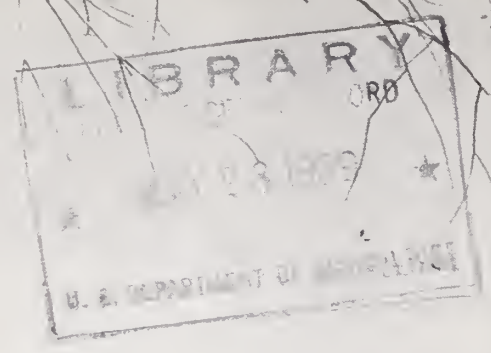


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Here, on Mt. Rose, Nevada, Dr. J. E. Church made
the first western snow survey 50 years ago.



FEDERAL - STATE - PRIVATE COOPERATIVE
SNOW SURVEY and WATER SUPPLY FORECASTS
for
MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE.
and
MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U.S. Forest Service, U.S. Geological Survey,
National Park Service, U.S. Bureau of Reclamation, State Engineers of
Montana and Wyoming and other Federal, State and private organizations.

AS OF
MAY 1, 1959

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	COOPERATING WITH	LOCATION
RIVER BASINS			
COLORADO, RIO GRANDE AND ARKANSAS	MONTHLY (FEB.-MAY).....	COLO. EXP. STATION..... COLO. STATE ENGINEER NEW MEXICO STATE ENGINEER	FT. COLLINS, COLO.
COLUMBIA <i>Includes Alaska</i>	MONTHLY (JAN.-MAY).....	IDAHO STATE ENGINEER.....	BOISE, IDAHO
UPPER MISSOURI.....	MONTHLY (FEB.-MAY).....	MONT.AGR.EXP.STATION.....	BOZEMAN, MONTANA
WEST-WIDE.....	(OCT. 1, APR. 1 AND MAY 1)	COOPERATORS.....	PORTLAND, OREGON
STATES			
ARIZONA.....	SEMI-MONTHLY..... (JAN. 15-APR.1)	SALT R. VALLEY WATER..... USERS ASSOCIATION	PHOENIX, ARIZONA
NEVADA.....	MONTHLY (FEB.-APR.).....	NEVADA STATE ENGINEER.....	RENO, NEVADA
OREGON.....	MONTHLY (JAN.-MAY).....	ORE.AGR.EXP.STATION..... UTAH STATE ENGINEER	PORTLAND, OREGON
UTAH.....	MONTHLY (JAN.-MAY).....	UTAH AGR.EXP.STATION.....	SALT LAKE CITY, UTAH
WASHINGTON.....	MONTHLY (FEB.-MAY).....	WASH. STATE DEPT. OF CONSERVATION	SPOKANE, WASHINGTON
WYOMING.....	MONTHLY (FEB.-JUNE).....	WYOMING STATE ENGINEER.....	CASPER, WYOMING

Copies of the various reports may be secured from: Head, Water Supply Forecasting Section
Soil Conservation Service
209 S.W. 5th Avenue, Portland 4, Oregon

PUBLISHED BY OTHER AGENCIES

OTHER SNOW SURVEY REPORTS

BRITISH COLUMBIA.....	MONTHLY (FEB.-JUNE).....	COMPTROLLER, WATER RIGHTS BR., DEPT. OF LANDS AND FORESTS, PARLIAMENT BLDGS. VICTORIA, B.C.
CALIFORNIA.....	MONTHLY (FEB.-MAY).....	CALIFORNIA DEPARTMENT OF WATER RESOURCES, SACRAMENTO, CALIFORNIA

FEDERAL-STATE-PRIVATE COOPERATIVE
SNOW SURVEYS and WATER SUPPLY FORECASTS
for
MONTANA AND NORTHERN WYOMING
(Upper Missouri and Upper Columbia River Basins)

Report Prepared by:

A. R. Codd
Hydraulic Engineer
Soil Conservation Service

Soil Conservation Service
U. S. Department of Agriculture
and
Montana Agricultural Experiment Station
Bozeman, Montana

Report Issued by:

H. D. Hurd
State Conservationist
of Montana

O. W. Monson
Irrigation Engineer
Montana Agricultural
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Director
Montana Agricultural
Experiment Station

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WATER SUPPLY OUTLOOK
FOR MONTANA
May 1, 1959

The 1959 Water Supply Outlook for the State of Montana is GOOD. The only apparent shortage is in the extreme southern end of the Beaverhead River, where a 75 percent normal supply is forecast.

The Sun River inflow to Gibson Reservoir is forecast at 159 percent average or 912,000 acre feet for the April-September period. Stations along the Missouri and Yellowstone Rivers are forecast for near normal flows this season.

The Blackfoot River near Bonner, the Swan River at Big Fork, and the Clark Fork River above Missoula are forecast to have extremely high flows from the record snow-pack in the mountains feeding these streams.

The April-September flow of the Clark Fork is forecast at 135 percent average below Missoula; a decrease to 125 percent average is forecast at Plains and Thompson Falls.

For May first, irrigation and hydro-electric reservoirs are at satisfactory levels to receive the anticipated spring runoff from the winter snow-pack.

In the Flathead basin, soil moisture under the snow-pack is, in general, slightly higher than last season.

At Bozeman, soil moisture is one-half inch less than last season.

MISSOURI RIVER BASIN

JEFFERSON RIVER:

The Red Rock portion of the Beaverhead River is forecast to flow 25 percent below average this season. This is the only apparent shortage in the State. April precipitation was only 27 percent of normal at Lima and snow cover on April first was 25 percent below average. The tributaries to the Beaverhead River between Armstead and Barratts are forecast to cover the apparent shortage. The April-July flow at Barratts on the Beaverhead is forecast to be 94 percent average or 126,000 acre feet.

MADISON RIVER:

May first snow surveys on the Madison River indicate that an above-average snow-pack exists at high elevations; low elevation snow-pack is below average or non existent. This could mean a prolonged runoff period.

GALLATIN RIVER:

Snow surveys made on May first indicate an above-average water supply for this river this season. The snow course at Devil's Slide, elevation 8,100 feet, showed 30.6 inches water content. This measurement is only one inch less than the record high of 31.6 water content measurement made in 1948.

MISSOURI RIVER MAIN STEM:

May first snow surveys on the tributaries to the Missouri between Toston and Fort Benton indicate an above-average snow-pack for this late in the season. Record high measurements at Kings Hill, Stemple Pass and Upper Tenmile Creek snow courses could produce local high water and a prolonged seasonal runoff.

UPPER YELLOWSTONE RIVER, MONTANA

May first snow surveys at a few key stations indicate a GOOD water supply outlook for the Yellowstone River and tributary streams from Gardiner to Livingston. The Yellowstone River is forecast to flow 99 percent average and 26 percent greater than last season. There was a normal decline of snow water content during April.

SHIELDS RIVER BASIN:

Although no snow surveys are made on May first in this basin, precipitation has been close to average at most stations. The April forecasts have not been lowered. The Shields River and tributaries should produce about 9 percent more water than last season and 90 percent of the average year.

COLUMBIA RIVER BASIN

FLATHEAD RIVER:

May first snow surveys indicate an above-average snow-pack this season. A heavy snow-pack of record proportions exists on the high elevation snow courses on the Mission and Swan mountains. Record water content measurements exist at Big Creek, east of Polson; North Fork Jocko, east of St. Ignatius; Trinkus Lake, Upper Holland Lake and Strawberry Lake on the Swan Range; and on Big Mountain, north of Kalispell. This heavy snow-pack is likely to cause extremely high water in the streams being fed from this area. The snow-pack on these courses is greater than it was in 1950.

The Flathead River at Columbia Falls is forecast to flow 117 percent average or 6,502,000 acre feet from April 1 through September 30. The South Fork of the Flathead River is forecast to flow 2,404,000 acre feet for the April-September period, with 2,034,000 acre feet during April, May and June. These figures are 117 percent of the average.

CLARK FORK RIVER:

The upper portion of the Clark Fork River, from Butte to Milltown, has a good snow-pack this season. All courses measured about May first were above average. The Clark Fork River above Bonner is forecast to flow 117 percent average this season.

The Blackfoot basin, to the north of the Clark Fork, has a heavy snow-pack at the higher elevations. May first snow survey measurements show record highs, exceeding 1950 by 4 inches of water content. This heavy snow-pack is certain to bring high spring flows during June and July. The Blackfoot River at Bonner is forecast at 169 percent average or 1,363,000 acre feet of water during the April-July period. This flow will enter the Clark Fork River above Missoula with a forecast of 151 percent average flow for the April-July period or 2,160,000 acre feet.

The Bitterroot River basin will produce only 107 percent of the average flow during the runoff season.

MONTANA STREAM-FLOW FORECASTS MAY 1, 1959

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature during the forecast period will be near average. Appreciable deviations from normal of temperature and/or precipitation during the forecast period will correspondingly modify these forecasts.

UPPER MISSOURI RIVER IN MONTANA		Seasonal Stream-Flow in Thousands of Acre Feet					
		FORECAST RUNOFF	% 15-Yr. AVG.	FORE- CAST PERIOD	Measured Runoff		1938-52 Average
					1957##	1956	
RED ROCK RIVER							
Monida (near) (1)	#5	61 57	75 75	Apr-Sept Apr-July	104 100	60 58	81 76
BEAVERHEAD RIVER							
Barratts (at)	#9	166 126	94 94	Apr-Sept Apr-July	204 162	155 122	177 134
BIG HOLE RIVER							
Melrose (near)	#85	631 584	85 85	Apr-Sept Apr-July	720 686	842 796	745 687
JEFFERSON RIVER							
Sappington (at)	#14	879 780	83 83	Apr-Sept Apr-July	1028 964	1045 967	1057 938
MADISON RIVER							
West Yellowstone (near)	#104	183 140	93 93	Apr-Sept Apr-July	220 168	255 200	198 151
Grayling (near) (2)	#106	382	91	Apr-Sept	454	488	420
(Net inflow to Hebgen Lk)		302	91	Apr-July	361	402	333
McAllister (near) (3)	#109	661 533	91 91	Apr-July Apr-July	750 615	802 672	726 585
GALLATIN RIVER							
Gateway (near)	#114	487 420	110 109	Apr-Sept Apr-July	469 406	499 443	445 384
Logan (at)	#116	539 462	112 112	Apr-Sept Apr-July	446 386	512 452	478 410
Hyalite Cr. R.S. (at)(7)	#118	40 34	114 114	Apr-Sept Apr-July	34 30	29 25	35 30
MISSOURI RIVER							
Toston (at) (3)	#15	2075 1756	82 81	Apr-Sept Apr-July	2187 1956	2345 2098	2535* 2191*
Fort Benton (at) (4)	#25	3335 2812	99 98	Apr-Sept Apr-July	3032 2608	3131 2722	3381 2874
Virgelle (at) (4)	#26	4098 3499	102 102	Apr-Sept Apr-July	3500 3019	3261 2806	4013 3445
Zortman (near) (4)	#27	4481 3814	103 102	Apr-Sept Apr-July	3739 3208	3588 3076	4357 3726
Ft. Peck Dam (below) (5)	#29	4396 3809	101 102	Apr-Sept Apr-July	3365 2728	3290 2613	4362 3666
Williston, N. D.	#33	10913 9438	92 92	Apr-Sept Apr-July	11203 9527	9673 8102	11750 10228

- (1) Observed flow plus change in storage in Lima Reservoir.
 (2) Observed flow plus change in storage in Hebgen Lake.
 (3) Observed flow plus change in storage in Hebgen and Ennis Lakes.
 (4) Observed flow plus change in storage in Canyon Ferry.
 (5) Observed flow plus change in storage in Canyon Ferry and Ft. Peck Reservoirs.
 (7) Observed flow plus change in storage in Hyalite Reservoir.
 (*) Less than 15 years in 1938-52 period. Average for 15 yrs. nearest the base period.
 (##) Preliminary data furnished by U. S. Geological Survey, subject to correction.

MONTANA STREAM-FLOW FORECASTS MAY 1, 1959

UPPER MISSOURI RIVER IN MONTANA		Seasonal Stream-Flow in Thousands of Acre Feet						
		FORECAST RUNOFF	% 15-Yr. AVG.	FORE- CAST PERIOD	Measured Runoff		1938-52 Average	
					1957##	1956		
SUN RIVER								
Net Inflow to Gibson Reservoir		#1535	912	159	Apr-Sept	531	668	573*
			833	159	Apr-July	488	618	524*
MARIAS RIVER								
Shelby (near)		#178	622	118	Apr-Sept	519	684	527
			572	119	Apr-July	486	617	482
JUDITH RIVER								
Utica (near)		#208	48	121	Apr-Sept	29.2	18.4	39.8
			44	121	Apr-July	27.6	17.6	36.3
MUSSELSHELL RIVER								
Delpine (near)		#216	8.2	120	Apr-Sept	6.0	4.8	6.8*
			6.7	120	Apr-July	4.9	4.1	5.6*
YELLOWSTONE RIVER								
Corwin Springs (at)		#317	1792	96	Apr-Sept	1964	2427	1870
			1495	96	Apr-July	1643	2099	1556
Livingston (near)		#318	2038	96	Apr-Sept	2272	2689	2134
			1693	95	Apr-July	1902	2322	1770
Billings (at)		#319	3659	91	Apr-Sept	5133	4788	4025
			3142	91	Apr-July	4521	4225	3446
Miles City (at)		#323	5842	92	Apr-Sept	7762	6175	6369
			5000	92	Apr-July	6764	5324	5421
Sidney (near)		#326	6054	91	Apr-Sept	7623	6114	6648
			5246	92	Apr-July	6735	5315	5724
SHIELDS RIVER								
Clyde Park (at)		#335	95.4	90	Apr-Sept	76.5	97.0	105.6
			88.8	91	Apr-July	71.8	94.2	98.0
ROSEBUD RIVER								
Absarokee (near)		#356	265	101	Apr-Sept	372	251	263
			214	101	Apr-July	321	208	212
STILLWATER RIVER								
Rosebud Cr. (above)		#3515	333	101	Apr-Sept	463	343	331
			290	101	Apr-July	413	321	288
Absarokee (near)		#352	596	100	Apr-Sept	850	611	594
			501	100	Apr-July	750	529	500
ROCK CREEK								
Red Lodge (near)		#365	107	100	Apr-Sept	154	134	107
			82	100	Apr-July	129	110	82
CLARK FORK RIVER								
Chance (at)		#360	599	103	Apr-Sept	715	716	580
			536	104	Apr-July	649	660	517
Edgar (at)		#362	619	101	Apr-Sept	785	773	614
			547	101	Apr-July	706	698	539

(##) Preliminary data furnished by U. S. Geological Survey, subject to correction.
 (*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

WYOMING STREAM-FLOW FORECASTS MAY 1, 1959
Prepared by SCS, Casper, Wyoming

LOWER YELLOWSTONE RIVER IN WYOMING	Seasonal Stream-Flow in Thousands of Acre Feet					1938-52 Average
	FORECAST RUNOFF	% 15-Yr. AVG.	FORE- CAST PERIOD	Measured Runoff		
				1957	1956	
NORTH POPO AGIE Milford (near)	66	77	Apr-Sept	123	96	86*
LITTLE POPO AGIE Lander (near)	34	70	Apr-Sept	62	44	49**
WIND RIVER Dubois (at)	92	90	Apr-Sept	146	114	102**
SHOSHONE RIVER Buffalo Bill Dam (below) (1)	780	95	Apr-Sept	1115	1014	823

(1) Observed flow corrected for storage in Buffalo Bill Reservoir and Hart Mountain Diversion.

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

** Estimated 1938-52 average.

MONTANA STREAM-FLOW FORECASTS MAY 1, 1959

UPPER COLUMBIA RIVER IN MONTANA		Seasonal Stream-Flow in Thousands of Acre Feet					
		FORECAST RUNOFF	% 15-Yr. AVG.	FORE- CAST PERIOD	Measured Runoff		1938-52 Average
					1957##	1956	
CLARK FORK RIVER							
Bonner (above) (14)	#4155	905	117	Apr-Sept	655	880	771
		797	117	Apr-July	580	780	578
		683	117	Apr-June	522	695	583
Missoula (above)	#415	2418	151	Apr-Sept	1577	2012	1602
		2160	151	Apr-July	1425	1817	1429
		1857	151	Apr-June	1292	1622	1229
Missoula (below)	#439	4023	135	Apr-Sept	2979	3960	2971
		3668	136	Apr-July	2764	3654	2700
		3213	137	Apr-June	2524	3290	2335
St. Regis (at)	#442	5398	137	Apr-Sept	4108	5749	3951
		4897	136	Apr-July	3787	5326	3588
		4339	139	Apr-June	3450	4817	3112
Plains (near) (15)	#503	13436	125	Apr-Sept	11159	15138	10747
		12268	125	Apr-July	10459	14070	9813
		10544	125	Apr-June	9527	12531	8434
Thompson Falls (at) (15)	#504	14345	125	Apr-Sept	11517	15920	11479
		13122	125	Apr-July	10820	14809	10500
		11258	125	Apr-June	9847	13188	9009
Cabinet Gorge (at)(15)	#507	15261	125	Apr-Sept	--	--	12211
		13980	125	Apr-July	--	--	11186
		11978	125	Apr-June	--	--	9584
BLACKFOOT RIVER							
Bonner (near)	#414	1513	169	Apr-Sept	922	1132	896**
		1363	168	Apr-July	844	1037	811**
		1174	169	Apr-June	769	927	693**
BITTERROOT RIVER							
Darby (near)	#422	557	106	Apr-Sept	515	740	525
		517	106	Apr-July	483	701	487
		452	105	Apr-June	441	649	429
Missoula (near) (16)	#438	1605	117	Apr-Sept	1402	1948	1369
		1508	119	Apr-July	1340	1837	1270
		1356	123	Apr-June	1232	1668	1106

- (14) Difference in observed flow, Clark Fork above Missoula & Blackfoot at Bonner.
 (15) Observed flow plus change in storage in Flathead Lake & Hungry Horse Reservoir.
 (16) Difference in observed flow, Clark Fork above and below Missoula.
 (**) Average for period of record.
 (##) Preliminary data furnished by U. S. Geological Survey, subject to correction.

MONTANA STREAM-FLOW FORECASTS MAY 1, 1959

UPPER COLUMBIA RIVER IN MONTANA	Seasonal Stream-Flow in Thousands of Acre Feet						
	FORECAST RUNOFF	% 15-Yr.	FORE- CAST PERIOD	Measured Runoff		1938-52 Average	
				1957##	1956		
FLATHEAD RIVER							
Columbia Falls (near) #444 (North Fork)	2020	117	Apr-Sept	1798	2308	1729	
	1840	117	Apr-July	1681	2139	1575	
	1585	117	Apr-June	1523	1864	1350	
Columbia Falls (at) (17) #458	6502	116	Apr-Sept	5716	7164	5619	
	6061	116	Apr-July	5411	6720	5214	
	5312	117	Apr-June	4962	5959	4530	
Polson (near) (15) #469	7654	116	Apr-Sept	6525	8603	6612	
	7120	116	Apr-July	6240	8082	6150	
	6156	116	Apr-June	5715	7137	5317	
MIDDLE FORK FLATHEAD RIVER							
West Glacier (near) #450	1947	117	Apr-Sept	1764	2093	1659*	
	1802	117	Apr-July	1672	1956	1540*	
	1522	114	Apr-June	1524	1712	1330*	
SOUTH FORK FLATHEAD RIVER							
Columbia Falls (near)(17) #457 (Net Inflow to Hungry Horse Reservoir)	2404	117	Apr-Sept	1976	2593	2058	
	2283	117	Apr-July	1857	2488	1950	
	2034	118	Apr-June	1778	2279	1724	
SWAN RIVER							
Big Fork (near) #466	910	156	Apr-Sept	575	750	584	
	809	156	Apr-July	520	676	518	
	674	157	Apr-June	451	581	427	

- (15) Observed flow plus change in storage in Flathead Lake & Hungry Horse Reservoir.
 (17) Observed flow plus change in storage in Hungry Horse Reservoir.
 (##) Preliminary data furnished by U. S. Geological Survey, subject to correction.
 (*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

AVAILABLE SOIL MOISTURE - ABOUT MAY 1, 1959

Station	No.	Elev.	PROFILE			SOIL MOISTURE CONTENT				Y e a r s
			Depth (In.)	Total Water- Holding Capacity (In.)	Date of Meas.	in Inches				
						1959	Past Record 1958	1957	Avg.	
<u>COLUMBIA - FLATHEAD DRAINAGE</u>										
Desert Mt.	13A2M	5600	48	--	4/29	11.30	9.37	8.39	-	3
Marias Pass	13A5M	5250	48	8.39	4/25	6.62	6.99	7.28	7.07	5
Spotted Bear R.S.	13B2M	3700	28	--	5/5	4.97	4.73	5.45	-	3
Trout Lake	13A12M	3600	48	--	5/4	12.30	12.78	12.38	-	3
<u>MISSOURI - GALLATIN DRAINAGE</u>										
College Site	11D2M	4860	50	14.48	5/1	11.91	12.34	11.35	-	3

MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

		SNOW COVER MEASUREMENTS							Total Years of Record
MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	1959 Snow Depth (In.)	Water Content (In.)	Past Record		15-Year Average 1938-52	
						Water Content	(In.)		
						1958	1957		
<u>JEFFERSON RIVER</u>									
(Rock-Beaverhead)									
Lakeview Canyon	11E4	6930	5/4	11	3.6	13.2	12.2	10.5*	8
Lakeview Ridge	11E3	7400	5/4	7	2.5	11.7	11.0	8.1*	8
(Big Hole)									
Gibbons Pass	13D2	7100	4/29	53	22.4	26.5	26.0	20.6*	23
Storm Lake	13C7	7780	4/30	38	15.3	21.4	16.4	14.2*	17
(Wise River)									
Elk Horn	13D15	8450	4/30	25	8.8	11.8	10.6	7.0*	16
<u>MADISON RIVER</u>									
Hebgen	11E5	6550	4/30	12	4.3	8.9	12.4	2.6	26
Norris Basin	10E2	7500	4/29	13	4.9	7.7	8.1	5.4*	8
Twenty-One Mile	11E6	7150	5/1	31	12.3	14.4	21.5	11.8	22
W. Yellowstone	11E7	6700	4/30	6	2.0	5.0	10.8	3.6	25
<u>GALLATIN RIVER</u>									
Devil's Slide	10D4	8100	5/2	75	30.6	26.6	24.6	22.0	24
Hood Meadow	10D3	6600	5/2	22	7.9	10.4	9.6	4.3	24
Twenty-One Mile	11E6	7150	5/1	31	12.3	14.4	21.5	11.8	22
<u>MISSOURI RIVER MAIN STEM</u>									
Chessman Res.	12C5	6200	4/30	7	2.5	4.8	3.1	1.6	23
King's Hill	10C1	7950	5/1	48	17.6	14.6	13.4	12.7*	18
Pipestone Pass	12D1	7200	5/1	11	3.2	10.4	5.2	2.2*	19
Stemple Pass	12C1	6900	5/1	37	13.4	13.4	9.5	6.8*	24
Tenmile, Lower	12C2	6250	5/3	7	2.3	6.7	6.6	2.0	23
Tenmile, Middle	12C3	6800	5/2	29	9.2	13.4	11.9	6.9	24
Tenmile, Upper	12C4	8000	5/2	39	14.6	18.5	15.1	10.4	23
(Marias River)									
Marias Pass	13A5	5250	4/29	50	21.4	15.5	17.0	9.9	24
<u>UPPER YELLOWSTONE</u>									
Canyon	10E3	7500	5/1	34	11.8	14.3	17.3	12.0**	12
Cooke City	10D7	7400	4/30	20	6.7	7.8	8.2	6.2**	14
Lake Camp	10E4	7850	4/30	23	6.5	9.4	9.3	8.7**	13
Lupine	10E1	7300	4/29	21	7.1	7.4	8.9	8.8**	8

*Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
 **Average for period of record.

MONTANA & WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

SNOW COVER MEASUREMENTS

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	1959		Past Record			Total Years of Record
				Snow Depth (In.)	Water Content (In.)	Water Content		(In.) 15-Year Average 1938-52	
						1958	1957		
<u>HUDSON BAY DRAINAGE</u>									
<u>ST. MARY BASIN</u>									
Iceberg Lake	13A3	5750	5/1	72	33.5	26.4	26.2	19.7	37
Josephine Lake #9	13A14	4900	4/30	49	20.3	15.8	19.6	20.1**	4
Mount Allen	13A7	5700	4/30	118	54.6	44.3	48.3	39.9	37
Piegian Pass #6	13A6	6250	4/30	49	20.3	37.8	41.3	29.5	37
Ptarmigan #8	13A8	6000	5/1	98	46.6	34.6	39.1	29.7	22
<u>WYOMING</u>									
<u>LOWER YELLOWSTONE - Clark's Fork</u>									
Lodgepole	9E1	8200	5/1	32	10.9	9.2	12.6	9.5*	19
<u>LOWER YELLOWSTONE - Wind River</u>									
Big Warm	9F12	8800	4/25	24	7.5	4.7	11.8	-	4
Burroughs Creek	9F4	8800	4/26	41	14.3	10.8	15.7	15.8**	10
Dinwoodie	9F10	10000	4/27	45	12.7	10.8	16.4	15.4**	10
Dry Creek	9F9	9500	4/28	28	7.0	5.9	10.4	8.3**	10
Dunoir	9F6	8750	4/25	21	6.5	5.2	10.7	7.4*	17
Geyser Creek	9F7	8500	4/25	17	5.4	4.1	10.2	6.6**	10
Little Warm	9F8	9500	4/25	57	17.4	16.6	23.9	21.0**	10
Sheridan R. S. #2	9F14	7500	4/27	9	0.5	2.7	8.0	-	4
T-Cross Ranch	9F3	8000	4/26	8	2.7	1.9	7.4	4.6*	16
#Togwotee Pass	10F9	9600	5/1	78	33.2	29.4	32.7	34.3**	10

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

** Average for period of record.

Adjacent Basin.

WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

SNOW COVER MEASUREMENTS									
MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	1959		Past Record			Total Years of Record
				Snow Depth (In.)	Water Content (In.)	Water Content (In.)		15-Year Average 1938-52	
						1958	1957		
<u>LOWER YELLOWSTONE</u> - Popo Agie River									
Blue Ridge	8G2	9500	5/2	23	7.0	12.2	15.3	12.5*	19
Bruce's Camp	8G5	6500	5/2	0	0	N.R.			3
Hobbs Park	9G3	10000	4/29	53	6.5	16.4	22.7	22.4**	10
Mosquito Park R.S.	9G4	9500	4/29	23	6.6	9.0	13.9	8.3**	14
Sawmill Glade	5G1	8500	5/2	10	2.9	9.4	11.6	6.8*	19
South Pass	8G3	9000	5/2	23	7.4	11.4	19.0	14.6*	19
St. Lawrence R.S.	9F11	9000	4/28	20	5.6	5.6	11.4	7.6*	15
Trout Creek	9G2	8400	4/29	10	2.9	6.1	10.4	3.2**	10
<u>LOWER YELLOWSTONE</u> - Owl Creek									
Beavers Mill	9F2	8900	4/28	21	7.0	N.R.	9.4	8.3	7
Owl Creek	8F1	8700	4/28	25	6.5	9.0	8.2	7.6**	10
<u>LOWER YELLOWSTONE</u> - Greybull River									
Timber Creek #2	9E3	8800	4/26	8	3.5	6.8	9.0		4
Wood River	9F15	8000	4/27	15	4.8	7.0	12.4		4
<u>LOWER YELLOWSTONE</u> - Shoshone River									
Carter Mountain	9E4	7800	4/25	17	4.5	9.6	12.7		2
East Entrance	10E6	7000	4/29	14	6.1	7.8	10.2		5
Sylvan Pass	10E5	7100	4/29	34	13.2	12.6	15.1	8.8*	17
#Togwotee Pass	10F9	9600	5/1	78	33.2	29.4	32.7	34.3**	10
<u>LOWER YELLOWSTONE</u> - Nowood Creek									
Cold Springs Camp	7E25	8700	5/3	30	10.0	7.2	6.1		3
Medicine Lodge Lk.	7E24	9500	5/3	49	15.3	11.8			2
Munkres Pass	7E8	9700	4/30	40	11.7	12.2	11.4	9.8**	8
Onion Gulch	7E27	8100	4/30	39	12.5	10.3	8.2		3
West Tensleep Lake	7E26	9075	4/29	49	14.2	11.7			2
Tensleep R.S.	7E7	8300	4/29	29	10.0	7.4	1.9	4.5	23
Tyrell R.S.	7E35	8300	4/29	39	12.4	9.0	N.R.		2

*Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

**Average for period of record.

#Adjacent Basin.

WYOMING SNOW SURVEYS ABOUT MAY 1, 1959

			SNOW COVER MEASUREMENTS					Total Years of Record	
MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	1959 Snow Depth (In.)	Water Content (In.)	Past Record			15-Year Average 1938-52
						1958	1957		
<u>LOWER YELLOWSTONE - Shell Creek</u>									
Bald Mountain	7E21	9600	4/25	85	30.9	19.9	23.5		3
Beaver-Tongue Div.	7E20	9200	4/24	78	29.8	17.0	19.3		3
Bone-Spring Div.	7E18	9200	4/27	73	23.8	20.3	19.8		3
Granite Cr. Camp	7E22	7800	5/1	T.		1.5	0		3
Granite Pass	7E17	8950	4/27	67	22.5	20.3	19.9		3
Ranger Creek	7E4	8800	5/1	35	12.2	8.2	9.2	6.4*	22
Shell Creek	7E23	9600	5/1	59	18.3	15.2	15.6		3
<u>LOWER YELLOWSTONE - Porcupine Creek</u>									
Five Springs Falls	7E31	7500	4/30	33	12.0	7.2	5.6		3
Medicine Wheel	7E30	9000	4/25	70	25.9	14.8	16.3		3
<u>LOWER YELLOWSTONE - Tongue River</u>									
Beaver-Tongue Div.	7E20	9200	4/24	78	29.8	17.0	19.3		3
Big Goose #2	7E32	7700	4/29	31	9.0	12.3	11.3		4
Bone-Spring Div.	7E18	9200	4/27	73	23.8	20.3	19.8		3
Burgess R.S. #2	7E33	7900	4/25	40	12.6	6.2	8.4		4
Dome Lake #2	7E34	8800	4/30	41	12.0	13.5	13.7		3
Gloom Creek	7E14	9300	4/26	60	19.8	16.9	16.0		3
Granite Pass	7E17	8950	4/27	67	22.5	20.3	19.9		3
Sibley Lake	7E11	8000	4/28	47	14.4	12.6	10.9		3
Sucker Creek	7E12	9000	4/26	56	19.0	14.9	15.3		3
Steamboat Point	7E10	7500	4/28	41	13.6	12.5	11.0		3
Wood Rock G.S.	7E13	8500	4/26	48	15.1	10.7	15.2		3
<u>LOWER YELLOWSTONE - Powder River</u>									
Muddy Creek G.S.	7E28	7800	4/30	13	3.6	5.7	3.6		3
Munkres Pass	7E8	9700	4/30	40	11.7	12.2	11.4	9.8**	8
Onion Gulch	7E27	8100	4/30	39	12.5	10.3	8.2		3
Soldier Park	7E5	8700	5/1	27	7.5	10.8	6.6	5.9**	8
Sour Dough	7E6	8500	5/2	24	7.3	10.5	10.4	5.4*	19

*Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
 **Average for period of record.

MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

			SNOW COVER MEASUREMENTS						
COLUMBIA DRAINAGE BASIN AND SNOW COURSE			Date of Survey	1959 Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.)			Total Years of Record
No.	Date	1958				1957	15-Year Average 1938-52		
<u>KOOTENAI RIVER</u> (above Libby, Montana)									
Baree Creek	15B11	5500	4/29	103	52.0	48.1	46.6	48.6**	3
Baree Mountain	15B1	6000	4/29	116	53.6	42.9	45.6	40.6	22
Brush Creek	14A4	5000	4/30	30	12.0	T.	11.8	8.7**	15
Ferguson	Can	2900	4/29	49	22.3	16.4	17.1	17.4**	13
Fernie	Can	3500	4/28	0	0	0	0	3.2**	13
Gray Creek	Can	5100	4/28	54	19.3	17.5	21.5	20.3**	11
Kimberley	Can	3800	4/29	0	0	0.7	0	0.7**	3
Marble Canyon	Can	5000	5/4	49	16.8	12.3	14.2	13.6**	12
New Fernie	Can	4100	4/28	Patches		0	0	8.8**	8
Red Mountain	15A1	6000	4/29	51	20.7	21.5	18.8	15.9	22
Sandon	Can	3500	5/1	14	6.6	-	5.3	8.6**	9
Sinclair Pass	Can	4500	5/1	4	0.7	0	1.9	3.0**	9
Smith Creek	16A1	4800	4/29	99	46.3	48.7	43.2	37.3*	20
Sullivan Mine	Can	5100	4/29	31	13.0	13.5	12.1	11.5**	13
Weasel Divide	14A7	5450	4/28	89	37.0	34.0	32.6	32.7*	20
<u>FLATHEAD RIVER</u>									
Basin Creek	13B14A	5000	4/30	0	0	T.	0	2.1**	8
Big Creek	13B3	6750	4/30	136	65.4	56.4	48.1	46.4**	10
Brush Creek	14A4	5000	4/30	30	12.0	T.	11.8	8.7**	15
Coyote Hill	13B10	4200	5/1	6	2.1	1.4	0.7	2.2**	12
Desert Mountain	13A2	5600	4/29	39	16.5	15.8	15.0	9.6	22
Hell Roaring Div.	14A3	5700	4/27	88	39.3	32.4	30.6	28.0*	17
Holbrook	13B13A	4530	4/30	0	0	0	0	1.5**	8
Logan Creek	14A5	4300	4/30	8	2.2	0	6.9	1.6*	20
Marias Pass	13A5M	5250	4/29	50	21.4	15.5	17.0	9.9	24
N. Fork Jocko	13B7	6330	5/1	125	62.4	51.7	42.8	41.8**	11
Spotted Bear Mt.	13B2M	7000				11.2	9.4	12.2**	8
Strawberry Lake	13A10	6500				47.3	42.9	41.9**	10
Trinkus Lake	13B1	6500				48.1	42.0	42.2**	10
Trout Lake	13A12M	3600				3.3	6.4	8.8**	11
Twin Creeks	13B11	3580				T.	0	1.3**	8
Upper Holland	13B5	7000				36.5	34.2	36.5**	8
Weasel Divide	14A7	5450	4/28	89	37	34.0	32.6	31.2*	20

*Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

**Average for period of record.

MONTANA SNOW SURVEYS ABOUT MAY 1, 1959

COLUMBIA DRAINAGE BASIN AND SNOW COURSE		SNOW COVER MEASUREMENTS							Total Years of Record	
		No.	Date	Date of Survey	1959 Snow Depth (In.)	Water Content (In.)	Past Record			
							1958	1957		15-Year Average 1938-52
<u>CLARK FORK</u>										
Baree Creek	15B11	5500	4/29	103	52.0	48.1	46.6	48.6**	3	
Baree Mountain	15B1	6000	4/29	116	53.6	42.9	45.6	40.6*	22	
Chessman Res.	12C5	6200	4/30	7	2.5	4.8	3.1	1.6	23	
Coyote Hill	13B10	4200	5/1	6	2.1	1.4	0.7	2.2**	12	
Fish Lake Airstrip	15C2	5000	4/30	95	40.6	41.7	42.9	43.0**	3	
Freezeout Summit	15B10	6800	5/4	87	37.7	36.4	36.2	31.5*	17	
Hoodoo Creek	15C1	6200	4/30	119	52.1	47.2	51.0	43.4*	16	
Lubrecht For. #6	13C8	5400	5/4	0	0	0	0	-	7	
N. Fork Jocko	13B7	6330	5/1	125	62.4	51.7	42.8	41.8**	11	
Pipestone Pass	12D1	7200	5/1	11	3.2	10.4	5.2	2.2*	19	
Smith Creek	16A1	4800	4/29	99	46.3	48.7	43.2	37.3*	20	
Stemple Pass	12C1	6900	5/1	37	13.4	13.4	9.5	6.8*	24	
Storm Lake	13C7	7780	4/30	38	15.3	21.4	16.4	14.2*	17	
Tenmile, Lower	12C2	6250	5/3	7	2.3	6.7	6.6	2.0	23	
Tenmile, Middle	12C3	6800	5/2	29	9.2	13.4	11.9	6.9	24	
Tenmile, Upper	12C4	8000	5/2	39	14.6	18.5	15.1	10.4	23	
TV Mountain	14B1	6800	5/5	61	24.6	21.0	21.1	21.8**	3	
#49 Meadows	15B3	5000	4/30	62	25.8	31.5	28.4	28.8*	17	
#Lookout	15B2	5250	4/30	77	34.6	38.4	35.3	22.1*	22	
<u>BITTERROOT</u>										
Gibbons Pass	13D2	7100	4/29	53	22.4	26.5	26.0	20.6*	23	
Nezperce Camp	14D2	5580	4/30	23	9.8	14.1	11.5	5.5*	20	
Nezperce Pass	14D1	6575	4/30	26	11.6	17.1	11.7	10.2*	21	
#Lolo Pass	14C5	5230	4/29	70	32.2	31.1	33.8	25.5*	19	
#Powell R. S.	14C6	4230	4/29	0	0					

*Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

**Average for period of record.

#Adjacent Basin.

STATUS OF RESERVOIR STORAGE
May 1, 1959

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET				YRS.
			1959	1958	1957	1938-52 AVG.	
<u>MISSOURI RIVER BASIN - MONTANA</u>							
Beaverhead	Lima	84.0	40.6	50.9	15.2	59.9*	18
Madison River	Hebgen Lake	345.0	181.2	167.8	175.7	234.0	23
Madison River	Ennis Lake	41.0	37.3	33.0	37.5	32.6	23
Hyalite Creek	Middle Creek	8.0	4.8	4.5	3.7	4.6**	7
Missouri River	Canyon Ferry	2043.0	1925.0	1831.0	1478.0	1353.0**	5
Missouri River	Hauser Lake & Lk. Helena	62.5	50.4	52.9	62.5	42.1*	19
Missouri River	Lake Helena	10.4	6.5	7.2	10.4	5.1**	13
Missouri River	Holter Lake	81.9	49.1	71.9	12.6	55.2	21
N.Fk. Sun River	Gibson	105.0	73.2	39.4	46.1	73.0	23
N.Fk. Sun River	Willow Creek	32.3	28.7	24.0	24.5	14.1	23
N.Fk. Sun River	Pishkun	32.0	19.2	17.0	19.0	18.5	23
Marias River	Tiber	1316.0	638.3	674.9	578.7	-	3
Birch Creek	Swift	30.0	30.2	24.7	28.7	24.9	23
Dupuyer & Birch	Lake Francis	112.0	97.2	97.4	92.0	78.8	23
Judith River	Ackley Lake	5.8	-	-	3.7	4.4*	19
Missouri River	Ft. Peck ^{3/}	19410.0	9659.0	8102.0	6372.0	11970.0*	18
Milk River	Fresno	127.2	124.4	125.5	124.4	93.6*	18
Milk River	Nelson	66.8	53.0	55.5	58.9	31.8	23
W. Rosebud Cr.	Mystic Lake	20.8	1.4	3.2	3.3	2.8	23
Tongue River	Tongue River	73.9	23.8	13.9	16.0	19.6*	18
Swiftcurrent Cr.	Sherburne Lake	66.1	29.2	26.9	17.7	24.9	23
<u>MISSOURI RIVER BASIN - WYOMING</u>							
Shoshone River	Buffalo Bill	440.0	44.7	106.2	97.6	266.6	24
Wind River	Boysen	408.6AC	84.1	197.6	202.5	237.9**	7
Wind River	Pilot Butte	31.6	17.9	27.7	27.7	20.9	23
Bull Creek	Bull Lake	152.0	40.0	56.6	60.1	45.6	20
Belle Fourche	Key Hole	190.0AC	1.4	3.2	3.2	13.0**	7

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
 ** Average for period of record.
^{3/} Gross contents: usable capacity less 617.0 A.F; minimum power pool 4,500 A.F.
 AC Active Capacity; USBR Billings.

STATUS OF RESERVOIR STORAGE
May 1, 1959

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET				YRS.
			1959	1958	1957	1938-52 AVG.	
<u>MISSOURI RIVER BASIN - NORTH DAKOTA</u>							
Heart River	Heart Butte	54.8AC	67.5	63.1	50.6	66.2**	9
Heart River	Dickinson	4.3AC	5.5	5.7	5.1	5.4**	8
Missouri River	Garrison Lake	13805.0AC	4051.4	4502.0	1102.5	-	4
James River	Jamestown	20.0AC	1.9	4.9	15.0	-	2
<u>MISSOURI RIVER BASIN - SOUTH DAKOTA</u>							
Belle Fourche	Belle Fourche	185.0AC	63.9	98.8	62.5	-	3
Cheyenne River	Angostura	160.0AC	-	68.8	40.1	-	3
Cheyenne River	Deerfield	15.1AC	9.6	12.2	9.2	12.8**	6
Grand River	Shadehill	84.0AC	82.8	152.8	82.4	148.4**	6
Missouri River	Ft. Randall	4900.0AC	3010.2	2830.5	2132.5	-	4
Missouri River	Gavins Point	385.0AC	234.3	243.7	225.7	-	2
Missouri River	Oahe	Total	696.0	-	-	-	0
Cheyenne River	Pactola	55.0AC	20.7	16.2	2.5	-	2
<u>COLUMBIA RIVER BASIN - MONTANA</u>							
Flint Creek	Georgetown Lake	31.0	21.4	21.6	16.0	21.7*	19
S. Fk. Flathead	Hungry Horse	3500.0	1904.0	2276.0	1970.0	1986.0**	5
Flathead River	Flathead Lake	1791.0	1174.0	722.0	679.0	981.0	15
Flathead River <u>6/</u>	Camas Res.	42.8	39.1	36.9	39.6	25.8*	18
Flathead River <u>7/</u>	Mission Valley	98.6	44.5	24.1	35.0	48.5*	18

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

** Average for period of record.

6/ Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River.

7/ Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.

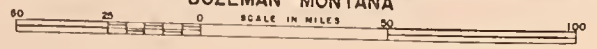
AC Active Storage; USBR Billings.



UPPER MISSOURI RIVER BASIN
SNOW SURVEY COURSES
IN
MONTANA & NORTHERN WYOMING

- LEGEND**
- TOWNS AND CITIES
 - 13D4 SNOW SURVEY COURSE
 - 9G1 IDAHO & WYOMING NUMBERS
 - ▲ STREAM GAGING STATIONS

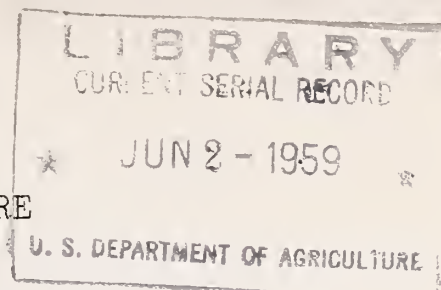
1959
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE
BOZEMAN MONTANA



INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

Drainage Basin and Course Name	Montana Number	Location			Record Began	Measuring Dates	Measured By	Drainage Basin and Course Name	Montana Number	Location			Record Began	Measuring Dates	Measured By	Drainage Basin and Course Name	Montana Number	Location			Record Began	Measuring Dates	Measured By	
		Elev.	Sec. Lat.	Top. Long.						Elev.	Sec. Lat.	Top. Long.						Elev.	Sec. Lat.	Top. Long.				
MISSOURI RIVER DRAINAGE (cont.)																								
(ROCK-BEAVEHEAD)							(UPPER YELLOWSTONE)							(TONQUE RIVER cont.)										
Lakeview Ridge	11E3	7400	27	14S	2W	1948	Camp Senia Canyon	9M	7890	2	8S	18E	1937	4	1	Hores Trail Div.	7E19	9200	29	55N	90W	1956	2,3,4,5	1
Lakeview Canyon	11E4	6930	26	14S	2W	1948	Cooks City	10E3	7750	14	9S	14E	1937	1,2,3,4,5	6	Lake Geneva	7E16	9000	7	52N	86W	1956	2,3,4,5	1
Linskill	12E2	6950	5	15S	9W	1948	Independence	10D7	7400	22	9S	9E	1935	3,4	6	North Tongue	7E15	8800	17	55N	89W	1956	2,3,4,5	1
White Pine Ridge	12E1	8850	18	14S	9W	1948	Lake Camp	10D5	8100	22	7S	12E	1940	3,4	2	Sibley Lake	7E11	8000	10	55N	88W	1956	2,3,4,5	1
(HORSE PRAIRIE)							(SHIELDS RIVER)							(POWDER RIVER) Wyoming										
Bloody Dick	13D10	7600	12	8S	16W	1948	Lupine Creek	10E4	7850	11	10	110°-24'	1936	1,2,3,4,5	6	Madry Creek G.S.	6E2	8200	6	47N	84W	1956	2,3,4,5	1
Old Stone	13D9	8100	11	8S	16W	1948	Lodgepole	10E1	7300	32	56N	106W	1940	2,3,4,5	1,4	Munkers Pass	6E1	7800	2	48N	84W	1956	2,3,4,5	1
Lomhi Pass	13E1	7460	9	10S	15W	1948	(WIND RIVER) Wyoming							COLUMBIA RIVER BASIN										
Terroll Creek	13D12	6650	14	9S	15W	1948	Big Warm	9F12	8800	36	42N	109W	1955	2,3,4,5	1	Brush Creek	13B8	6750	6&7	22N	18W	1941	3,4,5	5
Trail Creek	13E2	7090	15	10S	15W	1948	Brooke Lakes #3	10F8	9200	23	43N	107W	1948	2,3,4,5	1	Cattle Queen	13A1	4700	7	35N	17W	1939	3,4,5	6
Selway Junction	13D11	6800	27	8S	15W	1948	Burroughs Creek	9F4	8800	15	39N	105W	1948	2,3,4,5	1	Desert Mountain	13A2M	5600	24	31N	19W	1937	1,2,3,4,5	1,2
(BIG HOLE)							(LOWER YELLOWSTONE)							KOOTENAI RIVER										
Big Hole Pass	13D3	7240	28	3S	18W	1948	DuHoir	9F6	8750	27	42N	108W	1940	2,3,4,5	1	Bares Creek	15B11	5500	6	25N	30W	1956	4,5,5 1/2	2
Big Hole Pass-Be.	13D4	6900	24	3S	18W	1948	East Fork Oeysser Creek	9F7	8500	12	41N	108W	1948	2,3,4,5	1	Bares Mountain	15B1	6000	1	25N	31W	1937	4,5,5 1/2	2
East Boundary	13D5	6700	22	3S	17W	1948	Little Warm	9F8	9500	24	42N	109W	1939	2,3,4,5	1	Red Mountain	15A1	6000	4	36N	29W	1937	3,4,5,5 1/2	1,2
Gibbons Pass	13D2	7100	4	2S	19W	1934	Sheridan B.S. #1	9F5	7500	3	42N	109W	1939	2,3,4,5	1	Weasel Divide	14A7	5450	8	37N	24W	1955	4,5,5 1/2	1,2
Jainke Creek	13D8	7340	25	7S	16W	1948	Sheridan R.S. #2	9F4	7500	3	42N	109W	1939	2,3,4,5	1	FLATHEAD RIVER								
Miner Forke	13D6	7300	24	6S	17W	1948	T-Croes Ranch	9F3	8000	1	43N	107W	1940	2,3,4,5	1	Basin Creek	13B1A	5000	11	19N	12W	1951	2,3,4,5	2
Miner Lake	13D7	6720	10	6S	16W	1945	Togwotee Pass	10F9	9600	29	44N	110W	1936	2,3,4,5	11	Big Creek	13B8	6750	6&7	22N	18W	1941	3,4,5	5
(WISE RIVER)							(POPO AGIE RIVER) Wyoming							(MADISON RIVER)										
Anderson Mdw.	13D14	7000	18	3S	12W	1948	Blue Ridge	802	9500	23	31N	101W	1939	2,3,4,5	1	Hodgen	11E5	6550	22	11S	3E	1934	1,2,3,4,5	3
Elk Horn	13D15	8450	15	4S	12W	1935	Bruce's Camp	805	6500	24	32N	101W	1955	2,3,4	1	West Yellowstone	11E7	6700	34	13S	5E	1934	1,2,3,4,5	3
Wiss River	13D13	6300	15	2S	12W	1948	Nobb's Park	903	10000	22	2S	3W	1948	2,3,4,5	1	Harris Basin	10E2	7500	44	14	110°-42'	1936	3,4	6
(RUBY RIVER)							(Moosequitto Park B.S.)							(GALLATIN RIVER)										
Flashlight	12D3	6950	22	8S	7W	1945	Sawmill Glade	801	8500	3	31N	101W	1939	2,3,4,5	1	Devils Slide	10D4	8100	14	5S	6E	1935	2,3,4,5	2,1
(OWL CREEK) Wyoming							(Timber Creek #1)							(WOOD RIVER)										
Beavere Mill	9F2	8900	6	43N	102W	1948	Timber Creek #2	9E3	8800	25	47N	103W	1955	2,3,4,5	1	Wood World	10D1	6700	24	3S	6E	1939	1,2,3,4,5	7
Owl Creek	8F1	8700	36	43N	101W	1948	Wood River #1	9F1	8000	28	46N	103W	1939	2,3,4,5	1	21-Mile	11E6	7150	1	11S	5E	1934	1,2,3,4,5	3
(GREYBULL RIVER) Wyoming							(SHOSHONE RIVER) Wyoming							(MISSOURI RIVER MAIN STEM)										
Timber Creek #1	9E2	8800	25-	47N	103W	1948	East Entrance	10E6	7000	17	52N	109W	1948	1,2,3,4,5	6	Ghasman Reservoir	12D5	6200	2	8N	5W	1936	1,2,3,4,5	3
Timber Creek #2	9E3	8800	25	47N	103W	1955	Sylvan Pass	10E5	7100	12	52N	110W	1936	1,2,3,4,5	6	Crystal Lake	9C1	6100	19	12N	18E	1941	3,4	1,2
Wood River #1	9F1	8000	28	46N	103W	1939	(NOMWOOD CREEK) Wyoming							(CRASHOPPER)										
Wood River #2	9F15	8000	28	46N	103W	1956	Gold Springs Camp	7E25	8700	1	50N	88W	1956	2,3,4,5	1	Kings Hill	10C1	7950	35	13N	7E	1934	3,4,5	3
(SHELL CREEK) Wyoming							(TENSLEEP LAKE)							(PIEDMONT PASS)										
Bald Mountain	7E21	9600	33	56N	91W	1956	Medicine Lodge Lks	7E24	9500	7	51N	87W	1956	2,3,4,5	1	Picnic Grounds	12C6	6500	10	5N	6W	1941	2,3,4	4
Beaver-Tongue Div.	7E20	9200	12	55N	91W	1956	Munkers Pass	7E8	9700	11	48N	85W	1950	2,3,4,5	1	Pipestone Pass	12D1	7200	11	1N	7W	1938	3,4,5	1
Bone-Spring Div.	7E18	9200	32	55N	89W	1956	North Powder	7E36	8300	20	47N	85W	1956	2,3,4,5	1	Ten Mile Creek L	12D2	6250	13	8N	6W	1935	1,2,3,4,5	3
Granite Creek Camp	7E22	7800	15	53N	89W	1956	Onion Gulch	7E27	8100	31	48N	85W	1956	2,3,4,5	1	Ten Mile Creek M	12D3	6800	13	8N	6W	1934	1,2,3,4,5	3
Granite Pass	7E17	8950	19	51N	88W	1956	Tensleep Lake	7E26	9075	33	50N	86W	1956	2,3,4,5	1	Ten Mile Creek U	12D4	8000	19	8N	5W	1935	1,2,3,4,5	3
Horse-Trail Div.	7E19	9200	29	55N	90W	1956	Tensleep R.S.	7E7	8300	30	49N	86W	1935	2,3,4,5	1	(TETON RIVER)								
Ranger Creek	7E1	8800	32	53N	89W	1935	Tyrroll R.S.	7E35	8300	30	49N	86W	1956	2,3,4,5	1	Freight Creek	12A1	6000	13	26N	10W	1948	3,4	1
Shell Creek	7E23	9600	12	52N	88W	1956	(MARIAS RIVER)							(WALDRON CREEK)										
(FORCUPINE CREEK) Wyoming							(TONGUE RIVER) Wyoming							(WEST FORK)										
Five Spgs. Falls	7E31	7500	19	56N	92W	1956	Beaver Tongue Div.	7E20	9200	12	55N	91W	1956	2,3,4,5	1	Waldron Creek	12B2	5600	16	25N	9W	1948	3,4	1
Medicine Wheel	7E30	9000	24	56N	92W	1956	Big Goose #1	7E2	7700	4	53N	86W	1935	2,3,4,5	1	West Fork	12B1	6000	6	25N	9W	1948	3,4	1
(TONQUE RIVER) Wyoming							(MUSSELSHELL RIVER)							(SUN RIVER)										
Beaver Tongue Div.	7E20	9200	12	55N	91W	1956	Grasshopper	10C2	7000	19	9N	8S	1938	3,4	2	Benchmark	12B8	5500	9	20N	10W	1948	3,4	1
Big Goose #1	7E2	7700	4	53N	86W	1935	(CLARK FORK)							(CABIN CREEK)										
Big Goose #2	7E32	7700	4	53N	86W	1955	Baree Creek	15B11	5500	6	25N	30W	1956	4,5,5 1/2	2	12B6	5400	33	23N	10W	1949	3,4	1,2	
Bone-Spring Div.	7E18	9200	32	55N	89W	1956	Baree Mountain	15B1	6000	1	25N	31W	1937	4,5,5 1/2	2	12B9	5600	36	20N	10W	1948	3,4	1,2	
Burgess B.S. #1	7E1	7900	36	56N	89W	1950	Coyote Mill	13B10	4200	12	18N	16W	1952	1,2,3,4,5	2	12B5	5300	31	21N	10W	1949	3,4	1,2	
Burgess B.S. #2	7E33	7900	36	56N	89W	1955	El Dorado Mine	13C9	7800	23	8N	12W	1949	4	1	12B7	7000	20	27N	10W	1949	3,4	1,2	
Dome Lake #1	7E3	8800	11	53N	87W	1950	Fred Burr Pass	13C11	8000	12	6N	13W	1957	3,4,5	1	12B3	6800	17	25N	10W	1949	3,4	1,2	
Dome Lake #2	7E34	8800	11	53N	87W	1950	Freezeout Summit	13C10	6800	21	15N	27W	1937	4,5	2	12B4	5700	32	25N	10W	1949	3,4	1,2	
Gloom Creek	7E14	9300	32	55N	87W	1956	Gold Creek Lk.	13C10	7200	14	8N	12W	1949	4	1	(BITTEBOUT RIVER)								
Granite Pass	7E17	8950	19	51N	88W	1956	Hoodoo Creek	13C1	6200	9	14N	27W	1937	4,5	2	East Fork R.S.	13D1	5400	16	2N	17W	1937	4	1
(SASKATCHEWAN RIVER BASIN)							(ST. MARY RIVER)							(GIBBONS PASS)										
(MONTANA EXPERIMENT STATION)							(CITY OF BOZEMAN)							(LALO PASS)										
(DOMINION WATER & POWER BUREAU)							(U. S. FISH AND WILDLIFE SERVICE)							(NEZ PERCE PASS)										
(U. S. BUREAU OF RECLAMATION)							(MONTANA STATE FORESTRY SCHOOL)							(POWELL R.S.)										
(NATIONAL PARK SERVICE)							(SOIL MOISTURE)							(SKALKOHO SUMMIT)										
(AERIAL MARKER)							(ST. MARY RIVER)							(ICEBERG LAKE #3)										
(U. S. FOREST SERVICE)							(JOSEPHINE UPPER)							(JOSEPHINE LOWER #9)										
(U. S. GEOLOGICAL SURVEY)							(MOUNT ALLEN #7)																	

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UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Box 855
Bozeman, Montana

MONTANA SNOW SURVEY DATA - MAY 15, 1959

Following are snow survey measurements made on or about May 15, 1959 in the Kootenai River basin in northwestern Montana:

COLUMBIA DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	SNOW COVER MEASUREMENTS					Years of Record
				1959 Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.)		15-Year Average 1938-52	
						1958	1957		
<u>KOOTENAI RIVER</u>									
Baree Creek	15B11	5500	5/15	90	47.4	32.8	27.7	-	3
Baree Mountain	15B1	6000	5/15	108	54.0	35.6	36.0	48.5**	8
Red Mountain	15A1	6000	5/14	42	18.8	13.5	9.0	19.6**	7
Weasel Divide	14A7	5450	5/15	72	32.3	24.5	22.9	32.2**	8
Sullivan Mine	Can	5100	5/15	21	9.6	T.	-	7.2**	6

Following are snow survey data for the Flathead basin for insertion (page 14) in the May 1, 1959 Snow Survey and Water Supply Forecasts bulletin:

FLATHEAD RIVER

Spotted Bear Mt.	13B2M	7000	5/4	34	13.8	11.2	9.4	12.2**	8
Strawberry Lake	13A10	6500	5/1	98	44.3	47.3	42.9	41.9**	10
Trinkus Lake	13B1	6500	5/2	126	58.8	48.1	42.0	42.2**	10
Trout Lake	13A12M	3600	5/4	10	3.6	3.3	6.4	8.8**	11
Twin Creeks	13B11	3580	5/4	0	0	T.	0	1.3**	8
Upper Holland Lk.	13B5	7000	5/1	110	50.8	36.5	34.2	36.5**	8

**Average for period of record.

Agencies Cooperating in Collecting Data Contained
in this Bulletin

U. S. Forest Service
Region I, Missoula, Montana

U. S. Geological Survey
Helena, Montana

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Omaha, Nebraska
Riverdale, N. D.

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana

U. S. Fish & Wildlife Service
Red Rock Lakes Refuge
Monida, Montana

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Billings, Montana
Boise, Idaho

Montana Power Company
Butte, Montana

City of Bozeman
Bozeman, Montana

Bonneville Power Administration
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Yellowstone National Park
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Agricultural Experiment Station
North Montana Branch Station
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Soil Conservation Service
Montana, Wyoming, Idaho

Soil Conservation Districts
Montana Counties

Johnson Flying Service, Inc.
Missoula, Montana

Water Rights Branch
Dept. of Lands & Forests
Victoria, British Columbia

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Calgary, Alberta



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COOPERATIVE SNOW SURVEYS

Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"