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United States
Department of
Agriculture

Natural
Resources
Conservation
Service



Washington Basin Outlook Report March 1, 1996

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Basin Outlook Reports

and Federal - State - Private Cooperative Snow Surveys

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How forecasts are made

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Natural Resources Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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Washington Water Supply Outlook

March 1996

General Outlook

After the devastating floods and the ensuing cleanup, February seemed to cruise by without any further notable weather events. For the most part Washington was locked into a pattern of cool dry weather. This pattern was a saving grace for the thousands who were trying to pick up the pieces and rebuild their lives after being forced from homes, schools and businesses earlier in the month. The effects of this season's floods will be felt and remembered for years to come.

Streamflow

Forecasts for summer streamflow are for near to above average with a few streams on the westside forecasted below average. They vary from 142% of average for the Methow River near Pateros to 81% of normal for the Elwha River near Port Angeles. March forecasts for some Western Washington streams include: Cedar River near Cedar Falls, 88%; Green River, 105%; and the Dungeness River, 88%. Some Eastern Washington streams include Mill Creek at Walla Walla, 98%; the Wenatchee River at Peshastin, 108%; the Columbia River at The Dalles, 112%; and the Colville River, 107%. February streamflows varied greatly throughout the state but were all well above normal. The Naches at Naches River was the highest at 531% of average; and the Methow at Pateros, with 167% of normal, was the lowest in the state. Other streamflows were the following percentage of normal: Cowlitz River, 291%; Okanogan River, 245%; Spokane River, 328%; Columbia River at the Canadian border, 185%; and Yakima River at Parker, 384%.

BASIN

PERCENT OF AVERAGE
MOST PROBABLE FORECAST
(50 PERCENT CHANCE OF EXCEEDANCE)

Spokane.....	91
Colville-Pend Oreille.....	104-126
Okanogan-Methow.....	109-142
Wenatchee-Chelan.....	101-139
Yakima.....	106-125
Walla Walla.....	98-114
Cowlitz-Lewis.....	92-125
White-Green-Cedar.....	85-105
North Puget Sound.....	95-96
Olympic Peninsula.....	81-88

Snowpack

The March 1 statewide SNOTEL reading showed the snowpack at 89% of average. Snowpack varied across the state, with Olympic Peninsula River Basin reporting the lowest with 45% of average, and Entiat River Basin recording the highest at 144% of normal. Westside averages from SNOTEL and March 1 snow surveys include North Puget Sound River Basins with 79% of normal; White-Green-Cedar River Basins with 75%; and Lewis-Cowlitz Basins with 74% of normal. Snowpack along the east slopes of the Cascade Mountains include the Yakima with 95%, and the Wenatchee with 104%. Snowpack in Spokane River Basin was at 70%; Pend Oreille River Basin, including Canadian data, had 108% of normal. Maximum snow cover was at Lyman Lake SNOTEL in the north-central Cascade Mountains, with a water content of 63.1 inches. This site would normally have 48.4 inches of water content on March 1. High average in the state goes to Spirit Lake SNOTEL near Mt. St. Helens with 157% of normal. March 1 surveys indicated significant meltout at many of the lower to mid-elevation snow courses, bringing some basin-wide averages down slightly from last month. SNOTEL did not show any significant decreases.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane.....	85.....	70
Colville.....	NA.....	NA
Pend Oreille.....	134.....	108
Okanogan.....	105.....	111
Methow.....	95.....	126
Wenatchee.....	87.....	104
Chelan.....	107.....	131
Yakima.....	85.....	95
Walla Walla.....	83.....	82
Cowlitz.....	85.....	86
Lewis.....	63.....	62
White.....	86.....	103
Green.....	76.....	65
North Puget Sound.....	74.....	79
Olympic Peninsula.....	55.....	45

For more information contact your local Natural Resources Conservation Service office.

Precipitation

During the month of February the National Weather Service and Natural Resources Conservation Service climate stations showed above to much above normal precipitation across the state. The highest percent of average in the state was at Rimrock Dam in Yakima County, which reported 348% of normal for a total of 10.3 inches. Normal for this site is 2.9 inches for February. Averages for the water year varied from 116% of normal in the Olympic Peninsula River Basins, to 205% of normal in the Yakima River basin. The highest average for the year is 209% of normal at Bumping Ridge SNOTEL site in Yakima County.

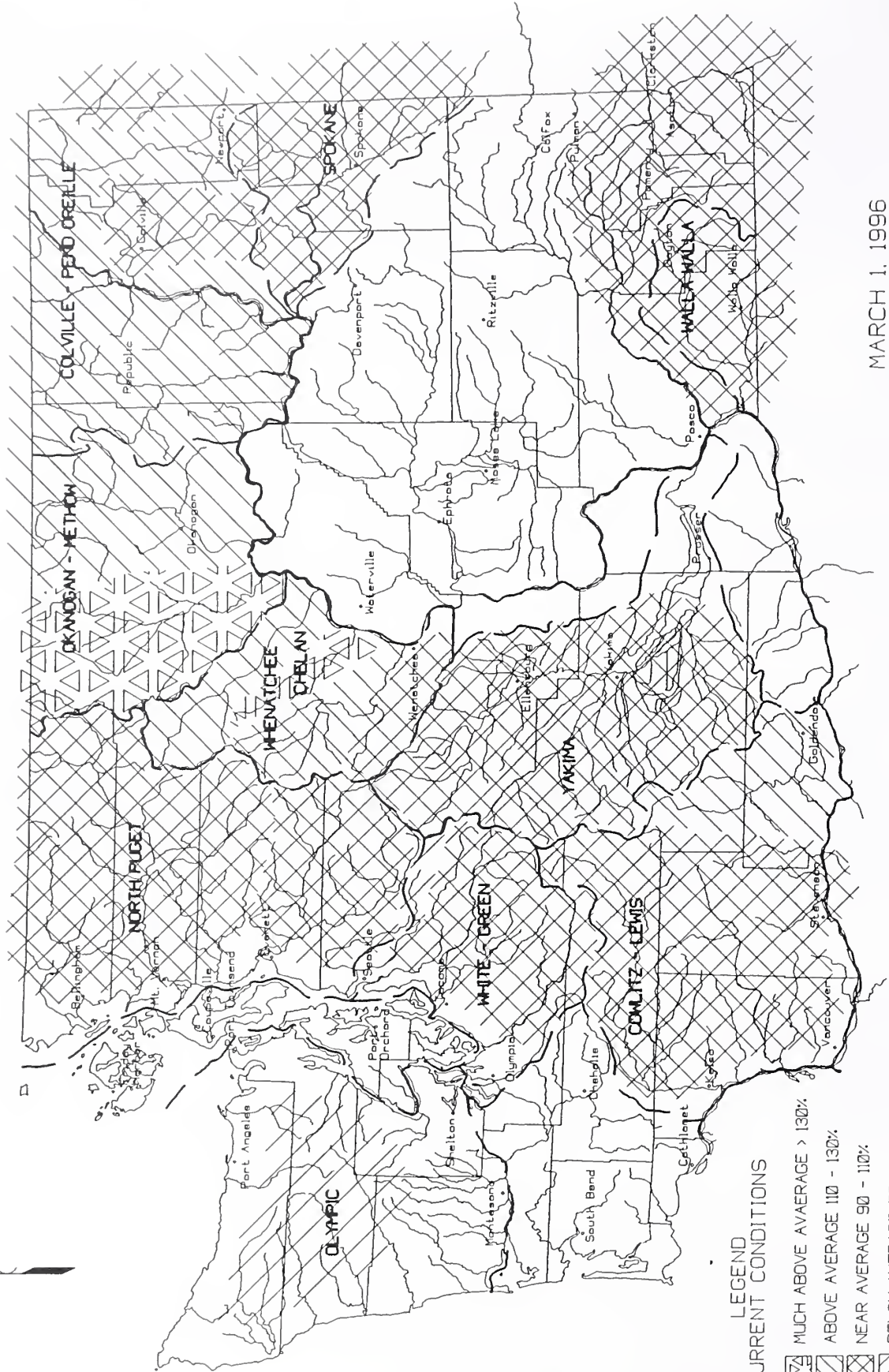
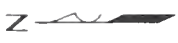
BASIN	FEBRUARY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane.....	201.....	149
Colville-Pend Oreille.....	165.....	135
Okanogan-Methow.....	156.....	124
Wenatchee-Chelan.....	190.....	151
Yakima.....	205.....	171
Walla Walla.....	158.....	140
Cowlitz-Lewis.....	193.....	161
White-Green-Cedar.....	168.....	158
North Puget Sound.....	163.....	159
Olympic Peninsula.....	116.....	122

Reservoir

Reservoir storage in Washington remained above average for March 1. Reservoir storage in the Yakima Basin was 911,500 acre feet, 131% of normal. Storage at other reservoirs included Roosevelt at 143% of average, and the Okanogan reservoirs with 131% of normal for March 1. The power generation reservoirs include the following: Coeur d'Alene Lake, 293,500 acre feet, or 197% of normal; Chelan Lake, 470,00 acre feet, 280% of average and 70% of capacity; and Ross Lake at 370% of average and 81% of capacity.

BASIN	PERCENT OF CAPACITY	PERCENT OF AVERAGE
Spokane.....	123.....	197
Colville-Pend Oreille.....	78.....	138
Okanogan-Methow.....	78.....	131
Wenatchee-Chelan.....	70.....	280
Yakima.....	86.....	131
North Puget Sound.....	81.....	370

For more information contact your local Natural Resources Conservation Service office.



LEGEND
CURRENT CONDITIONS

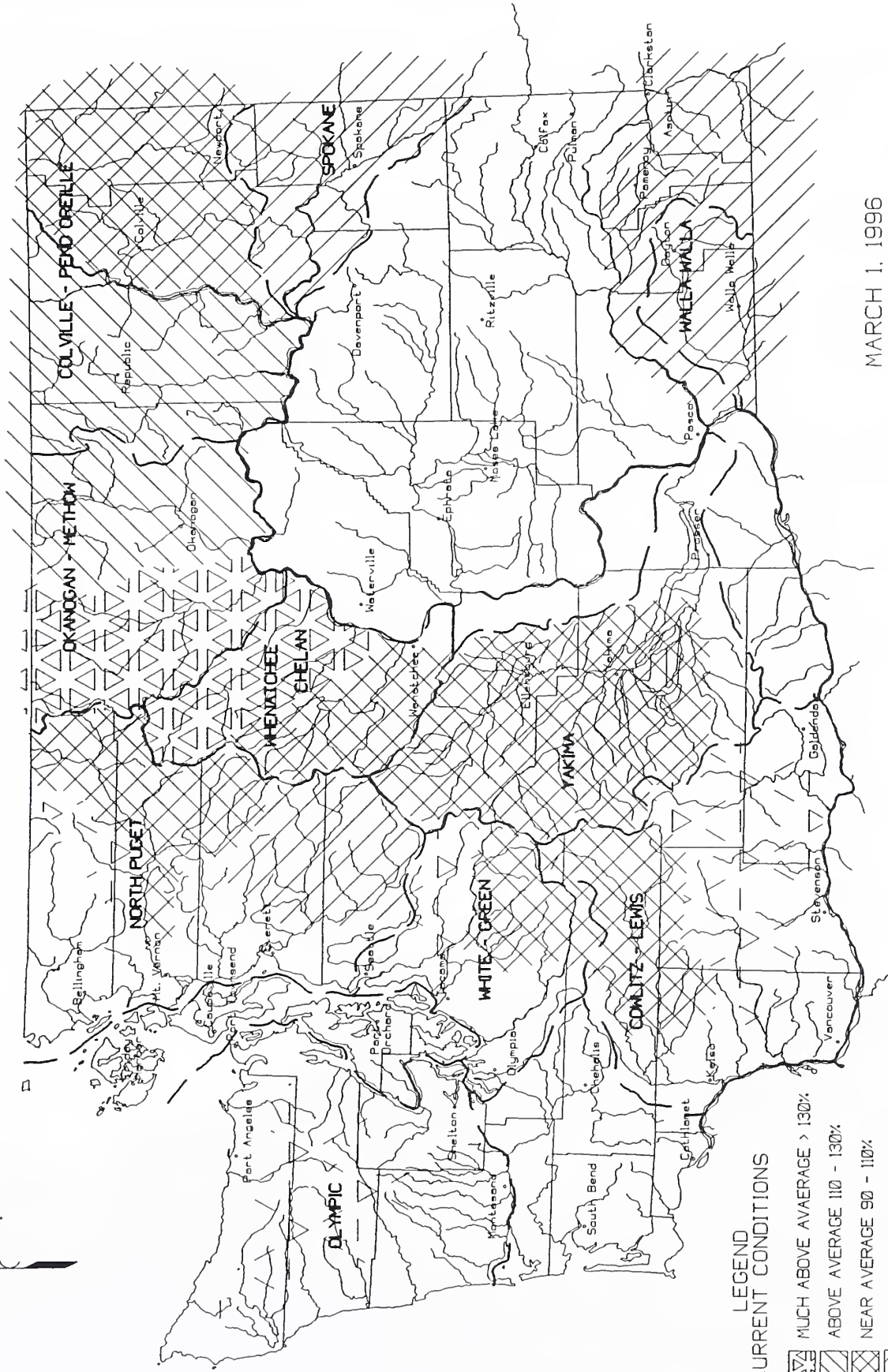
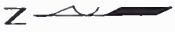
- MUCH ABOVE AVERAGE > 130%
- ABOVE AVERAGE 110 - 130%
- NEAR AVERAGE 90 - 110%
- BELOW AVERAGE 70 - 90%
- MUCH BELOW AVERAGE < 70%
- NOT FORCASTED
- WATERSHED BOUNDARY

MARCH 1, 1996








STREAMFLOW PROSPECTS WASHINGTON

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

NTS



LEGEND
CURRENT CONDITIONS

-  MUCH ABOVE AVERAGE > 130%
-  ABOVE AVERAGE 110 - 130%
-  NEAR AVERAGE 90 - 110%
-  BELOW AVERAGE 70 - 90%
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-  WATERSHED BOUNDARY

MARCH 1, 1996

MOUNTAIN SNOWPACK
WASHINGTON

US DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

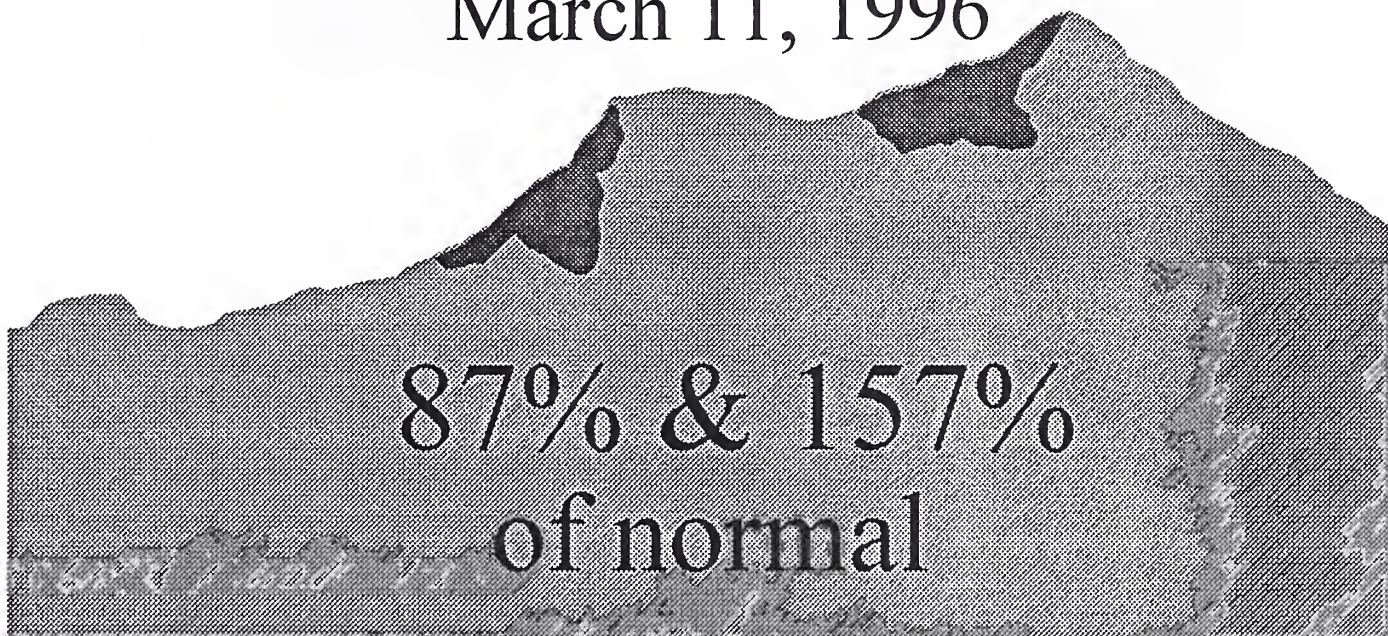
NTS

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
LYNN LAKE	4000	3/01/96	---	12.8E	9.6	16.0
SAWMILL RIDGE	4700	2/28/96	44	17.2	29.5	29.7
STAMPEDE PASS PILLOW	3860	3/01/96	---	29.8S	48.5	38.2
TWIN CAMP	4100	2/28/96	43	15.5	17.8	21.8
CEDAR RIVER						
CITY CABIN	2390	2/27/96	25	8.8	9.8	12.3
MT. GARDNER	3300	2/27/96	19	6.4	5.0	14.2
MT. GARDNER PILLOW	2860	3/01/96	---	9.0S	9.3	14.2
TINKHAM CREEK PILLOW	3000	3/01/96	---	18.5S	24.3	17.2
MEADOWS PASS PILLOW	3240	3/01/96	---	11.3S	12.0	18.1
SNOQUALMIE RIVER						
ALPINE MEADOWS	3500	2/27/96	50	16.6	32.0	33.8
OLALLIE MDWS PILLOW	3960	3/01/96	---	35.9S	39.5	44.6
OLALLIE MEADOWS	3630	3/01/96	29	18.4	24.7	38.7
SKYKOMISH RIVER						
STAMPEDE PASS PILLOW	3860	3/01/96	---	29.8S	48.5	38.2
STEVENS PASS PILLOW	4070	3/01/96	---	30.0S	41.3	34.7
STEVENS PASS SAND SD	3700	2/28/96	63	23.3	30.9	31.1
SKAGIT RIVER						
BEAVER CREEK TRAIL	2200	2/28/96	26	7.7	10.8	12.6
BEAVER PASS	3680	2/28/96	50	16.2	26.4	25.1
BROWN TOP AM	6000	2/28/96	134	51.0	56.0	51.9
CLOUDY PASS AM	6500	3/01/96	123	49.2	51.2	32.9
DEVILS PARK	5900	2/29/96	114	42.6	43.0	36.9
FREEZEOUT CK. TRAIL	3500	2/29/96	22	6.6	10.8	11.1
HARTS PASS	6500	2/29/96	125	43.1	40.0	36.2
HARTS PASS PILLOW	6500	3/01/96	---	47.6S	44.0	34.6
KLESILKWA CAN.	3710	3/01/96	10	2.4	4.0	11.4

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
LIGHTNING LAKE CAN.	4000	3/03/96	40	12.1	10.9	11.9
LYMAN LAKE PILLOW	5900	3/01/96	---	63.1S	64.1	48.4
MEADOWS CABIN	1900	2/29/96	8	3.1	2.3	6.2
NEW HOZOMEEN LAKE	2800	2/28/96	20	5.5	6.3	10.9
RAINY PASS	4780	3/01/96	94	31.0	40.0	33.4
RAINY PASS PILLOW	4780	3/01/96	---	51.3S	48.6	32.7
THUNDER BASIN	4200	3/01/96	49	14.8	19.2	18.5
THUNDER BASIN PILLOW	4200	3/01/96	---	27.7S	30.1	32.3
BAKER RIVER						
DOCK BUTTE AM	3800	2/29/96	65	26.0	49.0	56.1
EASY PASS AM	5200	2/29/96	120	53.0	86.0	64.5
JASPER PASS AM	5400	2/29/96	125	50.0	86.0	75.0
MARTEN LAKE AM	3600	2/29/96	84	33.0	63.0	63.6
MT. BLUM AM	5800	2/29/96	100	40.0	61.0	55.9
ROCKY CREEK AM	2100	2/29/96	36	14.0	33.0	25.2
SCHREIBERS MDW AM	3400	2/29/96	58	23.0	48.0	47.9
SF THUNDER CK AM	2200	2/29/96	4	1.5	.0	7.9
WATSON LAKES AM	4500	2/29/96	68	26.0	40.0	53.3
ELWHA RIVER						
HURRICANE	4500	2/29/96	18	4.0	10.4	17.4
MORSE CREEK						
COX VALLEY	4500	2/28/96	63	15.7	31.3	32.4
DUNGENESS RIVER						
DEER PARK	5200	2/28/96	30	7.8	11.2	17.3
QUILCENE RIVER						
MOUNT CRAG PILLOW	4050	3/01/96	---	16.9S	28.3	26.5
WYNOOCHEE RIVER						
CARROL PASS	3650	2/25/96	35	9.0	--	23.8

(d) Denotes discontinued site.

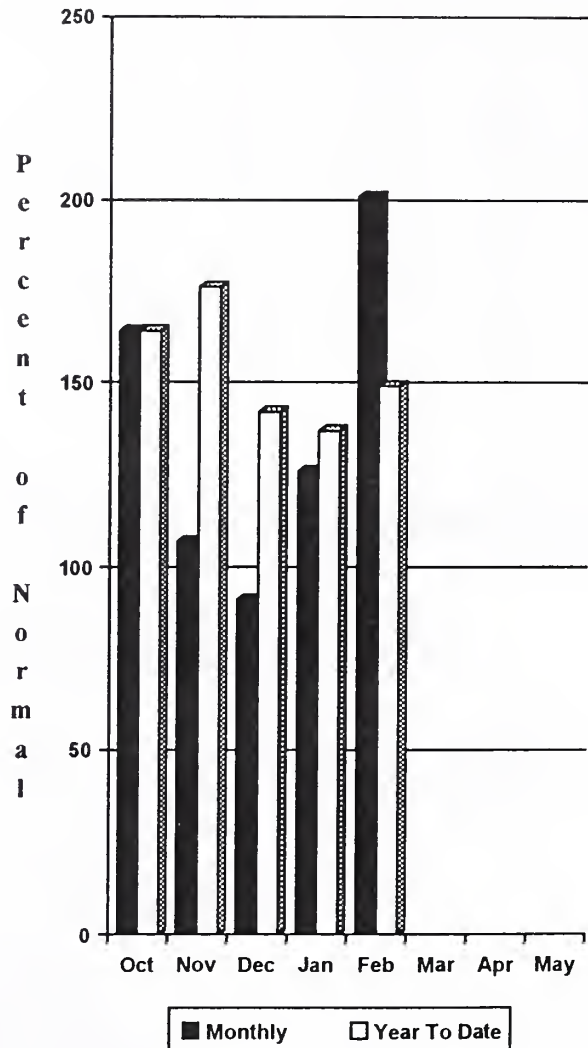
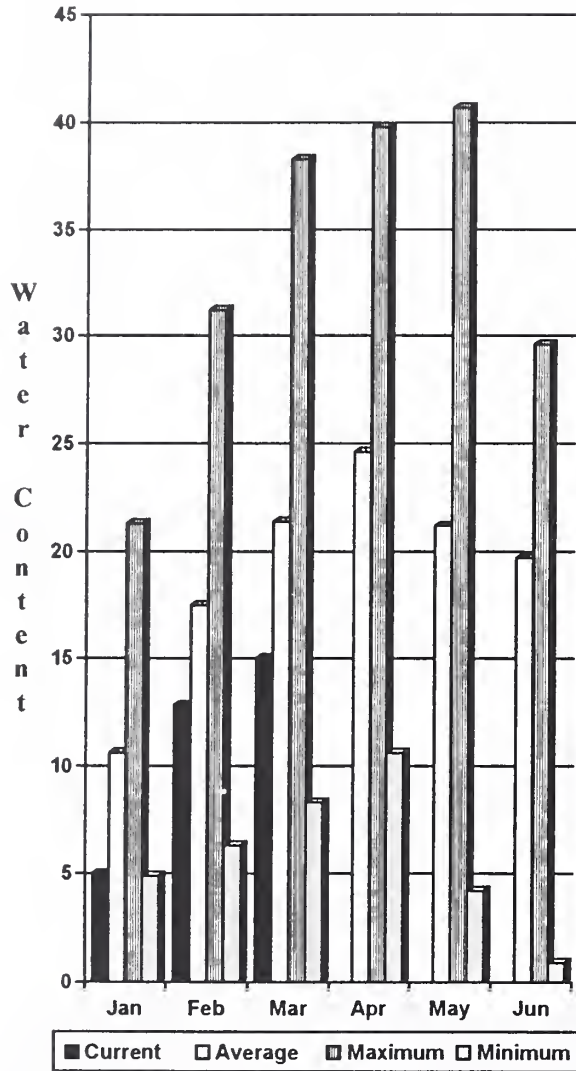
Washington Mountain Snowpack & Precipitation March 11, 1996



Spokane River Basin

Mountain Snowpack* (inches)

Precipitation* (% of normal)



*Based on selected stations

The March 1 forecasts for summer runoff within the Spokane River Basin are 91% of normal, about the same as last year at this time. The forecast is based on a basin snowpack that is 70% of average and precipitation that is 149% of normal for the water year. Precipitation for February was 201% of average. Streamflow on the Spokane River was 328% of average for February. March 1 storage in Coeur d'Alene Lake was 293,500 acre feet, 197% of normal, and 123% of capacity.

For more information contact your local Natural Resources Conservation Service office.

SPOKANE RIVER BASIN

Streamflow Forecasts - March 1, 1996

Forecast Point	Forecast Period	Drier		Future Conditions		Wetter		30-Yr Avg. (1000AF)
		90%	70%	Chance Of Exceeding *		30%	10%	
		(1000AF)	(1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	(1000AF)	(1000AF)	
SPOKANE near Post Falls (2)	APR-SEP	1900	2250	2490	91	2730	3080	2730
	APR-JUL	1820	2160	2400	91	2640	2980	2633
SPOKANE at Long Lake	APR-JUL	2050	2420	2670	91	2920	3290	2936
	APR-SEP	2230	2610	2870	91	3130	3510	3159

SPOKANE RIVER BASIN Reservoir Storage (1000 AF) - End of February

SPOKANE RIVER BASIN Watershed Snowpack Analysis - March 1, 1996

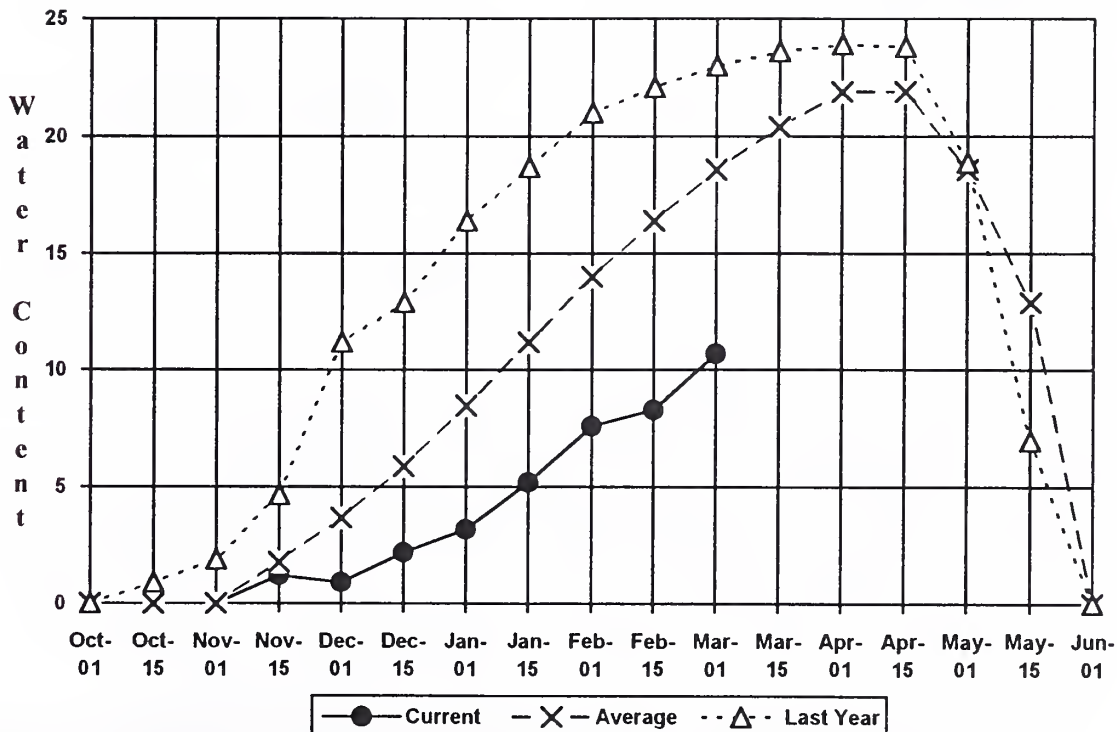
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
COEUR D'ALENE	238.5	293.5	348.5	149.1	Spokane River	18	85	70

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

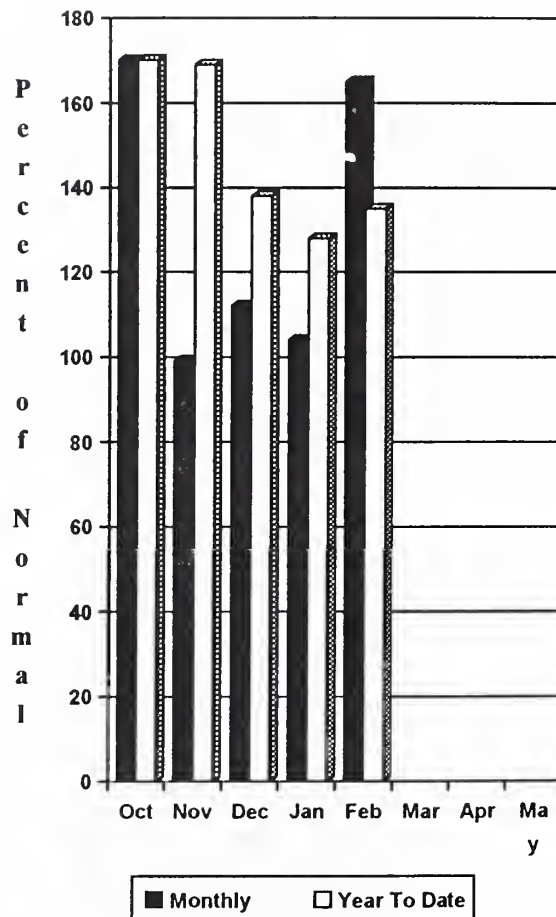
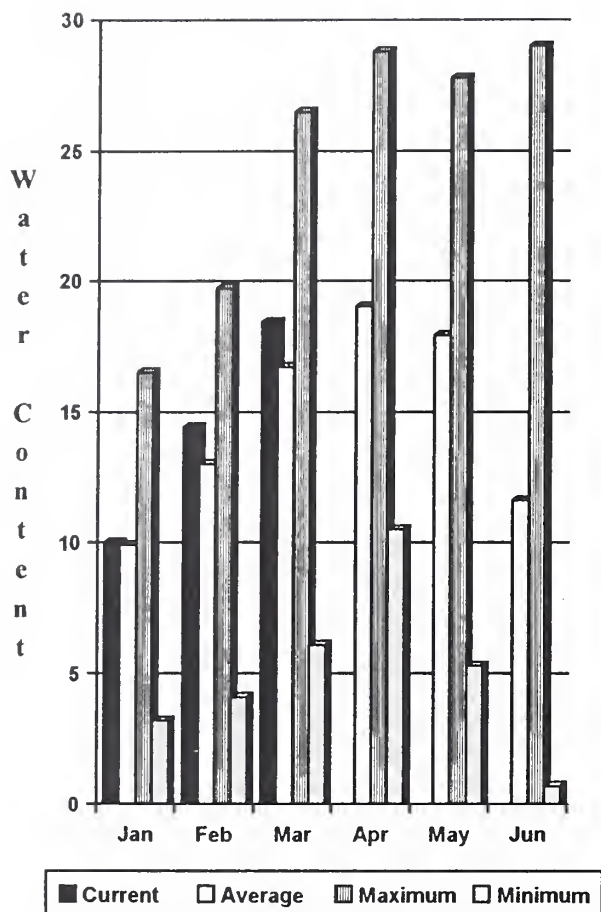
Quartz Peak SNOTEL Elevation 4700 ft.



Colville - Pend Oreille River Basins

Mountain Snowpack* (inches)

Precipitation* (% of normal)



*Based on selected stations

Forecasts for the basin are essentially unchanged from last month. The forecast for the Kettle River streamflow is for 126% of normal; the Pend Oreille, below Box Canyon, 113%; Priest River, near the town of Priest River, 104% of normal for the summer runoff period. Forecast for the Columbia River at Birchbank is for runoff to be 117% of average. February streamflow was 285% of normal on the Pend Oreille River; 185% on the Columbia at the International Boundary; and 255% on the Kettle River. March 1 snow cover was 108% of normal in the Pend Oreille Basin, and 113% for the Kettle River Basin. Precipitation during February was 165% of average, bringing the water year-to-date to 135% of normal.

For more information contact your local Natural Resources Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

Streamflow Forecasts - March 1, 1996

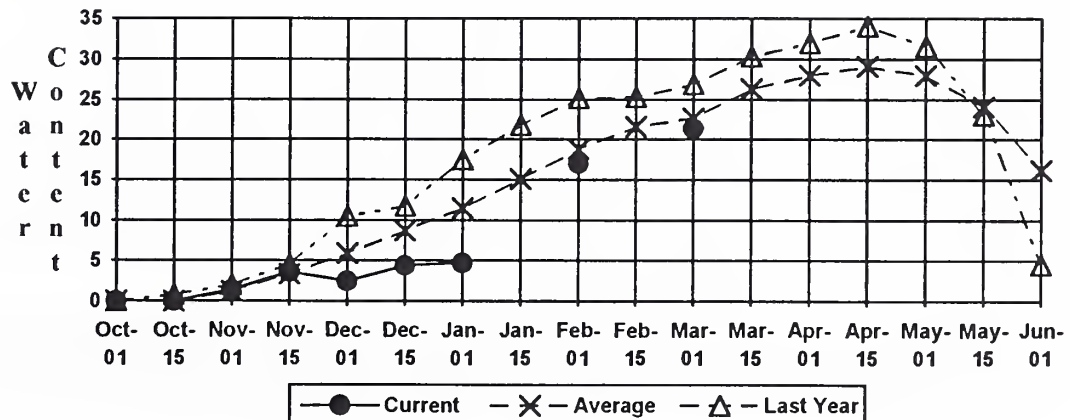
Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		Chance Of Exceeding *		Wetter		
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
PEND OREILLE Lake Inflow (1,2)	APR-JUL	11900	14000	15000	114	16000	18100	13150
	APR-SEP	13000	15400	16400	114	17500	19800	14370
	APR-JUN	10100	12100	13000	114	13900	15900	11390
PRIEST nr Priest River (1,2)	APR-JUL	635	780	850	104	920	1070	814
	APR-SEP	675	835	905	104	975	1140	868
PEND OREILLE bl Box Canyon (1,2)	APR-JUL	12400	14300	15100	113	15900	17800	13380
	APR-SEP	13300	15600	16500	113	17400	19600	14590
	APR-JUN	10700	12300	13070	113	13800	15400	11570
CHAMOKANE CK nr Long Lake	MAY-AUG	3.6	7.2	9.6	102	12.0	15.6	9.4
COLVILLE at Kettle Falls	APR-SEP	100	124	140	107	156	180	131
	APR-JUL	91	113	128	107	143	165	120
	APR-JUN	85	105	118	106	131	151	111
KETTLE near Laurier	APR-SEP	2030	2210	2340	126	2470	2650	1854
	APR-JUL	1940	2110	2220	126	2330	2500	1761
	APR-JUN	1750	1900	2000	126	2100	2250	1585
COLUMBIA at Birchbank (1,2)	APR-JUL	36000	39400	41000	117	42600	46000	35140
	APR-SEP	44800	49100	51100	117	53100	57400	43810
	APR-JUN	25900	28400	29500	115	30600	33100	25670
COLUMBIA at Grand Coulee Dm (1,2)	APR-SEP	65200	72300	75500	116	78700	85800	64850
	APR-JUL	54300	60200	62900	115	65600	71500	54543
	APR-JUN	42500	47100	49170	115	51300	55900	42756

COLVILLE - PEND OREILLE RIVER BASINS Reservoir Storage (1000 AF) - End of February					COLVILLE - PEND OREILLE RIVER BASINS Watershed Snowpack Analysis - March 1, 1996			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ROOSEVELT	5232.0	3964.4	2730.7	2763.0	Colville River	0	0	0
BANKS	715.0	681.6	613.3	606.0	Pend Oreille River	92	135	108
					Kettle River	10	119	113

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.
The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

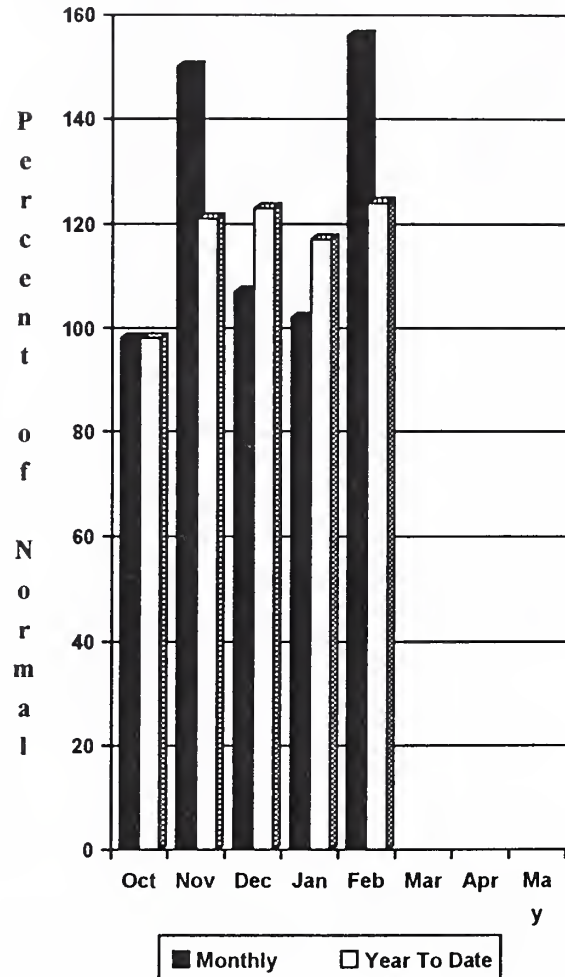
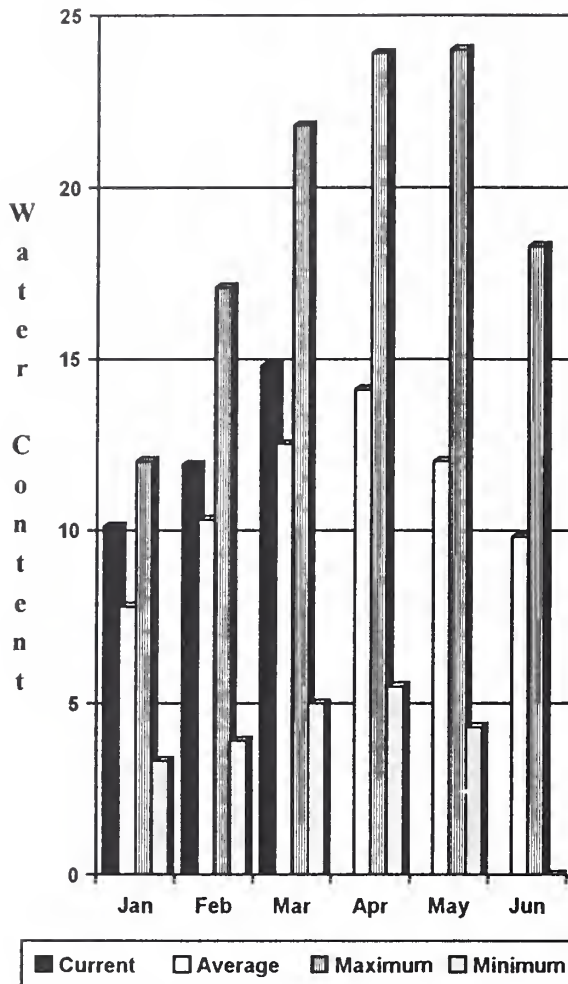
Bunchgrass Meadow SNOTEL Elevation 5000 ft.



Okanogan - Methow River Basins

Mountain Snowpack* (inches)

Precipitation* (% of normal)



*Based on selected stations

Summer runoff forecast for the Okanogan River is 126% of normal; the Similkameen River, 130%; the Methow River, 142%; and Salmon Creek, 109% of normal. March 1 snow cover on the Okanogan was 111% of normal, and on the Methow, 126%. February precipitation in the Okanogan-Methow was 156% of normal, with water year-to-date at 124% of average. February streamflow on the Methow River was 167% of normal; 245% on the Okanogan River; and 288% on the Similkameen. Snow-water-content at the Harts Pass SNOTEL, elevation 6,500 feet, was 47.6 inches; normal for this site is 34.6 inches. Storage in the Conconully Reservoirs was 18,300 acre feet, which is 78% of capacity and 131% of the March 1 average.

For more information contact your local Natural Resources Conservation Service office.

OKANOGAN - METHOW RIVER BASINS
Streamflow Forecasts - March 1, 1996

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		50% (Most Probable)		Wetter		
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
SIMILKAMEEN nr Nighthawk (1)	APR-SEP	1430	1720	1820	130	1920	2220	1399
	APR-JUL	1410	1610	1700	130	1790	1990	1304
	APR-JUN	1220	1380	1458	131	1530	1700	1113
OKANOGAN RIVER nr Tonasket (1)	APR-SEP	1430	1840	2040	126	2240	2650	1624
	APR-JUL	1280	1670	1846	126	2020	2410	1467
	APR-JUN	1160	1450	1580	128	1710	2000	1234
SALMON CREEK near Conconully	APR-JUL	8.0	15.6	21	109	26	34	19.1
	APR-SEP	8.5	16.4	22	109	27	35	20
METHOW RIVER near Pateros	APR-SEP	1010	1280	1340	142	1400	1670	942
	APR-JUL	1070	1150	1200	137	1250	1330	873
	APR-JUN	905	980	1030	138	1080	1160	746

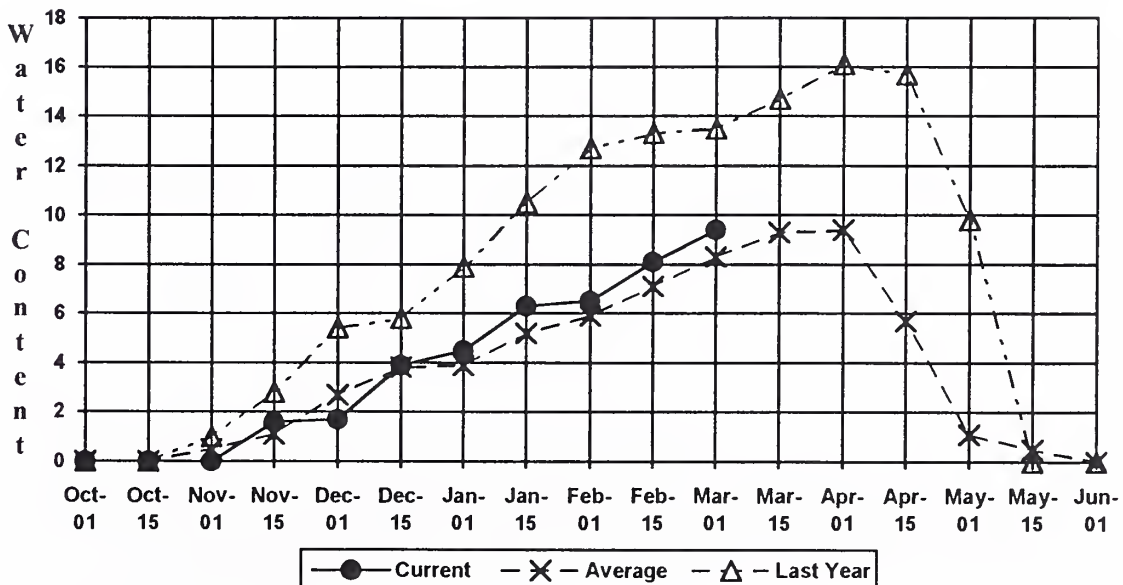
OKANOGAN - METHOW RIVER BASINS Reservoir Storage (1000 AF) - End of February				OKANOGAN - METHOW RIVER BASINS Watershed Snowpack Analysis - March 1, 1996				
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
SALMON LAKE		NO REPORT			Okanogan River	27	105	111
CONCONULLY RESERVOIR		NO REPORT			Methow River	4	95	126

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

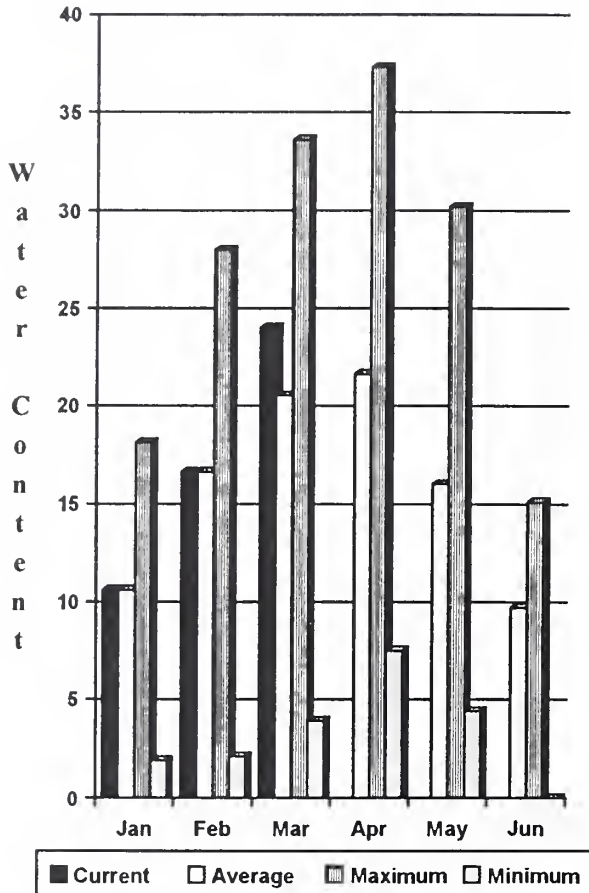
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

Salmon Meadows SNOTEL
Elevation 4500 ft.

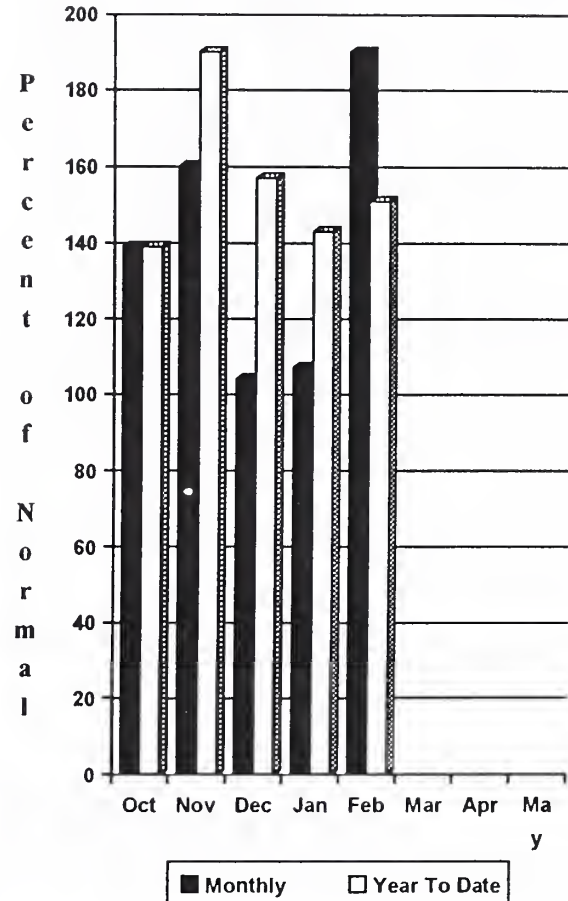


Wenatchee - Chelan River Basins

Mountain Snowpack* (inches)



Precipitation* (% of normal)



*Based on selected stations

Precipitation during February was 190% of normal in the basin and 151% for the year-to-date. Runoff for the Entiat River is forecast to be 139% of normal for the summer. The April-September forecast for the Chelan River is for 117%; for the Wenatchee River, 108%; and 117% on the Stehekin. Icicle Creek is forecast to be 101% of normal this summer. Streamflow for February on the Chelan River was 207% of average; on the Wenatchee River it was 284% of normal. March 1 snowpack in the Wenatchee Basin was 104% of average. The Chelan Basin was 131% of average, and Stemilt Creek was at 89% of normal. Snowpack in the Entiat River Basin was at 144% of average, up from 118% last month. Reservoir storage in Lake Chelan was 470,00 acre feet or 280% of March 1 average and 70% of capacity. Lyman Lake SNOTEL had the most snow water with 63.1 inches of water. This site normally has 48.4 inches and last year it had 64.1 inches on March 1.

For more information contact your local Natural Resources Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

Streamflow Forecasts - March 1, 1996

Forecast Point	Forecast Period	<<----- Drier ----- Future Conditions ----- Wetter ----->>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	10% (1000AF)	30% (1000AF)	10% (1000AF)	
CHELAN RIVER near Chelan	APR-SEP	1200	1290	1360	117	1430	1520	1160
	APR-JUL	1070	1160	1210	118	1270	1350	1024
	APR-JUN	850	920	970	119	1020	1090	812
STEHEKIN near STEHEKIN	APR-SEP	860	925	970	117	1010	1080	827
	APR-JUL	745	795	830	118	865	915	701
	APR-JUN	560	605	635	118	665	710	538
ENTIAT RIVER near Ardenvoir	APR-SEP	285	300	315	139	330	345	227
	APR-JUL	260	275	286	139	295	315	206
	APR-JUN	200	215	227	134	235	250	169
WENATCHEE at Plain	APR-SEP	1130	1220	1289	108	1350	1450	1190
	APR-JUL	1030	1110	1154	108	1200	1280	1072
	APR-JUN	895	945	982	114	1020	1070	864
WENATCHEE R. at Peshastin	APR-SEP	1240	1550	1770	108	1990	2300	1636
	APR-JUL	1120	1410	1600	108	1800	2080	1485
	APR-JUN	915	1140	1300	108	1460	1690	1204
STEMILT nr Wenatchee (miners in)	MAY-SEP	98	124	142	103	160	186	138
ICICLE CREEK nr Leavenworth	APR-SEP	255	325	375	101	425	495	370
	APR-JUL	235	300	343	101	385	450	340
	APR-JUN	187	240	273	101	310	360	270
COLUMBIA R. bl Rock Island Dam (2)	APR-SEP	71600	78500	83100	118	87700	94600	70485
	APR-JUL	60100	65900	69800	117	73700	79500	59736
	APR-JUN	47400	51900	55000	117	58100	62600	47007

WENATCHEE - CHELAN RIVER BASINS
Reservoir Storage (1000 AF) - End of February

WENATCHEE - CHELAN RIVER BASINS
Watershed Snowpack Analysis - March 1, 1996

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
CHELAN LAKE	676.1	470.0	231.7	168.1	Chelan Lake Basin	5	107	131
					Entiat River	2	100	144
					Wenatchee River	12	87	104
					Squilchuck Creek	0	0	0
					Stemilt Creek	2	72	89
					Colockum Creek	1	83	111

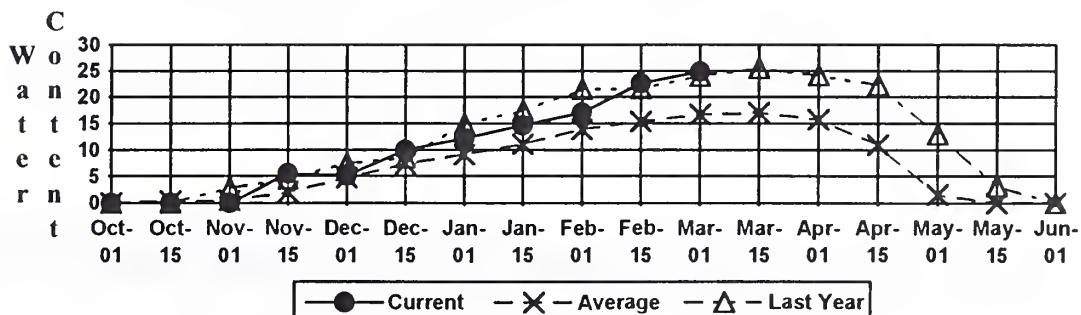
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

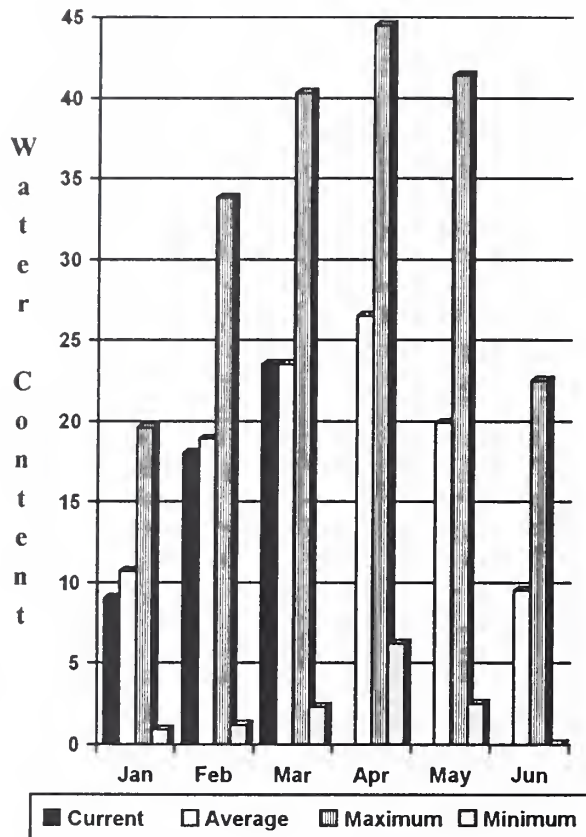
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Pope Ridge SNOTEL Elevation 3540 ft.

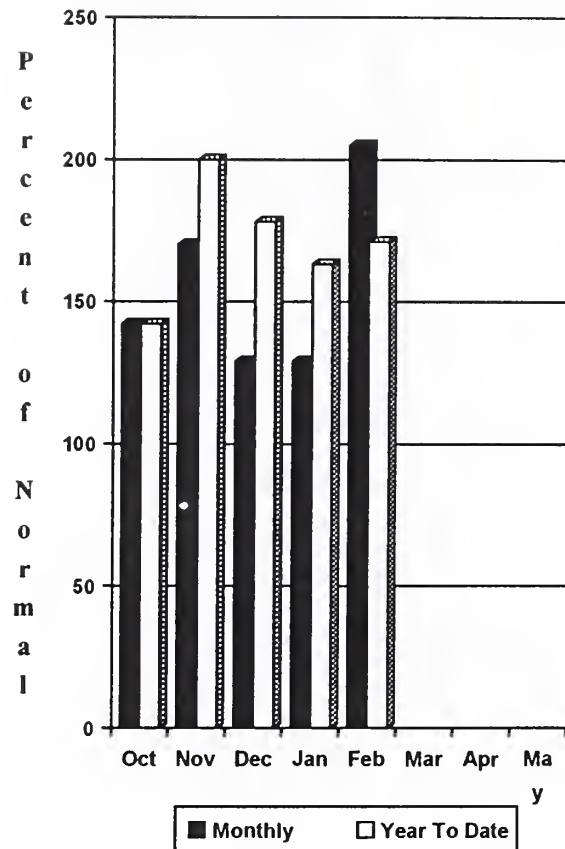


Yakima River Basin

Mountain Snowpack* (inches)



Precipitation* (% of normal)



*Based on selected stations

March 1 reservoir storage for the five major reservoirs was 911,500 acre feet, 131% of average. March 1 summer streamflow forecasts are for near to above normal in the Yakima Basin. Forecasts for the Yakima River at Cle Elum are for 107% of normal; Naches River, 112%; the Yakima River at Parker, 109%; Ahtanum Creek, 110%; and the Tieton River, 109%. The Klickitat River near Glenwood is forecast at 143% of normal flows this summer. February streamflows within the basin were; the Yakima River at Parker, 384% of normal; the Yakima near Cle Elum, 311%; and the Naches River at 531%. March 1 snowpack was 95%, based upon 17 snow courses and SNOTEL readings within the Yakima Basin. Precipitation was 205% of normal for February and 171% for the water year-to-date. Volume forecasts for the Yakima Basin are for natural flow. As such, they may differ from the U.S. Bureau of Reclamation's forecast for the total water supply available which includes irrigation return flow.

For more information contact your local Natural Resources Conservation Service office.

YAKIMA RIVER BASIN
Streamflow Forecasts - March 1, 1996

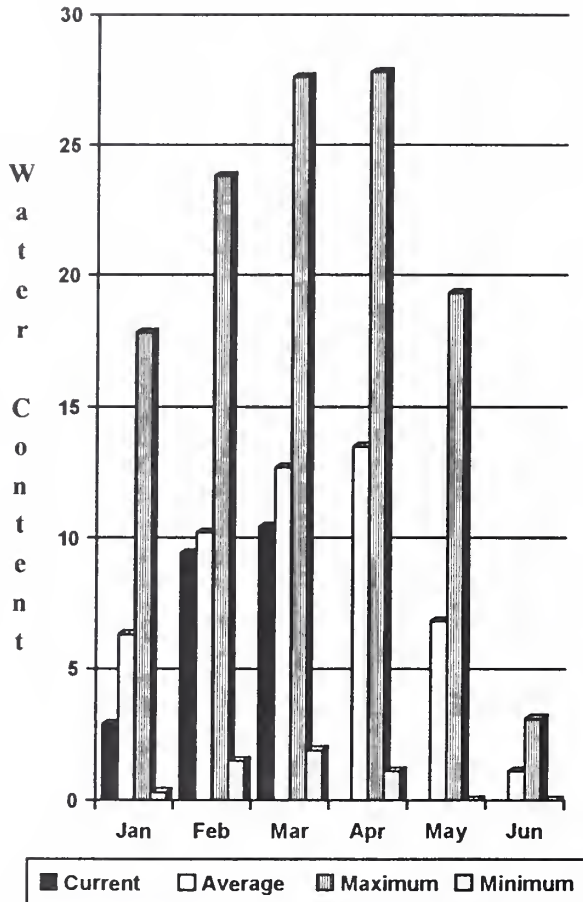
Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<----- Drier ----->>		----->>		----->>		
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
KEECHELUS LAKE INFLOW	APR-JUL	116	128	136	110	144	156	124
	APR-SEP	122	136	146	108	156	170	135
	APR-JUN	105	114	120	110	126	135	109
KACHESS LAKE INFLOW	APR-JUL	101	112	120	108	128	139	111
	APR-SEP	105	117	125	106	133	145	118
	APR-JUN	92	101	107	108	113	123	99
CLE ELUM LAKE INFLOW	APR-JUL	410	435	450	110	465	490	409
	APR-SEP	430	460	480	107	500	530	448
	APR-JUN	345	365	380	110	395	415	345
YAKIMA at Cle Elum	APR-JUN	710	755	785	109	815	860	721
	APR-JUL	815	870	907	109	945	1000	832
	APR-SEP	875	940	980	107	1020	1080	915
BUMPING LAKE INFLOW	APR-SEP	128	142	151	111	160	174	136
	APR-JUL	117	130	138	111	146	159	124
	APR-JUN	94	106	114	110	122	134	104
AMERICAN RIVER near Nile	APR-SEP	110	120	126	107	132	142	118
	APR-JUL	100	109	115	106	121	130	109
	APR-JUN	82	90	96	105	102	111	92
RIMROCK LAKE INFLOW	APR-SEP	225	245	260	109	275	295	238
	APR-JUL	193	210	220	110	230	245	200
	APR-JUN	154	168	178	110	188	200	162
NACHES near Naches	APR-SEP	810	880	930	112	980	1050	832
	APR-JUL	740	805	850	113	895	960	755
	APR-JUN	640	695	735	113	775	830	651
AHTANUM CREEK nr Tampico (2)	APR-SEP	33	43	51	110	58	68	46
	APR-JUL	30	40	46	110	53	62	42
	APR-JUN	26	34	40	110	45	54	36
YAKIMA near Parker	APR-SEP	1900	2060	2170	109	2280	2440	1994
	APR-JUL	1750	1890	1985	110	2080	2220	1805
	APR-JUN	1570	1680	1760	110	1840	1950	1597
KLiCKITAT near Glenwood	APR-JUN	117	130	138	126	146	159	110
	APR-SEP	146	163	175	125	187	204	140

YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of February					YAKIMA RIVER BASIN Watershed Snowpack Analysis - March 1, 1996			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
KEECHELUS	157.8	137.7	110.0	105.0	Yakima River	17	85	95
KACHESS	239.0	216.6	110.4	179.0	Ahtanum Creek	2	90	112
CLE ELUM	436.9	375.0	196.6	273.0				
BUMPING LAKE	33.7	18.6	17.2	10.0				
RIMROCK	198.0	163.6	138.0	130.0				

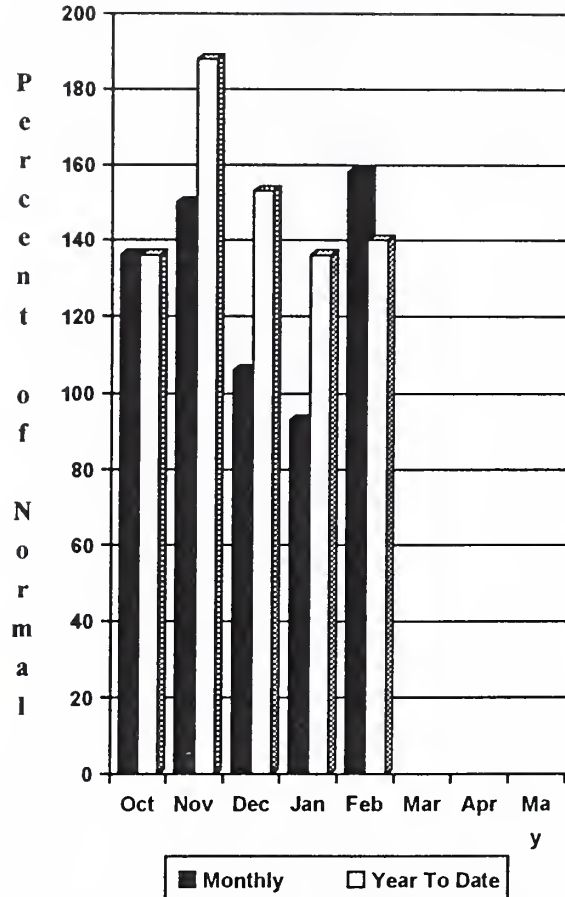
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.
The average is computed for the 1961-1990 base period.
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Walla Walla River Basin

Mountain Snowpack* (inches)



Precipitation* (% of normal)



*Based on selected stations

February precipitation was 158% of average, bringing the year-to-date precipitation to 83% of normal. March 1 snowpack was 82% of average. The forecast is for 114% of average streamflow in the Walla Walla River for the coming summer; for the Grande Ronde at Troy, 98%; and 98% for Mill Creek. February streamflow was 473% of normal for the South Fork Walla Walla River; 246% for the Snake River; and 401% for the Grande Ronde River near Troy. The Touchet SNOTEL site had 23.9 inches of snow-water-equivalent; the normal March 1 reading for this site is 27.8 inches.

For more information contact your local Natural Resources Conservation Service office.

WALLA WALLA RIVER BASIN

Streamflow Forecasts - March 1, 1996

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		Wetter		Chance Of Exceeding *		
		90% (1000AF)	70% (1000AF)	30% (1000AF)	10% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	
GRANDE RONDE at Troy (1)	MAR-JUL	1070	1370	1510	103	1650	1950	1471
	APR-SEP	880	1160	1280	98	1410	1680	1312
SNAKE blw Lower Granite Dam (1,2)	APR-JUL	16300	21300	23600	109	25900	30900	21650
	APR-SEP	18800	24400	27000	111	29600	35200	24360
MILL CREEK at Walla Walla	APR-SEP	9.3	13.7	16.7	98	19.7	24	17.1
	APR-JUL	9.2	13.6	16.6	98	19.6	24	16.9
	APR-JUN	9.1	13.5	16.4	98	19.3	24	16.7
SF WALLA WALLA nr Milton Freewater	APR-JUL	48	54	58	109	62	68	53
	APR-SEP	64	71	75	114	80	86	66
COLUMBIA R. at The Dalles (2)	APR-SEP	92800	104000	111000	112	118000	129000	98982
	APR-JUL	79000	88300	94600	112	101000	110000	84760
	APR-JUN	64600	72100	77200	112	82300	89800	68925

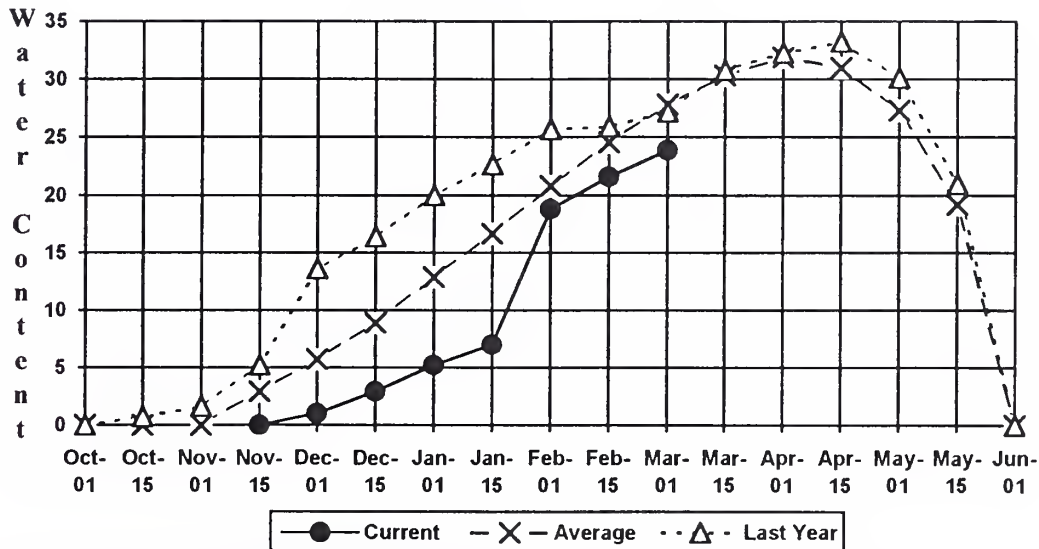
WALLA WALLA RIVER BASIN Reservoir Storage (1000 AF) - End of February				WALLA WALLA RIVER BASIN Watershed Snowpack Analysis - March 1, 1996				
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					Mill Creek	1	76	78

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

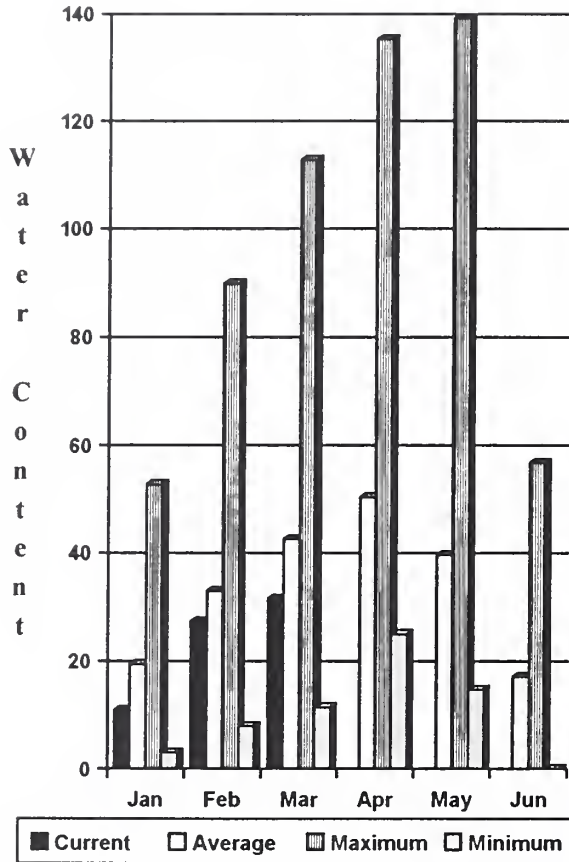
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

Touchet #2 SNOTEL Elevation 5530 ft.

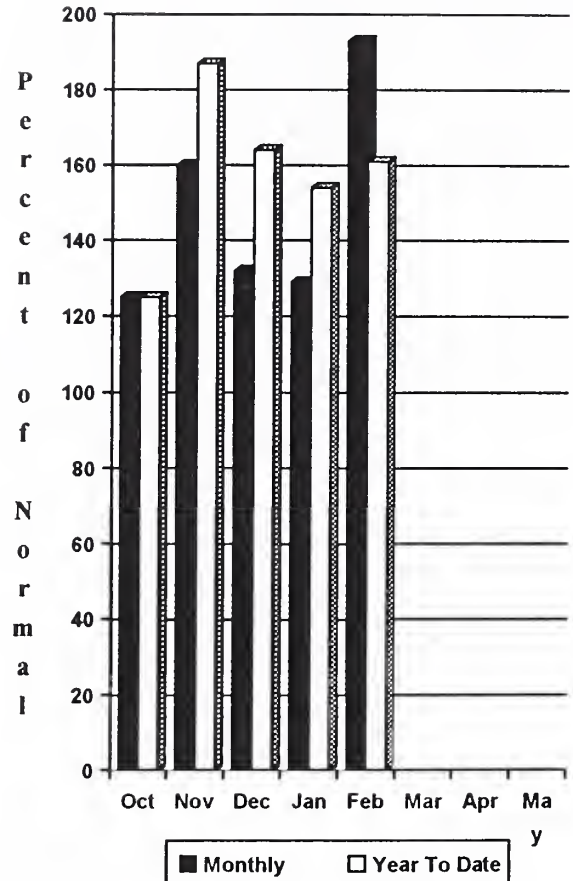


Cowlitz - Lewis River Basins

Mountain Snowpack* (inches)



Precipitation* (% of normal)



*Based on selected stations

The forecast for summer runoff in the Lewis River Basin is 105% of normal; the Cowlitz River at Castle Rock is forecast for 103% of normal runoff. February streamflow for the Cowlitz River was 291% of average, and 228% for the Lewis River. February precipitation was 193% of normal, 161% of average for the water year. March 1 snow cover for the Cowlitz River was 86%, and the Lewis River was 62% of average, both down considerably from last month. The Paradise Park SNOTEL recorded the most water content for the basin with 49.4 inches of water; normal March 1 water content is 47.9 inches. Forecasters believe that adequate higher elevation snowpack will help sustain summer runoff.

For more information contact your local Natural Resources Conservation Service office.

COWLITZ - LEWIS RIVER BASINS
Streamflow Forecasts - March 1, 1996

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		50% (Most Probable)		Wetter		
		90% (1000AF)	70% (1000AF)	50% (1000AF)	Chance Of Exceeding (% AVG.)	30% (1000AF)	10% (1000AF)	
LEWIS RIVER at Ariel (2)	APR-SEP	900	1120	1270	105	1420	1640	1204
	APR-JUL	780	970	1100	105	1230	1420	1051
	APR-JUN	695	865	980	105	1100	1270	933
COWLITZ R. b1 Mayfield Dam (2)	APR-SEP	845	1520	1810	92	2100	2780	1970
	APR-JUL	970	1340	1590	92	1840	2210	1731
	APR-JUN	830	1150	1360	92	1570	1890	1477
COWLITZ R. at Castle Rock (2)	APR-SEP	1390	2370	2750	103	3130	4110	2667
	APR-JUL	1590	2070	2400	103	2730	3210	2325
	APR-JUN	1360	1770	2055	103	2340	2760	1995
KLICKITAT near Glenwood	APR-JUN	117	130	138	126	146	159	110
	APR-SEP	146	163	175	125	187	204	140

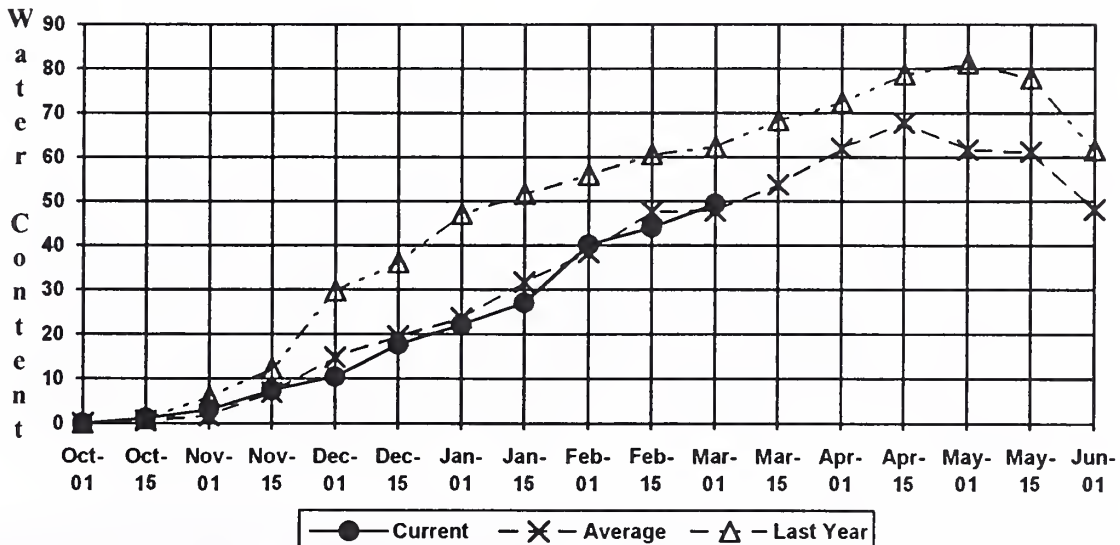
COWLITZ - LEWIS RIVER BASINS Reservoir Storage (1000 AF) - End of February				COWLITZ - LEWIS RIVER BASINS Watershed Snowpack Analysis - March 1, 1996				
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					Cowlitz River	7	85	86
					Lewis River	4	63	62

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

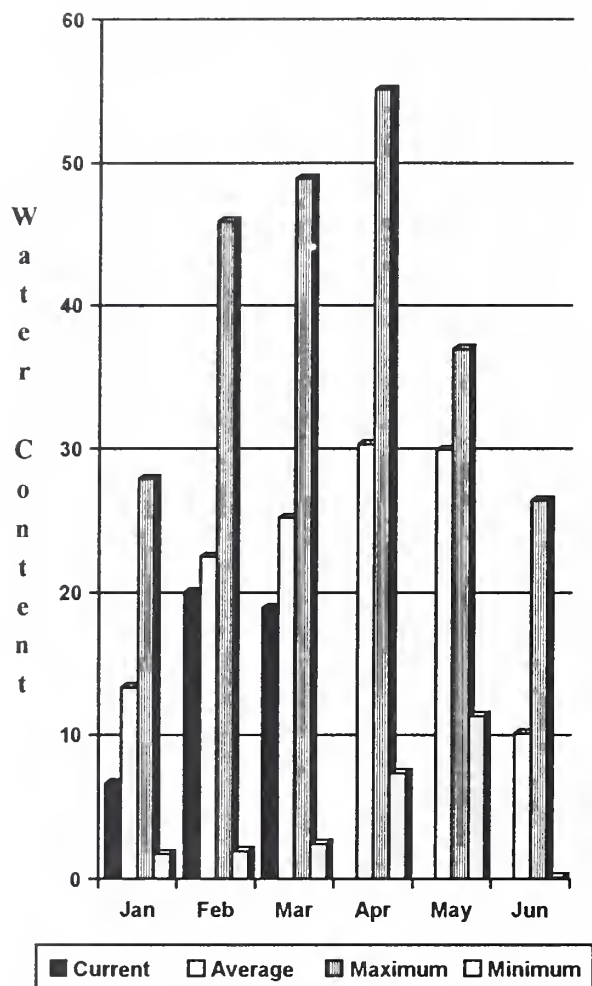
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

Paradise SNOTEL
Elevation 5120 ft.

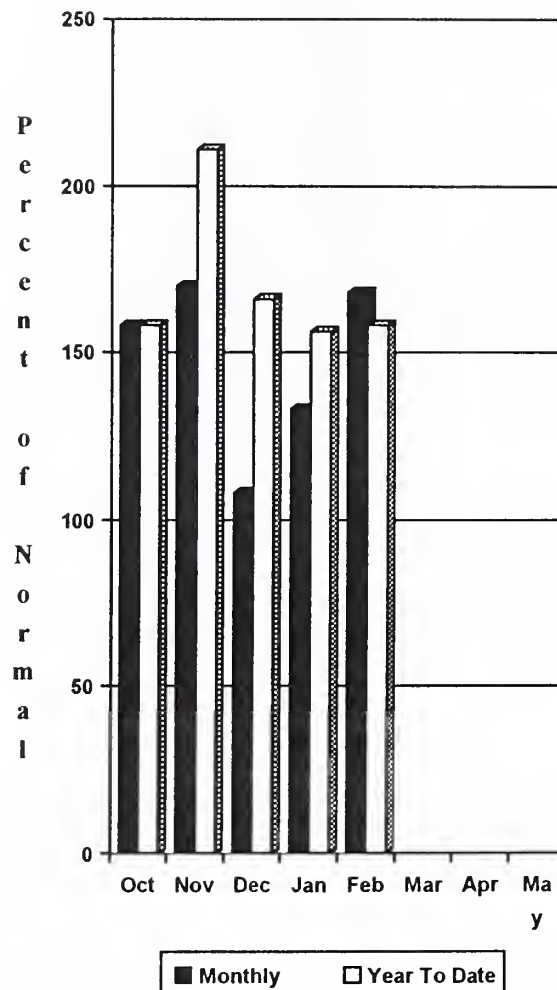


White - Green - Cedar River Basins

Mountain Snowpack* (inches)



Precipitation* (% of normal)



*Based on selected stations

Summer runoff is forecast to be 105% of normal for the Green River; and 88% for the Cedar River near Cedar Falls; 85% for the Rex River; 90% for the South Fork of the Tolt River; and 91% for the Cedar River at Cedar Falls. March 1 snowpack was 103% of normal in the White River Basin, and 64% in the Green River Basin. Water content on March 1 at the Morse Lake SNOTEL, at an elevation of 5,400 feet, was 43.7 inches. This site has a March 1 average of 38.5 inches. February precipitation was 168% of normal, bringing the water year-to-date to 158% of average.

For more information contact your local Natural Resources Conservation Service office.

WHITE - GREEN - CEDAR RIVER BASINS

Streamflow Forecasts - March 1, 1996

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		Wetter		Chance Of Exceeding *		
		90% (1000AF)	70% (1000AF)	30% (1000AF)	10% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	
GREEN RIVER below Howard Hanson Dam	APR-JUL	235	255	271	105	285	305	257
	APR-SEP	260	285	299	105	315	340	285
	APR-JUN	210	230	246	105	260	280	234
CEDAR RIVER near Cedar Falls	APR-JUL	54	62	68	88	74	82	77
	APR-SEP	61	69	75	88	81	90	85
	APR-JUN	49	56	61	89	66	73	68
REX RIVER near Cedar Falls	APR-JUL	17.0	20	23	85	26	29	27
	APR-SEP	19.0	23	26	85	28	32	30
	APR-JUN	16.0	19.0	21	85	23	26	25
CEDAR RIVER at Cedar Falls	APR-JUL	53	66	75	91	83	96	82
	APR-SEP	54	67	76	91	84	97	83
	APR-JUN	51	64	73	91	82	94	80
SOUTH FORK TOLT near Index	APR-JUL	11.0	12.6	13.6	89	14.6	16.2	15.2
	APR-SEP	12.7	14.7	16.0	90	17.3	19.3	17.8
	APR-JUN	9.6	11.0	11.9	91	12.8	14.2	13.1

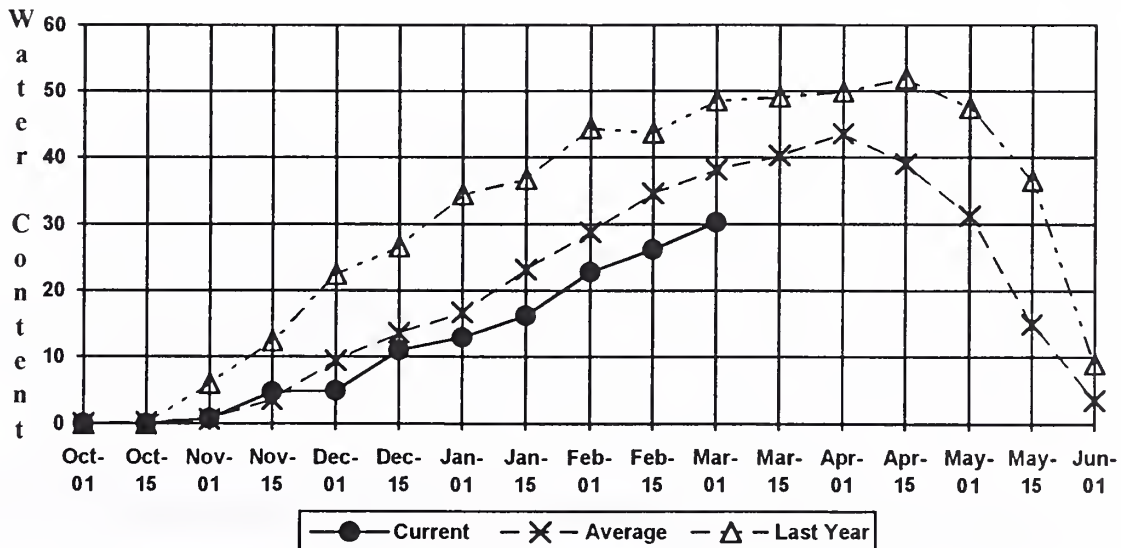
WHITE - GREEN RIVER BASINS Reservoir Storage (1000 AF) - End of February					WHITE - GREEN RIVER BASINS Watershed Snowpack Analysis - March 1, 1996			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					White River	3	86	103
					Green River	7	76	65
					Cedar River	2	103	57

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

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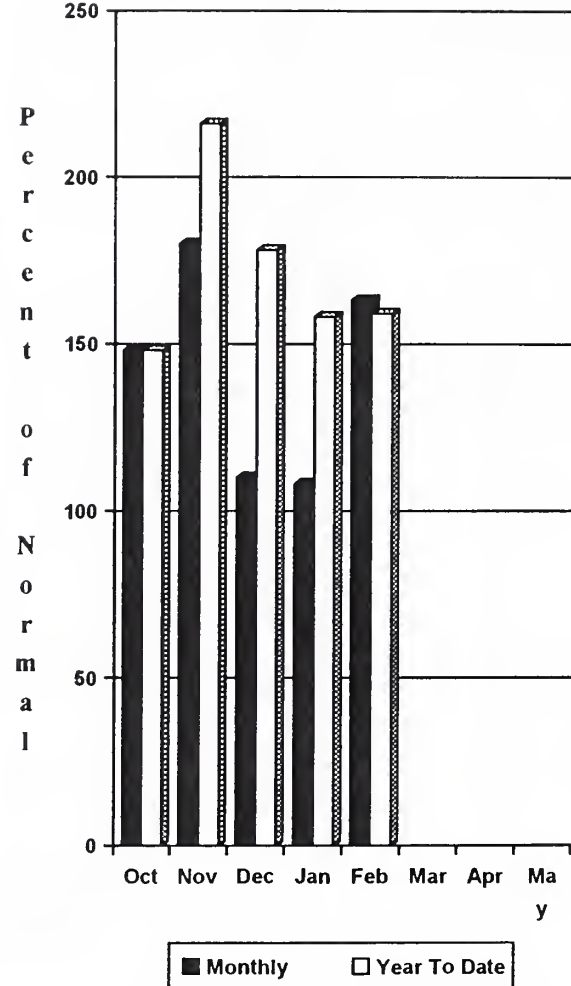
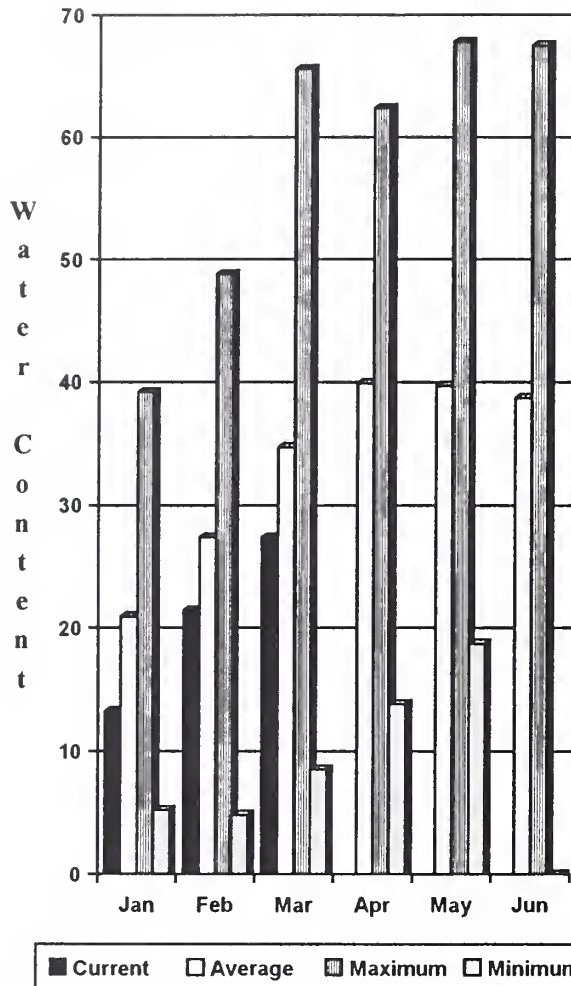
Stampede Pass SNOTEL Elevation 3860 ft.



North Puget Sound River Basins

Mountain Snowpack* (inches)

Precipitation* (% of normal)



*Based on selected stations

Forecast for the Skagit River streamflow is for 96% of normal for the spring and summer periods. February streamflow in the Skagit River was 186% of average. Other forecast points included the Baker River at 96%, and Thunder Creek at 95%. Basin-wide precipitation for February was 163% of average, bringing water year-to-date to 159% of normal. March 1 snow cover in the Skagit River Basin was 108%; the Baker River Basin was, 59%; and the Snohomish River Basin was 70% of average. Rainy Pass SNOTEL, at 4,780 feet, had 51.3 inches of water content; normal March 1 water content is 32.7 inches. March 1 reservoir storage showed Ross Lake at 370% normal and 81% of capacity.

For more information contact your local Natural Resources Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

Streamflow Forecasts - March 1, 1996

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		50% (Most Probable)		Wetter		
		90% (1000AF)	70% (1000AF)	220 (1000AF)	96 (% AVG.)	30% (1000AF)	10% (1000AF)	
THUNDER CREEK near Newhalem	APR-JUL	195	210	220	96	230	245	230
	APR-SEP	285	300	310	95	320	335	328
	APR-JUN	115	132	143	96	154	171	149
SKAGIT RIVER at Newhalem (2)	APR-SEP	1630	1910	2100	96	2290	2570	2185
	APR-JUL	1380	1620	1775	97	1940	2170	1830
	APR-JUN	1070	1250	1370	97	1490	1670	1410
BAKER RIVER near Concrete	APR-JUL	670	745	795	95	845	920	836
	APR-SEP	880	965	1025	96	1090	1170	1064
	APR-JUN	490	550	588	96	625	685	611

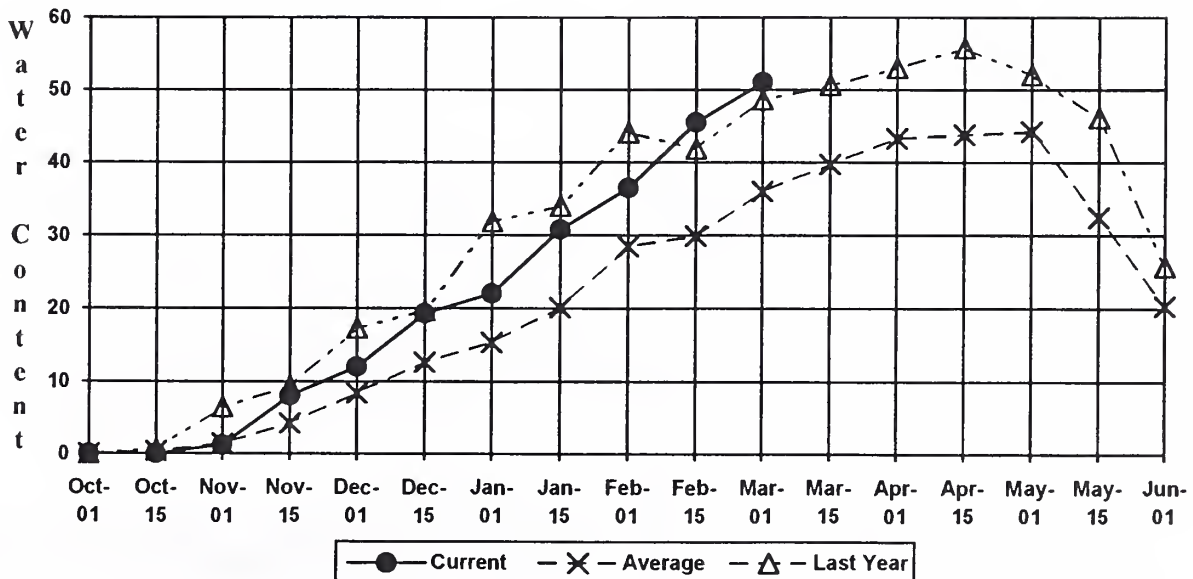
NORTH PUGET SOUND RIVER BASINS					NORTH PUGET SOUND RIVER BASINS			
Reservoir Storage (1000 AF) - End of February					Watershed Snowpack Analysis - March 1, 1996			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ROSS	1404.1	1138.6	811.9	307.6	Snohomish River	6	71	70
DIABLO RESERVOIR	90.6	85.6	85.7	---	Skagit River	14	94	108
GORGE RESERVOIR	9.8	7.4	7.6	---	Baker River	9	57	59

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

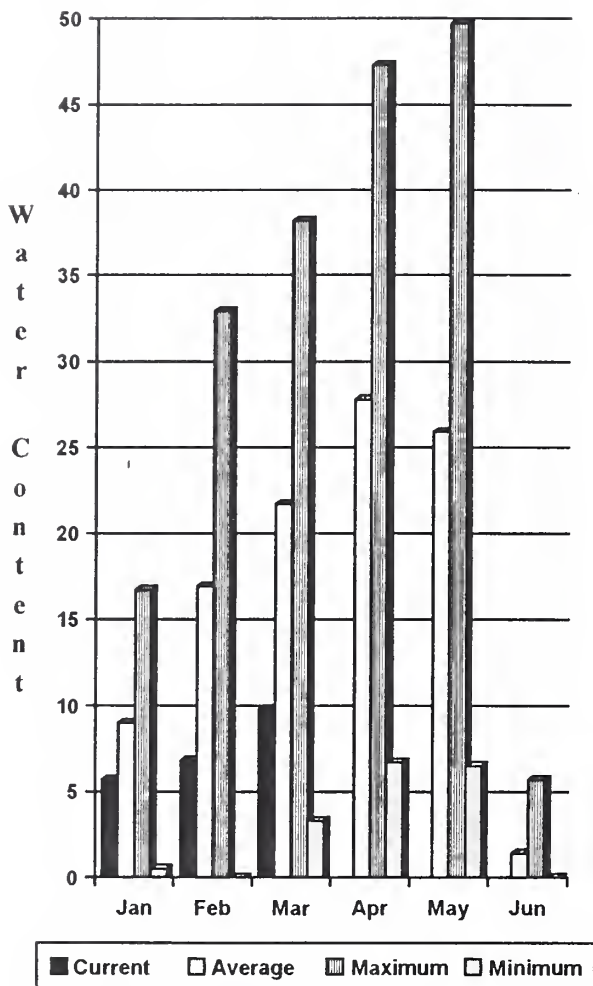
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

Rainy Pass SNOTEL Elevation 4780 ft.

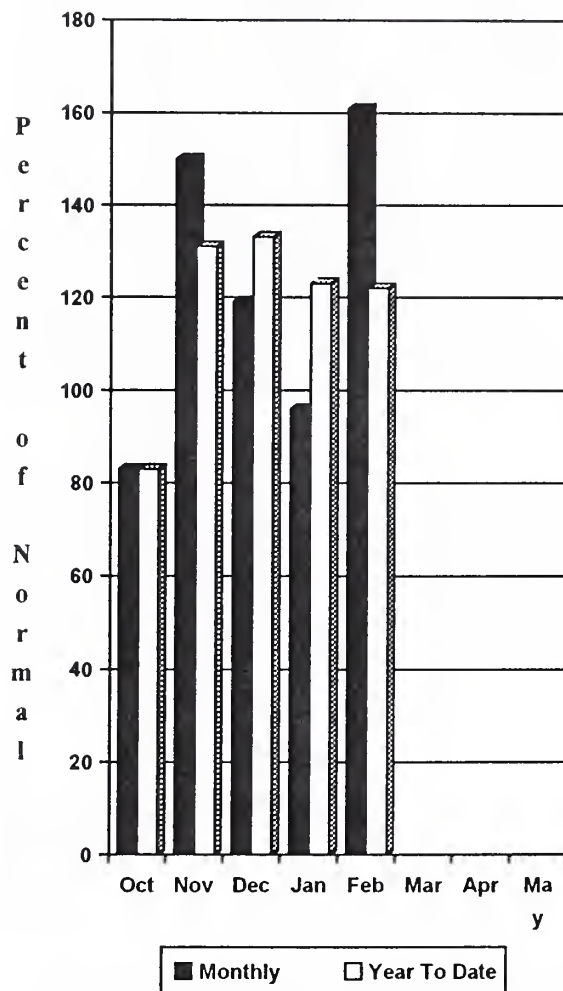


Olympic Peninsula River Basins

Mountain Snowpack* (inches)



Precipitation* (% of normal)



*Based on selected stations

The March forecasts for streamflow runoff in the Dungeness River Basin is 88% of average; the Elwha River is forecasted for 81% of average. The Big Quilcene can expect below normal runoff this summer as well. February precipitation was 116% of average, and has accumulated at 122% of normal for the water year. February precipitation at Quillayute was 10.23 inches, which is below normal at 85% of average. Average March 1 snow cover in the Olympic Basin was much below average at 45%. The Mount Crag SNOTEL near Quilcene had 16.9 inches of snow water-equivalent on March 1; normal for this site is 26.5 inches.

For more information contact your local Natural Resources Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

Streamflow Forecasts - March 1, 1996

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		Chance Of Exceeding *		Wetter		
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
DUNGENESS RIVER nr Sequim	APR-SEP	113	129	141	88	153	169	160
	APR-JUL	91	105	114	87	123	137	131
	APR-JUN	68	78	85	87	92	102	98
ELWHA RIVER nr Port Angeles	APR-SEP	305	365	406	81	445	505	502
	APR-JUL	265	310	345	83	380	425	417

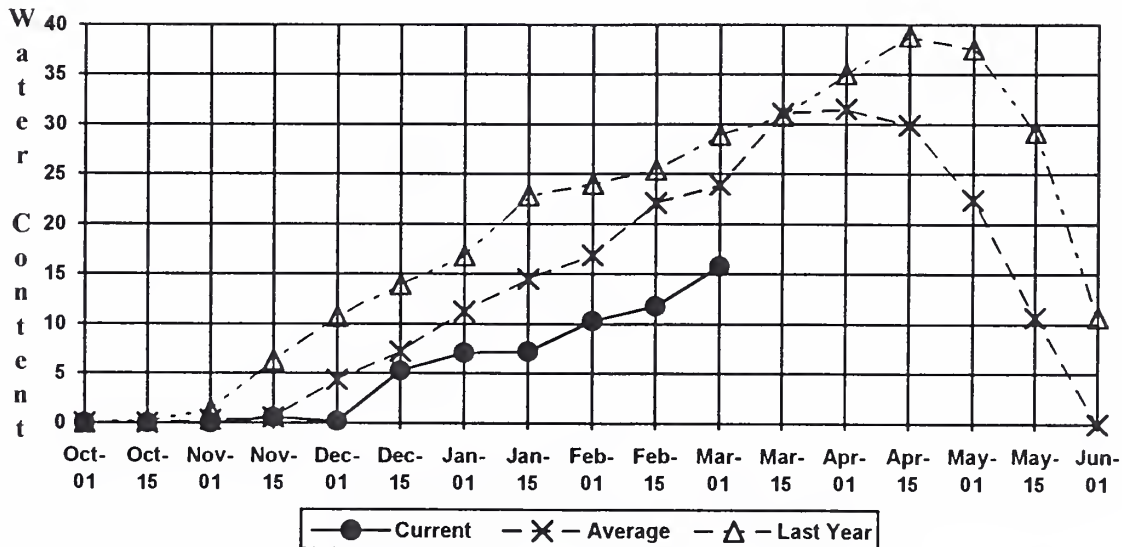
OLYMPIC PENINSULA RIVER BASINS Reservoir Storage (1000 AF) - End of February				OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - March 1, 1996			
Reservoir	Usable Capacity	*** Usable Storage ***		Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year Avg			Last Yr	Average
				Elwha River	1	38	23
				Morse Creek	1	50	48
				Dungeness River	1	70	45
				Quilcene River	1	60	64
				Wynoochee River	0	0	0

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural flow - actual flow may be affected by upstream water management.

Mount Crag SNOTEL Elevation 4050 ft.



Issued by

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The Following Organizations Cooperate With the Natural Resources Conservation Service in Snow Survey Work*:

Canada

Ministry of the Environment
Investigations Branch, Victoria, British Columbia

State

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal

Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service
Bureau of Indian Affairs

Local

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
Colville Confederated Tribes
Spokane County
Yakama Indian Nation

Private

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



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