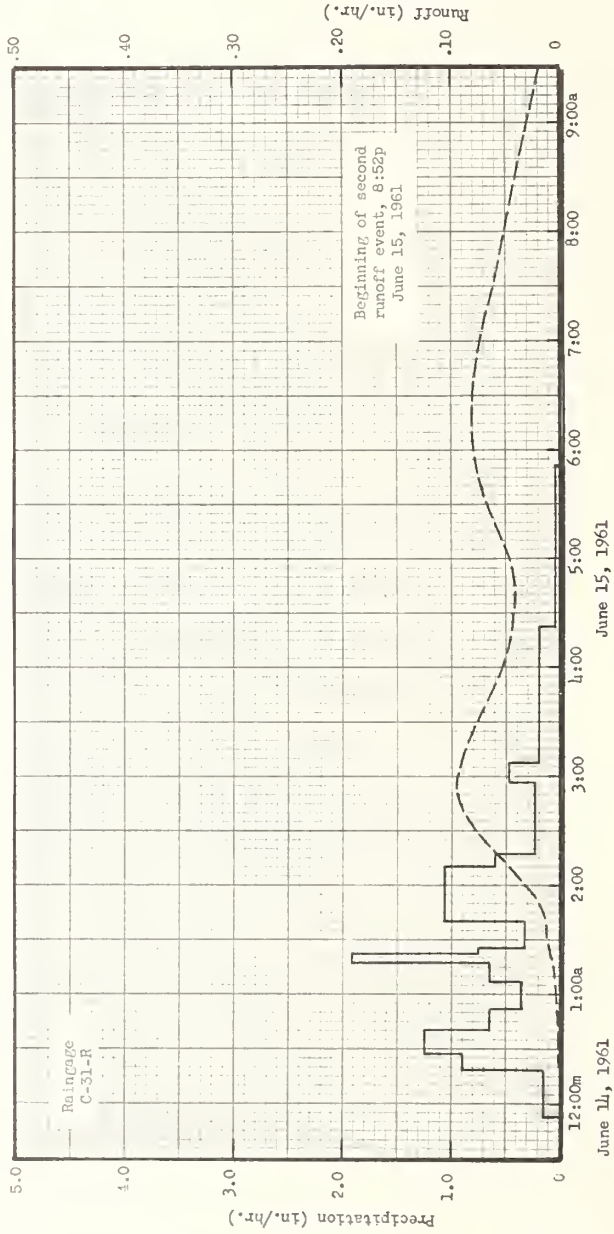


SELECTED RUNOFF EVENTS			Hastings, Nebraska Watershed W-8					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of June 14-15, 1961 (continued)								
			Raingage C-31-R					
6-14-61			11:54p	0	0			
6-15-61			12:18a	.13	.05			
			:28	.90	.20			
			:40	1.25	.45			
			:51	.65	.57			
			1:06	.36	.66			
			:16	.66	.77			
			:21	1.92	.93			
			:25	.75	.98			
			:40	.32	1.06			
			:50	1.08	1.24			
			2:10	1.08	1.60			
			:16	.60	1.66			
			:56	.23	1.81			
			3:06	.48	1.89			
			4:21	.20	2.14			
			5:51	.01	2.16			
			Raingage D-31-R					
6-14-61			11:56p	0	0			
			:58	1.50	.05			
6-15-61			12:14a	.11	.08			
			:21	1.03	.20			
			:38	.67	.39			
			:50	2.30	.85			
			:58	2.93	1.24			
			1:16	.60	1.42			
			:22	1.20	1.54			
			Clock stopped		3.09			
			Thiessen weighted average		2.09			

Notes:



HASTINGS, NEBRASKA WATERSHED W-8



MONTHLY PRECIPITATION AND RUNOFF (Inches)							Hastings, Nebraska Watershed W-11 Area - 3490 ac. (5.45 sq. mi.)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P 0.76	0.84 T	1.40 1.43	2.11 .68	5.70 1.73	5.15 .94	2.01 .01	1.79 T	3.06 .09	1.04 0	0.48 T	0.02 0	24.36 4.88
1961	P 0.06	.23 0	2.33 T	1.40 T	7.09 .86	4.78 .95	2.70 .01	3.40 .24	3.83 .15	.51 T	1.19 T	.66 0	28.18 2.21

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Hastings, Nebraska Watershed W-11									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-15	0.23	5-15	0.22	5-15	0.42	5-15	0.84	5-15	1.02	5-15	1.03	3-26	1.28	3-26	2.11
1961	6-15	.10	6-15	.10	6-15	.20	6-15	.55	6-15	.89	6-15	.92	6-15	.93	6-15	.93

Notes: Quality of records: monthly P excellent; monthly Q good to excellent except Dec. 1 to April 1 which are fair. Crop conditions: 1960 - wheat was excellent; other crops and meadow were good; pasture was fair. 1961 - wheat was excellent; other crops including meadow and pasture were good. The general crop rotation was corn or sorghum, fallow and wheat, predominantly straight-row farmed.

SELECTED RUNOFF EVENTS				Hastings, Nebraska Watershed W-11				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall 1/2 (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)

Event of May 15-17, 1960								
4-17-60	0.20	0	5-15-60	Raingage D-31-R	0	5-15-60		
4-25	.11	0	8:50p		0	9:56p	0	0
4-27	.06	0	9:02		.50	10:10	.0241	.0017
4-28	.09	0	:37		.07	:20	.0813	.0094
4-29	.34	0	:49		1.80	:36	.1070	.0343
5-3	.10	0	10:05		5.22	:44	.118	.0495
5-5	1.50	.06	:14		1.27	2:08	.102	.0860
5-6	.12	.01	:24		3.30	2:63	.0889	.1178
			:50		.23	:52	.0801	.1563
			5-15-60	Raingage A-31-R		5-16-60		
Watershed Conditions: Crops in following condition:			8:56p	0	0	12:04a	.0883	.1729
Corn - some planted			9:06	.36	.10	:16	.186	.1973
Wheat - 12" tall, excellent			:14	.60	.14	:24	.209	.2239
Oats - 4" tall, good			:42	.40	.19	:52	.215	.3231
Sorghum - some planted			:56	2.14	.69	1:04	.224	.3670
Alfalfa - 10" tall, good			10:10	3.81	1.58	1:20	.231	.4279
Meadow - 4" tall, good			:20	.84	1.72	:54	.192	.5496
Pasture - 2" tall, fair			:32	2.70	2.26	2:24	.150	.6367
Ground too wet for good tillage.			:38	.01	2.28	:44	.120	.6832
Pasture and meadow with fair ground cover. Watershed predominantly in straight-row farming. The land use (partially estimated) in percentage of the watershed area was as follows:			5-15-60	Raingage B-32-R		3:44	.0980	.7961
Sorghum . . . . .	29.7%		8:57p	0	0	4:24	.0832	.8562
Pasture . . . . .	21.3%		9:01	1.05	.07	5:12	.0764	.9199
Fallow . . . . .	14.4%		:13	.40	.15	5:44	.0630	.9569
Wheat . . . . .	15.2%		:45	.19	.25	6:24	.0298	.9878
Corn . . . . .	7.0%		:55	2.76	.71	7:56	.0068	1.0112
Alfalfa . . . . .	5.1%		10:00	1.56	.84	8:44	.0048	1.0150
Meadow . . . . .	2.6%		:08	5.03	1.51	5-17-60		
Roads . . . . .	1.9%		:15	1.12	1.64	11:00a	0	1.0374
Farmsteads . . . . .	1.3%		:29	2.18	2.15			
Sudan . . . . .	1.2%		:43	.30	2.22			
Barley . . . . .	.3%		5-15-60	Raingage C-31-R				
			8:53p	0	0			
			:59	1.50	.15			
			9:40	.13	.24			
			:55	2.24	.80			
			10:07	3.85	1.57			
			:13	.50	1.62			

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Notes: To convert runoff in in/hr to cfs, multiply by 3519. For map of watershed, see page 44.1-4. 1/ Thiessen weighted, using the same raingages as shown for the selected event.

SELECTED RUNOFF EVENTS			Hastings, Nebraska Watershed W-11					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches) <sup>1/</sup>	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 15-17, 1960 (continued)								
			5-15-60					
			10:27p	2.83	2.28			
			47	.15	2.33			
			5-15-60	Raingage E-30-R				
			8:50p	0	0			
			9:00	.54	.09			
			:38	.22	.23			
			:50	1.65	.56			
			10:06	4.80	1.84			
			:15	1.00	1.99			
			:26	2.95	2.53			
			:42	.34	2.62			
			5-15-60	Raingage G-42-R				
			8:50p	0	0			
			:58	.68	.09			
			9:33	.10	.15			
			:50	2.01	.72			
			10:04	3.86	1.62			
			:16	1.25	1.87			
			:26	3.00	2.37			
			:44	.33	2.47			
			Thiessen weighted average <sup>1/</sup>		2.46			
Event of June 14-17, 1961								
5-16-61	0.14	0	6-14-61	Raingage D-31-R		6-15-61		
5-17	.70	.01	11:56p	0	0	12:07a	0	0
5-19	.54	.02	:58	1.50	.05	:35	.0187	.0020
5-20	.27	.01	6-15-61			:51	.0312	.0087
5-21	1.86	.34	12:14a	.11	.08	1:03	.0559	.0174
5-22	1.17	.46	12:21	1.03	.20	:11	.0729	.0260
5-30	.07	0	:38	.67	.39	:23	.0843	.0417
5-31	.13	0	:50	2.30	.85	:31	.0869	.0531
6-2	.09	0	:58	2.93	1.24	2:03	.0875	.0996
6-4	.03	0	1:16	.60	1.42	:43	.0921	.1595
6-5	.88	T	:22	1.20	1.54	3:23	.0968	.2224
6-6	.46	.02	2/	nr	e 3.09	4:03	.100	.2880
6-13	.22	0				:43	.101	.3550
			6-14-61	Raingage A-31-R		5:23	.0980	.4213
			10:58p	0	0	:43	.0875	.4523
Watershed Conditions: Crops in following condition: Corn - Just out of ground, fair Wheat - About 3' tall, excellent Oats - 2' tall, good Sorghum - Just out of ground, fair Alfalfa - About 2' tall, excellent Meadow - 16" tall, excellent Pasture - 6" tall, excellent Late cultivation of fields due to wet soil. Pasture and meadow with good ground cover. Watershed predominantly in straight-row farming. The land use (partially estimated) in percentage of the watershed area was as follows: Sorghum . . . . . 21.8% Pasture . . . . . 21.0% Fallow . . . . . 20.1% Wheat . . . . . 16.4% Alfalfa . . . . . 5.8% Corn . . . . . 4.8% Meadow . . . . . 3.7% Oats . . . . . 2.2% Roads . . . . . 1.8% Farmsteads . . . . . 1.3% Sudan . . . . . 1.1%			11:47	.05	.04	:59	.0832	.4750
			:57	.84	.18	6:43	.0857	.5370
			6-15-61			7:03	.0850	.5654
			12:10a	0	.18	8:23	.0693	.6686
			:17	.94	.29	10:03	.0554	.7719
			:28	.22	.33	11:43	.0463	.8568
			:32	.45	.36	:59	.0429	.8687
			:48	.08	.38	12:43p	.0202	.8913
			1:04	.71	.57	1:23	.0097	.9008
			:14	.18	.60	:43	.0076	.9037
			:29	.44	.71	2:20	.0053	.9077
			:35	1.00	.81	3:20	.0032	.9119
			:50	.24	.87	4:20	.0022	.9146
			2:07	.11	.92	6:20	.0012	.9180
			:14	.43	.97	9:00	.0007	.9205
			10:40	.0005	.9215			
			6-16-61					
			1:00a	.0003	.9232			
			10:00	.0002	.9247			
			12:00n	.0004	.9254			
			6-14-61	Raingage B-32-R		8:00	.0001	.9272
			11:08p	0	0	6-17-61		
			12:00m	.10	.09	10:00a	T	.9281
			6-15-61					
			12:09a	0	.09			
			12:14	.24	.11			
			:21	.86	.21			
			:32	.33	.27			
			:47	.08	.29			
			1:00	.74	.45			

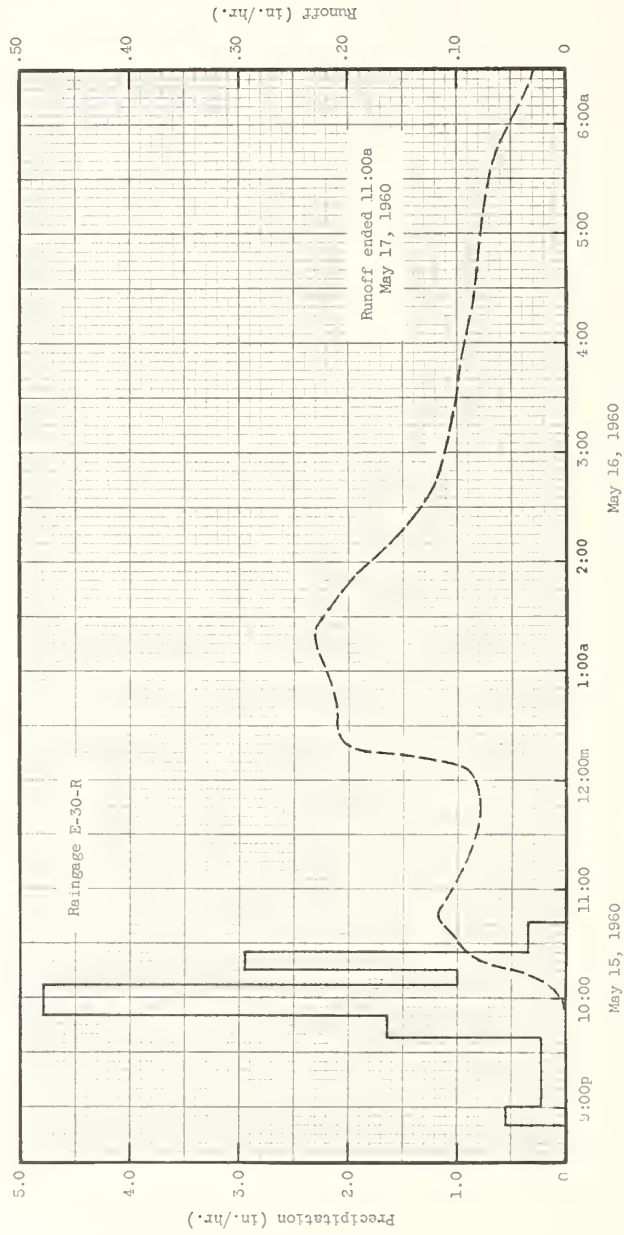
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Notes: To convert runoff in in/hr to cfs, multiply by 3519. <sup>1/</sup> Thiessen weighted using the same raingages as shown for selected event. <sup>2/</sup> Clock stopped.

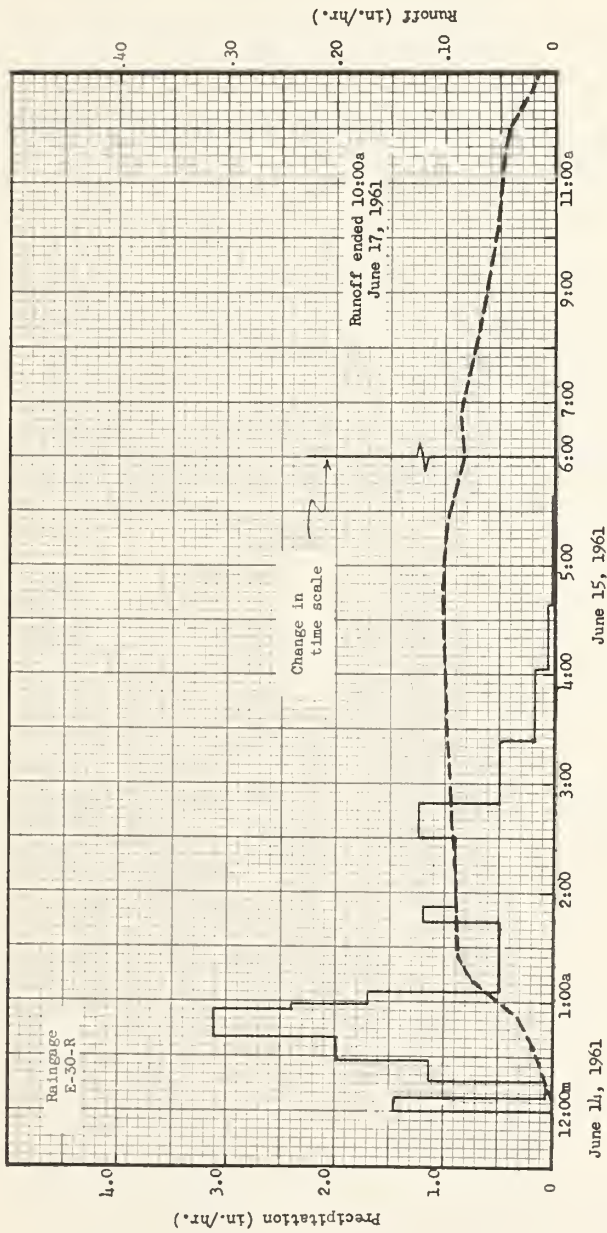


SELECTED RUNOFF EVENTS			Hastings, Nebraska Watershed W-11					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Acc. (inches)	
Event of June 14-17, 1961 (continued)								
			6-15-61					
			1:03	0.60	0.48			
			:08	1.80	.63			
			:14	.90	.72			
			:30	.26	.79			
			:45	.80	.99			
			:15	.34	1.16			
			:30	.96	1.40			
			:45	.72	1.58			
			3:20	.20	1.70			
			4:20	.08	1.78			
			6-14-61	Raingage C-31-R				
			11:54p	0	0			
			6-15-61					
			12:18a	.13	.05			
			:28	.90	.20			
			:40	1.25	.45			
			:51	.65	.57			
			1:06	.36	.66			
			:16	.66	.77			
			:21	1.92	.93			
			:25	.75	.98			
			:40	.32	1.06			
			2:10	1.08	1.60			
			:16	.60	1.66			
			:56	.23	1.81			
			3:06	.48	1.89			
			4:21	.20	2.14			
			5:51	.01	2.16			
			6-15-61	Raingage E-30-R				
			12:00m	0	0			
			:07	1.46	.17			
			:16	.07	.18			
			:27	1.14	.39			
			:40	1.99	.82			
			:56	3.11	1.65			
			:59	2.40	1.77			
			1:06	1.71	1.97			
			:44	.49	2.28			
			:52	1.20	2.44			
			2:30	.88	3.00			
			:48	1.23	3.37			
			3:24	.50	3.67			
			4:02	.19	3.79			
			:38	.05	3.82			
			5:38	.01	3.83			
			6-15-61	Raingage G-42-R				
			12:03a	0	0			
			:07	1.50	.10			
			:14	3.43	.50			
			:19	1.08	.59			
			:22	3.40	.76			
			:26	1.05	.83			
			:39	2.08	1.28			
			:49	2.58	1.71			
			:05	1.58	2.13			
			:17	.50	2.23			
			:47	.38	2.42			
			:27	1.26	3.26			
			:47	.69	3.49			
			3:27	.44	3.78			
			:57	.28	3.92			
			4:27	.12	3.98			
			:57	.02	3.99			
			Thiessen weighted average $\frac{1}{}$			2.69		

Notes:



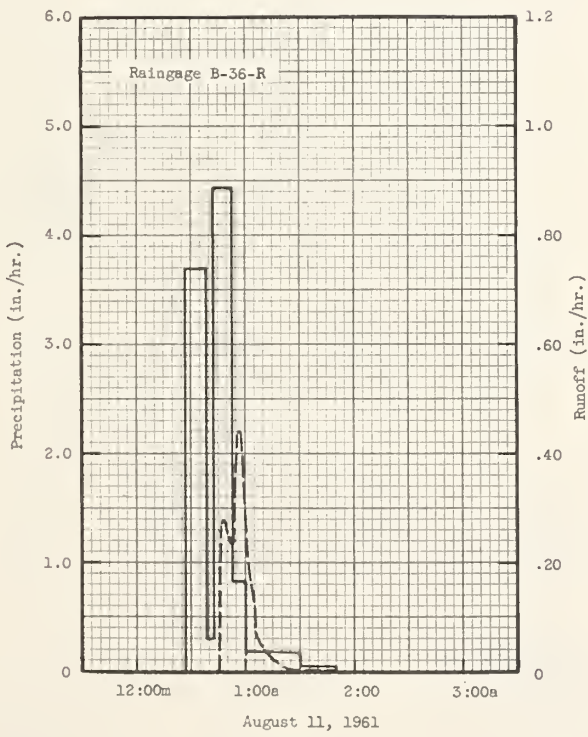
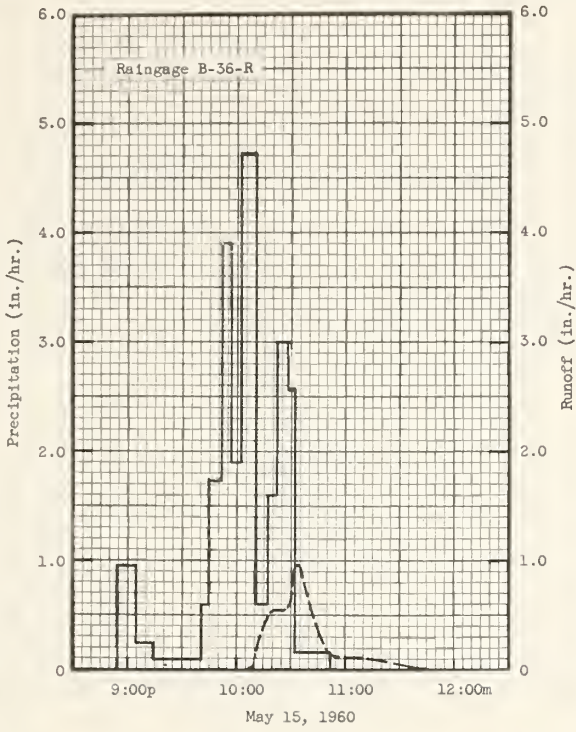
HASTINGS, NEBRASKA WATERSHED W-11



HASTINGS, NEBRASKA WATERSHED W-11

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Hastings, Nebraska Watershed 1-H (3.62 Ac.)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P Q	0.73 0	0.74 e .01	1.30 e .39	2.06 0	5.92 .38	5.59 .01	2.46 0	1.44 0	3.04 .02	0.98 0	0.43 0	0.02 0	21.71 .81
1961	P Q	.08 0	.15 0	1.96 0	1.39 0	6.86 T	4.19 T	2.44 T	3.48 .10	3.54 T	.50 0	1.01 0	.49 0	26.09 .10		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Hastings, Nebraska Watershed 1-H								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-15	0.97	5-15	0.38	5-15	0.38	5-15	0.38	5-15	0.38	5-15	0.38	5-15	0.38	3-26	e .39
1961	8-11	.44	8-11	.10	8-11	.10	8-11	.10	8-11	.10	8-11	.10	8-11	.10	8-11	.10
Notes: Quality of records: Monthly P and Q, good to excellent except estimated values which are fair. Crop conditions - 1960: Native grass meadow, good condition; yielded 2554 pounds per acre of air-dried hay. 1961: Native grass meadow, good condition; yielded 2000 pounds per acre of air-dried hay.																
SELECTED RUNOFF EVENTS								Hastings, Nebraska Watershed 1-H								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of May 15, 1960																
4-16-60	0.20	0	5-15-60	Raingage B-36-R		5-15-60										
4-25	.11	0	8:54p	0	0	10:09p	0	0								
4-27	.07	0	9:04	.96	.16	:14	.364	.02								
4-28	.08	0	:14	.24	.20	:18	.521	.04								
4-29	.29	0	:40	.09	.24	:25	.538	.106								
5-3	.18	0	:44	.60	.28	:28	.564	.12								
5-5	1.61	0	:52	1.73	.51	:31	.833	.17								
5-6	.14	0	:56	3.90	.77	:34	.970	.22								
			10:02	1.90	.96	:37	.837	.258								
			:10	4.73	1.59	:41	.578	.31								
			:16	.60	1.65	:46	.315	.34								
			:22	1.60	1.81	:51	.133	.36								
			:28	3.00	2.11	11:06	.129	.375								
			:32	2.55	2.28	:40	0	.38								
			:52	.15	2.33											
Event of August 11, 1961																
7-13-61	0.27	0	8-11-61	Raingage B-36-R		8-11-61										
7-18	.17	0	12:26a	0	0	12:45a	0	0								
7-20	.32	0	:38	3.70	.74	:46	.170	.0015								
7-21	.05	0	:42	.30	.76	:48	.279	.01								
7-22	.18	0	:52	4.44	1.50	:51	.236	.02								
7-26	.13	0	1:00	.82	1.61	:54	.324	.036								
8-1	.21	0	:30	.18	1.70	:55	.353	.04								
8-4	.06	0	:50	.03	1.71	:57	.441	.06								
						:59	.388	.0685								
						1:03	.170	.09								
						:04	.135	.0899								
						:06	.064	.09								
						:50	.00	.0969								
Watershed Conditions: 100% native grass meadow; meadow about 4" high, fair condition, good cover.																
Watershed Conditions: 100% native grass meadow; meadow about 14" high and forming seed, good condition, good cover.																
Notes: To convert runoff in in/hr to cfs, multiply by 3.650. <sup>1/</sup> Raingage B-36-R.																



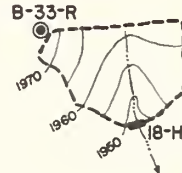


HASTINGS, NEBRASKA - WATERSHED 1-H

DRAINAGE AREAS OF WATERSHEDS

WATERSHED	LOCATION NO.	AREA
1-H	44.5	3.62
2-H	44.6	3.40
3-H	44.7	3.77 1/
4-H	44.8	3.64 1/
5-H	44.9	4.02 1/
6-H	44.10	4.01 1/
7-H	44.11	4.26 1/
8-H	44.12	3.97 1/
18-H	44.22	3.74

1/ AFTER REVISION OF WATERSHED BOUNDARIES ON JANUARY 1, 1959. SEE MAPS IN MP 945.



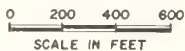
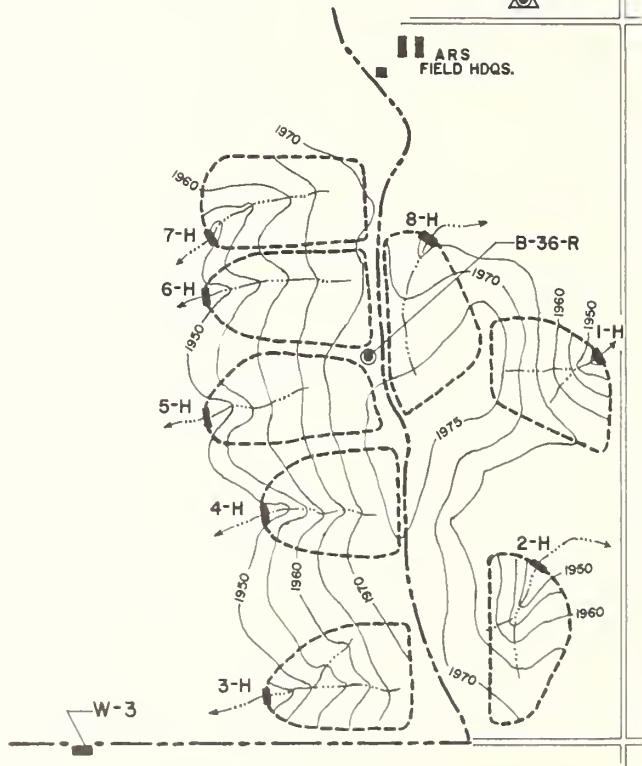
LEGEND

- WATERSHED BOUNDARY
- - - 2000 CONTOURS
- RECORDING RAIN GAGE
- WATERWAYS
- + RUNOFF STATION

MET. STA.



ARS FIELD HDQS.



SCALE IN FEET  
CONTOUR INTERVAL 5 FEET

HASTINGS, NEBRASKA  
SMALL WATERSHEDS  
1-H TO 8-H AND 18-H

6-52

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Hastings, Nebraska Watershed 2-H (3.40 Ac.)						
Year \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	0.73	0.74	1.30	2.06	5.92	5.59	2.46	1.44	3.04	0.98	0.43	0.02	24.71
Q	0	0.01	0.89	.16	.79	.04	0	0	.01	0	0	0	1.90
1961 P	.08	.15	1.96	1.39	6.86	4.19	2.44	3.48	3.54	.50	1.01	.49	26.09
Q	0	0	0	0	.10	.06	T	.16	0	0	.01	0	.33

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Hastings, Nebraska Watershed 2-H

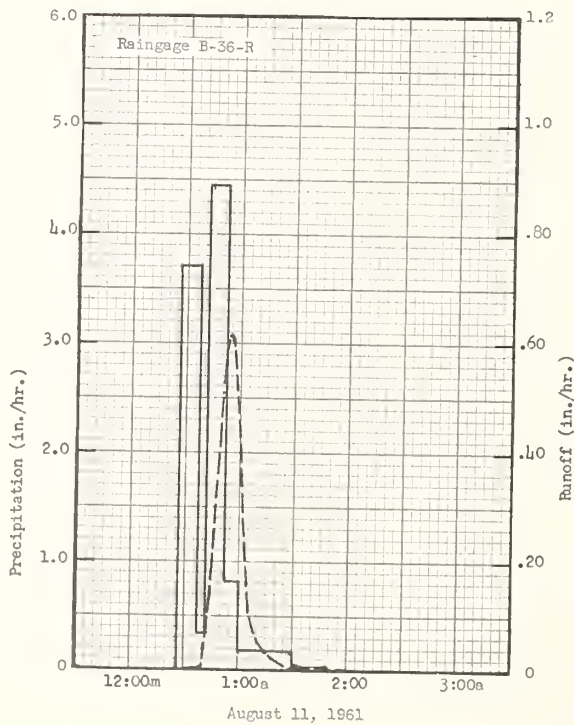
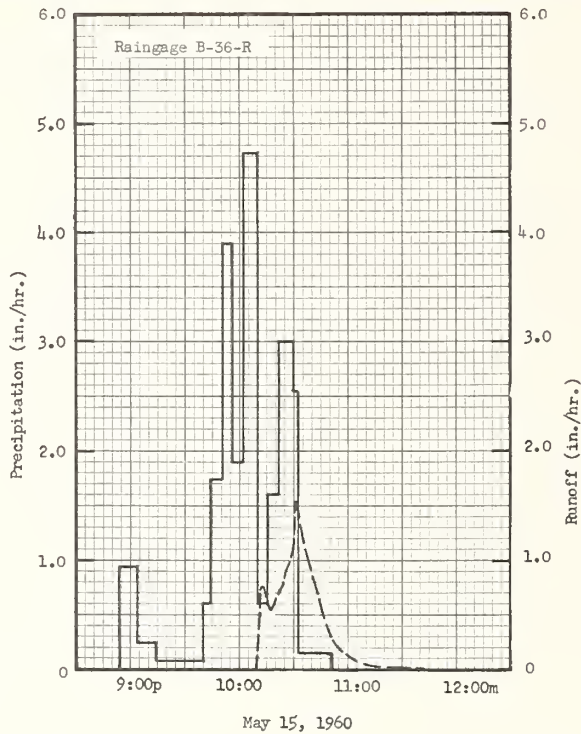
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-15	1.55	5-15	0.58	5-15	0.59	5-15	0.59	5-15	0.59	5-15	0.59	3-26	0.73	3-26	1.05
1961	8-11	.61	8-11	.16	8-11	.16	8-11	.16	8-11	.16	8-11	.16	8-11	.16	8-11	.16

Notes: Quality of records: Monthly P and Q, good to excellent except estimated values which are fair. Crop conditions-1960: Native grass meadow, good condition; yielded 2554 pounds per acre of air-dried hay 1961: Native grass meadow, good condition; yielded 2000 pounds per acre of air-dried hay.

SELECTED RUNOFF EVENTS Hastings, Nebraska Watershed 2-H

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall 1/ (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 15, 1960</u>								
4-16-60	0.20	0	5-15-60	Raingage B-36-R		5-15-60		
4-25	.11	0	8:54p	0	0	10:09p	0	0
4-27	.07	0	9:04	.96	.16	:10	.0068	.0001
4-28	.08	0	:14	.24	.20	:13	.750	.01
4-29	.29	0	:40	.09	.24	:15	.656	.036
5-3	.18	0	:44	.60	.28	:17	.519	.06
5-5	1.61	0	:52	1.73	.51	:20	.598	.08
5-6	.14	0	:56	3.90	.77	:23	.750	.12
			10:02	1.90	.96	:25	.884	.145
			:10	4.73	1.59	:28	1.01	.19
			:16	.60	1.65	:31	1.55	.26
			:22	1.60	1.81	:35	1.218	.345
			:28	3.00	2.11	:38	.992	.40
			:32	2.55	2.28	:43	.685	.47
			:52	.15	2.33	:53	.243	.55
						:58	.147	.57
						11:06	.049	.58
						:41	0	.59
<u>Event of August 11, 1961</u>								
7-13-61	0.27	0	8-11-61	Raingage B-36-R		8-11-61		
7-18	.17	0	12:26a	0	0	12:30a	0	0
7-20	.32	0	:38	3.70	.74	:41	.002	T
7-21	.05	0	:42	.30	.76	:45	.203	.0075
7-22	.18	0	:52	4.44	1.50	:49	.306	.02
7-26	.13	0	1:00	.82	1.61	:51	.443	.0369
8-1	.21	0	:30	.18	1.70	:55	.613	.07
8-4	.06	0	:50	.03	1.71	:58	.521	.1007
						1:03	.260	.13
						:11	.0563	.15
						:32	.0030	.1594
						2:00	0	.16

Notes: To convert runoff in in/hr to cfs, multiply by 3.428. For map of watershed area, see page 44.5-3. 1/ Raingage B-36-R.



HASTINGS, NEBRASKA WATERSHED 2-H



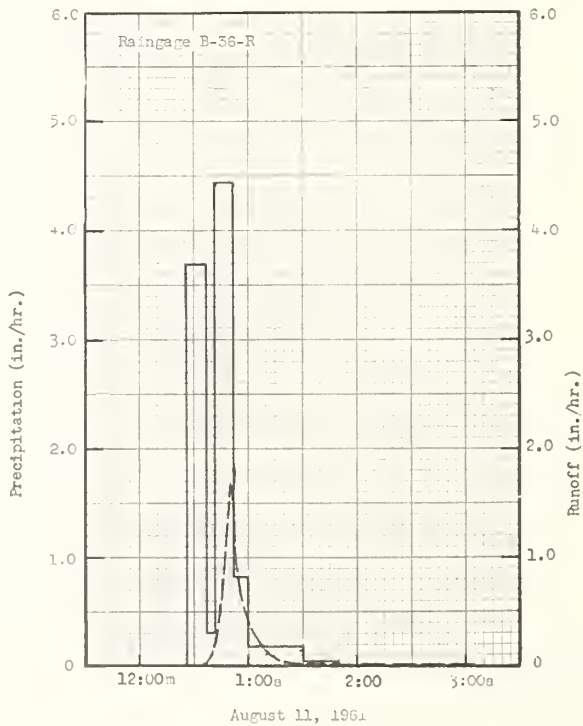
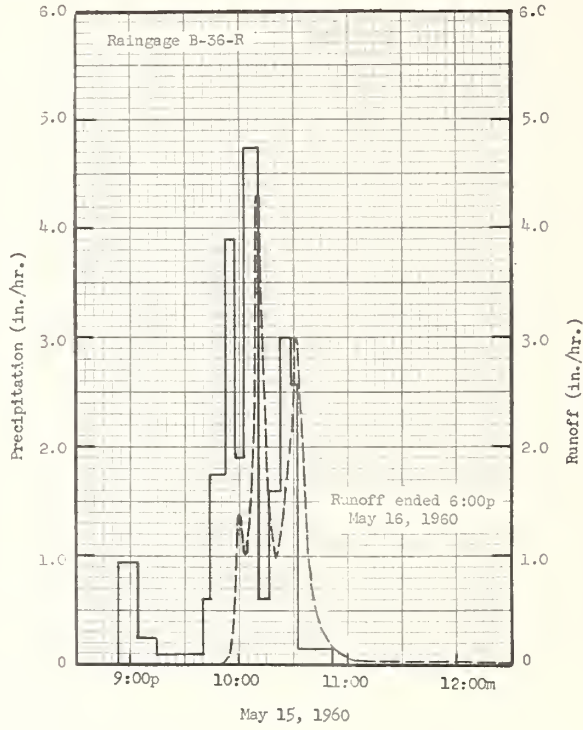
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Hastings, Nebraska Watershed 3-H (Area - 3.77 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	0.73	0.74	1.30	2.06	5.92	5.59	2.46	1.44	3.04	0.98	0.43
	Q	0	.03	3.13	.94	3.01	1.31	.05	0	.87	.04	.06	0	9.44
1961	P	.08	.15	1.96	1.39	6.86	4.19	2.44	3.48	3.54	.50	1.01	.49	26.09
	Q	0	0	.10	.05	1.58	.74	T	.71	.26	0	.05	0	3.49

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Hastings, Nebraska Watershed 3-H									
YEAR	MAXIMUM DISCHARGE	MAXIMUM VOLUME FOR SELECTED TIME INTERVAL															
		1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days			
		Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.		
1960		9-28	5.71	5-15	1.47	5-15	1.50	5-15	1.53	5-15	1.55	5-15	1.56	3-26	1.84	3-26	4.08
1961		8-11	1.66	8-11	.34	6-15	.58	6-15	.65	6-15	.65	6-15	.66	5-21	1.13	5-17	1.35

Notes: Quality of records: Monthly P and Q, good to excellent except estimated values which are fair. Sub-surface tilled on the contour. Crop conditions: 1960, fallow with good cover; 1961, wheat was excellent with a yield of 25 bu. per acre. Had good cover.

SELECTED RUNOFF EVENTS						Hastings, Nebraska Watershed 3-H			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall 1/2 (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of May 15-16, 1960</u>									
4-15-60	0.20	0	5-15-60	Reingage B-36-R		5-15-60			
4-25	.11	0	8:51p	0	0	9:50p	0	0	
4-27	.07	0	9:04	.96	.16	:55	.106	T	
4-28	.08	0	:14	.24	.20	:58	.829	.02	
4-29	.29	0	:40	.09	.24	10:00	1.38	.06	
5-3	.18	0	:44	.60	.28	:04	1.06	.14	
5-5	1.61	.47	:52	1.73	.51	:08	2.45	.24	
5-6	.14	.01	:56	3.90	.77	:10	4.32	.35	
			10:02	1.90	.96	:15	2.04	.70	
			:10	4.73	1.59	:20	.982	.81	
			:16	.60	1.65	:25	1.49	.91	
			:22	1.60	1.81	:31	2.98	1.123	
			:28	3.00	2.11	:33	2.52	1.218	
			:32	2.55	2.28	:35	1.89	1.30	
			:52	.15	2.33	:39	.829	1.38	
						:44	.421	1.42	
						:55	.106	1.47	
						11:00	.0695	1.477	
						:10	.0474	1.49	
						5-16-60			
						12:30a	.009	1.51	
						5:00	.0049	1.53	
						6:00p	0	1.56	
<u>Event of August 11, 1961</u>									
7-13-61	0.27	0	8-11-61	Reingage B-36-R		8-11-61			
7-18	.17	0	12:26a	0	0	12:27a	0	0	
7-20	.32	0	:38	3.70	.74	:38	.009	T	
7-21	.05	0	:42	.30	.76	:44	.421	.02	
7-22	.18	0	:52	4.44	1.50	:48	1.49	.08	
7-26	.13	0	1:00	.82	1.61	:50	1.66	.13	
8-1	.21	0	:30	.18	1.70	:53	1.15	.20	
8-4	.06	0	:50	.03	1.71	:55	.829	.236	
						:59	.468	.28	
						1:03	.307	.302	
						:10	.116	.33	
						:17	.054	.336	
						:35	.009	.34	
						3:05	0	.35	

Notes: To convert runoff in in/hr to cfs, multiply by 3.802. For map of watershed, see p. 44.5-3. 1/ Reingage B-36-R.



HASTINGS, NEBRASKA WATERSHED 3-H

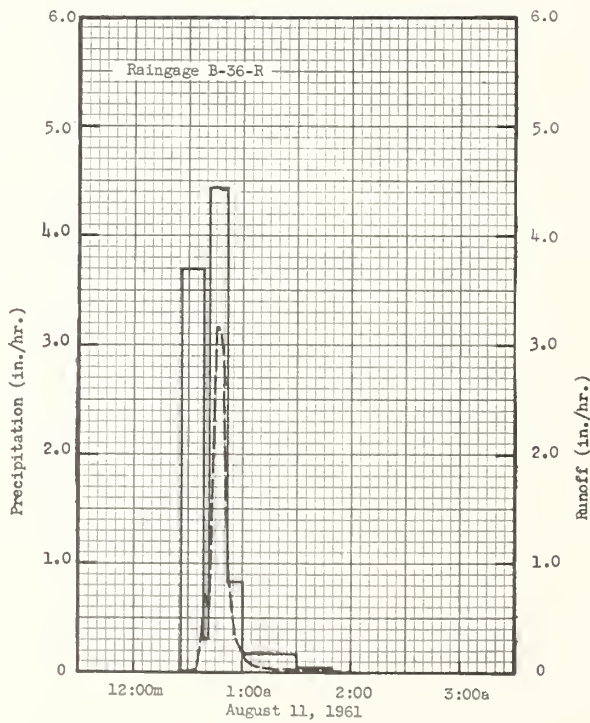
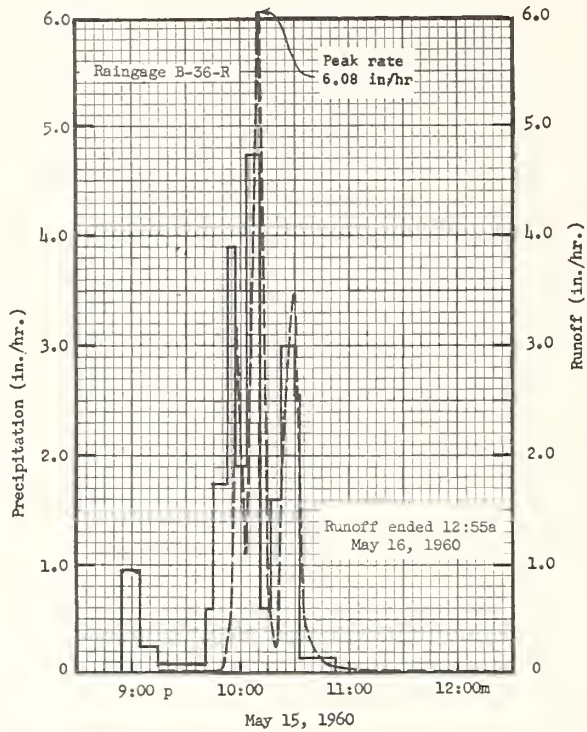
MONTHLY PRECIPITATION AND RUNOFF (Inches)							Hastings, Nebraska Watershed 4-H (3.64 Ac.)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	0.73	0.74	1.30	2.06	5.92	5.59	2.46	1.44	3.04	0.98	0.43	0.02	24.71
	Q	0	.03	2.63	1.38	3.43	1.48	.08	0	.40	0	0	0	9.43
1961	P	.08	.15	1.96	1.39	6.86	4.19	2.44	3.48	3.54	.50	1.01	.49	26.09
	Q	0	0	.01	.04	1.90	.88	T	.88	.45	0	.05	0	4.21

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Hastings, Nebraska Watershed 4-H									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	6.19	5-15	1.56	5-15	1.59	5-15	1.60	5-15	1.60	5-15	1.60	5-15	1.60	3-26	3.75
1961	8-11	3.17	8-11	.52	6-15	.72	6-15	.82	6-15	.83	5-21	1.20	5-20	1.61	5-17	1.75

Notes: Quality of records: Monthly P and Q, good to excellent except estimated values which are fair. Sub-surface tilled on the contour. Crop conditions: 1960, estimated yield of 50 bu. per acre if 90% hail damage had not occurred. 1961, sorghum was good, yield of 35 bu. per acre.

SELECTED RUNOFF EVENTS				Hastings, Nebraska Watershed 4-H				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall 1/2 (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 15-16, 1960</u>								
4-16-60	0.20	0	5-15-60	Raingage B-36-R		5-15-60		
4-25	.11	0	8:54p	0	0	9:20p	0	0
4-27	.07	0	9:04	.96	.16	:30	.002	T
4-28	.08	0	:14	.24	.20	:50	.0425	T
4-29	.29	0	:40	.09	.24	:54	.485	.02
5-3	.18	0	:44	.60	.28	:57	3.17	.10
5-5	1.61	.56	:52	1.73	.51	10:03	1.11	.28
5-6	.14	0	:56	3.90	.77	:10	6.08	.64
			10:02	1.90	.96	:15	.962	.95
			:10	4.73	1.59	:19	.260	.97
Watershed Conditions: 100% wheat, 12" high and starting to head, good condition. 60% ground cover.			:16	.60	1.65	:24	2.17	1.08
			:22	1.60	1.81	:30	3.46	1.35
			:28	3.00	2.11	:33	1.59	1.4655
			:32	2.55	2.28	:35	.506	1.50
			:52	.15	2.33	:39	.275	1.53
						:45	.132	1.55
						11:15	.0308	1.58
						5-16-60		
						12:55a	0	1.60
<u>Event of August 11, 1961</u>								
7-13-61	0.27	0	8-11-61	Raingage B-36-R		8-11-61		
7-18	.17	0	12:26a	0	0	12:27a	0	0
7-20	.32	0	:38	3.70	.74	:35	.002	.0002
7-21	.05	0	:42	.30	.76	:36	.204	T
7-22	.18	0	:52	4.44	1.50	:38	.714	.02
7-26	.13	0	1:00	.82	1.61	:41	.559	.05
8-1	.21	0	:30	.18	1.70	:43	1.59	.08
8-4	.06	0	:50	.03	1.71	:45	2.91	.15
						:47	3.17	.25
						:48	2.84	.303
Watershed Conditions: 100% sorghum, 3 1/2" high, heading and in good condition. Field cultivated 7/26/61; 55% density.						:50	1.81	.38
						:52	1.08	.43
						:57	.37	.48
						1:00	.169	.50
						:05	.076	.507
						:15	.0256	.51
						2:00	0	.52

Notes: To convert runoff in in/hr to cfs, multiply by 3.670. For map of watershed, see p. 44.5-3. 1/2 Raingage B-36-R.



HASTINGS, NEBRASKA WATERSHED 4-H



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Hastings, Nebraska Watershed 5-H (4.02 Ac.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	0.73	0.74	1.30	2.06	5.92	5.59	2.46	1.44	3.04	0.98	0.43
	Q	0	.03	2.33	.42	2.03	1.70	.09	.01	.22	0	0	0	6.83
1961	P	.08	.15	1.96	1.39	6.86	4.19	2.44	3.48	3.54	.50	1.01	.49	26.09
	Q	0	0	.02	.03	1.24	1.01	T	.94	.19	0	.10	0	3.53

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Hastings, Nebraska Watershed 5-H								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	4.24	5-15	1.02	5-15	1.06	5-15	1.06	5-15	1.06	5-15	1.06	5-15	1.06	3-26	2.46
1961	8-11	2.77	8-11	.47	6-15	.63	6-15	.73	6-15	.73	6-15	.73	5-20	1.03	5-17	1.17

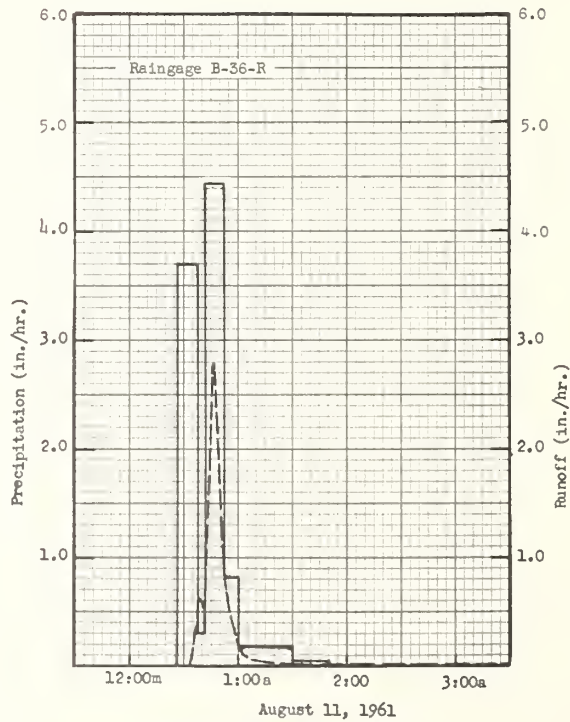
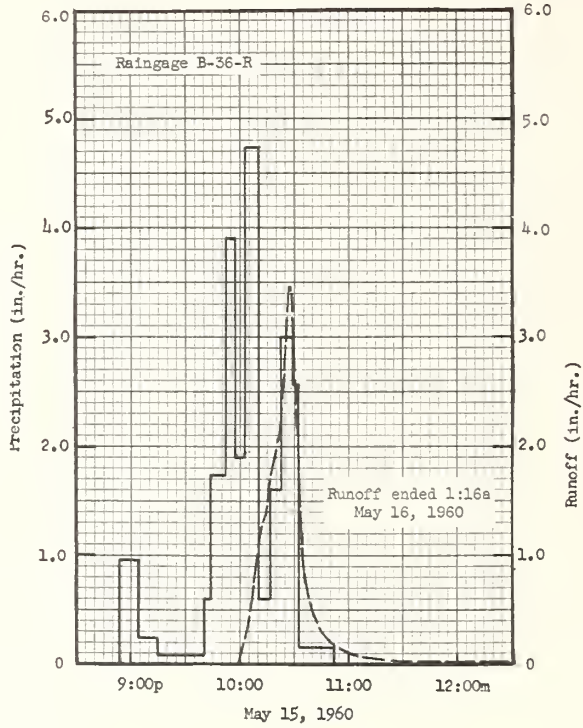
Notes: Quality of records: Monthly P and Q, good to excellent except estimated values which are fair. Sub-surface tilled on the contour. Crop conditions: 1960, sorghum was good, yield of 45 bu. per acre; 1961, fallow with good cover.

SELECTED RUNOFF EVENTS								Hastings, Nebraska Watershed 5-H			
Antecedent conditions				Rainfall				Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Event of May 15-16, 1960											
4-16-60	0.20	0	5-15-60	Raingage B-36-R		5-15-60					
4-25	.11	0	8:54p	0	0	9:59p	0	0			
4-27	.07	0	9:04	.96	.16	10:05	.427	.02			
4-28	.08	0	:14	.24	.20	:09	.972	.06			
4-29	.29	0	:40	.09	.24	:13	1.36	.14			
5-3	.18	0	:44	.60	.28	:17	1.72	.25			
5-5	1.61	.02	:52	1.73	.51	:22	2.05	.40			
5-6	.14	0	:56	3.90	.77	:25	2.82	.49			
			10:02	1.90	.96	:27	3.43	.62			
			:10	4.73	1.59	:30	2.39	.77			
			:16	.60	1.65	:34	1.15	.88			
			:22	1.60	1.81	:41	.427	.96			
			:28	3.00	2.11	:47	.212	.99			
			:32	2.55	2.28	:57	.119	1.02			
			:52	.15	2.33	11:17	.042	1.04			
						5-16-60					
						1:16a	0	1.06			
Event of August 11, 1961											
7-13-61	0.27	0	8-11-61	Raingage B-36-R		8-11-61					
7-18	.17	0	12:26a	0	0	12:34a	0	0			
7-20	.32	0	:38	3.70	.74	:36	.395	.01			
7-21	.05	0	:42	.30	.76	:38	.607	.03			
7-22	.18	0	:52	4.44	1.50	:40	.543	.04			
7-26	.13	0	1:00	.82	1.61	:43	1.42	.09			
8-1	.21	0	:30	.18	1.70	:46	2.77	.20			
8-4	.06	0	:50	.03	1.71	:50	1.34	.34			
						:54	.703	.40			
						:56	.459	.42			
						:58	.345	.43			
						1:00	.165	.44			
						:03	.109	.45			
						:19	.038	.47			
						3:34	0	.48			

Notes: To convert runoff in in/hr to cfs, multiply by 4.054. For map of watershed area, see page 44.5-3.  
 1/ Raingage B-36-R.





HASTINGS, NEBRASKA WATERSHED 5-H

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Hastings, Nebraska Watershed 6-H (4.01 Ac.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	0.73	0.74	1.30	2.06	5.92	5.59	2.46	1.44	3.04	0.98	0.43
	Q	0	0.03	2.12	.42	2.07	1.67	.10	0	.20	0	.02	0	6.63
1961	P	.08	.15	1.96	1.39	6.86	4.19	2.44	3.48	3.54	.50	1.01	.49	26.09
	Q	0	0	.02	0.02	1.22	1.06	0	1.28	.19	0	0.03	0	3.82

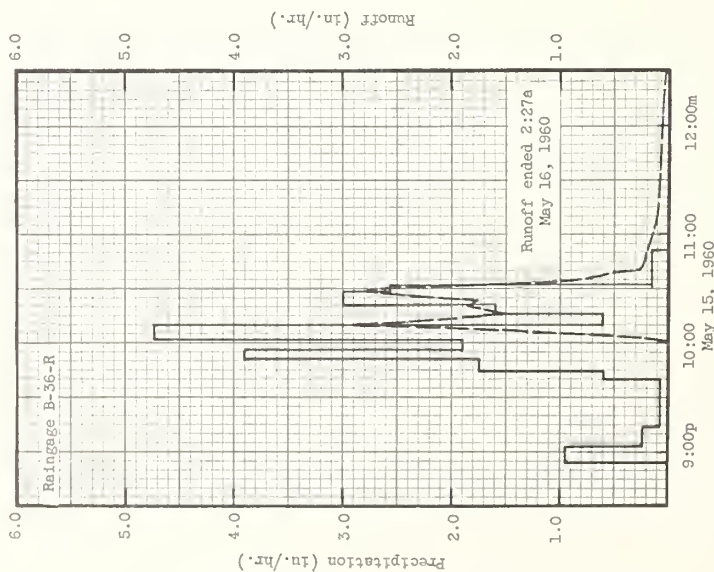
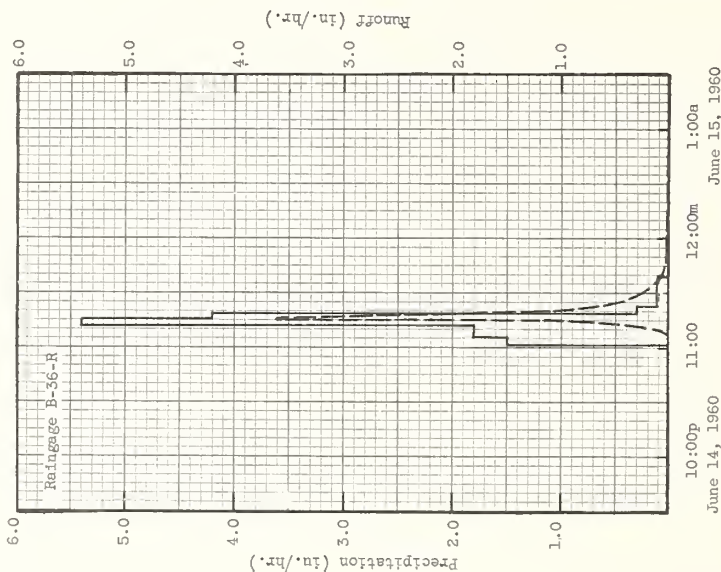
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Hastings, Nebraska Watershed 6-H								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-14	3.61	5-15	1.07	5-15	1.15	5-15	1.19	5-15	1.19	5-15	1.19	5-15	1.19	3-26	2.55
1961	8-11	2.19	8-11	.43	6-15	.72	6-15	.80	6-15	.81	6-15	.81	5-20	1.01	5-17	1.15

Notes: Quality of records: Monthly P and Q, good to excellent except estimated values which are fair. Sub-surface tilled on the contour. Crop conditions: 1960, sorghum was good with a yield of 45 bu. per acre; 1961, fallow with good cover.

SELECTED RUNOFF EVENTS					Hastings, Nebraska Watershed 6-H				
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall 1/ (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of May 15-16, 1960</u>									
4-16-60	0.20	0	5-15-60	Raingage B-36-R	5-15-60				
4-25	.11	0	8:54p	0	0	10:02p	0	0	
4-27	.07	0	9:04	.96	.16	:04	.507	T	
4-28	.08	0	:14	.24	.20	:05	1.10	.02	
4-29	.29	0	:40	.09	.24	:07	1.63	.06	
5-3	.18	0	:44	.60	.28	:09	2.30	.13	
5-5	1.61	.03	:52	1.73	.51	:10	2.89	.17	
5-6	.14	0	:56	3.90	.77	:11	2.30	.22	
			10:02	1.90	.96	:13	1.95	.28	
			:10	4.73	1.59	:16	1.53	.37	
			:16	.60	1.65				
			:22	1.60	1.81	:21	1.85	.50	
			:28	3.00	2.11	:24	1.74	.59	
			:32	2.55	2.28	:28	2.79	.74	
			:52	.15	2.33	:32	1.51	.89	
						:34	.973	.93	
						:36	.636	.96	
						:38	.440	.98	
						:42	.267	1.00	
						:45	.243	1.013	
						:47	.227	1.02	
						:57	.160	1.05	
						11:27	.090	1.11	
						5-16-60			
						12:01a	.054	1.15	
						2:27	0	1.20	
<u>Event of June 14-15, 1960 2/</u>									
5-15-60	0	0.13	6-14-60	Raingage B-36-R	6-14-60				
5-16	.06	0	11:01p	0	0	11:07 p	0	0	
5-18	1.11	.65	:05	1.50	.10	:10	.099	T	
5-19	.25	.17	:11	1.80	.28	:13	.440	.01	
5-20	.17	.02	:15	5.40	.64	:15	3.61	.08	
5-26	.03	0	:17	4.20	.78	:17	2.49	.18	
5-28	.04	0	:23	.30	.81	:20	1.34	.27	
6-4	.37	0	:38	.12	.84	:24	.596	.33	
6-8	.35	0				:30	.260	.37	
6-9	.88	.14				:40	.0947	.40	
6-11	.78	.17							

Notes: To convert runoff in in/hr to cfs, multiply by 4.044. For map of watershed, see p. 44.5-3.  
 1/ Raingage B-36-R. 2/ Event of June 14-15, 1960 used because 1961 events were too small for a good hydrograph.

SELECTED RUNOFF EVENTS				Hastings, Nebraska Watershed 6-H				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Watershed conditions: 100% sorghum, 1" to 2" high, last field operation (tedder) on 5-25-60 following seeding on 5-24-60. Good cover.			Event of June 14-15, 1960 - Continued			6-14-60		
			11:50p			:57	.0331	.41
Notes: To convert runoff in in/hr to cfs, multiply by 4.044.						6-15-60		
						12:05a		
						:15	.0035	.4155
						:45	0	.416



HASTINGS, NEBRASKA WATERSHED 6-H

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Haetings, Nebraska Watershed 7-H (4.26 Ac.)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	0.73	0.74	1.30	2.06	5.92	5.59	2.46	1.44	3.04	0.98	0.43	0.02	24.71
	Q	0	.03	1.95	1.47	2.72	.88	.04	0	.27	0	0	0	7.36
1961	P	.08	.15	1.96	1.39	6.86	4.19	2.44	3.48	3.54	.50	1.01	.49	26.09
	Q	0	0	T	.02	1.32	.85	0	.22	.22	0	e .01	0	2.64

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS  
Haetings, Nebraska Watershed 7-H

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-16	3.63	5-15	1.19	5-15	1.29	5-15	1.40	5-15	1.48	5-15	1.49	5-15	1.49	3-26	3.42
1961	6-15	.72	6-15	.39	6-15	.72	6-15	.81	6-15	.81	6-15	.83	5-20	1.14	5-17	1.24

Notes: Quality of Records: Monthly P and Q, good to excellent except estimated values which are fair. Sub-surface tilled on the contour. Crop conditions: 1960, wheat was excellent, estimated yield of 50 bu. per acre if 90% hail damage had not occurred. 1961, sorghum was good, yield of 37 bu. per acre.

SELECTED RUNOFF EVENTS  
Haetings, Nebraska Watershed 7-H

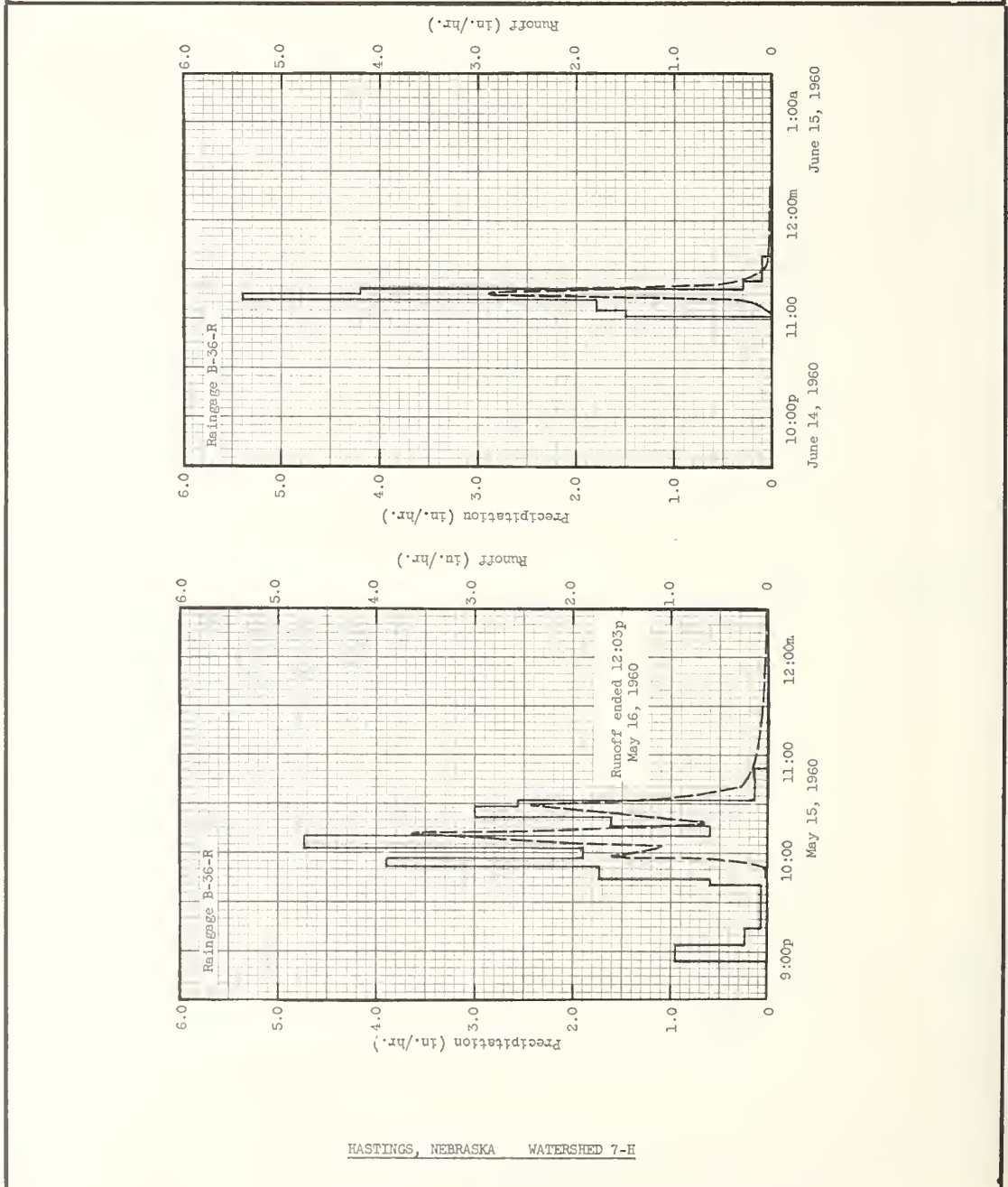
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 15-16, 1960								
4-16-60	0.20	0	5-15-60	Raingage B-36-R		5-15-60		
4-25	.11	0	8:54p	0	0	9:46p	0	0
4-27	.07	0	9:04	.96	.16	:51	.0178	T
4-28	.08	0	:14	.24	.20	:55	.354	.02
4-29	.29	0	:40	.09	.24	:58	1.60	.05
5-3	.18	0	:44	.60	.28	10:01	1.22	.12
5-5	1.61	.47	:52	1.73	.51	:03	1.07	.16
5-6	.14	.01	:56	3.90	.77	:05	1.74	.21
			10:02	1.90	.96	:07	2.28	.27
			:10	4.73	1.59	:09	2.93	.36
			:16	.60	1.65			
			:22	1.60	1.81	:11	3.63	.47
			:28	3.00	2.11	:13	2.31	.57
			:32	2.55	2.28	:15	1.42	.63
			:52	.15	2.33	:18	.677	.68
						:21	1.03	.72
						:24	1.60	.78
						:29	2.42	.92
						:36	.650	1.12
						:41	.275	1.16
						:48	.192	1.19
						11:00	.138	1.22
						:33	.0727	1.27
						5-16-60		
						1:03a	.0338	1.35
						2:03	.0263	1.38
						12:03p	0	1.49
Event of June 14-15, 1960 2/								
5-15-60	0	0.08	6-14-60	Raingage B-36-R		6-14-60		
5-16	.06	.18	11:01p	0	0	11:04p	0	0
5-18	1.11	.62	:05	1.50	.10	:09	.112	T
5-19	.25	.14	:11	1.80	.28	:13	.335	.02
5-20	.17	.01	:15	5.40	.64	:14	2.17	.04
5-26	.03	0	:17	4.20	.78	:16	2.88	.13
5-28	.04	0	:23	.30	.81	:17	2.17	.17
6-4	.37	T	:38	.12	.84	:21	.598	.26
6-8	.35	T				:24	.310	.28
6-9	.88	.02				:27	.156	.29
6-11	.78	T						

Notes: To convert runoff in in/hr to cfs, multiply by 4.296. For map of watershed, see p. 44.5-3.  
1/ Raingage B-36-R. 2/ Event of June 14-15, 1960 used because 1961 events were too small for a good hydrograph.  
Cooperative Research Project of USDA and Nebraska Agricultural Experiment Station



SELECTED RUNOFF EVENTS			Hastings, Nebraska Watershed 7-H					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Watershed conditions: 100% wheat, 5' high and all headed, 90% density, good condition.			Event of June 14-15, 1960			Continued		
						6-14-60 11:29p	0.102	0.30
						6-15-60 :32	.0615	.30
						6-15-60 12:20a	0	.31

Notes: To convert runoff in in/hr to cfs, multiply by 4.296.





6-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Hastings, Nebraska Watershed 8-H (3.97 Ac.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	0.73	0.74	1.30	2.06	5.92	5.59	2.46	1.44	3.04	0.98	0.43
	Q	0	.03	1.91	.31	1.35	.25	.02	0	.60	0	.03	0	4.50
1961	P	.08	.15	1.96	1.39	6.86	4.19	2.44	3.48	3.54	.50	1.01	.49	26.09
	Q	0	0	.02	T	1.00	.63	T	.31	.23	0	.01	0	2.20

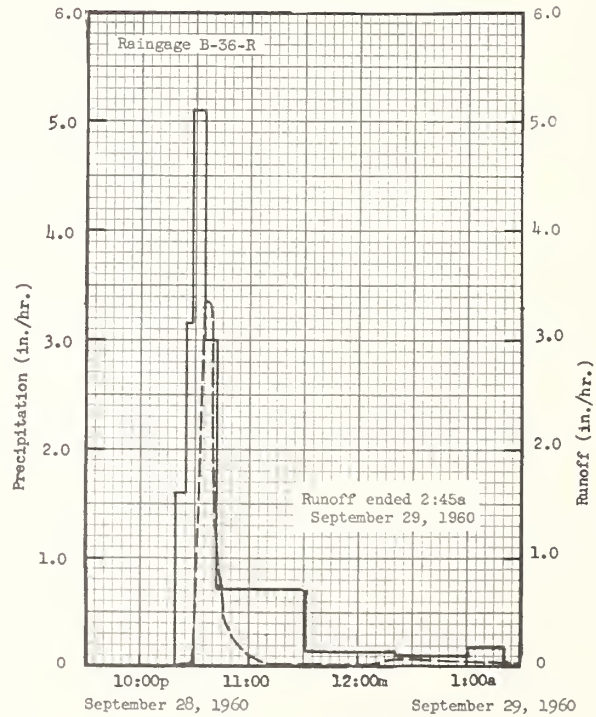
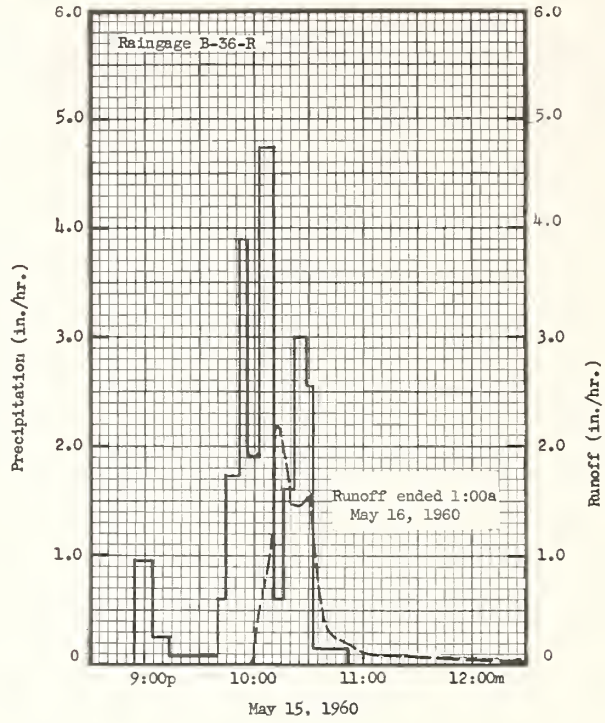
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Hastings, Nebraska Watershed 8-H								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-28	3.35	5-15	0.82	5-15	0.85	5-15	0.85	5-15	0.85	5-15	0.85	5-15	0.85	5-15	1.23
1961	6-15	.49	6-15	.31	6-15	.56	5-22	.72	5-22	.72	5-21	.85	5-20	.95	5-17	.97

Notes: Quality of records: Monthly P and Q, good to excellent except estimated values which are fair. Sub-surface tilled on the contour. Crop conditions: 1960, fallow, good cover; 1961, wheat was excellent with yield of 28 bu. per acre, good cover.

SELECTED RUNOFF EVENTS Hastings, Nebraska Watershed 8-H

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall 1/ (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 15-16, 1960</u>								
4-16-60	0.20	0	5-15-60	Raingage B-36-R		5-15-60		
4-25	.11	0	8:54p	0	0	9:59p	0	0
4-27	.07	0	9:04	.96	.16	10:04	.575	e .02
4-28	.08	0	:14	.24	.20	:06	.712	e .04
4-29	.29	0	:40	.09	.24	:09	1.00	e .09
5-3	.18	0	:44	.60	.28	:13	2.19	e .18
5-5	1.61	.12	:52	1.73	.51	:16	1.94	e .28
5-6	.14	0	:56	3.90	.77	:20	1.46	e .40
			10:02	1.90	.96	:30	1.54	e .63
			:10	4.73	1.59	:33	1.19	e .70
			:16	.60	1.65	:40	.323	e .76
			:22	1.60	1.81	:48	.225	e .78
			:28	3.00	2.11	11:00	.110	e .82
			:32	2.55	2.28	5-16-60		
			:52	.15	2.33	1:00a	0	e .85
Watershed Conditions: 100% fallow, chiseled on 5/12/60; good ground cover.								
<u>Event of September 28-29, 1960 2/</u>								
	0 3/	0 3/	9-28-60	Raingage B-36-R		9-28-60		
			10:19p	0	0	10:19p	0	0
			:25	1.60	.16	:28	.0191	T
			:29	3.15	.37	:30	.642	.01
			:35	5.10	.88	:33	1.74	.08
			:41	3.00	1.18	:36	3.35	.19
			11:31	.72	1.30	:39	2.33	.33
			9-29-60			:45	.669	.47
			12:21a	.14	1.42	:49	.370	.50
			1:01	.11	1.49	:52	.223	.52
			:21	.18	1.55	:58	.105	.53
						11:10	.0235	.54
						9-29-60		
						12:08a	.0018	.55
						:20	.0700	.55
						:35	.0700	.57
						1:07	.0390	.59
						2:45	0	.60

Notes: To convert runoff in in/hr to cfs, multiply by 4.003. For map of watershed, see page 44.5-3.  
 1/ Raingage B-36-R. 2/ Event of September 28-29, 1960 used because 1961 events were too small for a good hydrograph. 3/ No rainfall or runoff 30 days prior to selected event.



HASTINGS, NEBRASKA WATERSHED 8-H

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Hastings, Nebraska Watershed 18-H (Area - 3.74 acres)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P 0.72	0.68	1.26	2.14	5.82	5.74	2.34	1.31	3.48	1.01	0.40	0.03	24.93
	Q 0	.01	.51	.21	1.76	.62	.02	0	.37	0	0	0	3.50
1961	P 0.08	.22	2.05	1.58	6.50	4.20	2.49	3.63	3.47	.43	1.01	.62	26.28
	Q 0	0	T	.01	.42	.56	.01	.14	.03	0	0	0	1.17

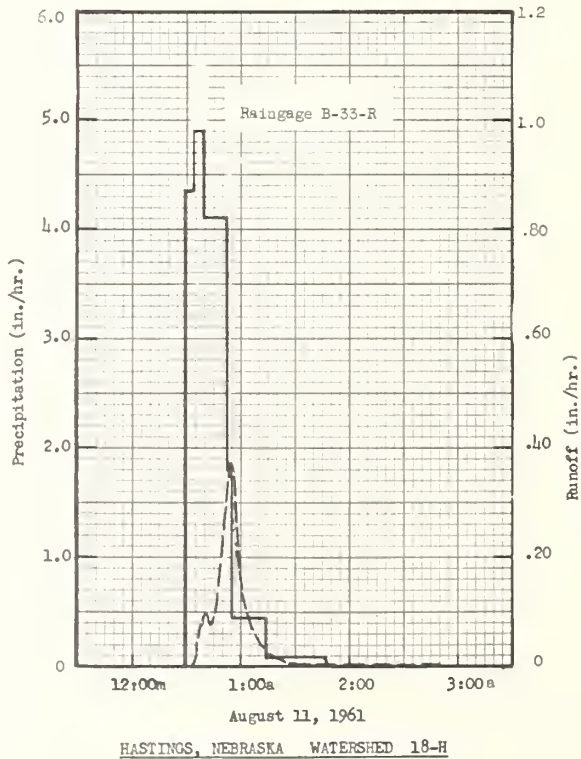
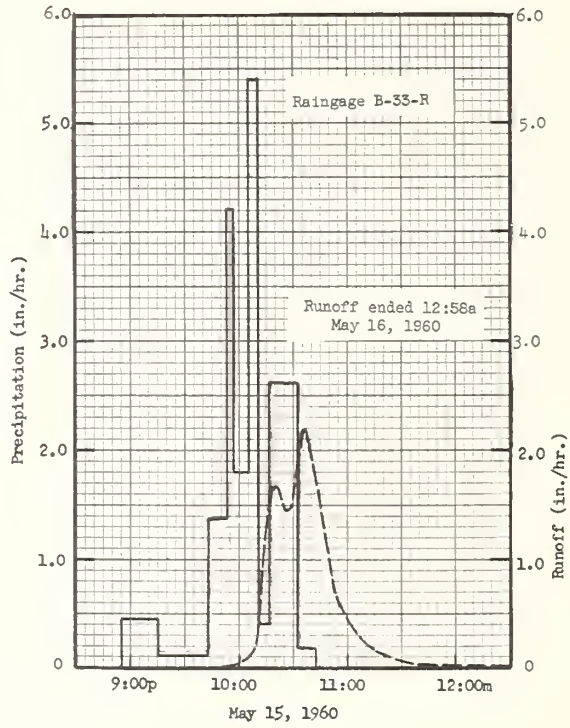
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Hastings, Nebraska Watershed 18-H									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-15	2.19	5-15	1.16	5-15	1.24	5-15	1.24	5-15	1.24	5-15	1.24	5-15	1.24	5-15	1.58
1961	6-15	.47	6-15	.30	6-15	.42	6-15	.46	6-15	.46	6-15	.46	6-13	.53	6-13	.53

Notes: Quality of records: Monthly P and Q, good to excellent except estimated values which are fair. Crop conditions: 1960 - Native grass pasture, fair condition, good cover; 1961 - Native grass pasture, good condition.

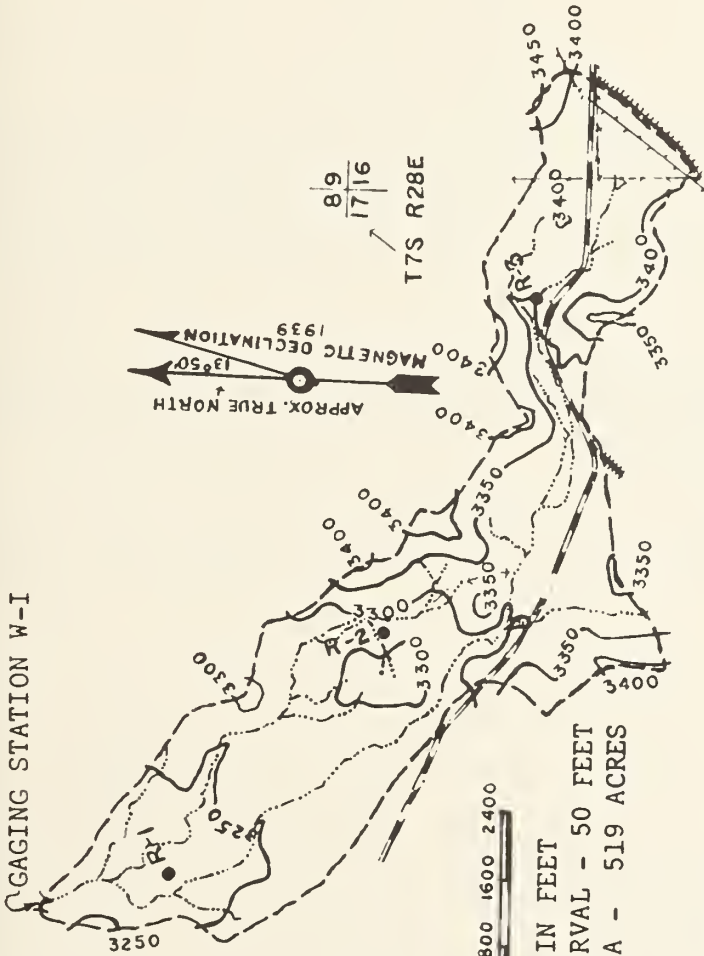
SELECTED RUNOFF EVENTS Hastings, Nebraska Watershed 18-H

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall 1/ (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 15-16, 1960</u>								
4-16-60	0.22	0	5-15-60	Raingage B-33-R		5-15-60		
4-25	.09	0	8:55p	0	0	9:54p	0	0
4-27	.05	0	9:15	.45	.15	10:04	.0785	.0036
4-28	.10	0	:43	.11	.20	:08	.192	.01
4-29	.28	0	:53	1.38	.43	:12	.406	.0308
5-3	.17	0	:57	4.20	.71	:16	1.42	.09
5-5	1.63	.18	10:05	1.80	.95	:20	1.68	.20
5-6	.10	0	:11	5.40	1.49	:27	1.46	.38
			:17	.40	1.53	:37	2.19	.67
			:33	2.62	2.23	:43	1.63	.769
Watershed Conditions: 100% pasture, 2 <sup>nd</sup> high, good condition, fair to good cover.								
			:43	.18	2.26	:52	.806	1.04
						:57	.560	1.094
						11:07	.297	1.16
						:22	.1136	1.211
						:35	.048	1.23
						5-16-60		
						12:58a	0	1.24
<u>Event of August 11, 1961</u>								
7-13-61	0.29	T	8-11-61	Raingage B-33-R		8-11-61		
7-18	.21	0	12:29a	0	0	12:33a	0	0
7-20	.20	0	:33	4.35	.29	:37	.067	.002
7-22	.16	0	:39	4.90	.78	:40	.097	.01
7-26	.13	0	:52	4.11	1.67	:43	.078	.01
8-1	.19	0	:55	1.80	1.76	:46	.117	.0157
8-4	.08	0	1:13	.43	1.89	:52	.374	.0400
			:47	.09	1.94	:55	.280	.0547
						:59	.171	.07
						1:05	.0826	.084
						:14	.025	.09
						:32	.0038	.0948
						2:49	0	.0958
Watershed Conditions: 100% pasture, 6 <sup>th</sup> high, excellent condition, 75% density.								

Notes: To convert runoff in in/hr to cfs, multiply by 3.771. -For map of watershed area, see p. 44.5-3. 1/ Raingage B-33-R.







SCALE IN FEET  
 CONTOUR INTERVAL - 50 FEET  
 DRAINAGE AREA - 519 ACRES

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SAFFORD, ARIZONA  
 WATERSHED W-I

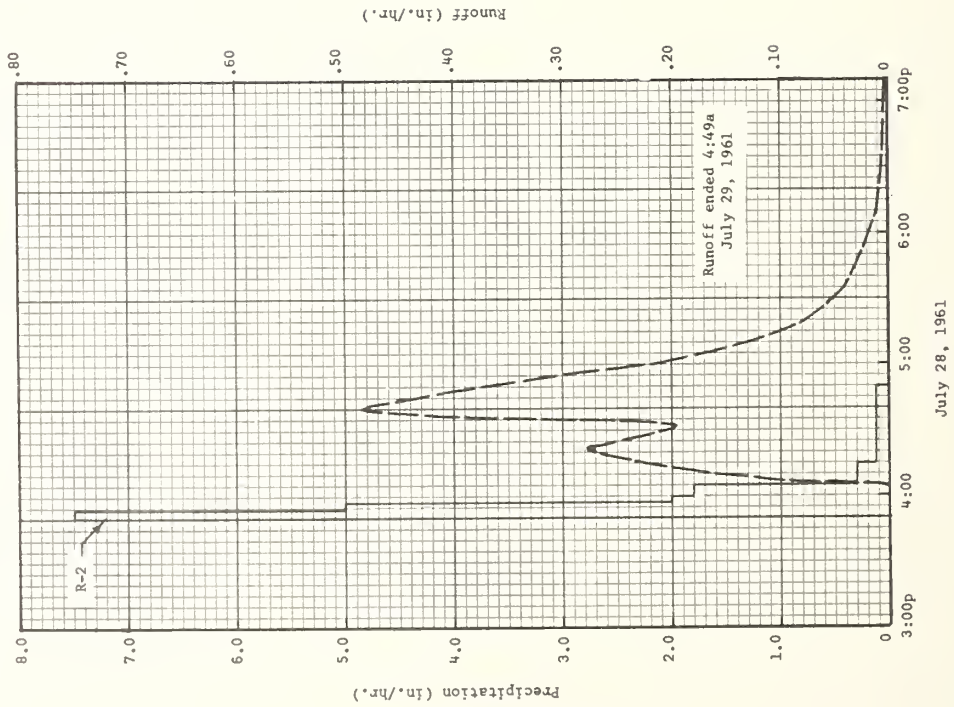
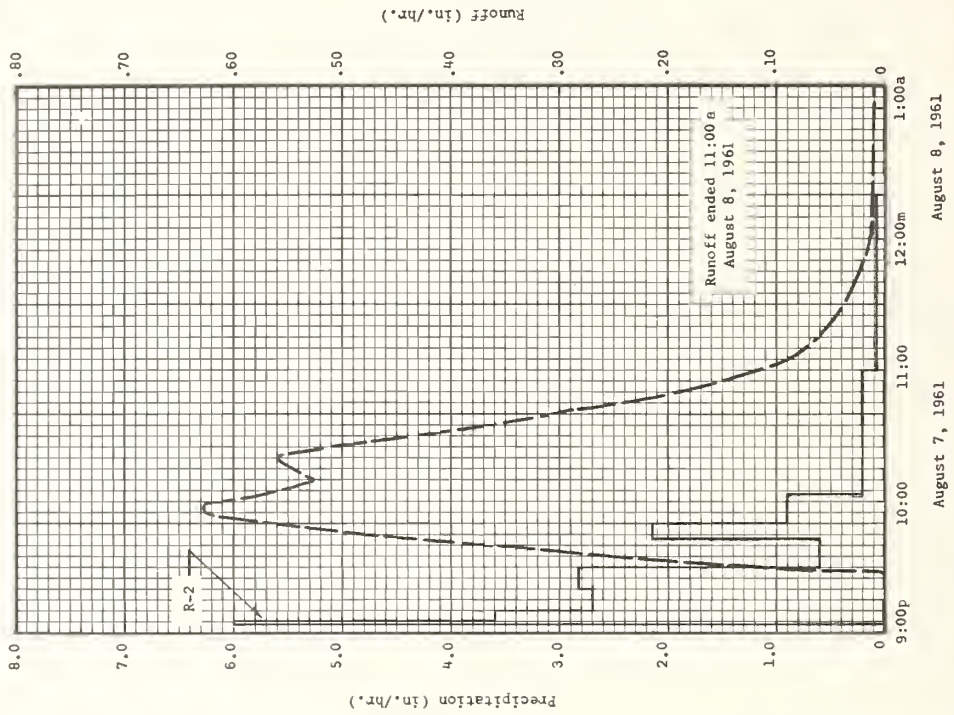


6-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Safford, Arizona Watershed W-I (Area - 519 acres)									
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1960	P	0.78	0.64	0.22	0	0.07	0	2.47	0.60	0.54	0.89	0	0.27	6.48		
	Q	0	0	0	0	0	0	0.07	0	T	0.01	0	0	.08		
1961	P	1.04	0	0.05	0	0	0.37	1.55	3.99	0.54	1.33	1.54	0.74	11.15		
	Q	0	0	0	0	0	0	0.34	0.76	0.06	0	0	0	1.16		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Safford, Arizona Watershed W-I									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	7-24	0.07	7-24	0.04	7-24	0.06	7-24	0.06	7-24	0.06	7-24	0.06	7-24	0.06	7-24	0.06
1961	8-7	.63	8-7	.47	8-7	.65	8-7	.67	8-7	.68	8-7	.68	8-7	.68	8-7	.68
Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good. Watershed Conditions: 85% of area is bare. Sparse vegetation is predominantly shrubs (cresotebush, snakeweed, and catclaw), with some short grasses (tobosa, three-awn, and curly mesquite). 1/ Thiessen weighted, using 3 raingages.																
SELECTED RUNOFF EVENTS							Safford, Arizona Watershed W-I									
Antecedent conditions			Rainfall			Runoff										
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
	None	None	Event of July 28-29, 1961													
			7-28-61	Raingage	R-2	7-28-61										
			3:50p	0	0	4:04p	0	0								
			:52	7.50	.25	:05	.0044	0								
			:54	7.50	.50	:06	.0772	.0006								
			:57	5.00	.75	:07	.0970	.0020								
			4:00	2.00	.85	:08	.1201	.0038								
			:05	1.80	1.00	:09	.1423	.0060								
			:15	.30	1.05	:10	.1601	.0085								
			:50	.12	1.12	:15	.2235	.0245								
						:20	.2712	.0451								
	None	None	7-28-61	Raingage	R-3	:22	.2770	.0542								
			3:47p	0	0	:30	.2025	.0862								
			:50	6.00	.30	:32	.1948	.0928								
			:53	4.00	.50	:34	.2330	.0999								
			:56	5.00	.75	:35	.2884	.1042								
	Watershed conditions: See description above.		4:00	6.75	1.20	:36	.3667	.1097								
			:04	3.25	1.45	:37	.4164	.1162								
			:20	.46	1.65	:40	.4813	.1386								
						:48	.3954	.1970								
						:56	.2884	.2426								
						5:00	.2158	.2594								
						:10	.1239	.2877								
						:19	.0772	.3028								
						:36	.0386	.3192								
						6:11	.0107	.3336								
						:43	.0044	.3376								
						7-29-61										
						4:49a	0	.3438								
Notes: To convert runoff in in/hr to cfs, multiply by 523.32. For map of watershed, see reprint on preceding page, 45.1-4 (Reprinted).																

SELECTED RUNOFF EVENTS			Safford, Arizona Watershed W-I					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 7-8, 1961								
7-28-61	Raingage R-2 1.12	0.34	8-7-61 9:04p	Raingage 0	R-2 0	8-7-61 9:27p	0	0
			:05	6.00	.10	:28	.0044	0
			:10	3.60	.40	:29	.0772	.0007
			:20	2.70	.85	:30	.1033	.0022
7-28-61	Raingage R-3 1.65	.34	:30	2.82	1.32	:31	.1287	.0041
			:43	.60	1.45	:32	.1622	.0065
			:50	2.14	1.70	:33	.2025	.0095
			10:03	.91	1.90	:34	.2368	.0132
			11:00	.21	2.10	:35	.2655	.0174
			12:20a	.08	2.20			
<u>Watershed conditions:</u> See description on page 45.1-1.						:36	.2884	.0220
						:40	.3591	.0436
						:45	.4813	.0786
						:50	.5711	.1224
						:55	.6284	.1724
						:59	.6284	.2143
						10:00	.6074	.2246
						:05	.5539	.2730
						:09	.5272	.3090
						:20	.5615	.4088
						:30	.4317	.4916
						:42	.2884	.5636
						:50	.1883	.5954
						11:00	.1165	.6208
						:09	.0772	.6353
						:30	.0371	.6536
						8-8-61 12:01a	.0142	.6669
						11:00	0	.6814

Notes: To convert runoff in in/hr. to cfs, multiply by 523.32.



SAFFORD, ARIZONA WATERSHED W-I

MONTHLY PRECIPITATION <sup>1</sup> AND RUNOFF (Inches)							Safford, Arizona Watershed W-II Area - 682 ac. (1.07 sq. mi.)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	0.89	0.57	0.14	0	0.18	0.24	0.52	1.80	0.43	1.91	0.04	0.37	7.09
	Q	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	P	1.32	0	0.30	0	0	0.48	1.04	2.46	0.24	1.39	2.80	2.41	12.44
	Q	0	0	0	0	0	0	0.02	0.26	0	0.05	T	0	.33

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Safford, Arizona Watershed W-II

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960		0		0		0		0		0		0		0		0
1961	8-22	0.45	8-22	0.23	8-22	0.25	8-22	0.26	8-22	0.26	8-22	0.26	8-22	0.26	8-22	0.26

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good. Watershed conditions: Sparsely vegetated rangeland. About 75% of area is bare. Vegetative cover is about equally divided between short grasses (black, hairy and side-oats grama) and shrubs (creosotebush, beargrass and mesquite). <sup>1</sup> Thiessen weighted, using 3 raingages.

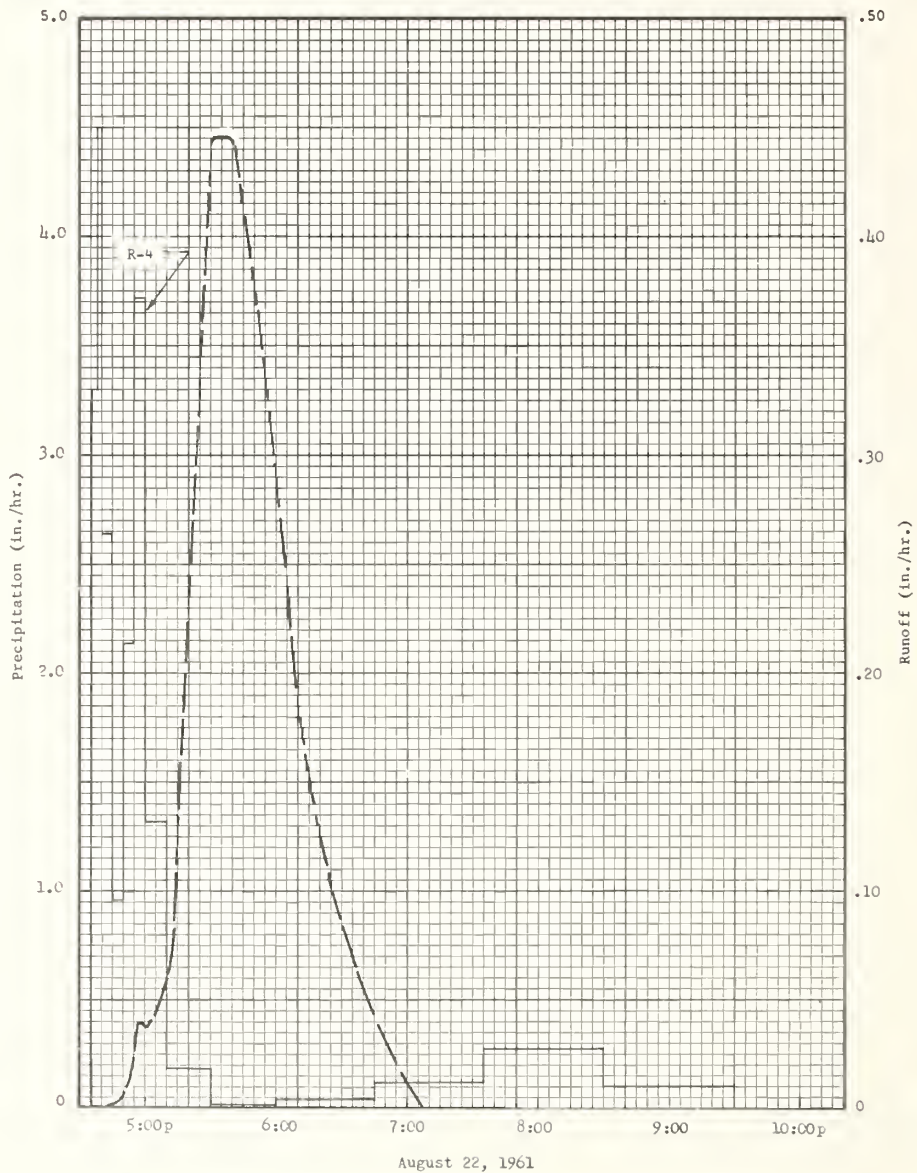
SELECTED RUNOFF EVENTS

Safford, Arizona Watershed W-II

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 22, 1961</u>								
8-15-61 8-17	Raingage R-4 0.11 .55	0 0	8-22-61 4:36p	Raingage 0	R-4 0	8-22-61 4:42p	0	0
			:38	3.30	.11	:43	.0001	0
			:40	4.50	.26	:45	.0005	0
			:45	2.64	.48	:47	.0014	0
			:50	.96	.56	:49	.0032	.0001
			:55	2.14	.73	:51	.0067	.0003
			5:00	3.72	1.04	:53	.0134	.0005
			:10	1.32	1.26	:56	.0319	.0016
			:30	.18	1.32	:57	.0392	.0022
			6:00	.02	1.33	5:02	.0384	.0054
			:45	.04	1.36	:06	.0468	.0082
			7:35	.12	1.46	:10	.0570	.0117
			8:30	.27	1.71	:11	.0651	.0127
			9:30	.10	1.81	:13	.0864	.0136
8-15-61 8-17	Raingage R-5 0.10 .45	0 0	8-22-61 4:15p	Raingage 0	R-5 0	:16	.1581	.0197
			:20	1.80	.15	:19	.2161	.0291
			:30	1.20	.35	:21	.2639	.0371
			:35	4.80	.75	:26	.3654	.0633
			:40	3.60	1.05	:30	.4452	.0903
			:52	1.20	1.25	:39	.4452	.1571
			5:10	.17	1.30	:44	.4118	.1928
			6:20	0	1.30	:50	.3727	.2320
			7:00	.15	1.40	7:06	0	.2580
			:30	.20	1.50			
			8:45	.20	1.75			

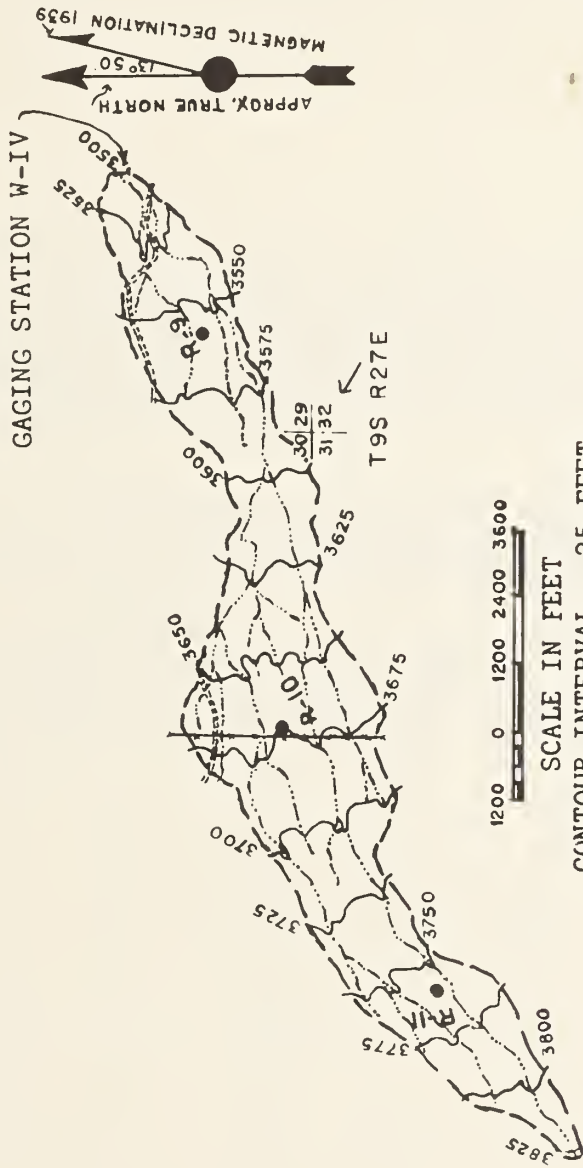
Notes: To convert runoff in in/hr to cfs, multiply by 687.68. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 45.2-5.





SAFFORD, ARIZONA WATERSHED W-11





1200 0 1200 2400 3600

SCALE IN FEET

CONTOUR INTERVAL - 25 FEET

DRAINAGE AREA - 764 ACRES

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SAFFORD, ARIZONA  
WATERSHED W-IV

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Safford, Arizona Watershed IV Area - 764 ac. (1.19 sq. mi.)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1960	P	0.90	0.68	0	0	0.03	0.14	1.52	0.79	0.31	0.78	0	0.51	5.66		
	Q	0	0	0	0	0	0	T	T	0	0	0	0	T		
1961	P	1.18	0	0.10	0	0	0.04	1.50	4.09	0.61	0.53	2.76	1.43	12.24		
	Q	0	0	0	0	0	0	0	nr 2/	0	0	0	0			
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Safford, Arizona Watershed IV								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-5	0.01	8-5	0.003	8-5	0.003	8-5	0.004	8-5	0.004	8-5	0.004	8-5	0.004	8-5	0.004
1961	8-22	nr 2/		nr		nr		nr		nr		nr		nr		nr
Notes: Quality of records: Monthly P and Q, fair; annual maximum discharges and volumes, fair. Watershed conditions: 80% of area is bare. Sparse vegetation is composed entirely of shrubs (creosotebush, snakeweed, cactus, and mesquite) except for trace of short grasses. 1/ Thiessen weighted, using 3 raingages. 2/ Instrument malfunction.																
SELECTED RUNOFF EVENTS 3/																
Antecedent conditions					Rainfall					Runoff						
Date	Rainfall (inches)		Runoff (inches)		Date and time	Intensity (in/hr)		Acc. (inches)		Date and time	Rate (in/hr)		Acc. (inches)			
Notes: For map of watershed, see reprint on preceding page, 45.3-4 (Reprinted). 3/ Instrument malfunctioned at time of only significant event in 1960-61.																

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)							Safford, Arizona Watershed W-V Area - 723 ac. (1.13 sq. mi)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	1.32	0.22	0.31	0.03	0.19	0	3.27	3.99	0.40	1.08	0	0.56	11.37
1960 Q	0	0	0	0	0	0	.02	.38	0	0	0	0	.40
1961 P	1.15	0	0	0	0	0	3.09	4.31	1.38	1.83	.96	1.75	14.47
1961 Q	0	0	0	0	0	0	.11	.25	.08	0	0	0	.44

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Safford, Arizona Watershed W-V

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-20	0.41	8-20	0.26	8-20	0.33	8-20	0.34	8-20	0.34	8-20	0.34	8-20	0.34	8-20	0.34
1961	8-15	.29	8-15	.16	8-15	.19	8-15	.19	8-15	.19	8-15	.19	8-15	.19	8-15	.19

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good.  
 Watershed conditions: About 80% of area is bare. Vegetation consists mostly of short grasses (black grama, side-oats grama, and tabosa), with some shrubs and forbs. <sup>1/</sup> Thiessen weighted, using 4 raingages.

SELECTED RUNOFF EVENTS Safford, Arizona Watershed W-V

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 20, 1960</u>								
8-4-60	Raingage R-12	0.04	8-20-60	Raingage	R-12	8-20-60		
8-15	1.50	0	6:05p	0	0	6:36p	0	0
	.15		:33	.06	.03	:40	.0030	.0001
			:41	3.52	.50	:45	.0237	.0012
			:50	1.60	.77	:49	.0534	.0038
			:52	1.50	.82	:53	.1001	.0089
			7:00	2.25	1.12	:55	.1466	.0130
			:06	3.00	1.42	:58	.2041	.0218
			:25	.94	1.72	7:00	.2315	.0291
			:40	.40	1.82	:05	.3315	.0526
			8:15	.17	1.92	:10	.3822	.0823
8-4-60	Raingage R-14	0.04				:12	.4096	.0952
8-15	1.37	0	8-20-60	Raingage	R-14	:18	.3480	.1331
	.10		6:06p	0	0	:21	.2548	.1507
			:28	.27	.20	:22	.3411	.1565
			:30	1.50	.25	:29	.3726	.1981
			:36	.52	.32	:35	.3288	.2332
			:40	5.40	.50	:40	.2603	.2577
			:46	4.00	.90	:43	.2041	.2693
			:50	3.30	1.12	:45	.1712	.2756
			:59	1.53	1.35	:50	.1189	.2877
			7:00	9.00	1.50	:55	.0867	.2963
			:10	3.60	2.10	8:02	.0745	.3057
			:20	1.80	2.40	:08	.0534	.3121
			:30	.78	2.53	:33	.0289	.3293
			:56	.16	2.60	:46	.0248	.3351
			8:05	.33	2.65	11:21	0	.3400
			:30	.05	2.67			

Watershed conditions:  
See description above.

Notes: To convert runoff in in/hr to cfs, multiply by 729.02. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 45.4-4.

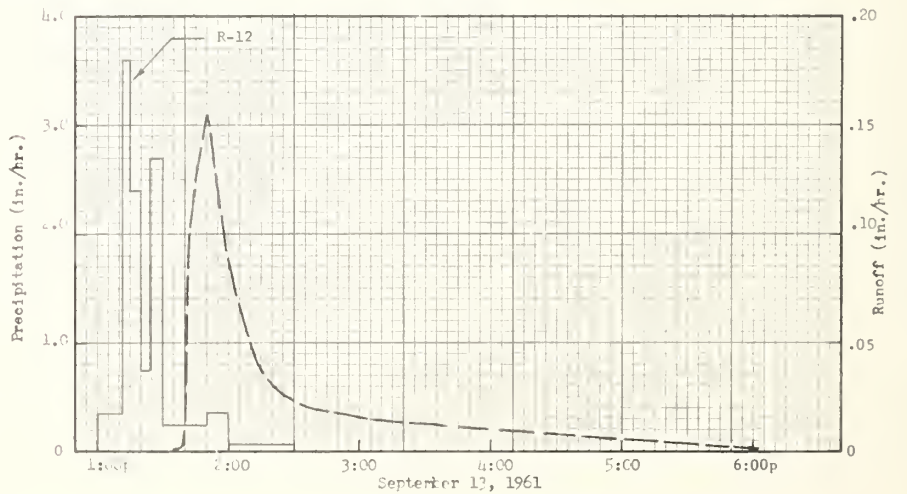
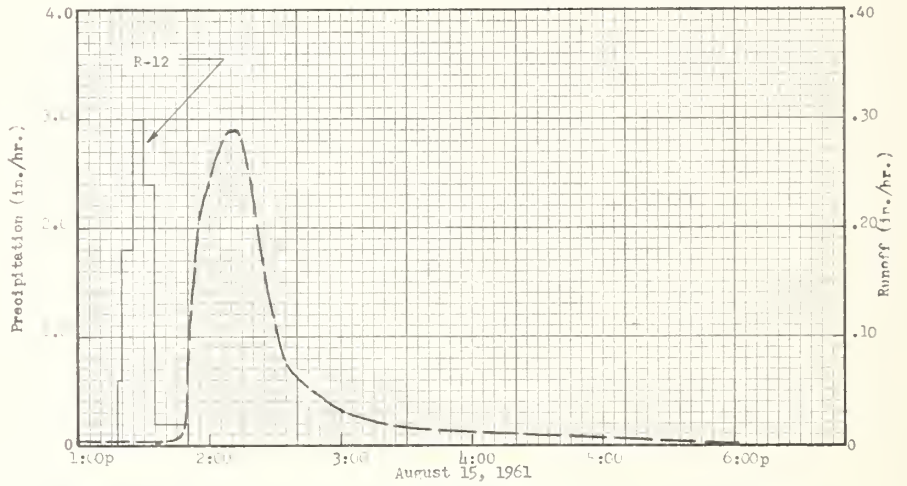
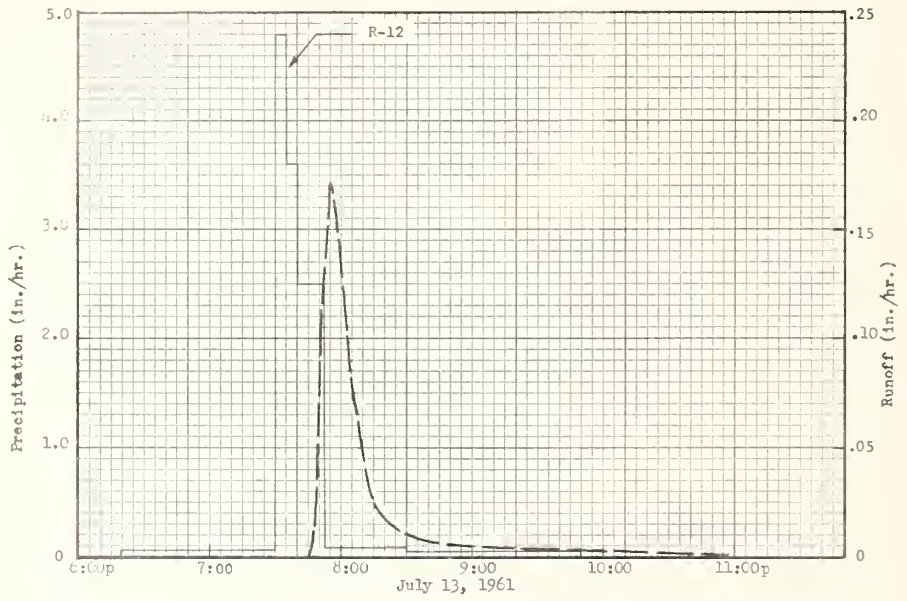
SELECTED RUNOFF EVENTS			Safford, Arizona Watershed W-V					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 13, 1961</u>								
7-2-61	Raingage R-12 0.15	0	7-13-61	Raingage	R-12	7-13-61		
7-3	.05	0	6:19p	0	0	7:45p	0	0
			7:30	.05	.06	:46	.0048	0
			:35	4.80	.46	:47	.0132	.0002
			:40	3.60	.76	:48	.0364	.0006
			:52	2.50	1.26	:49	.0534	.0013
			8:30	.08	1.31	:50	.0892	.0025
			9:50	.04	1.37	:51	.1142	.0042
						:55	.1713	.0137
			7-13-61	Raingage	R-14	8:00	.1330	.0266
					0.75			
						:04	.0841	.0338
						:07	.0534	.0372
						:15	.0248	.0424
						:27	.0124	.0463
						10:57	0	.0500
<u>Event of August 15, 1961</u>								
7-29-61	Raingage R-12 1.57	0.06	8-15-61	Raingage	R-12	8-15-61		
8-10	2.34	nr	1:18p	0	0	1:31p	0	0
8-11	.37	0	:20	.60	.04	:35	.0042	.0001
8-14	1.00	.05	:25	1.80	.17	:40	.0046	.0004
			:30	3.00	.42	:48	.0084	.0013
			:35	2.40	.62	:49	.0364	.0016
			:50	.20	.67	:50	.0867	.0026
						:51	.1143	.0043
			8-15-61	Raingage	R-14	:52	.1330	.0064
					1.12	:53	.1534	.0088
			8-15-61	Raingage	R-15	:54	.1754	.0115
			12:47p	0	0	:55	.2044	.0147
			:50	2.60	.13	2:00	.2384	.0331
			1:00	1.50	.38	:05	.2754	.0545
			:20	2.00	.88	:09	.2904	.0734
			:34	1.20	1.16	:13	.2904	.0928
			:42	.15	1.18	:18	.2452	.1151
						:21	.2044	.1263
						:25	.1603	.1384
						:30	.1029	.1494
						:35	.0745	.1568
						:44	.0534	.1664
						:55	.0395	.1749
						3:05	.0282	.1806
						:29	.0182	.1899
						6:00	0	.1943
<u>Event of September 13, 1961</u>								
8-28-61	Raingage R-12 0.60	0	9-13-61	Raingage	R-12	9-13-61		
			1:00p	0	0	1:35p	0	0
			:12	.35	.07	:36	.0001	0
			:15	3.60	.25	:37	.0005	0
			:20	2.40	.45	:38	.0008	0
			:24	.75	.50	:39	.0030	0
			:30	2.70	.77	:40	.0141	.0001
			:50	.24	.85	:41	.0918	.0010
			2:00	.36	.91	:44	.1174	.0062
			:30	.06	.94	:50	.1548	.0198
8-28-61	Raingage R-14 0.62	0	9-13-61	Raingage	R-14	2:00	.0867	.0399
8-29	.05	0	1:08p	0	0	:15	.0364	.0553
			:10	2.10	.07	:24	.0259	.0600
			:15	5.16	.50	:30	.0237	.0625
			:20	2.40	.70	:47	.0193	.0686
			:30	.42	.77	3:05	.0149	.0737
						:30	.0132	.0796
						6:01	0	.0834
<p>Watershed conditions: See description on page 45.4-1.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 729.02.





SAFFORD, ARIZONA WATERSHED V



SAFFORD, ARIZONA WATERSHED W-V

MONTHLY PRECIPITATION <sup>1/2</sup> AND RUNOFF (Inches)								Albuquerque, New Mexico Watershed W-I (Area - 97.2 acres)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	0.20	0.11	0.08	0.04	0.47	0.28	0.58	0.15	0.03	2.61	0	0.66	5.21
0	0	0	0	0	0	0	0	0	0	.04	0	0	.04
1961 P		.15	.56	.42	0	1.23	.73	.36	.32	.94	.58	.26	5.55
Q	0	0	0	0	0	0	.03	0	0	.01	0	0	.04

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Albuquerque, New Mexico Watershed W-I

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-15	0.01	10-15	0.01	10-15	0.02	10-15	0.03	10-15	0.04	10-15	0.04	10-15	0.04	10-15	0.04
1961	10-29	.02	7-6	.01	7-6	.02	7-6	.03	7-6	.03	7-6	.03	7-6	.03	7-6	.03

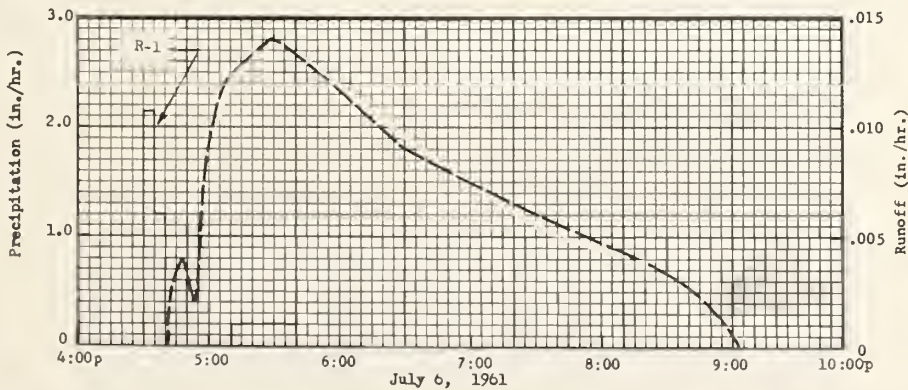
Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good.  
 Watershed Conditions: Rough broken rangeland. About 85% of the area is bare. Sparse vegetation consists of short grasses (blue and black grama), shrubs, and a few small juniper and pinon trees.  
<sup>1/2</sup> Thiessen weighted, using 2 rsiingages.

SELECTED RUNOFF EVENTS

Albuquerque, New Mexico Watershed W-I

Antecedent conditions			Rsinfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 6, 1961								
6-15-61	Raingage R-1 1.15	.0039	7-6-61 4:30p	Raingage 0	R=1 0	7-6-61 4:41p	0	0
			4:35	2.16	.18	4:43	.003	.0001
			4:40	1.20	.28	4:48	.004	.0004
			5:10	0	.28	4:53	.002	.0006
			4:40	.20	.38			
						5:07	.012	.0022
						5:31	.011	.0071
						6:30	.009	.0190
						7:30	.006	.0263
						8:15	.004	.0300
						9:02	0	.0310

Notes: To convert runoff in in/hr to cfs, multiply by 98.009. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 47.1-4.



ALBUQUERQUE, NEW MEXICO WATERSHED W-I



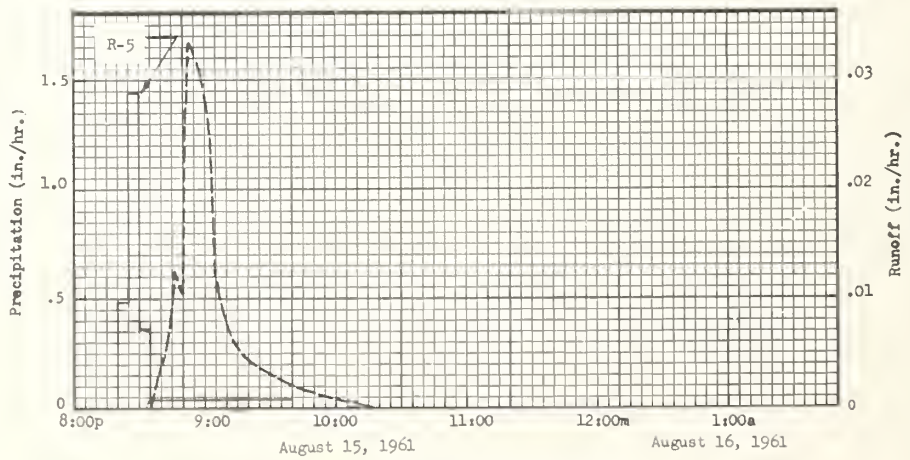
MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)							Albuquerque, New Mexico Watershed W-II (Area - 40.5 acres)						
Year \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	0.13	0.06	0.08	0.02	0.43	0.50	0.71	0.20	0.15	2.21	0	0.43	4.92
1960 Q	0	0	0	0	0	0	0	0	0	.01	0	0	.01
1961 P	0	.06	.56	.46	0	.69	1.01	.43	.29	.98	.45	.14	5.07
1961 Q	0	0	0	0	0	.01	.01	.01	0	0	0	0	.03

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Albuquerque, New Mexico Watershed W-II									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
	Date	Rate	1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-15	0.02	10-15	0.01	10-15	0.01	10-15	0.01	10-15	0.01	10-15	0.01	10-15	0.01	10-15	0.01
1961	8-15	.03	8-15	.01	8-15	.01	8-15	.01	8-15	.01	8-15	.01	8-15	.01	8-15	.01

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good.  
 Watershed Conditions: Sparsely vegetated rangeland. 80% of area is bare. Vegetation consists of short grasses (blue and black grama, and galleta) and shrubs (sagebrush, saltbush, and rabbit brush).  
 Vegetation is densest along lower two-thirds of principal waterway. 1/ Thiessen weighted, using 2 raingages.

SELECTED RUNOFF EVENTS						Albuquerque, New Mexico Watershed W-II			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
7-21-61	Raingage R-5 0.25	T	Event of August 15, 1961						
			8-15-61 8:20p	Raingage 0	R-5 0	8-15-61 8:35p	0	0	
			:25	.48	.04	:38	.002	.0001	
			:30	1.44	.16	:42	.004	.0003	
			:35	.36	.19	:45	.010	.0007	
			9:40	.04	.23	:47	.012	.0011	
						:50	.011	.0017	
						:51	.030	.0020	
						:52	.034	.0025	
						9:05	.012	.0075	
						:15	.006	.0090	
						:30	.003	.0101	
						:45	.002	.0107	
						10:15	0	.0112	
Watershed conditions: Sparsely vegetated rangeland. See description above.									

Notes: To convert runoff in in/hr to cfs, multiply by 40.837. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 47.2-4.



ALBUQUERQUE, NEW MEXICO WATERSHED W-II



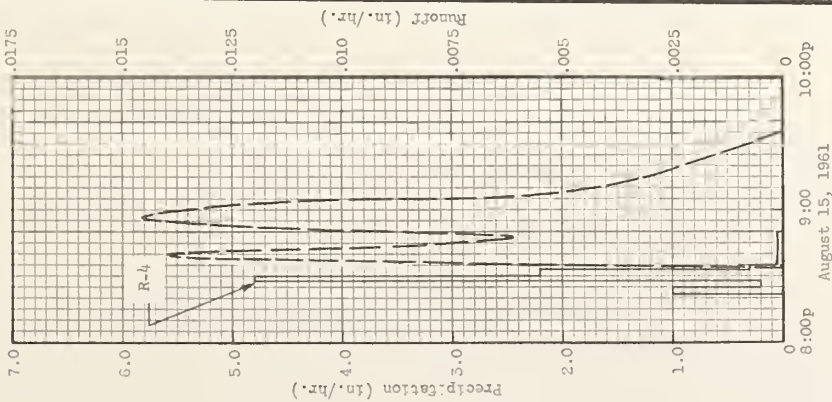
MONTHLY PRECIPITATION AND RUNOFF (Inches)								Albuquerque, New Mexico Watershed W-III (Area: 168 acres)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P 0.22 Q 0	0.07 0	0.10 0	0.04 0	0.31 0	0.52 0	0.64 0	0.22 0	0.18 0	2.19 0	0 0	0.64 0	5.13 0
1961	P 0 Q 0	.10 0	.57 0	.39 0	0 0	.58 T	1.05 T	.46 T	.28 0	.91 0	.36 0	.06 0	4.76 T

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Albuquerque, New Mexico Watershed W-III								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960		0		0		0		0		0		0		0		0
1961	8-15	0.02	8-15	0.003	8-15	0.003	8-15	0.003	8-15	0.003	8-15	0.003	8-15	0.003	8-15	0.003

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good. Watershed conditions: Sparsely vegetated rangeland; about 75% of area is bare. Vegetation consists of short grasses (blue and black grama and galleta), and shrubs (sagebrush, saltbush, and snakeweed). Vegetation is comparatively heavy in a narrow strip along the principal waterway. 1/ Thiessen weighted, using 2 raingages.

SELECTED RUNOFF EVENTS			Albuquerque, New Mexico Watershed W-III					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
7-21-61	Raingage R-4 0.20	0	Event of August 15, 1961			8-15-61		
			8-15-61 8:12p	Raingage 0	R-4 0	8-15-61 8:32p	0	0
			:25	1.00	.05	:35	.0055	.0001
			:28	.20	.06	:36	.0081	.0002
			:30	4.80	.22	:40	.0140	.0009
			:33	2.20	.33	:44	.0081	.0016
			:35	.30	.34	:47	.0061	.0020
			:50	.04	.35	:49	.0081	.0022
						:56	.0146	.0023
						9:05	.0081	.0025
						:34	.0001	.0027
						:35	0	.0027

Notes: To convert runoff in in/hr to cfs, multiply by 169.40. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 47.3-4.



ALBUQUERQUE, NEW MEXICO WATERSHED W-III

11-62

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)										Oxford, Mississippi Watershed W-4 <sup>2/</sup> Area - 2,000 ac. (3.13 sq. mi.)				
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	4.78	3.00	5.83	1.63	3.21	2.54	1.48	3.17	3.57	5.79	2.68
	Q	.35	.16	1.36	0	.10	0	0	T	.01	.54	.01	.02	2.55
1961	P	.69	8.58	8.57	3.73	3.08	1.67	3.60	3.66	2.72	1.02	8.59	8.72	54.63
	Q	0	1.54	1.54	.20	.01	.03	.01	.05	.19	0	.86	1.43	5.86

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Oxford, Mississippi Watershed W-4 <sup>2/</sup>						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-5	0.26	10-5	0.23	10-5	0.33	10-5	0.44	3-2	0.49	3-2	0.54	3-2	0.57	3-2	0.99
1961	3-5	.34	3-5	.27	3-5	.44	3-5	.58	2-20	.65	2-20	.96	2-20	1.36	2-18	1.52

Notes: Quality of records: Q - fair, P - good. Watershed conditions: About 22% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 42% pasture-idle -- good cover April - October with fair cover remainder of year; 34% woods; 2% bare gullies.

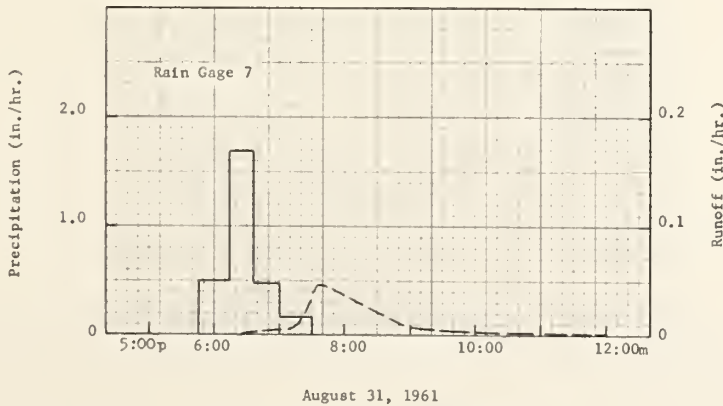
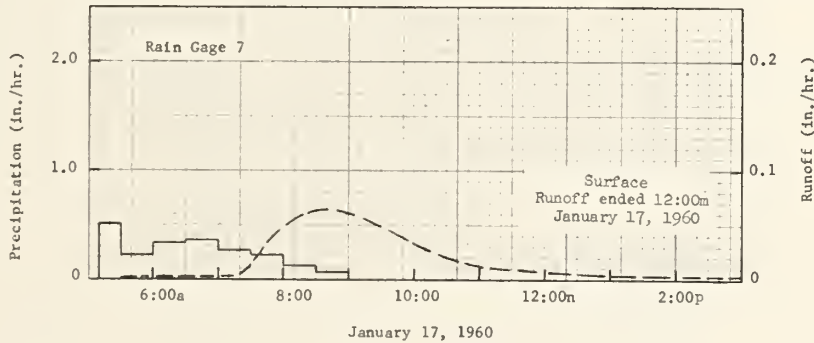
SELECTED RUNOFF EVENTS										Oxford, Mississippi Watershed W-4 <sup>2/</sup>				
Antecedent conditions				Rainfall				Runoff						
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)						
<u>Event of January 17, 1960 <sup>3/</sup></u>														
12-18-59	1.33	0.0050	1-17-60	Raingage 7		1-17-60								
12-19	0	.0048	5:10a	0	0	5:30a	0	0						
12-20	0	.0012	:30	.51	.17	7:15	.0011	.0019						
12-21	0	.0012	6:00	.22	.28	:45	.0342	.0190						
12-27	.85	.0464	:30	.34	.45	8:15	.0585	.0482						
12-28	0	.0012	7:00	.36	.63	:45	.0659	.0782						
			:30	.28	.77	9:15	.0560	.1062						
1-1-60	.19	0	8:00	.22	.88	10:45	.0173	.1321						
1-2	.24	0	:30	.12	.94	12:30p	.0069	.1442						
1-5	1.24 <sup>4/</sup>	0	9:00	.08	.98	3:30	.0019	.1499						
1-6	0	.0060	1-17-60	3 raingages <sup>1/</sup>		12:00m	.0007 <sup>5/</sup>	.1559						
1-7	0	.0024	5:00a	0	0									
1-8	0	.0036	:15	.08	.02									
1-9	0	.0131 <sup>6/</sup>	6:30	.30	.39									
1-10	0	.0083	7:15	.40	.69									
1-11	0	.0012	8:45	.16	.92									
1-12	.02	.0012												
1-13	.36	0												
1-14	.13	.0048												
1-15	0	.0012												
1-16	.07	0												

Watershed Conditions: 22% of area cotton and corn residue - fair to poor cover; 10% pasture, 32% idle, 34% woods - fair to good cover; 2% bare gullies.

Notes: To convert runoff in in/hr to cfs, multiply by 2016.7. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U.S., 1956-59, USDA Misc. Pub. 945, p. 62.1-4.  
<sup>1/</sup> Raingages 7, 8 and 18 Thiessen weighted. <sup>2/</sup> About 28% of area behind small desilting and retention dams.  
<sup>3/</sup> Isohyetal map on page 62.3-4.  
<sup>4/</sup> Less than .15 inch fell as rain - remainder as snow. <sup>5/</sup> Normal base flow.  
<sup>6/</sup> Runoff during this period from snow melt.

SELECTED RUNOFF EVENTS			Oxford, Mississippi Watershed W-4					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff		
Date	Rainfall <sup>2/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 31, 1961</u>								
8-2-61	0.04	0	8-31-61	Rain Gage 7		8-31-61		
8-5	.69	.0002	5:45p	0	0	6:20p	0	0
8-7	.33	.0002	6:15	.50	.25	:25	.0001	.0000
8-8	.19	0	:35	1.68	.81	:30	.0008	.0000
8-12	.06	0	7:00	.48	1.01	:40	.0018	.0003
8-15	.18	0	:30	.16	1.09	7:00	.0023	.0010
8-19	.02	0				:15	.0061	.0021
8-23	.72	.0001	8-31-62	3 Rain Gages <sup>2/</sup>		:25	.0214	.0044
8-24	.04	0	5:00p	0	0	:35	.0470	.0101
8-25	.03	0	:15	.04	.01	8:10	.0322	.0332
			:30	.04	.02	:45	.0124	.0462
			:45	.12	.05	9:30	.0028	.0519
			6:00	.52	.18	10:15	.0006	.0532
			:15	1.00	.43	11:00	.0001	.0535
			:30	1.64	.84	12:00m	0	.0536
			:45	1.00	1.09			
			7:00	.44	1.20			
			:15	.24	1.26			
			:30	.16	1.30			
			:45	.04	1.31			
<p><u>Watershed Conditions:</u> 22% of area in mature cotton and corn - fair cover; 10% pasture, 32% idle, 34% woods - good cover; 2% bare gullies.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 2016.7.  
<sup>1/</sup> Isohyetal map on page 62.11-6.  
<sup>2/</sup> Raingages 7, 8 and 18 Thiessen weighted.



OXFORD, MISSISSIPPI WATERSHED W-4

11-62

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Oxford, Mississippi Watershed W-5 <sup>2/</sup> Area - 1,130 ac. (1.76 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	4.56	3.08	5.70	1.88	3.10	2.42	1.56	3.83	3.30	5.13	2.54
	Q	1.09	.82	2.54	.01	.32	0	T	.03	.01	.89	.02	.28	6.01
1961	P	.73	8.68	8.50	4.65	2.69	1.20	3.89	5.13	1.64	.67	8.73	8.74	55.25
	Q	.02	3.24	3.59	.73	.06	0	.06	.50	.12	0	1.42	3.31	13.05

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Oxford, Mississippi Watershed W-5 <sup>2/</sup>								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-5	0.42	10-5	0.34	10-5	0.51	3-2	0.74	3-2	0.89	3-2	0.99	3-2	1.03	3-2	1.75
1961	3-5	.51	3-5	.48	3-5	.89	3-5	1.20	3-5	1.29	2-20	1.52	2-20	2.26	2-18	2.76

Notes: Quality of records: Q - good, P - good. Watershed conditions: About 26% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 51% pasture-idle -- good cover April - October with fair cover remainder of year; 21% woods; 2% bare gullies.

SELECTED RUNOFF EVENTS						Oxford, Mississippi Watershed W-5 <sup>2/</sup>		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of January 17, 1960 <sup>3/</sup>								
12-18-59	1.40	0.9056	1-17-60	Rain Gauge 8		1-17-60		
12-19	0	.0147	2:45a	0	0	5:45a	0	0
12-20	0	.0021	3:00	.04	.01	6:00	.0004	.0000
12-27	.83	.1411	5:00	.01	.03	:40	.0014	.0006
12-28	0	.0147	:30	.12	.09	:45	.0089	.0010
12-29	0	.0021	6:30	.30	.39	7:00	.0246	.0052
			7:00	.38	.58	:15	.0553	.0152
1-1-60	.19	0	8:00	.29	.87	:45	.1117	.0594
1-2	.32	.0021	:30	.12	.93	8:15	.1273	.1199
1-3	0	.0021				:45	.1159	.1809
1-5	1.10 <sup>4/</sup>	.0021				9:30	.0702	.2507
1-6	0	.0442				11:00	.0281	.3197
1-7	0	.0147				1:30p	.0088	.3672
1-8	0	.0632				6:00	.0036	.3920
1-9	0	.0927 <sup>5/</sup>				12:00m	.0025 <sup>6/</sup>	.4100
1-10	0	.0400						
1-11	0	.0084						
1-12	.02	.0021						
1-13	.29	.0021						
1-14	.11	.0400						
1-15	0	.0105						
1-16	.07	.0042						
1-17	0	.0001 <sup>7/</sup>						

Watershed Conditions: 26% of area cotton and corn residue - fair to poor cover; 30% pasture, 21% idle, 21% woods - fair to good cover; 2% bare gullies.

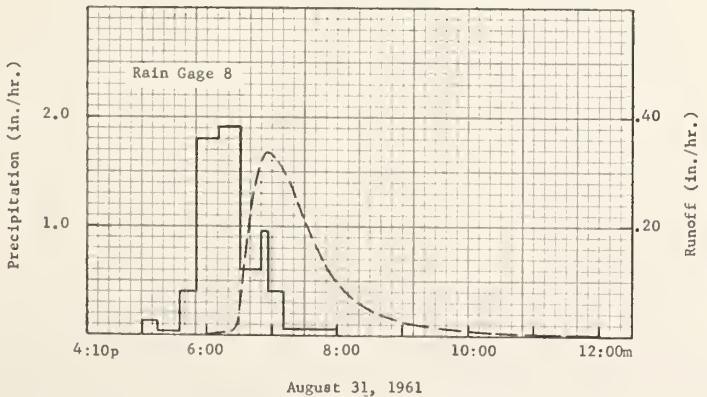
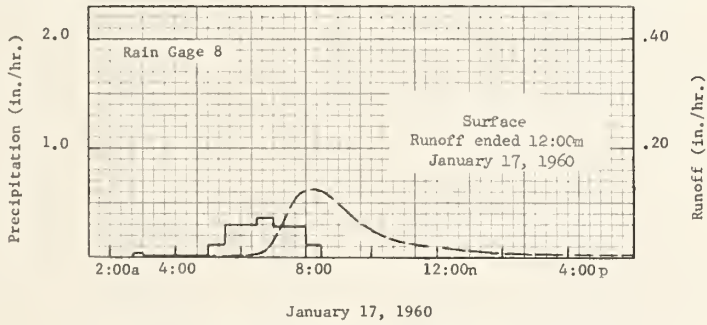
Notes: To convert runoff in in/hr to cfs, multiply by 1,139.4. For map of watershed, see Selected Runoff Events for Small Agricultural Watersheds in the United States, USDA, ARS, January 1960, page 62.2-3.  
<sup>1/</sup> Raingages 8 and 19 Thiessen weighted. <sup>2/</sup> About 10% of area behind small disilting and retention dams.  
<sup>3/</sup> Isohyetal map on page 62.3-4.  
<sup>4/</sup> Less than .15 inch fell as rain; remainder as snow.  
<sup>5/</sup> Runoff during this period from snow melt.  
<sup>6/</sup> Normal base flow. <sup>7/</sup> Runoff prior to 5:45a.



SELECTED RUNOFF EVENTS			Oxford, Mississippi Watershed W-5					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff		
Date	Rainfall (inches) <sup>2/</sup>	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31, 1961								
8-2-61	0.11	0	8-31-61	Rain Gage 8		8-31-61		
8-5	.97	.0068	5:00p	0	0	6:00p	0	0
8-7	.65	.0363	:15	.12	.03	:05	.0011	.0001
8-12	.10	0	:35	.03	.04	:25	.0083	.0017
8-15	.31	0	:50	.40	.14	:30	.0803	.0054
8-19	.09	0	6:10	1.80	.74	:35	.1745	.0160
8-23	.97	.0375	:30	1.92	1.38	:45	.2917	.0549
8-24	.03	0	:50	.60	1.58	:55	.3388	.1075
8-31	.04 <sup>3/</sup>	0	:55	.96	1.66	7:15	.2830	.2111
			7:10	.40	1.76	:45	.1448	.3181
			8:00	.06	1.81	8:15	.0649	.3705
						9:00	.0204	.4025
			8-31-61	2 Rain Gages <sup>2/</sup>		10:00	.0053	.4154
			4:45p	0	0	:45	.0013	.4179
			5:00	.04	.01	12:00m	0	.4188
			:15	.08	.03			
			:30	.04	.04			
			:45	.24	.10			
			6:00	1.72	.53			
			:15	1.68	.95			
			:30	1.96	1.44			
			:45	.64	1.60			
			7:00	.40	1.70			
			:15	.28	1.77			
			:30	.16	1.81			
			:45	.20	1.86			

Watershed Conditions: 26% of area in mature cotton and corn - fair cover; 30% pasture, 21% idle, 21% woods - good cover; 2% bare gullies.

Notes: To convert runoff in in/hr to cfs, multiply by 1,139.4.  
 1/ Isohyetal map on page 62.11-6.  
 2/ Raingages 8 and 19 Thiessen weighted.  
 3/ Rainfall 8:30 to 9:00a.



OXFORD, MISSISSIPPI WATERSHED W-5

11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)													Oxford, Mississippi Watershed W-10 <sup>2/</sup> Area - 5,530 ac. (8.64 sq. mi.)			
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P	4.70	3.47	5.70	2.54	3.33	2.72	1.83	3.75	2.66	4.43	2.56	4.20	41.89
	Q	.67	.73	2.37	.14	.38	.02	.04	.02	0	.28	.01	.07	4.73		
1961	P	.72	8.73	8.45	3.27	2.97	2.19	4.25	4.18	1.22	.83	8.52	9.25	54.58		
	Q	0	2.53	2.78	.58	.13	.19	.16	.69	.06	0	.67	2.44	10.23		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Oxford, Mississippi Watershed W-10 <sup>2/</sup>						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-2	0.20	3-2	0.18	3-2	0.30	3-2	0.62	3-2	0.75	3-2	0.81	3-2	0.87	3-2	1.55
1961	3-5	.23	3-5	.21	3-5	.37	3-5	.59	2-20	1.00	2-20	1.34	2-20	2.00	2-18	2.38
Notes: Quality of records: Q - fair, P - good. Watershed conditions: About 20% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 62% pasture-idle -- good cover April - October with fair cover remainder of year; 15% woods; 3% bare gullies.																
SELECTED RUNOFF EVENTS										Oxford, Mississippi Watershed W-10 <sup>2/</sup>						
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of January 17, 1960 <sup>3/</sup>																
12-18-59	1.02	0.4304	1-17-60	Raingage 13		1-17-60										
12-19	0	.0065	5:05a	0	0	5:00a	0.0002	0								
12-20	0	.0030	6:00	.27	.25	6:15	.0009	.0011								
12-21	0	.0026	7:00	.35	.60	7:00	.0068	.0062								
12-22	0	.0017	:45	.20	.75	:30	.0310	.0217								
12-23	0	.0009	8:00	.40	.85	:45	.0500	.0342								
12-24-25	0	.0008	:30	.20	.95	8:15	.0713	.0699								
12-27	.88	.0775				:30	.0800	.0899								
12-28	0	.0198	1-17-60	5 raingages <sup>1/</sup>		:50	.0845	.0967								
12-29	0	.0039	4:45a	0	0	9:00	.0821	.1310								
12-30	0	.0017	6:00	.30	.30	:30	.0664	.1642								
12-31	0	.0009	7:00	.37	.67	10:00	.0448	.1974								
			8:00	.24	.91	:45	.0253	.2163								
1-1-60	.17	.0013	:30	.12	1.03	11:45	.0158	.2321								
1-2	.19	.0013				1:30p	.0063	.2400								
1-3	0	.0009				4:30	.0041	.2523								
1-4	0	.0004				8:30	.0020	.2593								
1-5	1.30 <sup>4/</sup>	.0017				12:00m	.0014 <sup>5/</sup>	.2642								
1-6	0	.0056														
1-7	0	.0052														
1-8	0	.0077														
1-9	0	.0220 <sup>6/</sup>														
1-10	0	.0146														
1-11	0	.0108														
1-12	.01	.0073														
1-13	.39	.0073														
1-14	.07	.0228														
1-15	0	.0065														
1-16	.06	.0043														
1-17	0	.0011 <sup>7/</sup>														
Watershed Conditions: 20% of area cotton and corn residue - fair to poor cover; 9% pasture, 53% idle, 15% woods - fair to good cover; 3% bare gullies.																
Notes: To convert runoff in in/hr to cfs, multiply by 5,576. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 62.3-3. <sup>1/</sup> Raingages 13, 14, 20, 24 and 26 Thiessen weighted. <sup>2/</sup> About 12% of area behind small desilting and retention dam. <sup>3/</sup> Isohyetal map on page 62.3-4. <sup>4/</sup> Approximately .15 inch fell as rain; remainder as snow. <sup>5/</sup> Normal base flow. <sup>6/</sup> Runoff during this period from snow melt. <sup>7/</sup> Prior to 5:00a.																

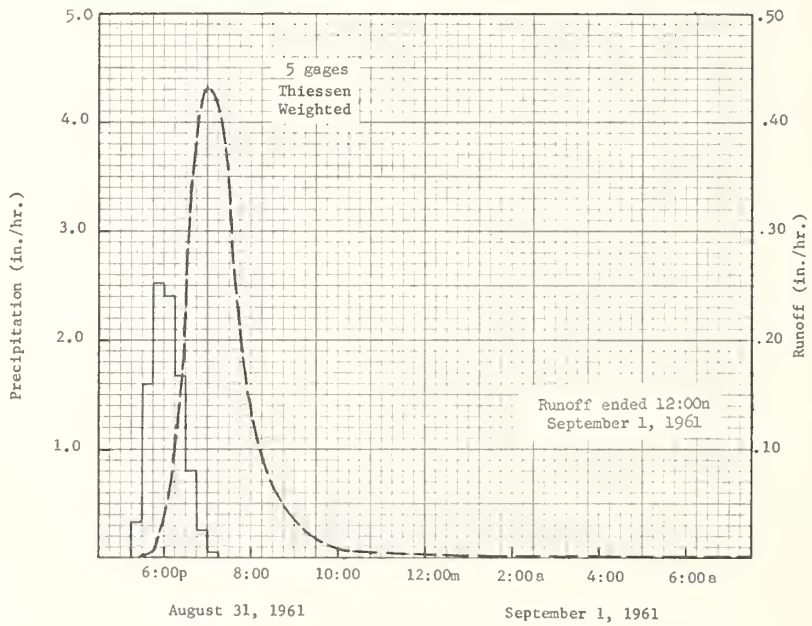
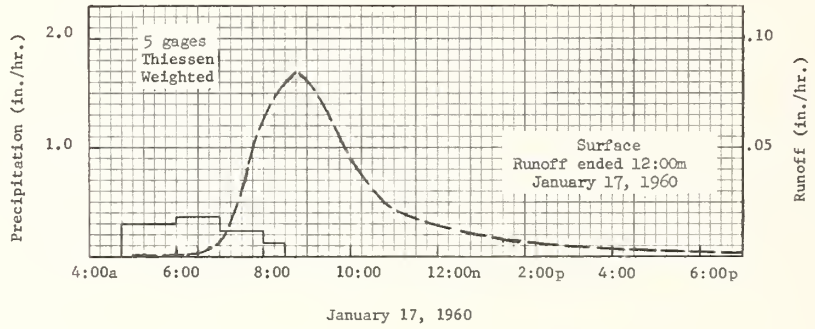
Cooperative Research Project of USDA, University of Mississippi, and Mississippi Agricultural Experiment Station

SELECTED RUNOFF EVENTS			Oxford, Mississippi Watershed W-10					
Antecedent conditions			Rainfall <sup>1/</sup>			Runoff		
Date	Rainfall <sup>2/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31 - September 1, 1961								
8-2-61	0.11	0	8-31-61	Rain Gage 13		8-31-61		
8-5	.51	.0194	5:30p	0	0	5:25p	0	0
8-6	0	.0005	:40	.30	.05	:45	.0066	.0011
8-7	.03	0	6:00	2.40	.85	6:00	.0304	.0057
8-8	.05	0	:15	1.60	1.25	:15	.1129	.0236
8-12	.08	0	:30	1.00	1.50	:25	.2152	.0509
8-15	.24	.4741	7:00	.72	1.86	:30	.2623	.0708
8-19	.03	0	:30	.08	1.90	:45	.3785	.1509
8-23	.68	.0045				7:00	.4331	.2523
8-25	.01	0	8-31-61	5 Rain Gages <sup>2/</sup>		:15	.4147	.3583
8-27	.12	0	5:15p	0	0	:30	.3281	.4512
			:30	.32	.08	:35	.2779	.4765
			:45	1.60	.48	:45	.2130	.5174
			6:00	2.52	1.11	8:00	.1426	.5618
			:15	2.40	1.71	:15	.0959	.5891
			:30	1.68	2.13	:45	.0491	.6254
			:45	.80	2.33	9:15	.0226	.6434
			7:00	.24	2.39	10:15	.0071	.6583
			:15	.04	2.40	:45	.0032	.6609
						11:30	.0009	.6625
						12:00m	.0005	.6629
						9-1-61		
						1:15 -	.0004	.6635
						3:15	.0002	.6641
						9:15	.0003	.6677
						10:30	.0001	.6680
						12:00m	0	.6682
<p>Watershed Conditions: 20% of area in mature cotton and corn - fair cover; 9% pasture, 53% idle, 15% woods - good cover; 3% bare gullies.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 5,576.

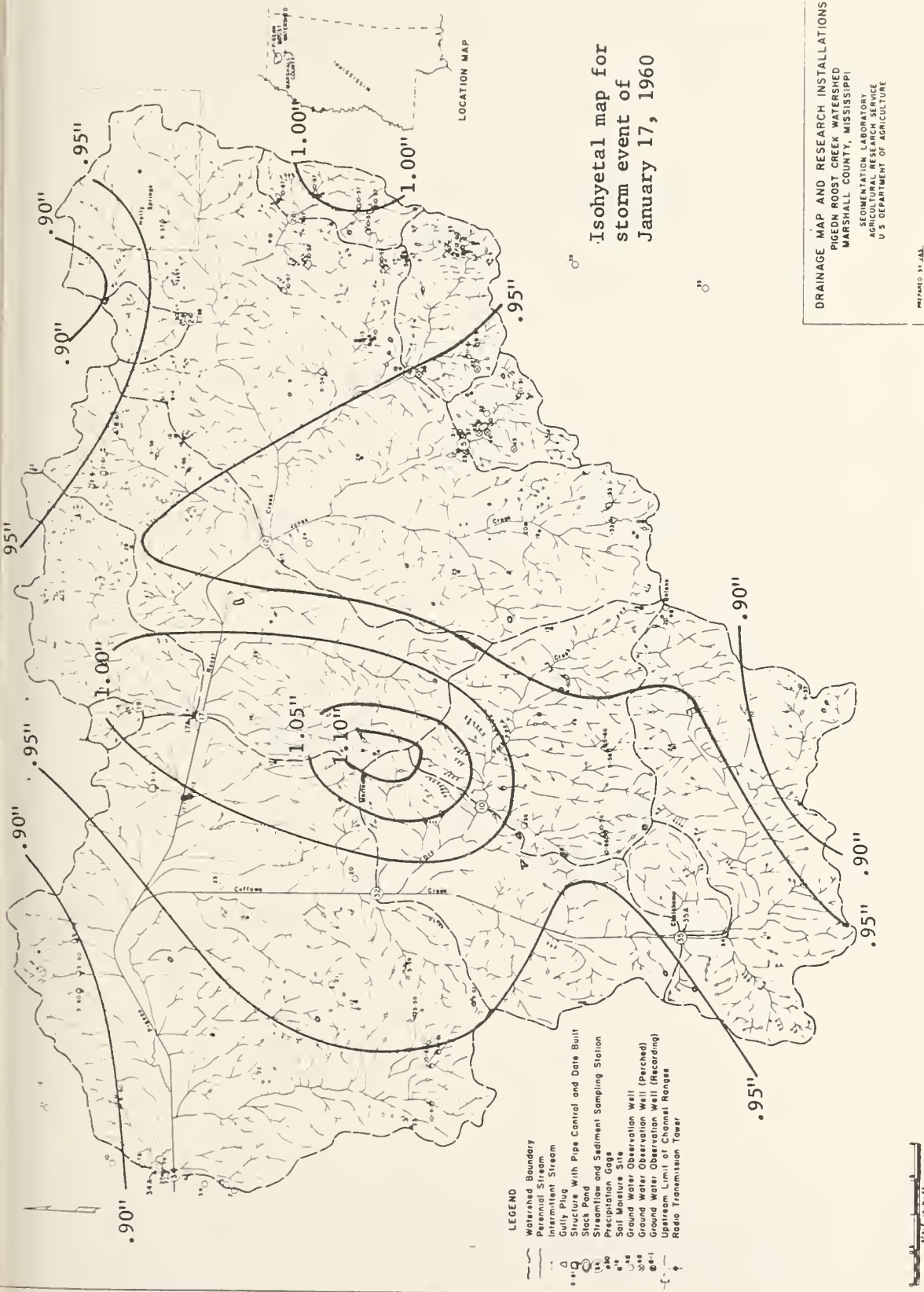
<sup>1/</sup> Isohyetal map on page 62.11-6.

<sup>2/</sup> Raingages 13, 14, 20, 24 and 26 Thiessen weighted.



OXFORD, MISSISSIPPI WATERSHED W-10





**Isohyetal map for  
storm event of  
January 17, 1960**

**DRAINAGE MAP AND RESEARCH INSTALLATIONS**  
 PIGEON ROOST CREEK WATERSHED  
 MARSHALL COUNTY, MISSISSIPPI  
 DOCUMENTATION LABORATORY  
 AGRICULTURAL RESEARCH SERVICE  
 U S DEPARTMENT OF AGRICULTURE

PREPARED BY J.E.L.  
 DRAWN BY J.E.L.  
 JANUARY 1962

**LEGEND**

- Watershed Boundary
- Parental Stream
- Subparent Stream
- Gully
- Structure With Pipe Control and Gate Built
- Stock Pond
- Streamflow and Sediment Sampling Station
- Precipitation Gage
- Soil Moisture Site
- Ground Water Observation Well
- Ground Water Observation Well (Perched)
- Ground Water Observation Well (Recording)
- Upstream Limit of Channel Ranges
- Radio Transmission Tower



11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches) <sup>1/</sup>													Oxford, Mississippi Watershed W-12 <sup>2/</sup> Area - 22,800 ac. (35.6 sq. mi.)		
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1960	P	4.70	3.18	5.78	2.03	3.32	2.83	1.65	3.73	2.84	4.99	2.61	4.06	41.72	
	Q	.48	.38	1.57	.05	.19	.02	.02	.01	.01	.35	.02	.06	3.16	
1961	P	.82	8.45	8.35	3.72	2.61	2.33	3.56	4.09	1.74	.90	8.56	8.55	53.68	
	Q	.02	1.82	2.08	.49	.05	.09	.03	.13	.04	.01	.56	1.73	7.05	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS													Oxford, Mississippi Watershed W-12 <sup>2/</sup>			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-5	0.13	10-5	0.12	10-5	0.20	3-2	0.41	3-2	0.51	3-2	0.54	3-2	0.56	3-2	1.00
1961	3-6	.21	3-6	.20	3-5	.36	3-5	.58	2-20	.67	2-20	.75	2-20	1.41	2-18	1.70

Notes: Quality of records: Q - fair, P - good. Watershed conditions: About 20% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 52% pasture-idle -- good cover April - October with fair cover remainder of year; 23% woods; 2% bare gullies; 3% urban.

SELECTED RUNOFF EVENTS													Oxford, Mississippi Watershed W-12 <sup>2/</sup>		
Antecedent conditions				Rainfall				Runoff <sup>3/</sup>							
Date	Rainfall (inches) <sup>1/</sup>	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)							
Event of March 2-3, 1960 <sup>4/</sup>															
2-2-60	0	0.0004	3-2-60	Rain Gage 5		3-2-60									
2-3	.06	.0004	12:01 a	0	0	12:10 a	0.0001	0							
2-4	.86	.0575	1:00	.12	.12	4:45	.0007	.0010							
2-5	.37	.1348	9:00	0	.12	5:45	.0036	.0028							
2-6		.0157	:30	.10	.17	6:45	.0057	.0072							
2-7	0	.0075	:45	.36	.39	9:30	.0056	.0229							
2-8	0	.0054	10:00	.52	.40	10:15	.0102	.0284							
2-9	0	.0046	:30	.18	.48	11:00	.0360	.0486							
2-10	.56	.0460	11:00	.98	.97	:45	.0483	.0800							
2-11	0	.0066	:30	.30	1.12	12:15 p	.0705	.1085							
2-12	0	.0027	2:00 p	.16	1.52	:30	.0861	.1280							
2-13	.09	.0029	3:00	.12	1.64	:45	.0971	.1505							
2-14	0	.0023	4:00	.03	1.67	1:00	.1084	.1762							
2-15-16	0	.0034				:30	.1023	.2286							
2-17	0	.0014	3-2-60	Rain Gage 15		:45	.0919	.2540							
2-18	0	.0011	12:01 a	0	0	2:30	.0727	.3150							
2-19	.03	.0011	2:30	.03	.10	3:15	.0579	.3978							
2-20	.14	.0011	4:00	.04	.35	4:45	.0404	.4474							
2-21	0	.0014	9:30	0	.35	6:00	.0274	.4892							
2-22-23	0	.0011	10:00	.18	.44	7:15	.0167	.5162							
2-24	.84	.0199	:15	.44	.55	10:00	.0028	.5352							
2-25	.11	.0481	:45	.78	.94	12:00 m	.0021	.5402							
2-26	0	.0062	11:00	.64	1.10	3-3-60									
2-27	0	.0029	:30	.40	1.30	3:00 s	.0018	.5462							
2-28	.11	.0029	12:00n	.12	1.36	6:00	.0012	.5507							
2-29	0	.0019	1:00p	.21	1.57	12:00 n	.0007	.5555							
3-1	.06	.0017	2:00	.12	1.69	12:00 m	.0003 <sup>5/</sup>	.5603							
			3:00	.06	1.75										

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 22,990. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 62.4-6.  
<sup>1/</sup> Raingages 4-9, 13, 15, 18-20, 25, 29, 30 and 31 Thiessen weighted. <sup>2/</sup> About 15% of srce behind small desilting and retention dams. <sup>3/</sup> Water temperature below 40° F.  
<sup>4/</sup> Isohyetsl map on page 62.11-5.  
<sup>5/</sup> Normal base flow.

SELECTED RUNOFF EVENTS			Oxford, Mississippi Watershed W-12								
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Event of March 2-3, 1960 (continued) <sup>2/</sup>											
			3-2-60 Rain Gage <sup>1/</sup>								
			12:05a	0	0						
			1:00	.06	.06						
			2:00	.01	.07						
			3:00	.03	.10						
			4:00	.05	.15						
			8:00	T	.15						
			9:30	.03	.19						
			10:00	.15	.27						
			:15	.33	.35						
			:30	.47	.47						
Watershed Conditions: 20% of area cotton and corn residue - fair to poor cover; 13% pasture, 39% idle, 23% woods - good to fair cover; 2% bare gullies; 3% urban.			11:00	.56	.75						
			:15	.65	.91						
			:30	.42	1.02						
			12:00m	.30	1.17						
			:30p	.21	1.28						
			1:30	.15	1.43						
			4:00	.08	1.63						
			6:00	.01	1.65						
						Additional rainfall data <sup>3/</sup>					
			Event of August 31 - September 1, 1961 <sup>4/</sup>								
			8-31-61 Rain Gage 29								
8-1-61	0	0.0003	8-31-61	5:00p	0	0	8-31-61	5:20p	0	0	
8-2	.08	.0003		:30	.28	.14		:45	.0002	.0000	
8-3-4	0	.0005		:45	.48	.26		6:00	.0003	.0001	
8-5	.90	.0018		6:00	1.36	.60		:20	.0017	.0004	
8-6	0	.0006		:30	1.34	1.27		:45	.0117	.0032	
8-7	.43	.0052		:45	1.80	1.72		7:00	.0248	.0078	
8-8	.15	.0018		7:15	.16	1.80		:25	.0323	.0197	
8-9	0	.0005		8-31-61	15 Rain Gages <sup>1/</sup>			:30	.0440	.0229	
8-10-11	0	.0006						:50	.0541	.0393	
8-12	.14	.0004		4:45p	0	0		8:15	.0434	.0596	
8-13-14	0	.0006		5:00	.24	.06		:45	.0298	.0779	
8-15	.16	.0003		:15	.20	.11		9:00	.0253	.0848	
8-16-18	0	.0009		:30	.32	.19		:30	.0157	.0951	
8-19	.03	.0003		:45	.48	.31		10:30	.0081	.1070	
8-20-22	0	.0006		6:00	.96	.55		12:00m	.0047	.1166	
8-23	.53	.0007		:15	1.44	.91					
8-24	.03	.0003		:30	1.36	1.25		9-1-61			
8-25	.01	.0003		:45	1.00	1.50		2:00a	.0016	.1230	
8-26-30	0	.0010		7:00	.28	1.57		3:15	.0008	.1245	
				:15	.20	1.62		5:00	.0003	.1255	
				:30	.20	1.67		7:30	.0001	.1256	
				:45	.03	1.68		11:00	0	.1259	
			Additional rainfall data <sup>5/</sup>								
Watershed Conditions: 20% of area in mature cotton and corn - fair cover; 13% pasture, 39% idle, 23% woods - good cover; 2% bare gullies; 3% urban.											

Notes: To convert runoff in in/hr to cfs, multiply by 22,990.

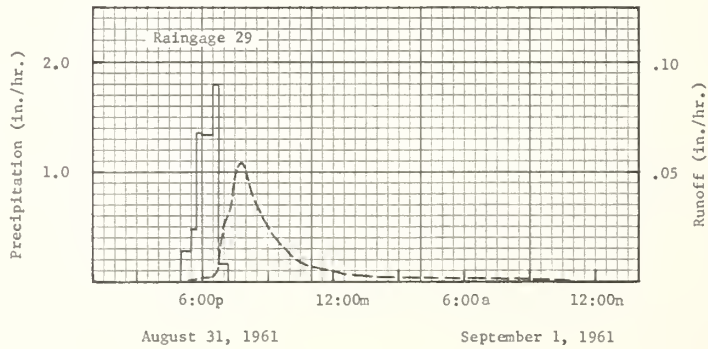
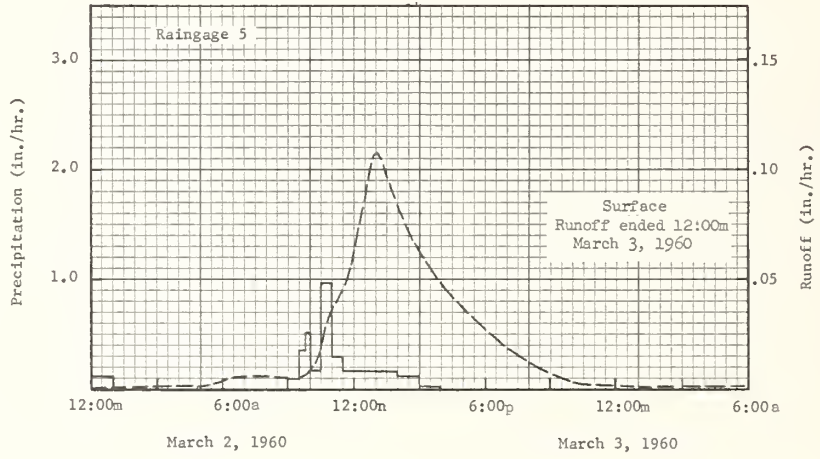
<sup>1/</sup> Raingages 4-9, 13, 15, 18-20, 25, 29, 30 and 31 Thiessen weighted.

<sup>2/</sup> Isohyetal map on page 6.11-5.

<sup>3/</sup> Rainfall for gages 4, 8 and 28 listed on page 62.5-1; gage 28 on page 62.5-2.

<sup>4/</sup> Isohyetal map on page 6.11-6.

<sup>5/</sup> Rainfall for gage 15 listed on page 62.5-2; gage 7 on page 62.1-2; gage 8 on page 62.2-3; gage 4 on p.62.7-2.



OXFORD, MISSISSIPPI WATERSHED W-12



11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Oxford, Mississippi Watershed W-17 <sup>2/</sup> Area - 32,100 ac. (50.2 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	4.69	3.42	5.61	2.32	3.38	3.14	1.95	3.76	2.67	4.77	2.67	4.10	42.48
	Q	.83	.79	2.10	.30	.47	.22	.23	.20	.18	.44	.20	.30	6.26
1961	P	.89	8.30	8.26	3.67	2.67	2.38	3.54	4.61	1.60	.96	8.39	8.87	54.14
	Q	.22	2.39	2.78	.70	.27	.25	.20	.46	.21	.18	.78	2.29	10.73

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Oxford, Mississippi Watershed W-17 <sup>2/</sup>					
---	--	--	--	--	--	--	--	--	--	--	--	--	--

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-9	C.11	3-9	.010	3-9	0.20	3-2	0.41	3-2	0.53	3-2	0.58	3-2	0.64	3-2	1.24
1961	3-6	.17	3-6	.17	3-6	.31	3-5	.54	2-20	.87	2-20	1.29	2-20	1.83	2-18	2.15

Notes: Quality of records: Q - good, P - good. Watershed conditions: About 20% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 55% pasture-idle -- good cover April - October with fair cover remainder of year; 21% woods; 2% bare gullies; 2% urban.

SELECTED RUNOFF EVENTS				Oxford, Mississippi Watershed W-17 <sup>2/</sup>					
------------------------	--	--	--	--	--	--	--	--	--

Antecedent conditions			Rainfall			Runoff <sup>3/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of March 2-3, 1960 <sup>4/</sup>								
2-2-60	0	0.0119	3-2-60	Rain Gage 29		3-2-60		
2-3	.07	.0119	12:01a	0	0	2:45a	0.0004	0
2-4	.93	.0778	1:00	.07	.07	3:00	.0007	0
2-5	.33	.1897	2:15	0	.07	6:00	.0030	.0033
2-6	0	.0274	3:15	.10	.17	7:00	.0057	.0069
2-7	0	.0178	9:00	0	.17	8:00	.0087	.0134
2-8	0	.0148	:45	.07	.22	10:00	.0107	.0296
2-9	0	.0141	10:00	.20	.27	:30	.0139	.0347
2-10	.72	.1126	:30	.44	.49	:45	.0189	.0379
2-11	0	.0193	11:00	.66	.82	11:30	.0438	.0650
2-12	0	.0133	:45	.40	1.12	12:00n	.0519	.0866
2-13	.11	.0133	12:00n	.20	1.17	:15 p	.0574	.0990
2-14	0	.0119	3:00p	.12	1.54	:30	.0673	.1138
2-15	0	.0111	4:00	.06	1.60	:45	.0790	.1308
2-16	0	.0104	6:00	.03	1.66	1:00	.0895	.1504
2-17-18	0	.0096	3-2-60	Rain Gage 4		:15	.0997	.1721
2-19	.03	.0089	9:30a	0	0	:45	.1057	.2209
2-20	.14	.0089	10:00	.14	.07	2:30	.0954	.2925
2-21	0	.0089	:15	.28	.14	3:00	.0846	.3340
2-22	0	.0089	:45	.62	.45	:45	.0685	.3882
2-23	0	.0089	11:00	.36	.57	4:30	.0568	.4324
2-24	.89	.0356	:30	.30	.72	5:00	.0469	.4560
2-25	.11	.0763	2:00 p	.15	1.10	:30	.0374	.4756
2-26	0	.0163	3:00	.08	1.18	6:00	.0321	.4916
2-27	0	.0119	6:00	.03	1.26	7:00	.0230	.5171
2-28	.11	.0111	3-2-60	Rain Gage 8		9:00	.0125	.5487
2-29	0	.0104	9:45a	0	0	12:00m	.0057	.5715
3-1	.06	.0096	10:00	.08	.02	3-3-60		
3-2	0	.0011 <sup>5/</sup>	:30	.26	.15	3:00 a	.0042	.5847
			11:00	.60	.45	6:00	.0029	.5943

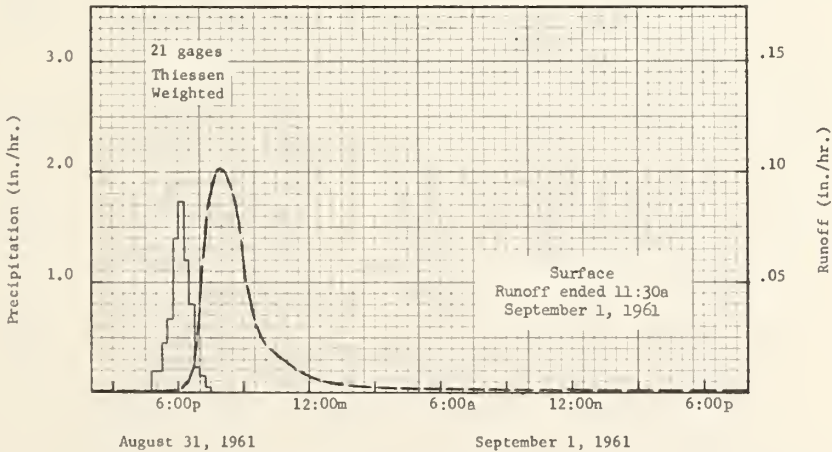
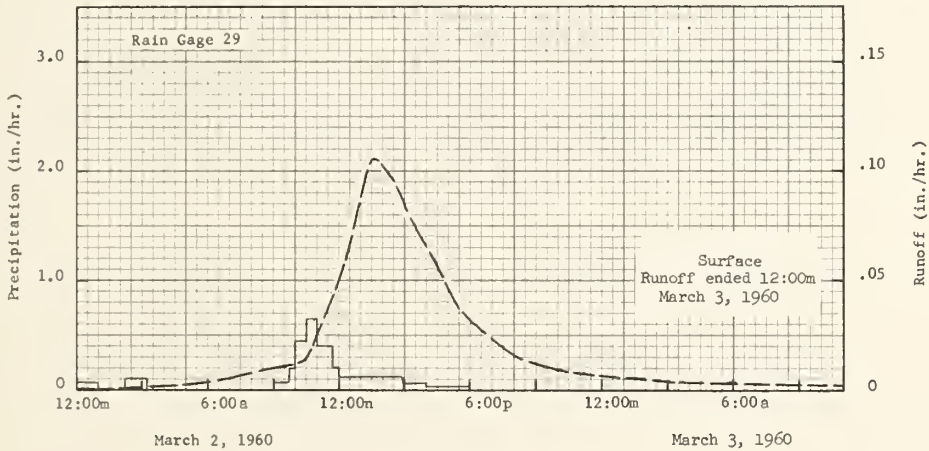
Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 32,367. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 965, p. 62.5-5. <sup>1/</sup> Raingages 2, 4-9, 13-15, 17-20, 22, 25, 28-31 Thiessen weighted. <sup>2/</sup> About 18% of area behind small desilting and retention dams. Watershed W-17A not included. <sup>3/</sup> Water temperature under 40° F. <sup>4/</sup> Isohyetal map on p. 62.11-5. <sup>5/</sup> Runoff prior to 2:45a.

SELECTED RUNOFF EVENTS						Oxford, Mississippi Watershed W-17			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of March 2-3, 1960 - continued</u>									
Watershed Conditions: 20% of area cotton and corn residue - fair to poor cover; 13% pasture, 42% idle, 21% woods - good to fair cover; 2% bare gul'ies; 2% urban.			3-2-60			3-3-60			
			11:30 a	0.30	0.60	12:00n	0.0020	0.6063	
			12:00n	.50	.85	12:00m	.0012 <sup>2/</sup>	.6207	
			:30 p	.60	1.15				
			1:00	.34	1.32				
			3:00	.19	1.70				
			5:00	.05	1.80				
			3-2-60	Rain Gage 28					
			9:45a	0	0				
			10:15	.22	.10				
			11:00	.61	.56				
			:30	.48	.80				
			12:00n	.16	.88				
			2:00p	.13	1.13				
			4:00	.08	1.29				
			6:00	.04	1.36				
			3-2-60	20 Rain Gages <sup>1/</sup>					
			12:01a	0	0				
			1:00	.06	.06				
			3:00	.02	.10				
		4:00	.05	.15					
		8:00	T	.15					
		9:30	.02	.18					
		10:00	.12	.24					
		:15	.29	.32					
		:30	.47	.44					
		11:15	.59	.88					
		:30	.43	.99					
		12:00n	.26	1.11					
		2:00p	.15	1.41					
		4:00	.07	1.55					
		6:00	.01	1.57					
			Additional rainfall data <sup>3/</sup>						
<u>Event of August 31 - September 1, 1961 <sup>4/</sup></u>									
8-1-61	0	0.0055	8-31-61	Rain Gage 15		8-31-61			
8-2	.14	.0059	4:55p	0	0	5:15p	0.0003	0	
8-3	0	.0057	5:15	.45	.15	:50	.0005	.0002	
8-4	0	.0055	:30	2.20	.65	6:00	.0008	.0003	
8-5	1.34	.0181	:50	1.59	1.18	:10	.0017	.0005	
8-6	0	.0093	6:00	.72	1.30	:45	.0135	.0049	
8-7	.29	.0077	:15	3.60	2.20	7:00	.0447	.0122	
8-8	.12	.0089	:30	3.28	3.02	:15	.0670	.0262	
8-9	0	.0072	:35	3.00	3.27	:30	.0900	.0458	
8-10	0	.0057	:45	.30	3.33	:40	.0981	.0615	
8-11	0	.0053	7:00	.24	3.39	8:00	.1013	.0947	
8-12	.25	.0144				:20	.0986	.1280	
8-13	0	.0068	8-31-61	20 Rain Gages <sup>1/</sup>		:40	.0858	.1587	
8-14	0	.0061	4:45p	0	0	9:15	.0458	.1883	
8-15	.15	.0057	5:00	.20	.05	:45	.0268	.2065	
8-16-18	0	.0165	:15	.20	.10	10:00	.0222	.2126	
8-19	.01	.0055	:30	.44	.21	11:00	.0146	.2306	
8-20-21	0	.0110	:45	.68	.38	12:00m	.0066	.2413	
8-22	0	.0057	6:00	1.40	.73				
8-23	.48	.0081	:15	1.72	1.16	9-1-61			
8-24	.02	.0065	:30	1.20	1.46	1:30a	.0047	.2499	
8-25	.01	.0063	:45	.80	1.66	2:45	.0029	.2547	
8-26-30	0	.0332	7:00	.24	1.72	3:30	.0021	.2566	
8-31	.18 <sup>5/</sup>	.0048 <sup>6/</sup>	:15	.16	1.76	4:30	.0015	.2584	
			:30	.04	1.77	6:00	.0010	.2604	

Notes: To convert runoff in in/hr to cfs, multiply by 32,367.  
<sup>1/</sup> Rain gages 2, 4-9, 13-15, 17-20, 22, 25, 28-31 Thiessen weighted. <sup>2/</sup> Normal base flow.  
<sup>3/</sup> Rainfall for gages 5 and 15 listed on page 62.4-1 and gage 8 listed on page 62.2-1.  
<sup>4/</sup> Isohyetal map on page 62.11-6.  
<sup>5/</sup> Prior to 4:55p.  
<sup>6/</sup> Runoff prior to 5:15p.

SELECTED RUNOFF EVENTS					Oxford, Mississippi Watershed W-17			
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31 - September 1, 1961 - continued								
Watershed Conditions: 20% of area in mature cotton and corn - fair cover; 13% pasture, 42% idle, 21% woods - good cover; 2% bare gullies; 2% urban.			8-31-61 7:45p	0.02	1.78	9-1-61 7:30a 11:30	0.0007 .0006 <u>1/</u>	0.2618 .2646
			Additional rainfall data <u>2/</u>					
Notes: <u>1/</u> Normal base flow. <u>2/</u> Rainfall for gage 29 listed on page 62.4-2; gage 8 on page 62.2-2; gage 7 on page 62.1-2 and gage 4 on page 62.7-2.								



OXFORD, MISSISSIPPI WATERSHED W-17

11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Oxford, Mississippi Watershed W-19 (Area - 243 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	4.62	3.78	5.20	3.07	3.35	3.62	3.51	4.59	1.95	3.71	2.70
	Q	.16	.48	1.15	.07	.21	.01	.12	.02	0	.07	.01	.01	2.31
1961	P	.84	7.66	9.40	4.09	2.38	1.84	3.39	7.16	1.36	1.18	7.40	9.43	56.14
	Q	0	.93	2.06	.39	0	0	0	.70	0	0	.23	2.00	6.31

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Oxford, Mississippi Watershed W-19								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-9	0.10	3-9	0.10	3-9	0.18	3-9	0.29	3-2	0.37	3-2	0.40	3-2 & 3-9	0.42	3-2	0.79
1961	3-7	.41	3-7	.33	3-7	.50	3-7	.73	3-7	.81	3-7	1.08	3-6	1.38	3-5	1.55

Notes: Quality of records: Q - fair, P - good. Watershed conditions: About 2% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 68% pasture-idle -- good cover April - October with fair cover remainder of year; 29% woods; 1% bare gullies.

SELECTED RUNOFF EVENTS						Oxford, Mississippi Watershed W-19					
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
<u>Event of January 17, 1960 2/</u>											
12-18-59	0.70	0.0500	1-17-60			1-17-60					
12-27	.76	0	5:00a	0	0	6:10a	0	0			
1-1-60	.06	0	:15	.08	.02	:45	.0008	.0005			
1-2	.22	0	6:00	.88	.24	7:15	.0045	.0028			
1-5	1.30	0	:55	.41	.62	:30	.0106	.0055			
1-12	.01	0	7:15	.21	.69	8:00	.0122	.0116			
1-13	.35	0	:30	.40	.79	:30	.0183	.0208			
1-14	.08	0	8:00	.14	.86	:50	.0347	.0318			
1-16	.06	0	:15	.40	.96	9:00	.0318	.0368			
			:30	.12	.99	:30	.0216	.0476			
Watershed Conditions: 2% of area cotton and corn residue - fair to poor cover; 4% pasture, 64% idle, 29% woods - fair to good cover; 1% bare gullies.							10:30	.0102	.0578		
							12:15p	.0032	.0634		
							3:15	.0012	.0670		
							8:00	.0003	.0684		
			12:00m	.0001 <sup>3/</sup>	.0688						
<u>Event of August 31 - September 1, 1961 4/</u>											
8-2-61	0.10	0	8-31-61			8-31-61					
8-5	2.55	.3123	5:00p	0	0	6:00p	0	0			
8-6	0	.0021	:15	.28	.07	:10	.0189	.0016			
8-7	.25	0	:25	.12	.09	:15	.0689	.0053			
8-8	.01	0	:35	1.86	.40	:20	.2775	.0197			
8-10	.01	0	:55	2.85	1.35	:27	.3017	.0535			
8-12	1.85	.1647	6:05	.30	1.40	:45	.2106	.1304			
8-13	0	.0004	:25	.09	1.43	:55	.1702	.1621			
8-15	.29	0	:45	.36	1.55	7:15	.0522	.1992			
8-23	.30	0	7:15	.10	1.60	:30	.0232	.2086			
8-24	.10	0				:45	.0168	.2136			
8-25	.10	0				8:15	.0088	.2200			
						:45	.0048	.2234			
						9:15	.0031	.2259			
						:45	.0023	.2273			

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 2.45. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 62.6-5.  
<sup>1/</sup> Rain gage 2.  
<sup>2/</sup> Isohyetal map on page 62.3-4.  
<sup>3/</sup> Normal base flow. <sup>4/</sup> Isohyetal map on page 62.11-6.





11-62

MONTHLY PRECIPITATION <sup>3/</sup> AND RUNOFF (Inches)								Oxford, Mississippi Watershed W-24 <sup>2/</sup> (Area - 511 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	4.69	3.28	5.75	2.16	3.47	3.25	1.83	3.91	3.27	4.81	2.66
	Q	.90	1.13	1.81	.17	.43	.01	.02	0	.01	.38	.01	.09	4.96
1961	P	.89	8.38	8.66	3.82	2.59	2.40	3.48	3.89	1.87	1.01	7.96	8.32	53.27
	Q	0	1.86	2.40	.89	.20	.02	.05	.13	.05	.01	.88	1.92	8.41

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Oxford, Mississippi Watershed W-24 <sup>2/</sup>								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-5	0.41	10-5	0.27	10-5	0.34	10-5	0.36	10-5	0.37	3-2	0.41	3-2 & 3-9	0.47	3-2	0.96
1961	3-7	.26	3-5	.17	3-5	.28	3-5	.41	2-20	.67	2-20	.98	3-6	1.18	2-20	1.73

Notes: Quality of records: Q - good in 1960, fair in 1961; P - good. Watershed conditions: About 3% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 35% pasture-idle -- good cover April - October with fair cover remainder of year; 59% woods, 3% bare gullies.

SELECTED RUNOFF EVENTS						Oxford, Mississippi Watershed W-24 <sup>2/</sup>		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of January 17, 1960<sup>3/</sup></u>								
12-18-59	1.31	0.4610	1-17-60	Rain Gage 4		1-17-60		
12-19	0	.0233	5:15a	0	0	5:30a	0	0
12-20	0	.0093	6:30	.32	.40	6:15	.0006	.0002
12-21	0	.0047	7:00	.40	.60	7:00	.0012	.0008
12-27	.86	.0931	:50	.18	.75	:30	.0310	.0089
12-28	0	.0186	8:25	.29	.92	:45	.0485	.0189
						8:15	.0582	.0456
1-1-60	.10	0	1-17-60	3 Rain Gages <sup>1/</sup>		:45	.0698	.0776
1-2	.20	0	4:45a	0	0	:55	.0757	.0898
1-4	0	.0047	5:15	.04	.02	9:15	.0679	.1138
1-5	1.22 <sup>4/</sup>	.0093	6:15	.28	.30	:45	.0466	.1418
1-6	0	.0186	:45	.04	.32	11:15	.0194	.1883
1-7	0	.0093	7:00	.36	.41	2:15p	.0083	.2273
1-8	0	.0093	:45	.16	.53	6:00	.0039	.2498
1-9	0	.0419 <sup>5/</sup>	8:15	.28	.67	12:00m	.0023 <sup>6/</sup>	.2684
1-10	0	.0419	:30	.12	.70			
1-11	0	.0093						
1-12	0	.0047						
1-13	.38	.0047						
1-14	.07	.0186						
1-15	0	.0047						
1-16	.07	0						

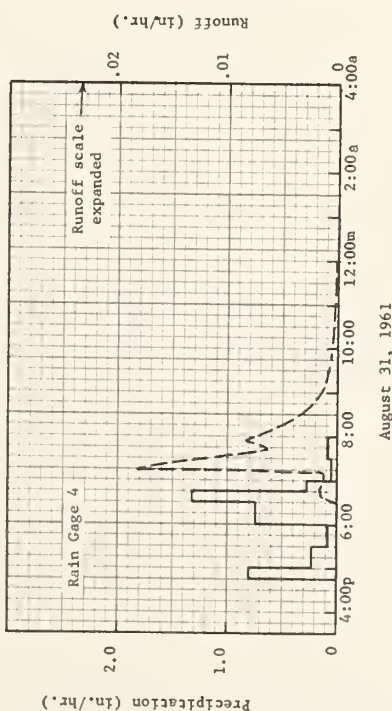
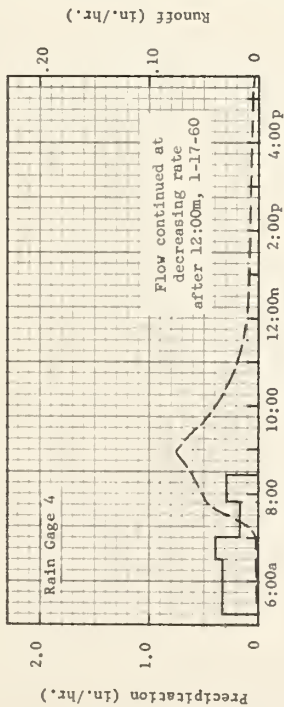
Watershed Conditions: 3% of area cotton and corn residue - fair to poor cover; 3% pasture, 32% idle, 59% woods - fair to good cover; 3% bare gullies.

Notes: To convert runoff in in/hr to cfs, multiply by 515.3. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 62.7-4.  
<sup>1/</sup> Rain gages 4, 30, and 31 Thiessen weighted. <sup>2/</sup> About 6% of area behind small desilting and retention dams.  
<sup>3/</sup> Isohyetal map on page 62.3-4.  
<sup>4/</sup> Approximately .05 fell as rain; remainder fell as snow.  
<sup>5/</sup> Runoff during this period from snow melt. <sup>6/</sup> Flow continued at decreasing rate after 12:00m.

SELECTED RUNOFF EVENTS			Oxford, Mississippi Watershed W-24					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31, 1961 <sup>2/</sup>								
8-5-61	0.76	0.0090	8-31-61	Rain Gage 4		8-31-61		
8-6	0	.0008	4:45p	0	0	6:30p	0	0
8-7	1.10	.0905	5:00	.80	.20	:37	.0016	.0001
8-8	.18	.0018	:30	.22	.31	:48	.0018	.0004
8-12	.18	0	6:00	.08	.35	7:00	.0011	.0007
8-15	.03	0	:30	.74	.62	:12	.0013	.0009
8-23	.42	0	:45	1.32	.95	:15	.0182	.0014
8-24	.03	0	7:00	.28	1.02	:43	.0063	.0051
8-25	.01	0	:30	.06	1.05	:52	.0083	.0062
			8:00	.08	1.09	8:30	.0032	.0099
			8-31-61	3 Rain Gages <sup>1/</sup>		9:15	.0010	.0114
			4:45p	0	0	:45	.0005	.0118
			5:00	.92	.23	12:00m	0	.0125
			:15	.24	.29			
			:30	.16	.33			
			:45	.04	.34			
			6:00	.36	.43			
			:15	.68	.60			
			:30	.92	.83			
			:45	.68	1.00			
			7:00	.24	1.06			
			:15	.28	1.13			
			:30	.08	1.15			

Watershed Conditions: 3% of area in mature cotton and corn - fair cover; 3% pasture, 32% idle, 59% wooda - good cover; 3% bare gullies.

Notes: To convert runoff in in/hr to cfs, multiply by 515.3.  
<sup>1/</sup> Rain gages 4, 30, and 31 Thiessen weighted.  
<sup>2/</sup> Isohyetal map on page 62.11-6.



OXFORD, MISSISSIPPI WATERSHED W-24

11-62

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Oxford, Mississippi Watershed W-28 <sup>2/</sup> Area - 1,080 ac. (1.69 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	4.85	2.98	5.76	1.61	3.23	2.65	1.66	3.73	3.05	5.73	2.70	4.10	42.05
	Q	.11	.08	.44	0	.02	0	0	0	0	.20	0	T	.85
1961	P	.85	8.53	8.25	4.19	2.65	2.81	3.59	2.78	2.26	.90	8.22	8.54	53.57
	Q	0	.61	.89	.22	.01	.03	0	0	.05	0	.18	.31	2.30

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Oxford, Mississippi Watershed W-28 <sup>2/</sup>								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	10-5	0.12	10-5	0.10	10-5	0.14	10-5	0.15	10-5	0.15	3-2	0.16	3-2	0.16	3-2	0.29
1961	3-5	.19	3-5	.15	3-5	.26	3-5	.33	3-5	.36	2-20	.38	2-20	.51	3-5	.62

Notes: Quality of records: Q - fair, P - good. Watershed conditions: About 12% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 58% pasture-idle -- good cover April - October with fair cover remainder of year; 26% woods; 4% bare gullies.

SELECTED RUNOFF EVENTS					Oxford, Mississippi Watershed W-28 <sup>2/</sup>				
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of January 17, 1960<sup>3/</sup></u>									
12-18-59	1.41	0.2200	1-17-60	Rain Gage 6		1-17-60			
12-27	.92	.0220	4:00a	0	0	6:40a	0	0	
			5:15	.02	.03	7:15	.0063	.0013	
1-1-60	.15	0	6:00	.27	.20	:45	.0220	.0086	
1-2	.21	0	7:15	.36	.65	8:00	.0413	.0164	
1-5	1.24	0	:55	.26	.82	:15	.0468	.0277	
1-13	.41	0	8:15	.30	.92	:30	.0422	.0388	
1-14	.11	0	:30	.12	.95	9:15	.0220	.0629	
1-16	.08	0				10:00	.0069	.0723	
			1-17-60	Rain Gage 5		11:15	.0017	.0771	
			5:15a	0	0	3:00p	.0004	.0809	
			6:00	.29	.22	12:00m	.0001 <sup>4/</sup>	.0827	
			7:05	.38	.63				
			:50	.20	.78				
			8:20	.08	.82				
			1-17-60	3 Rain Gages					
			4:45a	0	0				
			6:00	.17	.21				
			7:00	.36	.57				
			8:00	.27	.84				
			:45	.20	.99				
<u>Event of November 15-16, 1961</u>									
10-25-61	0.01	0	11-15-61	Rain Gage 6		11-15-61			
10-31	.06	0	8:30p	0	0	10:45p	0	0	
11-2	.18	0	:45	.16	.04	:55	.0488	.0041	
11-3	1.71	0	9:15	.02	.05	11:00	.1066	.0106	
11-5	.43	0	:45	.10	.10	:15	.1456	.0421	

Continued on next page

Notes: To convert runoff in in/hr to cfs, multiply by 1,089. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 62.8-5.  
<sup>1/</sup> Raingages 5, 6 and 7 Thiessen weighted.  
<sup>2/</sup> About 60% of area is non-contributing due to small desilting and retention dams; no overflow occurred.  
<sup>3/</sup> Isohyetal map on page 62.3-4.  
<sup>4/</sup> Flow continued at decreasing rate after 12:00m.



**SELECTED RUNOFF EVENTS**

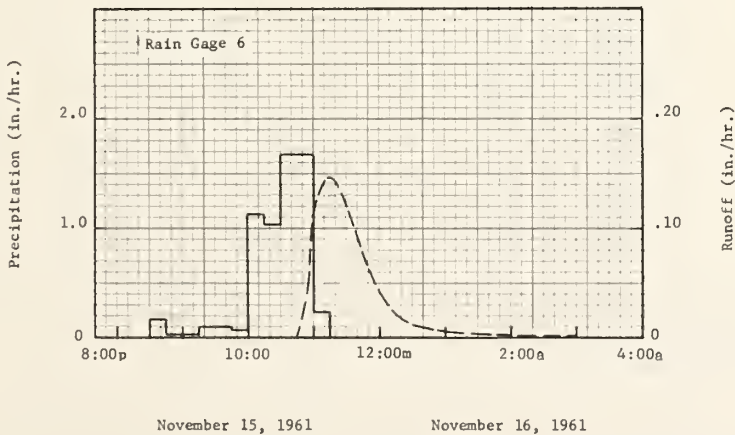
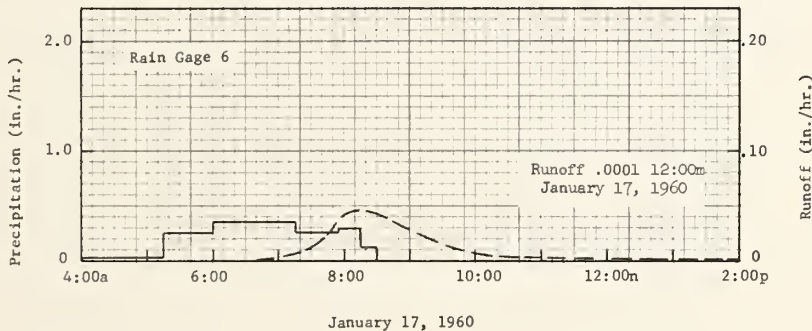
Oxford, Mississippi Watershed W-28

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of November 15-16, 1961 - continued</u>								
11-11	0.37	0	11-15-61			11-15-61		
11-12	.61	0	10:00p	0.08	0.12	11:30p	0.1238	0.0758
11-13	.22	0	:15	1.12	.40	:45	.0770	.1009
11-14	.12	0	:30	1.04	.66	12:00m	.0432	.1159
11-15	.81	0	11:00	1.68	1.50	11-16-61		
			:15	.24	1.56	12:15a	.0203	.1238
			11-15-61	Rain Gages <sup>1/</sup>		1:00	.0039	.1329
			8:30p	0	0	:30	.0004	.1340
			:45	.16	.04	2:00	.0001	.1341
			9:00	.01	.04	3:00	0	.1342
			:15	.04	.05			
			:30	.04	.06			
			:45	.16	.10			
			10:00	.12	.13			
			:15	1.12	.41			
			:30	1.12	.69			
			:45	2.28	1.26			
			11:00	1.00	1.51			
			:15	.16	1.55			

Watershed Conditions: 12% of area in matured cotton and corn - fair cover; 10% pasture, 48% idle, 26% woods - good to fair cover; 4% bare gullies.

Notes: To convert runoff in in/hr to cfs, multiply by 1,089.

<sup>1/</sup> Rain gages 5, 6 and 7 Thiessen weighted.



OXFORD, MISSISSIPPI    WATERSHED W-28

11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)													Oxford, Mississippi Watershed W-32 <sup>2/</sup> Area - 20,000 ac. (31.3 sq. mi.)		
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
		1960	P	4.66	3.38	5.68	2.67	3.24	2.73	1.73	3.49	2.66	4.51	2.58	4.18
	Q	1.02	.94	2.77	.15	.53	.02	.01	.01	0	.46	.03	.11	6.05	
1961	P	.69	8.75	8.65	3.16	3.25	1.83	4.19	3.55	1.30	.85	8.44	9.28	53.94	
	Q	.03	3.81	3.56	.60	.27	.05	.28	.39	.05	0	.85	3.52	13.41	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Oxford, Mississippi Watershed W-32 <sup>2/</sup>						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-2	0.21	3-2	0.20	3-2	0.38	3-2	0.83	3-2	1.03	3-2	1.10	3-2	1.15	3-2	1.88
1961	3-6	.28	3-5	.27	3-5	.50	3-5	.83	2-20	1.53	2-20	2.14	2-20	2.98	2-18	3.47

Notes: Quality of records: Q - good, P - good. Watershed conditions: About 23% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 63% pasture-idle -- good cover April - October with fair cover remainder of year; 12% woods; 2% bare gullies.

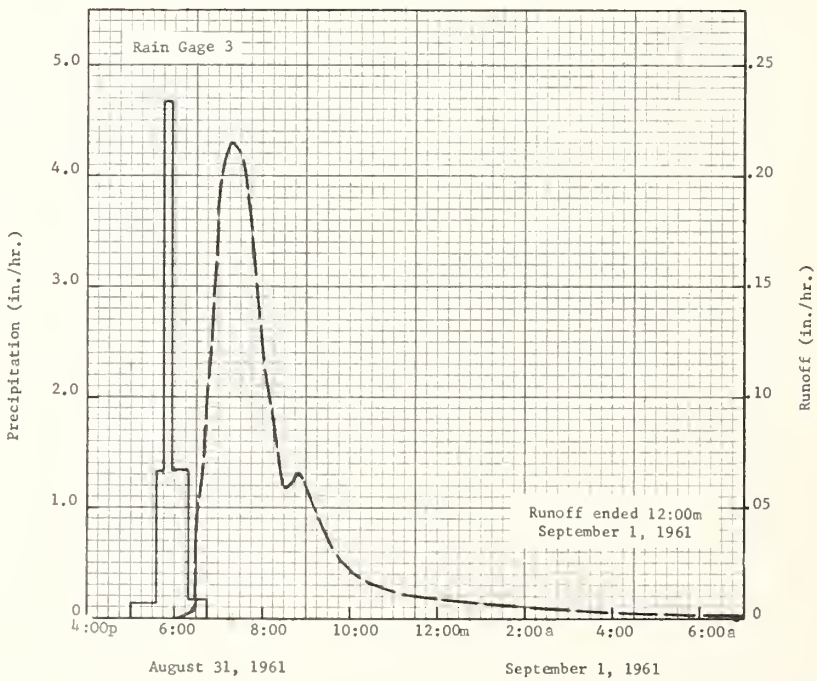
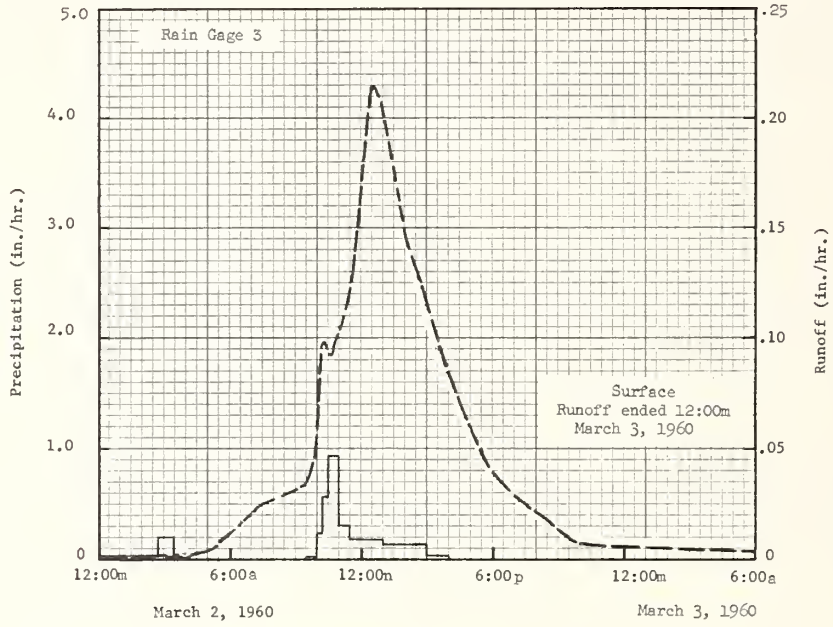
SELECTED RUNOFF EVENTS										Oxford, Mississippi Watershed W-32 <sup>2/</sup>			
Antecedent conditions				Rainfall				Runoff <sup>3/</sup>					
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)					
Event of March 2-3, 1960 <sup>4/</sup>													
2-2-60	0	0.0007	3-2-60	Rain Gage 3		3-2-60							
2-3	0.07	.0005	12:01 a	0	0	12:05 a	0.0001	0					
2-4	1.07	.1378	2:45	.03	.10	4:00	.0006	.0006					
2-5	.22	.3909	3:30	.20	.25	:30	.0030	.0016					
2-6	0	.0333	9:30	0	.25	5:30	.0079	.0073					
2-7	0	.0131	10:00	.02	.26	7:00	.0242	.0217					
2-8	0	.0048	:15	.24	.32	9:30	.0352	.0547					
2-9	0	.0025	:30	.56	.46	10:00	.0590	.0637					
2-10	.64	.1188	11:00	.92	.92	:15	.0972	.0773					
2-11	0	.0081	:30	.30	1.07	:40	.0920	.1156					
2-12	0	.0032	1:00 p	.17	1.32	11:00	.1046	.1494					
2-13	.10	.0042	3:00	.13	1.57	:30	.1250	.2048					
2-14	0	.0032	4:00	.03	1.60	:45	.1478	.2387					
2-15	0	.0015				12:00 n	.1716	.2786					
2-16	0	.0011	3-2-60	10 Rain Gages <sup>1/</sup>		:15 p	.1983	.3244					
2-17	0	.0007	12:01 a	0	0	:30	.2142	.3749					
2-18	0	.0005	1:00	.06	.06	1:00	.2042	.4804					
2-19	.08	.0004	2:00	.01	.07	:30	.1755	.5755					
2-20	.14	.0002	4:00	.08	.23	2:00	.1468	.6567					
2-21	0	.0004	6:00	.01	.25	:45	.1250	.7581					
2-22	0	.0004	8:30	T	.25	3:30	.1000	.8424					
2-23	0	.0002	9:00	.02	.26	4:15	.0783	.9096					
2-24	.88	.0618	:30	.04	.28	5:00	.0580	.9604					
2-25	.11	.1283	10:00	.20	.38	6:00	.0394	1.0083					
2-26	0	.0131	:45	.47	.73	8:00	.0219	1.0659					
2-27	0	.0018	11:00	.72	.91	10:00	.0068	1.0907					
2-28	.08	.0011	:15	.88	1.13	12:00 m	.0058	1.1031					
2-29	0	.0005	12:00 n	.32	1.37	3-3-60							
3-1	.10	.0002	2:00 p	.15	1.67	3:00 a	.0046	1.1172					
			3:00	.08	1.75	6:00	.0033	1.1268					
			4:00	.03	1.79	12:00 n	.0020	1.1388					
			6:00	.01	1.81	12:00 m	.0009 <sup>5/</sup>	1.1496					

Watershed Conditions: 23% of area cotton and corn residue - fair to poor cover; 14% pasture, 49% idle, 12% woods - good to fair cover; 2% bare gullies.

Notes: To convert runoff in in/hr to cfs, multiply by 20,166.6.  
 For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59. USDA Misc. Pub. 945, p. 62.10-5.  
<sup>1/</sup> Ringages 3, 10-14, 20, 21, 24, and 26, Thiessen weighted. <sup>2/</sup> About 12% of area behind small desilting and retention dams. <sup>3/</sup> Water temperature below 40° F. <sup>4/</sup> Isohyetal map on p. 62.11-5. <sup>5/</sup> Normal base flow.



11-62



OXFORD, MISSISSIPPI WATERSHED W-32



11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Oxford, Mississippi Watershed W-34 <sup>2/</sup> Area - 75,000 ac. (117.2 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	4.65	3.34	5.49	2.77	3.24	3.26	2.32	3.86	2.57	4.59	2.70	4.13	42.92
	Q	1.36	1.23	2.67	.58	.79	.37	.44	.38	.32	.63	.37	.59	9.73
1961	P	.77	8.28	8.62	3.50	2.76	2.34	3.68	4.41	1.73	.99	7.98	9.10	54.16
	Q	.42	3.10	3.67	1.02	.53	.40	.44	.57	.39	.31	.99	3.05	14.89

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Oxford, Mississippi Watershed W-34 <sup>2/</sup>

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-2	0.06	3-2	0.06	3-2	0.12	3-2	0.36	3-2	0.58	3-2	0.64	3-2	0.75	3-2	1.42
1961	2-20	.07	2-20	.07	2-20	.14	2-20	.43	2-20	.84	2-20	1.44	2-20	2.09	2-18	2.57

Notes: Quality of records: Q - good except fair for out-of-bank flow; P - good. Watershed conditions: About 22% in cultivation (cotton and corn) -- fair cover November - March; poor cover during April and May improving to good by mid-July; 55% pasture-idle -- good cover April - October with fair cover remainder of year; 21% woods, 2% bare gullies.

SELECTED RUNOFF EVENTS Oxford, Mississippi Watershed W-34 <sup>2/</sup>

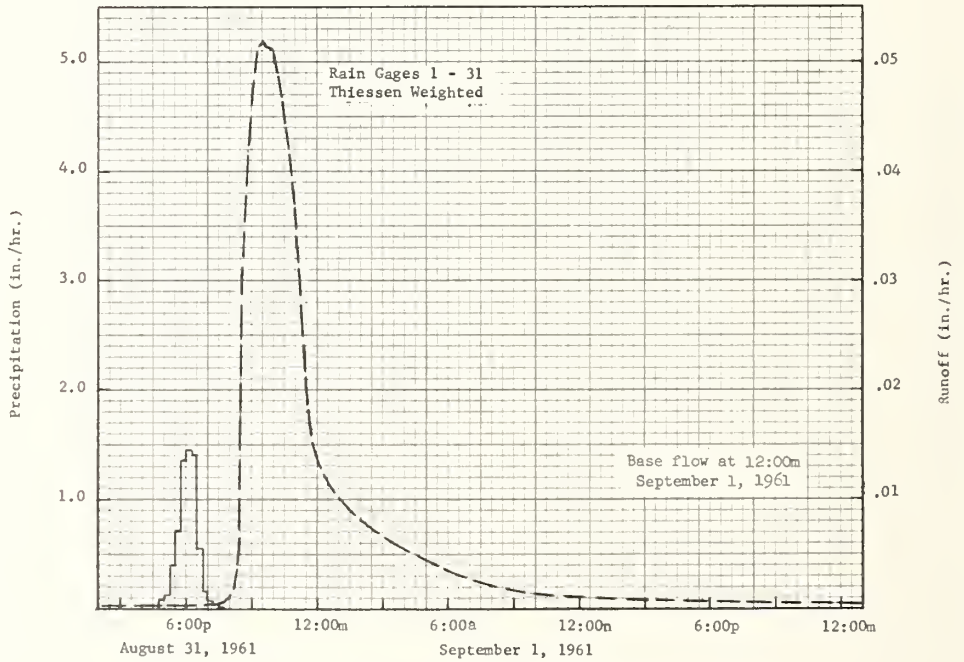
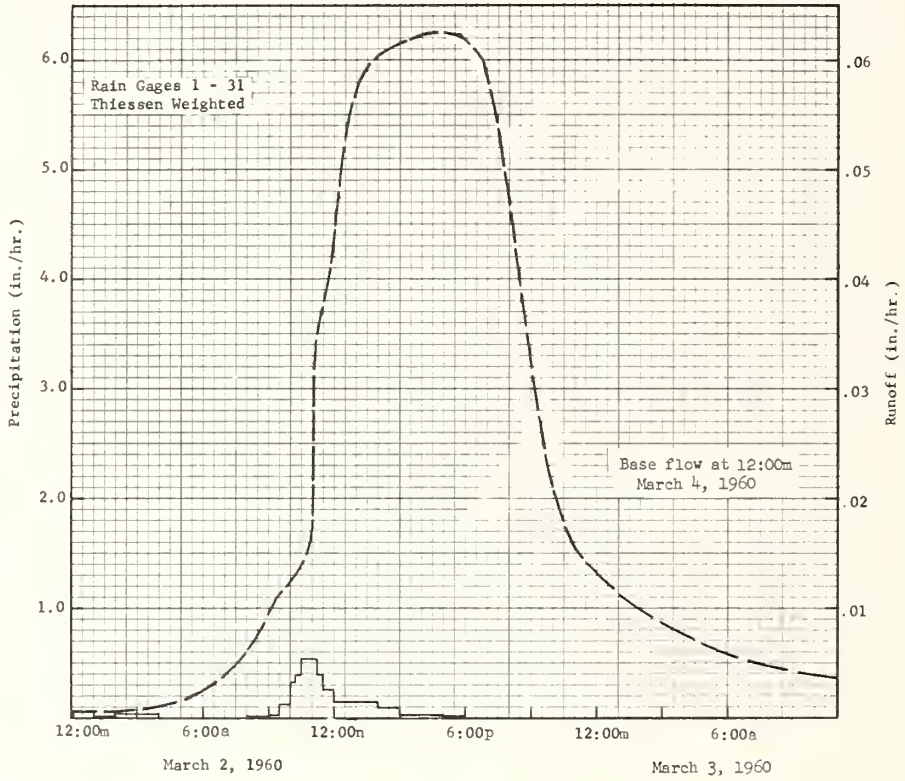
Antecedent conditions			Rainfall			Runoff <sup>3/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of March 2-4, 1960 <sup>4/</sup>								
2-2-60	0	0.0175	3-2-60	Rain Gage 14		3-2-60		
2-3	.07	.0159	9:30a	0	0	12:05a	0.0007 <sup>5/</sup>	0
2-4	.92	.0823	10:00	.02	.01	3:15	.0009	.0025
2-5	.27	.2505	:30	.10	.06	5:00	.0015	.0046
2-6	0	.0467	11:00	.50	.31	6:00	.0025	.0066
2-7	0	.0248	:30	.62	.62	7:00	.0037	.0097
2-8-9	0	.0416	12:00m	.34	.79	8:30	.0078	.0183
2-10	.74	.0212	1:00	.11	.90	9:15	.0104	.0251
2-11	0	.0299	2:00	.17	1.07	10:00	.0126	.0337
2-12	0	.0181	3:00	.08	1.15	:45	.0151	.0441
2-13	.10	.0181	5:00	.03	1.21	11:00	.0182	.0483
2-14-17	0	.0674				:15	.0355	.0550
2-18	0	.0165	3-2-60	Rain Gage 1		:45	.0400	.0739
2-19	.04	.0156	9:30a	0	0	12:15p	.0474	.0957
2-20	.14	.0153	10:45	.09	.14	1:15	.0588	.1497
2-21-22	0	.0330	11:00	.28	.21	3:00	.0617	.2544
2-23	0	.0153	12:00m	.46	.67	4:15	.0626	.3322
2-24	.89	.0518	:30p	.26	.80	5:45	.0624	.4260
2-25	.11	.1513	1:00	.12	.86	6:45	.0600	.4873
2-26	0	.0289	:30	.18	.95	7:45	.0501	.5422
2-27	0	.0184	2:00	.10	1.00	8:45	.0366	.5856
2-28	.10	.0181	:15	.04	1.01	9:30	.0260	.6091
2-29	0	.0165	:45	.18	1.10	10:45	.0164	.6350
3-1	.06	.0153	4:30	.05	1.19	12:00m	.0134	.6534
			7:00	.02	1.25			
Watershed Conditions: 22% of area cotton and corn residue - fair to poor cover; 13% pasture, 42% idle, 21% woods - good to fair cover; 2% bare gullies.			3-2-60	Rain Gage 12		3-3-60		
			9:30a	0	0	2:00s	.0100	.6764
			10:00	.08	.04	5:30	.0060	.7034
			:15	.24	.10	12:45p	.0033	.7360
			:45	.74	.47	5:00	.0024	.7479

Notes: To convert runoff in in/hr to cfs, multiply by 75,625. For map of watershed, see Hydrologic Dets for Experimental Agricultural Watersheds in U. S., 1956-59, USDA Misc. Pub. 945, p. 62.11-4.  
<sup>1/</sup> Raingages 1-31 Thiessen weighted.  
<sup>2/</sup> About 15% of area, principally, in upper reaches, behind small desilting and retention dams.  
<sup>3/</sup> Water temperature below 40° F.  
<sup>4/</sup> Isohyetal map on page 62.11-5.  
<sup>5/</sup> Base flow at beginning of event.

SELECTED RUNOFF EVENTS				Oxford, Mississippi Watershed W-34				
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of March 2-4, 1960 - continued <sup>2/</sup>								
			3-2-60			3-3-60		
			11:00a	0.32	0.55	12:00m	0.0017	0.7619
			1:00p	.15	.85			
			3:00	.10	1.06	3-4-60		
			5:00	.05	1.16	12:00m	.0008 <sup>3/</sup>	.7908
			3-2-60	Rain Gage 13				
			9:30a	0	0			
			10:00	.06	.03			
			11:30	.26	.42			
			:50	1.95	1.07			
			12:00n	.18	1.10			
			2:00p	.14	1.37			
			4:00	.05	1.52			
			6:00	.02	1.56			
			3-2-60	32 Rain Gages <sup>1/</sup>				
			12:01a	0	0			
			1:00	.06	.06			
			2:00	.01	.07			
			4:00	.04	.15			
			8:00	T	.16			
			9:00	.01	.17			
			:30	.02	.18			
			10:00	.12	.24			
			:15	.32	.32			
			:30	.40	.42			
			11:15	.56	.86			
			:30	.40	.96			
			12:00n	.28	1.10			
			2:00p	.15	1.40			
			3:00	.10	1.50			
			5:00	.03	1.56			
			6:00	.02	1.58			
			Additional rainfall data <sup>4/</sup>					
Event of August 31 - September 1, 1961 <sup>5/</sup>								
8-1-61	0	0.0098	8-31-62	Rain Gages <sup>1/</sup>		8-31-62		
8-2	.13	.0100	4:45p	0	0	7:15p	0.0004 <sup>3/</sup>	0
8-3	0	.0100	5:00	.08	.02	:30	.0004	.0001
8-4	0	.0100	:15	.12	.05	:45	.0006	.0002
8-5	1.03	.0378	:30	.40	.15	8:00	.0013	.0005
8-6	0	.0675	:45	.72	.33	:15	.0033	.0011
8-7	.27	.0131	6:00	1.36	.77	:25	.0120	.0024
8-8	.14	.0215	:15	1.44	1.03	:30	.0259	.0040
8-9	0	.0113	:30	1.40	1.38	:50	.0419	.0153
8-10	0	.0111	:45	.56	1.52	9:00	.0469	.0227
8-11	0	.0111	7:00	.16	1.56	:15	.0508	.0337
8-12	.31	.0169	:15	.08	1.58	:30	.0519	.0466
8-13	0	.0182	:30	.04	1.59	:40	.0516	.0552
8-14	0	.0100	:45	.01	1.59	10:00	.0510	.0723
8-15	.21	.0111				:35	.0435	.0999
8-16	0	.0107	8-31-61	Rain Gage 16		:45	.0411	.1070
8-17	0	.0107	5:00p	0	0	11:00	.0366	.1167
8-18	0	.0107	:10	1.08	.18	:15	.0293	.1250
8-19	.03	.0107	:40	.42	.39	:20	.0263	.1273
8-20	0	.0107	6:00	.48	.55	:30	.0210	.1313
8-21	0	.0107	:15	.04	.56	:45	.0163	.1360
8-22	0	.0107	:20	.60	.61	12:00m	.0138	.1398
8-23	.58	.0107	:50	.12	.67			
8-24	.02	.0107	7:00	.18	.70	9-1-61		
8-25	.02	.0107				12:30a	.0116	.1462

Notes: To convert runoff in in/hr to cfs, multiply by 75,625.  
<sup>1/</sup> Rain gages 1-31 Thiessen weighted.  
<sup>2/</sup> Isohyetal map on page 62.11-5.  
<sup>3/</sup> Base flow. <sup>4/</sup> Rainfall for gages 4, 8 and 29 listed on page 62.5-1; gage 3 on page 62.10-1; gage 28 on page 62.5-2; gage 10 on page 62.12-1; and gages 5 and 15 on page 62.4-1.  
<sup>5/</sup> Isohyetal map on page 62.11-6.

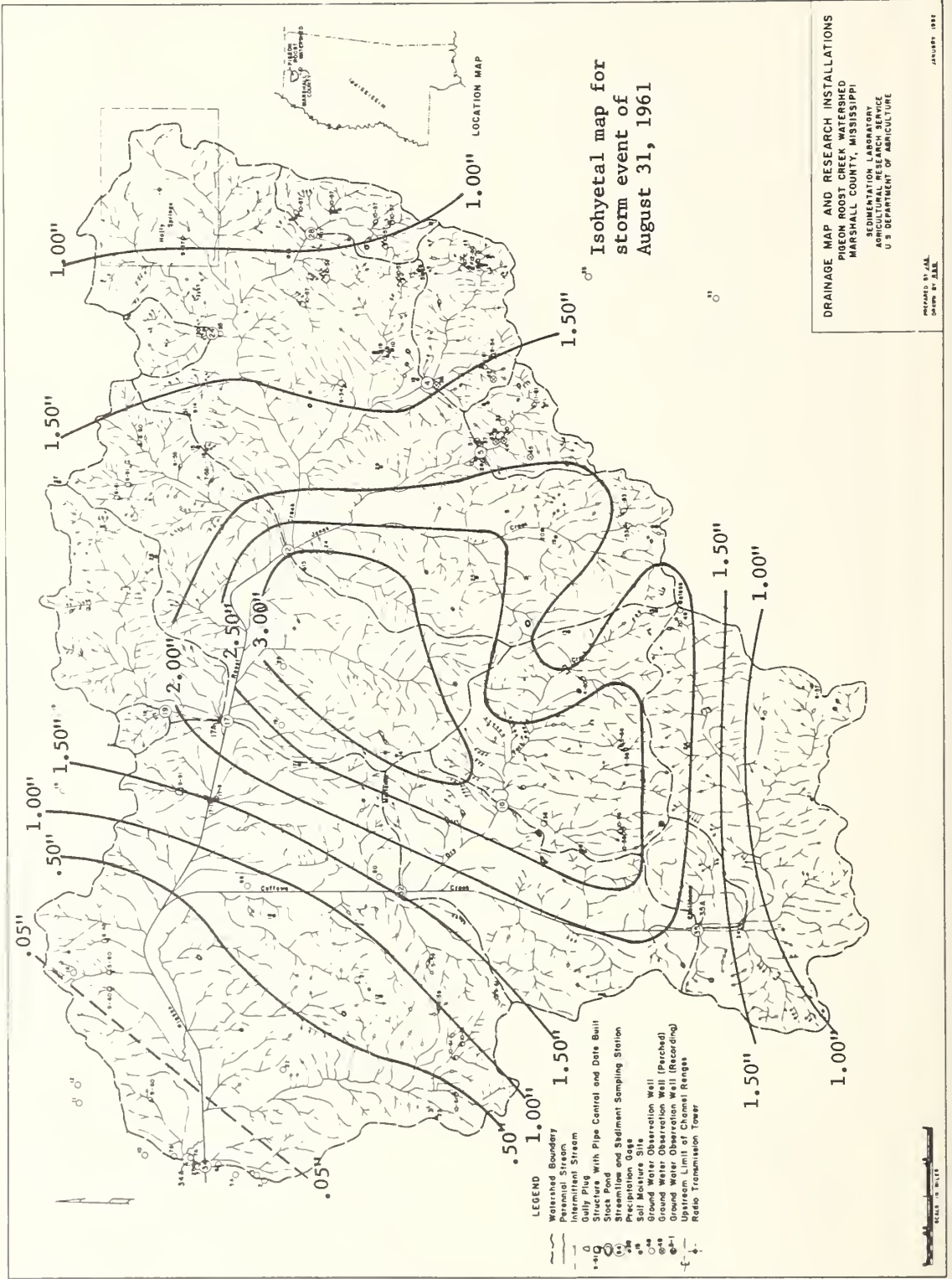




OXFORD, MISSISSIPPI WATERSHED W-34







11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Oxford, Mississippi Watershed W-35 <sup>2/</sup> Area - 7,550 ac. (11.8 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	4.58	3.25	5.69	2.40	3.21	2.67	1.42	3.20	2.74	4.58	2.49	4.13	40.36
	Q	1.14	1.03	2.56	.08	.51	.04	0	0	0	.32	T	.12	5.80
1961	P	.64	8.95	8.77	3.12	3.59	1.50	3.51	2.90	1.38	.78	8.67	9.33	53.14
	Q	.01	3.65	4.31	.56	.44	0	.06	.11	.01	0	.76	3.99	13.90

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Oxford, Mississippi Watershed W-35 <sup>2/</sup>								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-2	0.23	3-2	0.21	3-2	0.40	3-2	0.84	3-2	1.04	3-2	1.13	3-2	1.19	3-2	1.77
1961	3-6	.39	3-5	.37	3-5	.68	3-5	1.14	2-20	1.27	2-20	1.90	2-20	2.88	2-18	3.44

Notes: Quality of records: Q - fair, P - good. Watershed conditions: About 20% in cultivation (cotton and corn) -- fair cover November - March, poor cover during April and May improving to good by mid-July; 72% pasture-idle -- good cover April - October with fair cover remainder of year; 6% woods; 2% bare gullies.

SELECTED RUNOFF EVENTS				Oxford, Mississippi Watershed W-35 <sup>2/</sup>				
Antecedent conditions			Rainfall			Runoff <sup>3/</sup>		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)

Event of March 2-4, 1960 <sup>4/</sup>

2-3-60	0.06	0	3-2-60	6 Rain Gages <sup>1/</sup>		3-2-60		
2-4	1.06	.1671	12:01a	0	0	4:00a	0	0
2-5	.22	.4793	1:00	.06	.06	:15	.0077	.0003
2-6	0	.0378	2:00	.01	.07	5:15	.0115	.0084
2-7	0	.0038	4:00	.09	.25	6:15	.0197	.0239
2-8-9	0	0	5:00	.02	.27	7:15	.0199	.0444
2-10	.55	.1072	7:00	.01	.29	8:45	.0199	.0728
2-11	0	.0022	8:30	0	.29	9:15	.0250	.0846
2-12	0	0	9:00	T	.30	10:00	.0853	.1240
2-13	.81	0	:30	.04	.32	:15	.0788	.1445
2-14-18	0	0	10:00	.16	.40	:45	.0998	.1893
2-19	.09	0	:15	.40	.50	11:00	.1150	.2161
2-20	.15	0	:30	.52	.63	:30	.1734	.2876
2-21-23	0	0	:45	.68	.80	:45	.2009	.3332
2-24	.86	.0946	11:00	.88	1.02	12:15p	.2330	.4390
2-25	.10	.1324	:15	1.20	1.32	1:15	.1773	.6446
2-26	0	.0218	:30	.32	1.40	:45	.1497	.7254
2-27	0	.0003	12:00m	.20	1.50	2:15	.1269	.7944
2-28	.06	0	2:00p	.13	1.76	3:45	.0742	.9446
2-29	0	0	3:00	.08	1.84	4:30	.0555	.9924
3-1	.11	0	6:00	.01	1.87	5:30	.0425	1.0371
			3-2-60	Rain Gage 10		7:00	.0275	1.0805
			9:00a	0	0	9:00	.0111	1.1045
			:15	.36	.09	12:00m	.0068	1.1318
Watershed Conditions: 20% of area cotton and corn residue - fair to poor cover; 19% pasture, 53% idle, 6% woods good to fair cover; 2% bare gullies.			:45	.16	.17	3-3-60		
			10:00	.40	.27	6:00a	.0032	1.1576
			:30	.64	.59	12:00m	.0017	1.1720
			11:00	.86	1.02	12:00m	.0014	1.1888
			:30	.54	1.29			
			12:00m	.26	1.42	3-4-60		
			3:00p	.15	1.86	12:00m	.0005 <sup>5/</sup>	1.2008
			4:00	.04	1.90			

Notes: To convert runoff in in/hr to cfs, multiply by 7,613. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U.S., 1956-59, USA Misc. Pub. 945, p. 62.12-5.

<sup>1/</sup> Raingages 10, 11, 20, 21, 24 and 26 Thiessen weighted.

<sup>2/</sup> About 8% of area behind small desilting and retention dams. Watershed W-35A not included.

<sup>3/</sup> Water temperature below 40° F.

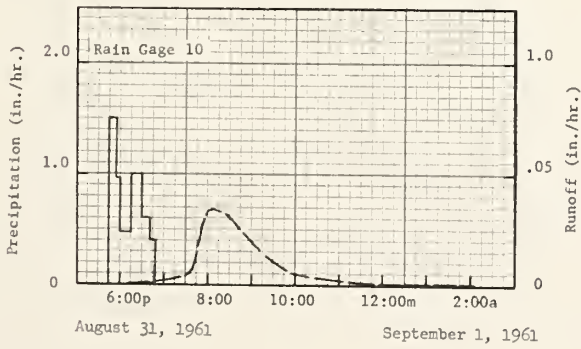
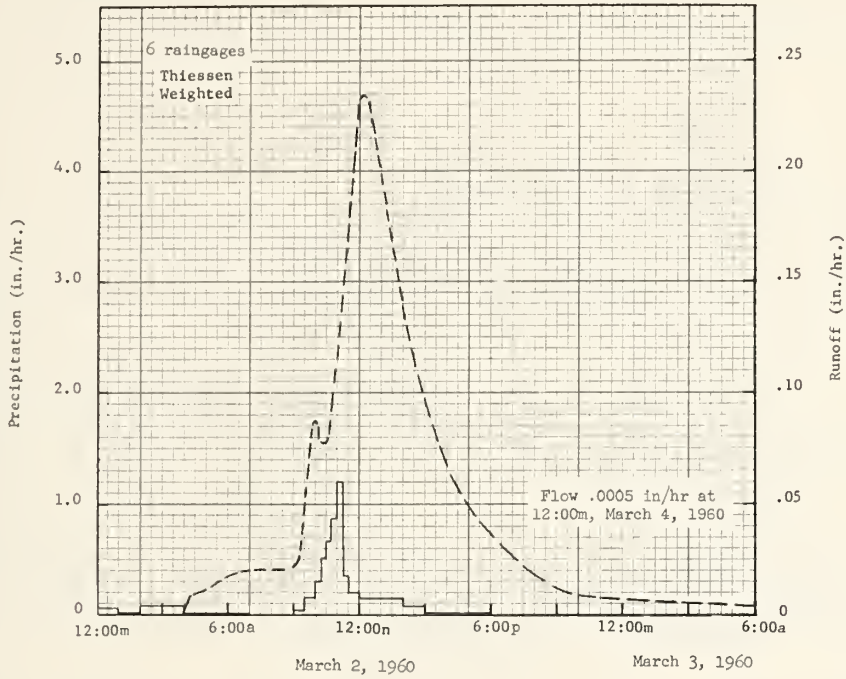
<sup>4/</sup> Isohyetal map on page 62.11-5. <sup>5/</sup> Slowly decreasing flow after 12:00m.

Cooperative Research Project of USDA, University of Mississippi, and Mississippi Agricultural Experiment Station

SELECTED RUNOFF EVENTS						Oxford, Mississippi Watershed W-35		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31 - September 1, 1961 <sup>2/</sup>								
8-2-61	0.01	0	8-31-61	Rain Gage 10 -		8-31-61		
8-5	.19	0	5:45p	0	0	6:05p	0	0
8-7	.02	0	:55	1.50	.25	:10	.0005	0
8-8	.04	0	6:00	.96	.33	:30	.0007	.0002
8-12	.23	0	:15	.48	.45	:35	.0007	.0003
8-15	.10	0	:30	1.00	.70	7:10	.0022	.0012
8-19	.13	0	:40	.60	.80	:25	.0046	.0021
8-23	.80	0	:50	.40	.84	:35	.0049	.0029
8-25	.01	0				:45	.0166	.0047
8-27	.05	0	8-31-61	Rain Gage 11		:50	.0254	.0064
			5:10p	0	0	:55	.0293	.0087
			:40	.20	.10	8:00	.0324	.0113
			6:00	.75	.35	:05	.0342	.0141
			:15	1.64	.76	:15	.0339	.0198
			:30	.76	.95	:30	.0304	.0279
			:45	.16	.99	9:30	.0104	.0483
						:45	.0072	.0527
			8-31-61	6 Rain Gages <sup>1/</sup>		10:45	.0025	.0576
			5:00p	0	0	11:30	.0010	.0589
			:15	.02	0	12:00m	.0005	.0593
			:30	.20	.05	9-1-61		
			:45	.88	.27	1:30a		
			6:00	1.04	.53	2:05	0	.0598
			:15	1.40	.88			
			:30	1.04	1.14			
			:45	.52	1.27			
			7:00	.06	1.28			
			:15	.02	1.29			
<p>Watershed Conditions: 20% of area in mature cotton and corn - fair cover; 19% pasture, 53% idle, 6% woods - good cover; 2% bare gullies.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 7.613.  
<sup>1/</sup> Raingages 10, 11, 20, 21, 24 and 26 Thiessen weighted.  
<sup>2/</sup> Isohyetal map on page 62.11-6.





OXFORD, MISSISSIPPI WATERSHED W-35

11-62

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Oxford, Mississippi, Watershed WC-1 (Area - 3.88 acres)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	4.77	4.11	5.43	2.30	3.78	2.38	2.79	6.04	2.22	5.83	3.08	4.39	47.12
1960 Q	1.90	1.45	2.74	T	1.03	.06	.49	1.59	.09	1.87	.71	.80	12.73
1961 P	.76	7.82	9.20	4.06	4.56	4.98	5.23	4.19	1.63	1.35	8.16	9.04	60.98
1961 Q	.04	3.64	5.09	.95	.20	2.08	.94	1.43	.46	.20	3.44	5.09	23.56

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Oxford, Mississippi, Watershed WC-1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	2-10	1.92	10-5	1.00	10-5	1.25	10-5	1.43	10-5	1.49	10-5	1.49	10-5	1.49	10-5	1.83
1961	6-10	7.34	6-10	1.94	6-10	1.98	6-10	1.99	6-10	1.99	6-10	1.99	2-20	2.08	12-9	4.26

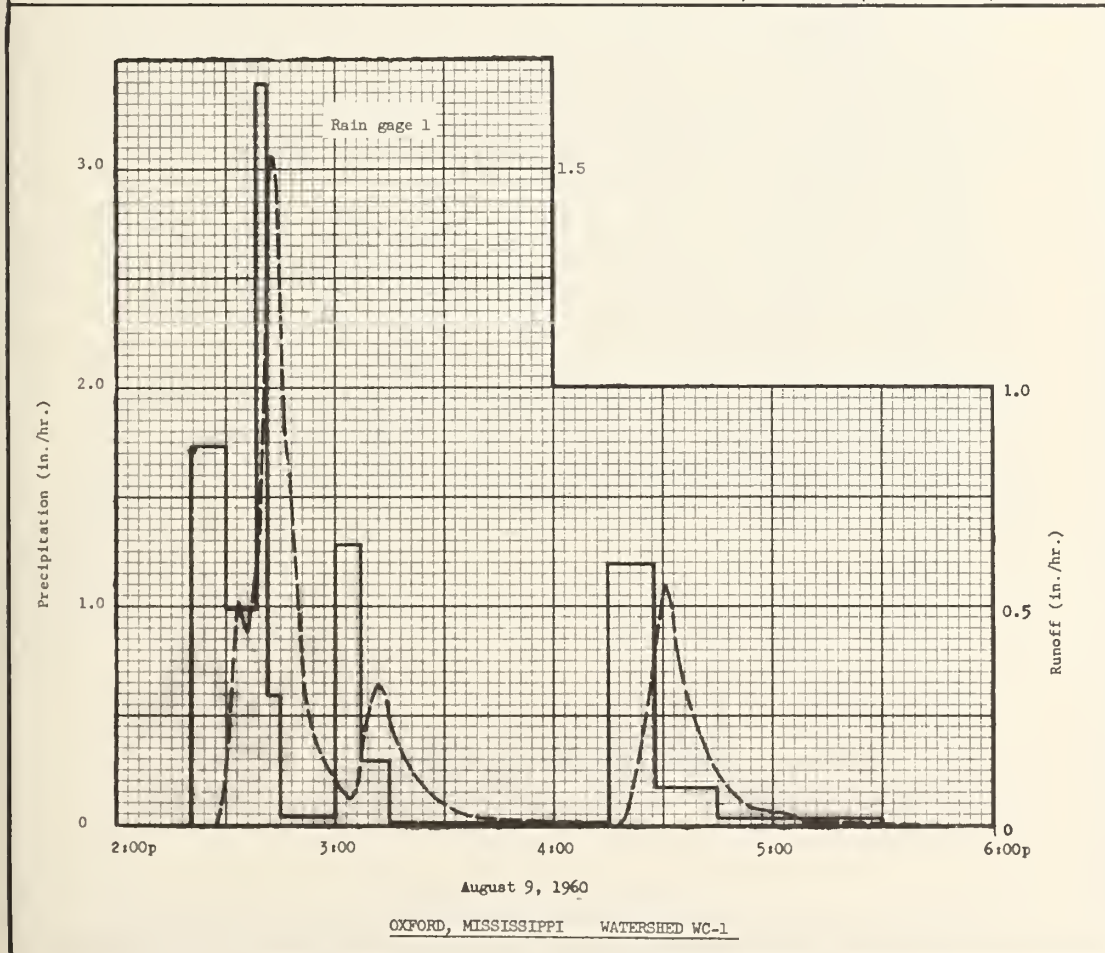
Notes: Quality of records: P - good, Q - good. Watershed Conditions: 1960 and 1961 - 100% of area was cultivated in corn, low crop yields, poor winter cover provided by crop residue.  
<sup>1/</sup> Raingages R-1 and R-3 Thiessen weighted.

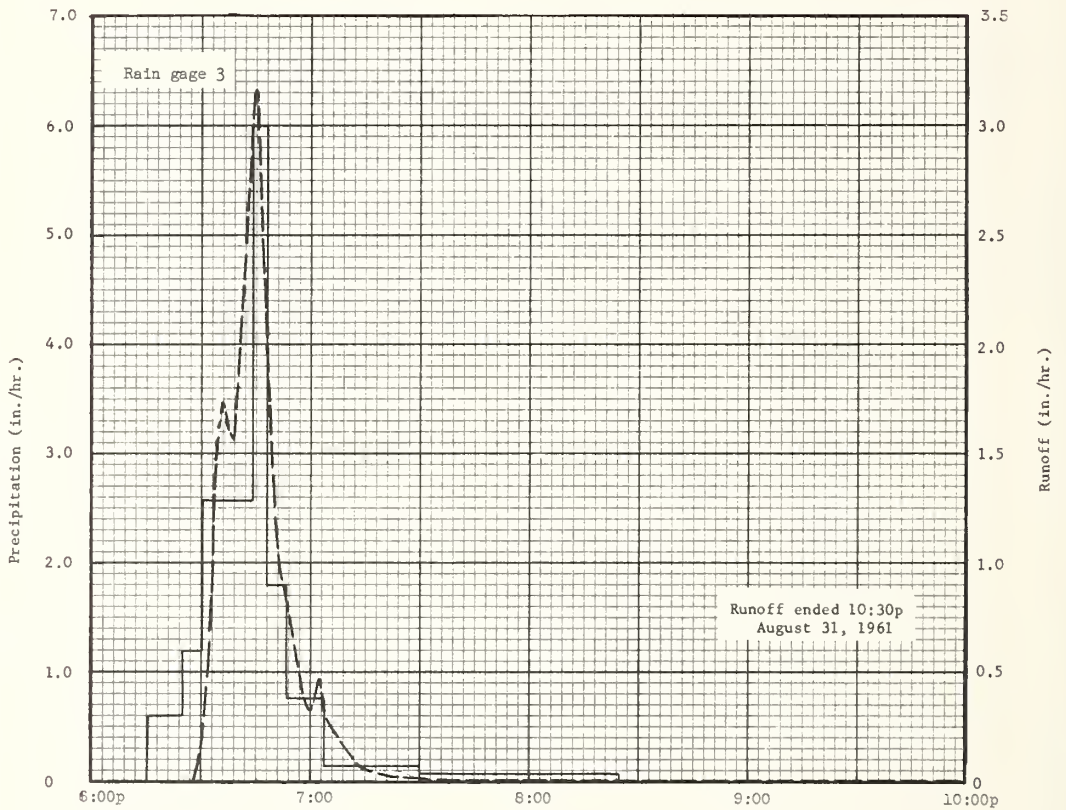
SELECTED RUNOFF EVENTS						Oxford, Mississippi, Watershed WC-1			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of August 9, 1960</u>									
7-11-60	Raingage R-1 0.14	0	8-9-60	Rain Gage R-1		8-9-60			
7-13	.04	0	2:20p	0	0	2:28p	0	0	
7-20	.93	.20	:30	1.74	.29	:32	.383	.01	
7-23	.64	.16	:38	.98	.42	:34	.514	.03	
8-4	.05	0	:41	3.40	.59	:36	.440	.04	
8-5	.90	.30	:45	.60	.63	:40	.698	.08	
8-7	.27	.01	3:00	.04	.64	:42	1.475	.11	
8-8	.03	0	:07	1.29	.79	:43	1.533	.14	
8-9	.09 <sup>2/</sup>	0	:15	.30	.83	:44	1.475	.16	
			4:15	.01	.84	:46	.925	.20	
			:28	1.20	1.10	:50	.493	.25	
			:45	.18	1.15	:52	.317	.26	
			5:30	.03	1.17	:56	.169	.28	
						3:04	.059	.29	
						:08	.197	.30	
						:11	.317	.31	
						:13	.317	.32	
						:19	.169	.35	
						:28	.059	.37	
						:40	.020	.37	
						:54	.005	.38	
						4:10	0	.38	
						:18	0	.38	
						:20	.020	.38	
						:22	.077	.38	
						:27	.317	.39	
						:30	.493	.41	
						:31	.552	.42	
						:33	.493	.44	
						:36	.317	.46	
						:42	.169	.48	
						:48	.077	.50	
						:54	.041	.50	
						5:01	.026	.51	
						:09	.013	.51	
						:40	0	.51	

Notes: To convert runoff in in./hr. to cfs, multiply by 3.912.  
 For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 62.16-4  
<sup>2/</sup> Prior to 2:20p.

SELECTED RUNOFF EVENTS			Oxford, Mississippi Watershed WC-1					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31, 1961								
Raingage R-3			Rain Gage R-3			8-31-61		
8-5-61	0.07	0	8-31-61			6:28p	0	0
8-7	.15	0	6:15p	0	0	:32	.698	.02
8-8	.28	.02	:25	.60	.10	:34	1.447	.05
8-12	.81	.27	:30	1.20	.20	:36	1.738	.11
8-23	.27	0	:44	2.57	.80	:39	1.562	.19
8-23	.08	0	:48	6.00	1.20	:40	1.797	.22
8-24	.07	0	:53	1.80	1.35	:42	2.403	.29
8-25	.78	.35	7:04	.76	1.49	:44	2.991	.38
8-31	.05 <sup>1/</sup>	0	:30	.14	1.55	:45	3.169	.43
			8:25	.09	1.63	:46	2.888	.48
						:48	1.858	.56
						:51	1.051	.63
						:53	.787	.66
						:59	.332	.71
						7:00	.332	.72
						:02	.475	.73
						:04	.317	.75
						:07	.225	.76
						:10	.130	.77
						:14	.066	.77
						:22	.026	.78
						:33	.008	.78
						:57	.003	.79
						10:30	0	.80

Notes: To convert runoff in in/hr to cfs, multiply by 3.912.  
 1/ Rainfall of 8-31-61 preceding the selected event.





August 31, 1961

OXFORD, MISSISSIPPI WATERSHED WC-1



11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Oxford, Mississippi, Watershed WC-2 (Area - 1.45 acres)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	4.77	4.11	5.43	2.30	3.78	2.38	2.79	6.04	2.22	5.83	3.08	4.39	47.12
1960 Q	1.82	1.27	2.72	.02	.67	.01	.26	1.12	.01	1.10	.27	.81	10.08
1961 P	.76	7.82	9.20	4.06	4.56	4.98	5.23	4.19	1.63	1.35	8.16	9.04	60.98
1961 Q	.01	3.12	3.96	.78	.22	1.20	.34	.65	.32	.04	2.49	4.31	17.44

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Oxford, Mississippi, Watershed WC-2						
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YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-6	1.48	10-5	0.76	10-5	0.90	10-5	0.97	10-5	0.97	10-5	0.97	10-5	0.97	3-2	1.69
1961	6-10	4.81	6-10	1.08	6-19	1.10	3-7	1.15	3-7	1.17	3-7	1.17	2-20	1.76	12-9	3.66

Notes: Quality of records: P - good, Q - good. Watershed Conditions: 1960 and 1961 - 100% of area was cultivated in corn, high crop yields, fair winter cover provided by crop residue.

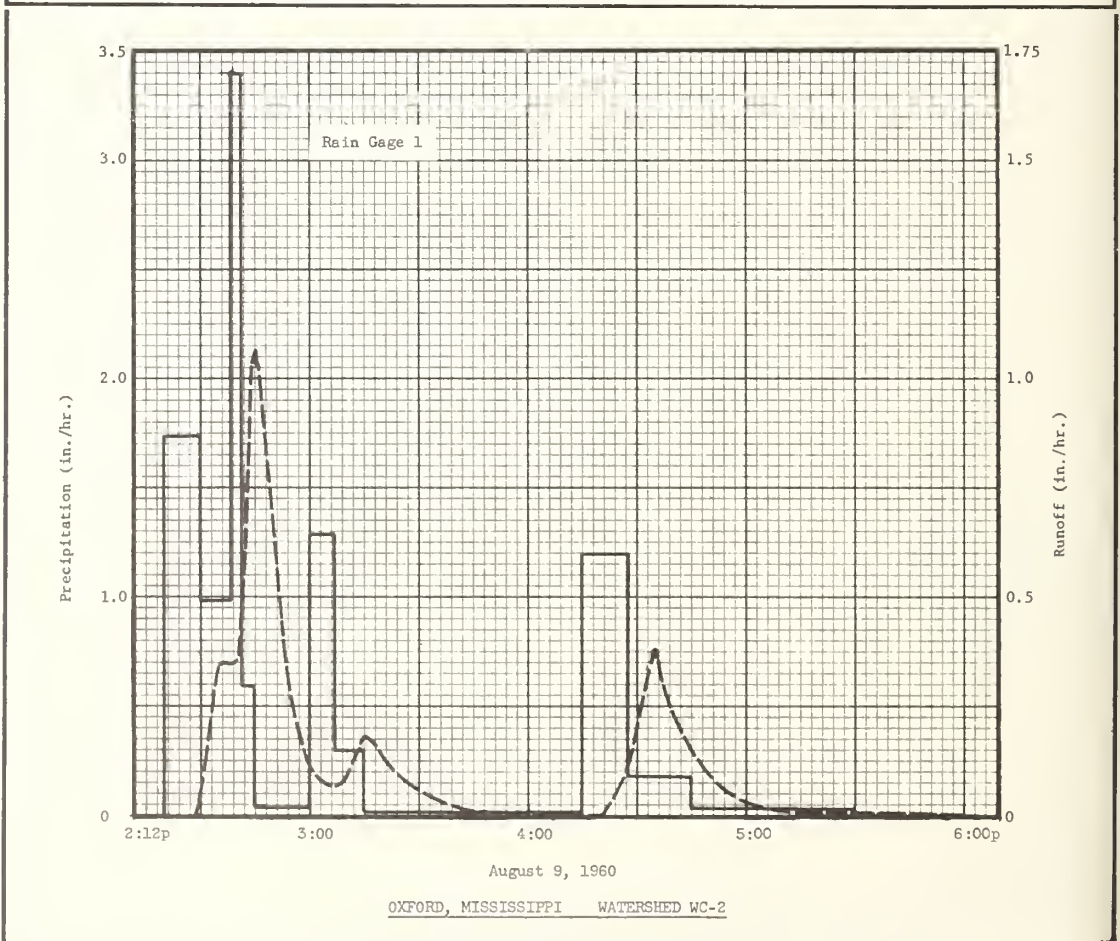
SELECTED RUNOFF EVENTS							Oxford, Mississippi, Watershed WC-2						
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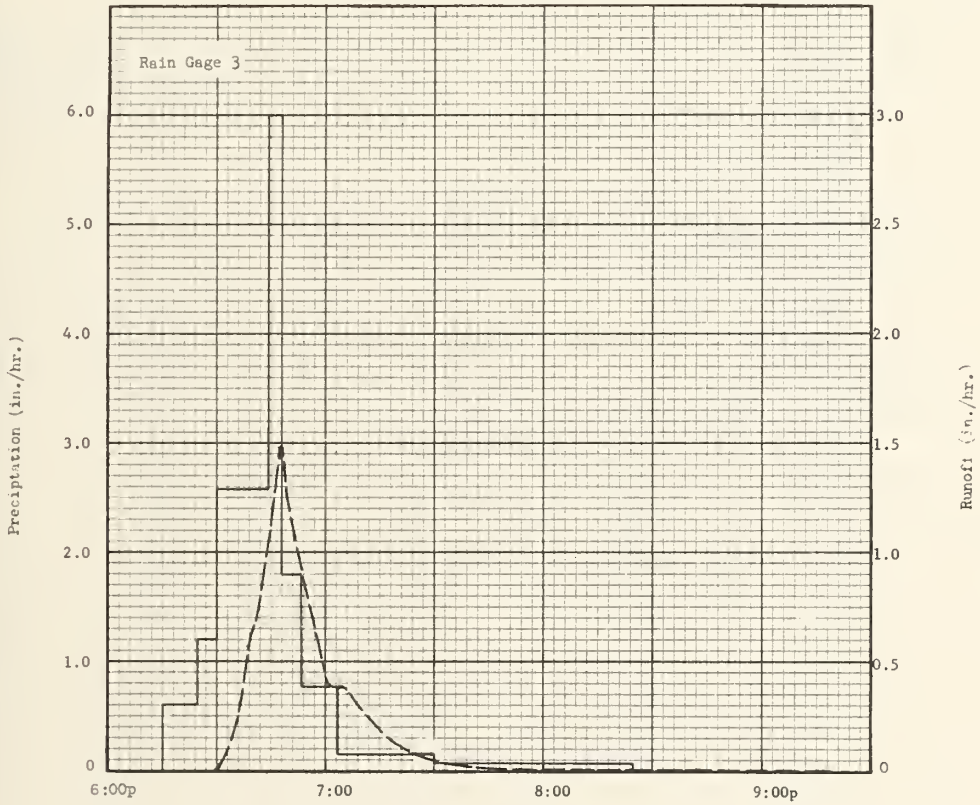
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 9, 1960								
7-11-60	Raingage R-1 0.14	0	8-9-60	Rain Gage R-1	0	8-9-60		
7-13	.04	0	2:20p	0	0	2:29p	0	0
7-20	.93	.20	:30	1.74	.29	:32	.157	0
7-23	.64	.16	:38	.98	.42	:35	.349	.02
8-4	.05	0	:41	3.40	.59	:40	.349	.04
8-5	.90	.30	:45	.60	.63	:42	.602	.06
8-7	.27	.01	3:00	.04	.64	:44	1.026	.09
8-8	.03	0	:07	1.29	.79	:45	1.074	.10
8-9	.09	0	:15	.30	.83	:46	1.026	.12
			4:15	.01	.84	:52	.451	.20
			:28	1.20	1.10	:58	.157	.23
			:45	.18	1.15	3:07	.068	.24
			5:30	.03	1.17	:15	.178	.26
						:35	.034	.29
						4:20	0	.30
						:29	.157	.31
						:35	.383	.34
						:45	.157	.39
						:56	.055	.41
						5:14	.014	.42
						6:00	0	.42

Notes: To convert runoff in in./hr. to cfs, multiply by 1.462. For map of watershed, see Hydrologic Data For Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 62.16-4.  
1. Raingages R-1 and R-3 Thiessen weighted. 2/ Prior to 2:20p.

11-62

SELECTED RUNOFF EVENTS						Oxford, Mississippi, Watershed WC-2		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 31, 1961</u>								
	Rain Gage R-3			Rain Gage R-3				
8-5-61	0.07	0	8-31-61			8-31-61		
8-7	.15	0	6:15p	0	0	6:30p	0	0
8-8	.28	.02	:25	.60	.10	:34	.130	0
8-12	.81	.27	:30	1.20	.20	:38	.561	.03
8-23	.27	0	:44	2.57	.80	:41	.718	.06
8-23	.08	0	:48	6.00	1.20	:46	1.272	.14
8-24	.07	0	:53	1.80	1.35	:47	1.477	.17
8-25	.78 <sub>1/</sub>	.35	7:04	.76	1.49	:48	1.477	.19
8-31	.05 <sub>1/</sub>	0	:30	.14	1.55	:49	1.272	.21
			8:25	.09	1.63	:54	.848	.30
						:59	.451	.35
						7:01	.383	.36
						:05	.383	.39
						:12	.233	.42
						:18	.130	.44
						:27	.068	.46
						:37	.034	.47
						:56	.014	.47
						9:30	0	.48
<p>Watershed Conditions: 100% of area in corn, 85% matured. Approximately 10,000 plants per acre. Good cover provided by corn and native grasses. Last tillage operation June 19. Contour cultivation on 0.2 to 0.4% slope.</p>								
<p>Notes: To convert runoff in in/hr to cfs, multiply by 1.462.  <sub>1/</sub> Rainfall of 8-31-61 preceding the selected event.</p>								





August 31, 1961

OXFORD, MISSISSIPPI WATERSHED WC-2

11-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Oxford, Mississippi, Watershed WC-3 (Area - 1.61 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	4.77	4.11	5.43	2.30	3.78	2.38	2.79	6.04	2.22	5.83	3.08	4.39	47.12
	Q	1.23	1.23	2.65	T	.81	.09	.55	1.68	.11	1.92	.80	.79	11.86
1961	P	.76	7.82	9.20	4.06	4.56	4.98	5.23	4.19	1.63	1.35	8.16	9.04	60.98
	Q	.03	3.70	5.08	.97	.29	1.92	.85	1.48	.49	.22	3.68	5.20	23.91

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Oxford, Mississippi, Watershed WC-3

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-6	2.41	10-5	0.99	10-5	1.25	10-5	1.39	10-5	1.49	10-5	1.49	10-5	1.49	10-5	1.89
1961	6-10	5.96	6-10	1.82	6-10	1.85	6-10	1.85	6-10	1.85	2-20	2.10	2-20	2.10	12-9	4.31

Notes: Quality of records: P - good, Q - good. Watershed Conditions: 1960 and 1961 - 100% of area was cultivated in corn, low crop yields, poor winter cover provided by crop residue.  
1/ Raingages R-1 and R-3 Thiessen weighted.

SELECTED RUNOFF EVENTS Oxford, Mississippi, Watershed WC-3

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 9, 1960</u>								
	Raingage R-1							
7-11-60	0.14	0	8-9-60			8-9-60		
7-13	.04	0	2:20p	0	0	2:28p	0	0
7-20	.93	.20	:30	1.74	.29	:30	.684	.01
7-23	.64	.16	:38	.98	.42	:31	.924	.02
8-4	.05	0	:41	3.40	.59	:33	.924	.05
8-5	.90	.30	:45	.60	.63	:37	.573	.10
8-7	.27	.01	3:00	.04	.64	:40	1.287	.15
8-8	.03	0	:07	1.29	.79	:43	1.897	.23
8-9	.09 <u>2/</u>	0	:15	.30	.83	:46	.764	.29
			4:15	.01	.84	:50	.142	.31
			:28	1.20	1.10	3:00	.018	.32
			:45	.18	1.15	:03	.018	.33
			5:30	.03	1.17	:08	.407	.34
						:11	.407	.36
						:18	.142	.39
						:25	.031	.40
						:50	.006	.41
						4:16	0	.41
						:20	.099	.41
						:21	.185	.42
						:26	.407	.43
						:29	.647	.47
						:31	.647	.49
						:33	.407	.51
						:38	.142	0.53
						:46	.031	.54
						5:20	.006	.55
						:40	0	.55

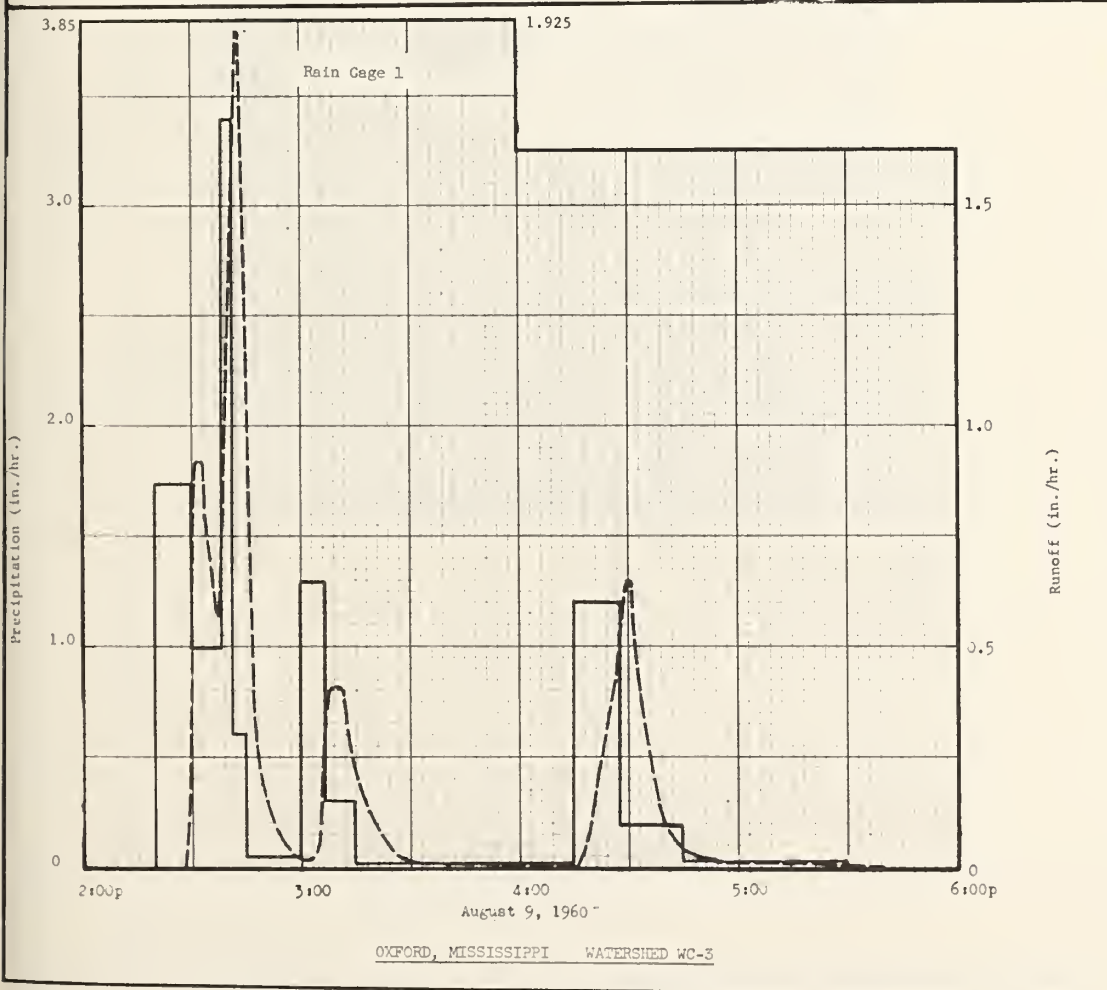
Notes: To convert runoff in in./hr. to cfs, multiply by 1.623.  
 For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 195(-59, USDA Misc. Pub. 945, p. 62.16-4.  
2/ Prior to 2:20p.

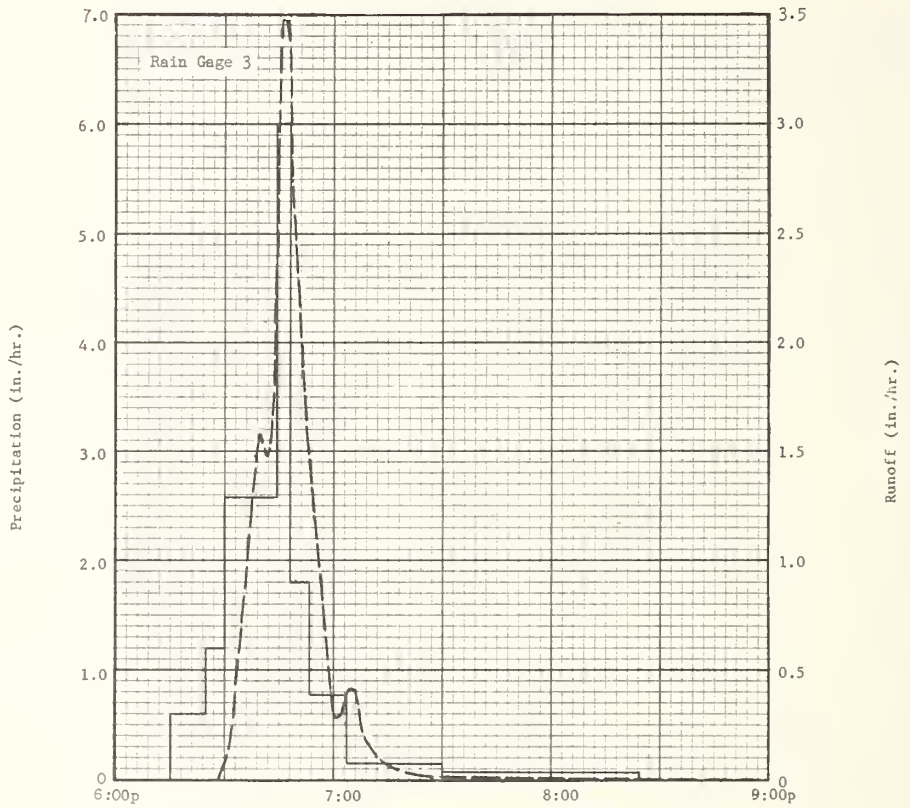


SELECTED RUNOFF EVENTS			Oxford, Mississippi, Watershed WC-3					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31, 1961								
8-5-61	Rain Gage R-3 0.07	0	8-31-61	Rain Gage R-3		8-31-61		
8-7	.15	0	6:15p	0	0	6:28p	0	0
8-8	.28	.02	:25	.60	.10	:31	.142	0
8-12	.81	.27	:30	1.20	.20	:34	.647	.02
8-23	.27	.0	:44	2.57	.80	:38	1.478	.09
8-23	.08	0	:48	6.00	1.20	:39	1.583	.12
8-24	.07	0	:53	1.80	1.35	:40	1.583	.14
8-25	.78	.35	7:04	.76	1.49	:42	1.478	.19
8-31	.05 <sup>1/</sup>	0	:30	.14	1.55	:43	1.682	.23
			8:25	.09	1.63	:44	2.470	.25
						:46	3.487	.35
						:47	3.487	.41
						:48	2.895	.47
						:49	2.532	.51
						:52	1.682	.61
						:54	1.189	.66
						7:00	.290	.72
						:02	.290	.73
						:04	.407	.75
						8:06	.407	.76
						:08	.209	.77
						:26	.018	.79
						9:00	0	.80

Watershed Conditions: 100% of area in corn, 80% matured. Approximately 5000 plants per acre. Fair cover provided by corn and native grasses. Last tillage operation June 19. Cultivation approximately parallel to mid contour.

Notes: To convert runoff in in./hr. to cfs, multiply by 1.623.  
<sup>1/</sup> Rainfall of 8-31-61 preceding the selected event.





August 31, 1961

OXFORD, MISSISSIPPI WATERSHED WC-3

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Oxford, Mississippi Watershed WP-4 (Area - 3.01 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	4.77	4.11	5.43	2.30	3.78	2.38	2.62	5.49	2.08	5.46	2.90	3.96	45.28
	Q	1.70	1.66	2.83	.26	1.12	.22	.33	.92	.05	2.28	.83	.66	12.86
1961	P	.78	7.80	8.92	3.41	4.26	4.45	5.01	4.12	1.63	1.27	8.08	8.98	58.71
	Q	.03	3.45	5.03	1.27	1.09	2.10	1.58	1.45	.33	.07	3.11	3.86	23.37

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Oxford, Mississippi Watershed WP-4								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	3-29	2.55	10-5	1.36	10-5	1.67	10-5	1.87	10-5	1.92	10-5	1.92	10-5	1.92	10-5	2.25
1961	6-10	5.30	6-10	1.97	6-10	1.97	6-10	1.97	6-10	1.97	6-10	1.97	2-20	2.00	3-5	3.57

Notes: Quality of records: P - good, Q - good. Watershed conditions: 1960 and 1961 - permanent pasture, overgrazed, no fertilization. Approximately 85% of area had reasonably good cover, 15% poor cover.  
 1/ Raingage R-4.

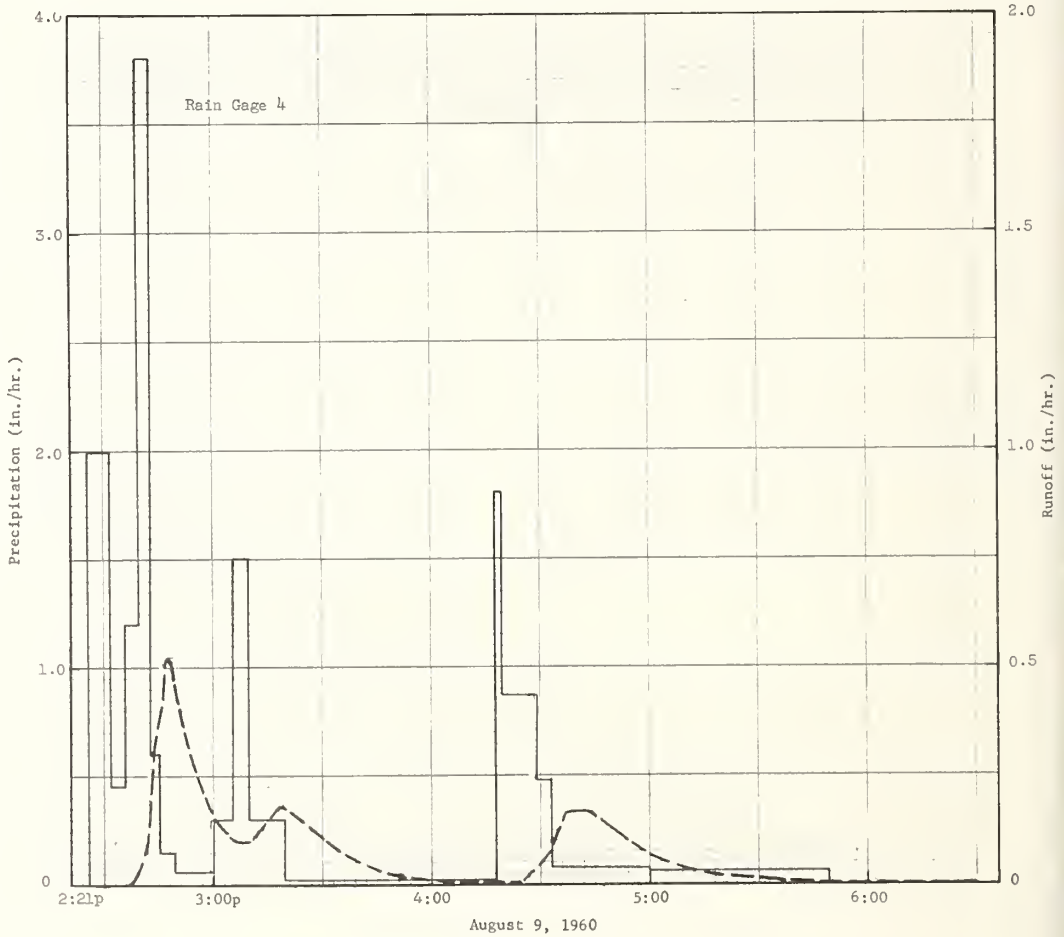
SELECTED RUNOFF EVENTS					Oxford, Mississippi Watershed WP-4				
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	

Event of August 9, 1960								
Rain Gage R-4			Rain Gage R-4					
7-11-60	0.12	0	8-9-60			8-9-60		
7-13	.04	0	2:26p	0	0	2:38p	0	0
7-20	.88	.12	:32	2.00	.20	:42	.099	0
7-23	.66	.11	:36	.45	.23	:44	.326	.01
8-4	.06	0	:40	1.20	.31	:46	.409	.02
8-5	.83	.15	:43	3.80	.50	:47	.517	.03
8-7	.26	0	:46	.60	.53	:49	.517	.05
8-8	.04	0	:50	.15	.54	:51	.409	.06
8-9	.07 2/	0	3:00	.06	.55	:57	.217	.09
			:06	.30	.58	3:07	.099	.12
			:10	1.50	.68	:10	.099	.13
			:20	.30	.73	:19	.185	.15
			4:18	.01	.74	:34	.076	.18
			:20	1.80	.80	:51	.016	.19
			:29	.87	.93	4:14	.003	.20
			:34	.48	.97	:26	.003	.20
			5:00	.07	1.00	:33	.076	.20
			:50	.06	1.05	:37	.168	.21
						:44	.168	.23
						:58	.076	.26
						5:10	.033	.27
						:19	.016	.27
						:35	.007	.28
						:50	.003	.28
						6:30	0	.28

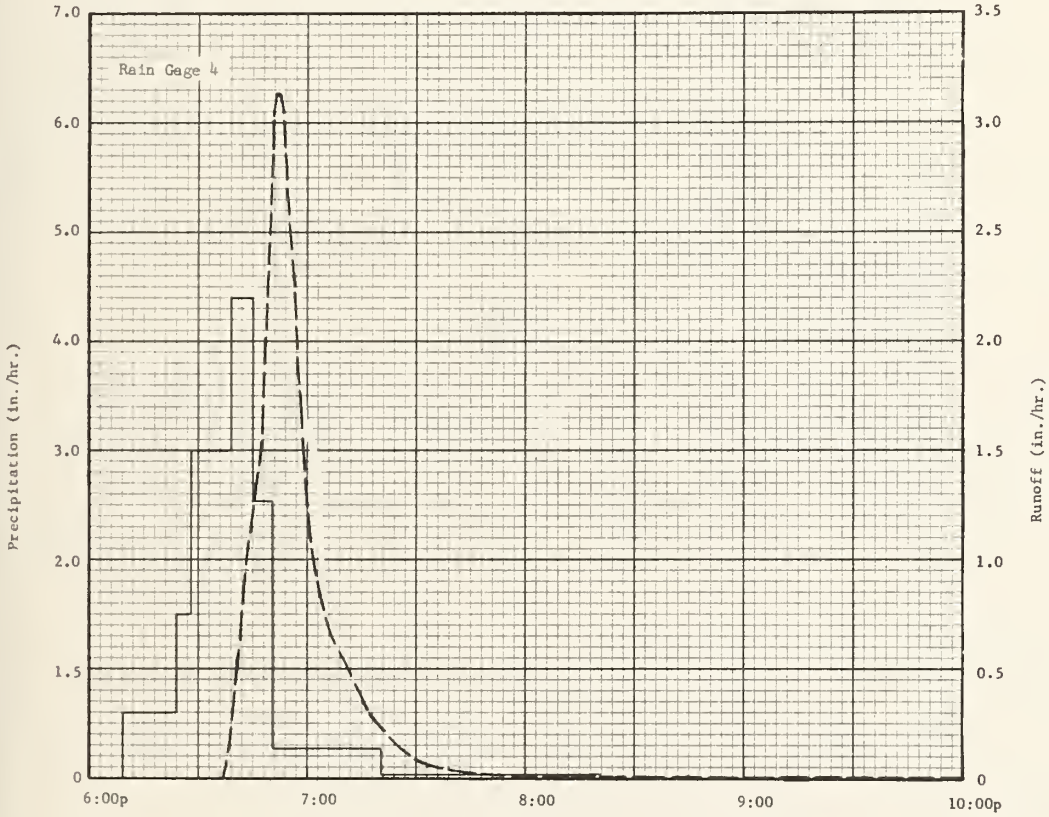
Notes: To convert runoff in in./hr. to cfs, multiply by 3.035.  
 For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 62.16-4.  
 2/ Prior to 2:26p.

11-62

SELECTED RUNOFF EVENTS						Oxford, Mississippi Watershed WP-4		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31, 1961								
	Rain Gage R-4			Rain Gage R-4				
8-5-61	0.07	0	8-31-61			8-31-61		
8-7	.09	0	6:09p	0	0	6:37p	0	0
8-8	.28	.01	:24	.60	.15	:40	.451	.01
8-12	.88	.25	:28	1.50	.25	:43	.956	.05
8-23	.21	0	:39	3.00	.80	:47	1.516	.13
8-23	.05	0	:45	4.40	1.24	:49	2.395	.19
8-24	.07	0	:50	2.52	1.45	:50	3.012	.24
8-25	.80	.32	7:20	.28	1.59	:51	3.143	.29
8-31	.04 <sup>1/</sup>	0	8:20	.04	1.63	:52	3.143	.34
						:55	2.514	.48
Watershed Conditions: 100% of area in permanent pasture (common lespedeza and native grasses). 85% of area had good cover, 15% poor cover.						:58	1.723	.58
						7:02	.956	.67
						:04	.764	.70
						:10	.540	.76
						:18	.270	.81
						:30	.086	.85
						8:18	.007	.87
10:00	0	.88						
Notes: To convert runoff in in./hr. to cfs, multiply by 3.035. 1/ Rainfall of 8-31-61 preceding the selected event.								







August 31, 1961

OXFORD, MISSISSIPPI WATERSHED WP-4

OXFORD, MISSISSIPPI Watershed W-17A

**LOCATION:** Marshall Co., Miss.; 7.8 mi. SW of Holly Springs on County road; Pigeon Roost Creek Watershed, Yazoo River Basin.

**AREA:** 3,200 ac. (5.0 sq. mi.)

**SHAPE:** Leaf; 1.3 mi. wide, 4.0 mi. long.

<b>SLOPES:</b>	Percent Slope	0-2%	2-5%	5-8%	8-12%	12-17%	17% and above
	Percent of Area	24	14	3	7	42	10

**SOILS:** Loess soils underlain by Coastal Plains material; soils derived from Coastal Plains material; and alluvial soils of mixed loess and Coastal Plains material.

Type	% of Area	Topsoil			Subsoil			Substratum		Internal Drainage
		Depth	Structure	Permeability	Structure	Permeability	Depth To (Av.)	Permeability		
Ruston fine sandy loam to sandy clay loam	43	0-4"	weak : fine : crumb	moderately rapid	weak, fine granular sub-angular blocky	rapid	54"	moderately rapid	rapid	
Collins silt loam	24	0-8"	weak : fine : granular	moderately rapid	-----	----	6"	moderately rapid	rapid	
Providence silt loam and silty clay loam	14	0-5"	weak : fine, medium : granular	moderate	weak : medium subangular blocky	slow	36"	moderate	medium to slow	
Grenada silt loam	10	0-6"	weak : fine, medium : granular	moderate	weak : medium subangular blocky	moderate	36"	moderate	medium to rapid	
Loring silt loam to silty clay loam	9	0-6"	weak : fine, medium : granular	moderate	weak : medium subangular blocky	moderate	36"	moderate	medium to rapid	

<b>EROSION:</b>	Erosion Class	+	2	3
	Percent of Area	24	19	57

<b>LAND CAPABILITY:</b>	Class	II	III	IV	VI	VII
	Percent of Area	26	7	6	9	52

**GEOLOGY:** Outcrop of the Kosciusko formation, Tallahatta formations, and valley alluvial material are found within the watershed. The two formations represent material of the Claiborne group of Eocene age underlain by the Meridian formation of the same group, which represents the major ground-water aquifer within the area. Surface outcrop areas present within the watershed are Kosciusko (47%), and Tallahatta (40%), with the remaining surface area valley alluvial deposits (13%). The only subsurface structure within the watershed is a slight dip of approximately 8-10 feet per mile to the west which also follows the ground water contours. The textures of the geological material are all similar, predominately sand with local clay lenses which may cause small perched water bodies. The thickness of the Kosciusko is approximately 120 feet, Tallahatta varies from 120 to 150 feet, and the Meridian represents approximately 200 feet of water saturated sands.

**SURFACE DRAINAGE:** Good; length of principal waterway - 4.5 mi.; sand bed channels. Approximately 11% non-contributory area due to small desilting and retarding structures. Discharges from Watersheds W-17A and W-17 mix at high stages or the gaging station for W-17A becomes an auxiliary station for Watershed W-17 at high flood stages.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff - current meter rated section of natural sand-bottom channel; continuous water-stage recorder. Precipitation - one recording gage inside watershed; three other gages nearby.

**WATERSHED CONDITIONS:** Normally about 16% is in cultivation - cotton and corn; 52% idle - good to poor cover of broom sedge and common grasses; 2% pasture - good to fair cover; 28% woods - good to fair cover; 2% bare gullies.

**GENERALLY REPRESENTS:** Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain, (P-133), and the Southern Mississippi Valley Silty Uplands, (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Oxford, Mississippi Watershed W-17A						
Year \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1957 P	7.68	7.24	2.04	6.60	5.34	6.76	3.25	1.47	7.38	3.10	9.04	5.43	65.33
Q	3.22	1.80	.06	1.55	1.32	.71	.15	.01	.38	.08	3.31	1.59	14.18
1958 P	2.52	1.69	3.13	6.80	4.62	6.79	6.02	1.90	11.68	.88	3.02	1.74	50.79
Q	.12	.05	.13	1.73	.95	.47	.32	.01	2.48	0	.05	.02	6.33
1959 P	4.51	3.82	3.50	4.20	3.07	2.83	5.08	5.99	1.59	2.27	2.67	6.52	46.65
Q	1.10	.74	.31	.40	T	.03	.28	.53	.13	.01	T	.52	4.05
1960 P	4.58	3.84	5.05	2.02	3.57	3.64	2.84	4.31	2.31	3.92	2.75	4.10	42.93
Q	.40	.77	1.65	.15	.54	.02	.08	.03	.01	.10	.02	.11	3.88
1961 P	.83	7.63	8.61	3.72	2.81	2.10	3.56	5.61	1.37	1.10	7.48	9.57	54.39
Q	.03	2.04	3.23	.49	.01	T	T	.39	.01	.01	.39	2.04	8.64

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 62.5-5. <sup>1</sup>/<sub>Thirteen weighted, using 2 gages.</sub>

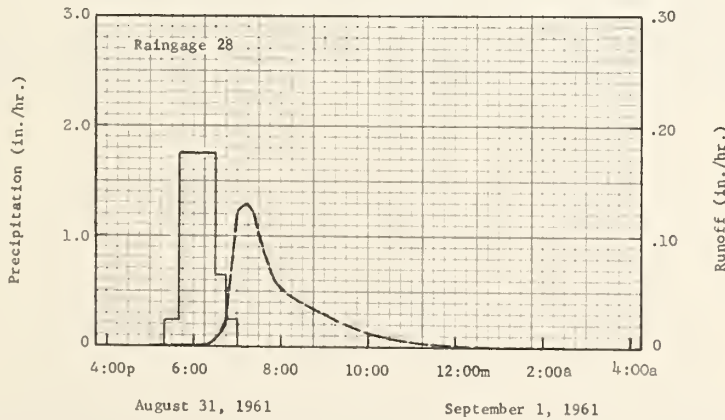
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS										Oxford, Mississippi Watershed W-17A <sup>1/</sup>						
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
	Date	Rate	1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
			Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957 1958 1959 1960 1961																
	3-7	.29	3-7	.29	3-7	.55	3-7	1.08	3-7	1.24	3-7	1.65	3-5	2.37	3-5	2.64

Notes: Quality of records: Q - fair, P - good. Watershed conditions: About 16% in cultivation (cotton and corn) -- fair cover November - March, poor cover during April and May improving to good by mid-July; 54% pasture-idle -- good cover April - October with fair cover remainder of year; 28% woods; 2% bare gullies.

**SELECTED RUNOFF EVENTS** Oxford, Mississippi Watershed W-17A <sup>1/</sup>

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31 - September 1, 1961 <sup>3/</sup>								
8-1-61	Raingage 28 0	.0001	8-31-61	Rain Gage 28		8-31-61		
8-2	.14	.0001	5:20p	0	0	5:00p	0	0
8-3-4	0	.0002	:40	.24	.08	:30	.0001	.0001
8-5	1.15	.1378	6:30	1.76	1.55	:55	.0002	.0002
8-6	0	.0008	:45	.64	1.71	6:25	.0043	.0014
8-7	.10	.0001	7:00	.24	1.77	:30	.0074	.0019
8-8-11	0	.0005				:40	.0182	.0040
8-12	.70	.0036	Additional rainfall data <sup>4/</sup>			:45	.0341	.0061
8-13-14	0	.0014				7:00	.1221	.0256
8-15	.04	.0007				:15	.1289	.0570
8-16-19	0	.0029				:25	.1171	.0775
8-20	0	.0009				8:00	.0518	.1268
8-21	0	.0007				:15	.0455	.1390
8-22	0	.0006				:40	.0350	.1558
8-23	.83	.0006				9:15	.0241	.1731
8-24-28	0	.0030				10:30	.0071	.1926
8-29	.04	.0006				11:30	.0022	.1973
8-30	0	.0007				12:00m	.0012	.1982
Watershed Conditions: 16% of area in mature cotton and corn - fair cover; 2% pasture, 52% idle, 28% woods - good cover; 2% bare gullies.						9-1-61		
						1:00a	.0002	.1989
						2:30	0	.1991

Notes: To convert runoff in in/hr to cfs, multiply by 3,227. <sup>1/</sup> Auxiliary watershed. Flow mixes with that of Watershed W-17 at extremely high discharge rates. <sup>2/</sup> Maximum discharges and volumes not obtainable from poor records of 1957-60. <sup>3/</sup> Isohyetal map on page 62.11-6. <sup>4/</sup> Rainfall for gage 2 on page 62.6-1.



OXFORD, MISSISSIPPI WATERSHED W-17A

OXFORD, MISSISSIPPI Watershed W-35A

LOCATION: Marshall Co., Miss.; 0.3 mi. W of Chulahoma on State Highway No. 4; Cuffawa Creek, Pigeon Roost Creek Watershed, Yazoo River Basin.

AREA: 1,090 ac. (1.7 sq. mi.)

SHAPE: Rectangular; 1.0 mi. wide, 1.7 mi. long.

<u>SLOPES:</u>	Percent Slope	0-2%	2-5%	5-8%	8-12%	12-17%
	Percent of Area	16	37	14	16	17

SOILS: Loess soils underlain by Coastal Plains material; soils derived from Coastal Plains material; and alluvial soils of mixed loess and Coastal Plains material.

Type	% of Area	Topsoil		Subsoil		Substratum		Internal Drainage	
		Depth	Structure	Permeability	Structure	Permeability	Depth To(Av.)		Permeability
Ruston fine sandy loam to sandy clay loam	46	0-4"	: weak : fine : crumb	: moderately : rapid	weak, fine granular sub-angular blocky	: : rapidly	54"	: moderate-ly rapid	rapid
Collins silt loam	16	0-8"	: weak : fine : granular	: moderately : rapid	-----	: : -----	6"	: moderate-ly rapid	rapid
Providence silt loam and silty clay loam	16	0-5"	: weak : fine, medium : granular	: moderate	weak medium subangular blocky	: : slow	36"	: moderate	medium to slow
Loring silt loam to silty clay loam	12	0-6"	: weak : fine, medium : granular	: moderate	weak medium subangular blocky	: : moderate	36"	: moderate	medium to rapid
Grenada silt loam	10	0-6"	: weak : fine, medium : granular	: moderate	weak medium subangular blocky	: : moderate	36"	: moderate	medium to rapid

<u>EROSION:</u>	Erosion Class	+	2	3
	Percent of Area	16	28	56

<u>LAND CAPABILITY:</u>	Class	II	III	IV	VI	VII
	Percent of Area	24	26	8	7	35

GEOLOGY: Surface outcrops in the watershed are limited to the Kosciusko formation of Eocene age and the Claiborne group making up 90 percent of the total area, while the remaining 10 percent of the surface area is recent valley alluvial deposits. Underlying the Kosciusko formation is the Tallahatta and Meridian formations which are also members of the Claiborne Group. All three formations are predominately sand with local areas of clay lenses. The Kosciusko is approximately 120 feet thick within the watershed and has a slightly lower average permeability rate than the underlying unconsolidated Eocene sediments due to the more even dissemination of the clay. The Meridian represents the major ground water aquifer. All the formations have a westerly to southwesterly dip of approximately 8 to 10 feet per mile. The ground water flow pattern is slightly disturbed by a fault lying south of the watershed causing a divergent flow to the Southwest.

SURFACE DRAINAGE: Good; length of principal waterway - 2.7 mi.; sand bed channels. About 1% non-contributory area due to small desilting and retention dams. Discharges from watersheds W-35A and W-35 mix at high stages or the gaging station for W-35A becomes an auxiliary station for watershed W-35 at high flood stages.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff - current meter rated section of natural sand-bed channel; continuous water-stage recorder. Precipitation - three recording rain gages located within one mile of watershed.

WATERSHED CONDITIONS: Normally about 26% is in cultivation - cotton and corn; 45% idle - fair to poor cover of broom sedge and common grasses; 28% pasture - fair cover; 1% bare gullies.

GENERALLY REPRESENTS: Moderately to severely eroded uplands in the transitional zone between the Southern Coastal Plain, (P-133), and the Southern Mississippi Valley Silty Uplands, (P-134), in the states of Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, and southern Missouri.

Notes: For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 62.12-5.



MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)							Oxford, Mississippi Watershed W-35A <sup>2/</sup>							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1957	P	7.78	6.55	2.47	7.68	5.82	6.82	2.50	1.72	6.26	3.64	9.84
	Q	3.15	1.77	.29	2.12	.73	.43	.16	.02	.56	.02	3.94	1.33	14.52
1958	P	2.69	1.97	4.05	7.95	5.15	4.27	6.50	.95	9.47	.97	3.44	1.73	49.14
	Q	.68	.49	.99	2.91	2.09	.12	.53	0	1.16	0	.41	.02	9.40
1959	P	4.22	4.15	3.33	4.26	5.20	3.18	5.16	3.09	4.36	1.99	2.73	6.69	48.36
	Q	1.78	1.67	.54	1.00	.65	.07	.10	0	.13	.05	.02	2.05	8.06
1960	P	4.58	3.19	5.74	2.76	3.09	2.64	1.40	2.76	3.63	4.79	2.52	4.20	41.30
	Q	1.52	.89	2.85	.22	.63	.07	0	0	0	.34	.02	.29	6.83
1961	P	.62	8.76	8.64	3.12	3.34	1.60	3.79	2.88	1.36	.74	8.51	9.13	52.49
	Q	.02	3.58	3.14	.58	.71	0	.17	.52	.02	0	1.11	3.39	13.24

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Oxford, Mississippi Watershed W-35A <sup>2/</sup>

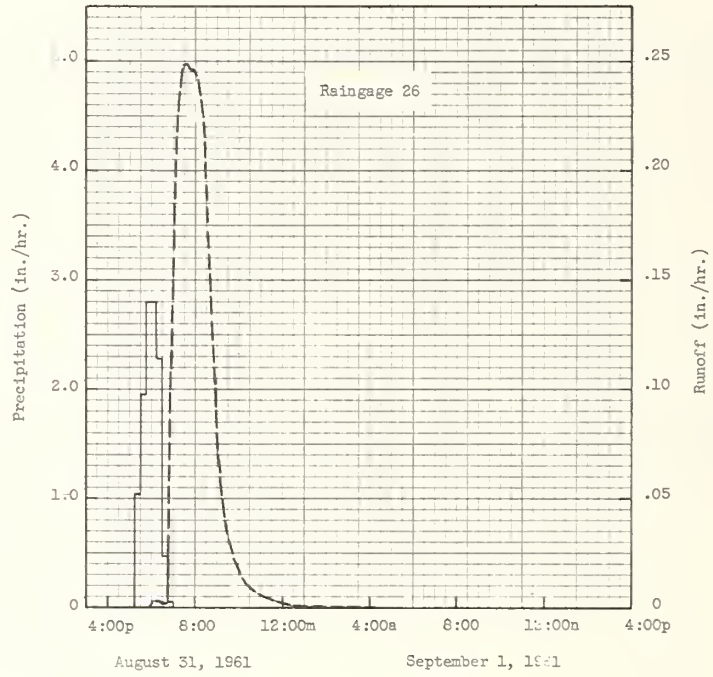
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1957																
1958																
1959																
1960																
1961	3-5	.27	3-5	.24	3-5	.37	3-5	.72	2-20	1.28	2-20	1.93	2-20	2.63	2-17	3.24

Notes: Quality of records: Q - fair, P - good. Watershed conditions: About 25% cultivated (cotton and corn) -- fair cover November - March, poor cover during April and May improving to good by mid-July; 73% pasture-idle -- good cover April - October with fair cover remainder of year; 2% bare gullies.

SELECTED RUNOFF EVENTS Oxford, Mississippi Watershed W-35A <sup>2/</sup>

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall <sup>1/</sup> (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 31 - September 1, 1961 <sup>4/</sup>								
Rain Gage 26								
8-2-61	.10	0	8-31-61			8-31-61		
8-5	.03	0	5:15p	0.	0.	5:55p	0	0
8-8	.05	0	:30	1.04	.26	6:00	.0024	.0001
8-12	.06	0	:45	1.96	.75	:05	.0032	.0003
8-15	.20	0	6:15	2.80	2.15	:35	.0030	.0019
8-19	.03	0	:30	2.28	2.72	:40	.0026	.0021
8-23	.60	0	:45	.48	2.84	:50	.1101	.0115
8-27	.15	0	7:00	.04	2.85	7:10	.2132	.0654
						:25	.2424	.1223
						:35	.2487	.1632
Additional rainfall data <sup>5/</sup>								
						:45	.2462	.2045
						8:00	.2462	.2661
						:20	.2245	.3446
						:37	.1554	.3984
						:45	.1237	.4170
						9:00	.0719	.4415
						:30	.0334	.4679
						10:15	.0127	.4852
						11:00	.0053	.4920
						12:00m	.0018	.4956
						9-1-61		
						1:00a	.0005	.4968
						2:30	.0001	.4973
						4:15	0	.4975

Notes: To convert runoff in in/hr to cfs, multiply by 1,099. <sup>1/</sup> Raingage 26. <sup>2/</sup> Auxiliary watershed. Flow mixes with that of Watershed W-35 at extremely high discharge rates. <sup>3/</sup> Maximum discharges and volumes not obtainable from poor records of 1957-60. <sup>4/</sup> Isohyetal map on page 62.11-6. <sup>5/</sup> Rainfall for gage 10 on page 62.12-1.



OXFORD, MISSISSIPPI WATERSHED W-35A

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Tombstone, Arizona Watershed W-1 Area - 36,900 ac. (57.7 sq. mi.)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1960	P Q	1.55 0	0.46 0	0.32 0	0 0	0 0	0.05 0	1.71 0	1.18 T	1.03 0	0.71 0	0 0	0.29 0	7.30 T
1961	P Q	0.40 0	0.06 0	0.01 0	0 0	0 0	0.64 0	1.74 T	3.55 .36	0.92 .04	1.74 0	0.37 0	1.07 0	10.50 .40

## ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

Tombstone, Arizona Watershed W-1

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL															
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days			
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.		
1960	8-20	0.0014	8-20	0.0008	8-20	0.0013	8-20	0.0022	8-20	0.0022	8-20	0.0022	8-20	0.0022	8-20	0.0022	8-20	0.0022
1961	8-22	.1856	8-22	.0899	8-22	.0941	8-22	.1409	8-22	.1425	8-22	.1425	8-20	.1528	8-17	.2922		

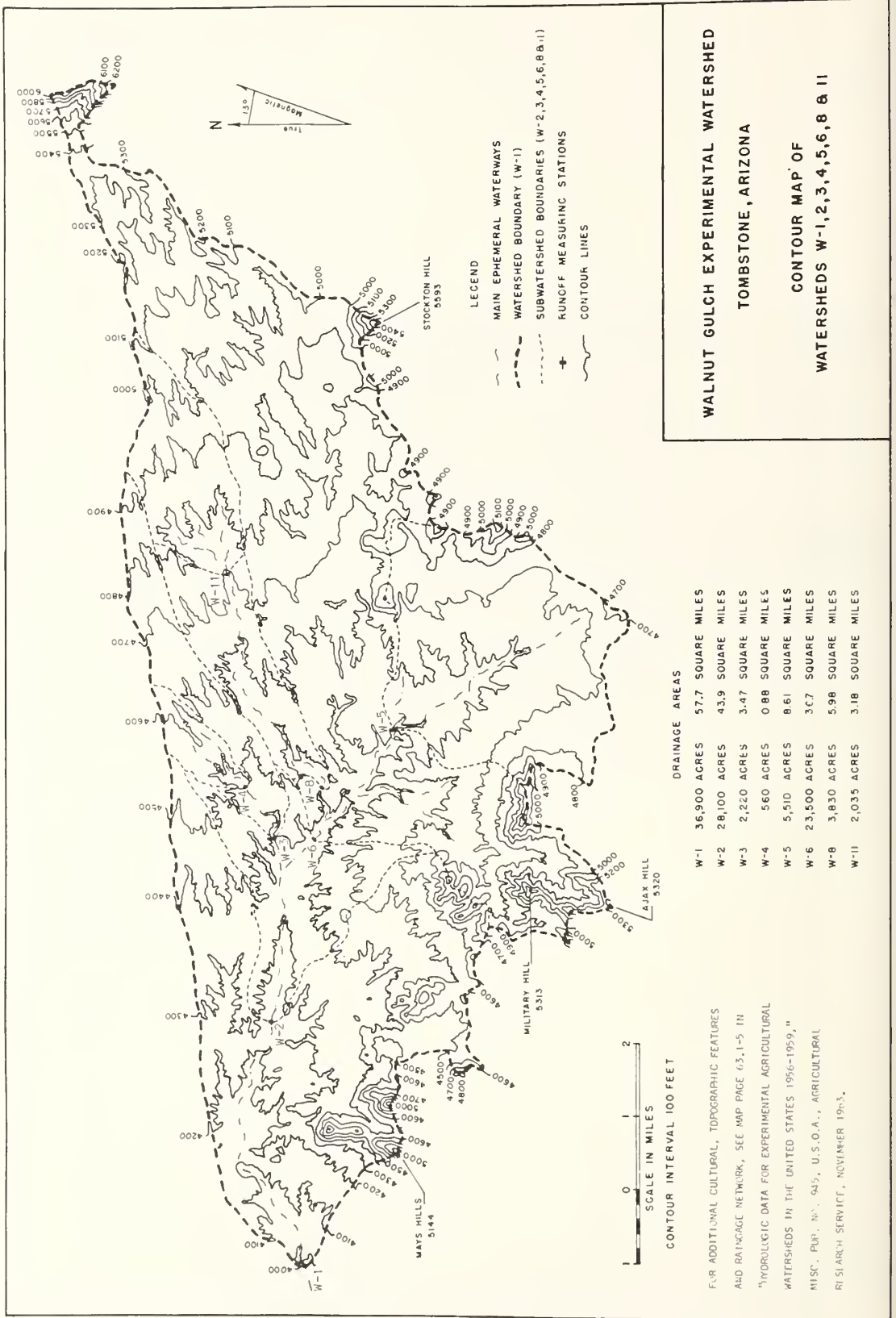
Notes: Quality of records: Monthly P - good; monthly Q - poor; annual maximum discharges and volumes - poor. Watershed conditions (includes W-2, W-3, W-4 and W-5 which lie within the boundaries of W-1): 65 percent of area supports desert shrubs (whitethorn, creosotebush, tarbush) with 23% cover and 2% grass cover; 35% is grassland with approximately 20% grass cover (crown spread) and 5% shrub cover. 1/ Monthly precipitation is averaged by arithmetic method.

## SELECTED RUNOFF EVENTS 2/

Tombstone, Arizona Watershed W-1

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)

Notes: For contour map of watershed, see page 63.1-2; for map showing other cultural features, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 63.1-5.  
2/ No suitable selected event available.



**WALNUT GULCH EXPERIMENTAL WATERSHED  
TOMBSTONE, ARIZONA  
CONTOUR MAP OF  
WATERSHEDS W-1, 2, 3, 4, 5, 6, 8 & 11**

	DRAINAGE AREAS	
W-1	36,900 ACRES	57.7 SQUARE MILES
W-2	28,100 ACRES	43.9 SQUARE MILES
W-3	2,220 ACRES	3.47 SQUARE MILES
W-4	560 ACRES	0.88 SQUARE MILES
W-5	5,510 ACRES	8.61 SQUARE MILES
W-6	23,500 ACRES	36.7 SQUARE MILES
W-8	3,830 ACRES	5.98 SQUARE MILES
W-11	2,035 ACRES	3.18 SQUARE MILES

SCALE IN MILES  
0 1 2  
CONTOUR INTERVAL 100 FEET

FOR ADDITIONAL CULTURAL, TOPOGRAPHIC FEATURES AND RAINFALL NETWORK, SEE MAP PAGE 63, 1-5 IN "HYDROLOGIC DATA FOR EXPERIMENTAL AGRICULTURAL WATERSHEDS IN THE UNITED STATES 1956-1959," MISC. PUB. NO. 945, U.S.O.A., AGRICULTURAL RESEARCH SERVICE, NOVEMBER 1963.



MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Tombstone, Arizona Watershed W-2 Area - 28,100 ac. (43.9 sq. mi.)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P Q 1.57 0	0.45 0	0.33 0	0 0	0 0	0.02 0	1.89 T	1.13 T	0.94 T	0.69 0	0 0	0.29 0	7.31 T
1961	P Q 0.42 0	0.52 0	0.01 0	0 0	0 0	0.68 T	1.78 .03	3.20 .30	1.11 .09	1.75 0	0.39 0	1.03 0	10.89 .42

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Tombstone, Arizona Watershed W-2

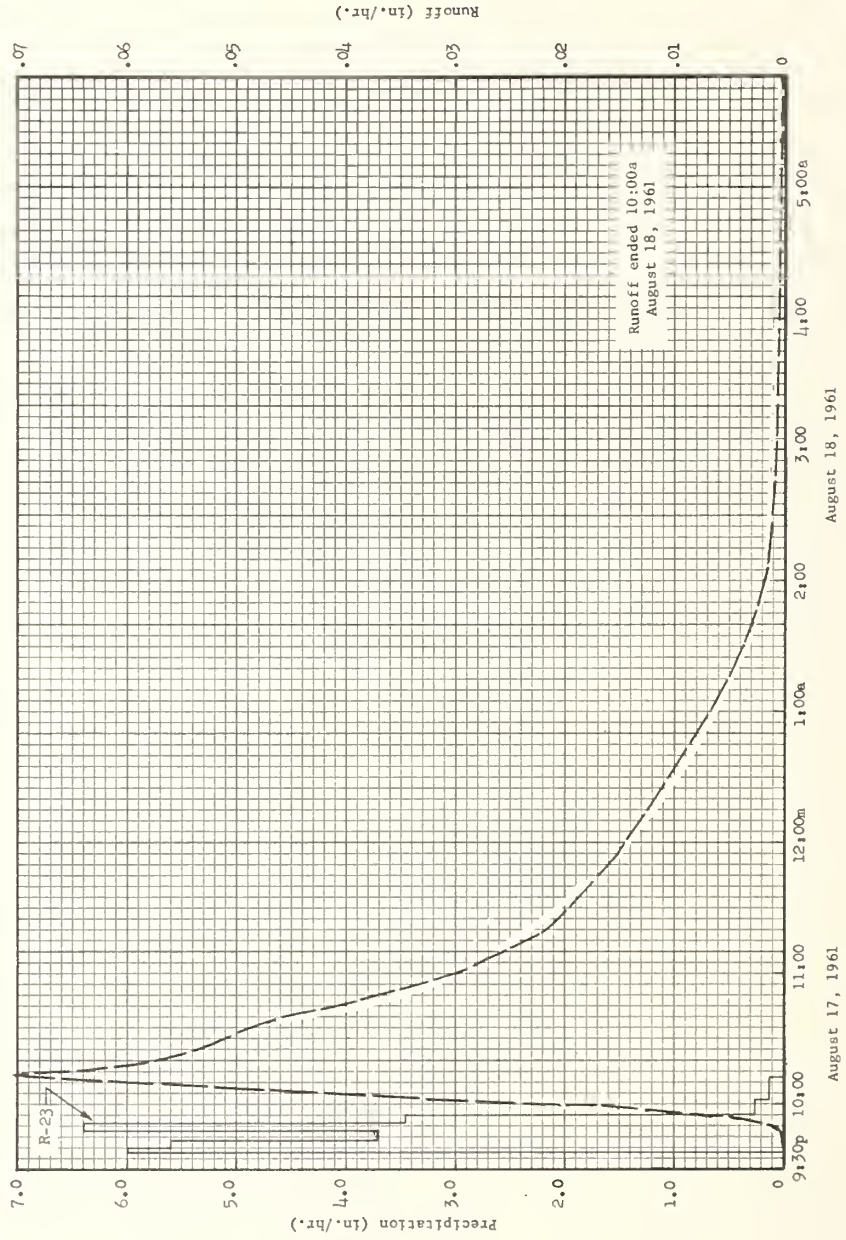
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-20	0.0055	8-20	0.0031	8-20	0.0035	8-20	0.0035	8-20	0.0036	8-20	0.0036	8-20	0.0036	8-20	0.0036
1961	8-17	.0710	8-17	.0478	8-17	.0685	8-17	.0861	8-17	.0890	8-17	.1310	8-17	.1317	8-13	.1325

Notes: Quality of records: Monthly P and Q - good; Annual maximum discharges and volumes - good. Watershed conditions (includes W-3, W-4 and W-5 which lie within the boundaries of W-2): 55% of area supports desert shrubs (whitethorn, tarbush, creosotebush) with 23% cover and 2% grass cover; 45% is grassland, with 20% cover (crown spread) of grasses and 5% cover of shrubs. 1/ Monthly precipitation is average of raingages by arithmetic method.

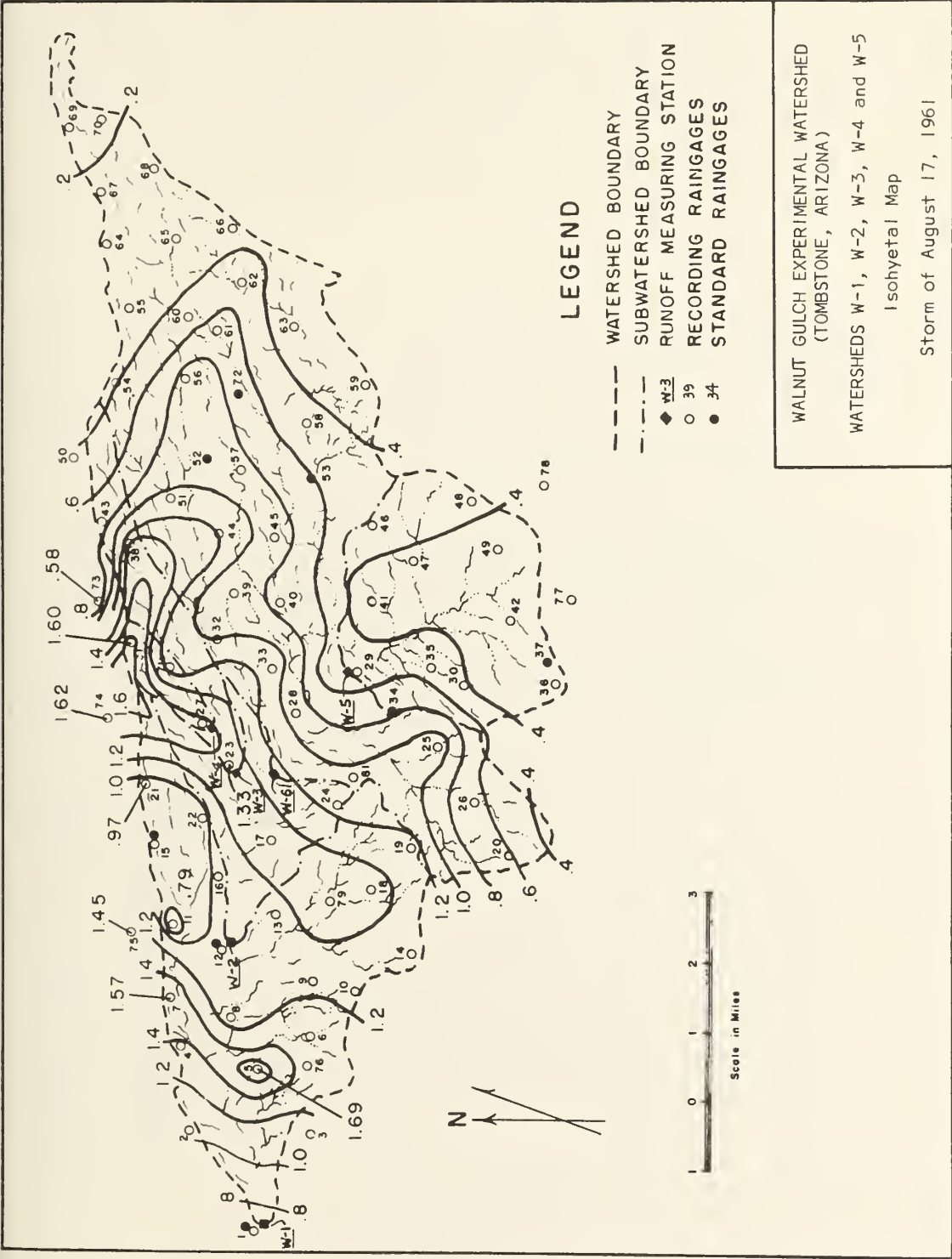
SELECTED RUNOFF EVENTS Tombstone, Arizona Watershed W-2

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 17-18, 1961 2/								
7-31-61	Raingage R-23 0.03	0.0120	8-17-61 9:38p	Raingage 0	R-23 0	8-17-61 9:38p	0	0
8-8	.01	0	:40	6.00	.20	:40	0	0
8-12	.01	0	:43	5.60	.48	:45	.00008	0
8-14	.03	0	:48	3.72	.79	:47	.00026	.00001
			:51	6.40	1.11	:49	.00060	.00002
			:55	3.45	1.34	:50	.00107	.00003
			10:02	.26	1.37	:52	.00202	.00008
			:12	.12	1.39	:54	.00474	.00019
						:55	.00957	.00031
7-30-61	Raingage R-24 0.09	0	8-17-61 9:32p	Raingage 0	R-24 0	:59	.01666	.00118
8-2	.02	0	:38	2.50	.25	10:00	.02238	.00151
8-3	.02	0	:45	2.06	.49	:02	.02796	.00235
8-4	.04	0	:48	2.40	.61	:03	.03452	.00287
						:07	.05119	.00573
8-6	.22	0	:51	3.60	.79	:11	.06463	.00959
8-8	.10	0	:56	.48	.83	:13	.07095	.01185
8-11	.11	0	10:08	.30	.89	:15	.06608	.01413
8-13	.73	.001				:20	.05690	.01925
8-14	.05	0				:30	.05119	.02826
8-15	.11	0				:40	.04564	.03633
						11:00	.02983	.04859
						:20	.02164	.05717
						:50	.01589	.06655
						12:00m	.01458	.06909
						8-18-61 1:00a	.00678	.07977
						2:00	.00193	.08413
						4:00	.00043	.08649
						10:00	0	.08907

Notes: To convert runoff in in/hr to cfs, multiply by 28,330. For contour map of watershed, see page 63.1-2; for map showing other cultural features, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 63.1-5. 2/ Isohyetal map of storm of August 17, 1961 on page 63.2-3.



TOMBSTONE, ARIZONA WATERSHED W-2



### LEGEND

- WATERSHED BOUNDARY
- · - · - SUBWATERSHED BOUNDARY
- ◆ W-3 RUNOFF MEASURING STATION
- 39 RECORDING RAINGAGES
- 34 STANDARD RAINGAGES

WALNUT GULCH EXPERIMENTAL WATERSHED  
(TOMBSTONE, ARIZONA)

WATERSHEDS W-1, W-2, W-3, W-4 and W-5

Isohyetal Map

Storm of August 17, 1961

MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)								Tombstone, Arizona Watershed W-3 Area - 2220 ac. (3.47 sq. mi.)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	1.54	0.47	0.27	0	0	0.01	2.11	2.00	1.10	0.46	0	0.23	8.19
	Q	0	0	0	0	0	0	0	T	T	0	0	0	T
1961	P	0.35	0.08	0	0	0	0.63	1.85	3.36	0.89	1.84	0.30	0.89	10.19
	Q	0	0	0	0	0	.01	.03	.42	0	0	0	0	.46

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Tombstone, Arizona Watershed W-3								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-20	0.0098	8-20	0.0047	8-20	0.0047	8-20	0.0047	8-20	0.0047	8-20	0.0047	8-20	0.0047	8-20	0.0048
1961	8-17	.3107	8-17	.2116	8-17	.2589	8-17	.3033	8-17	.3049	8-17	.3049	8-17	.3164	8-17	.3169

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good.  
 Watershed Conditions: 55% supports desert shrubs with a cover of 23% with a grass understory of 2%.  
 45% grassland with a grass canopy of 20%. <sup>1/</sup> Monthly precipitation is average of raingages by arithmetic method.

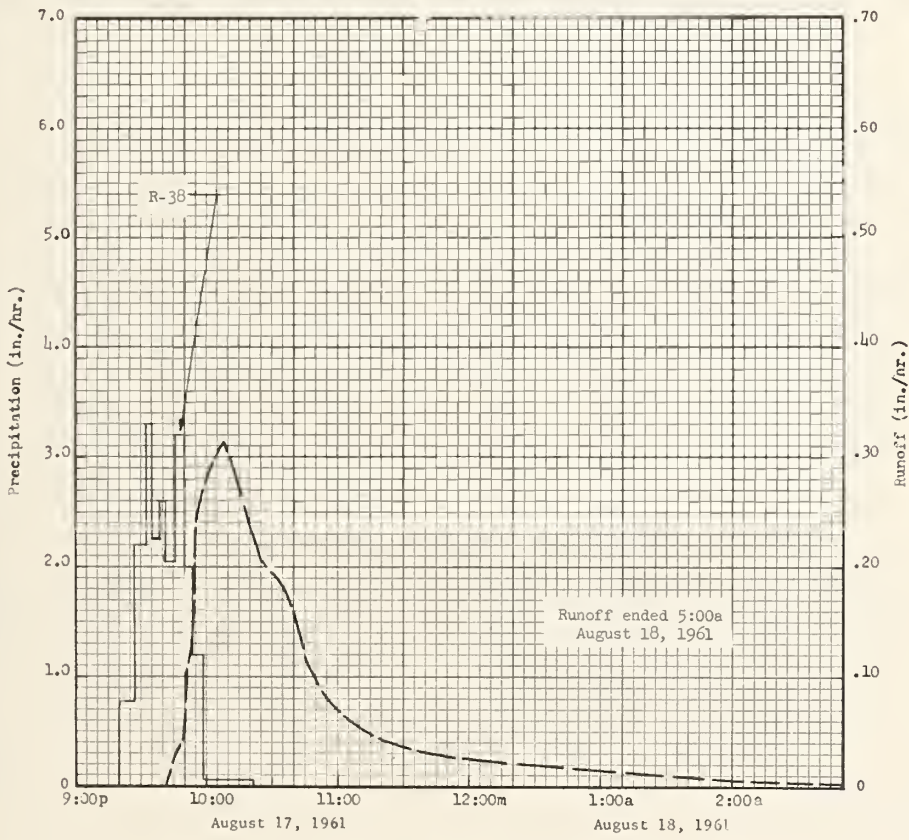
  

SELECTED RUNOFF EVENTS						Tombstone, Arizona Watershed W-3		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 17-18, 1961</u> <sup>2/</sup>								
	Raingage R-27		8-17-61	Raingage	R=27	8-17-61		
7-31-61	0.03	0	9:25p	0	0	9:42p	0	0
8-6	.01	0	:32	1.11	.13	:43	.0083	.0001
8-8	.02	0	:38	3.20	.45	:44	.0152	.0003
8-11	.01	0	:48	3.36	1.01	:45	.0241	.0006
8-12	.05	0	:58	2.34	1.40	:50	.0492	.0036
8-13	.01	0	10:19	.23	1.48	:51	.1028	.0049
8-14	.03	0				:53	.1207	.0086
8-15	.01	0				:54	.1632	.0110
8-17	.03	0	8-17-61	Raingage	R=38	:55	.2414	.0144
			9:20p	0	0			
	Raingage R-38		:27	.77	.09	10:00	.2816	.0362
			:33	2.20	.31	:08	.3107	.0757
7-31-61	0.30	0	:35	3.30	.42	:15	.2682	.1094
8-2	.13	0				:25	.2056	.1489
8-13	.07	0	:39	2.25	.57	:35	.1833	.1813
8-15	.10	0	:42	2.60	.70			
8-17	.01 <sup>3/</sup>	0	:47	2.04	.87	:45	.1162	.2063
			:50	3.20	1.03	11:00	.0670	.2292
			:53	2.00	1.13	:15	.0483	.2436
			:58	1.20	1.23	12:00m	.0250	.2711
			10:22	.05	1.25	8-18-61		
						1:00a	.0134	.2903
						2:00	.0056	.2998
						3:00	.0015	.3034
						5:00	0	.3049

Watershed conditions: See description above.

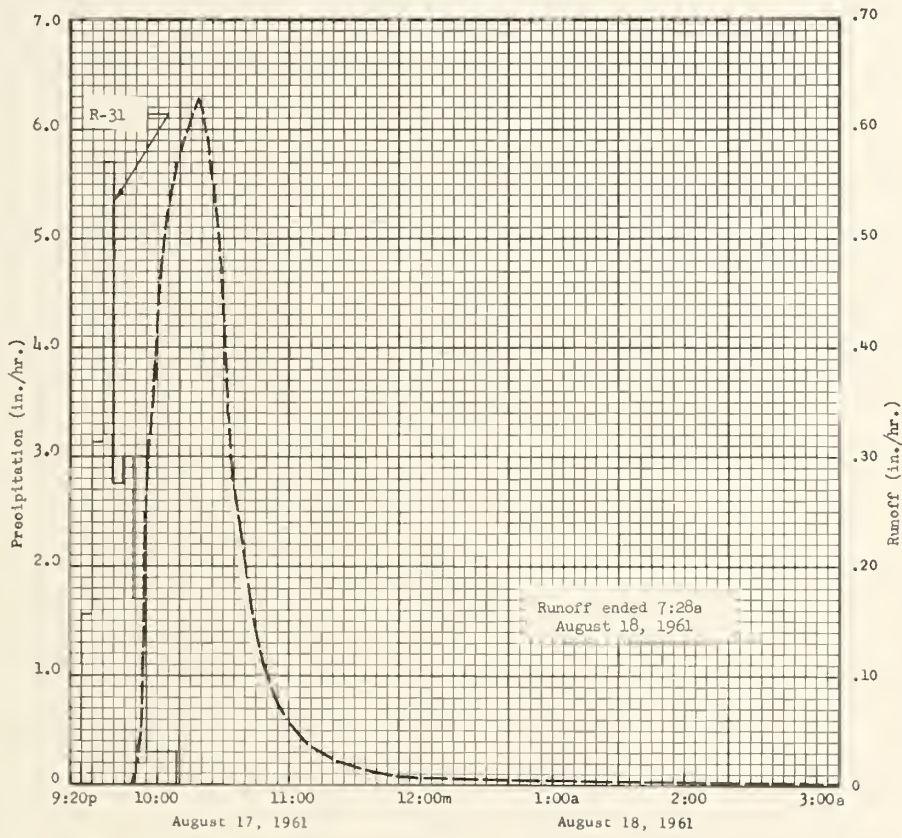
Notes: To convert runoff in in/hr to cfs, multiply by 2238. For contour map of watershed, see page 63.1-2; for map showing other cultural features, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 63.1-5. <sup>2/</sup> Isohyetal map of August 17, 1961 storm on page 63.2-3.  
<sup>3/</sup> Prior to 9:25p.





TOMSTONE, ARIZONA WATERSHED W-3

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Tombstone, Arizona Watershed W-4 (Area - 560 acres)								
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
1960	P	1.69	0.46	0.29	0	0	0	2.45	2.08	1.13	0.50	0	0.26	8.06		
	Q	0	0	0	0	0	0	0	0	0	0	0	0	0		
1961	P	0.34	0.13	0.01	0	0	0.74	1.90	4.20	0.44	1.87	0.38	1.00	11.01		
	Q	0	0	0	0	0	0	.01	.57	T	0	0	0	.58		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Tombstone, Arizona Watershed W-4								
YEAR	MAXIMUM DISCHARGE	MAXIMUM VOLUME FOR SELECTED TIME INTERVAL														
		1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days		
		Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	
1960	0		0		0		0		0		0		0			
1961	8-17	0.3354	8-17	0.3572	8-17	0.4206	8-17	0.4383	8-17	0.4395	8-17	0.4523	8-17	0.4523	8-17	0.4523
Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good. Watershed Conditions: Shrub cover of 25%. 1/ Monthly precipitation is average of raingages using arithmetic method.																
SELECTED RUNOFF EVENTS								Tombstone, Arizona Watershed W-4								
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of August 17-18, 1961 2/																
7-31-61	Raingage R-31	0	8-17-61	Raingage	R-31	8-17-61										
8-2	0.15	0	9:25p	0	0	9:48p	0	0								
8-13	.17	0	:30	1.56	.13	:51	.0142	.0004								
8-15	.13	0	:35	3.12	.39	:53	.0832	.0020								
	.06	0	:39	5.70	.77	:54	.2319	.0046								
8-17	.13 3/	0	:44	2.76	1.00	:58	.3823	.0251								
			:49	3.00	1.25	10:02	.4832	.0539								
			:55	1.70	1.42	:08	.5699	.1066								
			10:09	.30	1.49	:13	.6000	.1553								
7-31-61	Raingage R-71	0	8-17-61	Raingage	R-71	:18	.6284	.2065								
8-2	0.10	0	9:25p	0	0	:23	.5629	.2561								
8-13	.12	0	:32	2.57	.30	:33	.3229	.3300								
8-15	.05	0	:39	4.54	.83	:43	.1588	.3702								
8-17	.02	0	:48	3.40	1.54	11:08	.0375	.4111								
8-15	.05	0	:55	2.66	1.85	:53	.0081	.4282								
8-17	.10 3/	0	10:19	.18	1.92											
						8-18-61										
						12:53a	.0029	.4337								
						2:53	.0011	.4377								
						4:53	.0003	.4391								
						7:28	0	.4395								
Watershed conditions: Shrub cover of 25%.																
Notes: To convert runoff in in/hr to cfs, multiply by 565. For contour map of watershed, see page 63.1-2; for map showing other cultural features, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 63.1-5. 2/ Isohyetal map of August 17, 1961 storm on page 63.2-3. 3/ Prior to 9:25a.																



TOMBSTONE, ARIZONA WATERSHED W-4

6-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Tombstone, Arizona Watershed W-5 Area - 5510 ac. (8.61 sq. mi.)					
Year \ Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P Q	1.77 0	0.44 0	0.23 0	0 0	0 0	1.48 T	0.72 T	0.44 0	0.64 0	0.02 0	0.27 0	6.01 T
1961	P Q	0.39 0	0.04 0	0 0	0 0	0.76 T	1.94 .06	2.99 .07	0.75 .02	1.83 0	0.32 0	0.93 0	9.95 .15

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS Tombstone, Arizona Watershed W-5

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	8-1-60	0.0012	8-1	0.0005	8-1	0.0006	8-1	0.0006	8-1	0.0006	8-1	0.0006	8-1	0.0006	8-1	0.0021
1961	7-31-61	.0623	7-31	.0348	7-31	.0446	7-31	.0489	7-31	.0496	7-31	.0496	7-31	.0496	8-22	.0656

Notes: Quality of Records: Monthly P, good, and Q, fair; annual maximum discharges and volumes, fair.  
 Watershed Conditions: Desert Shrubs (whitethorn, tarbush, creosotebush) cover 25%.  
 Grassland, grass canopy 22%. 1/ Monthly precipitation is average of raingages, using arithmetic method.

SELECTED RUNOFF EVENTS 2/ Tombstone, Arizona Watershed W-5

Antecedent conditions			Rainfall				Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	

Notes: For contour map of watershed, see page 63.1-2; for map showing other cultural features, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 63.1-5.  
 2/ No suitable selected event available.



MONTHLY PRECIPITATION <sup>1/</sup> AND RUNOFF (Inches)							SANTA ROSA, NEW MEXICO Watershed W-I Area - 42,880 ac. (67 sq. mi.)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	0.58	0.38	0.44	0.03	0.76	4.62	7.35	1.04	0.72	3.23	0	0.84	19.99
	Q	0	0	0	0	0	1.60	1.50	0	0	0	0	0	3.10
1961	P	.19	.13	.70	.87	.98	.78	3.85	2.16	2.52	1.16	.39	.77	14.50
	Q	T	T	T	T	T	0	.21	.04	.04	T	T	T	.29

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS

SANTA ROSA, NEW MEXICO Watershed W-I

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	6-5	.1718	6-5	.171	6-5	.333	6-5	.698	6-5	.83	6-5	.92	6-5	1.08	7-4	1.26
1961	7-13	.0261	7-13	.0245	7-13	.0490	7-13	.1351	7-13	.203	7-13	.203	7-13	.203	7-13	.203

Notes: Quality of records: Monthly P and Q, good; annual maximum discharges and volumes, good.  
 Watershed Conditions: Grazing land. About 75% of the area is grassland, vegetation consisting of blue grama, galleta, buffalo and ring molly. Remaining 25% of area is pinon, juniper, and various shrubs, with some grasses interspersed. <sup>1/</sup> Monthly precipitation is arithmetic average of 55 raingages.

SELECTED RUNOFF EVENTS

SANTA ROSA, NEW MEXICO Watershed W-1

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
5-29-60	Raingage R-34 .70	0	Event of June 5-7, 1960 <sup>2/</sup>			6-5-60		
			4:35p	Raingage 0	R-34 0	5:52p	0	0
			:37	2.70	.09	:56	.0111	.0004
			:38	9.00	.24	:59	.0179	.0012
			:39	6.60	.35	6:06	.0262	.0037
			:41	8.70	.64	:14	.0367	.0079
			:44	2.80	.78	:21	.0489	.0129
			:46	6.30	.99	:28	.0636	.0195
			:48	36.00	2.19	:33	.0805	.0255
			:50	20.10	2.86	:38	.1007	.0330
			:52	9.60	3.18	:43	.1241	.0424
			:54	2.10	3.25	:48	.1502	.0538
			:59	3.12	3.51	:53	.1608	.0668
			5:03	1.35	3.60	:59	.1629	.1099
			:31	.69	3.92	7:29	.1639	.1644
			:53	.05	3.96	:33	.1662	.1754
			6:12	0	3.96	:41	.1665	.1976
			:20	.15	3.98	:55	.1718	.2370
			:35	.04	3.99	8:27	.1718	.3287
			:54	.19	4.05	9:20	.1698	.4795
			7:08	.04	4.06	9:31	.1261	.5067
			:41	0	4.06	:51	.1130	.5464
			:52	.11	4.08	10:11	.0935	.5808
			9:35	.01	4.09	:31	.0779	.6094
						:51	.0672	.6336
						11:06	.0597	.6495
						:36	.0498	.6768
						:49	.0453	.6871
						6-6-60		
						12:09a	.0435	.7020

Continued on next page

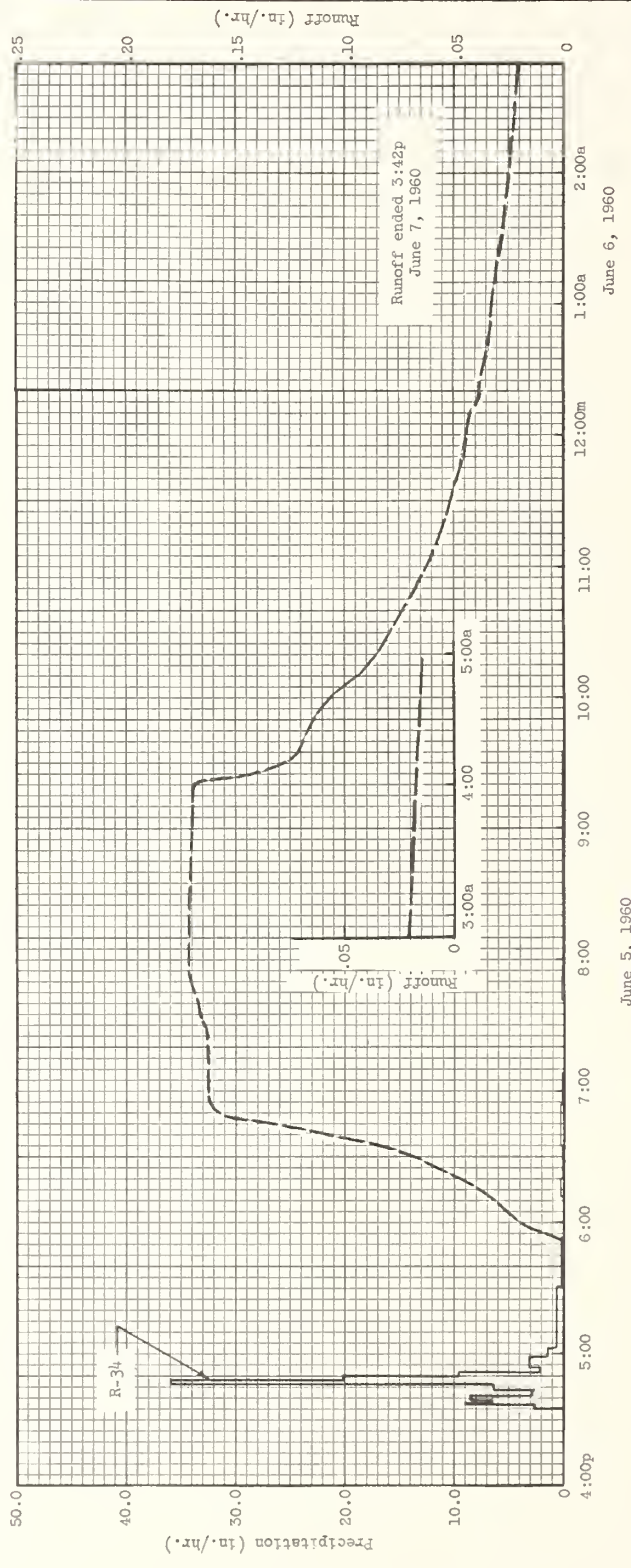
Notes: To convert runoff in in/hr to cfs, multiply by 43,240.  
 Contour map of watershed not available. <sup>2/</sup> Isohyetal map on page 64.1-6.

SELECTED RUNOFF EVENTS			SANTA ROSA, NEW MEXICO Watershed W-I					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			Event of June 5-7, 1960 - continued 1/					
5-29-60	Raingage R-44 0.80	0	6-5-60	Raingage	R-44	6-6-60 - continued		
5-31	.02	0	4:45p	0	0	12:17a	0.0383	0.7074
			:52	3.09	.36	:28	.0375	.7144
			5:09	7.66	2.53	:36	.0349	.7192
			:15	4.00	2.93	:50	.0338	.7272
			:29	1.76	3.34	:52	.0328	.7283
			6:00	.54	3.62	1:19	.0307	.7426
			7:00	.04	3.66	:28	.0281	.7470
			:15	.16	3.70	2:16	.0241	.7679
			:25	0	3.70	3:20	.0197	.7898
						4:20	.0164	.8079
						5:20	.0139	.8231
						6:20	.0120	.8360
						7:20	.0102	.8472
						8:20	.0089	.8568
						9:20	.0081	.8653
						10:20	.0074	.8730
						11:20	.0069	.8802
						12:20p	.0065	.8870
						1:20	.0062	.8933
						2:20	.0059	.8994
						3:20	.0058	.9053
						4:20	.0057	.9110
						5:20	.0055	.9166
						6:20	.0058	.9224
						7:36	.0053	.9295
						9:21	.0056	.9389
						11:21	.0058	.9504
						6-7-60		
						12:21a	.0061	.9563
						2:21	.0064	.9688
						4:21	.0066	.9817
						8:21	.0069	1.0100
						1:21p	.0069	1.0666
						3:42	0	1.0851
			Event of July 13, 1961 1/					
			7-13-61	Raingage	R-21	7-13-61		
7-2-61	Raingage R-21 0.02	0	1:20a	0	0	1:40a	0	0
7-7	.30	0	:24	4:05	.27	:46	.00010	0.00001 2/
7-8	.44	0	:26	10.80	.63	:49	.00011	.00001
			:28	7.80	.89	:52	.00009	.00002
			:30	7.80	1.15	:58	.00015	.00003
			:32	10.80	1.51	2:01	.00037	.00004
			:34	19.80	2.17	:04	.00123	.00008
			:36	17.70	2.78	:07	.00213	.00016
			:38	15.60	3.26	:09	.00372	.00026
			:45	.51	3.32	:12	.00578	.00050
			:53	.82	3.43	:17	.00879	.00111
			2:55	.03	3.46	:24	.01110	.00227
			3:06	.27	3.51	:28	.01422	.00311
			:16	.24	3.55	:30	.01781	.00364
			7-13-61	Raingage	R-22	:36	.02255	.00566
			1:25a	0	0	:42	.02433	.00800
			:30	10.20	.85	:47	.02551	.01008
			:37	3.60	.97	:51	.02593	.01179
			:46	10.80	1.32	:52	.02595	.01222
			:58	12.80	1.96	:53	.02609	.01265
			2:16	1.00	2.06	3:00	.02609	.01569
			:41	1.03	2.18	:07	.02505	.01867
			3:14	0	2.20	:17	.02255	.02105
						:27	.02142	.02325
Watershed conditions: Grazing land See description on page 64.1-1.								
			Continued on next page					

Notes: To convert runoff in in/hr. to cfs, multiply by 43,200. 1/ Isohyetal map on page 64.1-6. 2/ Five significant figures are used on runoff of 7-13-61 in order to record early stages of runoff.

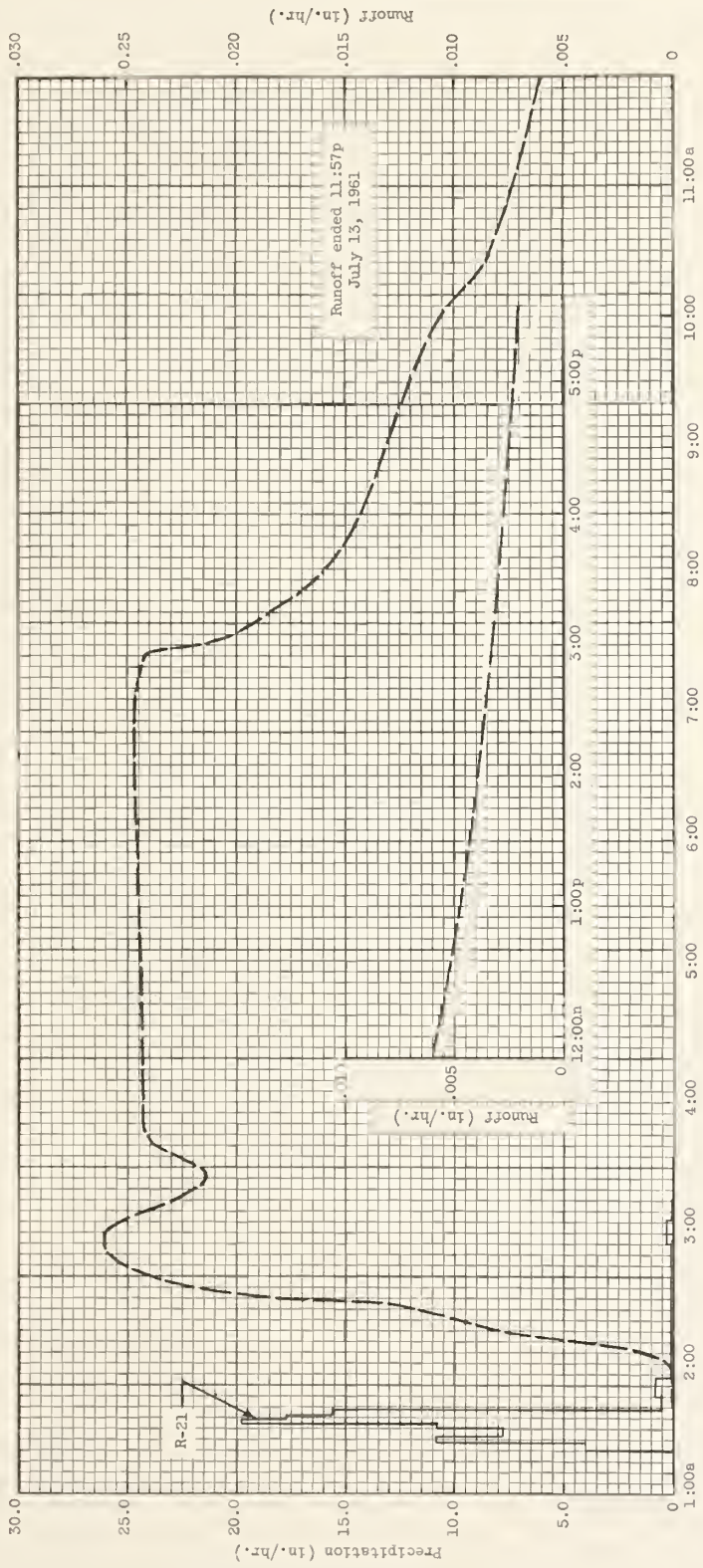
SELECTED RUNOFF EVENTS			SANTA ROSA, NEW MEXICO Watershed W-I					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of July 13, 1961 - continued</u>								
						7-13-61		
						3:42a	0.02399	0.02893
						:47	.02424	.03094
						4:22	.02433	.04510
						:58	.02443	.05973
						5:45	.02452	.07891
						7:08	.02461	.11288
						:27	.02417	.12060
						:32	.02089	.12248
						:50	.01788	.12829
						8:45	.01360	.14272
						9:52	.01110	.15651
						10:24	.00863	.16177
						11:59	.00578	.17317
						2:16p	.00372	.18402
						5:13	.00213	.19263
						11:07	.00104	.20195
						:57	0	.20253

Notes: To convert runoff in in/hr. to cfs, multiply by 43,210.

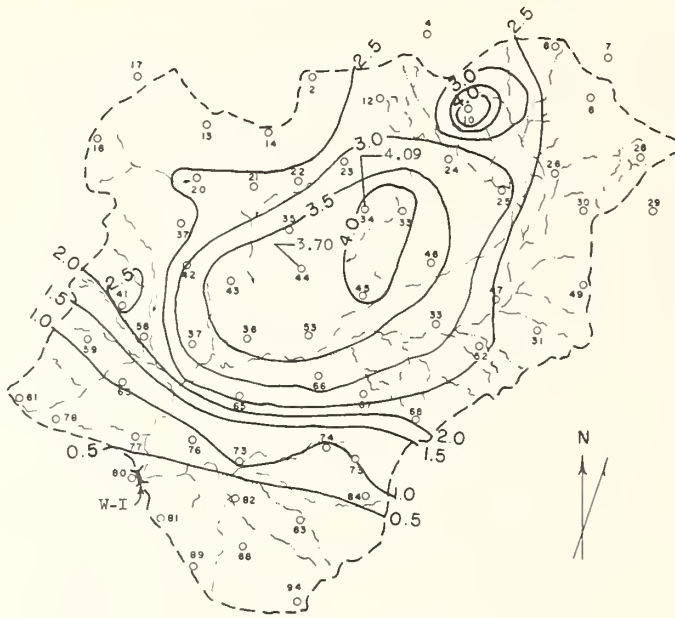


SANTA ROSA, NEW MEXICO WATERSHED W-I

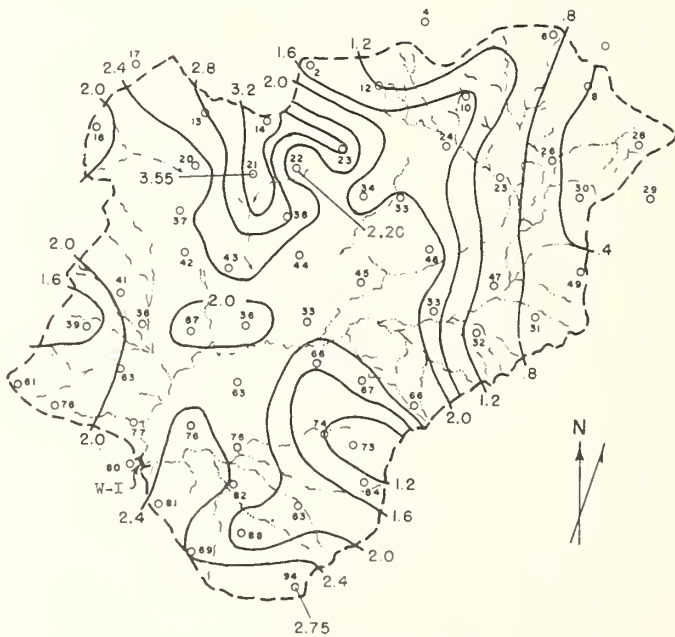




SANTA ROSA, NEW MEXICO - WATERSHED W-I



Isohyetal Map, Storm of June 5, 1960



Isohyetal Map, Storm of July 13, 1961



LEGEND

- - - WATERSHED BOUNDARY
- RECORDING RAINGAGES
- W-I RUNOFF MEASURING STATION
- ..... INTERMITTENT WATERWAY

SANTA ROSA, NEW MEXICO Watershed W-I

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Newell, South Dakota, Watershed W-2 (Area - 115 acres)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.14	.17	.24	.32	.99	2.48	.57	1.85	1.60	.11	.04	.18	8.69
Q	0	.030	.455	0	0	.011	.007	.012	.079	0	0	0	.59
1961 P	.10	.06	.24	1.03	.66	1.64	.94	1.05	1.70	.72	.19	.19	8.52
Q	0	.012	.001	0	0	.142	0	0	0	0	0	0	.16
Normal P 2/	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

DAILY PRECIPITATION AND RUNOFF (Inches) Newell, South Dakota Watershed W-2

Date	Precipitation	Runoff	Date	Precipitation	Runoff	Date	Precipitation	Runoff
Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-1-60	0.07	0	8-16	0.19	0	7-17	0.03	0
1-3	.02		8-17	1.17	.012	7-25	.05	
1-4	.01		8-23	.06		7-27	.39	
1-17	.01		9-7	.30	.079	7-28	.02	
1-18	.03		9-8	.03		8-8	.20	
2-1	.02		9-14	.02		8-10	.19	
2-8	.02		9-16	.07		8-16	.09	
2-9	.08		9-17	.42		8-21	.57	
2-10	.10	.030	9-18	.01		9-1	.07	
2-21	.01		9-21	.05		9-2	.03	
2-22	.03		9-22	0.20		9-6	.17	
2-28	.01		10-17	.03		9-7	.01	
3-1	.01		10-18	.06		9-11	.03	
3-2	.02		10-29	.02		9-12	1.00	T
3-8	.09		11-27	.04		9-18	.19	
3-9	.06		12-17	.07		9-19	.01	
3-10	.04		12-20	.11		9-21	.17	
3-15	T	.031	Watershed conditions, 1960: Production of cover 1090 lbs/ac oven dry wt. 3/ Degree of use: Close (see below).			9-29	.02	
3-19		.151	Year of 1961			10-7	.46	
3-20	.01		1-1-61	0.05	0	10-8	.04	
3-21	.01	.201	1-18	.03		10-11	.09	
3-22	T	.007	1-25	.02		10-28	.13	
3-23		.010	2-1	.05		11-2	.05	
3-24		.001	2-12	.01		11-3	.04	
3-25		.010				11-15	.10	
3-26		.023	2-27		.012	12-3	.05	
3-27		.008	3-3	.03		12-8	.07	
3-28		.012	3-4	.05		12-23	.01	
3-30		.001	3-5	.02		12-29	.06	
4-10	.12		3-12	.10		Watershed conditions, 1961: Production of cover 1740 lbs/ac oven dry wt. 3/ Degree of use: Close (see definition below).		
4-24	.20		3-18	.02		Definitions of degree of use: Unused: No livestock use. Slight: Practically undisturbed, only choice areas and forage grazed. Moderate: Most of range grazed, little or no use of poor forage, little trailing to grazing. Full: All fully accessible areas grazed; major sites have key forage species properly utilized. Over-use less than 10% of pasture area. Close: All accessible range plainly shows use, major sections closely cropped, livestock forced to use poor forage. Severe: Key forage species almost completely used, low value forage carrying grazing load, trampling damage widespread in accessible areas. Extreme: Range appears stripped of vegetation, key forage species weak from continued grazing, poor forage closely grazed, livestock trail great distances for forage. (Use observations made each October)		
5-2	.04		3-19	T	.001			
5-3	.06		3-21					
5-4	.20		3-25	.02				
5-5	.10		4-4	.26				
5-17	.29		4-10	.32				
5-24	.20		4-20	.17				
5-25	.06		4-22	.06				
5-26	.02		4-24	.02				
5-27	.02		4-30	.20				
6-5	.01		5-4	.21				
6-7	.60	.009	5-5	.10				
6-9	.55	.001	5-15	.22				
6-12	.19		5-16	.11				
6-15	.59	.001	5-17	.01				
6-19	.14		5-18	.01				
5-20	.29		6-1	.05				
6-30	.11		6-9	.17				
7-11	.06		6-12	1.10	.142			
7-12	.08		6-14	.21				
7-17	.32	.007	6-18	.05				
7-29	.11		6-19	.06				
8-5	.11		7-1	.29				
8-6	.28		7-5	.08				
8-15	.04		7-9	.08				

Notes: Quality of records: P—good; Q—fair. Watershed conditions: 100% rangeland. For watershed map, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.2-4. 1/ Rainage W-2A. 2/ Normal P based on 54-year (1908-61) U. S. Weather Bureau record at Newell S. D. 3/ July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year.

3-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Newell, South Dakota, Watershed W-3 (Area - 90 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	.13	.17	.24	.30	.95	2.40	.68	1.78	1.58	.07	.04	.18	8.52 .21
	Q	0	.002	.209	0	0	0	0	T	T	0	0	0	
1961	P	.08	.06	.22	.99	.74	1.13	.68	.95	1.69	.72	.19	.19	7.64 .01
	Q	0	0	0	0	0	.01	0	0	0	0	0	0	
Normal	P <u>2/</u>	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland. This watershed will be continued for bulk runoff yields, but results will not be reported after 12-31-61.

DAILY PRECIPITATION AND RUNOFF (Inches)						Newell, South Dakota, Watershed W-3		
Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff
<u>Year of 1960</u>			<u>Year of 1960 - continued</u>			<u>Year of 1961 - continued</u>		
1-1-60	0.07	0	8-16	0.15	0	6-9	0.15	0
1-3	.01		8-17	1.15	T	6-12	.65	
1-4	.01		8-23	.05		6-13	.23	
1-17	.01		9-8	.80	T	6-18	.03	
1-18	.03		9-9	.03		6-19	.03	
2-1	.02		9-14	.07		7-1	.05	
2-2		.001	9-17	.41		7-5	.05	
2-8	.02		9-18	.02		7-25	.04	
2-9	.08		9-21	.03		7-27	.47	.010
2-19		.001	9-22	.22		7-28	.07	
2-21	.02		10-17	.02		8-8	.15	
2-22	.02		10-18	.03		8-10	.13	
2-28	.01		10-29	.02		8-16	.07	
3-1	.01		11-27	.04		8-21	.60	
3-2	.02		12-16	.07		9-1	.06	
3-8	.09		12-19	.11		9-2	.02	
3-9	.04		Watershed conditions, 1960: Production of cover 2344 lbs/ac oven dry wt. <u>3/</u> Degree of grazing of rangeland: Close. <u>4/</u>			9-6	.10	
3-10	.06					9-7	.02	
3-18		.013				9-11	.02	
3-20	.01					9-12	1.03	
3-21	.01		1-1-61	0.03	0	9-18	.20	
3-24		.196	1-18	.03		9-19	.02	
4-10	.12		1-25	.02		9-21	.18	
4-24	.18		2-1	.05		9-29	.02	
5-2	.04		2-12	.01		10-7	.46	
5-3	.05		3-3	.02		10-8	.04	
5-4	.17		3-4	.04		10-11	.09	
5-5	.13		3-5	.02		10-28	.13	
5-16	.22		3-12	.10		11-2	.05	
5-24	.24		3-18	.02		11-3	.04	
5-25	.06		3-25	.02		11-15	.10	
6-7	.47		4-3	.28		12-4	.05	
6-9	.55		4-10	.26		12-8	.07	
6-12	.22		4-20	.15		12-23	.01	
6-15	.65		4-22	.10		12-29	.06	
6-19	.15		4-24	.05		Watershed conditions, 1961: Production of cover 1758 lbs/ac oven dry wt. <u>3/</u> Degree of grazing of rangeland: Close. <u>4/</u>		
6-20	.25		4-30	.15				
6-30	.11		5-3	.03				
7-11	.12		5-4	.25				
7-12	.08		5-5	.07				
7-17	.38		5-15	.10				
7-29	.10		5-16	.10				
8-5	.10		5-17	.17				
8-6	.30		5-18	.02				
8-15	.03		6-1	.04				

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.3-4. <sup>1/</sup> Precipitation from Raingage 3A. <sup>2/</sup> Normal P based on 54-year (1908-61) U. S. Weather Bureau record period at Newell, S. D. <sup>3/</sup> July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. <sup>4/</sup> For definitions of degree of use, see p. 65.2-1.



MONTHLY PRECIPITATION AND RUNOFF (Inches)							Newell, South Dakota, Watershed W-4 <sup>2/</sup> (Area - 105 acres)						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.24	.18	.19	.32	1.52	1.92	.02	2.20	1.48	.11	.18	.30	8.66
Q	0	.003	.334	0	.001	.006	0	.005	T	0	0	0	.35
1961 P	.09	.12	.21	.79	.63	.84	.59	1.15	2.09	.58	.24	.40	7.73
Q	0	0	0	0	0	0	0	.004	.007	0	0	0	.01
Normal P <sup>3/</sup>	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland.

DAILY PRECIPITATION AND RUNOFF (Inches)				Newell, South Dakota Watershed W-4 <sup>2/</sup>				
Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff
<u>Year of 1960</u>			<u>Year of 1960 - continued</u>			<u>Year of 1961 - continued</u>		
1-1-60	0.17	0	8-14	0.06	0	5-15	0.05	0
1-4	.05		8-16	.70		5-16	.20	
1-17	.01		8-17	.74	.005	5-17	.04	
1-18	.01		8-26	.03		5-23	.03	
2-3		.002	9-7	.77		6-1	.03	
2-8	.02		9-8	.05		6-9	.09	
2-9	.11		9-16	.01		6-14	.64	
2-17		.001	9-17	.50		6-19	.02	
2-21	.04		9-21	.03		6-30	.03	
2-22	.01		9-22	.13		6-31	.03	
3-1	.01		10-17	.01		7-1	.20	
3-2	.03		10-18	.06		7-5	.08	
3-10	.06		10-29	.04		7-12	.13	
3-14	.04		11-27	.18		7-27	.16	
3-18		.004	12-4	.08		7-28	.02	
3-20	.01	.080	12-8	.02		8-8	.15	
3-21	.02	.249	12-17	.02		8-10	.14	
3-23		.001	12-18	.02		8-21	.86	.004
3-27	.01		12-19	.04		9-1	.02	
3-28	.01		12-27	.12		9-2	.10	
4-10	.12		Watershed conditions, 1960: Production of cover 2869 lbs/ac oven dry wt. <sup>4/</sup> Degree of grazing of rangeland: Full. <sup>5/</sup>			9-6	.10	
4-24	.20					9-11	.02	
5-2	.03					9-12	1.24	.006
5-3	.05					9-18	.29	
5-4	.13					9-21	.32	.001
<u>Year of 1961</u>			<u>Year of 1961 - continued</u>			<u>Year of 1961 - continued</u>		
5-5	.08		1-1-61	0.04	0	10-7	.06	
5-17	.15		1-18	.03		10-9	.31	
5-18	.02		1-25	.02		10-12	.03	
5-23	.33		2-1	.09		10-18	.02	
5-24	.50	.001	2-22	.03		10-28	.16	
5-25	.19		3-3	.03		11-4	.03	
5-30	.04		3-4	.04		11-8	.21	
6-4	.03		3-5	.02		12-4	.25	
6-7	.05		3-12	.10		12-8	.03	
6-8	.11		3-25	.02		12-11	.06	
6-9	.28		4-3	.28		12-18	.02	
5-12	.23	.002	4-9	.02		12-21	.03	
6-15	.98	.004	4-11	.06		12-25	.01	
6-19	.08		4-20	.18				
6-20	.04		4-22	.07				
6-27	.02		4-24	.03		Watershed conditions, 1961: Production of cover 2132 lbs/ac oven dry wt. <sup>4/</sup> Degree of grazing of rangeland: Full. <sup>5/</sup>		
6-30	.10		4-30	.15				
7-17	.02		5-3	.03				
8-5	.40		5-4	.27				
8-6	.27		5-5	.01				

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.4-4. <sup>1/</sup> Precipitation from W-4A. <sup>2/</sup> Station discontinued Dec. 31, 1961. <sup>3/</sup> Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. <sup>4/</sup> July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. <sup>5/</sup> For definitions of degree of use, see p. 65.2-1.

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Newell, South Dakota, Watershed W-5 (Area - 46 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.05	.12	.33	.26	1.39	2.46	.06	2.32	.94	.08	.04	.34	8.39
Q	.001	.002	.276	0	0	.083	0	.024	0	0	0	0	.39
1961 P	.10	.12	.23	.91	.77	1.32	1.24	1.00	1.63	.48	.17	.30	8.27
Q	0	0	0	0	0	0	0	.004	.021	0	0	0	.03
Normal P <sup>2/</sup>	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland.

DAILY PRECIPITATION AND RUNOFF (Inches)				Newell, South Dakota Watershed W-5						
Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff		
Year of 1960			Year of 1960 - continued			Year of 1961 - continued				
1-4-60	0.02	0	8-17	0.84	0.006	6-1	0.03	0		
1-17	.01		9-7	.36		6-12	.20			
1-18	.02		9-8	.02		6-13	.68			
1-31		.001	9-14	.01		6-14	.31			
2-3		.002	9-16	.01		6-18	.04			
2-8	.04		9-17	.42		6-19	.06			
2-9	.03		9-22	.12		7-1	.76			
2-21	.03		10-17	.01		7-5	.04			
2-22	.02		10-18	.05		7-12	.12			
3-1	.01		10-29	.02		7-27	.32			
3-2	.02		11-27	.04		8-8	.14			
3-7	.05		12-4	.08		8-9	.01			
3-8	.12		12-8	.03		8-10	.05			
3-10	.05		12-17	.02		8-21	.80	.004		
3-14	.03		12-18	.02		9-1	.02			
3-20	.01		12-19	.04		9-2	.10			
3-21	.04		12-27	.15		9-6	.08			
3-25		.276				9-12	1.04	.021		
4-10	.11					9-18	.15			
4-11	.02					9-21	.24			
4-24	.13		Watershed conditions, 1960: Production of cover 2689 lbs/ac oven dry wt. <sup>3/</sup> Degree of grazing of rangeland: full. <sup>4/</sup>			10-7	.22			
5-2	.03							10-8	.02	
5-3	.04							10-11	.03	
5-4	.07							10-18	.05	
5-5	.05							10-28	.16	
5-17	.03		1-1-61	0.04	0	11-1	.04			
5-18	.03		1-18	.03		11-3	.07			
5-23	.27		1-25	.03		11-15	.06			
5-24	.69		2-1	.10		12-3	.14			
5-25	.14		2-22	.02		12-8	.03			
5-30	.04		3-3	.03		12-21	.04			
6-7	.05		3-4	.03		12-25	.01			
6-8	.48		3-5	.02		12-29	.08			
6-9	.10		3-12	.11						
6-11	.05		3-18	.02						
6-12	.23		3-25	.02		Watershed conditions, 1961: Production of cover 1724 lbs/ac oven dry wt. <sup>3/</sup> Degree of grazing of rangeland: Close. <sup>4/</sup>				
6-15	1.41	.083	4-3	.36						
6-27	.08		4-9	.09						
6-30	.06		4-10	.07						
7-11	.04		4-11	.06						
7-16	.02		4-20	.13						
8-5	.86	.017	4-22	.09						
8-6	.25		4-30	.11						
8-15	.01		5-3	.03						
8-16	.36	.001	5-4	.37						
			5-5	.03						
			5-15	.06						
			5-16	.17						
			5-17	.08						
			5-23	.03						

Notes: Quality of records: P - good; Q - fair. For watershed map, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.5-4. <sup>1/</sup> Precipitation from raingage W-5A. <sup>2/</sup> Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. <sup>3/</sup> July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. <sup>4/</sup> For definitions of degree of use, see p. 65.2-1.

3-62

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Newell, South Dakota, Watershed W-6 (Area - 30 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P Q	.82 T	.19 T	.51 .391	.29 T	1.39 .013	3.15 .329	.08 0	1.57 .149	.94 .012	.08 0	.11 0	.35 0	9.48 .89
1961 P Q	.08 0	.13 0	.27 0	.72 0	.68 0	.83 0	.96 0	.95 0	1.86 .022	.57 0	.12 0	.25 0	7.42 .02
Normal P <u>2/</u>	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland. This watershed will be continued for bulk runoff yields but results will not be reported after 12-31-61.

DAILY PRECIPITATION AND RUNOFF (Inches)			Newell, South Dakota Watershed W-6					
Date	Precipitation <u>1/</u>	Runoff	Date	Precipitation <u>1/</u>	Runoff	Date	Precipitation <u>1/</u>	Runoff

Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-1-60	0.31	0	8-5	0.30	0.006	5-4	0.40	0
1-2	.12		8-6	.16	.002	5-5	.02	
1-3	.06		8-15	.04		5-15	.06	
1-4	.11		8-16	.48	.029	5-16	.40	
1-5	.15		8-17	.57	.112	5-17	.09	
1-6	.06		8-25	.02		5-18	.01	
1-18	.01		9-7	.25	.001	5-23	.03	
2-3			9-8	.03		6-1	.08	
2-8	.02		9-14	.02		6-9	.05	
2-9	.11		9-17	.52	.011	6-14	.68	
2-21	.03		9-18	.01		6-19	.02	
2-22	.03		9-22	.11		7-1	.14	
3-1	.01		10-18	.07		7-5	.09	
3-2	.03		10-29	.01		7-9	.09	
3-6	.03		11-27	.11		7-12	.03	
3-7	.20		12-4	.07		7-25	.05	
3-10	.09		12-8	.01		7-27	.56	
3-14	.12		12-18	.04		8-8	.19	
3-20	.01		12-19	.06		8-10	.23	
3-21	.02	.331	12-27	.17		8-21	.49	
3-22		.009	Watershed conditions, 1960: Production of cover 2966 lbs/ac oven dry wt. <u>3/</u> Degree of grazing of rangeland: Full. <u>4/</u>			8-29	.04	
3-23		.025				9-1	.01	
3-25		.011				9-2	.10	
3-26		.015				9-6	.15	
4-10	.10					9-11	.04	
4-24	.19		Year of 1961			9-12	1.24	.022
5-3	.07		1-1-61	0.04	0	9-18	.12	
5-4	.11		1-18	.02		9-21	.20	
5-17	.10		1-25	.02		10-7	.20	
5-18	.06		2-1	.10		10-8	.15	
5-23	.21		2-18	.01				
5-24	.58	.004	2-22	.02		10-11	.05	
5-25	.22	.009	3-3	.02		10-18	.06	
5-30	.04		3-4	.02		10-28	.11	
6-7	.03		3-5	.04		11-1	.02	
6-8	.23		3-12	.16		11-3	.01	
6-9	.24		3-18	.01		11-14	.09	
6-12	.91	.053	3-25	.02		12-3	.10	
6-15	1.52	.269	4-3	.26		12-8	.05	
6-16	.03	.002	4-9	.02		12-29	.10	
6-19	.06		4-10	.02				
6-29	.04		4-11	.08		Watershed conditions, 1961: Production of cover 2834 lbs/ac oven dry wt. <u>3/</u> Degree of grazing of rangeland: Moderate. <u>4/</u>		
6-30	.09		4-20	.16				
7-12	.03		4-22	.16				
7-16	.05		4-30	.02				
			5-3	.03				

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.0-4. 1/ Precipitation from rain gauge W-6A. 2/ Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. 3/ July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. 4/ For definitions of degree of use, see p. 65.2-1.

10-60

NEWELL, SOUTH DAKOTA Watershed W-7

LOCATION: Butte Co., South Dakota, 35 mi. NE of Newell, Tributary Trail Creek; South Moreau River Watershed.

AREA: 160 acres.

SHAPE: Trapezoidal, about 500' wide, 4000' long.

SLOPES: 80% is 3-9%; 20% is 9-18%.

ASPECT: E

SOILS: Residual, zonal: 39% - moderately deep and deep moderately coarse-textured soils, moderately rapid permeability; 35% shallowly developed and shallow moderately coarse-textured soils, moderately rapid permeability; 23% - solodized solonetz clay pan soils, slow to very slow permeability; 3% - deep moderately coarse-textured soils, rapid permeability. Flasher-Terry fine sandy loams - 35%; Rhoades-Moline loams - 34%; Vebar-Rhoades fine sandy loams - 26%; Lihen-Rhoades sandy loams - 3%; Timmer fine sandy loam - 1%; Rhoades loams - 1%. Internal drainage - medium.

EROSION: 1 - 100%.

LAND CAPABILITY: IVe = 39%; VIe = 32%; VIs = 29%.

SURFACE DRAINAGE: Good, well-defined; main drainages, length 3600', 1500'.

CHARACTER OF FLOW: Ephemeral, continuous.

INSTRUMENTATION: Runoff: A-35 waterstage recorder on stock pond. Precipitation: One recording gage.

WATERSHED CONDITIONS: 100% rangeland. Range condition, good. Leading species: Needle and thread - 12%; blue grama - 35%; thread leaf sedge - 20%; little blue stem, prairie sand reed and forbs - 33%. Production of cover: 3400 lbs. per acre. Range sites: Sandy - 39%; shallow - 35%; panspots - 23%; sands - 3%. Use (degree of grazing of rangeland): 1957 - full; 1958 - moderate; 1959 - full.

GENERALLY REPRESENTS: Rangeland in Powder-Yellowstone Residual Plains and Residual Plains, west Dakota, especially soils formed in materials weathered from Fox Hills and Hell Creek formations. Pierre Shale Plains and Badlands land resource area (G-60).

MONTHLY PRECIPITATION AND RUNOFF (Inches)

Newell, South Dakota Watershed W-7

Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1958	P	0.11	0.52	0.57	1.57	0.46	3.36	3.18	1.07	0.21	0.25	0.36
	Q	0	0	T	0	0	.006	.213	T	0	0	0	0	.22
1959	P	.25	.36	.29	.56	2.30	2.47	.40	.83	1.69	.58	.58	.32	10.63
	Q	0	0	.206	0	T	.002	0	0	.004	0	0	0	.21
Normal	P <sup>1/</sup>	.44	.37	.79	1.67	2.65	2.95	2.11	1.34	1.29	1.02	.55	.39	15.57

Notes: <sup>1/</sup> Normal P based on 52-year (1908-1959) record at Newell USWB station, Newell, South Dakota.

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MONTHLY PRECIPITATION AND RUNOFF (Inches)								Newell, South Dakota, Watershed W-7 (Area - 160 acres)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.21	.21	.50	.34	1.55	3.63	.30	2.43	1.00	.07	.14	.32	10.70
1960 Q	0	T	.398	0	.003	.022	0	.043	0	0	0	0	.47
1961 P	.09	.12	.27	.94	.98	1.05	1.57	1.08	1.64	.57	.20	.30	8.81
1961 Q	0	0	0	0	0	0	0	.002	.001	0	0	0	.003
Normal P <u>2/</u>	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland.

DAILY PRECIPITATION AND RUNOFF (Inches)			Newell, South Dakota Watershed W-7					
Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff
<u>Year of 1960</u>			<u>Year of 1960 - continued</u>			<u>Year of 1961 - continued</u>		
1-1-60	0.12	0	6-20	0.04	0	6-18	0.06	0
1-3	.04		6-26	.02		7-1	.90	T
1-4	.02		6-27	.19		7-5	.10	
1-17	.01		6-30	.06		7-12	.07	
1-18	.02		7-11	.10		7-27	.50	
2-8	.05		7-12	.03		8-8	.19	
2-9	.03		7-14	.02		8-9	.01	
2-21	.04		7-16	.04		8-10	.05	
2-22	.03		7-17	.03		8-21	.80	.002
2-27	.01		7-23	.08		8-29	.03	
2-28	.02		8-5	1.00	.040	9-1	.04	
2-29	.03		8-6	.30		9-2	.09	
3-1	.02		8-8	.02		9-6	.08	
3-2	.04		8-15	.01		9-12	1.07	.001
3-6	.03		8-16	.24		9-18	.15	
3-7	.05		Watershed conditions, 1960: Production of cover 2952 lbs/ac oven dry wt. <u>3/</u> Degree of grazing of rangeland: Close. <u>4/</u>			9-21	.21	
3-8	.14					10-7	.27	
3-10	.08					10-8	.02	
3-11	.03					10-11	.03	
3-12	.02		<u>Year of 1961</u>			10-18	.05	
3-17	.02		1-1-61	0.04	0	10-28	.20	
3-18		.006	1-18	.02		11-1	.04	
3-19		.001	1-25	.03		11-3	.07	
3-20	.04	.115	2-1	.10		11-15	.09	
3-21	.03	.249	2-18	.01		12-3	.14	
3-22		.002	2-22	.01		12-8	.03	
3-23		.010	3-3	.03		12-20	.04	
3-25		.004	3-4	.03		12-25	.01	
3-26		.011	3-5	.02		12-29	.08	
4-10	.11		3-12	.15				
4-11	.02		3-18	.02		8-17-60	0.86	0.003
4-24	.21		3-25	.02		9-6	.28	
5-2	.03		4-3	.29		9-7	.01	
5-3	.10		4-9	.09		9-14	.02	
5-4	.06		4-10	.07		9-16	.05	
5-5	.03		4-11	.06		9-17	.49	
5-17	.03		4-20	.13		9-18	.01	
5-18	.09		4-22	.13		9-22	.14	
5-23	.36		4-30	.17		10-18	.06	
5-24	.69	.003	5-3	.04		10-29	.01	
5-25	.12		5-4	.42		11-27	.14	
5-30	.04		5-5	.03		12-4	.08	
6-5	.02		5-15	.06		12-8	.01	
6-6	.01		5-16	.36		12-17	.02	
6-7	.03		5-17	.04		12-18	.02	
6-8	.52	.006	5-23	.03		12-19	.02	
6-9	.15		6-9	.20		12-26	.17	
6-11	.07		6-12	.50				
6-12	.93	.004	6-14	.25		Watershed conditions, 1961: Production of cover 2048 lbs/ac oven dry wt. <u>3/</u> Degree of grazing of rangeland: Close. <u>4/</u>		
6-15	1.59	.012	6-17	.04				

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.7-4. 1/ Precipitation from Rainage W-7A. 2/ Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. 3/ July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. 4/ For definitions of degree of use, see p. 65.2-1.

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Newell, South Dakota, Watershed W-8 (Area - 160 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	.16	.15	.19	.28	1.66	2.36	.24	3.17	.89	.06	.14	.45	9.75
	Q	0	.007	.457	0	.007	.015	0	.136	0	0	0	0	.62
1961	P	.12	.11	.19	1.12	.55	2.37	1.91	.83	1.91	.49	.32	.42	10.34
	Q	0	.004	0	0	0	.152	.044	.006	.050	0	0	0	.26
Normal	P 3/	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland.

DAILY PRECIPITATION AND RUNOFF (Inches)				Newell, South Dakota Watershed W-8				
Date	Precipitation	Runoff	Date	Precipitation	Runoff	Date	Precipitation	Runoff
Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-1-60	0.04	0	9-14	0.01	0	7-5	0.06	0
1-2	.02		9-17	.38		7-12	.11	
1-4	.04		9-22	.21		7-27	1.02	.039
1-16	.01		9-23	.02		7-28	.08	
1-17	.02		10-18	.04		8-1	.04	
1-18	.03		10-29	.02		8-8	.30	
2-8	.02		11-27	.14		8-10	.15	
2-9	.09		12-4	.09		8-21	.47	.006
2-17		.007	12-9	.02		9-1	.08	
2-21	.02		12-17	.02		9-2	.01	
2-22	.02		12-18	.04		9-6	.03	
3-1	.01		12-19	.21		9-11	.11	
3-2	.02		12-27	.07		9-12	1.26	.020
3-6	.01		Watershed conditions, 1960: Production of cover 3155 lbs/ac oven dry wt. 4/ Degree of grazing of rangeland: Close. 5/			9-18	.15	.008
3-7	.01					9-21	.36	.022
3-8	.14		Year of 1961			10-8	.34	
3-22		.387				10-28	.15	
3-23		.033				11-2	.09	
3-25		.015				11-4	.04	
3-26		.022				11-15	.18	
4-10	.11		1-1-61	0.06	0	11-29	.01	
4-24	.17		1-18	.03		12-3	.20	
5-4	.03		1-25	.03		12-8	.08	
5-5	.09		2-1	.07		12-21	.03	
5-6	.06		2-14		.004	12-25	.03	
5-18	.01		2-18	.02		12-29	.08	
5-23	.73	.005	2-22	.01				
5-24	.30		3-3	.06				
5-25	.24	.002	3-4	.03				
5-27	.09		3-5	.02				
5-31	.11		3-12	.14		Watershed conditions, 1961: Production of cover 2048 lbs/ac oven dry wt. 4/ Degree of grazing of rangeland: Close. 5/		
6-5	.03		3-18	.02				
6-9	.41	.005	3-25	.02				
6-12	.27		4-3	.38				
6-15	1.23	.010	4-9	.07				
6-27	.34		4-10	.33				
6-30	.08		4-20	.16				
7-7	.10		4-22	.10				
7-11	.08		4-30	.26				
7-17	.01		5-3	.03				
7-24	.01		5-4	.36				
7-29	.04		5-5	.02				
9-5	.40	.001	5-16	.24				
8-6	.53	.003	6-1	.03				
8-7	.02		6-10	.10				
8-8	.01		6-12	1.52	.152			
8-15	.01		6-13	.02				
8-16	1.21	.118	6-14	.45				
8-17	.99	.014	6-18	.34				
9-7	.27		7-1	.68	.005			

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.8-4. 1/ Precipitation Thiessen weighted, using rain-gages W-8A and W-8B in 1960 and gages W-8A, W-8B and W-8C in 1961. 2/ Watershed discontinued Dec. 31, 1961. 3/ Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. 4/ July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. 5/ For definitions of degree of use, see p. 65.2-1.

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Newell, South Dakota, Watershed W-9 Area - 815 acres (1.27 sq. mi.)					
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.22	.17	.18	.29	1.68	2.12	.56	2.64	.91	.07	.13	.45	9.42
Q	0	.006	.597	0	.025	.007	.004	.018	0	0	0	0	.66
1961 P	.06	.06	.19	.99	.61	2.12	1.75	.85	1.71	.49	.32	.42	9.57
Q	.002	0	.002	0	0	.052	.010	0	.009	0	0	0	.08
Normal P	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland.

DAILY PRECIPITATION AND RUNOFF (Inches) Newell, South Dakota Watershed W-9

Date	Precipitation	Runoff	Date	Precipitation	Runoff	Date	Precipitation	Runoff
Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-1-60	0.03	0	10-18	0.05	0	7-11	0.07	0
1-2	.01		10-29	.02		7-15	.12	
1-4	.13		11-27	.13		7-27	.60	
1-17	.02		12-4	.10		7-28	.01	
1-18	.03		12-8	.02		8-8	.26	
2-8	.03		12-17	.03		8-9	.03	
2-9	.09		12-18	.04		9-10	.14	
2-17		.006	12-19	.14		8-21	.43	
2-21	.02		12-27	.12		9-1	.06	
2-22	.03		Watershed conditions, 1960: Production of cover 2688 lbs/ac oven dry wt. 4/ Degree of grazing of rangeland: Full. 5/			9-2	.01	
3-1	.02					9-6	.05	
3-2	.03		Year of 1961			9-11	.07	
3-6	.01					9-12	.90	.009
3-8	.12		9-18	.17				
3-17		.009	9-20	.30				
3-22		.291	10-8	.34				
3-29		.297	1-5-61	0.05	0	10-28	.15	
4-10	.11		1-18	.03		11-2	.09	
4-24	.18		1-25	.03		11-4	.04	
5-3	.04		1-31		.002	11-15	.18	
5-4	.05		2-1	.08		11-29	.01	
5-5	.10		2-18	.01		12-3	.20	
5-18	.03		2-22	.03		12-8	.08	
5-23	.73	.012	3-3	.08		12-21	.03	
5-24	.32	.007	3-4	.03		12-25	.03	
5-25	.20	.006	3-5	.02				
5-27	.10		3-12	.10		12-29	.08	
5-31	.11		3-15		.002			
6-5	.01		3-18	.02		Watershed conditions, 1961: Production of cover 2220 lbs/ac oven dry wt. 4/ Degree of grazing of rangeland: Moderate. 5/		
6-8	.04		3-25	.02				
6-9	.28		4-3	.34				
6-12	.18		4-9	.08				
6-15	1.23	.007	4-10	.03				
6-27	.29		4-11	.14				
6-30	.09		4-20	.15				
			4-22	.11				
7-7	.24		4-30	.18				
7-11	.24	.004	5-3	.03				
7-24	.03		5-4	.35				
7-29	.05		5-5	.01				
8-5	.28		5-16	.31				
8-6	.57		5-30	.05				
8-7	.05		6-1	.03				
8-16	.91	T	6-10	.04				
8-17	.83	.018	6-12	1.13	.052			
9-7	.32		6-14	.29				
9-8	.02		6-18	.22				
9-14	.01		6-19	.13				
9-17	.30		6-29	.06				
9-22	.22		7-1	.79	.010			
9-23	.03		7-5	.08				

Notes: Quality of records: P - good; Q - fair. For watershed map, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.9-4. 1/ Precipitation Thiessen weighted, using raingages W-9A, 9B, 9C, 9D in 1960 and W-9A, 9B, 9D, 9E, 9A, 9B in 1961. 2/ Watershed discontinued Dec. 31, 1961. 3/ Normal P based on 54-year (1908-61) U. S. Weather Bureau record period at Newell, S. D. 4/ July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. 5/ For definitions of degree of use, see p. 65.2-1.

MONTHLY PRECIPITATION AND RUNOFF <sup>1/</sup> (Inches)								Newell, South Dakota, Watershed W-10 <sup>2/</sup> (Area - 280 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	.70	.30	.31	.31	1.62	2.74	.30	2.57	.93	.04	.17	.41	10.40
	Q	0	.026	.622	0	0	.025	0	.083	T	0	0	0	.76
1961	P	.14	.09	.39	1.24	1.01	1.25	2.60	.61	1.76	.85	.23	.27	10.44
	Q	0	.026	.015	.017	.006	0	.020	0	.003	0	0	0	.09
Normal P <sup>3/</sup>		.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

DAILY PRECIPITATION AND RUNOFF (Inches)						Newell, South Dakota Watershed W-10		
Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff

Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-1-60	0.38	0	8-17	1.37	0.083	5-15	0.13	0
1-2	.11		8-22	.03		5-16	.06	
1-3	.03		8-23	.09		5-17	.06	
1-4	.06		9-8	.12		5-18	.07	
1-5	.07		9-16	.12		6-10	.07	
1-17	.01		9-17	.23		6-11	.07	
1-18	.03		9-21	.10		6-13	.08	
2-1	.02		9-22	.36		6-14	.49	
2-8	.05		10-29	.04		6-18	.42	
2-9	.08		11-27	.17		6-19	.04	
2-19		.026	12-3	.07		6-30	.07	
2-21	.05		12-10	.04		7-1	.75	.010
2-22	.03		12-11	.04		7-5	.38	
2-24		T	12-12	.01		7-9	.49	
2-27	.02		12-18	.03		7-10	.03	
2-28	.05		12-19-60	0.03		7-20	.08	
3-2	.01		12-20	.16		7-27	.76	.010
3-6	.04		12-27	.03		7-28	.11	
3-7	.10		Watershed conditions, 1960: Production of cover 732 lbs/ac oven dry wt. <sup>4/</sup> Degree of grazing of rangeland: Full. <sup>5/</sup>			8-1	.09	
3-8	.06					8-8	.10	
3-12	T	.001				8-10	.08	
3-16	.03					8-21	.34	
3-20	.02					9-1	.07	
3-21	.02					9-2	.07	
3-24	.03	.621				9-6	.08	
3-31	.01		Year of 1961			9-10	.02	
4-10	.11		1-1-61	0.08	0	9-11	.27	
4-24	.20	T	1-18	.03		9-12	.77	.003
5-4	.15		1-25	.03		9-18	.18	
5-5	.26		2-1	.05		9-19	.03	
5-17	.13		2-12	.02				
5-18	.15		2-13		.026	9-21	.25	
5-23	.34		2-22	.02		9-23	.02	
5-24	.47		3-3	.06		10-7	.16	
5-27	.09		3-4	.08		10-8	.33	
			3-5	.03		10-9	.01	
5-31	.03		3-12	.10		10-12	.01	
6-7	.16		3-15	.02		10-29	.34	
6-8	.05		3-18	.02		11-2	.02	
6-9	.63		3-20		.015	11-4	.04	
6-12	.43		3-25	.10		11-15	.12	
6-15	.39		4-3	.36		11-16-61	0.05	
6-19	.03		4-10	.53	.017	12-3	.10	
6-20	.19		4-20	.25		12-9	.04	
6-27	.87	.025	4-22	.08		12-22	.01	
7-12	.13		4-30	.02		12-26	.01	
7-17	.17		5-2	.21		12-29	.02	
8-6	.68	T	5-4	.20	.006	12-30	.08	
8-7	.08		5-5	.09		12-31	.01	
8-8	.02		5-11	.14				
8-16	.29	T	5-12	.07		Watershed conditions, 1961: Production of cover 762 lbs/ac oven dry wt. <sup>4/</sup> Degree of grazing of rangeland: Close. <sup>5/</sup>		

Notes: Quality of records: P—good; Q—fair. Watershed conditions: 100% rangeland. For watershed map, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.10-4. <sup>1/</sup> Precipitation Thiessen weighted, using raingages W-10A, W-10B and W-11B. <sup>2/</sup> Watershed discontinued Dec. 31, 1961. <sup>3/</sup> Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. <sup>4/</sup> July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. <sup>5/</sup> For definitions of degree of use, see p. 65.2-1.



MONTHLY PRECIPITATION AND RUNOFF (Inches)							Newell, South Dakota, Watershed W-11 <sup>2/</sup> (Area - 160 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.49	.15	.16	.19	1.54	2.77	.35	2.43	.76	.03	.12	.34	9.33
Q	.003	.044	.647	0	.015	.328	0	.179	0	0	0	0	1.22
1961 P	.12	.09	.28	.85	.81	.95	2.37	.64	1.59	.85	.23	.27	9.05
Q	0	.014	.006	0	0	0	.159	0	.014	0	0	0	.193
Normal P <sup>3/</sup>	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

DAILY PRECIPITATION AND RUNOFF (Inches) Newell, South Dakota Watershed W-11

Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff
Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-1-60	0.28	0	8-16	0.28	0.004	5-15	0.80	0
1-2	.10		8-17	1.38	.175	5-16	.30	
1-3	.01		8-23	.08		5-17	.30	
1-4	.02		9-7	.07		5-18	.60	
1-5	.02		9-17	.20		6-10	.60	
1-11		.003	9-21	.10		6-13	.80	
1-17	.01		9-22	.34		6-14	.38	
1-18	.05		10-29	.03		6-18	.32	
2-1	.01		11-27	.12		6-19	.49	
2-8	.02		12-3	.06		6-30	.19	
2-9	.05		12-9	.03		7-1	.45	
2-19		.044	12-10	.03		7-5	.40	
2-21	.02		12-11	.01		7-9	.55	.034
2-22	.02		12-18	.03		7-10	.04	
2-28	.03		12-19	.03		7-19	.09	
3-6	.02		12-20	0.12		7-27	.75	.125
3-7	.06		12-27	.03		7-28	.10	
3-8	.06		Watershed conditions, 1960: Production of cover 995 lbs/ac oven dry wt. <sup>4/</sup> Degree of grazing of rangeland: Close. <sup>5/</sup>			8-1	.65	
3-15		.002				8-8	.95	
3-16	.01					8-10	.65	
3-20	.01	.325				8-21	.42	
3-21	.134					9-1	.56	
3-22	.016		9-2	.65				
3-24	.068		9-6	.61				
3-25	.034		9-10	.25				
3-26	.035		Year of 1961			9-11	.24	
3-27	.015		1-1-61	0.06	0	9-12	.71	.014
3-28	.018		1-18	.03		9-18	.14	
4-10	.04		1-25	.03		9-19	.03	
4-24	.15		2-1	.05		9-21	.25	
5-4	.10		2-12	.02		9-23	.02	
5-5	.25		2-13		.014	10-7	.16	
5-17	.06		2-22	.02		10-8	.33	
5-18	.17		3-3	.03		10-9	.01	
5-23	.41	.002	3-4	.06		10-12	.01	
5-24	.50	.013	3-5	.02		10-29	.34	
5-31	.05		3-12	.07		11-2	.02	
6-7	.12		3-15	.02		11-4	.04	
6-8	.03		3-18	.02		11-15	.12	
6-9	.55		3-21		.006	11-16	.05	
6-12	.45		3-25	.06		12-3	0.10	
6-15	.40		4-3	.29		12-9	.04	
6-19	.03		4-10	.31		12-22	.01	
6-20	.16		4-20	.18		12-26	.01	
6-27	1.03	.328	4-22	.05		12-29	.02	
7-12	.16		4-30	.02		12-30	.08	
7-17	.19		5-2	.19		12-31	.01	
8-5	.08		5-4	.15		Watershed conditions, 1961: Production of cover 855 lbs/ac oven dry wt. <sup>4/</sup> Degree of grazing of rangeland: Close. <sup>5/</sup>		
8-6	.52		5-5	.80				
8-7	.09		5-11	.12				
			5-12	.70				

Notes: Quality of records: P - good; Q - fair. Watershed conditions: 100% rangeland. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.11-4. <sup>1/</sup> Precipitation Thiessen weighted, using raingages W-11A and W-11B. <sup>2/</sup> Watershed discontinued Dec. 31, 1961. <sup>3/</sup> Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. <sup>4/</sup> July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. <sup>5/</sup> For definitions of degree of use, see p. 65.2-1.



NEWELL, SOUTH DAKOTA Watershed W-13

**LOCATION:** Meade Co., South Dakota, 26 mi. east of Newell, South Fork Sulphur Creek; Cheyenne River Watershed.

**AREA:** 160 acres.

**SHAPE:** Trapezoidal, club shape 5500' by 2000'.

**SLOPES:** 12% is 0-3%; 80% is 3-9%; 6% is 9-18%; 2% is 18-35%.

**ASPECT:** SE

**SOILS:** Residual, zonal: 79% - deep and moderately deep, somewhat dispersed clay soils and clay loam surface soils with very slow permeability of subsoils; 9% - deep medium-textured soils, moderate permeability; 7% - solodized solonetz clay pan soils, slow permeability; 5% - shallow to very shallow medium-textured soils to rock outcrops over sandy to silty shales, moderate permeability. Promise clay - 46%; Pierre heavy clay - 16%; Cushman loam - 7%; Rhoades loams - 6%; Rhoades loams - 12%; Pierre-Lismas clays - 5%; Solonchalk shallow to shale - 2%; Midway-Bainville-Rock outcrop - 2%; Alluvial soils, undifferentiated - 2%; Midway clay loam - 1%; Rhoades-Regent loams - 1%; Chama and Cushman loams - trace. Internal drainage - slow.

**EROSION:** 1 - 100%.

**LAND CAPABILITY:** IIIs = 7%; IVe = 67%; VIs = 19%; VIw = 2%; VIe = 1%; VIIe = 2%; VIIIs = 2%.

**SURFACE DRAINAGE:** Good, two channels 5500' and 2500'.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff: A-35 waterstage recorder. Precipitation: Three recording gages.

**WATERSHED CONDITIONS:** 100% rangeland. Condition classes: Excellent - 3%; good - 79%; fair - 18%. Principal species: Western wheat grass - 45%; blue grama - 11%; buffalo grass - 10%; thread leaf sedge, cacti, and other species - 34%. Production of cover: 2400 lbs. per acre. Range sizes: Clayey - 79%; silty - 7%; panspots - 7%; thin breaks - 2%; overflow - 2%; very shallow - 2%; shallow - 1%. Use (degree of grazing of rangeland): 1957 - full; 1958 - full; 1959 - close.

**GENERALLY REPRESENTS:** Rangelands in Pierre Shale Plains in transitions to Residual Plains, west Dakotas. A large part of this watershed is on concave rather than convex slopes. Pierre Shale Plains and Badlands land resource area (G-60).

MONTHLY PRECIPITATION AND RUNOFF (Inches)

Newell, South Dakota Watershed W-13

Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958	P	0.01	0.41	0.57	1.43	1.82	4.31	0.72	0.48	0	0.49	0.33	0.17	10.74
	Q	0	.004	.009	.063	0	1.210	0	0	0	0	.009	0	1.30
1959	P 1/	.29	.33	.14	.74	1.76	1.94	.83	.27	1.34	.67	.81	.14	9.26
	Q	0	0	.433	.009	.013	.001	.003	0	.002	.001	.002	0	.46
Normal	P 2/	.44	.37	.79	1.67	2.65	2.95	2.11	1.34	1.29	1.02	.55	.39	15.57

Notes: 1/ Thiessen weighted precipitation after June 1959 (3 gages).

2/ Normal P based on 52-year (1908-1959) record at Newell USWB station, Newell, South Dakota.

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MONTHLY PRECIPITATION AND RUNOFF (Inches)							Newell, South Dakota, Watershed W-13 (Area - 160 acres)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	.36	.15	.30	.34	1.04	3.30	.29	1.24	.90	.03	.07	.50	8.52
	Q	0	.016	.540	0	.002	.082	0	.006	T	0	0	0	.65
1961	P	.10	.10	.18	.73	1.22	1.42	1.68	.56	1.29	.50	.13	.30	8.21
	Q	0	.003	0	0	0	0	0	0	0	0	0	0	.003
Normal	P	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland.

DAILY PRECIPITATION AND RUNOFF (Inches)			Newell, South Dakota Watershed W-13					
Date	Precipitation	Runoff	Date	Precipitation	Runoff	Date	Precipitation	Runoff
Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-1-60	0.19	0	6-30	0.02	0	4-30	0.14	0
1-2	.05		7-12	.09		5-3	.30	
1-3	.02		7-14	.10		5-4	.28	
1-4	.04		7-17	.10		5-5	.03	
1-5	.02		8-5	.28	.002	5-15	.08	
1-17	.01		8-6	.63	.004	5-16	.50	
1-18	.03		8-7	.01		5-30	.03	
2-8	.02		8-16	.11	T	6-11	.01	
2-9	.07		8-17	.21	T	6-12	.02	
2-15		.016	9-7	.08		6-13	.75	
2-21	.02		9-8	.01		6-14	.34	
2-22	.04		9-14	.09		6-18	.18	
3-1	.01		9-17	.27	T	6-19	.12	
3-2	.03		9-22	.42	T	7-1	.32	
3-3	.02		9-23	.03	T	7-5	.36	
3-4	.04		10-29	0.03		7-27	.90	
3-6	.01		11-27	.07		7-29	.10	
3-7	.01		12-4	.26		8-1	.07	
3-8	.09		12-7	.01		8-8	.15	
3-9	.03	.002	12-8	.05		8-20	.34	
3-10	.06		12-10	.01		9-2	.05	
3-20		.001	12-17	.03		9-12	.91	
3-21		.100	12-20	.06		9-18	.15	
3-22		.402	12-27	.08		9-19	.09	
3-23		.008	Watershed conditions, 1960: Production of cover 1722 lbs/ac oven dry wt. 3/ Degree of grazing of rangeland: Close. 4/			9-21	.08	
3-24		.016				9-23	.01	
3-26		.010				10-7	.14	
3-27		.001				10-8	.05	
4-10	.04		Year of 1961			10-11	.04	
4-11	.05					10-18	.02	
4-24	.13		1-1-61	0.05	0	10-28	.25	
4-28	.12		1-18	.03		11-2	.03	
5-3	.05		1-25	.02		11-15	.10	
5-18	.11		2-1	.04		12-3	.05	
5-23	.25		2-12	.02		12-8	.10	
5-24	.41	.002	2-14		.003	12-21	.05	
5-25	.10		2-18	.02		12-29	.10	
5-28	.07		2-22	.02		Watershed conditions, 1961: Production of cover 1506 lbs/ac oven dry wt. 3/ Degree of grazing of rangeland: Close. 4/		
5-30	.05		3-3	.02				
6-7	.02		3-4	.03				
6-8	.10		3-5	.02				
6-9	.26		3-12	.08				
6-12	.17		3-18	.01				
6-15	1.27	.008	3-19	.02				
6-16	.03		4-3	.14				
6-19	.07		4-9	.19				
6-20	.08		4-10	.09				
6-27	1.25	.073	4-11	.09				
6-28		.001	4-20	.02				
6-29	.03		4-22	.06				

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.13-4. 1/ Precipitation Thiessen weighted, using rain-gauges W-13A, W-13B and W-13C. 2/ Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. 3/ July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. 4/ For definitions of degree of use, see p. 65.2-1.



NEWELL, SOUTH DAKOTA Watershed W-14

**LOCATION:** Butte Co., South Dakota, 16 mi. SE of Newell; Belle Fourche River Watershed.

**AREA:** 35 acres.

**SHAPE:** Rectangular, 2200' by 800'.

**SLOPES:** 97% is 3-9%; 3% is 9-18%.

**ASPECT:** E

**SOILS:** Residual, zonal: 97% - moderately deep and deep clay soils with slow permeability - granular surface horizons at 3-5 inches thick over prismatic and blocky sub-surface horizons with clay shale at variable depths - 24 to 60 inches, large cracks when dry and that swell when wet; 3% - shallow to shale clay soils. Pierre-Promise clays - 96%; Lismas clays - 4%. Internal drainage - very slow.

**EROSION:** 1 - 100%.

**LAND CAPABILITY:** IVe = 96%; VI s = 4%.

**SURFACE DRAINAGE:** Good, well-defined channel, length 2200'.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff: A-35 waterstage recorder. Precipitation: One recording gage. Early precipitation records from 1-inch gage on John Anderson ranch 3.6 miles southwest of dam.

**WATERSHED CONDITIONS:** 100% rangeland. Condition classes: Good - 57%; fair - 43%. Leading species: Western wheat grass - 45%; blue grama - 30%; thread leaf sedge, buffalo grass, and other species - 25%. Production of cover: 1400 lbs. per acre. Range sites: Clayey - 96%; shallow - 4%. Use (degree of grazing of rangeland): 1957 - moderate; 1958 - moderate; 1959 - moderate.

**GENERALLY REPRESENTS:** Rangelands in Pierre Shale Plains, particularly eastward in 15-19-inch precipitation area. Pierre Shale Plains and Badlands land resource area (G-60).

MONTHLY PRECIPITATION AND RUNOFF (Inches)

Newell, South Dakota Watershed W-14

Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1958	P 1/ Q 0	T 0	0.25 0	0.29 0	1.82 .087	0.65 0	4.67 .505	5.08 1.128	0.62 0	0.10 0	0.51 0	0.45 .017
1959	P Q	.24 0	.12 .092	.15 .142	.74 .061	2.36 .030	1.43 .017	.89 .016	.23 0	2.02 .018	.45 0	.66 .069	.13 .008	9.42 .45
Normal	P 2/	.44	.37	.79	1.67	2.65	2.95	2.11	1.34	1.29	1.02	.55	.39	15.57

Notes: 1/ Precipitation record prior to 4-1-58 from Anderson gage.

2/ Normal P based on 52-year (1908-1959) record at Newell USWB station, Newell, South Dakota.

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MONTHLY PRECIPITATION AND RUNOFF (Inches)							Newell, South Dakota, Watershed W-14 (Area - 35 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.51	.16	.42	.61	2.25	.78	.73	2.23	.73	.03	.12	.40	8.97
Q	0	.148	.609	0	.013	.001	.005	.196	.003	0	0	0	.98
1961 P	.15	.14	.25	1.52	.77	4.37	2.23	.62	1.10	.69	.39	.52	12.75
Q	0	.022	.018	.042	.010	1.493	.190	0	0	0	0	0	1.78
Normal P <u>2/</u>	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100% rangeland.

DAILY PRECIPITATION AND RUNOFF (Inches)				Newell, South Dakota Watershed W-14				
Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff
Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-1-60	0.21	0	8-5	0.02	0	5-5	0.02	0
1-4	.03		8-6	1.64	.194	5-15	.09	
1-5	.22		8-8	.14		5-16	.31	
1-17	.02		8-16	.26	.002	5-18	.03	
1-18	.03		8-17	.17		5-30	.03	
2-8	.02		9-7	.17		6-10	.11	
2-9	.08		9-17	.12		6-11	.03	
2-15		.148	9-22	.42	.003	6-12	.26	
2-21	.02		9-23	.02		6-13	.06	
2-22	.04		10-29	.03		6-14	.64	
3-1	.01		11-27	.12		6-18	.03	
3-2	.03		12-4	.27		6-29	3.24	1.493
3-3	.02		12-10	.03		7-1	.25	
3-6	.04		12-17	.03		7-5	.59	.081
3-7	.06		12-19	.04		7-9	.24	
3-10	.07		12-27	0.03		7-10	.07	
3-19		.069				7-12	.28	
3-20		.074				7-19	.04	
3-21		.126				7-27	.76	.109
3-22		.190				8-4	.06	
3-23		.060				8-8	.12	
3-24	.02	.007				8-10	.08	
3-25		.006				8-21	.30	
3-26		.006				8-31	.06	
3-27	.01	.007				9-11	.09	
3-28	.02	.020	1-1-61	0.06	0	9-12	.66	
3-29	.07	.044	1-14	.04		9-18	.18	
3-31	.07		1-18	.02		9-19	.03	
4-10	.11		1-25	.03		9-21	.08	
4-16	.11		2-1	.04		9-26	.08	
4-23	.08		2-12	.02		10-7	.13	
4-24	.23		2-14		.022	10-8	.02	
4-28	.08		2-18	.02		10-18	.10	
5-5	.06		2-22	.06		10-28	.44	
5-18	.07		3-3	.03		11-2	.24	
5-23	.21		3-4	.03		11-3	.04	
5-24	1.57	.008	3-5	.05		11-12	.03	
5-27	.08	.005	3-12	.11		11-15	.05	
5-30	.26		3-13		.018	11-18	.03	
6-5	.04		3-18	.02		12-3	.03	
6-9	.06		3-19	.01		12-8	0.06	
6-12	.21		4-4	.15		12-18	.18	
6-15	.30	.001	4-9	.04		12-19	.08	
6-19	.07		4-10	.56	.017	12-28	.10	
6-20	.04		4-11	.08		12-29	.07	
6-29	.06		4-20	.09				
7-10	.03		4-22	.60	.025			
7-12	.55	.005	5-2	.05				
7-15	.12		5-3	.01				
7-17	.03		5-4	.23	.010			

Watershed conditions, 1960: Production of cover 1305 lbs/ac oven dry wt. 3/ Degree of grazing of rangeland: Close. 4/

Watershed conditions, 1961: Production of cover 1190 lbs/ac oven dry wt. 3/ Degree of grazing of rangeland: Close. 4/

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.14-4. <sup>1/</sup> Precipitation from raingage W-14A. <sup>2/</sup> Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. <sup>3/</sup> July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. <sup>4/</sup> For definitions of degree of use, see p. 65.2-1.

NEWELL, SOUTH DAKOTA Watershed W-15

**LOCATION:** Meade Co., South Dakota, 16 mi. SE of Newell; Belle Fourche River Watershed.

**AREA:** 115 acres.

**SHAPE:** Elongated fan, 4500' by 1200'.

**SLOPES:** 19% is 0-3%; 81% is 3-9%.

**ASPECT:** SE

**SOILS:** Residual, zonal: 81% - moderately deep and deep clay pan soils with slow permeability - granular surface horizons 3-5 inches thick over prismatic and block sub-surface horizons with clay shale at variable depths - 24 to 60 inches, large cracks when dry and that seal when wet; 18% - moderately deep, somewhat solodized clay pan soils, very slow permeability; 1% - shallow clay soils. Pierre-Promise clays, gently sloping - 81%; Hurley clays - 18%; Lismas clay gently sloping - 1%. Internal drainage - very slow.

**EROSION:** 1 - 100%.

**LAND CAPABILITY:** IVE = 81%; VI5 = 19%.

**SURFACE DRAINAGE:** Good, well-defined channel 5300' long.

**CHARACTER OF FLOW:** Ephemeral, continuous.

**INSTRUMENTATION:** Runoff: A-35 waterstage recorder. Precipitation: One recording gage. Early precipitation record from 1-inch gage on John Anderson ranch 3.6 miles southwest of dam.

**WATERSHED CONDITIONS:** 100% rangeland. Condition classes: Good - 40%; fair - 60%. Leading species: Western wheat grass - 30%; blue grama - 35%; other species of grasses and forbs - 35%. Production of cover - 1300 lbs. per acre. Range sites: Clayey - 81%; panspots - 18%; shallow - 1%. Use (degree of grazing of rangeland): 1957 - moderate; 1958 - moderate; 1959 - moderate.

**GENERALLY REPRESENTS:** Rangelands in Pierre Shale Plains, particularly east of 15-19-inch rainfall belt. Pierre Shale Plains and Badlands land resource area (G-60).

MONTHLY PRECIPITATION AND RUNOFF (Inches)

Newell, South Dakota Watershed W-15

Year	Month												Year	
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
1958	P 1	T	0.25	0.29	1.82	0.78	4.78	5.65	0.65	0.08	0.54	0.50	0.18	15.52
	Q 0	0	.080	.384	0	.533	1.240	0	0	.005	.043	0	2.29	
1959	P	.35	.16	.12	.88	2.44	1.56	1.02	.29	2.13	.59	1.03	.15	10.72
	Q	0	0	.089	.061	.025	.017	T	0	.035	.012	.028	0	.27
Normal	P 2/	.44	.37	.79	1.67	2.65	2.95	2.11	1.34	1.29	1.02	.55	.39	15.57

Notes: 1/ Precipitation record prior to 4-1-58 by Anderson gage.

2/ Normal P based on 52-year (1908-1959) record at Newell USWB station, Newell, South Dakota.

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MONTHLY PRECIPITATION AND RUNOFF (Inches)							Newell, South Dakota, Watershed W-15 (Area - 115 acres)						
Month Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	1.00	.16	.44	.76	2.34	1.02	.84	2.30	.69	.03	.12	.50	10.20
Q	0	.018	.342	T	.027	.002	0	.112	0	0	0	0	.50
1961 P	.20	.17	.28	1.75	.77	3.94	2.35	.68	1.14	.83	.41	.52	13.04
Q	0	.012	0	.003	0	1.044	.269	0	0	0	0	0	1.33
Normal P <u>2/</u>	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

Notes: Quality of records: P - good; Q - fair.  
Watershed conditions: 100%.

DAILY PRECIPITATION AND RUNOFF (Inches)			Newell, South Dakota Watershed W-15					
Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff	Date	Precipitation <sup>1/</sup>	Runoff
<u>Year of 1960</u>			<u>Year of 1960 - continued</u>			<u>Year of 1961 - continued</u>		
1-1-60	0.18	0.01	8-5	0.04	0	5-5	.02	
1-4	.02		8-6	1.63	.111	5-15	.10	
1-5	.73		8-8	.13		5-16	.30	
1-17	.03		8-16	.36	.001	5-18	.03	
1-18	.04		8-17	.14		5-30	.03	
2-8	.02		8-23	.45		6-10	.25	
2-9	.07		9-7	.04		6-11	.02	
2-15		.018	9-8	.04		6-12	.25	
2-21	.02		9-17	.15		6-13	.09	
2-22	.05		9-22	.45	T	6-14	.67	
3-1	.01		9-23	.01		6-18	.06	
3-2	.03		10-29	.03		6-29	2.60	1.044
3-3	.02		11-27	.12		7-1	.28	
3-6	.04		12-4	.32		7-5	.96	.192
3-7	.04		12-10	.02		7-9	.12	
3-8	.02		12-17	0.02		7-10	.12	
3-10	.07		12-19	.04		7-12	.21	
3-19		.125	12-27	.10		7-19	.04	
3-20		.138	Watershed conditions, 1960: Production of cover 1280 lbs/ac oven dry wt. <u>3/</u> Degree of grazing of rangeland: Close. <u>4/</u>			7-27	.62	.077
3-21		.038				8-4	.08	
3-22		.034				8-8	.15	
3-23		.005				8-10	.06	
3-24	.02					8-21	.30	
3-25		.002				8-31	.09	
3-27	.01					9-11	.13	
			<u>Year of 1961</u>					
3-28	.02		1-1-61	0.09	0	9-12	.59	
3-29	.09		1-14	.06		9-18	.20	
3-31	.07		1-18	.02		9-19	.02	
4-10	.09		1-25	.03		9-21	.10	
4-16	.13		2-1	.04		9-26	.10	
4-24	.10		2-12	.02		10-7	.13	
4-25	.05		2-14		.012	10-8	.02	
4-28	.39	T	2-18	.02		10-18	.10	
5-5	.06		2-22	.09		10-28	.58	
5-18	.07		3-3	.03		11-2	.14	
5-23	.21	.001	3-4	.03		11-3	.10	
5-24	1.18	.022	3-5	.05		11-12	.03	
5-25		.003	3-12	.14		11-15	.11	
5-27	.09		3-18	.02		11-18	.03	
5-30	.23	.001	3-19	.01		12-3	.03	
6-5	.10		4-4	.15		12-8	0.06	
6-9	.10	.001	4-9	.04		12-18	.18	
6-12	.20		4-10	.72	.003	12-19	.08	
6-15	.34	.001	4-11	.14		12-28	.10	
6-19	.18		4-12			12-29	.07	
6-20	.06		4-20	.10		Watershed conditions, 1961: Production of cover 1030 lbs/ac oven dry wt. <u>3/</u> Degree of grazing of rangeland: Close. <u>4/</u>		
6-29	.04		4-22	.60				
7-12	.66		5-2	.05				
7-15	.12		5-3	.01				
7-17	.06		5-4	.23				

Notes: Quality of records: P - good; Q - fair. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 65.15-4. <sup>1/</sup> Precipitation from raingage W-15A. <sup>2/</sup> Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. <sup>3/</sup> July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. <sup>4/</sup> For definitions of degree of use, see p. 65.2-1.



NEWELL, SOUTH DAKOTA Watershed W-16

**LOCATION:** Meade County, South Dakota; 49 mi. SE of Newell - upper Dry Creek - a tributary of Elk Creek - Cheyenne River Watershed.

**AREA:** About 13,000 acres (20.31 sq. mi.)

**SHAPE:** Roughly trapezoidal

**SLOPES:** 32% is 0-3%; 47% is 3-9%; 20% is 9-18%; 1% is 18-35%.

**ASPECT:** SE

**SOILS:** Residual, zonal: 60% - deep and moderately deep fine-textured soils, slow permeability; 20% - deep medium and moderately fine-textured soils, moderately slow permeability; 12% - solodized solonetz clay pan soils, slow to very slow permeability; 5% - shallowly developed gravelly soils, moderate to moderately slow permeability; 2% - medium-textured soils shallow to gravel, rapid permeability; 1% - clay soils shallow to shale, slow permeability. Internal drainage - medium.

**EROSION:** 1 - 95%; 2 - 4%; geologic - 1%.

**LAND CAPABILITY:** II - 1%; III - 17%; IV - 43%; VI - 38%; VII - 1%.

**SURFACE DRAINAGE:** Good, two main drainages.

**CHARACTER OF FLOW:** Ephemeral, continuous, 2.7 miles, 4.3 miles.

**INSTRUMENTATION:** Runoff: A-35 waterstage recorder on stock pond. Precipitation: Four recording gages. Early precipitation record from 1-inch gage on Harold Gossard ranch 1.2 miles east of pond.

**WATERSHED CONDITIONS:** 1000 acres - cultivated, wheat, alfalfa, sorghum-fallow rotation. Cover - good. 12,000 acres rangeland. Condition: Good - 60%, fair - 40%. Dominant species: Blue grama - 15%; buffalo grass - 12%; western wheat - 15%; crested wheat grass - 5%; green needle grass 10%; mixed grasses and forbs - 43%. Range Sites: 59% is clayey; 20% is silty; 12% is panspots; 8% is shallow; 1% is overflow. Use (degree of grazing of rangeland): 1957 - moderate; 1958 - moderate; 1959 - full. Production of cover: 4400 lbs. per acre.

**GENERALLY REPRESENTS:** Mixed range and cropland in Pierre Shale Plains, especially in complex soils areas where soils are formed in part in clays weathered from clay shales and in part from old gravelly alluvium of quaternary age. Pierre Shale Plains and Badlands land resource area (G-60).

MONTHLY PRECIPITATION<sup>1/</sup> AND RUNOFF (Inches)

Newell, South Dakota Watershed W-16

Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		T	O	T	T	T	T	T	T	T	T	T		
1958	P <sup>2/</sup>		0.05	0.10	1.47	1.36	4.34	1.54	1.20	0.43	0.43	0.22	0.12	11.26
	Q	0	0	.039	.158	T	.131	T	0	0	0	0	0	.33
1959	P	.26	.29	.17	1.34	3.10	2.20	1.54	T	1.63	.18	1.25	.10	12.06
	Q	T	.020	.011	.027	.035	.008	.003	0	.023	0	.016	0	.14
Normal	P <sup>3/</sup>	.44	.37	.79	1.67	2.65	2.95	2.11	1.34	1.29	1.02	.55	.39	15.57

Notes: 1/ Thiessen weighted precipitation (4 gages).

2/ Precipitation prior to 4-13-58 from Gossard's gage.

3/ Normal P based on 52-year (1908-1959) record at Newell USWB station, Newell, South Dakota.

REPRINT

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DAILY PRECIPITATION AND RUNOFF (Inches)				Newell, South Dakota Watershed W-16				
Date	Precipitation <u>1/</u>	Runoff <u>2/</u>	Date	Precipitation	Runoff	Date	Precipitation	Runoff
	1958			1959		1959 - Continued		
1-16 <u>3/</u>	T	0	1-4	0.03	0	11-10	.10	0
2-25	.05	0	1-16	.04	0	11-11	.30	0
3-11 <u>4/</u>	0	.029	1-18	.15	0	11-12	.12	0
3-23	.10	.004	1-25	.04	0	11-15	.08	0
3-30	0	.006	2-1	.03	0	11-20	.05	0
4-1	.15	0	2-12	.08	0	11-21	.40	T
4-2	.23	0	2-13	.08	0	11-24	0	.015
4-3	.28	.027	2-24	.06	0	11-26	.01	0
4-4	.09	0	2-27	.04	.018	11-27	.01	0
4-13 <u>5/</u>	.11	0	2-28	0	.002	12-3	.05	0
4-20	.01	0	3-1	.03	.001	12-21	.02	0
4-23	.46	.119	3-4	0	.001	12-25	.01	0
4-27	.06	.007	3-5	0	.001	12-26	.02	0
4-30	.08	.004	3-8	0	.001			
5-4	.02	0	3-9	0	.001			
5-17	.18	T	3-10	0	.001			
5-30	1.00	T	3-11	0	.001			
5-31	.16	T	3-24	.08	0			
6-1	.25	0	4-10	.15	0			
6-4	.02	0	4-12	.04	0			
6-7	.55	0	4-16	.12	.005			
6-8	1.84	.073	4-17	0	.001			
6-9	.31	.041	4-18	0	.009			
6-10	0	T	4-19	0	.008			
6-11	.18	T	4-20	1.00	.004			
6-12	.25	T	4-26	.03	0			
6-13	.16	.002	5-3	.10	.002			
6-14	0	.005	5-4	.84	.012			
6-15	.15	.006	5-5	0	.002			
6-20	.46	0	5-10	.06	0			
6-21	.17	0	5-19	.46	0			
7-2	.31	0	5-20	.59	T			
7-3	.18	0	5-24	.05	0			
7-6	.04	0	5-27	.50	0			
7-14	.25	0	5-29	.08	0			
7-19	.21	0	5-30	.42	.017			
7-29	.08	0	5-31	0	.002			
7-30	.46	0	6-8	.37	0			
7-31	.01	0	6-14	.05	0			
8-2	.04	0	6-15	.03	0			
8-14	.11	0	6-16	.03	0			
8-16	.63	0	6-20	.06	0			
8-23	.42	0	6-24	.06	0			
9-9	.35	0	6-25	.08	0			
9-13	.08	0	6-26	.39	0			
10-20	.25	0	6-27	.23	0			
10-21	.10	0	6-28	.11	0			
10-22	.08	0	6-29	.34	.008			
11-14	.08	0	6-30	.45	0			
11-15	.02	0	7-3	.38	.002			
11-16	.06	0	7-9	.02	0			
11-21	.02	0	7-15	.72	.001			
11-24	.04	0	7-16	.24	0			
12-1	.03	0	7-22	.04	0			
12-7	.03	0	9-16	.55	0			
12-8	.02	0	9-17	.44	.001			
12-14	.04	0	9-18	.22	.002			
			9-19	0	.003			
			9-20	.04	0			
			9-24	.34	.017			
			9-25	.04	0			
			10-1	.13	0			
			10-18	.03	0			
			10-26	.02	0			
			11-4	.18	0			

Notes: Quality of records: Precipitation - fair except for period before 4-13-58 which is poor. Runoff - good. Months of January, February, March, April, November and December include snow and snow melt. 1/ Precipitation prior to 4-13-58 from Gossard's gage. 2/ Runoff prior to 3-11-58 based on weekly observations. 3/ Beginning of observations. 4/ Stage recorder installed. 5/ Recording raingages installed.

MONTHLY PRECIPITATION AND RUNOFF (Inches)								Newell, South Dakota, Watershed W-16 Area - 13,000 ac. (20.31 sq. mi.)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	.30	.21	.50	1.38	1.00	3.90	1.26	1.69	1.26	.06	.39	.69	12.64
Q	.002	.023	.199	.003	.003	.017	.001	.022	0	0	0	0	.27
1961 P	.02	.22	.44	1.35	.82	.93	1.82	.67	1.61	.84	.33	.13	9.18
Q	.005	.016	0	0	0	0	0	0	0	0	0	0	.01
Normal P	.43	.37	.77	1.64	2.58	2.91	2.07	1.36	1.29	1.00	.53	.39	15.34

DAILY PRECIPITATION AND RUNOFF (Inches) Newell, South Dakota Watershed W-16

Date	Precipitation	Runoff	Date	Precipitation	Runoff	Date	Precipitation	Runoff
Year of 1960			Year of 1960 - continued			Year of 1961 - continued		
1-3-60	0.30	0	6-20	0.17	0	2-28-61		0.006
1-31		.002	6-27	.04		3-2		.03
2-1		.003	6-29	.46	.002	3-5		.10
2-2	.05		6-30	.01		3-11		.07
2-6		.010	7-4	.46	.001	3-12		.12
2-9	.10		7-11	.52		3-26		.12
2-19	.03		7-12	.01		4-3		.09
2-20		.010	7-15	.01		4-4		.08
2-26	.03		7-16	.14		4-10		.24
3-8	.20		7-17	.10		4-11		.13
3-15	.25	.008	7-24	.01		4-20		.08
3-16		.018	7-29	.01		4-22		.64
3-17		.015	8-5	.50	.003	4-24		.06
3-18		.017	8-6	.27	.005	4-30		.03
3-19		.015	8-7	.09		5-3		.06
3-20		.016	8-8	.09		5-4		.23
3-21		.012	8-14	.03		5-5		.04
3-22		.024	8-15	T		5-15		.11
3-23		.023	8-16	.25		5-16		.25
3-24		.021	8-17	.16		5-17		.04
3-25		.005	8-21	.05		5-18		.09
3-26		.008	8-24	.25	T	6-12		.40
3-27		.007	9-4	.02		6-14		.47
3-28		.010	9-5	.05		6-18		.06
3-31	.05		9-7	.39		7-1		.80
4-2		.001	9-8	.13		7-5		.41
4-3		.001	9-15	.01		7-10		.04
4-5		.001	9-22	.64		7-11		.09
4-10	.08		9-23	.02		7-17		.08
4-15	.06		10-13	.06		7-19		.09
4-16	.72		11-3	.06		7-27		.19
4-24	.05		11-7	.06		7-28		.06
4-25	.01		11-27	.27		7-29		.03
4-27	.01		12-4	.38		7-30		.03
4-28	.45		12-18	.01		8-8		.05
5-5	.13		12-19	.03		8-10		.04
5-6	.02		12-20	.10		8-21		.58
5-17	.02		12-21	.07		9-1		.04
5-18	.03		12-22	.04		9-11		.10
5-23	.29		12-25	.02		9-12		.49
5-24	.16	.002	12-31	.04		9-13		.09
5-25	.12	.001				9-18		.13
5-27	.10					9-19		.03
5-28	.13					9-21		.04
6-5	.08					9-23		.41
6-7	.02					9-26		.07
6-8	.16					9-29		.21
6-9	.82	.001	1-1-61	0.02	0	10-29		.84
6-11	.16		1-30		.005	11-2		.14
6-12	.67	.008	2-1	.04		11-15		.19
6-14	.08		2-12	.15				
6-15	.27	.003	2-17	.03		12-3		.03
6-16	.23					12-29		.10
6-17	.08							
6-19	.65	.003						

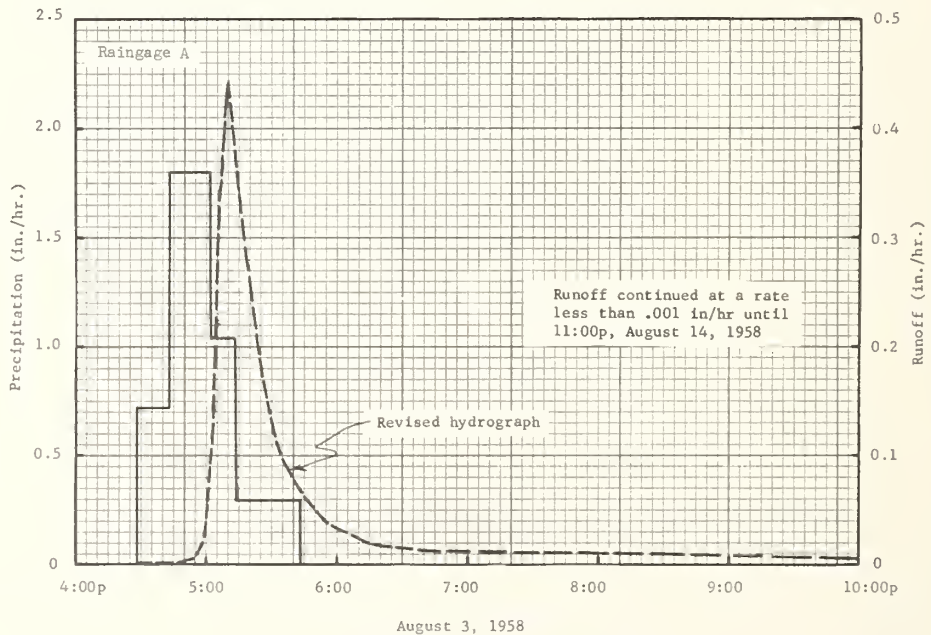
Watershed conditions, 1960: Production of cover 1800 lbs/ac oven dry wt. 4/ Degree of grazing of rangeland: Full 5/

Watershed conditions, 1961: Production of cover not reported. Degree of grazing of rangeland: Close. 5/

Notes: Quality of records: P, good; Q, fair. Watershed conditions: 12,000 acres rangeland; 1000 acres cultivated land. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 65.16-4. 1/ 1960 precipitation Thiessen weighted, using raingages W-16A, W-16B, W-16C, and W-16D; 1961 precipitation from raingage W-16B. 2/ Watershed discontinued Dec. 31, 1961. 3/ Normal P based on 54-yr. (1908-61) U. S. Weather Bureau record period at Newell, S. D. 4/ July or August clippings on circular (9.6 sq. ft.) plots with locations changed each year. 5/ For definitions of degree of use, see p. 65.2-1.

SELECTED RUNOFF EVENTS			Moorefield, West Virginia, Watershed 1 (8.25 Acres)					
Antecedent conditions			Rainfall			Runoff (Revised)		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of August 3-4, 1958								
7-4-58	Raingage A 0.25	0	8-3-58	Raingage A		8-3-58		
7-5	.05	0	4:28p	0	0	4:29p	0	0
7-6,7	0	0	:43	.72	.18	:44	<u>.0001</u>	T
7-8	.02	0	5:02	1.80	.75	:54	<u>.0070</u>	T
7-9	.03	0	:13	1.04	.94	:58	<u>.0202</u>	T
7-10,11	0	0	:43	.30	1.09	5:00	<u>.0397</u>	T
7-12	.20	0				:03	.1421	.01
7-13,17	0	0				:06	.3438	.02
7-18	.50	T				:08	<u>.4190</u>	.03
7-19,20	0	0				:10	.4436	.05
7-21	.68	T				:15	.3438	.08
7-22	1.49	.03				:24	.1950	.12
7-23	.50	T				:29	<u>.1421</u>	.13
7-24	.25	T				:34	<u>.1018</u>	.14
7-25	0	0				:43	.0686	.16
Watershed Conditions:								
7-26	.45	T				:55	<u>.0397</u>	.17
7-27	.08	.01				6:14	<u>.0202</u>	.18
7-28	.20	T				:34	.0142	.18
7-29	0	T				9:54	.0070	.21
7-30	0	0				12:00m	<u>.0060</u>	.23
7-31	.10	0				8-4-58		
8-1	.25	T				12:00n	.0018 <u>1/</u>	.30
8-2	0	0						
8-3	.21 <u>2/</u>	0						

Notes: 1/ To convert runoff in in/hr to cfs, multiply by 8.3168. 2/ Runoff continued at a rate less than .001 in/hr until runoff ends at 11:00p 8-14-58. 3/ Prior to 4:28p. UNDERLINED RUNOFF RATES WERE ADDED IN THE REVISION.



MOOREFIELD, WEST VIRGINIA WATERSHED 1



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Moorefield, West Virginia Watershed 1 (Area = 8.25 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
		1960	P	1.44	2.96	1.56	2.07	5.49	2.62	1.64	1.99	4.83	1.36	0.31
	Q	.16	.75	.44	.51	.99	.19	0	0	.09	0	0	0	3.13
1961	P	1.50	3.58	2.85	3.04	2.39	3.62	1.80	3.72	2.34	1.52	1.62	3.40	31.38
	Q	0	1.67	.70	.93	.14	T	0	.02	0	0	0	.06	3.52

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Moorefield, West Virginia Watershed 1								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-19	0.15	5-8	0.12	5-8	0.18	5-8	0.33	5-8	0.44	5-8	0.51	5-8	0.61	5-8	0.79
1961	2-25	.25	2-25	.11	2-25	.13	2-25	.18	2-18	.27	2-18	.44	2-17	.79	2-17	1.28

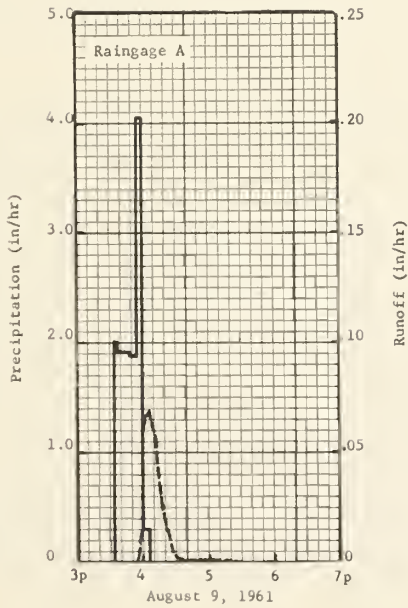
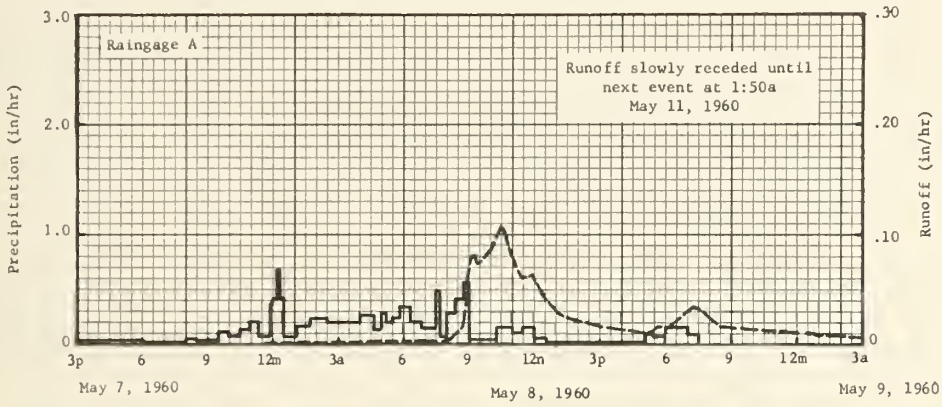
Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Volumes - excellent. Watershed Conditions: grassland - 100%, controlled grazing April through November; sparse cover over about 10% of area; fair to good cover over 90% of area. Note that page 62.1-2 showing August 3, 1958 selected runoff event has been completely revised on the page preceding this. 1/ Raingage A.

SELECTED RUNOFF EVENTS				Moorefield, West Virginia Watershed 1					
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
Event of May 7, 8, 9 and 10, 1960									
4-7-60	Raingage A 0	0.03	5-7-60	Raingage A 0	0	5-7-60			
4-8	.08	.02	3:00p	0	0	11:40p	0	0	
4-9,17	0	.09	6:00	.02	.05	5-8-60			
4-18	.05	T	8:00	.01	.08	6:22a	.0033	.01	
4-19,24	0	T	:30	.04	.10	8:10	.0041	.01	
4-26	.48	T	9:32	.03	.14	:30	.0129	.01	
4-27,29	0	T	10:00	.11	.19	:42	.0186	.02	
			:33	.07	.23	:56	.0468	.02	
			11:00	.13	.29	9:06	.0810	.04	
			:14	.21	.34	:14	.0810	.05	
			:55	.09	.40	:24	.0746	.06	
			12:00m	.36	.43	10:00	.0877	.11	
			5-8-60			:30	.1092	.16	
			12:12a	.40	.51	:40	.1018	.18	
			:20	.68	.60	:52	.0877	.19	
			:30	.42	.67	11:30	.0600	.24	
			1:10	.08	.72	:56	.0625	.26	
			:46	.18	.83	12:24p	.0468	.29	
			2:30	.23	1.00	1:24	.0254	.32	
			4:00	.20	1.30	3:00	.0186	.36	
			:40	.27	1.48	4:30	.0129	.38	
			5:00	.12	1.52	5:24	.0129	.39	
			:15	.28	1.59	:40	.0186	.40	
			:30	.20	1.64	6:04	.0171	.40	
			:53	.23	1.73	7:10	.0311	.43	
			6:20	.33	1.88	:20	.0332	.44	
			:50	.20	1.98	:40	.0311	.45	
			7:30	.14	2.07	8:30	.0186	.47	
			:36	.50	2.12	9:00	.0156	.49	
			8:00	.08	2.15	11:00	.0115	.50	
			:24	.28	2.26	5-9-60			
			:44	.42	2.40	2:30a	.0080	.54	
			9:00	.56	2.55	5-10-60			
			10:20	.03	2.97	12:00m	.0008 2/	.64	
			11:00	.17	3.08				

Notes: To convert runoff in in/hr to cfs, multiply by 8.3188.  
 For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 66.1-3.  
 2/ Runoff continued at a rate less than .0008 until next event at 1:50a, 5-11-60.

SELECTED RUNOFF EVENTS						Moorefield, West Virginia Watershed 1		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 7, 8, 9 and 10, 1960</u>								
			5-8-60					
			11:30a	0.10	3.13			
			12:00n	.14	3.20			
			:33p	.04	3.22			
			5:10	.01	3.25			
			:28	.10	3.28			
			6:00	.09	3.33			
			7:00	.16	3.48			
			:30	.10	3.53			
<u>Event of August 9, 1961</u>								
7-10-61	Raingage A 0	0	8-9-61	Raingage A	0	8-9-61		
7-12	.10	0	3:34p	0	0	3:57p	0	0
7-13	.12	0	:37	2.00	.10	4:00	.0219	T
7-15	.40	0	:48	1.91	.45	:04	.0655	T
7-16	.03	0	:56	1.88	.70	:08	.0686	.01
7-18	.04	0	4:00	4.05	.97	:10	.0625	.01
7-20	.25	0	:06	.30	1.00	:12	.0572	.01
7-21	.05	0				:14	.0420	.01
7-25	.12	0				:18	.0254	.02
8-2	.55	0				:26	.0070	.02
8-3	.75	T				:30	.0032	.02
						:40	.0008	.02
						5:30	0	.02
<p><u>Watershed Conditions:</u>                      Grassland - 100%, controlled grazing; sparse cover over about 10% of area; fair to good cover over 90% of area.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 8.3188.

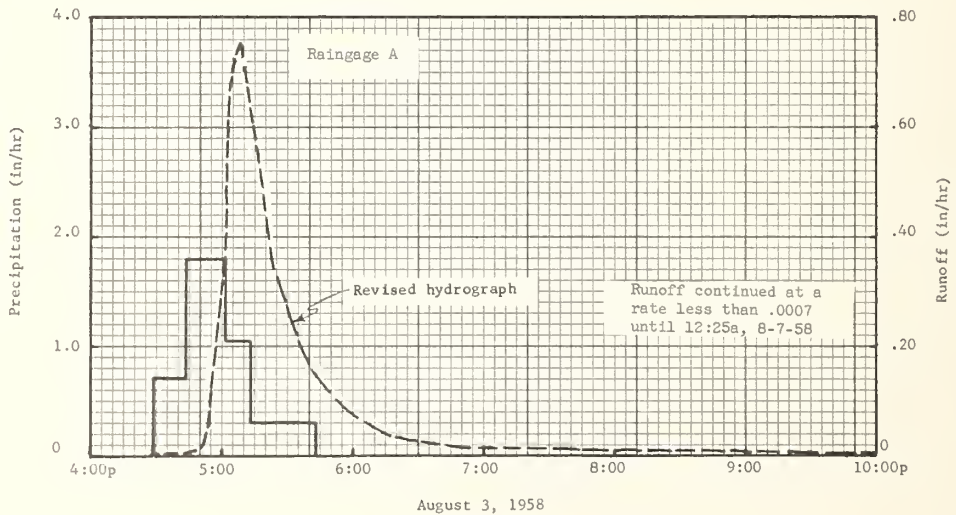


MOOREFIELD, WEST VIRGINIA WATERSHED 1

SELECTED RUNOFF EVENT			Moorefield, West Virginia, Watershed 2 (10.06 acres)					
Antecedent conditions			Rainfall			Runoff (Revised)		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of August 3-4, 1958</u>								
7-4-58	Raingage A 0.25	0	8-3-58	Raingage A		8-3-58		
7-5	.05	0	4:28p	0	0	4:28p	0.0007	0
7-6,7	0	0	:43	.72	.18	:46	.0066	.001
7-8	.02	0	5:02	1.80	.75	:51	.0179	.002
7-9	.03	0	:13	1.04	.94	5:01	.3504	.022
7-10,11	0	0	:43	.30	1.09	:04	.6777	.049
7-12	.20	0				:08	.7587	.097
7-13,17	0	0				:15	<u>.5846</u>	.177
7-18	.50	0				:18	.4984	.204
7-19,20	0	0				:30	<u>.2760</u>	.280
7-21	.68	T				:36	.2011	.304
7-22	1.49	.140				:42	<u>.1556</u>	.322
7-23	.50	.027				:56	.0835	.349
7-24	.25	.016				6:20	<u>.0345</u>	.371
7-25	0	T				:52	.0179	.385
7-26	.45	.024				12:00m	.0040	.423
7-27	.08	.002				8-4-58		
7-28	.20	T				12:00m	.0007 <u>1/</u>	.459
7-29,30	0	0						
7-31	.10	.007						
8-1	.25	.014						
8-2	0	.011						
8-3	.21 <u>2/</u>	.007 <u>2/</u>						

Watershed conditions: Mixed grass cover; 60-70% of area covered by vegetation.

Notes: To convert runoff in in/hr to cfs, multiply by 10.1437. 1/ Runoff continued at a rate less than .0007 in/hr. until runoff ended 12:25a, 8-7-58. 2/ Prior to 4:28p. UNDERLINED RUNOFF RATES WERE ADDED IN THE REVISION.



MOOREFIELD, WEST VIRGINIA WATERSHED 2



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Moorefield, West Virginia Watershed 2 (Area - 10.06 acres)						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	1.44	2.96	1.56	2.07	5.49	2.62	1.64	1.99	4.83	1.36	0.31	1.70	27.97
	Q	.32	.86	.51	.61	1.08	.21	0	0	.26	0	0	0	3.85
1961	P	1.50	3.58	2.85	3.04	2.39	3.62	1.80	3.72	2.34	1.52	1.62	3.40	31.38
	Q	.23	1.77	.66	1.07	.18	.01	0	.11	T	0	0	.29	4.32

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS  
Moorefield, West Virginia Watershed 2

YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-19	0.38	5-8	0.14	5-8	0.27	5-8	0.48	5-8	0.55	5-8	0.72	5-8	0.78	5-8	0.91
1961	2-25	.45	2-25	.18	2-25	.21	2-25	.27	2-18	.39	2-18	.68	2-17	1.09	2-17	1.52

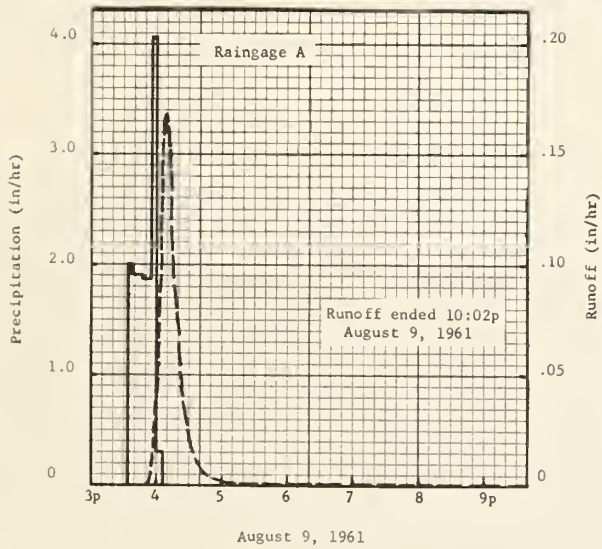
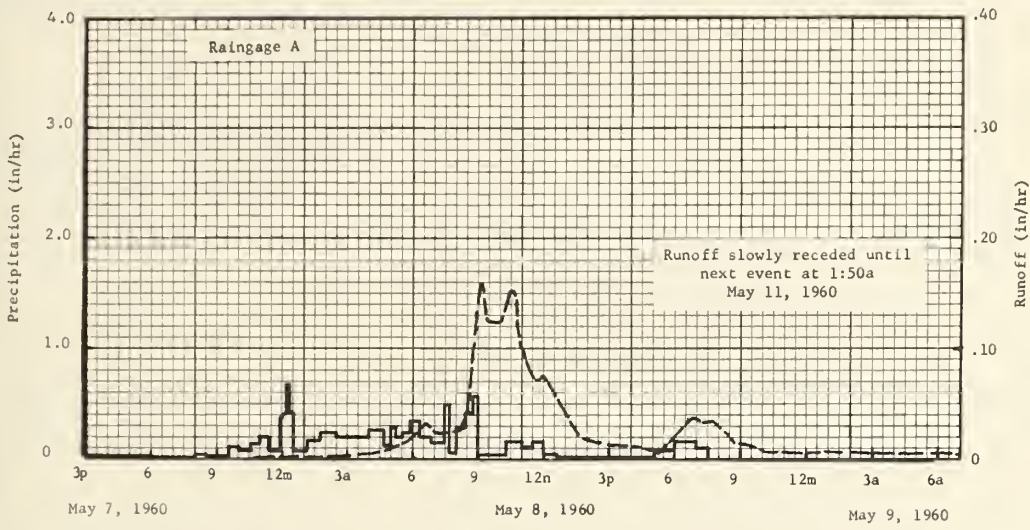
Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Volumes - excellent. Watershed Conditions: native pasture - 100%, controlled grazing; poor to fair cover over about 90% of area, good cover - 10% of area. Note that page 66.2-2 showing August 3-4, 1958 selected runoff event for this watershed has been completely revised on the page preceding this. 1/ Raingage A.

SELECTED RUNOFF EVENTS  
Moorefield, West Virginia Watershed 2

Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
			Event of May 7, 8, 9 and 10, 1960					
4-7-60	Raingage A 0	0.024	5-7-60	Raingage A		5-7-60		
4-8	.06	.019	3:00p	0	0	10:42p	0	0
4-9	0	.011	6:00	.02	.05	5-8-60		
4-10,16	0	.049	8:00	.01	.08	2:03a	.0011	.002
4-17	0	.005	:30	.04	.10	5:13	.0106	.017
4-18	.05	.002	9:32	.03	.14	:53	.0153	.025
4-19	0	.002	10:00	.11	.19	6:33	.0307	.040
4-20	0	.001	:33	.07	.23	7:03	.0239	.054
4-26	.40	0	11:00	.13	.29	8:13	.0255	.082
4-27	.08	0	:14	.21	.34	:23	.0345	.087
			:55	.09	.40	:31	.0513	.092
			12:00m	.36	.43	:43	.0895	.106
			5-8-60			9:01	.1469	.140
			12:12a	.40	.51	:05	.1599	.151
Watershed Conditions: Mixed grass cover; 50-80% of area covered by vegetation.			:20	.68	.60	:29	.1236	.208
			:30	.42	.67	10:03	.1236	.278
			1:10	.08	.72	:18	.1390	.310
			:46	.18	.83	:29	.1512	.337
			2:30	.23	1.00	:35	.1512	.352
			4:00	.20	1.30	:53	.1201	.393
			:40	.27	1.48	11:03	.0993	.411
			5:00	.12	1.52	:39	.0719	.461
			:15	.28	1.59	:59	.0746	.485
			:30	.20	1.64	12:09p	.0719	.497
			:53	.23	1.73	1:33	.0223	.554
			6:20	.33	1.88	:59	.0179	.563
			:50	.20	1.98	2:33	.0140	.572
			7:30	.14	2.07	4:13	.0106	.594
			:36	.50	2.12	5:23	.0085	.605
			8:00	.08	2.15	:49	.0153	.610
			:24	.28	2.26	6:43	.0364	.632
			:44	.42	2.40	:57	.0364	.640
			9:00	.56	2.55	7:09	.0345	.647
			10:20	.03	2.97	:33	.0345	.661
			11:00	.17	3.08	8:43	.0153	.690

Notes: To convert runoff in in/hr to cfs, multiply by 10.144. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 66.2-3.

SELECTED RUNOFF EVENTS			Moorefield, West Virginia Watershed 2					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 7, 8, 9 and 10, 1960 (continued)</u>								
			5-8-60			5-8-60		
			11:30a	0.10	3.13	9:03	.0128	.694
			12:00n	.14	3.20	10:23	.0085	.708
			:33p	.04	3.22	12:00m	.0066	.721
			5:10	.01	3.25	5-9-60		
			:28	.10	3.28	3:34a	.0040	.740
			6:00	.09	3.33	12:00m	.0011	.784
			7:00	.16	3.48	5-10-60		*
			e :30	.10	3.53	12:00m	.0011 <u>1/</u>	.810
<u>Event of August 9, 1961</u>								
7-10-61	Reingage A 0	0	8-9-61	Reingage A 0	0	8-9-61	0	0
7-12	.10	0	3:34p	0	0	3:51p	0	0
7-13	.12	0	:37	2.00	.10	:56	.0066	T
7-15	.40	0	:48	1.91	.45	:59	.0239	.001
7-16	.03	0	:56	1.88	.70	4:00	.0384	.001
7-18	.04	0	4:00	4.05	.97	:06	.1027	.009
7-20	.25	0	:06	.30	1.00	:09	.1686	.016
7-21	.05	0	5:58	0	1.00	:12	.1469	.024
7-25	.12	0	6:10	.40	1.08	:18	.0865	.035
8-2	.55	0				:22	.0561	.040
8-3	.75	.018				:26	.0345	.043
						:32	.0180	.045
						:48	.0049	.048
						5:02	.0015	.049
						7:02	.0001	.049
						10:02	0	.050
<u>Watershed Conditions:</u>								
Native pasture - 100%, controlled grazing; poor to fair cover over about 90% of area, good cover - 10% of area.								
<u>Notes:</u> To convert runoff in in/hr to cfs, multiply by 10.144.								
<u>1/</u> Runoff continued at a rate less than .0011 in/hr until next event at 1:50a - 5-11-60.								

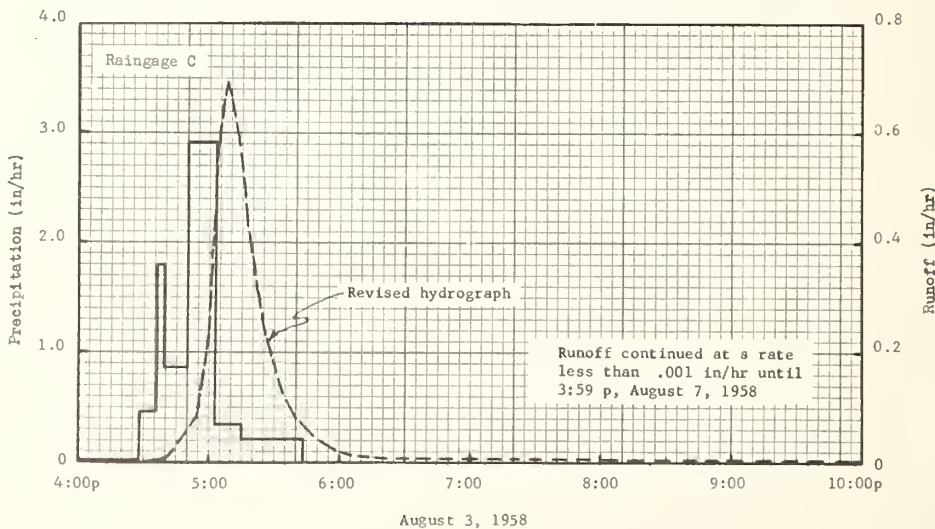


MOOREFIELD, WEST VIRGINIA WATERSHED 2

SELECTED RUNOFF EVENTS						Moorefield, West Virginia Watershed 4 (6.32 acres)		
Antecedent conditions			Rainfall			Runoff (Revised)		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Raingage C			<b>Event of August 3-4, 1958</b>					
7-4-58	0.25	0	8-3-58	Raingage C		8-3-58		
7-5	.05	0	4:00p	0	0	4:29p	0	0
7-6,7	0	0	:27	.02	.01	:40	<u>.0078</u>	T
7-8	.02	0	:36	.47	.08	:44	<u>.0243</u>	T
7-9	.03	0	:39	1.80	.17	:54	<u>.0816</u>	.01
7-10,11	0	0	:50	.87	.33	:56	<u>.1232</u>	.01
7-12	.20	0	5:03	2.91	.96	5:00	.2338	.03
7-13,17	0	0	:15	.35	1.03	:04	<u>.5790</u>	.05
7-18	.50	T	:43	.21	1.13	:07	.6936	.08
7-19,20	0	0				:14	.5790	.16
7-21	.66	.01				:19	<u>.3845</u>	.20
7-22	1.29	.11				:26	<u>.2338</u>	.23
7-23	.22	.01				:34	<u>.1232</u>	.26
7-24	.28	.01				:40	<u>.0816</u>	.27
7-25	0	0				:47	.0488	.27
7-26	.44	.04				:57	<u>.0243</u>	.28
7-27	.11	.02				6:05	.0151	.28
7-28	.14	.01				:22	.0078	.29
7-29	0	.01				12:00m	.0033	.31
7-30	0	0				8-4-58		
7-31	.12	0				12:00m	<u>.0017</u> <u>1/</u>	.36
8-1	.27	.01						
8-2	0	0						
8-3 to	.16 <u>2/</u>	T <u>3/</u>						

Watershed Conditions: Mixed grass cover; 40-65% of area covered by vegetation.

Notes: To convert runoff in in/hr to cfs, multiply by 6.3728. 1/ Runoff continued at a rate less than .001 in/hr until runoff ends at 3:59p 8-7-58. 2/ Prior to 4:00p. 3/ Runoff prior to 4:29p. UNDERLINED RUNOFF RATES WERE ADDED IN THE REVISION.



MOOREFIELD, WEST VIRGINIA WATERSHED 4



MONTHLY PRECIPITATION AND RUNOFF (Inches)								Moorefield, West Virginia Watershed 4 (Area - 6.32 acres)					
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960 P	1.39	2.94	1.56	2.24	5.59	2.64	1.71	1.88	4.72	1.37	0.32	1.45	27.81
1960 Q	.10	.23	.11	.42	.79	.05	T	.01	.22	T	0	0	1.93
1961 P	1.57	3.65	2.86	3.19	2.35	3.65	1.53	3.70	2.29	1.44	1.68	3.45	31.36
1961 Q	.08	1.76	.42	.50	.05	.02	0	.12	.03	T	T	.22	3.20

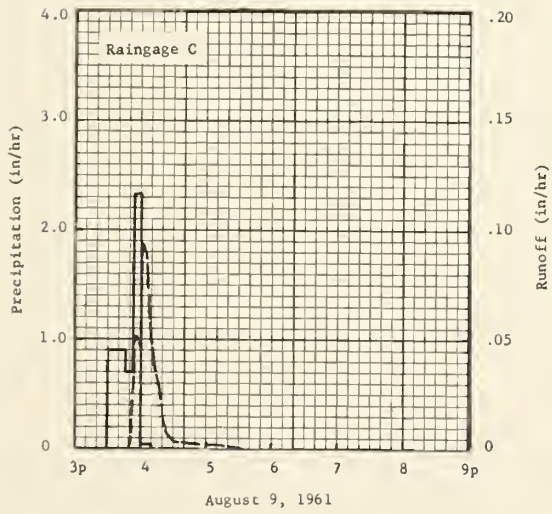
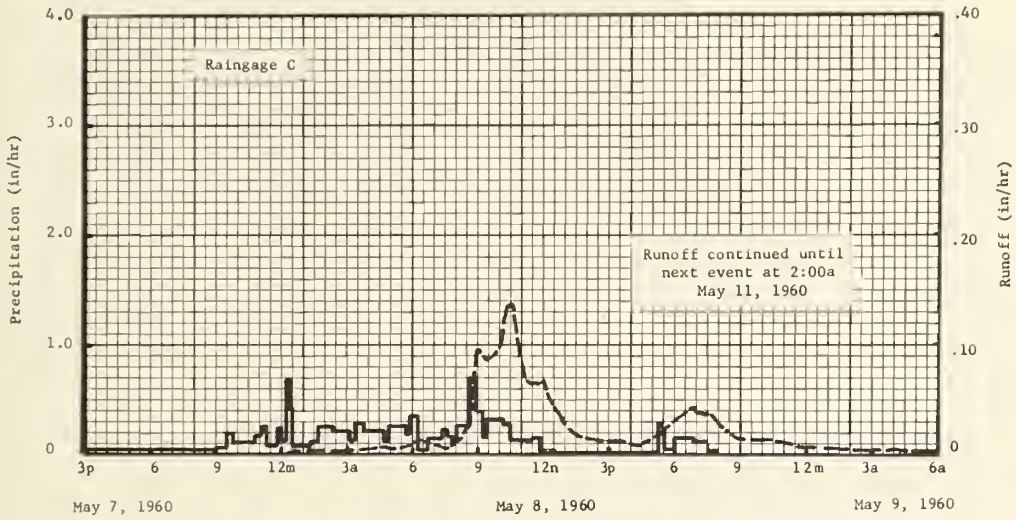
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								Moorefield, West Virginia Watershed 4								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	9-19	0.24	5-8	0.12	5-8	0.21	5-8	0.35	5-8	0.48	5-8	0.59	5-8	0.67	5-8	0.75
1961	2-25	.31	2-19	.18	2-19	.31	2-19	.54	2-19	.67	2-18	.81	2-18	.97	2-17	1.54

Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Volumes - excellent. Watershed Conditions: 100% of area in native grass pasture with controlled grazing; sparse cover over about 25% and poor to fair cover over about 75% of area. Note that page 66.4-2 showing August 3-4, 1958 selected runoff event for this watershed has been completely revised on the page preceding this. 1/ Raingage C.

SELECTED RUNOFF EVENTS						Moorefield, West Virginia Watershed 4		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of May 7, 8, 9 and 10, 1960</u>								
4-7-60	Raingage C 0	0.03	5-7-60 3:00p	Raingage C 0	0	5-8-60 12:16a	0	0
4-8	.06	.02	9:00	.03	.09	:34	.0042	T
4-9, 11	0	.06	:30	.04	.11	3:10	.0042	.01
4-12	0	T	:45	.20	.16	4:44	.0078	.02
4-18	.07	0	10:46	.11	.27	5:00	.0053	.02
4-26	.50	0	11:04	.17	.32	6:20	.0135	.03
4-27	.13	0	:20	.26	.39	7:34	.0053	.04
			:55	.09	.44	8:20	.0151	.05
			12:00m	.24	.46	:46	.0488	.06
			5-8-60			9:00	.0974	.08
			12:05a	.12	.47	:30	.0856	.12
			:20	.68	.64	10:00	.0974	.16
			:30	.42	.70	:24	.1328	.21
			:50	.09	.73	:30	.1377	.22
			1:36	.12	.82	:32	.1377	.23
			2:20	.25	1.00	:38	.1232	.24
			3:10	.22	1.18	11:00	.0856	.28
			:28	.13	1.22	:26	.0642	.31
			3:45	.28	1.30	:44	.0642	.33
			4:45	.21	1.51	12:00n	.0677	.35
			:55	.12	1.53	:14p	.0549	.36
			5:44	.26	1.74	1:30	.0185	.40
			:54	.18	1.77	2:50	.0135	.42
			6:17	.34	1.90	3:20	.0135	.43
			:40	.05	1.97	4:20	.0091	.44
			7:25	.15	2.08	5:46	.0264	.46
			:33	.22	2.11	6:40	.0406	.49
			:40	.17	2.13	:50	.0406	.49
			8:00	.12	2.17	7:00	.0380	.50
			:35	.27	2.33	:34	.0380	.52
			:58	.70	2.60	8:20	.0204	.55
			9:10	.40	2.68	:50	.0151	.56
			:17	.17	2.70	10:46	.0105	.58
			10:10	.32	2.98	12:00m	.0079	.59

Notes: To convert runoff in in/hr to cfs, multiply by 6.3728.  
For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 66.4-3.

SELECTED RUNOFF EVENTS						Moorefield, West Virginia Watershed 4		
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 7, 8, 9 and 10, 1960 (continued)								
			5-8-60			5-9-60		
			10:30a	0.27	3.07	3:00a	.0053	.61
			11:30	.13	3.20	6:00	.0042	.62
			:50	.15	3.25	12:00m	.0017	.66
			12:30p	.04	3.28	5-10-60		
			5:14	.01	3.31	12:00m	.0011 <sup>1/</sup>	.70
			:20	.30	3.34			
			:30	.24	3.38			
			6:00	.04	3.40			
			:52	.14	3.52			
			7:30	.11	3.59			
			8:00	.04	3.61			
Event of August 9, 1961								
7-10-61	Raingage C 0	0	8-9-61	Raingage C	0	8-9-61		
7-12	.10	0	3:30p	0	0	3:48p	0	0
7-13	.12	0	:46	.90	.24	:50	.0033	T
7-15	.25	0	:52	.70	.31	:52	.0105	T
7-16	.05	0	4:00	2.33	.62	:54	.0331	T
7-18	.05	0	:10	.06	.63	:57	.0518	T
7-20	.20	0	5:50	0	.63	4:00	.0460	.01
7-21	.05	0	6:10	.70	.21	:03	.0935	.01
7-25	.11	0				:12	.0380	.02
8-2	.65	T				:16	.0292	.02
8-3	.11	T						
						:22	.0091	.02
						:30	.0033	.02
						5:32	0	.02
<p><u>Watershed Conditions:</u>  100% of area in native grass pasture with controlled grazing; sparse cover over about 25% and poor to fair cover over about 75% of area.</p>								
<p>Notes: To convert runoff in in/hr to cfs, multiply by 6.3728.  <sup>1/</sup> Runoff continued at a rate less than .0011 in/hr until next event at 2:00a, 5-11-60.</p>								

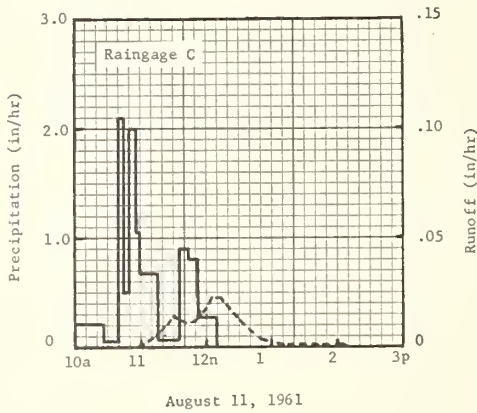
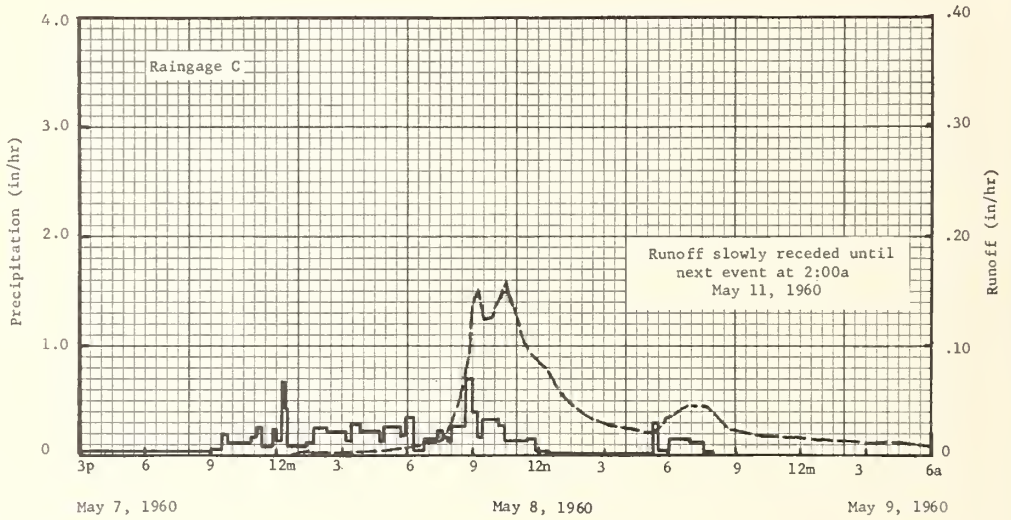


MOOREFIELD, WEST VIRGINIA WATERSHED 4

MONTHLY PRECIPITATION AND RUNOFF (Inches)							Moorefield, West Virginia Watershed 5 (Area - 9.55 acres)									
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year		
		1960	P	1.39	2.94	1.56	2.24	5.59	2.64	1.71	1.88	4.72	1.37	0.32	1.45	27.81
	Q	.32	.88	.35	.53	1.21	.11	0	0	.16	0	0	0	3.56		
1961	P	1.57	3.65	2.86	3.19	2.35	3.65	1.53	3.70	2.29	1.44	1.68	3.45	31.36		
	Q	.17	2.62	.69	.94	.14	T	0	.03	T	0	0	.27	4.86		
ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							Moorefield, West Virginia Watershed 5									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	5-8	0.16	5-8	0.15	5-8	0.27	5-8	0.56	5-8	0.75	5-8	0.86	5-8	1.06	5-8	1.16
1961	2-25	.25	2-19	.17	2-19	.30	2-19	.56	2-19	.73	2-18	.99	2-18	1.39	2-17	2.21
Notes: Quality of records: Monthly P & Q and Annual Maximum Discharges and Volumes - excellent. Watershed Conditions: 100% of area in native grass pasture; sparse cover on about 10% of area; fair to good cover over about 75%, good cover on about 15% of area.																
SELECTED RUNOFF EVENTS							Moorefield, West Virginia Watershed 5									
Antecedent conditions				Rainfall				Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)								
Event of May 7, 8, 9 and 10, 1960																
4-7-60	0	0.02	5-7-60	Raingage C		5-8-60										
4-8	.06	.01	3:00p	0	0	12:40a	0	0								
4-9, 12	0	T	9:00	.03	.09	3:30	.0011	T								
4-18	.05	0	:30	.04	.11	6:46	.0111	.01								
4-26	.50	0	:45	.20	.16	:54	.0122	.02								
4-27	.13	0	10:46	.11	.27	7:10	.0122	.02								
			11:04	.17	.32	:36	.0135	.02								
			:20	.26	.39	8:50	.0847	.06								
			:55	.09	.44	9:04	.1423	.09								
			12:00m	.24	.46	:06	.1506	.09								
Watershed Conditions: Mixed grass cover; 95-98% of area covered with vegetation.																
			5-8-60			:12	.1506	.11								
			12:05a	.12	.47	:30	.1265	.15								
			:20	.68	.64	:56	.1265	.20								
			:30	.42	.70	10:20	.1506	.26								
			:50	.09	.73	:30	.1593	.28								
			1:36	.12	.82	:50	.1340	.33								
			2:20	.25	1.00	11:30	.0975	.41								
			3:10	.22	1.18	12:30p	.0758	.50								
			:28	.13	1.22	1:08	.0540	.54								
			:45	.28	1.30	2:30	.0323	.60								
			4:45	.21	1.51	3:28	.0287	.63								
			:55	.12	1.53	5:20	.0203	.67								
			5:44	.26	1.74	:40	.0287	.68								
			:54	.18	1.77	:54	.0343	.69								
			6:17	.34	1.90	6:14	.0363	.70								
			6:40	.05	1.97	:40	.0448	.72								
			7:25	.15	2.08	7:40	.0448	.76								
			:33	.22	2.11	8:44	.0251	.80								
			:40	.17	2.13	10:00	.0189	.82								
			8:00	.12	2.17	12:00m	.0147	.86								
			:35	.27	2.33	5-9-60										
			:58	.70	2.60	3:00a	.0111	.90								
			9:10	.40	2.68	5-10-60										
			:17	.17	2.70	12:00m	.0011 <sup>1/2</sup>	1.06								
			10:10	.32	2.98											
Notes: To convert runoff in in/hr to cfs, multiply by 9.6296. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1956-59, USDA Misc. Pub. 945, p. 66.5-3. <sup>1/2</sup> Runoff continued at a rate less than .0011 until next event at 2:00a, 5-11-60.																



SELECTED RUNOFF EVENTS			Moorefield, West Virginia Watershed 5					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of May 7, 8, 9 and 10, 1960 (continued)								
			5-8-60					
			10:30a	0.27	3.07			
			11:30	.13	3.20			
			:50	.15	3.25			
			12:30p	.04	3.28			
			5:14	.01	3.31			
			:20	.30	3.34			
			:30	.24	3.38			
			6:00	.04	3.40			
			:52	.14	3.52			
			7:30	.11	3.59			
			8:00	.04	3.61			
Event of August 11, 1961								
	Raingage C		8-11-61	Raingage C		8-11-61		
7-12-61	0.10	0	10:00a	0	0	10:59a	0	0
7-13	.12	0	:26	.12	.05	11:20	.0089	T
7-15	.25	0	:40	.04	.06	:30	.0147	T
7-16	.05	0	:44	2.10	.20	:42	.0123	.01
7-18	.05	0	:50	.50	.25	:50	.0123	.01
7-20	.20	0	:56	2.00	.45	12:00n	.0174	.01
7-21	.05	0	11:00	1.05	.52	:06p	.0235	.01
7-25	.11	0	:16	.68	.70	:12	.0235	.01
8-2	.65	0	:37	.03	.71	:30	.0123	.02
8-3	.77	T	:43	.90	.80	:50	.0035	.02
8-9	.70	T	:52	.80	.92	1:10	.0011	.02
			12:10p	.27	1.00	2:10	0	.02
<p><u>Watershed Conditions:</u>                      100% of area in native grass pasture; sparse cover on about 10% of area; fair to good cover over about 75%, good cover on about 15% of area.</p>								
<p><b>Notes:</b> To convert runoff in in/hr to cfs, multiply by 9.6296.</p>								



MOOREFIELD, WEST VIRGINIA WATERSHED 5

MONTHLY PRECIPITATION AND RUNOFF (Inches)							North Danville, Vermont Watershed W-1 Area - 10,610 ac. (16.58 sq. mi.)							
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.65	3.37	1.83	3.56	3.44	3.28	3.17	1.57	4.20	4.15	2.80	1.80	36.12
	Q	1.55	1.27	1.14	8.80	2.29	.69	.31	.17	.39	1.07	1.10	.65	19.43
1961	P	.87	2.57	1.94	4.13	2.73	4.84	4.04	3.09	1.58	1.63	3.05	2.59	33.16
	Q	.38	1.04	1.56	5.40	2.76	1.88	1.04	.40	.28	.19	.55	.64	16.12

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							North Danville, Vermont Watershed W-1									
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1958 <u>2</u>	10-24	.02	10-24	.02	10-24	<u>.04</u>	10-24	.11	10-24	.21	10-23	<u>.32</u>	10-23	<u>.43</u>	10-23	<u>1.09</u>
1959 <u>2</u>	10-24	.10	10-24	.10	10-24	.20	10-24	.50	10-24	.77	10-24	<u>1.14</u>	10-25	<u>1.45</u>	4-10	<u>3.13</u>
1960	4-18	.07	4-18	.07	4-18	.13	4-18	.33	4-18	.55	4-17	<u>.83</u>	4-17	<u>1.44</u>	4-12	3.86
1961	4-23	.04	4-23	.04	4-23	.07	4-23	.19	4-23	.32	4-23	.56	4-22	.86	4-21	2.59

Notes: Quality of records: Monthly P and Q, excellent. Watershed conditions: Very little change from descriptions previously shown for 1958-59. 1/ Monthly P is Thiessen weighted, using 6 raingages. 2/ 1958 and 1959 maximum runoff volumes and dates are revised as indicated by underlining.

SELECTED RUNOFF EVENTS							North Danville, Vermont Watershed W-1						
Antecedent conditions			Rainfall			Runoff							
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)					

Event of July 30-August 4, 1960								
6-30-60	Raingage R-22A	0.12	7-30-60	Raingage	R-22A	7-30-60		
7-1	0	.0097	12:00n	0	0	12:30p	0.0001	0
7-2	0	.0075	4:0p	.12	.08	1:30	.0002	.0002
7-3	.45	.0104	1:00	.18	.14	3:00	.0002	.0005
7-4	0	.0142	2:00	.06	.20	:30	.0002	.0006
7-5	.19	.0102	:35	.14	.28	4:20	.0003	.0008
7-6	0	.0114	3:10	.34	.48	:45	.0003	.0009
7-7	0	.0084	4:0	.24	.60	5:30	.0006	.0013
7-8	.09	.0072	:50	0	.60	6:00	.0009	.0016
7-9	.02	.0081	4:10	.24	.68	:45	.0015	.0026
7-10	0	.0063	:30	0	.68	7:15	.0017	.0034
7-11	0	.0057	:40	.90	.83	:30	.0018	.0038
7-12	0	.0051	5:00	.30	.93	8:00	.0027	.0049
7-13	.07	.0051	:15	0	.93	9:00	.0039	.0082
7-14	0	.0058	:20	.60	.98	:15	.0040	.0092
7-15	0	.0049	:40	.21	1.05	:40	.0049	.0110
7-16	0	.0043	6:10	.06	1.08	10:25	.0088	.0162
7-17	0	.0041	:55	0	1.08	11:15	.0118	.0245
7-18	0	.0043	7:20	.12	1.13	:30	.0120	.0274
7-19	.25	.0064	8:00	0	1.13	:45	.0131	.0306
7-20	0	.0092	9:00	.30	1.43	12:00m	.0131	.0338
7-21	0	.0062	:40	.37	1.68	7-31-60		
7-22	0	.0047	10:00	.12	1.72	12:20a	.0129	.0382
7-23	0	.0046	11:00	.01	1.73	3:15	.0072	.0676
7-24	0	.0041				4:45	.0054	.0770
7-25	0	.0035				7:30	.0035	.0892
7-26	0	.0031				9:45	.0027	.0961
7-27	.27	.0037				1:30p	.0017	.1044
7-28	0	.0055				7:30	.0011	.1128
7-29	0	.0042				9:45	.0009	.1150
7-30	0	.0019 <u>3</u>				12:00m	.0007	.1168
					Total Rainfall			
					R-1	1.95		
					R-2	1.81		
					R-12	1.73		
					R-16	1.76		
					R-19	1.95		
Watershed Conditions: 64% forest land; 10% hay with about 6 inch growth since last cutting; 15% pastured land; 3% idle land with dense grass and brush growth; 1% seeded to corn which was just coming up; 1% horesites.					Thiessen weighted average (6 raingages)	1.83		
							Continued on next page	

Notes: To convert runoff in in/hr to cfs, multiply by 10,698.4. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 67.1-4. 3/ Runoff prior to 12:30p.

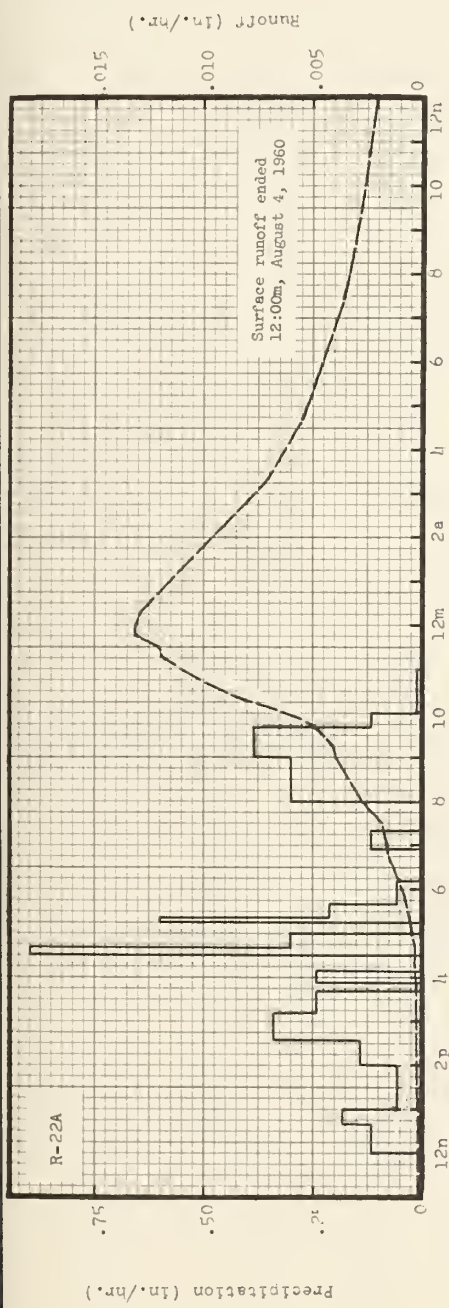
12-63

SELECTED RUNOFF EVENTS			North Danville, Vermont Watershed W-1					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 30-August 4, 1960 (continued)								
						8-2-60 12:00m	.0003	.1364
						8-3-60 12:00m	.0002	.1424
						8-4-60 12:00m	.0002 1/	.1472
Event of June 2-5, 1961								
	Raingage R-22A			Raingage	R-22A			
5-3-61	.19	.2157	6-2-61			6-2-61		
5-4	0	.1655	2:00a	0	0	2:10a	.0012	0
5-5	0	.1254	:30	.04	.02	:55	.0013	.0009
5-6	0	.1040	:40	0	.02	3:35	.0014	.0018
5-7	.13	.1076	3:00	.18	.08	4:10	.0015	.0026
5-8	0	.1022	:10	.12	.10	:40	.0016	.0034
5-9	.49	.0992	:15	.24	.12	6:05	.0026	.0064
5-10	.19	.2506	:20	0	.12	:15	.0031	.0069
5-11	0	.1106	:30	.30	.17	:25	.0040	.0075
5-12	0	.0825	:45	.20	.22	:55	.0054	.0098
5-13	0	.0726	:50	0	.22	7:10	.0066	.0113
5-14	0	.0636	4:00	.12	.24	:25	.0078	.0131
5-15	0	.0547	:05	.36	.27	:35	.0094	.0146
5-16	.47	.0667	:10	.12	.28	:55	.0129	.0183
5-17	0	.0633	:30	0	.28	8:05	.0154	.0206
5-18	0	.0480	:50	.12	.32	:30	.0177	.0275
5-19	0	.0423	5:35	0	.32	:55	.0196	.0353
5-20	0	.0375	:40	.24	.34	9:10	.0204	.0403
5-21	.10	.0384	:45	.36	.37	:20	.0207	.0437
5-22	0	.0479	:55	0	.37	:30	.0204	.0472
5-23	0	.0391	6:05	.60	.47	:45	.0202	.0522
5-24	0	.0357	:10	.96	.55	:55	.0207	.0556
5-25	0	.0324	:15	.24	.57	10:00	.0207	.0574
5-26	.49	.0494	:20	.36	.60	:35	.0196	.0691
5-27	.25	.0989	:30	.24	.64	1:15p	.0137	.1136
5-28	0	.0588	:35	.36	.67	5:00	.0094	.1569
5-29	.10	.0520	:40	.60	.72	8:00	.0070	.1815
5-30	0	.0465	:50	.18	.75	9:45	.0060	.1929
5-31	0	.0357	:55	.24	.77	12:00m	.0053	.2054
6-1	0	.0311	7:00	0	.77	6-3-61		
6-2	0	.0026 2/	:10	.12	.79	3:30a	.0044	.2225
			:30	.06	.81	7:00	.0039	.2370
			:50	.03	.82	12:00n	.0037	.2560
			8:00	.06	.83	9:00p	.0024	.2834
			:30	0	.83	12:00m	.0022	.2903
			:40	.24	.87	6-4-61		
				Total Rainfall		6:00a	.0021	.3032
				n-1	.85	2:00p	.0019	.3194
				n-2	.97	9:00	.0016	.3319
						12:00m	.0016	.3368
				R-12	.90	6-5-61		
				R-16	.92	12:00n	.0015	.3556
				R-19	.95	12:00m	.0013 1/	.3725
				Thiessen weighted average (6 raingages)				
					.91			

Watershed Conditions: 64% forest land; 16% hay with heavy growth about 8 inches in height; 15% pastured land; 3% idle land with dense growth of grass and brush; 1% in newly seeded hay land; 1% homesites.

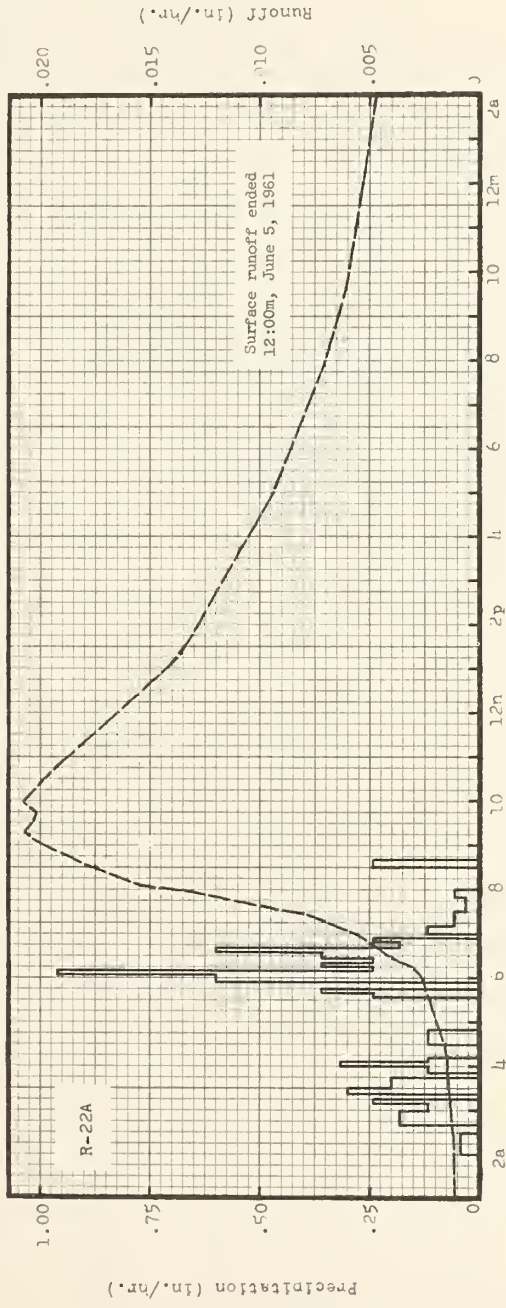
Notes: To convert runoff in in/hr to cfs. multiply by 10,698.4. 1/ Beginning of next event. 2/ Runoff prior to 2:10a.





July 31, 1960

July 30, 1960



June 2, 1961

NORTH DANVILLE, VERMONT WATERSHED W-1

12-63

MONTHLY PRECIPITATION AND RUNOFF (Inches)							North Danville, Vermont (Area - 146 acres)						Watershed W-2	
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	2.19	2.69	1.51	3.51	2.88	2.84	3.07	1.88	3.86	4.03	2.60	1.55	32.61
	Q	1.63	1.20	1.02	5.35	2.03	.73	.31	.18	.31	.50	.53	.50	14.29
1961	P	.86	2.50	1.57	3.89	2.77	3.98	4.23	3.42	1.61	1.60	2.66	2.55	31.64
	Q	.30	.65	1.43	2.93	2.16	1.36	1.04	.68	.37	.27	.43	.44	12.06

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS							North Danville, Vermont						Watershed W-2			
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1950	<u>2/</u> 10-23	.01	10-23	.01	10-23	.02	10-23	<u>.04</u>	10-23	.08	10-23	<u>.11</u>	10-23	<u>.15</u>	10-23	<u>.44</u>
1959	<u>2/</u> 10-24	<u>.05</u>	10-24	<u>.04</u>	10-24	.07	10-24	.18	11-28	.31	11-28	<u>.42</u>	4-10	<u>.58</u>	4-8	<u>1.92</u>
1960	4-18	.03	4-18	.03	4-18	.05	4-18	.12	4-18	.19	4-18	.28	4-4	.55	4-11	1.86
1961	6-2	.03	6-2	.02	6-2	.04	4-16	.10	2-26	.17	2-25	.26	2-25	.33	4-16	.92

Notes: Quality of records: P & Q, excellent. Watershed conditions: No change in cultural use from that previously described for 1958-59. 1/ Raingage R-22 installed Dec. 1960; 1961 P values are Thiessen weighted average of Raingages R-22 and R-22A. 2/ Maximum discharge rate and date for 1959 and maximum runoff volumes for 1958 and 1959 are revised and indicated by underlining.

SELECTED RUNOFF EVENTS							North Danville, Vermont						Watershed W-2	
Antecedent conditions			Rainfall			Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)						
Event of July 30-31, 1960														
6-30-60	Raingage R-22A <u>2/</u>	.12	7-30-60	Raingage R-22A <u>3/</u>	0	7-30-60	0	0						
7-1	0	.0080	12:00p	0	0	12:15p	.0001	0						
7-2	0	.0069	:40p	.12	.08	:45	.0002	.0001						
7-3	.45	.0300	1:00	.18	.14	1:15	.0007	.0003						
7-4	0	.0189	2:00	.06	.20	3:00	.0010	.0018						
7-5	.19	.0165	:35	.14	.28	:20	.0015	.0022						
7-6	0	.0114	3:10	.34	.48	4:00	.0057	.0046						
7-7	0	.0090	:40	.24	.60	:45	.0061	.0090						
7-8	.09	.0077	:50	0	.60	5:40	.0112	.0170						
7-9	.02	.0091	4:10	.24	.68	6:00	.0112	.0207						
7-10	0	.0055	:30	0	.68	8:00	.0042	.0362						
7-11	0	.0059	:40	.90	.83	:30	.0042	.0383						
7-12	.04	.0047	5:00	.30	.93	9:00	.0084	.0414						
7-13	.07	.0060	:15	0	.93	10:00	.0224	.0569						
7-14	0	.0069	:20	.60	.98	:30	.0182	.0670						
7-15	0	.0046	:40	.21	1.05	11:30	.0084	.0804						
7-16	0	.0032	6:10	.06	1.08	12:00m	.0057	.0839						
7-17	0	.0031	:55	0	1.08	7-31-60								
7-18	0	.0045	7:20	.12	1.13	12:30a	.0042	.0864						
7-19	.25	.0108	8:00	0	1.13	1:30	.0027	.0899						
7-20	.07	.0071	9:00	.30	1.43	4:00	.0015	.0952						
7-21	0	.0033	:40	.38	1.08	10:00	.0007	.1018						
7-22	0	.0038	10:00	.12	1.72	3:00p	.0004	.1044						
7-23	0	.0031	11:00	.01	1.73	6:00	.0003	.1054						
7-24	0	.0006				12:00m	.0003 <u>4/</u>	.1071						
7-25	0	.0010												
7-26	0	.0008												
7-27	.32	.0022												
7-28	0	.0054												
7-29	0	.0033												
7-30	0	.0010 <u>5/</u>												

Watershed Conditions: Pastured land had average height of 5 inches, 38%; hay had just been cut and baled, 37%; forest land 25%.

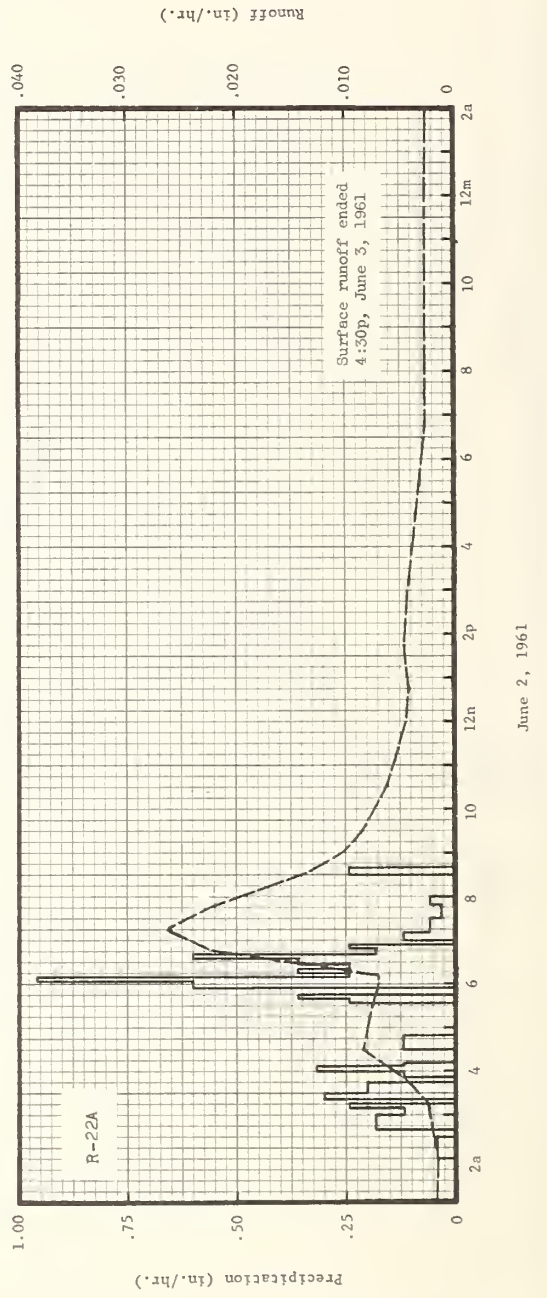
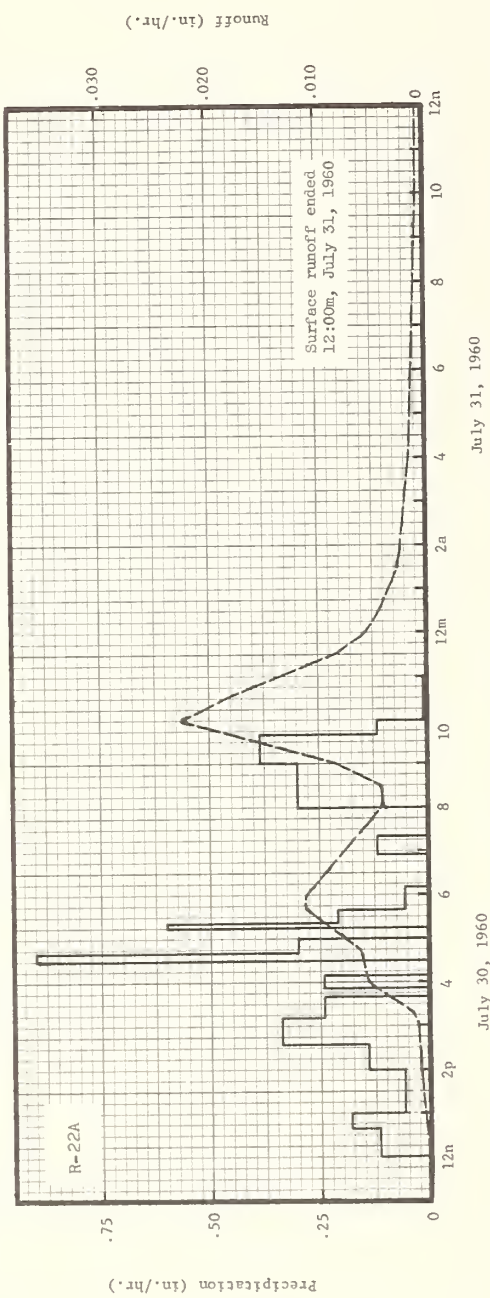
Notes: To convert runoff in in/hr to cfs, multiply by 147.22. For map of watershed, see Hydrologic Data for Experimental Agricultural Watersheds in the U. S., 1956-59, USDA Misc. Pub. 945, p. 67.2-4. 3/ Only raingage in operation at time of event. 4/ Return to normal base flow. 5/ Runoff prior to 12:15p.

Cooperative Research Project of the USDA, the Agricultural Experiment Station and the College of Technology, University of Vermont, and the Vermont Department of Water Resources.

SELECTED RUNOFF EVENTS			North Danville, Vermont Watershed W-2					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
<u>Event of June 2-3, 1961</u>								
5-3-61	Raingage R-22A .19	.1062	6-2-61	Raingage R-22A		6-2-61		
5-4	0	.0847	2:00a	0	0	2:00a	.0017	0
5-5	0	.0707	:30	.04	.02	3:00	.0022	.0020
5-6	0	.0688	:40	0	.02	:15	.0025	.0026
5-7	.13	.0810	3:00	.18	.08	:45	.0042	.0043
5-8	0	.0779	:10	.12	.10	4:30	.0084	.0090
5-9	.49	.0870	:15	.24	.12	5:15	.0079	.0152
5-10	.19	.1244	:20	0	.12	6:00	.0070	.0207
5-11	0	.0728	:30	.30	.17	:10	.0070	.0219
5-12	0	.0653	:45	.20	.22	:45	.0224	.0305
5-13	0	.0629	:50	0	.22	7:15	.0262	.0427
5-14	0	.0588	4:00	.12	.24	:45	.0224	.0549
5-15	0	.0524	:05	.32	.27	8:30	.0138	.0684
5-16	.47	.0877	:10	.12	.28	9:00	.0101	.0744
5-17	0	.0595	:30	0	.28	:30	.0084	.0790
5-18	0	.0553	:50	.12	.32	10:30	.0061	.0863
5-19	0	.0535	5:35	0	.32	12:00n	.0046	.0943
5-20	0	.0496	:40	.24	.34	:45p	.0042	.0976
5-21	.10	.0528	:45	.36	.37	1:45	.0046	.1020
5-22	0	.0603	:55	0	.37	3:00	.0042	.1075
5-23	0	.0535	6:05	.60	.47	6:45	.0027	.1205
5-24	0	.0535	:10	.96	.55	12:00m	.0027	.1348
5-25	0	.0453	:15	.24	.57	6-3-61		
5-26	.49	.0790	:20	.36	.60	3:00a	.0025	.1426
5-27	.25	.0768	:30	.24	.64	12:00n	.0022	.1638
5-28	0	.0492	:35	.36	.67	4:30p	.0017 1/	.1727
5-29	.10	.0613	:40	.60	.72			
5-30	0	.0524	:50	.18	.75			
5-31	0	.0413	:55	.24	.77			
6-1	0	.0383	7:00	0	.77			
6-2	0	.0033 2/	:10	.12	.79			
			:30	.06	.81			
			:50	.03	.82			
			8:00	.06	.83			
			:30	0	.83			
			:40	.24	.87			
				<u>Total Rainfall</u>				
				R-22	.95			
				Thiessen weighted average (2 raingages)	.91			
<p>Watershed Conditions: Pastured land had heavy growth, 30%; very good hay with average height 8 inches, 37%; forest land 25%.</p>								

Notes: To convert runoff in in/hr to cfs, multiply by 147.22. 1/Return to normal base flow. 2/ Runoff prior to 2:00n.





NORTH DANVILLE, VERMONT WATERSHED W-2



## NORTH DANVILLE, VERMONT Watershed W-3

LOCATION: Caledonia Co., Vt.; 7.5 mi. NW of St. Johnsbury; Pope Brook, Sleepers River, Connecticut River Basin.

AREA: 2067 ac. (3.23 sq. mi.)

SHAPE: Roughly oval, 1.8 mi. wide, 2.7 mi. long.

SLOPES:	Percent Slope	0-3%	3-8%	8-15%	15-25%	25-35%	Over 35%
	Percent of Area	1	27	38	22	12	0

SOILS: Medium acid to neutral glacial till derived from schist interbedded with limestone.

Type	% of Area	Topsoil			Subsoil		Substratum		Internal Drainage
		Av. depth	Structure	Permeability	Structure	Permeability	Depth to	Permeability	
Glover rocky loam	32	7"	weak fine granular	rapid	weak fine subangular blocky	moderate	24"	(rock) zero	medium
Calais loam	21	8"	moderate medium granular	rapid	weak medium subangular blocky	moderate	27"	moderate	medium
Cabot silt loam	20	9"	moderate medium blocky	moderate	moderate medium blocky	moderate	18"	slow	medium
Royalton loam	19	8"	moderate medium granular	moderately rapid	weak medium subangular blocky	moderate	27"	slow	medium
Woodstock rocky fine sandy loam	3	6"	weak granular	rapid	weak granular	rapid	24"	(rock) zero	rapid
Worthington loam	2	9"	weak fine granular	rapid	weak fine granular	moderately rapid	27"	rapid	rapid
Peacham silt loam	2	10"	moderate fine subangular blocky	moderate	structure-less massive	slow	12"	slow	very slow
Colrain fine sandy loam	1	6"	weak granular	rapid	weak granular	rapid	33"	rapid	rapid

EROSION: Class 1 - 100%

LAND CAPABILITY:	Class	I	II	III	IV	V	VI	VII
	Percent of Area	0	8	30	16	16	12	18

**GEOLOGY:** Very slightly anticlinal with no faults. Eastern portion (95% of watershed) is Waits River Formation made up of Calcareous granulate, calcareous schists, and cal-silicate rocks interbedded with quartz-mica schists and micaceous quartzite. This formation is approximately 10,000 feet thick. The western portion (5% of watershed) is Gile Mountain Formation of dark and light gray schists 3000-6500 feet thick. Both formations are dense and impervious with no solution chambers. Both formations are Silurian and/or Devonian. Strike is generally northwest-southeast with dip toward the northeast in the eastern part of the watershed. Strike becomes east-west in the central part of the watershed with dip to the north. The western portion has a north-south strike with dip to the west. Dip ranges from 15° to 45° with an average of about 35°. Overlying these geologic formations is a dense, impervious glacial till (boulder clay) that is from 0-90 feet deep. Source of data: The Geology of the Lyndonville Area, Vermont and The Geology of the St. Johnsbury Quadrangle, Vermont and New Hampshire, Bulletin Nos. 8 and 13, Vermont Geological Survey, Vermont Development Commission, Montpelier, Vermont. See geologic map and sections on page 67.5-6.

**SURFACE DRAINAGE:** Main stream has slope of 1% for 200 ft. then divides into two streams; one with average slope of 4.6% for 2.3 miles then 9.1% for 1300 ft.; the other stream is 2.2 miles long with average slope of 5.6%.

**CHARACTER OF FLOW:** Perennial, continuous.

**INSTRUMENTATION:** Runoff - artificial control, 16 in. broad crested concrete weir with 5:1 crest slope to a height of 6.5 ft., continuous waterstage recorder with chart speed of 9.6 in/day and gage scale of 1:6, field rating established by current meter measurements; precipitation - 6 locations each having a recording raingage with a 24 hr. chart; 5 snow courses taken weekly during snow season.

**WATERSHED CONDITIONS:** Very little change in land use conditions in the last 20 years. Forest 67%, predominately hardwoods, beech, birch and maple with scattered spruce, fir and pine softwoods; pasture 19%, bluegrass and other mixed small grasses; cultivated 11%, mostly orchard grass and clover hay, small portion is planted to corn each year and reseeded to hay in fall; idle land 3%, abandoned fields in dense grass and brush.

**GENERALLY REPRESENTS:** Sloping to steep cultivated and forested land at higher elevations in the New England and Eastern New York Upland resource area (R-114) with rapid to slowly permeable soils, rapid to moderate internal drainage, excellent surface drainage, and little or no erosion problems.

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MONTHLY PRECIPITATION AND RUNOFF (Inches)								North Danville, Vermont Watershed W-3						
Year	Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1960	P	3.02	3.66	1.88	5.31	3.80	3.55	3.71	1.47	4.56	4.37	2.89	1.93	40.15
	Q	1.80	1.74	1.19	8.85	2.91	1.16	.57	.34	.54	1.01	1.27	.94	22.32
1961	P	.92	2.74	2.04	4.20	2.65	5.79	3.68	3.01	1.46	1.72	3.24	2.92	34.37
	Q	.67	1.01	1.50	5.63	3.75	2.85	1.48	.67	.45	.34	.64	.72	19.71
Normal	P <u>2/</u>	2.32	2.14	2.47	2.64	2.96	3.53	3.64	3.57	3.52	2.93	2.96	2.48	35.16

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								North Danville, Vermont Watershed W-3								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	4-18	.06	4-18	.05	4-18	.09	4-18	.28	4-18	.56	4-18	.86	4-17	1.40	4-14	3.79
1961	4-26	.035	4-26	.035	4-26	.07	4-26	.18	4-26	.32	4-26	.52	4-23	.84	4-21	2.86

Notes: Quality of records: Monthly P and Q, excellent. 1/ Monthly P values are Thiessen weighted averages of 3 to 6 gages. 2/ Normal P based on 67-year (1895-1961) U. S. Weather Bureau record period at St. Johnsbury, Vt.

SELECTED RUNOFF EVENTS						North Danville, Vermont Watershed W-3			
Antecedent conditions			Rainfall			Runoff			
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)	
<u>Event of July 30 - August 2, 1960</u>									
6-30-60	Raingage R-16	.0206	7-30-60	Raingage R-16		7-30-60			
7-1	0	.0212	11:35a	0	0	1:00p	.0004	0	
7-2	0	.0177	12:05p	.04	.02	4:00	.0005	.0013	
7-3	.25	.0157	:55	.11	.11	5:30	.0006	.0021	
7-4	0	.0190	1:15	.18	.17	6:15	.0007	.0025	
7-5	.15	.0187	:40	0	.17	7:45	.0009	.0038	
7-6	0	.0196	:55	.08	.19	9:30	.0012	.0057	
7-7	0	.0177	2:15	.06	.21	:40	.0024	.0060	
7-8	.25	.0155	:30	.04	.22	:45	.0048	.0063	
7-9	0	.0155	:50	.27	.31	:55	.0152	.0079	
7-10	0	.0140	3:00	.66	.42	10:00	.0161	.0092	
7-11	0	.0123	:20	.27	.51	:25	.0177	.0163	
7-12	0	.0113	:25	.12	.52	11:05	.0161	.0275	
7-13	.06	.0098	:35	.48	.60	12:00m	.0124	.0405	
7-14	0	.0106	:50	.04	.61	7-31-60			
7-15	0	.0105	4:00	0	.61	12:30a	.0118	.0466	
7-16	0	.0097	:10	.48	.67	2:00	.0113	.0640	
7-17	0	.0091	:30	.09	.70	3:30	.0106	.0804	
7-18	0	.0091	:40	.42	.77	6:30	.0074	.1074	
7-19	.30	.0122	:50	.60	.87	7:30	.0065	.1143	
7-20	.10	.0234	5:10	.18	.93	10:00	.0048	.1284	
7-21	0	.0186	:30	.12	.97	1:00p	.0035	.1409	
7-22	0	.0151	:40	.30	1.02	3:00	.0029	.1472	
7-23	0	.0131	6:00	.15	1.07	5:15	.0024	.1533	
7-24	0	.0113	:20	.09	1.10	10:00	.0020	.1637	
7-25	0	.0098	:55	.03	1.12	12:00m	.0018	.1674	
7-26	0	.0086	7:00	.24	1.14	8-1-60			
7-27	.29	.0084	:20	.09	1.17	7:00a	.0016	.1792	
7-28	0	.0115	:25	.48	1.21	12:00m	.0015	.1868	
7-29	0	.0107	:50	.02	1.22	12:00m	.0012	.2032	
7-30	0	.0049 <u>3/</u>	8:15	.12	1.27	8-2-60			
			:40	.29	1.39	12:00n	.0006 <u>4/</u>	.2141	
			9:20	.42	1.67	6:00p	.0005 <u>4/</u>	.2174	
			:50	.10	1.72				
			10:30	.02	1.73				

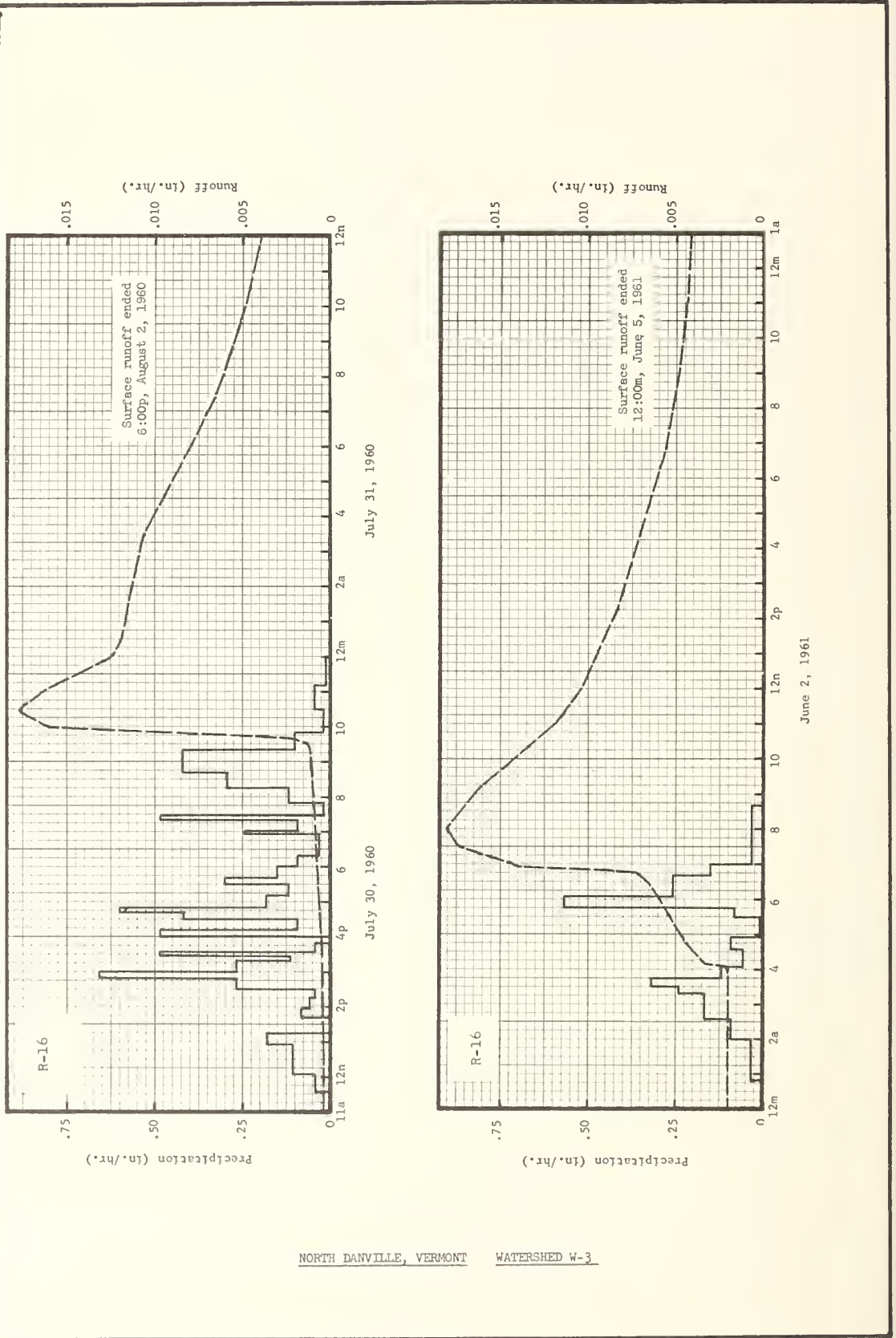
Watershed Conditions: 67% forest land; 19% pasture; 1% hay about 6 in. growth since first cutting; 3% idle land in dense grass and brush.

Notes: To convert runoff in in/hr to cfs, multiply by 2084.4. 3/ Runoff prior to 1:00p. 4/ Return to normal base flow.

12-63

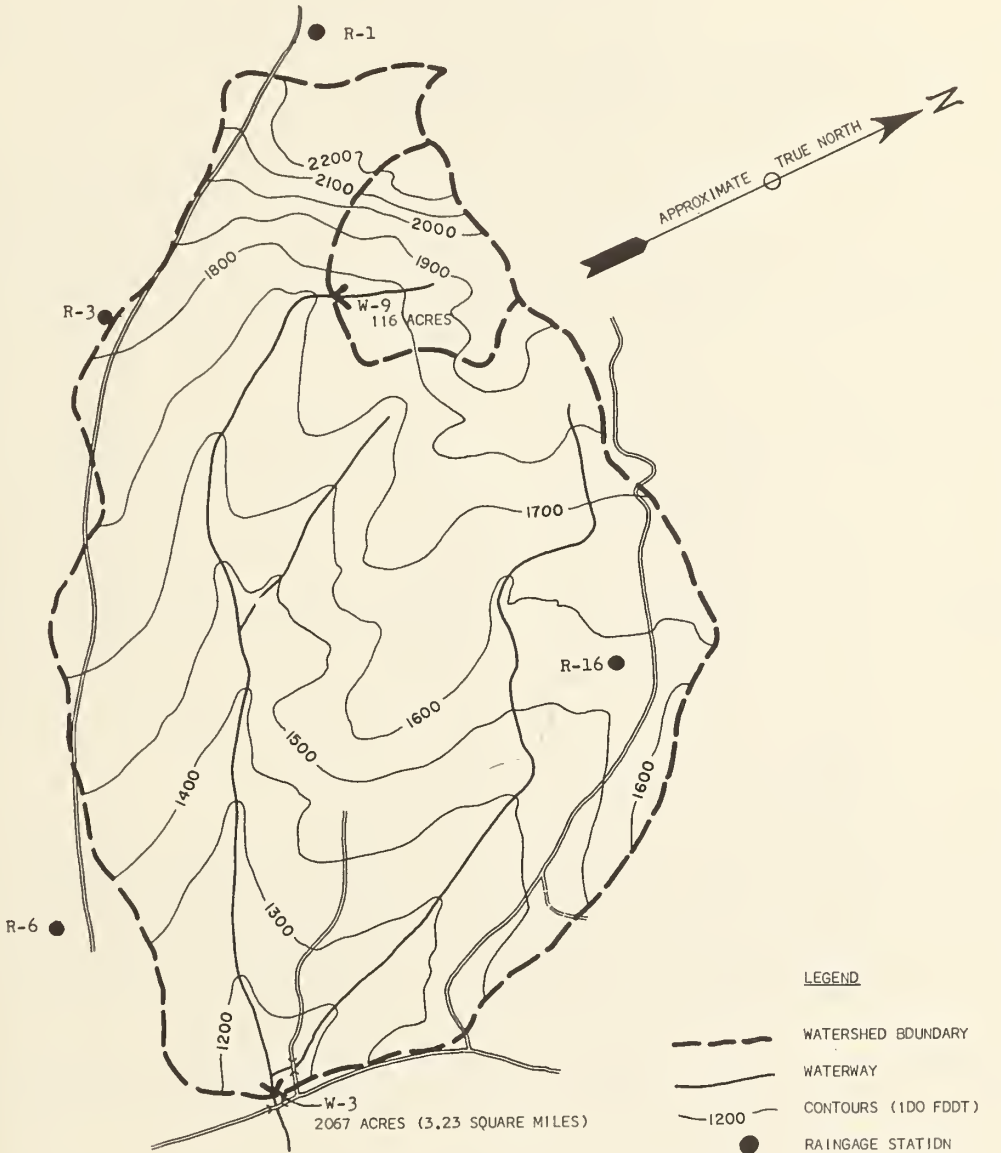
SELECTED RUNOFF EVENTS			North Danville, Vermont Watershed W-3					
Antecedent conditions			Rainfall			Runoff		
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)
Event of July 30-August 2, 1960 (continued)								
			7-30-60					
			11:10	.04	1.76			
			12:00m	.01	1.77			
			<u>Total Rainfall</u>					
				R-1	1.95			
				R-12	1.73			
			Thiessen weighted average (3 raingages)			1.81		
Event of June 2-5, 1961								
	Raingage R-16		6-2-61	Raingage R-16		6-2-61		
5-3-61	.15	.2546	12:50a	0	0	4:05a	.0020	0
5-4	0	.2074	2:00	.03	.03	:10	.0034	.0002
5-5	0	.1735	:35	.09	.08	:15	.0035	.0005
5-6	0	.1549	3:20	.17	.21	:45	.0044	.0025
5-7	.05	.1567						
5-8	0	.1486	:30	.24	.25	6:00	.0059	.0090
5-9	.54	.1492	:45	.32	.33	:25	.0065	.0115
5-10	.13	.2826	:55	.12	.35	:45	.0072	.0138
5-11	0	.1471	4:05	.12	.37	:50	.0094	.0145
5-12	0	.1211	:35	.06	.40	:55	.0140	.0155
5-13	0	.1127	:55	.09	.43	7:00	.0143	.0167
5-14	0	.1308	5:30	.01	.44	:30	.0174	.0246
5-15	0	.0883	:45	.08	.46	8:00	.0180	.0334
5-16	.25	.0956	6:05	.57	.65	:15	.0177	.0379
5-17	0	.0907	:40	.26	.80	9:10	.0161	.0533
5-18	0	.0767	7:00	.15	.85	11:00	.0118	.0789
5-19	0	.0700	8:40	.03	.90	12:00n	.0104	.0900
5-20	0	.0647				2:15p	.0084	.1111
5-21	.17	.0665				6:45	.0056	.1426
5-22	0	.0750				9:00	.0048	.1543
			<u>Total Rainfall</u>					
5-23	.05	.0625		R-1	.87	11:00	.0044	.1636
5-24	.06	.0534		R-3	.90	12:00m	.0043	.1679
5-25	0	.0551		R-6	.95	6-3-61		
5-26	.40	.0603		R-20	.91	9:00a	.0035	.2028
5-27	.20	.0981		R-20A	.96	3:00p	.0029	.2201
			Thiessen weighted average (6 raingages)			.91		
5-28	.04	.0700				9:00	.0026	.2386
5-29	.17	.0673				12:00m	.0026	.2464
5-30	0	.0666				6-4-61		
5-31	0	.0550				12:00n	.0024	.2765
6-1	0	.0491				7:00p	.0021	.2924
6-2	0	.0080 <u>1/</u>				12:00m	.0021	.3031
Watershed Conditions: 67% forest land; 17% pasture; 11% hay about 8 in. high; 3% idle land in dense grass and brush.						6-5-61		
						12:00n	.0021	.3286
						3:00p	.0020	.3348
						12:00m	.0018 <u>2/</u>	.3516

Notes: To convert runoff in in/hr to cfs, multiply by 2084.4. 1/ Runoff prior to 4:05a. 2/ Return to normal base flow.


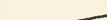
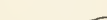


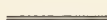


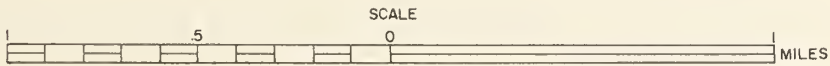
NORTH DANVILLE, VERMONT WATERSHED W-3





LEGEND

-  WATERSHED BOUNDARY
-  WATERWAY
-  CONTOURS (100 FDDT)
-  RAINGAGE STATION
-  STREAM GAGING STATION
-  HIGHWAYS AND ROADS



SLEEPERS RIVER EXPERIMENTAL WATERSHED  
 NDRTH DANVILLE, VERMONT  
 TOPOGRAPHY OF  
 WATERSHEDS W-3 AND W-9

12-63

## NORTH DANVILLE, VERMONT Watershed W-5

**LOCATION:** Caledonia Co., Vt.; 2 mi. NW of St. Johnsbury; Sleepers River, Connecticut River Basin.

**AREA:** 27,469 ac. (42.72 sq. mi.)

**SHAPE:** Roughly diamond, 8.1 mi. wide by 8.7 mi. long.

SLOPES:	Percent Slope	0-3%	3-8%	8-15%	15-25%	25-35%	Over 35%
	Percent of Area	3	30	31	23	12	1

**SCILLS:** Medium acid to neutral glacial till derived from schist interbedded with limestone.

Type	% of Area	Topsoil			Subsoil		Substratum		Internal Drainage
		Av. depth	Structure	Permeability	Structure	Permeability	Depth to	Permeability	
Cabot silt loam	26	9"	moderate medium blocky	moderate	moderate medium blocky	moderate	18"	slow	medium
Koyalton loam	17	8"	moderate medium granular	moderately rapid	weak medium subangular blocky	moderate	27"	slow	medium
Woodstock rocky fine sandy loam	16	6"	weak granular	rapid	weak granular	rapid	24"	(rock) zero	rapid
Glover rocky loam	12	7"	weak fine granular	rapid	weak fine subangular blocky	moderate	24"	(rock) zero	medium
Calais loam	12	8"	moderate medium granular	rapid	weak medium subangular blocky	moderate	27"	moderate	medium
Colrain fine sandy loam	10	6"	weak granular	rapid	weak granular	rapid	33"	rapid	rapid
Peacham silt loam	3	10"	moderate fine subangular blocky	moderate	structure-less massive	slow	12"	slow	very slow
Other	4	less than 1% in any other soil type							

**EROSION:** Class 1 - 100%.

LAND CAPABILITY:	Class	I	II	III	IV	V	VI	VII
	Percent of Area	0	15	35	12	11	14	13

**GEOLOGY:** Very slightly anticlinal with no faults. Eastern portion (94% of watershed) is Waits River Formation made up of calcareous granulate, calcareous schists, and cal-silicate rocks interbedded with quartz-mica schists and micaceous quartzite. This formation is approximately 10,000 feet thick. The western portion (6% of watershed) is Gile Mountain Formation of dark and light gray schists 3000-6500 feet thick. Both formations are dense and impervious with no solution chambers. Both formations are Silurian and/or Devonian. Strike is generally north-south with dip toward the east in the eastern part of the watershed. Strike becomes east-west in the central part of the watershed with dip to the north. The western portion has a north-south strike with dip to the west. Dip ranges from 9° to 45° with an average of about 30°. Overlying these geologic formations is a dense, impervious glacial till (boulder clay) that is from 0-90 feet deep. Source of data: The Geology of the Lyndonville Area, Vermont and The Geology of the St. Johnsbury Quadrangle, Vermont and New Hampshire, Bulletin Nos. 8 and 13, Vermont Geological Survey, Vermont Development Commission, Montpelier, Vermont. See geologic map and sections on page 67.5-6.

**SURFACE DRAINAGE:** Well defined - principal waterway 2.08 miles long with average grade of .4%; then splits into two waterways, one 7.46 miles long with average grade of 4.6%, the other runs 1.58 miles at an average grade of 2.4% and divides again with one stream 4.82 miles long at a grade of 5.1% and the other 4.66 miles long with a 4.9% grade.

**CHARACTER OF FLOW:** Perennial, continuous.

**INSTRUMENTATION:** Runoff - natural control, bedrock crossing stream perpendicular to flow, continuous waterstage recorder with chart speed of 9.6 in/day and gage scale of 1:6; field rating established by current meter measurements; precipitation - 27 locations with 28 recording raingages, 23 with 24 hr. charts, 3 with 96 hr. charts, and 1 tipping bucket gage, 17 snow courses taken weekly during snow season.

**WATERSHED CONDITIONS:** Land use has remained a proximately the same for a period of 20 years, general trend is toward more forested land. Forest 67%, predominately hardwood, birch, beech, and maple with mixed softwoods, fir, spruce, and some sizeable white pine plantations; 17% cultivated land, orchard grass and clover hay, with small amount in row crops; pasture 13%, bluegrass and other mixed small grasses; idle land 2%, abandoned farms in dense grass and brush; homesites and roads 1%.

**GENERALLY REPRESENTS:** Sloping to steep cultivated and forested land at higher elevations in the New England and Eastern New York Upland resource area (R-14d) with rapid to slowly permeable soils, rapid to moderate internal drainage, excellent surface drainage, and little or no erosion problems.

MONTHLY PRECIPITATION AND RUNOFF (Inches)								North Danville, Vermont Watershed W-5						
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
1960 P	2.40	2.95	1.66	3.47	3.24	3.44	3.40	1.68	4.09	4.03	2.72	1.72	34.80	
Q	2.79	3.05	3.12	8.46	2.59	.90	.40	.26	.47	1.05	1.18	1.22	25.49	
1961 P	.87	2.56	2.01	4.10	2.76	5.06	4.04	3.18	1.50	1.62	2.87	2.67	33.24	
Q	.65	1.41	1.89	5.23	3.15	2.28	1.11	.46	.31	.22	.54	.70	17.95	
Normal P 2/	2.32	2.14	2.47	2.64	2.95	3.53	3.64	3.57	3.52	2.93	2.96	2.48	35.16	

ANNUAL MAXIMUM DISCHARGES IN INCHES PER HOUR AND ANNUAL MAXIMUM VOLUMES OF RUNOFF IN INCHES FOR SELECTED TIME INTERVALS								North Danville, Vermont Watershed W-5								
YEAR	MAXIMUM DISCHARGE		MAXIMUM VOLUME FOR SELECTED TIME INTERVAL													
			1 hour		2 hours		6 hours		12 hours		1 day		2 days		8 days	
	Date	Rate	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.	Date	Vol.
1960	4-18	.04	4-18	.04	4-18	.08	4-18	.20	4-18	.35	4-18	.57	4-17	1.04	4-12	3.14
1961	4-23	.03	4-23	.03	4-23	.05	4-23	.15	4-23	.27	4-23	.47	4-23	.74	4-21	2.32

Notes: Quality of records: P and Q excellent, May-November; good, December-April. 1/ Monthly P is Thiessen weighted, using 14 raingages. 2/ Normal P based on 67-year (1895-1961) U. S. Weather Bureau record period at St. Johnsbury, Vt.

SELECTED RUNOFF EVENTS								North Danville, Vermont Watershed W-5						
Antecedent conditions			Rainfall			Runoff								
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)						
Event of July 30-August 5, 1960														
6-30-60	Raingage R-22A .12	.0153	7-30-60	Raingage R-22A		7-30-60								
7-1	0	.0146	12:00n	0	0	12:45p	.0002	0						
7-2	0	.0114	4:0p	.12	.08	4:15	.0003	.0008						
7-3	.45	.0133	1:00	.18	.14	5:15	.0004	.0011						
7-4	0	.0218	2:00	.06	.20	6:20	.0005	.0016						
7-5	.19	.0143	:35	.14	.28	7:15	.0007	.0022						
7-6	0	.0146	3:10	.34	.48	8:50	.0022	.0044						
7-7	0	.0118	:40	.24	.60	9:45	.0037	.0071						
7-8	.09	.0104	:50	0	.60	10:15	.0047	.0093						
7-9	.02	.0112	4:10	.24	.68	11:00	.0074	.0138						
7-10	0	.0094	:30	0	.68	:45	.0102	.0204						
7-11	0	.0081	:40	.90	.83	12:00m	.0109	.0230						
7-12	.04	.0073	5:00	.30	.93	7-31-60								
7-13	.07	.0073	:15	0	.93	12:30a	.0127	.0239						
7-14	0	.0077	:20	.60	.98	:50	.0131	.0332						
7-15	0	.0069	:40	.21	1.05	1:30	.0127	.0418						
7-16	0	.0059	6:10	.06	1.08	3:45	.0090	.0663						
7-17	0	.0056	:55	0	1.08	5:15	.0067	.0782						
7-18	0	.0058	7:20	.12	1.13	6:45	.0055	.0876						
7-19	.25	.0077	8:00	0	1.13	8:30	.0044	.0962						
7-20	.07	.0157	9:00	.30	1.43	10:15	.0037	.1033						
7-21	0	.0102	:40	.38	1.68	1:30p	.0028	.1138						
7-22	0	.0076	10:00	.12	1.72	4:30	.0022	.1212						
7-23	0	.0069	11:00	.01	1.73	10:30	.0013	.1283						
7-24	0	.0059				12:00m	.0009	.1322						
7-25	0	.0049		Total Rainfall										
7-26	0	.0043		R-1	1.95	8-1-60								
7-27	.32	.0044		R-2	1.81	2:30a	.0009	.1345						
7-28	0	.0076		R-7	1.79	9:00	.0007	.1396						
7-29	0	.0061		R-10	1.63	3:00p	.0006	.1436						
						12:00m	.0005	.1487						
7-30	0	.0027 3/		R-11	1.47	8-2-60								
				R-12	1.73	6:00a	.0005	.1516						
				R-15	1.86	2:00p	.0004	.1552						
				R-16	1.77	12:00m	.0004	.1594						
				R-17	1.70									

Watershed Conditions: 67% forest land; 13% pasture; 17% hay with 6 in. growth since last cutting; 2% idle land in dense grass and brush; 1% homesites and roads.

Continued on next page

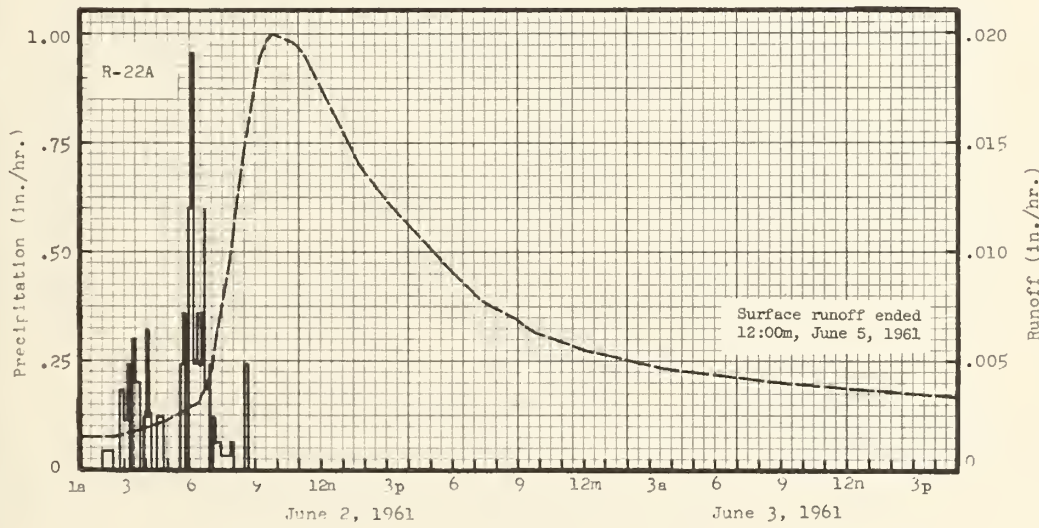
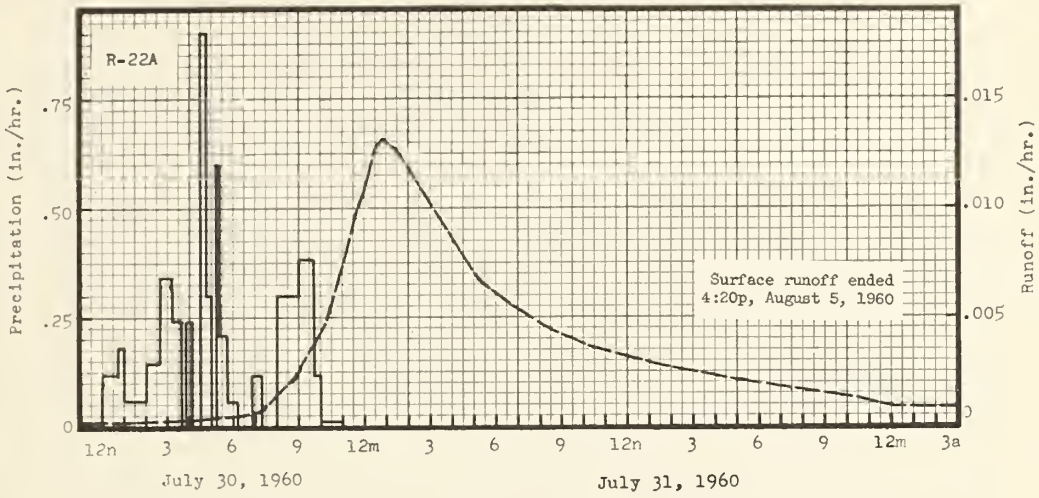
Notes: To convert runoff in in/hr to cfs, multiply by 27,097.6. 3/ Runoff prior to 12:45p.

SELECTED RUNOFF EVENTS			North Danville, Vermont Watershed W-5								
Antecedent conditions			Rainfall			Runoff					
Date	Rainfall (inches)	Runoff (inches)	Date and time	Intensity (in/hr)	Acc. (inches)	Date and time	Rate (in/hr)	Acc. (inches)			
Event of July 30-August 5, 1960 (continued)											
			Total rainfall			8-3-60					
				R-18	1.72	12:00m	.0004	.1683			
				R-19	1.95	8-4-60					
				R-23	1.48	12:00m	.0003	.1759			
				R-24	1.60	8-5-60					
				Thiessen weighted average (14 gages) 1.73		4:20p	.0003 1/	.1803			
Event of June 2-5, 1961											
Raingage R-22A			Raingage R-22A								
5-3-61	.19	.2156	6-2-61			6-2-61					
5-4	0	.1622	2:00a	0	0	2:30a	.0015	0			
5-5	0	.1321	:30	.04	.02	3:50	.0018	.0022			
5-6	0	.1151	:40	0	.02	4:50	.0022	.0041			
5-7	.13	.1196	3:00	.18	.08	6:05	.0028	.0073			
5-8	0	.1156	:10	.12	.10	:20	.0031	.0080			
5-9	.49	.1117	:15	.24	.12	:30	.0034	.0085			
5-10	.19	.2644	:20	0	.12	:45	.0037	.0094			
5-11	0	.1234	:30	.30	.17	:50	.0040	.0097			
5-12	0	.0982	:45	.20	.22	7:00	.0047	.0105			
5-13	0	.0897	:50	0	.22	:15	.0064	.0118			
5-14	0	.0821	4:00	.12	.24	:45	.0091	.0157			
5-15	0	.0725	:05	.32	.27	8:00	.0109	.0182			
5-16	.47	.0885	:10	.12	.28	:15	.0127	.0212			
5-17	0	.0842	:30	0	.28	:30	.0147	.0246			
5-18	0	.0653	:50	.12	.32	9:00	.0179	.0328			
5-19	0	.0587	5:35	0	.32	:15	.0190	.0374			
5-20	0	.0539	:40	.24	.34	:30	.0197	.0422			
5-21	.10	.0549	:45	.36	.37	:45	.0200	.0472			
5-22	0	.0646	:55	0	.37	10:30	.0197	.0621			
5-23	0	.0547	6:05	.60	.47	:45	.0176	.0671			
5-24	0	.0507	:10	.96	.55	11:15	.0190	.0767			
5-25	0	.0436	:15	.24	.57	1:45p	.0140	.1160			
5-26	.49	.0633	:20	.36	.60	3:15	.0121	.1376			
5-27	.25	.1136	:30	.24	.64	5:30	.0096	.1621			
5-28	0	.0732	:35	.36	.67	7:15	.0079	.1774			
5-29	.10	.0653	:40	.60	.72	9:00	.0069	.1903			
5-30	0	.0605	:50	.18	.75	:45	.0064	.1953			
5-31	0	.0465	:55	.24	.77	10:45	.0060	.2015			
6-1	0	.0377	7:00	0	.77	12:00m	.0055	.2087			
6-2	0	.0037 2/	:10	.12	.79	6-3-61					
Watershed Conditions; 67% forest land; 13% pasture; 16% hay with 8 in. growth; 1% plowed and seeded to corn and new grass; 2% idle land in dense grass and brush; 1% homesites and roads.			:30	.06	.81	1:15a	.0051	.2180			
			:50	.03	.82	3:30	.0047	.2266			
			8:00	.06	.83	6:00	.0044	.2380			
			:30	0	.83	9:00	.0040	.2506			
			:40	.24	.97	4:30p	.0034	.2783			
						Total Rainfall			12:00m	.0028	.3013
							R-1	.87	6-4-61		
							R-2	.97	3:00a	.0027	.3094
									2:00p	.0025	.3376
							R-7	.90	9:00	.0022	.3540
				R-10	.84	12:00m	.0021	.3604			
				R-11	.99	6-5-61					
				R-12	.90	1:00p	.0021	.3871			
				R-15	.94	7:00	.0018	.3986			
				R-16	.90	12:00m	.0016 1/	.4069			
				R-17	.83						
				R-18	1.00						
				R-19	.95						
				R-23	1.09						
				R-24	.90						
				Thiessen weighted average (14 gages)							
					.92						

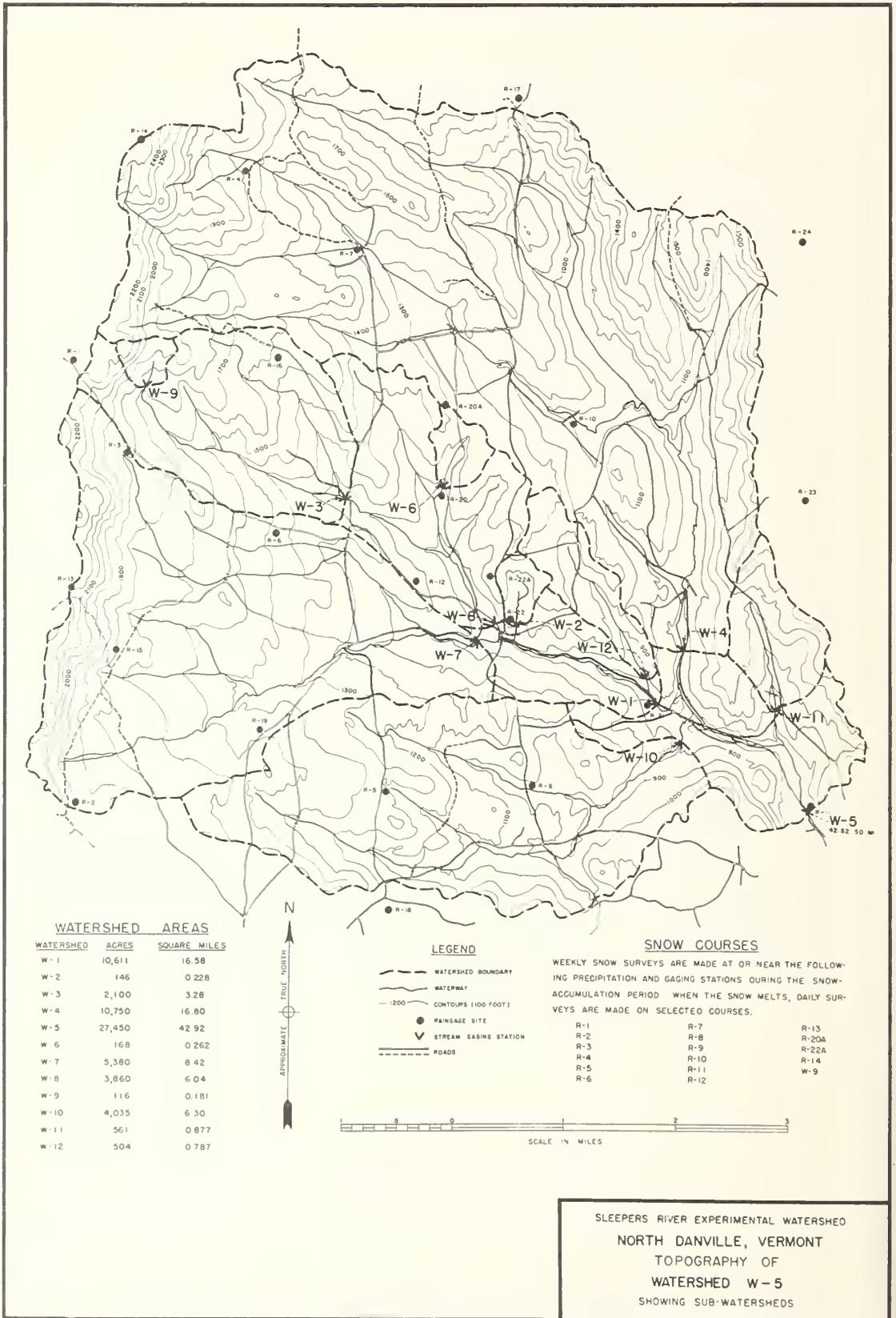
Notes: To convert runoff in in/hr to cfs, multiply by 27,697.6. 1/ Beginning of next event. 2/ Runoff prior to 2:30a.



12-63



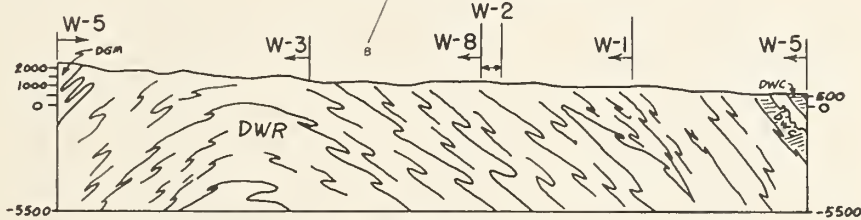
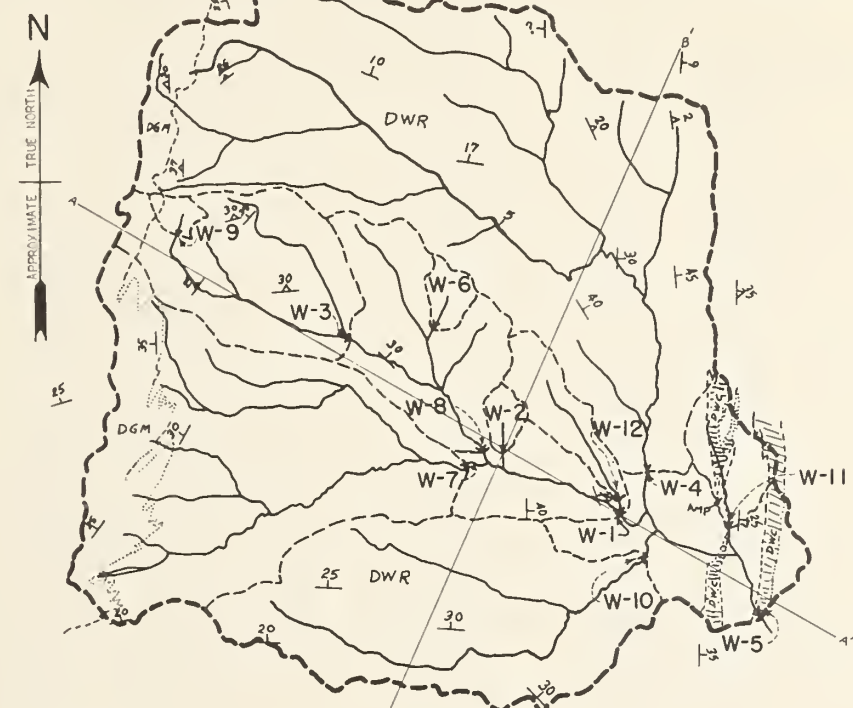
NORTH DANVILLE, VERMONT    WATERSHED W-5



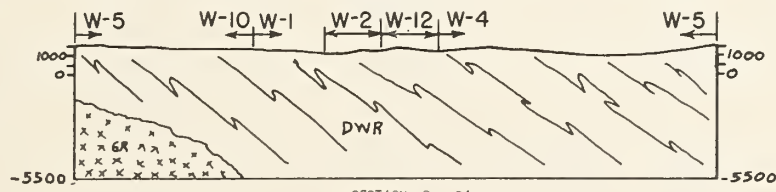
SCALE IN MILES

REFERENCES

VERMONT GEOLOGICAL SURVEY  
BULLETINS NO. 8 & 13  
1956 and 1959



SECTION A - A'



SECTION B - B'

LEGEND

- DWR - WAITS RIVER FORMATION - QUARTZ MICA SCHIST AND MINOR MICACEOUS QUARTZITE.
- DWC - WAITS RIVER FORMATION - QUARTZ MICA SCHIST, GRAY QUARTZITE AND QUARTZ FELDSPAR GRANULITE
- AMP - WAITS RIVER FORMATION - AMPHIBOLITES OF HORN-  
BLENDE, PLAGIOCLASE AND MINOR AMOUNTS OF  
GARNET.
- DGM - GILE MOUNTAIN FORMATION - DARK AND LIGHT  
GRAY SCHISTS.
- GR - GRANITE

LEGEND

- $\frac{30}{|}$  STRIKE AND DIP OF BEDDING
- $\frac{20}{|}$  STRIKE AND DIP OF SCHISTOSITY
- CONTACT BOUNDARY (APPROXIMATE)
- CONTACT BOUNDARY (ACCURATE)
- WATERSHED BOUNDARY
- SUB-WATERSHED BOUNDARIES

NORTH OANVILLE, VERMONT  
SLEEPERS RIVER WATERSHED W-5  
GEOLOGIC MAP AND SECTIONS

TABLE 4.— Index to selected runoff events, by States, published by Agricultural Research Service through 1961

Location, location No., watershed No.	Area acres, (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/	Location, location No., watershed No.	Area acres, (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/
ARIZONA						COLORADO					
Safford						Colorado Springs					
45.1	519	7-19-57	0.1560	1-39	4	46.4	35.6	8-10-38	2.33	4-38	3
W-I		7-26-57	.3266		4	W-IV		8-2-39	1.49		3
		8-3,4-59	.2426		4			8-13-45	1.64	(End)	3
		7-28,29-61	.4813		5			7-15-46	.829	11-46)	3
		8-7,8-61	.6284		5						
45.2	682	7-26-40	1.01	1-39	3	FLORIDA					
W-II	(1.07)	9-28-41	1.45		3	Vero Beach					
		8-7-42	.848		3	8.1	49,915	10-1-6-51	0.0419	4-51	3
		8-9-43	1.00		3	W-1	(78.0)	10-17-22-53	.0306		3
		8-20-56	.4118		4			6-15-22-54	.0399		3
		7-16-59	1.2035		4			10-15-22-56	.0797		3
		8-22-61	.4452		5			3-16-23-59	.0349		4
45.3	764	7-28-58	.1716	1-39	4			6-17-23-59	.0781		4
W-IV	(1.19)	8-16-58	.6565		4			3-15-25-60	.0748		5
								9-21-10-2-60	.1033		5
45.4	723	8-28-57	.3603	1-39	4	8.2	63,100	3-16-28-59	.0221	7-55	4
W-V	(1.13)	8-30-57	.3603		4	W-2	(98.6)	6-17-25-59	.0700		4
		8-20-60	.4096		5			3-15-4-1-60	.0303		5
		7-13-61	.1713		5			9-15-10-4-60	.0374		5
		8-15-61	.2904		5						
		9-13-61	.1548		5	8.3	10,000	3-16-24-59	.0441	7-55	4
Tombstone						W-3	(15.6)	6-17-24-59	.0941		4
63.1	36,900	8-17,18-57	.5380	1-54	4			3-15-31-60	.0911		5
W-1	(57.7)	8-16,17-58	.1641		4			9-15-10-1-60	.0462		5
		7-26,27-59	.1332		4	GEORGIA					
63.2	28,100	10-4,5-54	.0918	1-54	4	Americus					
W-2	(43.9)	7-19,20-55	.1853		4	9.4	59.2	12-26-41	0.470	8-38	3
		7-20,21-59	.0376		4	W-IV		3-21-42	.346		3
		7-21,22-59	.0516		4			8-19-42	.168	(End)	3
		7-26,27-59	.1298		4			1-17-43	.155	4-43)	3
		8-17,18-61	.07095		5	Watkinsville					
63.3	2220	7-19,20-55	1.2637	5-54	4	10.1	19.2	7-11-41	1.96	9-39	4
W-3	(3.47)	8-14-58	.3174		4	W-1		5-15-42	1.26		4
		8-16,17-58	.5588		4			11-26-30-48	.4013		4
		8-17,18-61	.3107		5			4-22,23-51	.0738		4
63.4	560	8-14,15-54	.8443	6-54	4			8-13-58	1.3377		5
W-4		7-19,20-55	2.4795		4			3-5,6-59	.0914		5
		7-22,23-55	.9523		4			1-29-60	.0197		5
		8-14-58	.2301		4			1-30,31-60	.0405		5
		8-16-58	.3151		4			8-1-61	1.8336		5
		8-17,18-61	.6284		5	IDAHO					
63.5	5510	10-4,5-54	.9540	1-54	4	Emmett					
W-5	(8.61)	8-17,18-57	.5652		4	55.2	69.4	5-12-40	0.006	9-38	3
						W-2		5-14-41	.004		3
								6-18-41	.008	(End)	3
								6-19-41	.011	12-43)	3
						Moscow					
						56.1	146.8	10-29-40	.0026	11-37	3
						W-1		4-9-41	.0049	(End)	3
								4-25-41	.0009	12-42)	3
						56.2	177.9	3-26-40	.0076	11-37	3
						W-2		4-9-40	.0392	(End)	3
								5-4-40	.0018	12-42)	3
ARKANSAS						ILLINOIS					
Bentonville						Edwardsville					
33.5	19.4	5-25-39	0.8738	10-38	3	17.1	27.22	5-27,28-38	2.41	3-38	3
W-5		8-31-40	.3388		3	W-1		6-21-42	.397		3
		4-27-42	.6592	(End)	3			3-31,4-1-52	2.12	(End)	3
		6-9-42	.9964	9-47)	3			7-2-52	1.87	12-55)	3
CALIFORNIA											
Placerville						17.4	289.8	5-27,28-38	1.06	3-38	3
50.1	41.0	4-1-37	0.0585	1-36	3	W-4		6-21-42	.980		3
W-1		12-24-42	.2303	(End)	3			3-31,4-1-52	1.77	(End)	3
		12-28-42	.0777	3-44)	3			7-2,3-52	1.86	12-55)	3
Sebastopol											
52.1	83.0	4-3-41	.1475	10-36	3						
W-1		2-2-42	.2240	(End)	3						
		4-17-42	.1287	7-43)	3						
Watsonville											
54.3	27.4	1-5-41	.098	10-38	3						
W-3		2-16-41	.024		3						
		4-1-41	.147	(End)	3						
		2-6-42	.180	3-42)	3						

1/ For References 3 and 4, see page 1. Reference 5 is the present volume.



TABLE 4.—Index to selected runoff events, by States, published by Agricultural Research Service through 1961—Continued

Location, location No., watershed No.	Area acres, (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/	Location, location No., watershed No.	Area acres, (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/
ILLINOIS—Continued						MARYLAND—Continued					
Monticello						College Park					
61.1	82.0	10-21-49	0.237	7-49	3	5.9	12.05	5-12-15-43	0.012	9-40	3
IA		6-27,28-51	.496		4	W-9		11-8-10-43	.078		3
		7-9-51	.700		3			7-26-31-45	.073	(End	3
		10-6,7-55	.340		4			11-25,26-50	.123	12-54)	3
61.2	45.5	10-21-49	.286	9-49	3	Hagerstown					
IB		6-27,28-51	.229		4	6.2	80.8	6-22,23-39	1.01	10-38	3
		7-9-51	.279		3	W-II		7-20-22-42	.267		3
		10-6,7-55	.327		4			11-8,9-43	.124	(End	3
								6-1-3-46	.180	11-47)	3
INDIANA						MICHIGAN					
Lafayette						East Lansing					
19.4	2.87	7-4,5-43	2.80	4-40	3	23.1	1.98	3-5-7-59	0.2019	2-41	4
5		6-19,20-46	1.57		3	A		3-14,15-59	.5610	(End	4
		6-7,8-47	.837	(End	3			3-19,20-59	.1828	12-59)	4
		6-24-50	4.89	9-53)	3	23.2	1.35	3-5-7-59	.2174	2-41	4
19.5	2.79	7-4,5-43	1.84	4-40	3	B		3-14,15-59	.4555	(End	4
6		6-19,20-46	.354		3			3-19,20-59	.1521	12-59)	4
		6-7,8-47	.951	(End	3	23.3	1.65	6-2,3-43	.4352	2-41	4
		6-24-50	4.12	9-53)	3	W		4-5,6-47	.1010	(End	4
								3-19,20-48	.2086	12-59)	4
IOWA						MISSISSIPPI					
Iowa City						Oxford					
21.1	1926	6-1-3-43	0.4890	9-24	3	62.1	2,000	5-22-57	0.2445	1-57	3
Ralston	(3.01)	7-21-48	.3395		3	W-4	(3.13)	4-3,4-58	.1453		4
Creek		7-1,2-50	.6490		3			9-9,10-59	.2910		4
		7-18,19-56	.8580		3			1-17-60	.0659		5
		11-15,16-61	.129		5			8-31-61	.0470		5
MARYLAND						MISSISSIPPI					
College Park						62.2	1,130	1-22,23-57	.1509	1-57	3
5.1	8.22	8-10,11-42	1.67	9-39	3	W-5	(1.77)	12-6,7-57	.2808		3
W-1		7-22,23-45	3.61		3			4-3,4-58	.3072		4
		8-3-48	2.68	(End	3			6-10,11-59	.6073		4
		6-15-54	2.45	12-54)	3			6-11-59	.4994		4
5.2	7.44	8-10,11-42	.495	9-39	3			1-17-60	.1273		5
W-2		7-22-45	2.47		3			8-31-61	.3388		5
		8-3-48	1.24	(End	3	62.3	5,530	4-3-5-58	.4824	1-57	3
		6-15-54	1.298	12-54)	3	W-10	(8.64)	9-10-12-58	.1354		3
5.6	3.53	8-19-41	.452	9-40	3			5-22,23-59	.0941		4
W-6		8-10-42	1.65		3			1-17-60	.0845		5
		8-27-43	1.01		3			8-31,9-1-61	.4331		5
		7-22-45	1.80		3	62.4	22,800	5-22,23-57	.2475	1-57	4
		12-20,21-57	.083		4	W-12	(35.6)	11-13,14-57	.1818		4
		7-8,9-58	.142		4			4-3,4-58	.0835		4
		9-11-60	.142		5			3-2,3-60	.1084		5
		9-11-60	.026		5			8-31,9-1-61	.0541		5
		9-11,12-60 <sup>2/</sup>	.154		5	62.5	32,100	5-22,23-57	.1990	1-57	4
		8-25,26-61	.051		5	W-17	(50.2)	11-13,14-57	.1778		4
		8-26-61	.074		5			3-2,3-60	.1057		5
5.7	4.11	8-19-41	.795	9-40	3			8-31,9-1-61	.1013		5
W-7	3/3.52	8-10-42	2.42		3	62.6	243	6-4,5-57	.2734	1-57	4
		8-27-43	.324		3	W-19		7-12-58	.1061		4
		7-22-45	1.44		3			8-24,25-59	.1469		4
		12-20,21-57	.355		4			1-17-60	.0347		5
		7-8,9-58	.277		4			8-31,9-1-61	.3017		5
		9-11-60	.260		5	62.7	511	11-18,19-57	.3919	1-57	4
		9-11-60	.041		5	W-24		5-9,10-58	.1102		4
		9-11,12-60 <sup>2/</sup>	.355		5			1-17-60	.0757		5
		8-25,26-61	.204		5			8-31-61	.0182		5
		8-26-61	.355		5						
5.8	2.43	5-11-14-43	.108	8-40	3						
W-8		11-8,9-43	.503		3						
		7-26-28-45	.222	(End	3						
		11-24-27-50	.358	12-54)	3						

1/ For References 3 and 4, see page 1. Reference 5 is the present volume.

2/ Donna hurricane.

3/ Area reduced 8-29-41.

TABLE 4.—Index to selected runoff events, by States, published by Agricultural Research Service through 1961—Continued

Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/	Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/
MISSISSIPPI—Continued						NEBRASKA					
Oxford						Hastings					
62.8	1,080	6-30-57	0.1331	1-57	4	44.1	481	6-20,21-39	1.15	8-38	3
W-28	(1.69)	7-22-58	.2415		4	W-3		7-10-51	1.74		3
		9-9-59	.5610		4			6-7,8-53	.718		3
		1-17-60	.0468		5			4-22,23-57	.404		4
		11-15,16-61	.1456		5			5-1,2-57	.466		4
								6-15-57	1.82		3
62.9	113	6-30-57	.2633	1-57	4			6-15-57	B/1.18		4
W-30		4-3,4-58	.1580	(End	4			6-12-58	.182		4
		9-9-59	1.1498	12-59)	4			5-15,16-60	.932		5
								8-11-61	.144		5
62.10	20,000	11-18,19-57	.2826	1-57	4	44.2	411	5-29,30-57	.159	7-39	4
W-32	(31.3)	4-14—16-58	.0823		4	W-5		6-15-57	.270		4
		5-22,23-59	.0892		4			6-12-58	.323		4
		3-2,3-60	.2142		5			7-3—5-59	1.15		4
		8-31,9-1-61	.2150		5			5-15—17-60	.644		5
								6-14,15-61	.249		5
62.11	75,000	12-6—8-57	.0859	1-57	3	44.3	2086	6-5,6-42	.164	1-39	3
W-34	(117.2)	3-25—27-58	.0123		3	W-8	(3.259)	7-10-51	.352		3
		4-14—16-59	.0467		3			6-7—9-53	.264		3
		5-22,23-59	.0230		4			8-28—30-57	.217		3
		3-2—4-60	.0626		5			6-12-58	.136		4
		8-31,9-1-61	.0519		5			7-3—6-59	.601		4
62.12	7,550	11-18,19-57	.2325	1-57	4			5-15—17-60	.266		5
W-35	(11.8)	4-14,15-58	.1135		4			6-14,15-61	.0960		5
		5-22,23-59	.1708		4						
		3-2—4-60	.2330		5						
		8-31,9-1-61	.0342		5	44.4	3490	6-15,16-57	.415	1-39	4
						W-11	(5.45)	8-28—9-1-57	.118		4
								7-3—6-59	.237		4
62.13	3.88	5-26-59	3.911	1-58	4			5-15—17-60	.231		5
WC-1		6-11-59	4.959		4			6-14—17-61	.101		5
		8-9-60	1.533		5						
		8-31-61	3.169		5						
62.14	1.45	5-26-59	4.022	7-58	4	44.5	3.62	6-16,17-57	1.35	3-39	4
WC-2		6-11-59	4.022		4	1-H		6-12-58	.677		4
		8-9-60	1.074		5			7-3-59	.901		4
		8-31-61	1.477		5			5-15-60	.970		5
								8-11-61	.441		5
62.15	1.61	5-26-59	4.552	7-58	4	44.6	3.40	6-12-58	.849	3-39	4
WC-3		6-11-59	5.082		4	2-H		7-3-59	2.52		4
		8-9-60	1.897		5			5-15-60	1.55		5
		8-31-61	3.487		5			8-11-61	.613		5
62.16	3.01	5-26-59	2.596	7-58	4	44.7	3.95	7-18,19-58	1.56	3-39	4
WP-4		6-11-59	4.646		4	3-H	4/3.77	7-3-59	6.45		4
		8-9-60	.517		5			5-15,16-60	4.32		5
		8-31-61	3.143		5			8-11-61	1.66		5
62.17	3,200	8-31,9-1-61	.1289	1-57	5	44.8	3.84	7-18,19-58	1.25	4-39	4
W-17A	(5.0)					4-H	4/3.64	5-4-59	1.23		4
								5-15,16-60	6.08		5
62.18	1090	8-31,9-1-61	.2487	1-57	5			8-11-61	3.17		5
W-35A	(1.7)										
MISSOURI						44.9	3.93	6-12,13-58	.469	4-39	4
						5-H	4/4.02	5-4-59	.531		4
								7-3-59	3.50		4
								5-15,16-60	3.43		5
								8-11-61	2.77		5
Bethany											
24.6	4.85	5-21-33	2.95	7-32	3						
D-3	2/4.48	10-19-34	2.03		3	44.10	4.16	6-27-56	1.48	4-39	4
		5-1-35	4.62	(End	3	6-H		6-12,13-58	.424		4
		6-17-35	2.48	12-42)	3		4/4.01	7-3-59	3.24		4
								5-15,16-60	2.89		5
								6-14,15-60	3.61		5
McCredie											
25.1	153	10-4,5-41	2.01	1-41	4	44.11	4.15	7-18,19-58	.782	4-39	4
W-1		6-26-42	.944		4	7-H	4/4.26	5-4-59	.720		4
		6-7-45	1.18		4			7-3-59	5.56		4
		8-19-49	.359		4			5-15,16-60	3.63		5
		9-21,22-51	.183		4			6-14,15-60	2.88		5
25.2	44.33	6-29,30-57	1.328	1-51	4	44.12	3.93	7-18,19-58	.394	3-39	4
Pond #2						8-H	4/3.97	5-15,16-60	2.19		5
								9-28,29-60	3.35		5

1/ For References 3 and 4, see page 1. Reference 5 is the present volume.  
2/ Area reduced 5-11-34.

3/ Data in Reference 3 revised.  
4/ Areas changed 1-1-59.

TABLE 4.—Index to selected runoff events, by States, published by Agricultural Research Service through 1961—Continued

Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/	Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/		
NEBRASKA—Continued						NEW MEXICO—Continued							
Hastings						Santa Rosa							
44.22	3.74	6-15-57	2.07	7-39	4	64.1	42,880	7-19—21-55	0.0622	1-55	4		
18-H		6-12-58	1.31		4	W-1	(67.0)	7-9—11-56	.0437		4		
		5-18-59	.427		4			8-16—18-57	.0253		4		
		5-15,16-60	2.19		5			6-5—7-60	.1718		5		
		8-11-61	.374		5			7-13-61	.02609		5		
NEW JERSEY						NEW YORK							
Freehold						Cohocton							
4.1	15.7	6-12-38	1.28	1-38	3	2.2	13.8	6-7-38	0.346	5-38	3		
W-I		7-15-38	1.68		3	W-II		9-12,13-38	.062		3		
	2/17.5	7-11-42	.918	(End	3			7-17,18-42	.050	(End	3		
		6-17-43	1.56	9-43)	3			5-25—27-43	.032	9-45)	3		
4.2	34.2	8-6-38	.748	3-38	3	2.3	24.2	7-21-38	.276	1-38	3		
W-II	3/32.9	5-21-40	1.65		3	W-III		7-17,18-42	.323		3		
		7-11-42	.226		3			5-25,26-43	.060	(End	3		
		8-3-50	.283	5-50 <sup>4/</sup>	3			7-23-45	.296	9-45)	3		
		8-6,7-52	.0871	(End	3	NORTH CAROLINA							
		9-10,11-54 <sup>5/</sup>	.0615	8-55)	3	High Point							
NEW MEXICO						11.1	20,544	7-23,24-38	0.0685	7-23	3		
Albuquerque						West Fork	(32.1)	12-26—28-38	.0305		3		
47.1	97.2	9-8-47	1.58	8-39	3	Deep River		2-26,27-39	.0479		3		
W-I		8-4-48 <sup>6/</sup>	.636		3			5-2,3-39	.0151		3		
		8-4-48 <sup>5/</sup>	.652		3			9-25—29-56	.0599		4		
		8-19-56	.871		4			4-8—10-57	.042	(End	4		
		8-9-57	.551		4			1-24—27-58	.0368	9-58)	4		
		8-24-57	2.71		3	OHIO							
		8-14-59	.324		4	Coshocton							
		7-6-61	.014		5	26.1	1.26	9-23-45	0.583	4-37	4		
47.2	40.5	8-24-57	2.793	8-39	4	102 <sup>8/</sup>		6-12-57	3.64	5-57	4		
W-II		8-21,22-58	1.186		4			6-28-57	1.76		4		
		5-23-59	.519		4			8-21,22-60	.725	4-60	5		
		8-15-61	.034		5			4-25-61	1.42		5		
47.3	183	8-19-56	.5259	8-39	4	26.2	1.33	9-23-45	.183	4-37	4		
W-III	7/168	10-19-57	.2006		4	104		(End		12-46)			
		8-21-58	.1386		4			26.3	2.71	9-23-45	.527	4-38	4
		8-15-61	.0146		5	129		6-12-57	2.36		4		
Mexican Springs								6-28-57	1.16		4		
48.2	610	7-28-39	.295	1-37	3			1-21-59	.249		4		
W-2		8-24-39	.209		3			8-21,22-60	.556		5		
		8-26-39	.179	(End	3			4-25-61	1.16		5		
		9-5-40	.179	12-42)	3	26.4	2.69	9-23-45	.678	4-38	4		
48.4	5550	7-9-41	.176	6-37	3	135		6-12-57	2.38		4		
W-6	(8.67)	8-6,7-41	.223	(End	3			6-28-57	1.01		4		
				12-42)				1-21-59	.199		4		
48.6	20,910	8-26,27-39	.038	1-37	3			8-21,22-60	.324		5		
W-8	(32.7)	7-19—21-41	.0581	(End	3			4-25-61	1.32		5		
		7-23,24-41	.213	12-42)	3	26.5	1.63	9-23-45	.852	5-38	4		
48.8	46,080	8-26,27-39	.070	1-37	3	130		6-12-57	4.06		4		
W-11	(72.0)	9-22,23-40	.0706	(End	3			6-28-57	1.43		4		
				10-40)				1-21-59	.444		4		
Santa Fe								8-21,22-60	.195		5		
49.1	141	8-18-44	.901	7-39	3	26.6	2.59	4-25-61	1.23		5		
W-I		7-25-45	1.272		3	107		9-23,24-45	1.31	9-38	4		
		8-25-47	1.04	(End	3			(End		2-46)			
		8-4,5-48	.356	12-48)	3								

1/ For References 3 and 4, see page 1. Reference 5 is the present volume.

2/ Area enlarged 8-17-38.

3/ Area reduced 2-20-39.

4/ No records October 1943 through April 1950.

5/ Edna hurricane.

6/ Two storms on same day.

7/ Area reduced in 1957.

8/ Watershed discontinued January 1, 1947, to April 30, 1957, and September 1, 1957, to March 29, 1960.

TABLE 4.—Index to selected runoff events, by States, published by Agricultural Research Service through 1961—Continued

Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/	Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/
OHIO—Continued						OHIO—Continued					
Coshocton						Coshocton					
26.7	2.21	9-23-45	0.101	5-38	4	26.20	1.56	9-23-45	2.21	4-39	4
131		6-12-57	1.18		4	106		6-12-57	3.03		4
		6-28-57	.328		4			6-28-57	1.35		4
		1-21-59	.0749		4			1-21-59	.452		4
		8-21,22-60	0		5			8-21,22-60	1.28		5
		4-25-61	.283		5			4-25-61	.954		5
26.8	0.59	8-21,22-60	0	5-48	5	26.21	2.05	9-23-45	1.95	9-39	4
132		4-25,26-61	1.05		5	188		6-28-57	1.25		4
26.9	0.92	9-23-45	.0725	5-38	4			1-21-59	.432		4
134				(End 6-47)				8-21,22-60	.186		5
26.10	1.37	9-23-45	.377	1-39	4	26.22	2.07	4-25-61	.798		5
123		6-12-57	5.97		4	124		9-23-45	1.43	9-39	4
		6-28-57	1.91		4			(End 6-47)			
		1-21-59	.553		4			9-23-45	1.90	9-39	4
		8-21,22-60	.478		5	26.23	7.40	6-12-57	2.65		4
		4-25-61	1.23		5	185		6-28-57	1.31		4
26.11	1.61	9-23-45	1.63	4-39	4			1-21-59	.229		4
115		6-12-57	4.12		4			8-21,22-60	.0730		5
		6-28-57	1.59		4			4-25,26-61	.834		5
		1-21-59	.321		4						
		8-21,22-60	.172		5	26.24	7.20	9-23-45	.806	1-41	4
		4-25-61	1.16		5	187		6-12-57	2.75		4
26.12	1.65	6-12-57	3.12	5-49	4			6-28-57	1.57		4
127		6-28-57	1.27		4			1-21-59	.354		4
		1-21-59	.468		4			8-21,22-60	.0231		5
		8-21,22-60	1.18		5			4-25-61	1.03		5
		4-25,26-61	1.39		5	26.25	7.59	9-23-45	.789	9-39	4
26.13	1.69	9-23-45	.780	11-38	4	192		6-12-57	2.09		4
109		6-12-57	3.99		4			6-28-57	.776		4
		6-28-57	1.36		4			1-21-59	.600		4
		8-21,22-60	.106		5			8-21,22-60	T		5
		4-25-61	.827		5			4-25-27-61	.568		5
26.14	0.65	9-23-45	1.54	4-39	4	26.26	43.6	9-23-45	.353	2-39	4
103		6-12-57	4.01		4	172		6-12-57	2.64 e		4
		6-28-57	1.94		4			6-28-57	.969		4
		1-21-59	.600		4			1-21-59	.278		4
		8-21,22-60	.0598		5			8-21,22-60	.0573		5
		4-25,26-61	1.63		5			4-25-61	.833		5
26.15	1.27	9-23-45	.905	4-39	4	26.27	29.0	9-23-45	1.37	1-40	4
110		6-12-57	4.24		4	169		6-12-57	2.59		4
		6-28-57	1.66		4			6-28-57	1.40		4
		1-21-59	.478		4			1-21-59	.465		4
		8-21,22-60	0		5			8-21,22-60	.0499		5
		4-25-61	1.23		5			4-25-61	1.04		5
26.16	1.45	9-23,24-45	1.08	9-39	4	26.28	75.6	9-23-45	.721	1-40	4
113		6-12-57	3.77		4	177		6-12-57	3.14		2/4, 5
		6-28-57	2.08		4			6-28-57	1.18		4
		1-21-59	.505		4			1-21-59	.441		4
		8-21,22-60	.274		5			8-21,22-60	.165		5
		4-25-61	1.20		5			4-25-61	1.04		5
26.17	1.96	9-23-45	1.36	1-40	4	26.29	74.2	9-23-45	1.41	3-38	4
118		6-12-57	3.11		4	183		6-16-46	2.58		3
		6-28-57	1.36		4			8-16-47	.388		3
		1-21-59	.393		4			9-1-50	1.76		3
		8-21,22-60	.0622		5			6-12,13-57	2.50		3
		4-25-27-61	1.02		5			6-28-57	1.30		4
26.18	1.18	9-23-45	1.47	9-39	4			8-21,22-60	.0373		5
111		6-12-57	3.82		4	26.30	303	4-25-61	1.14		5
		6-28-57	1.62		4	196		9-23-45	1.06	5-37	4
		1-21-59	.620		4			6-16,17-46	1.90		3
		8-21,22-60	.0133		5			8-16-47	.586		3
		4-25-61	1.29		5			9-1,2-50	1.77		3
26.19	1.42	9-23-45	.592	4-39	4			6-12-57	3.72		3
121		6-12-57	1.62		4			6-28-57	1.39		4
		6-28-57	.936		4			1-21-59	.504		4
		8-21,22-60	.218		5			8-21,22-60	.145		5
		4-25,26-61	.633		5			4-25-61	1.11		5

1/ For References 3 and 4, see page 1. Reference 5 is the present volume.

2/ Reprinted on page 182 of present volume.



TABLE 4.—Index to selected runoff events, by States, published by Agricultural Research Service through 1961—Continued

Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/	Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/
OHIO—Continued						OKLAHOMA—Continued					
Coahocton						Cherokee					
26.31 10	122	9-23-45 6-12-57 1-21-59 8-21,22-60 4-25-61	1.72 .329 .236 .363 .880	1-39	4 4 4 5 5	34.4 W-4	4.35	6-24-58 10-13-59 5-28-60	1.03 .467 2.05	1-42 (End 8-60)	4 4 4
26.32 5	349	9-23-45 6-12-57 6-28-57 1-21-59 8-21,22-60 4-25-61	.321 .432 1.09 .290 .960 .275	1-40	4 4 4 4 5 5	34.5 W-5	7.85	6-24,25-58 10-13-59 5-28-60	.475 .322 1.44	1-42 (End 8-60)	4 4 4
26.33 92	920 (1.44)	9-23-45 6-12-57 6-28-57 1-21-59 8-21,22-60 4-25,26-61	.229 .282 .623 .282 .541 .470	1-39	4 4 4 4 5 5	34.6 W-6	1.75	6-24-58 9-25-59 5-28-60	.121 1.22 2.40	1-42 (End 7-60)	4 4 4
26.34 94	1520 (2.37)	9-23-45 6-12-57 6-28-57 1-21-59 8-21,22-60 4-25,26-61	.397 .437 .918 .348 .625 .503	1-39	4 4 4 4 5 5	34.7 W-7	1.99	6-24-58 5-28-60	1.69 2.41	1-42 (End 7-60)	4 4
26.35 95	2570 (4.02)	9-23-45 6-12-57 6-28-57 1-21-59 8-21,22-60 4-25-61	.362 .346 .614 .350 .411 .456	1-39	4 4 4 4 5 5	34.8 W-8 <sup>3/</sup>	4.72	6-24-58 9-25-59 5-28-60	2/ .54 .302 1.36	4-41 7-56 (End 8-60)	4 4 4
26.36 97	4580 (7.16)	6-4-41 9-23,24-45 7-11-46 6-12-57 6-28,29-57 1-21-59 8-21,22-60 4-25-61	.360 .323 .211 .260 .724 .373 .272 .548	1-37	3 3 3 4 3 4/4,5 5 5	34.9 W-9	8.50	6-9-42 3-19-45 3-18,19-48 6-14-54 6-24-58 9-25-59 5-28-60	1.135 1.517 .640 .713 .860 .407 1.31	1-42 3 3 3 4 (End 8-60)	3 3 3 4 4
26.37 994	17,500 (27.34)	9-23,24-45 6-28,29-57 1-21,22-59 8-21,22-60 4-25,26-61	.114 .4385 .2510 .1386 .2216	10-36	4 4 4 5 5	34.10 W-10	1.68	5-21-61 6-2-61	2.58 2.76	8-60	5 5
26.38 174	52.8	8-21,22-60 4-25-61	0 1.034	6-60	5 5	34.11 W-11	2.12	5-21-61 6-2-61	1.20 2.03	8-60	5 5
26.39 194	187	8-21,22-60 4-25-61	.0992 .8697	1-60	5 5	34.12 W-12	1.68	7-3,4-60 5-21-61 6-2-61	2.86 2.29 2.96	7-60	5 5 5
Hamilton						34.13 W-13	1.99	7-4-60 5-21-61 6-2-61	1.17 1.51 2.83	7-60	5 5 5
27.1 W-1	187	7-4-39 5-17,18-43 7-7-43	.490 .506 .541	11-38 (End 5-44)	3 3 3	34.14 W-14	2.16	5-21-61 6-2-61	1.68 2.29	9-60	5 5
						34.15 W-15	2.15	5-21-61 6-2-61	2.41 2.64	9-60	5 5
						Guthrie					
						35.11 W-VI	94.8	9-8-42 6-26-45 5-20,21-49 7-5,6-49	.3190 .6028 .3831 .3375	1-42 (End 12-55)	3 3 3
						Stillwater					
						37.1 W-1	16.7	4-18-57 6-27,28-57 10-1,2-59 10-2,3-59 5-28,29-60 5-21-61	6.99 2.46 2.669 1.82 3.0210 2.9243	7-51	5/4,5 3/4,5 4 4 5 5
Cherokee						37.2 W-3	92.0	5-23,24-55 4-18-57 6-10-57 6-27,28-57 10-1,2-59 10-2,3-59 5-28-61-60 5-21-61	.936 4.52 .859 .934 1.749 1.24 1.4168 1.8575	7-51	3 3 3 3 4 4 5 5
34.1 W-1	2.23	6-24-58 9-25-59 5-28-60	1.29 .769 2.97	1-42 (End 6-60)	4 4 4						
34.2 W-2	4.82	6-24-58 10-13-59 5-28-60	1.06 .506 2.82	1-42 (End 6-60)	4 4 4						
34.3 W-3	8.04	6-24-58 10-13-59 5-28-60	1.02 .050 2.02	1-42 (End 6-60)	4 4 4						

1/ For References 3 and 4, see page 1. Reference 5 is the present volume.

2/ Published tabular peak, page 34.8-1 (1956-59), should be 0.54 in/hr at 9:04p instead of 1.57 at 8:54p, which should read 0.157. Hydrograph on page 34.8-3 is correct.

3/ Watershed discontinued 7-1-55 to 6-30-56.

4/ Reprinted on page 208 of present volume.

5/ Reprinted on pages 252 and 253 of present volume.

TABLE 4.—Index to selected runoff events, by States, published by Agricultural Research Service through 1961—Continued

Location, location No., watershed No.	Area acres, (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. <u>1/</u>	Location, location No., watershed No.	Area acres, (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. <u>1/</u>
OKLAHOMA—Continued						TEXAS—Continued					
Stillwater						Riesel (Waco)					
37.3 W-4	206	4-18-57 6-27-29-57 10-1,2-59 10-2,3-59 5-28-6-3-60 5-21-61	2.79 .865 1.633 .939 .9980 1.2552	7-51	4 4 4 4 5 5	42.8 W-6 <sup>4/</sup>	42.3	4-24-57 5-13-57 6-24,25-59 6-18-61 6-25-61	2.20 1.64 1.60 .230 .135	5-39 1-46	4 4 4 5 5
OREGON						TEXAS					
Newberg						42.10 W-10 <sup>2/</sup>	19.7	4-24-57 5-13-57 6-4-57 6-23,24-59 5-22,23-61 6-25-61	2.79 1.98 .853 1.96 .422 .334	8-38 6-46	4 4 4 4 5 5
57.1 W-1	13.2	5-21-39 10-1-41	0.572 .991	8-38 (End 12-42)	3 3	42.11 Y <sup>8/</sup>	309	3-31,4-1-57 4-24,25-57 6-4,5-57 6-23,24-59 6-25-61 7-16,17-61	1.50 1.81 1.43 .661 .205 .0598	5-37 5-46	4 4 4 4 5 5
57.3 W-3	12.8	2-4-40 3-31-40 12-4,5-40 11-14-41	.122 .174 .041 .061	9-38 (End 12-42)	3 3 3 3	42.12 Y-2	132	4-24-57 5-13-57 6-4-57 6-23,24-59 6-25-61 7-16,17-61	1.68 1.24 1.79 .796 .253 .0721	1-39	4 4 4 4 5 5
57.4 W-4	6.20	1-26-40 12-22-41	.012 .092	9-38 (End 12-42)	3 3	42.13 Y-4 <sup>7/</sup>	79.9	4-24,25-57 5-13-57 6-4,5-57 6-23,24-59 6-25-61 7-16,17-61	1.61 1.14 1.59 .789 .325 .0622	1-39 1-46	4 4 4 4 5 5
Riesel (Waco)						42.14 Y-6 <sup>8/</sup>	16.3	4-24-57 5-13-57 6-4-57 6-23,24-59 5-25-61 6-15-61	1.05 .803 .931 1.03 .211 .815	1-39 5-47	4 4 4 4 5 5
42.2 C <sup>2/</sup>	579	4-24,25-57 5-9-57 5-13-57 6-23,24-59 7-9,10-61 7-16,17-61	0.868 .112 .566 .625 .0498 .149	2-38 3-49	4 4 4 4 5 5	42.15 Y-7 <sup>8/</sup>	40.0	4-24-57 5-13-57 6-4-57 6-23,24-59 5-22,23-61 7-16,17-61	2.36 2.03 1.37 1.76 .152 .0687	1-39 5-47	4 4 4 4 5 5
42.3 D <sup>2/</sup>	1110 1.73	6-10,11-41 6-15,16-42 7-15-50 4-24,25-57 5-3,4-57 6-23,24-59 12-31-59 7-16,17-61 7-23-61	.747 .322 .536 .797 .670 .604 .0697 .164 .0459	12-37 3-49	3 3 3 3 4 4 5 5	42.16 Y-8 <sup>7/</sup>	20.8	4-24-57 5-13-57 6-4-57 6-23,24-59 6-18,19-61	2.71 2.23 2.15 1.68 .0782	3-39 1-49	4 4 4 4 5 5
42.4 G <sup>3/</sup>	4380 (6.84)	2-14-59 7-23,24-59 11-4,5-59 12-31-59 7-16,17-61 7-23,24-61	.0487 .384 .0743 .0517 .0675 .0211	1-38 6-57	4 4 4 4 5 5	42.17 Y-10 <sup>9/</sup>	18.6	4-24-57 5-13-57 6-4-57 6-23,24-59 5-25-61 6-15-61	2.70 1.91 2.40 .703 .366 .338	7-38 5-46	4 4 4 4 5 5
42.5 J	5860 (9.16)	3-23,24-41 6-10,11-41 6-6-42 6-15,16-42	.0372 .2281 .0417 .1261	7-37 (End 6-43)	3 3 3 3	42.24 SW-12 <sup>10/</sup>	2.97	6-4-57 6-23,24-59	.610 .714	1-38 6-47	4 4
42.6 W-1	176	6-10-41 3-26-46 4-27,28-49 4-24-57 5-13-57 6-4-57 6-23,24-59 6-15-61 7-16,17-61	3.40 .926 .627 2.20 1.64 1.09 1.89 .270 .132	7-37	3 3 3 3 4 4 5 5	42.28 SW-17 <sup>11/</sup>	2.99	3-31-57 4-24-57 5-13-57 6-23,24-59 6-25-61 7-16,17-61	.441 2.90 1.74 2.17 .604 .348	2-39 1-48	4 4 4 4 5 5
42.7 W-2	130	4-24-57 5-13-57 6-23,24-59 5-22,23-61 6-25-61	2.04 1.54 1.42 .0459 .201	7-37	4 4 4 5 5						

1/ For References 3 and 4, see page 1. Reference 5 is the present volume.

2/ Watershed discontinued 6-30-43 to 3-1-49.

3/ Watershed discontinued 7-22-43 to 6-1-57.

4/ Watershed discontinued 6-30-43 to 1-1-46.

5/ Watershed discontinued 6-30-43 to 6-1-46.

6/ Watershed discontinued 6-30-43 to 5-1-46.

7/ Watershed discontinued 6-30-43 to 1-1-49.

8/ Watershed discontinued 6-30-43 to 5-1-47.

9/ Watershed discontinued August 1943 to May 1946.

10/ Watershed discontinued 6-30-43 to 6-1-47.

11/ Watershed discontinued 6-30-43 to 1-1-48.

TABLE 4.—Index to selected runoff events, by State, published by Agricultural Research Service through 1961—Continued

Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/	Location, location No., watershed No.	Area acres (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. 1/
TEXAS—Continued						VIRGINIA—Continued					
Riesel (Waco)						Blackaburg					
42.31 P-1 <sup>2/</sup>	0.243	6-25-61 7-16,17-61	1.67 .131	1-38 1-60	5 5	13.7 W-I Crab Creek	786 (1.23)	7-28,29-57 7-21-59 7-27-59 10-16,17-60 8-25—28-61	0.0728 .0189 .0087 .0066 .1656	8-57	5 5 5 5 5
42.32 P-2 <sup>2/</sup>	0.243	6-25-61 7-16,17-61	1.67 .188	1-38 1-60	5 5	13.8 W-I Bruah Creek	893 (1.40)	5-30,31-59 7-22,23-59 9-6,7-59 8-14,15-60 8-31,9-1-59	.2874 .8471 .0862 .1510 .0697	8-57	4 4 4 5 5
42.33 P-3 <sup>2/</sup>	0.243	6-25-61 7-16,17-61	1.53 .310	1-38 1-60	5 5	13.9 W-I Powells Creek	182	7-10—12-59 10-8-59 4-9—12-61 4-12—14-61	.0816 .3908 .4277 .2502	1-58	5 5 5 5
42.34 P-4 <sup>2/</sup>	0.243	6-25-61 7-16,17-61	1.86 .245	1-38 1-60	5 5	13.10 W-I Little Winna Creek	1471 (2.30)	10-10—12-59 8-26—28-60 9-2—4-60 8-23-61	1.1156 .2566 .1793 .0672	1-58	5 5 5 5
Tyler						13.11 W-I Rocky Run Branch	555	6-26—29-58 7-10,11-59 9-30—10-2-59 6-7,8-61	.1289 .1303 .0282 .2240	4-58	5 5 5 5
40.1 2	9.15	5-17-42 5-10-43 10-8-45	.0873 .0934 .598	1-43 (End 11-45)	3 3 3	13.12 W-I Pony Mt. Branch	192	6-9,10-58 6-12,13-58 6-2—10-59 9-30,10-1-59	.0921 .4323 .2842 .0367	6-58	5 5 5 5
Vega						13.13 W-I Chub Run	2023 (3.16)	9-30—10-8-59 6-9,10-61 8-25-61	.2855 .0160 .0061	10-59	5 5 5
41.2 W-II	95.9	5-30-38 10-9-38 6-21-39	1.46 1.17 .611	2-38 (End 2-44)	3 3 3	13.14 W-I Fostera Creek	389	9-5—10-60 2-25—28-61	.0427 .1200	9-60	5 5
VERMONT						VIRGINIA					
North Danville						13.15 W-I Cheatnut Branch	1058 (1.65)	8-24,25-61 11-6—8-61	.0423 .2610	9-60	5 5
67.1 W-1	10,610 (16.58)	10-24,25-59 7-30—8-4-60 6-2—5-61	0.1029 .0131 .0207	11-58	4 5 5	Chatham					
67.2 W-2	146	11-28,29-59 7-30,31-60 6-2,3-61	.0360 .0224 .0262	10-58	4 5 5	14.3 W-III	17.1	9-1-38 8-6-39 8-31—9-2-40 6-23-41	1.98 1.53 1.93 1.55	8-38	3 3 (End 11-48) 3
67.3 W-3	2067 (3.23)	7-30—8-2-60 6-2—5-61	.0177 .0180	1-60	5 5	Staunton					
67.5 W-5 Sleepers River	27,469 (42.92)	7-30—8-5-60 6-2—5-61	.0131 .0200	1-60	5 5	15.1 W-I	390	9-8-48 4-13—17-49 7-19-53 6-7,8-55	.0059 .399 .0109 .0053	7-48	3 3 (End 9-55) 3
VIRGINIA						WASHINGTON					
Blackaburg						Pullman					
13.2 W-III	19.3	8-15-39 6-14-40 6-5-42 7-6-49 8-18-56 7-17,18-57 9-6-57 9-10-57 8-21-60	1.10 .103 1.90 .420 .073 .118 .039 .034 1.775	5-39	3 3 3 3 4 4 4 4 5	60.1 GS-2	68.2	1-25-41 3-3-41 4-20-43	0.015 .019 .053	8-31 (End 6-46)	3 3 3
13.3 W-IV	3.49	5-5-58 9-30-59 4-4-60	.747 .280 .120	9-51	5 5 5	60.6 GS-8	762 (1.19)	4-13-37 1-25-41 3-3-41 6-6-41	.0167 .0297 .0316 .0342	7-34 (End 8-41)	3 3 3 3
13.4 W-V	6.08	5-5-58 9-30-59 4-4-60	.705 .276 .060	1-52	5 5 5						
13.5 W-VI	7.70	6-23-55 5-5—8-58 4-4—7-60	.317 .953 .207	9-51	5 5 5						
13.6 W-I Thorne Creek	3054 (4.77)	7-29,30-57 9-13,14-57 1-14-58 4-3,4-60 8-2,3-61	.0532 .0344 .0347 .0397 .0043	6-57	4 4 4 5 5						

1/ For References 3 and 4, see page 1. Reference 5 is the present volume.

2/ Watershed discontinued 7-21-43 to 1-1-60.

TABLE 4.—Index to selected runoff events, by States, published by Agricultural Research Service through 1961—Continued

Location, location No., watershed No.	Area acres, <sup>2</sup> (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. <u>1</u> /	Location location No., watershed No.	Area acres, <sup>2</sup> (miles <sup>2</sup> )	Date of event	Peak rate (in/hr)	Record began (mo-yr)	Reference No. <u>1</u> /	
WASHINGTON—Continued						WISCONSIN—Continued						
Pullman						Fennimore						
60.8	4430 (6.92)	2-1-42	0.0123	7-41	3	31.2	22.8	8-12-43	0.371	7-38	3	
GS-10		1-25,26-47	.0252	(End 6-47)	3	W-2		7-11-44	2.69		3	
WEST VIRGINIA						WISCONSIN—Continued						
Moorefield						Fennimore						
66.1	8.25	8-3-58 <sup>2</sup> / <sub>1</sub>	0.4436	6-58	4	31.3	52.5	8-12-43	1.125	7-38	4	
W-1		5-7-10-60	.1092		5	W-3		7-11-44	.6640		4	
		8-9-61	.0686		5			6-28-45	1.63		4	
66.2	10.06	8-3,4-58 <sup>2</sup> / <sub>1</sub>	.7587	6-58	4			6-24,25-49	.4785		4	
W-2		5-7-10-60	.1599		5			7-15,16-50	1.30		4	
		8-9-61	.1686		5			8-5,6-51	1.40		4	
66.4	6.32	8-3,4-58 <sup>2</sup> / <sub>1</sub>	.6936	6-58	4	31.4	171	8-12-43	1.21	6-38	3	
W-4		5-7-10-60	.1377		5	W-4		7-11-44	.362		3	
		8-9-61	.0935		5			6-28-45	1.31		3	
66.5	9.55	8-3,4-58	.6513	6-58	4			6-24-49	1.00		3	
W-5		5-7-10-60	.1593		5			7-15,16-50	1.07		4	
		8-11-61	.0235		5			8-5,6-51	1.76		4	
WISCONSIN						WISCONSIN—Continued						
Colby						La Crosse						
29.1	345	7-28,29-49	0.0808	5-49	3	32.3	2.71	8-16-40	1.92	1-37	4	
W-1		5-13,14-56	.151		3	CW		6-29-41	1.25		4	
		6-4,5-58	.576		3				9-15-41		2.58	4
		5-16-18-60	.1847		5				6-23-52		4.50	4
Fennimore						La Crosse						
31.1	330	8-12-43	.906	7-38	3	32.4	2.95	6-23-52	3.39	1-52	4	
W-1		7-11,12-44	.303		3	CWA		7-19-52	3.53		4	
		6-28-45	1.01		3				8-26,27-59		2.30	4
		6-24-49	.723		3							
		7-15,16-50	1.04		4							
		8-5,6-51	1.69		4							

<sup>1</sup>/ For References 3 and 4, see page 1. Reference 5 is the present volume.

<sup>2</sup>/ Tabular data and graph revised. See pages 66.1-2, 66.2-2, and 66.4-2 (revised) in this volume.





