U.S. Department of Agriculture
Natural Resources Conservation Service

Washington Basin Outlook Report April 1, 1998

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 in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

Washington
Water Supply Outlook

April 1998

General Outlook

Overall Washington maintained near normal snowpack and precipitation levels. Below average snowpack and precipitation accumulations during March have driven most streamflow forecasts down by as much as 10%. March streamflows varied across the State but on average were near normal. Reservoir storage is currently above average in most areas. Temperatures for the month were 2-4 degrees above normal and have been 1-3 degrees above normal for the water-year-to-date.

Snowpack

The April 1 statewide SNOTEL readings showed 103% of average snowpack; a slight decrease from last month. Snowpack varied from 68% of average in the Elwha River Basin to as high as 142% in the Colockum Creek Basin. Westside averages from SNOTEL, and April 1 snow surveys, included the North Puget Sound river basins with 89% of average, the Olympic Peninsula basins with 94%, and the Lewis-Cowlitz basins with 106% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 102% of average, and the Wenatchee area with 96%. Snowpack in the Spokane River Basin remained below average at 72%, and the Pend Oreille River Basin, including Canadian data, also had 72% of average. Maximum snow cover in the state was at Easy Pass in Northwest Washington, with estimated water content of 80 inches. This site would normally have 82.9 inches of water content on April 1. The highest average in the state was the Moses Peak snow course in the Omak River Basin with 319% of average.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane	45	72
Newman Lake	44	86
Colville	58	100
Pend Oreille	49	72
Okanogan	84	112
Similkameen	60	76
Methow	72	104
Chelan	69	103
Wenatchee	62	96
Stemilt Creek	90	111
Yakima	65	102
Ahtanum Creek	74	108
Walla Walla	43	75
Cowlitz	67	98
Lewis	66	113
White	78	111
Green	47	74
Cedar	48	97
Snoqualmie	66	93
Skykomish	62	95
Skagit	63	93
Baker	73	95
Nooksack	55	79
Olympic Peninsula	91	94

Precipitation

During the month of March, the National Weather Service and Natural Resources Conservation Service climate stations showed considerable variations in precipitation across Washington. The highest percent of average in the state was at Laurier, near the Canadian Border in Ferry County. Laurier climate station reported 142% of average for a total of 2.03 inches. The March average for this site is 1.43 inches. Averages for the water year varied from 114% of average on the Olympic Peninsula to 82% in the Walla Walla River Basin. The highest individual site average for the water year was 164% of average at Trough SNOTEL site near Wenatchee.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	96	85
Colville-Pend Oreille	101	93
Okanogan-Methow	92	106
Wenatchee-Chelan	92	108
Yakima	91	106
Walla Walla	68	82
Cowlitz-Lewis	84	110
White-Green	103	98
Central Puget Sound	91	97
North Puget Sound	83	94
Olympic Peninsula	71	114

Reservoir

Storage levels are beginning to stabilize with the start of spring runoff and the irrigation season. Reservoir storage in the Yakima Basin was 860,800 acre feet, or 116% of average. Storage at other reservoirs included Roosevelt at 176% of average and 53% of capacity; Banks Lake at 116% of average and 95% of capacity; and the Okanogan reservoirs with 141% of average for April 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 190,500 acre feet, or 112% of average and 80% of capacity; Chelan Lake, 309,600 acre feet, 146% of average and 46% of capacity; and the Skagit River reservoirs at 235% of average and 50% of capacity.

BASIN	PERCENT OF CAPACITY	PERCENT OF AVERAGE
Spokane	80	112
Colville-Pend Oreille	58	160
Okanogan-Methow	90	114
Wenatchee-Chelan	46	146
Yakima	81	116
North Puget Sound	50	235

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

Streamflow

The below normal snowpack and precipitation accumulations for most of the state last month caused Forecasters to lower most predictions for summer runoff. Forecasts varied from 115% of average for Salmon Creek near Conconully, to 70% of average for the Spokane River near Post Falls. April forecasts for some Western Washington streams include: Cedar River near Cedar Falls, 90% of average; Green River, 83%; and the Dungeness River, 98%. Some Eastern Washington streams include the Yakima River near Parker, 95% of average; the Wenatchee River at Peshastin, 97%; and the Colville River at Kettle Falls, 88%. Volumetric forecasts are developed using current, historic, and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. A beneficial fact sheet, "Interpreting Streamflow Forecasts," is available on the World Wide Web at http://www.wcc.nrcs.usda.gov/factpub/factpub.html

Streamflows reported for March varied from well above to well below average. The Kettle River at Laurier, had the highest flows at 226% of average; and the Similkameen River at Nighthawk, with 58% of average, had the lowest flows in the state. Other streamflows were the following percentage of average: the Priest River, 144%; the Columbia at the International Boundary, 123%; the Spokane River at Spokane, 96%; the Columbia below Rock Island Dam, 109%; the Cle Elum River near Roslyn, 112%; and the Snake River below Ice Harbor Dam, 87%.

BASIN	PERCENT OF AVERAGE MOST PROBABLE FORECAST (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	64-65
Colville-Pend Oreille	68-110
Okanogan-Methow	74-115
Wenatchee-Chelan	92-98
Yakima	88-109
Walla Walla	81-88
Cowlitz-Lewis	89-100
Green River	78
Central Puget Sound	81-90
North Puget Sound	89-95
Olympic Peninsula	94-96

STREAM	PERCENT OF AVERAGE MARCH STREAMFLOWS
Pend Oreille Below Box Canyon	94
Kettle at Laurier	226
Columbia at Birchbank	123
Spokane at Long Lake	95
Similkameen at Nighthawk	58
Okanogan at Tonasket	128
Methow at Pateros	129
Chelan at Chelan	118
Wenatchee at Pashastin	101
Yakima at Cle Elum	109
Yakima at Parker	120
Naches at Naches	108
Yakima at Kiona	112
Grande Ronde at Troy	95
Snake below Lower Granite Dam	100
SF Walla Walla near Milton Freewater	152
Columbia at The Dalles	103
Lewis at Ariel	112
Cowlitz below Mayfield Dam	100
Skagit at Concrete	91

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

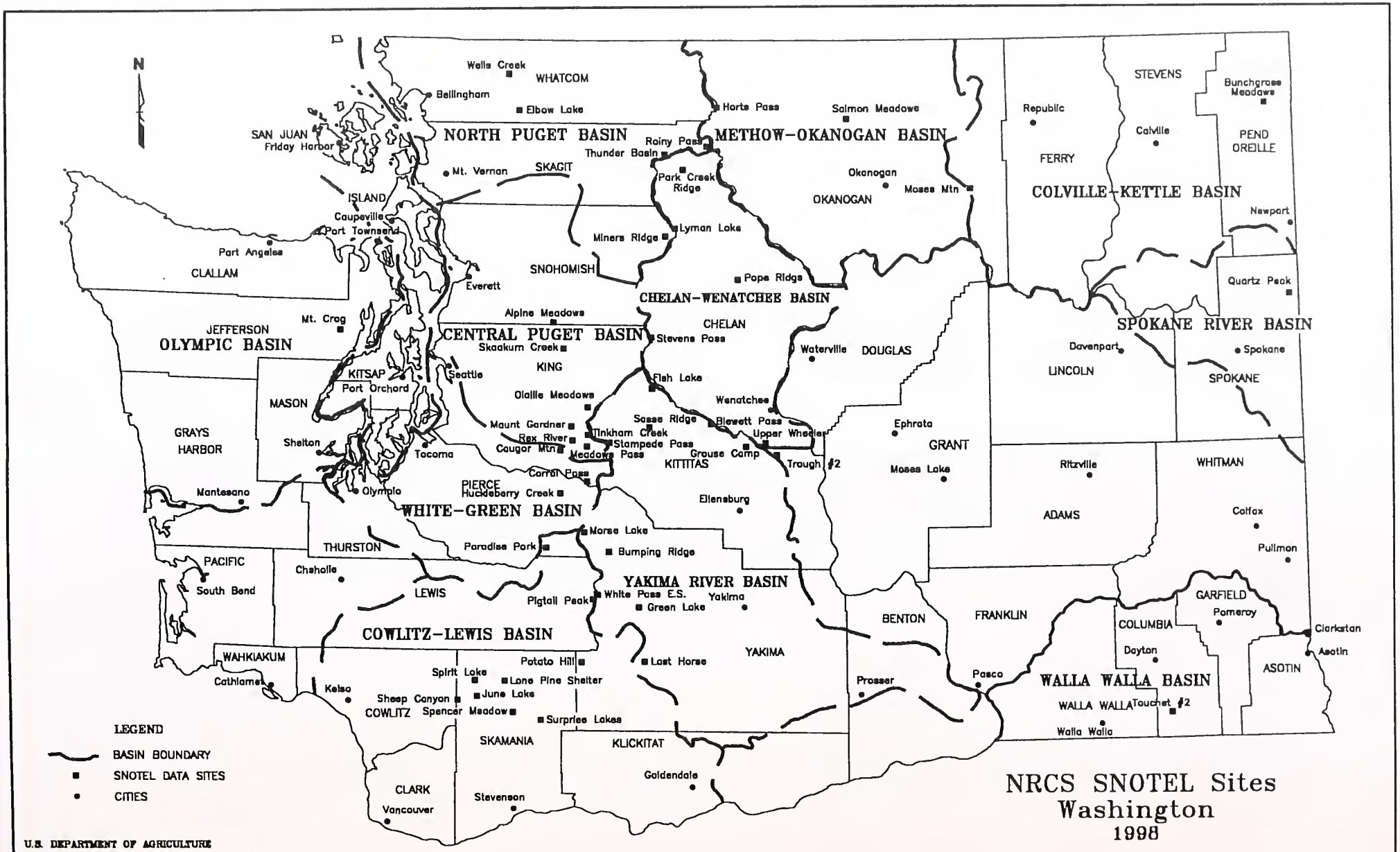
BASIN SUMMARY OF SNOW COURSE DATA

APRIL 1998

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
ABERDEEN LAKE CAN.	4000	3/27/98	13	4.3	8.3	5.7
ABOVE ROLAND	4350	3/25/98	57	22.8	52.0	32.3
ALPINE MEADOWS	3500	4/02/98	104	42.1	61.4	43.7
ALPINE MEADOWS PILL	3500	4/01/98	---	50.0S	67.8	43.5
AMBROSE	6480	4/01/98	---	9.4E	19.7	13.2
ASHLEY DIVIDE	4820	3/31/98	10	3.2	12.3	6.6
BADGER PASS	6900	3/31/98	69	23.3	--	38.4
BADGER PASS PILLOW	6900	4/01/98	---	23.0	46.3	36.5
BAREE CREEK	5500	3/30/98	76	31.8	59.9	45.3
BAREE MIDWAY	4600	3/30/98	64	24.3	51.6	35.1
BAREE TRAIL	3800	3/30/98	15	6.0	17.5	8.4
BARKER LAKES PILLOW	8250	4/01/98	---	12.1	18.6	15.4
BARNES CREEK CAN.	4950	3/26/98	47	17.6	30.2	20.4
BASIN CREEK PILLOW	7180	4/01/98	---	9.7	10.4	8.7
BASSOO PEAK	5150	3/31/98	15	5.0	16.5	11.3
BEAVER CREEK TRAIL	2200	4/01/98	---	10.0E	27.9	11.6
BEAVER PASS	3680	3/31/98	69	30.3	41.0	29.7
BERNE-MILL CREEK (d)	3170	3/30/98	61	24.9	43.3	27.2
BIG CREEK	6750	3/30/98	88	32.6	59.8	45.7
BIG WHITE MTN CAN.	5100	3/28/98	52	19.1	25.9	18.9
BLACK MOUNTAIN	7750	3/27/98	52	15.8	19.7	16.3
BLACK PINE PILLOW	7100	4/01/98	---	8.3	18.0	12.7
BLACKWALL PEAK CAN.	6370	4/01/98	---	26.3	42.5	33.8
BLEWETT PASS #2	4270	3/25/98	40	16.0	22.8	15.1
BLEWETT PASS#2PILLOW	4270	4/01/98	---	13.4S	24.2	17.8
BLUE LAKE	5900	3/31/98	36	11.8	30.1	25.3
BRENDA MINE CAN.	4450	4/01/98	---	12.5	19.6	12.8
BRIEF	1600	3/28/98	7	2.0	9.6	2.5
BROOKMERE CAN.	3000	3/27/98	21	7.1	11.7	8.3
BRUSH CREEK TIMBER	5000	3/30/98	12	3.1	12.4	9.5
BULL MOUNTAIN	6600	3/25/98	12	2.9	9.8	6.4
BUMPING LAKE (NEW)	3400	3/30/98	43	16.6	34.7	18.3
BUMPING RIDGE PILLOW	4600	4/01/98	---	29.4S	51.7	21.2
BUNCHGRASS MDWPILLOW	5000	4/01/98	---	30.3	48.7	26.6
BUTTE CREEK	4070	3/31/98	22	8.2	11.3	9.0
CAMP MISERY	6400	3/29/98	107	40.9	80.8	49.0
CARMI CAN.	3800	3/29/98	11	3.5	7.9	5.9
CAYUSE PASS	5300	3/31/98	189	77.3	90.0	82.4
CEDAR GROVE	3760	3/26/98	20	5.9	24.8	12.2
CHESSMAN RESERVOIR	6200	3/26/98	5	1.5	3.3	3.9
CHICKEN CREEK	4060	3/31/98	29	10.7	27.4	14.0
CHIWAUKUM G.S.	2500	3/30/98	18	7.8	17.8	8.9
CITY CABIN	2390	4/01/98	---	12.5E	23.2	13.6
COLOCKUM PASS	5370	3/25/98	50	18.7	22.4	16.5
COMBINATION PILLOW	5600	4/01/98	---	3.0	7.0	5.8
COPPER BOTTOM PILLOW	5200	4/01/98	---	5.7	19.3	11.7
COPPER CAMP	6950	4/01/98	42	16.2	--	29.9
COPPER CREEK	5700	4/01/98	16	6.4	19.9	14.2
COPPER MOUNTAIN	7700	3/27/98	35	10.0	17.1	11.4
CORNER CREEK	3150	3/31/98	19	8.4	16.8	6.1
CORRAL PASS PILLOW	6000	4/01/98	---	35.4S	55.3	32.6
COTTONWOOD CREEK	6400	3/27/98	27	7.7	13.0	8.8
COUGAR MTN. PILLOW	3200	4/01/98	---	14.0S	37.8	18.8
COX VALLEY	4500	3/29/98	102	40.0	49.3	39.5
COYOTE HILL	4200	3/30/98	19	6.3	19.0	9.5
DALY CREEK PILLOW	5780	4/01/98	---	9.6	19.0	11.9
DEER PARK	5200	3/27/98	44	17.5	17.3	20.9
DESERT MOUNTAIN	5600	4/01/98	29	10.6	23.7	15.5
DEVILS PARK	5900	4/01/98	---	40.0E	55.0	42.9
DISCOVERY BASIN	7050	3/30/98	32	10.2	16.8	11.3
DIX HILL	6400	3/29/98	24	8.0	14.0	11.3
DOMMERIE FLATS	2200	3/31/98	0	.0	11.0	4.3
EAST FORK R.S.	5400	3/26/98	14	3.2	10.4	5.6
EAST RAGGED SADDLE	3740	3/29/98	46	19.5	34.4	20.4
EASY PASS AM	5200	4/01/98	---	80.0E	118.0	82.9
EL DORADO MINE	7800	3/28/98	56	19.4	25.6	21.6
ELBOW LAKE PILLOW	3200	4/01/98	---	28.4S	59.4	32.0
EMERY CREEK	4350	4/01/98	30	11.9	26.4	15.7
EMERY CREEK PILLOW	4350	4/01/98	---	10.1	24.7	16.3
ENDERBY CAN.	5800	3/29/98	104	38.3	48.4	38.9
ESPERON CK. MID CAN	4250	3/28/98	33	11.5	18.1	14.3
ESPERON CK. UP CAN.	5050	3/28/98	40	14.2	21.1	17.0
FARRON CAN.	3700	4/01/98	35	13.7	17.6	13.3
FATTY CREEK	5500	3/30/98	51	17.6	44.5	24.3
FISH CREEK	8000	3/24/98	34	9.8	13.3	9.9
FISH LAKE	3370	3/31/98	70	32.1	49.5	31.4
FISH LAKE PILLOW	3370	4/01/98	---	28.4S	54.6	31.9
FLATTOP MTN PILLOW	6300	4/01/98	---	37.5	65.7	47.1
FLEECER RIDGE	7500	3/25/98	24	7.3	17.5	11.3
FOURTH OF JULY SUM	3200	4/02/98	2	1.0	16.2	6.8
FRED BURR PASS	8000	3/30/98	69	22.8	32.2	25.4
FREEZEOUT CK. TRAIL	3500	4/01/98	23	8.2	20.0	11.5
FROHNER MDWS PILLOW	6480	4/01/98	---	6.5	9.5	8.7
GIBBONS PASS	7100	3/26/98	47	17.0	31.6	23.2
GOAT CREEK	3600	3/30/98	15	5.6	6.8	4.3
GOLD CREEK LAKE	7200	3/28/98	36	11.6	20.4	15.9
GRANITE PEAK	6000	3/30/98	83	31.8	64.7	43.5
GRASS MOUNTAIN #2	2900	4/02/98	0	.0	17.4	15.9
GRAVE CREEK	4300	3/27/98	37	13.7	25.8	17.0
GRAVE CRK PILLOW	4300	4/01/98	---	12.8	24.7	16.7
GRAYSTOKE LAKE CAN.	5500	3/31/98	33	12.0	18.0	16.2
GREEN LAKE	6000	4/01/98	---	40.7E	61.9	33.9
GREEN LAKE PILLOW	6000	4/01/98	---	24.9S	37.8	20.7
GREYBACK RES CAN.	4700	4/01/98	28	9.3	12.8	9.0
GRIFFIN CR DIVIDE	5150	3/31/98	16	5.0	17.2	11.2
GROUSE CAMP PILLOW	5380	4/01/98	---	20.1S	27.8	19.8
GUNSIGHT LAKE	6300	3/31/98	72	27.8	52.4	40.0
HAMILTON HILL CAN.	4550	4/02/98	25	9.1	18.3	14.7
HAND CREEK	5030	3/30/98	24	8.0	20.6	13.6
HAND CREEK PILLOW	5030	4/01/98	---	8.3	20.5	13.3
HARTS PASS PILLOW	6500	4/01/98	---	41.2S	54.3	41.3
HEART LAKE TRAIL	4800	3/30/98	45	15.4	33.6	21.6
HELL ROARING DIVIDE	5770	3/28/98	60	21.2	40.2	31.0
HERRIG JUNCTION	4850	3/31/98	52	20.7	39.2	26.0
HIGH RIDGE PILLOW	4980	4/01/98	---	17.4S	36.6	24.4
HOLBROOK	4530	3/30/98	14	5.0	16.9	9.0
HOODOO BASIN PILLOW	6050	4/01/98	---	30.8	70.7	47.0
HUMBOLDT GLCH PILLOW	4250	4/01/98	---	7.7	17.8	13.3
HURRICANE	4500	3/28/98	46	15.1	24.6	22.1
INTERGAARD	6450	3/26/98	22	7.1	12.1	8.6
ISINTOK LAKE CAN.	5100	3/27/98	17	4.4	8.0	7.1
JUNE LAKE PILLOW	3200	4/01/98	---	28.7S	56.4	36.3
KELLER RIDGE	3700	3/23/98	10	3.5	--	3.0
KELLOGG PEAK	5560	3/29/98	56	21.6	44.1	31.6
KISHENEHN	3890	3/27/98	20	6.6	14.5	7.0
KIT CARSON PASTURE	4950	3/27/98	18	6.1	13.1	8.8
KLESILKWA CAN.	3450	4/02/98	13	5.1	20.8	11.9
KRAFT CREEK PILLOW	4750	4/01/98	---	8.5	28.7	15.3
LESTER CREEK	3100	4/02/98	50	18.9	41.0	23.3
LIGHTNING LAKE CAN.	3700	3/31/98	28	10.7	18.2	12.4
LOGAN CREEK	4300	3/30/98	14	3.8	11.2	7.1
LOLO PASS PILLOW	5240	4/01/98	---	20.5	51.7	32.3
LONE PINE PILLOW	3800	4/01/98	---	39.5S	60.7	32.1
LOOKOUT PILLOW	5140	4/01/98	---	25.3	49.9	33.4
LOST HORSE	5940	3/28/98	53	17.6	43.6	32.3
LOST HORSE MTN CAN.	5850	3/26/98	28	7.6	10.3	9.3
LOST HORSE PILLOW	5000	4/01/98	---	25.8S	31.0	26.4
LOST LAKE PILLOW	6110	4/01/98	---	41.4	97.9	63.2
LOWER SANDS CREEK #2	3120	4/01/98	44	18.1	37.0	19.6
LUBRECBT FOREST NO 3	5450	4/01/98	10	2.8	10.4	6.8
LUBRECHT FOREST NO 4	4650	4/01/98	0	.0	4.1	2.1
LUBRECHT FOREST NO 6	4040	3/31/98	0	.0	6.4	2.3
LUBRECHT HYDROPLOT	4200	3/31/98	0	.0	8.5	4.2
LUBRECHT PILLOW	4680	4/01/98	---	2.8	7.7	5.1
LYMAN LAKE PILLOW	5900	4/01/98	---	64.5S	82.0	56.9
LYNN LAKE	4000	4/02/98	46	18.0	33.0	22.0
MARIAS PASS	5250	3/27/98	32	11.4	30.0	17.4
MARTEN LAKE AM	3600	4/01/98	---	70.0E	101.0	73.4
MCCULLOCB CAN.	3900	3/30/98	18	6.6	8.1	6.3
MEADOWS PASS PILLOW	3240	4/01/98	---	20.9S	45.8	24.9
MERRITT	2140	3/30/98	16	6.7	22.6	12.8
MICA CREEK PILLOW	4750	4/01/98	---	18.3	46.8	--
MINERAL CREEK	4000	3/28/98	41	15.5	30.6	17.5
MISSEZULA MTN CAN.	4700	4/01/98	23	7.2	12.0	9.3
MISSION CREEK CAN.	5800	4/01/98	49	17.3	25.8	20.4
MISSION RIDGE	5000	3/27/98	48	18.7	22.3	16.5
MONASBEE PASS CAN.	4200	3/26/98	30	11.1	20.4	13.6
MOOSE CREEK PILLOW	6200	4/01/98	---	13.0	31.1	18.0
MORRISSEY RIDGE CAN.	6100	4/01/98	---	26.1	40.7	28.5
MORSE LAKE PILLOW	5400	4/01/98	---	67.4S	85.5	47.2
MOSES MOUNTAIN (1)	4800	3/26/98	83	30.0	--	13.5
MOSES MTN PILLOW	4800	4/01/98	---	17.1S	17.8	15.5
MOSES PEAK (2)	6650	3/26/98	48	18.2	--	5.7
MOSQUITO RDG PILLOW	5200	4/01/98	---	27.5	56.1	37.3
MOULTON RESERVOIR	6850	3/24/98	16	5.5	12.8	6.8
MOUNT CRAG PILLOW	4050	4/01/98	---	39.0S	32.8	31.5
MT. KOBAU CAN.	5500	3/29/98	44	15.0	14.8	12.7
MOUNT TOLMAN	2000	3/23/98	0	.0	--	--
MT. GARDNER	3300	4/01/98	26	10.2	31.3	14.1
MT. GARDNER PILLOW	2860	4/01/98	---	13.3S	29.2	14.0
MUTTON CREEK #1	5700	4/02/98	48	17.6	17.5	13.2
N.F. ELK CR PILLOW	6250	4/01/98	---	8.8	17.8	13.2
NEVADA CREEK PILLOW	6480	4/01/98	---	10.1	21.2	13.4
NEZ PERCE CMP PILLOW	5650	4/01/98	---	11.1	23.7	15.1
NEZ PERCE PASS	6570	3/27/98	36	13.2	23.6	19.2
NOISY BASIN	6040	3/29/98	98	38.4	76.4	45.4
NOISY BASIN PILLOW	6040	4/01/98	---	36.0	71.1	40.7
NORTH FORK JOCKO	6330	3/30/98	79	31.7	64.1	44.9
OLALLIE MDWS PILLOW	3960	4/01/98	---	55.6S	93.3	53.5
OLALLIE MEADOWS	3630	3/30/98	64	30.3	34.7	44.8
OPHIR PARK	7150	3/29/98	37	11.6	21.4	18.0
OYAMA LAKE CAN.	4100	3/31/98	20	6.7	10.0	6.4
PALISADE CREEK	8250	3/26/98	74	26.4	42.3	29.9
PARADISE PARK PILLOW	5500	4/01/98	---	66.3S	108.0	62.1
PARK CK RIDGE PILLOW	4600	4/01/98	---	44.8S	72.8	41.6
PETERSON MDW PILLOW	7200	3/31/98	---	9.9	14.4	11.0

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
PIGTAIL PEAK PILLOW	5900	4/01/98	---	52.3S	97.6	49.3
PIKE CREEK	5930	3/31/98	44	15.8	38.2	26.7
PIKE CREEK PILLOW	5930	4/01/98	---	17.9	42.2	27.9
PIPESTONE PASS	7200	3/26/98	16	5.0	8.0	5.9
POPE RIDGE PILLOW	3540	4/01/98	---	18.8S	31.0	15.7
POSTILL LAKE CAN.	4200	3/31/98	24	7.8	11.3	8.7
POTATO HILL PILLOW	4500	4/01/98	---	25.9S	39.1	25.3
QUARTZ PEAK PILLOW	4700	4/01/98	---	19.6	36.1	21.9
ROUND TOP MTN	4020	3/27/98	26	9.9	20.5	--
RAGGED RIDGE	3330	3/27/98	6	2.3	13.5	3.5
RAINY PASS PILLOW	4780	4/01/98	---	32.9S	56.4	38.0
REX RIVER PILLOW	1900	4/01/98	---	26.9S	46.7	27.6
ROCKER PEAK PILLOW	8000	4/01/98	---	13.3	18.0	15.3
ROLAND SUMMIT	5120	3/25/98	65	28.0	54.7	37.3
RUSTY CREEK	4000	4/02/98	19	6.6	8.8	5.9
SADDLE MTN PILLOW	7900	4/01/98	---	20.4	39.2	26.1
SAGE CREEK SADDLE	4080	3/31/98	39	15.0	34.9	17.8
SALMON MDWS PILLOW	4500	4/01/98	---	13.5S	17.9	9.4
SASSE RIDGE PILLOW	4200	4/01/98	---	37.7S	61.4	32.1
SAVAGE PASS PILLOW	6170	4/01/98	---	20.0	38.0	27.2
SAWMILL RIDGE	4700	4/02/98	79	31.6	64.8	36.3
SHEEP CANYON PILLOW	4050	4/01/98	---	34.4S	41.0	39.8
SILVER STAR MTN CAN.	5600	3/29/98	71	25.8	35.7	28.6
SKALKAHO PILLOW	7260	4/01/98	---	20.4	39.5	24.9
SKITWISH RIDGE	5110	4/01/98	66	27.2	54.1	31.3
SKOOKUM CREEK PILLOW	3920	4/01/98	---	23.2S	44.3	29.3
SLIDE ROCK MOUNTAIN	7100	3/28/98	34	11.2	20.5	16.7
SPENCER MDW PILLOW	3400	4/01/98	---	38.3S	51.7	29.6
SPIRIT LAKE PILLOW	3100	4/01/98	---	.6S	.8	3.6
SPOTTED BEAR MTN	7000	3/31/98	21	7.3	22.4	14.9
STAHL PEAK PILLOW	6030	4/01/98	---	33.1	49.2	35.1
STAMPEDE PASS PILLOW	3860	4/01/98	---	38.8S	62.1	44.4
STEMILT SLIDE	5000	3/27/98	36	14.0	15.0	12.8
STEMPLE PASS	6600	3/27/98	19	5.4	13.8	10.6
STEVENS PASS PILLOW	4070	4/01/98	---	35.7S	68.6	42.3
STEVENS PASS SAND SD	3700	3/30/98	67	27.0	52.9	33.7
STORM LAKE	7780	3/31/98	45	12.7	18.3	14.0
STRANGER MOUNTAIN	4230	3/30/98	37	13.9	20.9	12.2
STRYKER BASIN	6180	3/31/98	74	27.4	44.5	34.6
STUART MOUNTAIN	7400	3/30/98	66	25.2	50.9	32.9
SUMMERLAND RES CAN.	5050	3/26/98	22	68.9	13.3	9.1
SUMMIT G.S.	4600	3/31/98	26	8.8	1.2	8.1
SUNSET PILLOW	5540	4/01/98	---	15.6	47.9	37.6
SURPRISE LKS PILLOW	4250	4/01/98	---	53.8S	74.3	44.2
TEN MILE LOWER	6600	3/26/98	16	4.2	8.7	7.8
TEN MILE MIDDLE	6800	3/26/98	27	7.2	13.8	12.2
THUNDER BASIN	4200	4/01/98	---	16.0E	36.8	21.7
TINKHAM CREEK PILLOW	3000	4/01/98	---	26.8S	54.0	19.9
TOGO	3370	4/01/98	---	9.0E	18.3	10.8
TOUCHET #2 PILLOW	5530	4/01/98	---	24.7	61.3	31.9
TRAPPING CK LOW CAN.	2850	3/29/98	5	1.7	4.9	3.1
TRAPPING CK UP CAN.	4100	3/28/98	15	5.0	11.3	8.3
TRINKUS LAKE	6100	3/31/98	75	30.6	67.9	43.4
TROUGH #2 PILLOW	5310	4/01/98	---	13.8S	12.0	9.7
TROUT CREEK CAN.	5650	3/30/98	19	5.7	10.2	6.9
TRUMAN CREEK	4060	3/29/98	8	2.3	9.0	3.5
TUNNEL AVENUE	2450	3/31/98	40	17.3	31.6	20.8
TV MOUNTAIN	6800	3/30/98	39	13.3	29.6	19.2
TWELVEMILE PILLOW	5600	4/01/98	---	12.7	31.9	18.6
TWIN CAMP	4100	4/02/98	49	17.1	40.4	25.1
TWIN CREEKS	3580	3/31/98	13	4.9	21.3	10.3
TWIN LAKES	2700	3/24/98	20	6.8	--	5.2
TWIN LAKES PILLOW	6400	4/01/98	---	31.6	65.9	40.4
TWIN SPIRIT DIVIDE	3480	3/29/98	30	11.8	24.7	13.9
UPPER HOLLAND LAKE	6200	3/31/98	66	27.2	53.0	35.4
UPPER WHEELER PILLOW	4400	4/01/98	---	15.3S	17.5	13.6
VASEUX CREEK CAN.	4250	4/01/98	16	5.6	7.3	6.3
WARM SPRINGS PILLOW	7800	4/01/98	---	20.5	31.2	22.3
WATSON LAKES AM	4500	4/01/98	---	60.0E	69.0	64.9
WEASEL DIVIDE	5450	3/27/98	74	26.4	41.0	33.8
WELLS CREEK PILLOW	4200	4/01/98	---	27.6S	43.1	39.0
WHITE PASS ES PILLOW	4500	4/01/98	---	21.5S	40.3	22.9
WHITE ROCKS MTN CAN.	7200	4/02/98	57	20.0	25.1	23.0

(d) Denotes discontinued site.



NRCS SNOTEL Sites
Washington
1998

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
WASHINGTON STATE OFFICE, SPOKANE

USDA NRCS

Natural Resources Conservation Service

Washington State

Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://wcp.wsu.edu/nrcs/CoopSnoSrvy.htm

Oregon:
http://crystal.or.nrcs.usda.gov/snowsurveys/

Idaho:
http://id.nrcs.usda.gov/snow/snow.htm

National Water and Climate Center (NWCC):
http://www.wcc.nrcs.usda.gov/

NWCC Anonymous FTP Server:
ftp.wcc.nrcs.usda.gov

USDA-NRCS Agency Homepages

Washington:
http://wcp.wsu.edu/nrcs/

NRCS National:
http://www.ftw.nrcs.usda.gov/

USDA NRCS

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Washington State

Snow, Water and Climate Services

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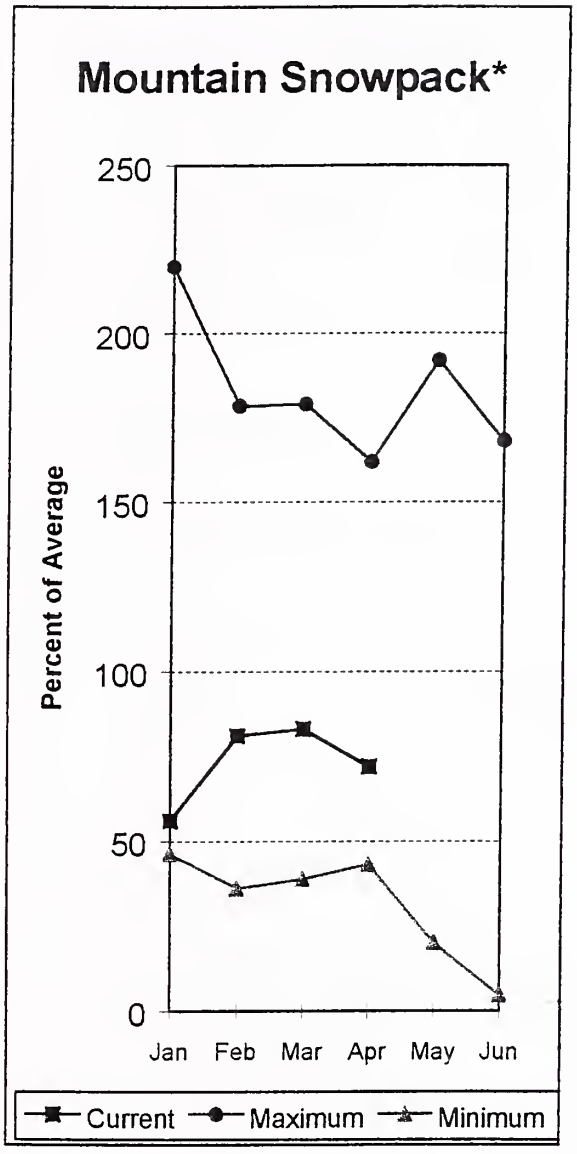
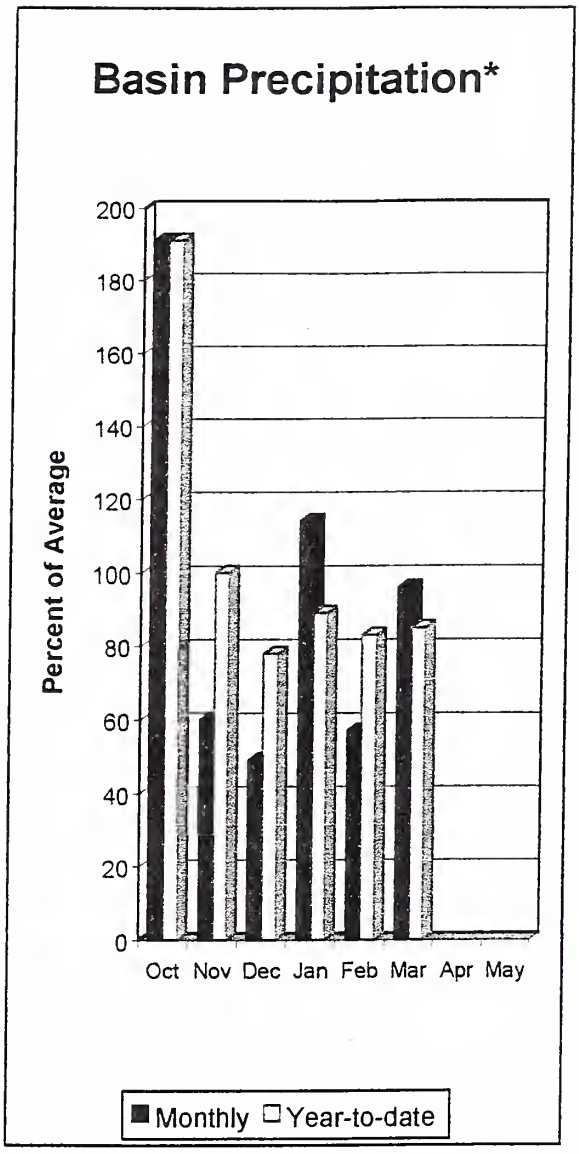
Spokane River Basin





*Based on selected stations

The April 1 forecasts for summer runoff within the Spokane River Basin are 64% of average near Post Falls and 65% of average at Long Lake. These forecasts dropped slightly from last month. The forecast is based on a basin snowpack that is 72% of average and precipitation that is 85% of average for the water year. Precipitation for March was near normal at 96% of average. Streamflow on the Spokane River at Long Lake, was 95% of average for March. April 1 storage in Coeur d'Alene Lake, was 190,500 acre feet, 112% of average, and 80% of capacity. Snowpack at Quartz Peak SNOTEL site contained 19.6 inches of water, compared to the average April 1 reading of 21.9 inches. Average temperatures in the Spokane Basin were 4 degrees above normal.

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

Streamflow Forecasts - April 1, 1998

SPOKANE near Post Falls (2)	APR-SEP	1288	1557	1740	64	1923	2192	2730
	APR-JUL	1239	1502	1680	64	1858	2121	2633
SPOKANE at Long Lake	APR-JUL	1373	1663	1860	63	2057	2347	2936
	APR-SEP	1539	1840	2044	65	2248	2549	3159

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
COEUR D'ALENE	238.5	190.5	307.3	170.1

* SPOKANE RIVER BASIN
Watershed Snowpack Analysis - April 1, 1998

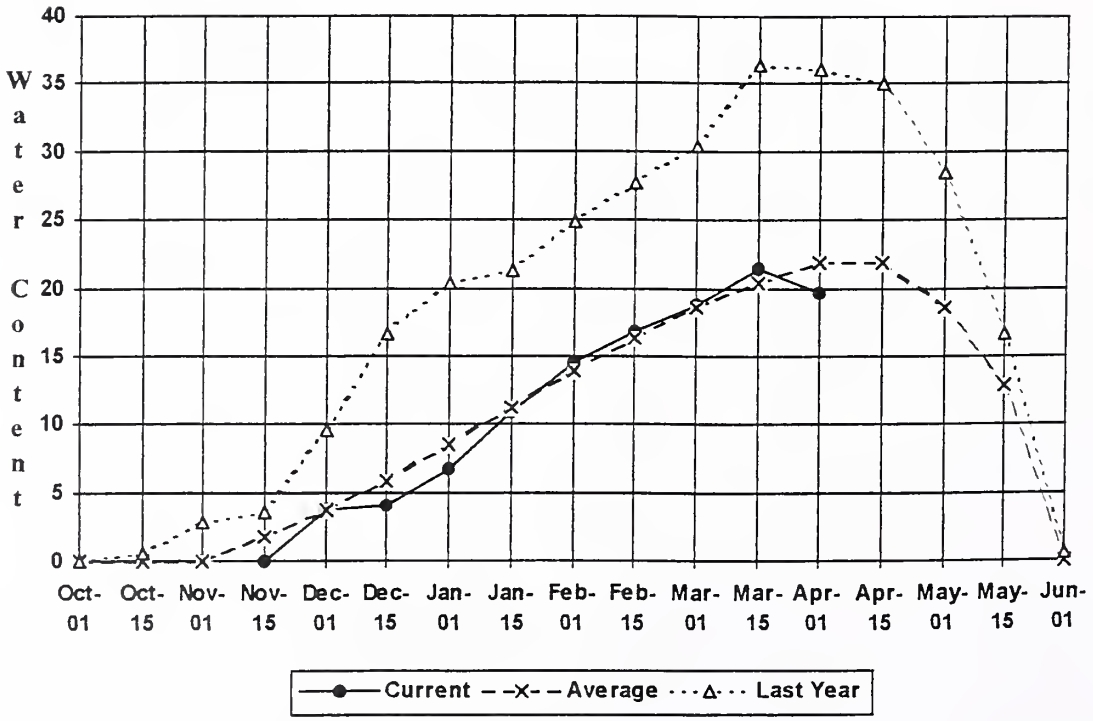
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SPOKANE RIVER	19	45	72
NEWMAN LAKE	2	44	86

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

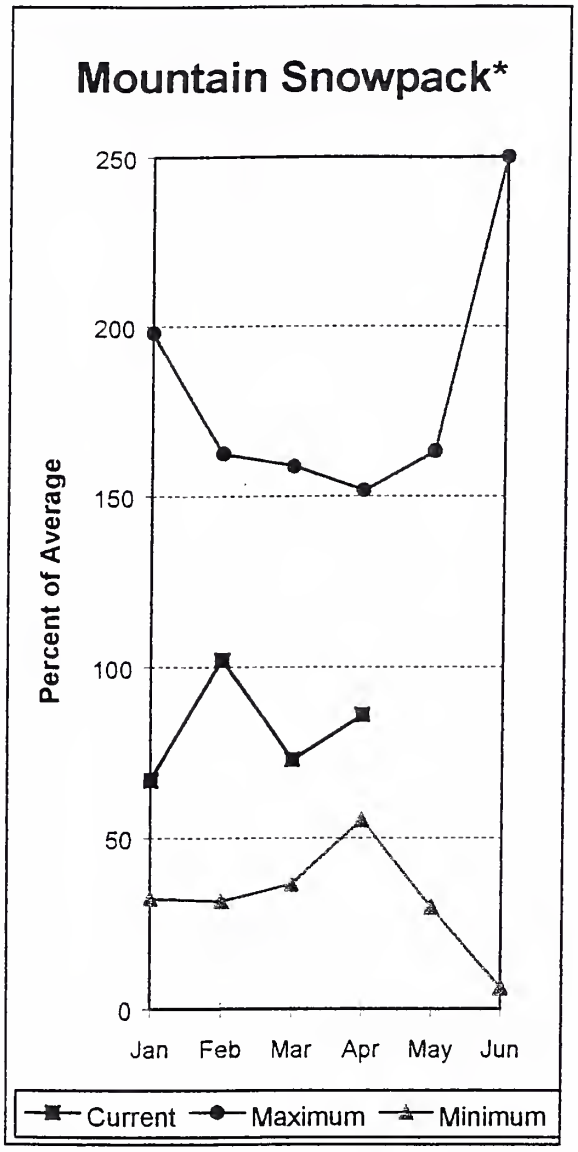
The average is computed for the 1961-1990 base period.

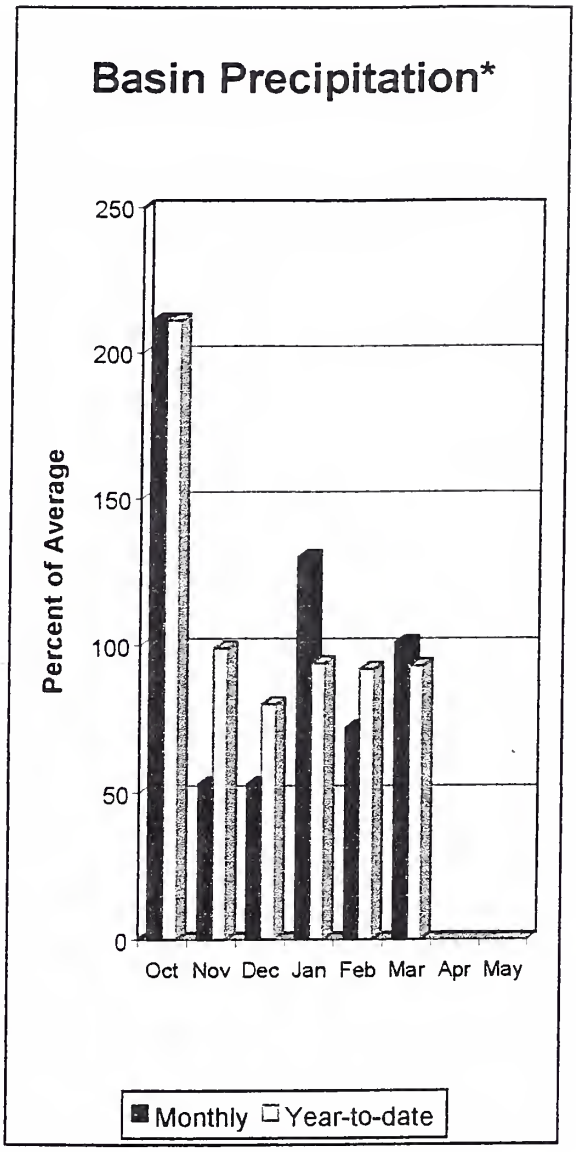
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Quartz Peak SNOTEL
Elevation 4700 ft.



Colville - Pend Oreille River Basins





*Based on selected stations

The forecast for the Kettle River streamflow is 110% of average; the Pend Oreille below Box Canyon, 68%; and the Priest River near the town of Priest River, 72% of average for the summer runoff period. March streamflow was 94% of average on the Pend Oreille River; 123% on the Columbia at the International Boundary; and 226% on the Kettle River. April 1 snow cover was 72% of average in the Pend Oreille Basin and 88% of average in the Kettle River Basin. Precipitation during March was 101% of average, bringing the year-to-date precipitation to 93% of average. Reservoir storage in Roosevelt and Banks Lakes was reported to be 160% of average and 58% of capacity on April 1. Average temperatures were 4 degrees above normal.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<------ Drier ------ Future Conditions ------ Wetter ------>> 90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
PEND OREILLE Lake Inflow (1,2)	APR-JUL	6398	8222	9050	69	9878	11702	13150
	APR-SEP	6988	8984	9890	69	10796	12792	14370
	APR-JUN	5355	7078	7860	69	8642	10365	11390
PRIEST nr Priest River (1,2)	APR-JUL	378	520	585	72	650	792	814
	APR-SEP	404	556	625	72	694	846	868
PEND OREILLE bl Box Canyon (1,2)	APR-JUL	6710	8381	9140	68	9899	11570	13380
	APR-SEP	7318	9142	9970	68	10798	12622	14590
	APR-JUN	5779	7217	7870	68	8523	9961	11570
CHAMOKANE CREEK near Long Lake	MAY-AUG	4.65	6.83	8.30	97	9.77	11.95	8.52
COLVILLE at Kettle Falls	APR-SEP	77	98	113	86	128	149	131
	APR-JUL	70	90	103	86	116	136	120
	APR-JUN	65	82	94	85	106	123	111
KETTLE near Laurier	APR-SEP	1755	1925	2040	110	2155	2325	1854
	APR-JUL	1689	1839	1940	110	2041	2191	1761
	APR-JUN	1556	1687	1777	112	1867	1998	1585

COLVILLE - PEND OREILLE RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
ROOSEVELT	5232.0	2794.4	1306.4	1586.0
BANKS	715.0	678.3	680.5	583.0

COLVILLE - PEND OREILLE RIVER BASINS
Watershed Snowpack Analysis - April 1, 1998

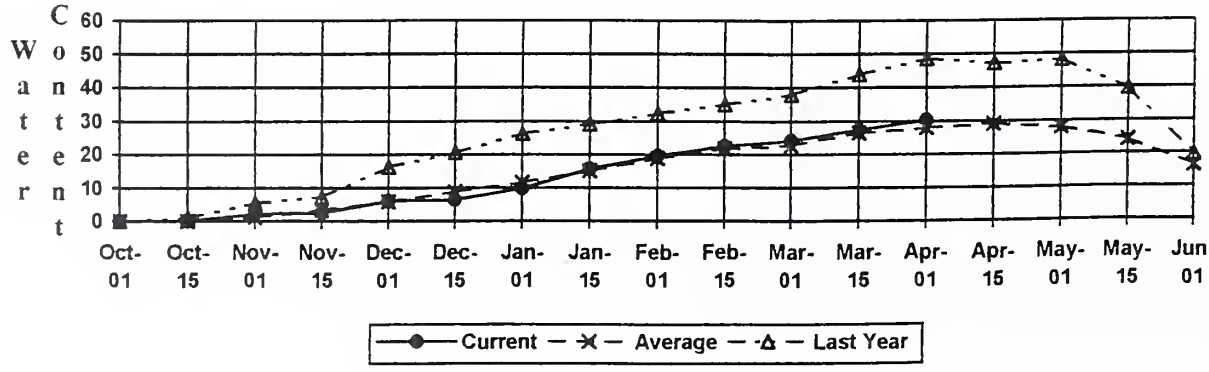
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
COLVILLE RIVER	2	58	100
PEND OREILLE RIVER	109	49	72
KETTLE RIVER	11	68	88

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

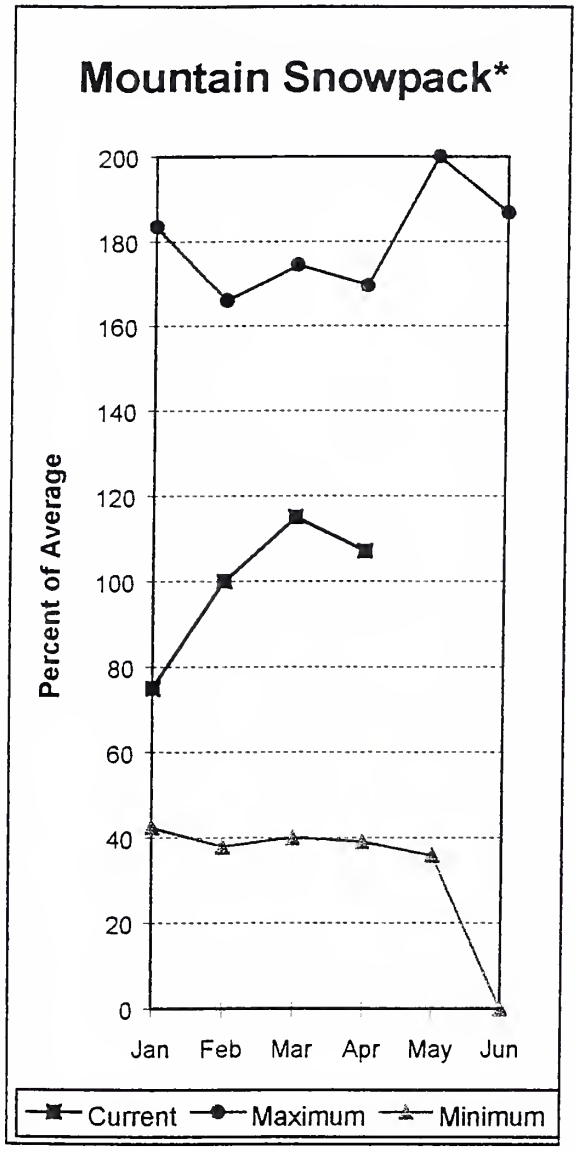
The average is computed for the 1961-1990 base period.

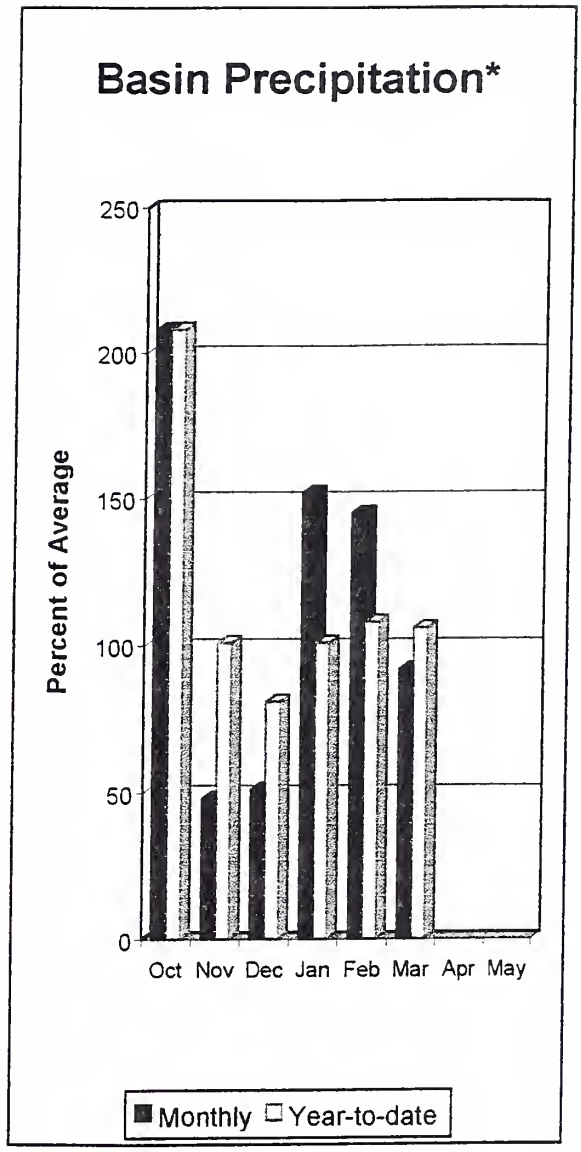
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Bunchgrass Meadow SNOTEL
Elevation 5000 ft.



Okanogan - Methow River Basins





*Based on selected stations

Summer runoff forecast for the Okanogan River is 77% of average; the Similkameen River, 74%; the Methow River, 97%; and Salmon Creek, 115% of average. April 1 snow cover on the Okanogan was 112% of average; the Methow, 104%; and the Similkameen River, 76%. Salmon Meadows SNOTEL site above Conconully Lake had an April 1 reading of 144% of average. March precipitation in the Okanogan-Methow was 92% of average, with precipitation for the water year at 106% of average. March streamflow for the Methow River was 129% of average; 128% for the Okanogan River; and 58% for the Similkameen. Snow-water-content at the Salmon Meadows SNOTEL, near Conconully, was 13.5 inches. Average for this site is 9.4 inches on April 1.. Combined storage in the Conconully Reservoirs was 21,200 acre feet, which is 90% of capacity and 141% of the April 1 average.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<------ Drier ------ Future Conditions ------ Wetter ------>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SIMILKAMEEN near Nighthawk (1)	APR-JUL	639	860	960	74	1060	1281	1304
	APR-SEP	695	927	1032	74	1137	1369	1399
	APR-JUN	526	737	833	75	929	1140	1113
OKANOGAN near Tonasket (1)	APR-JUL	577	960	1134	77	1308	1691	1466
	APR-SEP	631	1057	1250	77	1443	1869	1623
	APR-JUN	494	805	946	77	1087	1398	1233
SALMON CREEK near Conconully	APR-JUL	10.3	17.3	22	115	27	34	19.1
	APR-SEP	10.7	18.0	23	115	28	35	20
METHOW RIVER near Pateros	APR-SEP	798	867	915	97	963	1032	942
	APR-JUL	760	823	865	99	907	970	873
	APR-JUN	642	700	740	99	780	838	746

OKANOGAN - METHOW RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
SALMON LAKE	10.5	8.9	8.4	8.0
CONCONULLY RESERVOIR	13.0	12.3	10.0	7.0

OKANOGAN - METHOW RIVER BASINS
Watershed Snowpack Analysis - April 1, 1998

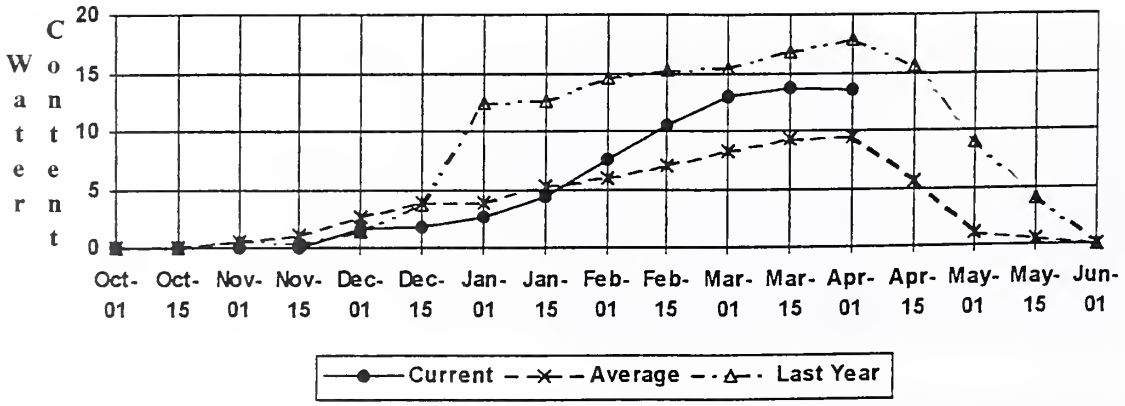
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
OKANOGAN RIVER	24	84	112
OMAK CREEK	1	96	110
SANPOIL RIVER	0	0	0
SIMILKAMEEN RIVER	5	60	76
CONCONULLY LAKE	3	85	132
METHOW RIVER	5	72	104

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

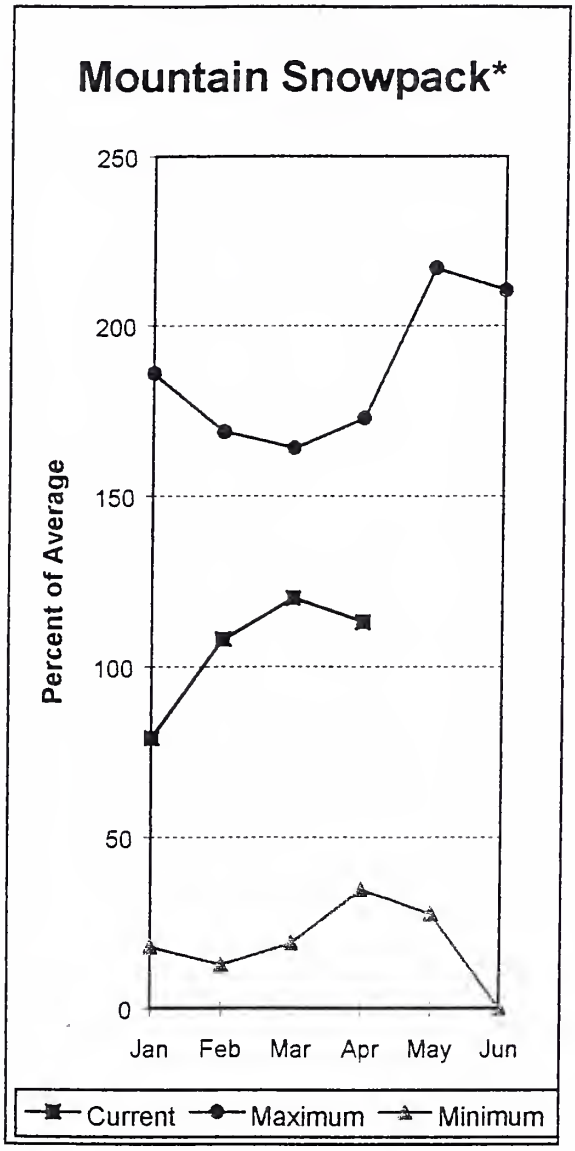
The average is computed for the 1961-1990 base period.

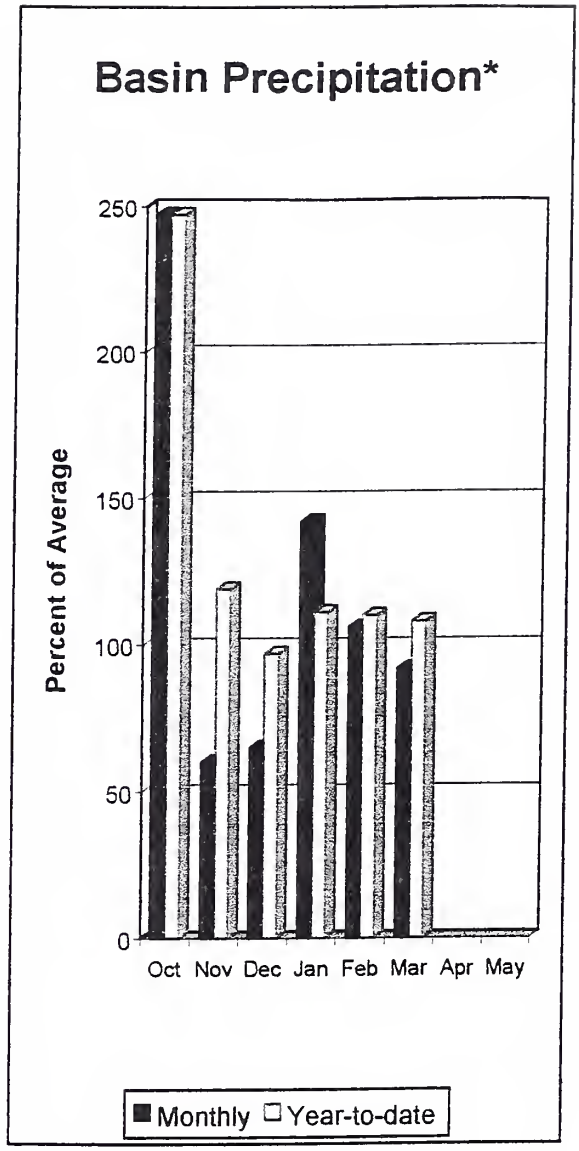
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Salmon Meadows SNOTEL
Elevation 4500 ft.



Wenatchee - Chelan River Basins





*Based on selected stations

Precipitation during March was 92% of average in the basin and 108% for the year-to-date. Runoff for the Entiat River is forecast to be 98% of average for the summer. The April-September forecast for the Chelan River is for 97% of average; for the Wenatchee River at Peshastin it is 94%; and for the Stehekin it is 97% of average. Icicle, Stemilt and Squilchuck Creeks are all expected to have near normal flows this summer. March streamflows on the Chelan River was 118% of average, and the Wenatchee River averaged 101% of normal flows. April 1 snowpack in the Wenatchee Basin was 96% of average. The Chelan Basin was 103% of average; Colockum Ridge was 142%; and Stemilt Creek was 111% of average. Snowpack in the Entiat River Basin was 114% of average. Reservoir storage in Lake Chelan was 309,600 acre feet, or 146% of April 1 average and 46% of capacity. Lyman Lake SNOTEL had the most snow water with 64.5 inches of water. This site would normally have 56.9 inches on April 1. Temperatures were 2-3 degrees above normal for March.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<------ Drier ------ Future Conditions ------ Wetter ------>> 90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
CHELAN RIVER near Chelan	APR-SEP	984	1065	1120	97	1175	1256	1160
	APR-JUL	894	963	1010	99	1057	1126	1024
	APR-JUN	682	752	800	99	848	918	812
STEHEKIN near STEHEKIN	APR-SEP	704	761	800	97	839	896	827
	APR-JUL	603	649	680	97	711	757	701
	APR-JUN	442	489	520	97	551	598	538
ENTIAT RIVER near Ardenvoir	APR-SEP	197	212	222	98	232	247	227
	APR-JUL	180	194	204	99	214	228	206
	APR-JUN	146	160	169	100	178	192	169
WENATCHEE at Plain	APR-SEP	952	1037	1095	92	1153	1238	1190
	APR-JUL	872	940	986	92	1032	1100	1072
	APR-JUN	708	763	800	93	837	892	864
WENATCHEE R. at Peshastin	APR-SEP	1024	1331	1540	94	1749	2056	1636
	APR-JUL	934	1211	1400	94	1589	1866	1485
	APR-JUN	755	978	1130	94	1282	1505	1204
STEMILT nr Wenatchee (miners in)	MAY-SEP	84	110	128	93	146	172	138
ICICLE CREEK near Leavenworth	APR-SEP	277	300	315	92	330	353	344
	APR-JUL	259	277	290	91	303	321	318
	APR-JUN	205	225	239	91	253	273	263

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CHELAN LAKE	676.1	309.6	189.8	212.1

WENATCHEE - CHELAN RIVER BASINS
Watershed Snowpack Analysis - April 1, 1998

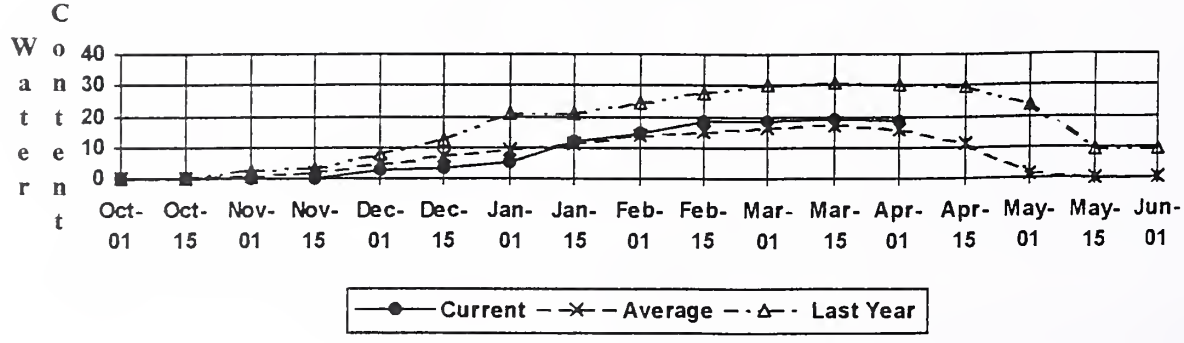
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CHELAN LAKE BASIN	4	69	103
ENTIAT RIVER	2	51	114
WENATCHEE RIVER	13	62	96
SQUILCHUCK CREEK	0	0	0
STEMILT CREEK	2	90	111
COLOCKUM CREEK	1	115	142

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

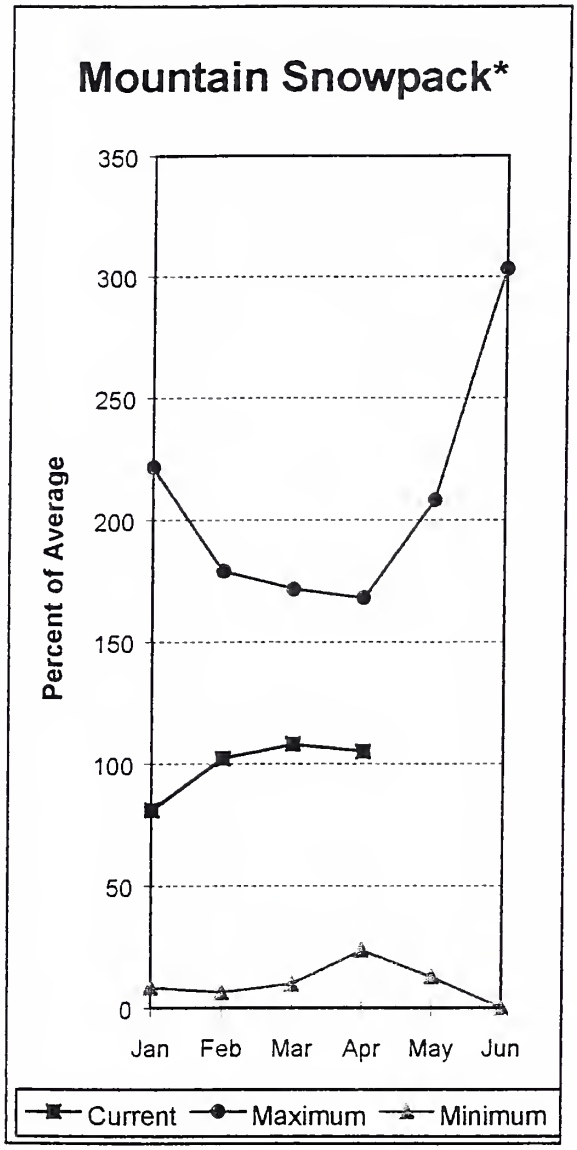
The average is computed for the 1961-1990 base period.

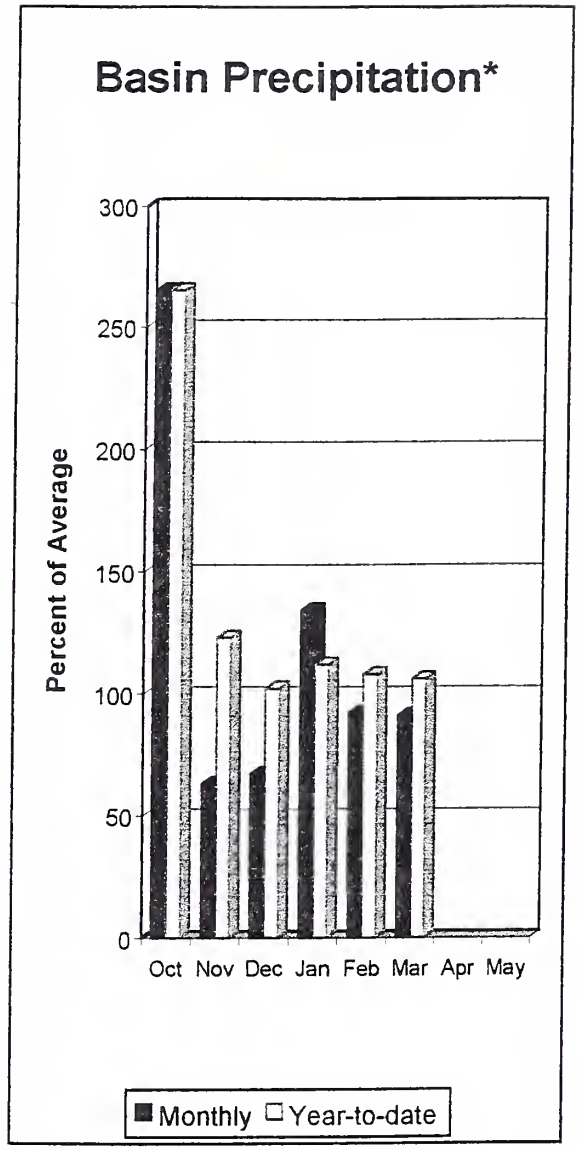
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Pope Ridge SNOTEL
Elevation 3540 ft.



Yakima River Basin





*Based on selected stations

April 1 reservoir storage for the five major reservoirs was 860,800 acre feet, or 116% of average. April 1 summer streamflow forecasts are for near to slightly below normal in the Yakima Basin. Forecasts for the Yakima River at Cle Elum, are for 88% of average; Naches River, 94%; the Yakima River near Parker, 90%; Ahtanum Creek, 94%; and the Tieton River, 99%. The Klickitat River near Glenwood is forecast for normal flows this summer. 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. March streamflows within the basin were: the Yakima River near Kiona, 112% of average; the Yakima River near Cle Elum, 109%; and the Naches River at 108%. April 1 snowpack was 102% based upon 20 snow courses and SNOTEL readings within the Yakima Basin. Precipitation was 91% of average for March and 106% for the water year-to-date.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
KEECHELUS LAKE INFLOW	APR-JUL	97	107	114	92	121	131	124
	APR-SEP	104	116	124	92	132	144	135
	APR-JUN	82	93	100	92	107	118	109
KACHESS LAKE INFLOW	APR-JUL	85	93	98	88	103	111	111
	APR-SEP	89	98	104	88	110	119	118
	APR-JUN	72	81	87	88	93	102	99
CLE ELUM LAKE INFLOW	APR-JUL	323	345	360	88	375	397	409
	APR-SEP	353	378	395	88	412	437	448
	APR-JUN	265	288	304	88	320	343	345
YAKIMA at Cle Elum	APR-JUN	556	602	634	88	666	712	721
	APR-JUL	660	702	730	88	758	800	832
	APR-SEP	726	773	805	88	837	884	915
BUMPING LAKE INFLOW	APR-SEP	114	122	127	93	132	140	136
	APR-JUL	104	111	116	94	121	128	124
	APR-JUN	83	92	98	94	104	113	104
AMERICAN RIVER near Nile	APR-SEP	116	123	128	109	133	140	118
	APR-JUL	106	113	118	108	123	130	109
	APR-JUN	83	92	98	106	104	112	92
RIMROCK LAKE INFLOW	APR-SEP	210	225	235	99	245	260	238
	APR-JUL	181	192	200	100	208	219	200
	APR-JUN	138	151	160	99	169	182	162
NACHES near Naches	APR-SEP	707	750	780	94	810	853	832
	APR-JUL	649	691	720	95	749	791	755
	APR-JUN	542	589	620	95	651	698	651
AHTANUM CREEK nr Tampico (2)	APR-SEP	26	36	43	94	50	60	46
	APR-JUL	24	33	40	94	46	55	42
	APR-JUN	21	29	34	95	40	47	36
YAKIMA near Parker	APR-SEP	1631	1732	1800	90	1868	1969	1994
	APR-JUL	1501	1590	1650	91	1710	1799	1805
	APR-JUN	1310	1404	1468	92	1532	1626	1597
KLICKITAT near Glenwood	APR-JUN	99	108	114	104	120	129	110
	APR-SEP	118	131	140	100	149	162	140

YAKIMA RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
KEECHELUS	157.8	140.2	124.2	110.0
KACHESS	239.0	193.3	148.0	187.0
CLE ELUM	436.9	360.4	302.7	290.0
BUMPING LAKE	33.7	12.4	12.2	11.0
RIMROCK	198.0	154.5	140.8	142.0

YAKIMA RIVER BASIN
Watershed Snowpack Analysis - April 1, 1998

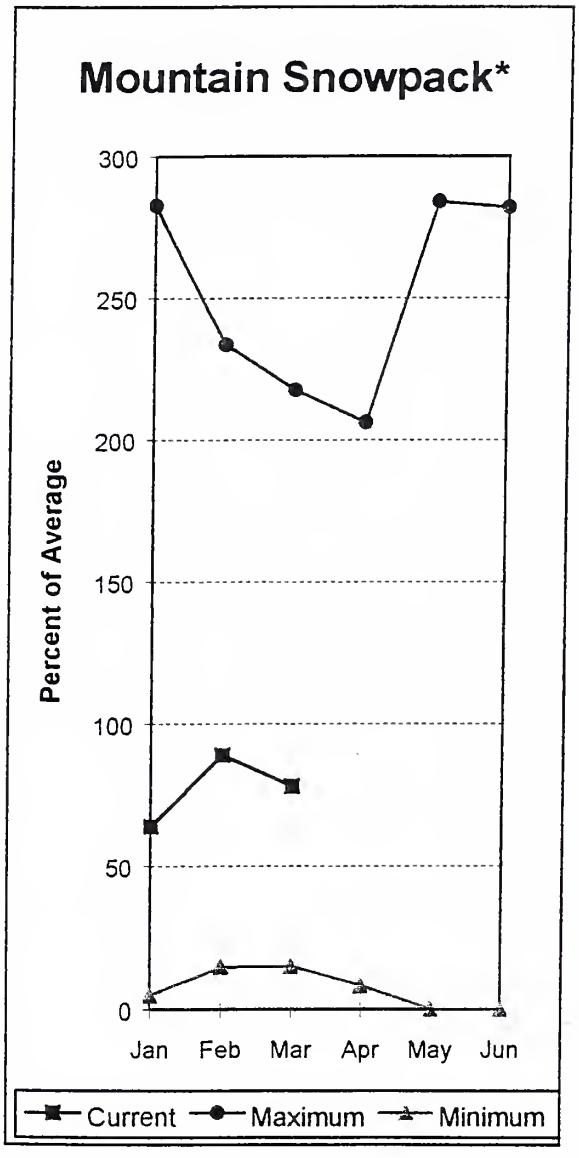
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
YAKIMA RIVER	20	65	102
AHTANUM CREEK	2	74	108

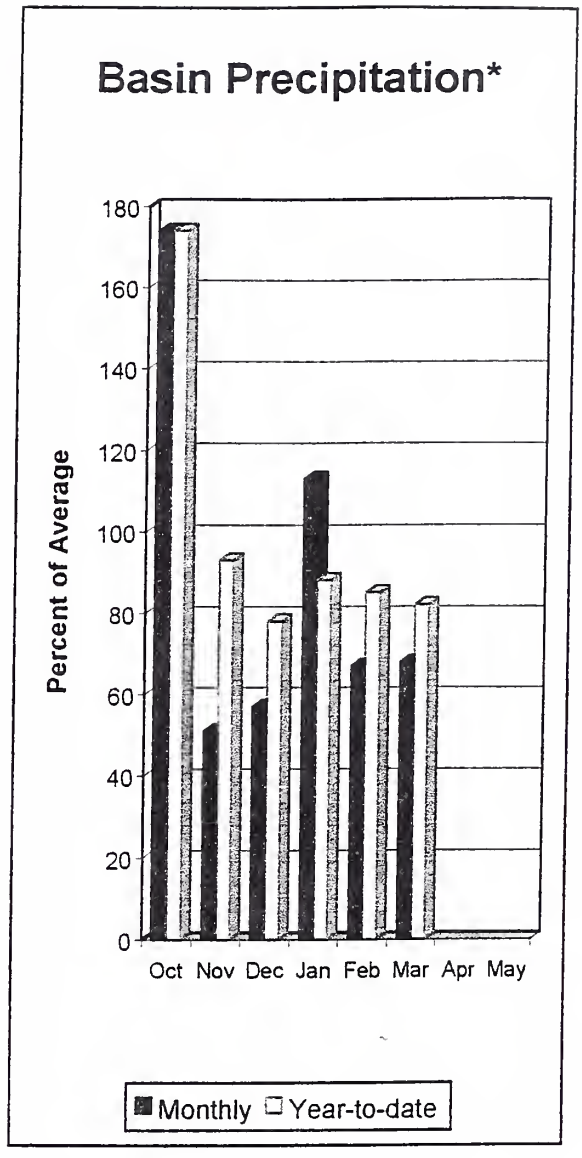
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

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





*Based on selected stations

March precipitation was 68% of average, bringing the year-to-date precipitation to 82% of average. April 1 snowpack was 75% of average. The summer forecast is for 81% of average streamflow in the Snake River below Lower Granite Dam, 88% for the Grande Ronde at Troy, and 88% for Mill Creek. March streamflow was 152% of average for the Walla Walla River; 100% for the Snake River below Lower Granite Dam; and 95% for the Grande Ronde River near Troy. The Touchet SNOTEL site had 24.7 inches of snow-water-equivalent. The average April 1 reading for this site is 31.9 inches. Average temperatures were 2 degrees above normal for the area.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<------ Drier ------ Future Conditions ------ Wetter ------>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
GRANDE RONDE at Troy (1)	APR-JUL	819	1053	1160	96	1267	1501	1214
	APR-SEP	792	1045	1160	88	1275	1528	1312
SNAKE blw Lower Granite Dam (1,2)	APR-JUL	12484	15865	17400	80	18935	22316	21650
	APR-SEP	14175	17974	19700	81	21426	25225	24360
MILL CREEK at Walla Walla	APR-SEP	9.1	12.7	15.1	88	17.5	21	17.1
	APR-JUL	8.9	12.5	14.9	88	17.3	21	16.9
	APR-JUN	8.8	12.3	14.7	88	17.1	21	16.7
SF WALLA WALLA near Milton-Freewater	APR-JUL	38	43	46	87	49	54	53
	APR-SEP	48	53	57	86	61	66	66

WALLA WALLA RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

WALLA WALLA RIVER BASIN
Watershed Snowpack Analysis - April 1, 1998

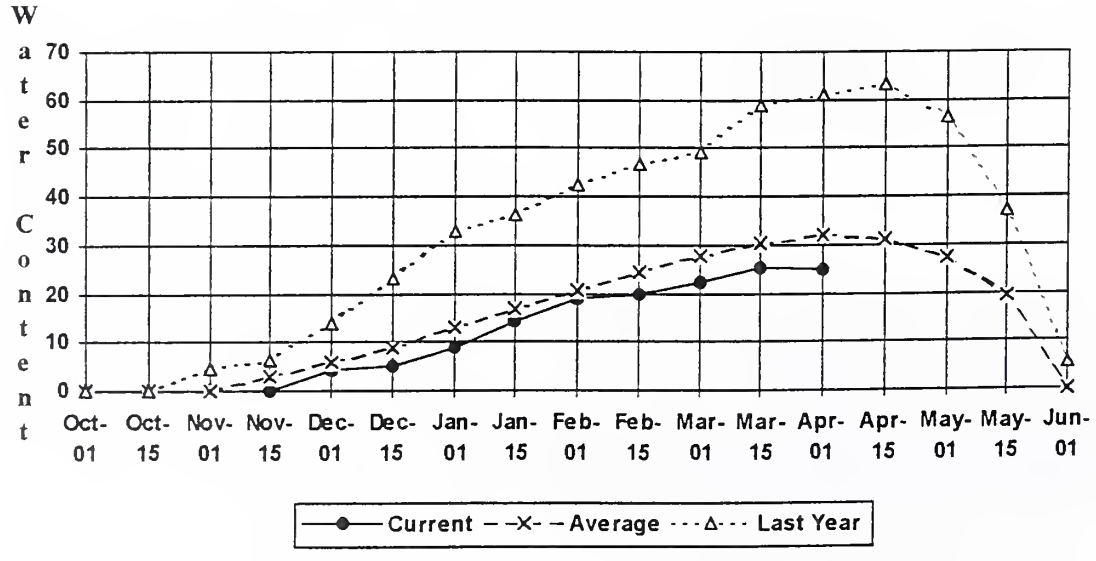
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WALLA WALLA RIVER	2	43	75

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

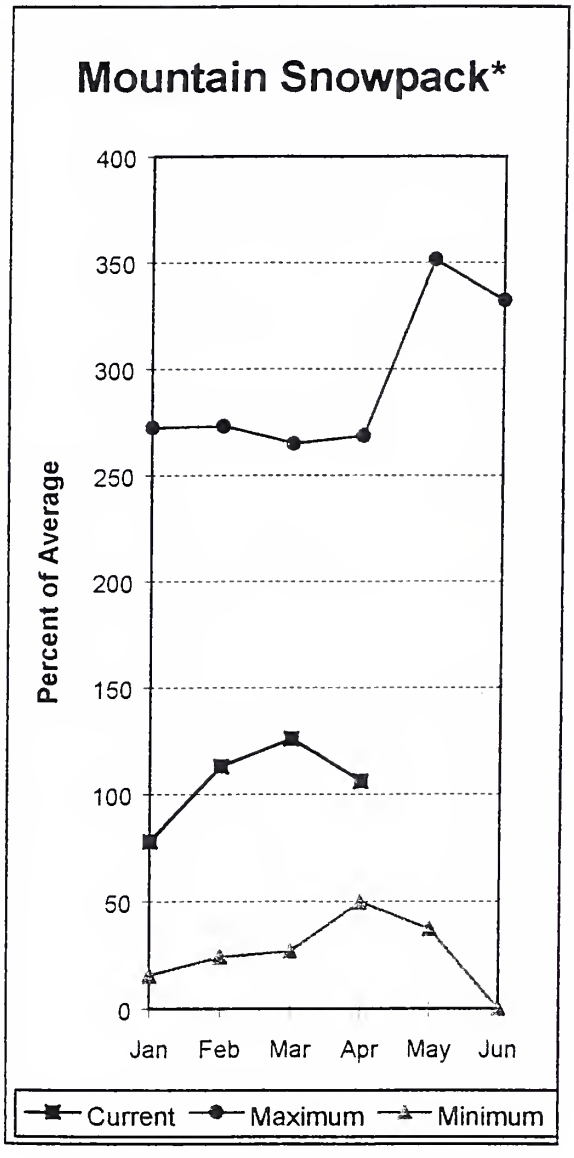
The average is computed for the 1961-1990 base period.

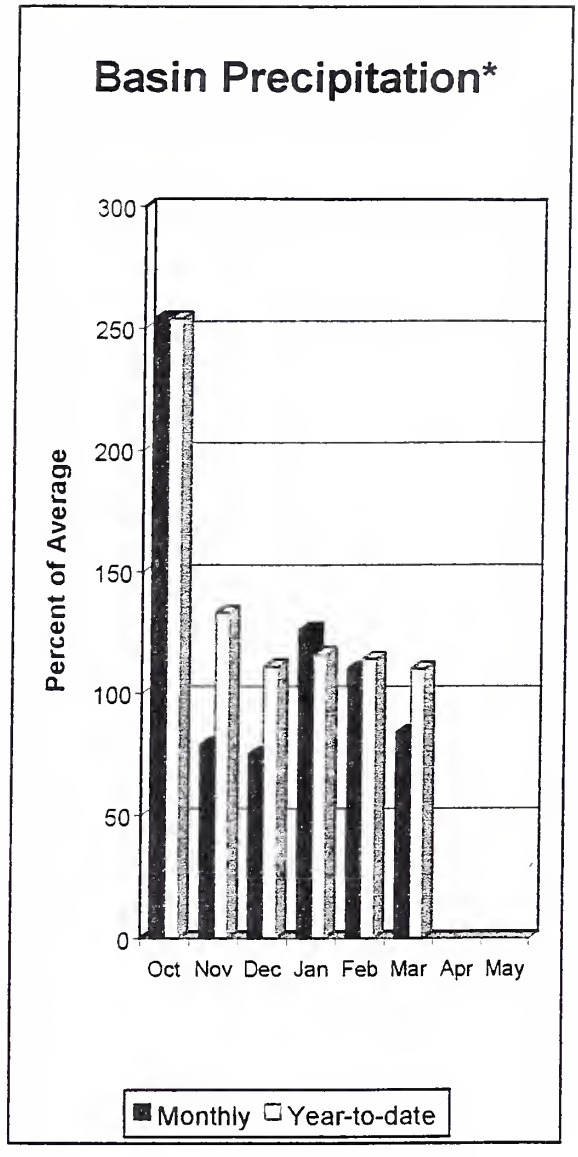
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Touchet #2 SNOTEL
Elevation 5530 ft.



Cowlitz - Lewis River Basins





*Based on selected stations

The forecast for summer runoff in the Lewis River Basin is 89% of average. The Cowlitz River at Castle Rock, is forecast for 95% of average runoff. March streamflow was normal for the Cowlitz River, and 112% of average for the Lewis River. March precipitation was 84% of average. It was 110% of average for the water-year. April 1 snow cover for the Cowlitz River was 98%, and the Lewis River was 113% of average. The Cayuse Pass snow course recorded the most water-content for the basin with 77.3 inches of water. Average April 1 water-content is 82.4 inches. Average temperatures were 2 degrees above normal during March.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<== Drier == Future Conditions == Wetter ==>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
LEWIS at Ariel (2)	APR-JUL	660	825	937	89	1049	1214	1053
	APR-SEP	786	955	1070	89	1185	1354	1206
	APR-JUN	569	724	830	89	936	1091	935
COWLITZ R. bl Mayfield Dam (2)	APR-SEP	1061	1531	1850	94	2169	2639	1970
	APR-JUL	941	1351	1630	94	1909	2319	1731
	APR-JUN	800	1152	1390	94	1628	1980	1477
COWLITZ R. at Castle Rock (2)	APR-SEP	1560	2132	2520	95	2908	3480	2667
	APR-JUL	1363	1861	2200	95	2539	3037	2325
	APR-JUN	1180	1609	1900	95	2191	2620	1995
KLICKITAT near Glenwood	APR-JUN	99	108	114	104	120	129	110
	APR-SEP	118	131	140	100	149	162	140

COWLITZ - LEWIS RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

COWLITZ - LEWIS RIVER BASINS
Watershed Snowpack Analysis - April 1, 1998

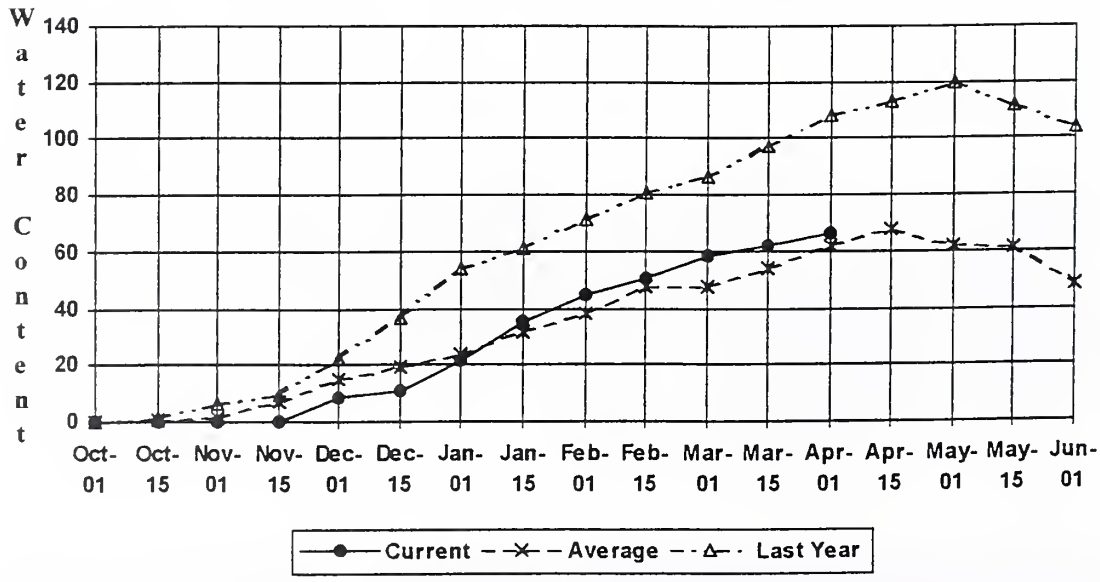
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
LEWIS RIVER	4	66	113
COWLITZ RIVER	7	67	98

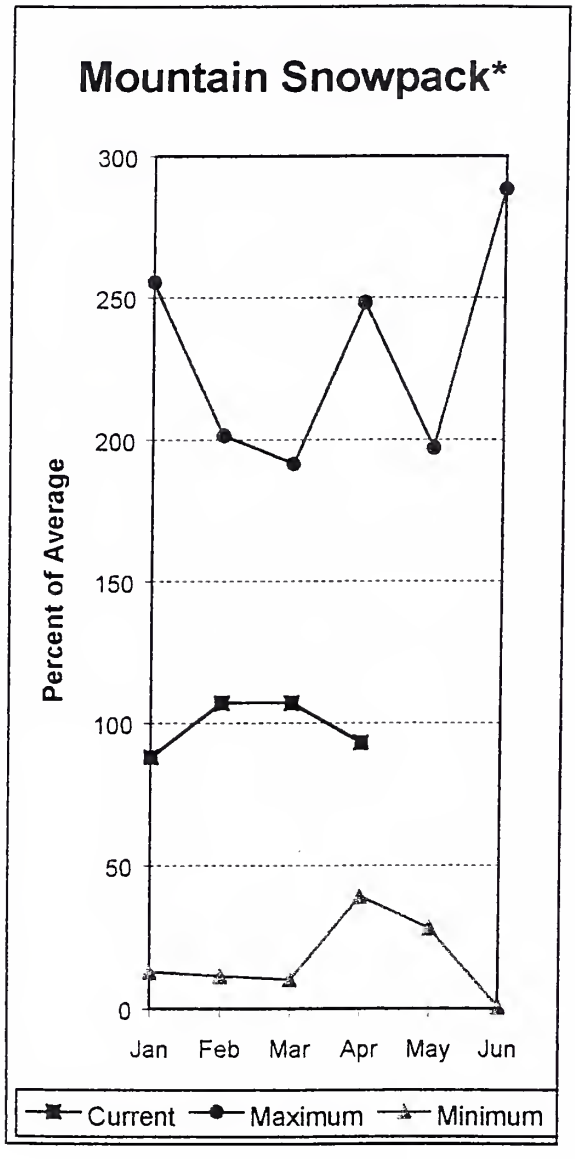
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

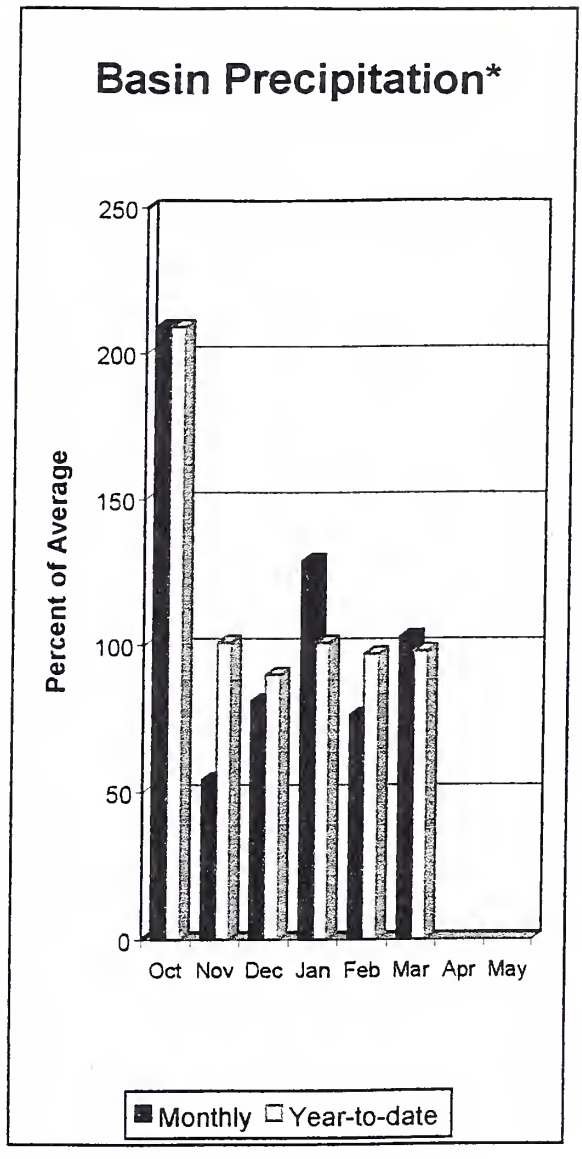
The average is computed for the 1961-1990 base period.

(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.

Paridise SNOTEL
Elevation 5120 ft.







*Based on selected stations

Summer runoff is forecast to be 78% of average for the Green River. The White River should see near normal flows while the Nisqually River will most likely experience below normal flows this summer. April 1 snowpack was 111% of average in the White River Basin; and 74% in the Green River Basin. Water-content on April 1 at the Morse Lake SNOTEL, at an elevation of 5,400 feet, was 67.4 inches. This site has an April 1 average of 47.2 inches. March precipitation was 103% of average, bringing the water year-to-date to 98% of average for the basins. March temperatures were slightly above average.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter ======>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
GREEN RIVER below Howard Hanson Dam	APR-JUL	153	183	203	79	223	253	257
	APR-SEP	170	200	221	78	242	272	285
	APR-JUN	139	166	185	79	204	231	234

WHITE - GREEN RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

WHITE - GREEN RIVER BASINS
Watershed Snowpack Analysis - April 1, 1998

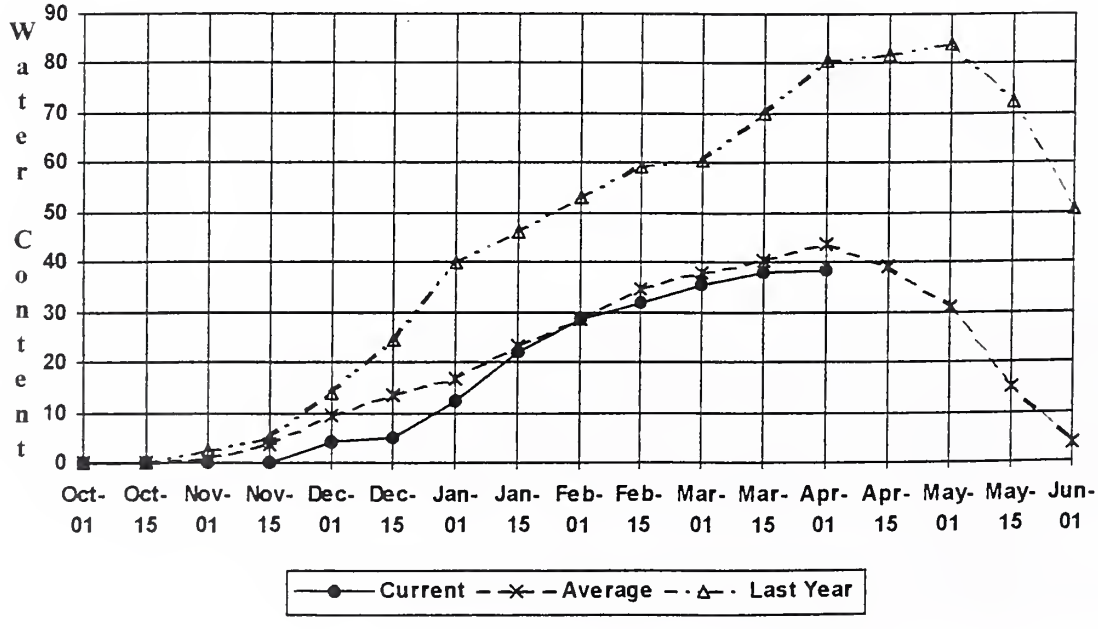
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WHITE RIVER	3	78	111
GREEN RIVER	7	47	74

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

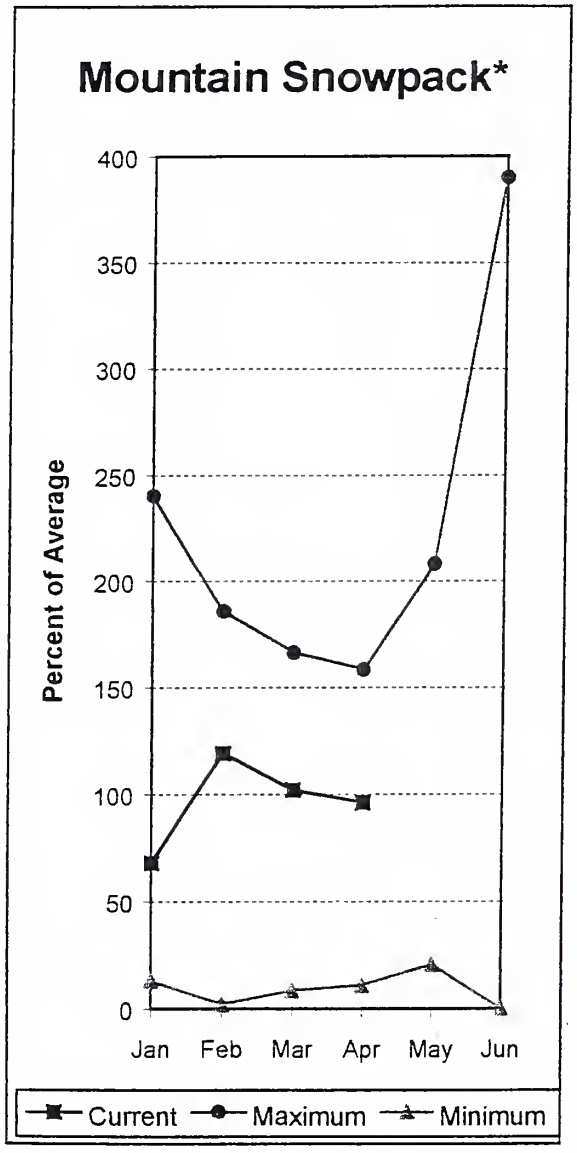
The average is computed for the 1961-1990 base period.

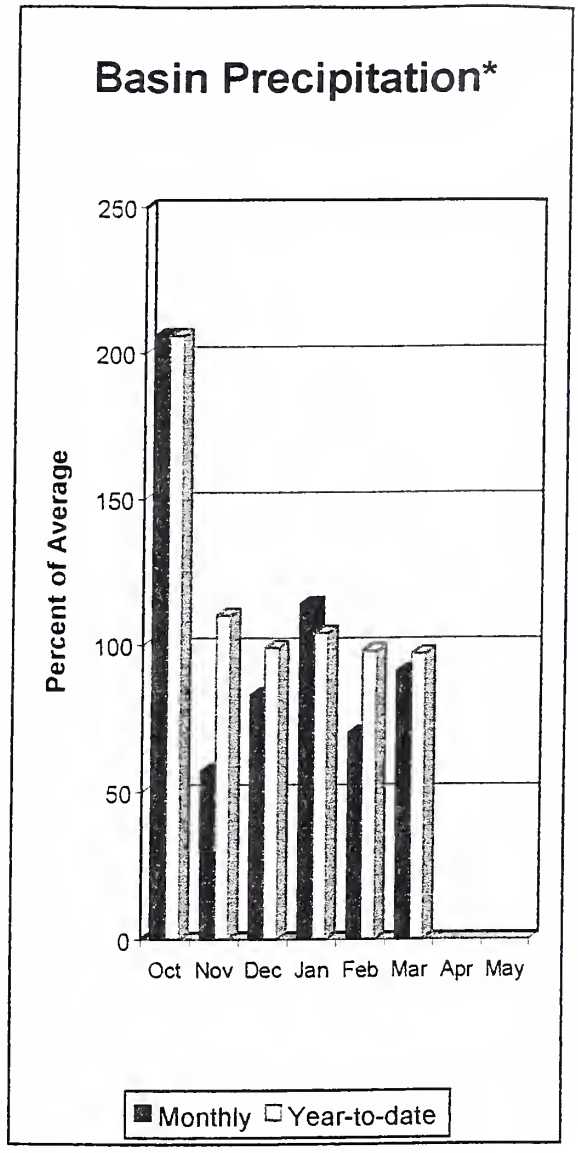
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Stampede Pass SNOTEL
Elevation 3860 ft.



Central Puget Sound River Basins





*Based on selected stations

Forecast for spring and summer flows are: 86% for the Cedar River near Cedar Falls; 84% for the Rex River; 90% for the South Fork of the Tolt River; and 81% for the Cedar River at Cedar Falls. The Cedar River at Cedar Falls stream gage may be affected by upstream reservoir control. Basin-wide precipitation for March was 91% of average, bringing the water-year-to-date to 97% of average. April 1 snow cover in the Cedar River Basin was 97%; the Tolt River Basin was 99%; the Snoqualmie River Basin was 93%; and the Skykomish River Basin was 95% of average. Stevens Pass SNOTEL, at 4,070 feet, had 35.7 inches of water content. Average April 1 water content is 42.3 inches. March temperatures were 2 degrees above normal.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<------ Drier ------ Future Conditions ------- Wetter ------>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
CEDAR near Cedar Falls	APR-JUL	52	60	66	85	71	80	77
	APR-SEP	57	66	72	86	79	88	84
	APR-JUN	47	54	59	87	64	72	68
REX near Cedar Falls	APR-JUL	15.8	19.8	23	83	25	29	27
	APR-SEP	18.0	22	25	84	28	33	30
	APR-JUN	14.7	18.3	21	84	23	27	25
CEDAR RIVER at Cedar Falls (2)	APR-JUL	45	58	67	81	75	88	82
	APR-SEP	48	60	67	81	75	86	83
	APR-JUN	44	56	65	81	73	86	80
SOUTH FORK TOLT near Index	APR-JUL	11.3	12.7	13.7	90	14.7	16.1	15.2
	APR-SEP	12.9	14.8	16.0	90	17.2	19.1	17.8
	APR-JUN	9.2	10.8	11.8	90	12.8	14.4	13.1

CENTRAL PUGET SOUND RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

CENTRAL PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - April 1, 1998

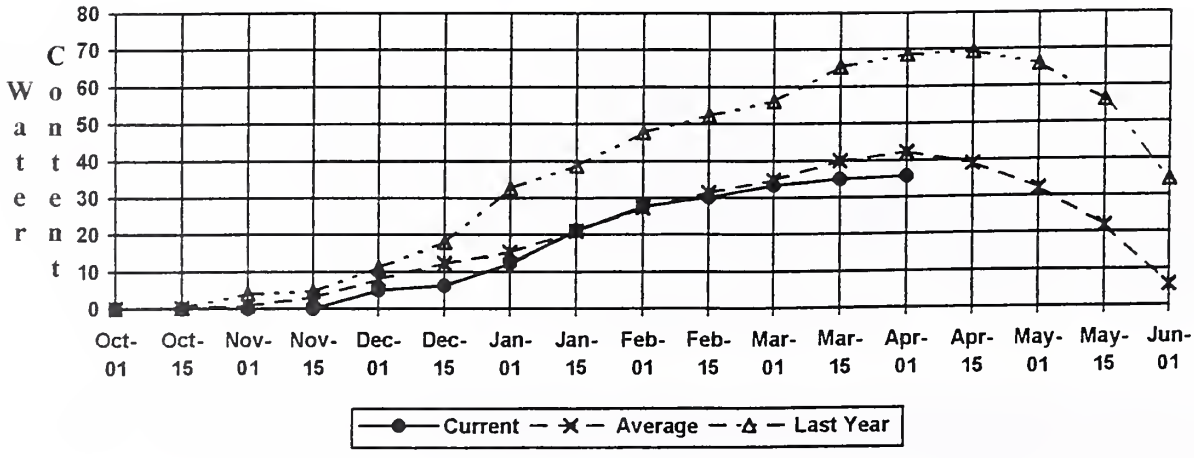
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CEDAR RIVER	6	48	97
TOLT RIVER	3	66	99
SNOQUALMIE RIVER	6	66	93
SKYKOMISH RIVER	4	62	95

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

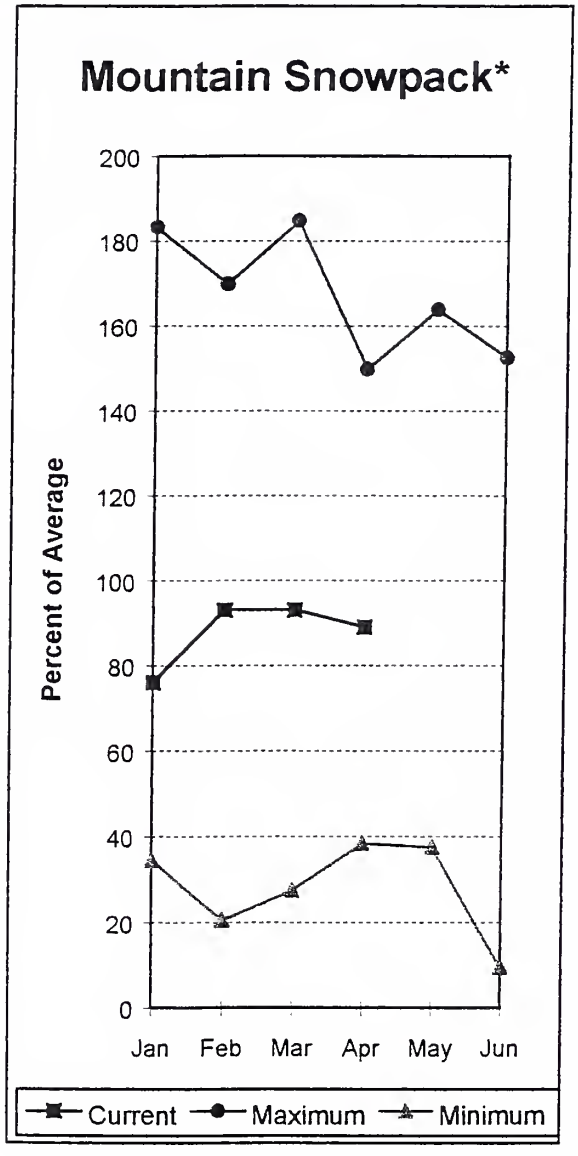
The average is computed for the 1961-1990 base period.

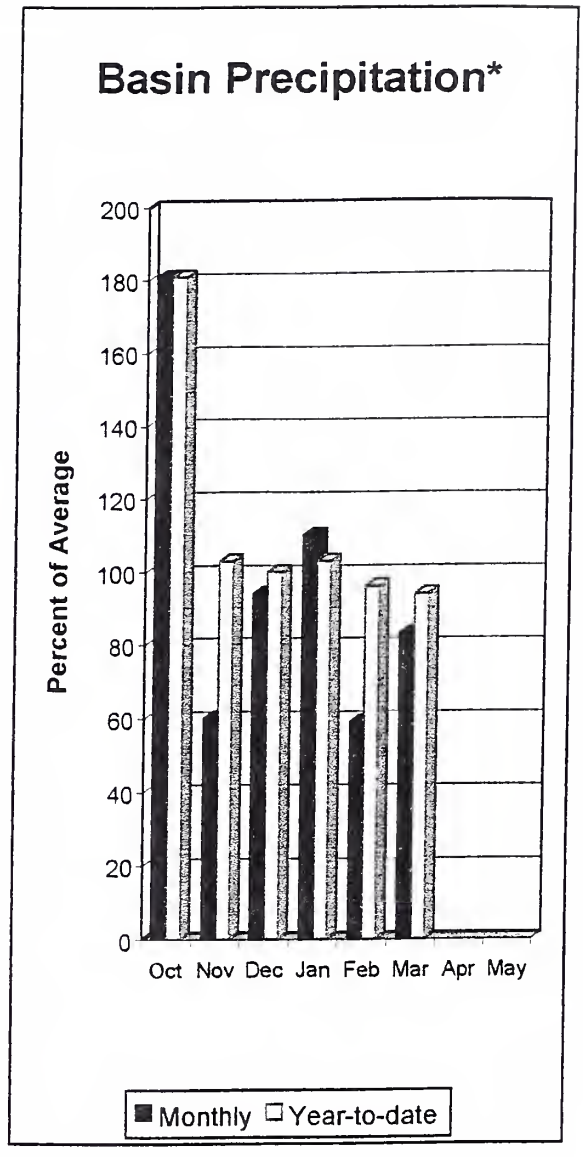
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Stevens Pass SNOTEL
Elevation 4070 ft.



North Puget Sound River Basins





*Based on selected stations

Forecast for the Skagit River streamflow is for 89% of average for the spring and summer period. March streamflow in the Skagit River was 91% of average. Other forecast points included the Baker River at 91%; and Thunder Creek at 95% of average. Basin-wide precipitation for March was only 83% of average, bringing water-year-to-date to 94% of average. April 1 snow cover in the Skagit River Basin was 93%; the Baker River Basin was 95%; and the Nooksack River Basin dropped to 79% of average. Rainy Pass SNOTEL, at 4,780 feet, had 32.9 inches of water content. Average April 1 water content is 38 inches. April 1 Skagit River reservoir storage was 235% of average and 50% of capacity. Average March temperatures were about 3-5 degrees above normal for the basin.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<------ Drier ------ Future Conditions ------ Wetter ------>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
THUNDER CREEK near Newhalem	APR-JUL	191	207	218	95	229	245	230
	APR-SEP	282	299	311	95	323	340	328
	APR-JUN	111	131	144	97	157	177	149
SKAGIT near Newhalem (2)	APR-JUL	1514	1619	1690	90	1761	1866	1879
	APR-SEP	1740	1865	1950	89	2035	2160	2191
	APR-JUN	1130	1234	1305	90	1376	1480	1455
BAKER RIVER near Concrete	APR-JUL	660	719	760	91	801	860	836
	APR-SEP	845	918	968	91	1018	1091	1064
	APR-JUN	454	514	555	91	596	656	611

NORTH PUGET SOUND RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
ROSS	1404.1	701.1	736.3	298.0
DIABLO RESERVOIR	90.6	87.6	87.0	---
GORGE RESERVOIR	9.8	8.2	8.1	---

NORTH PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - April 1, 1998

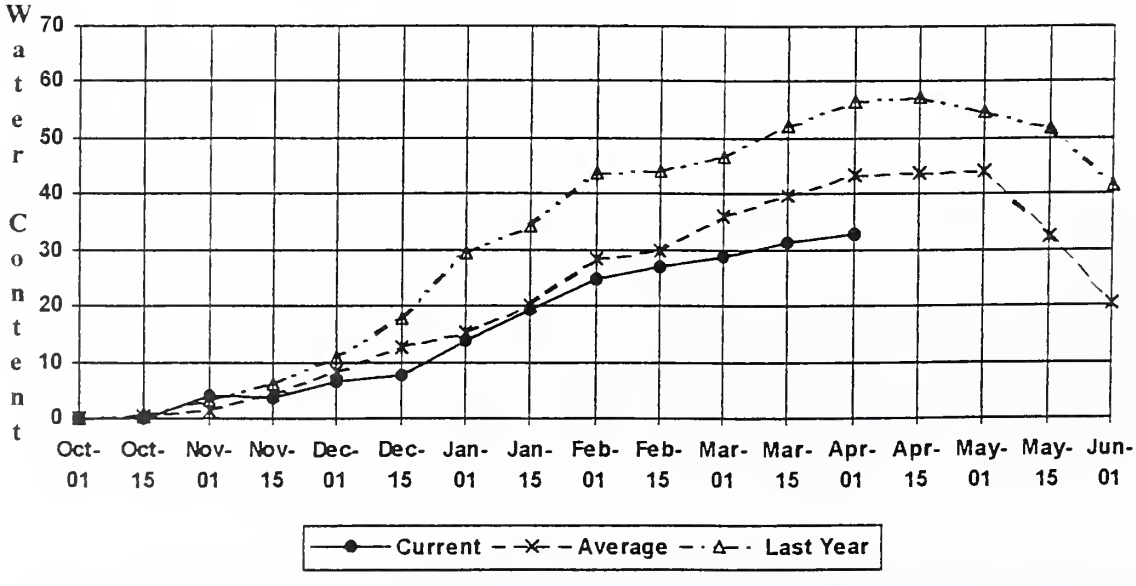
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SKAGIT RIVER	10	63	93
BAKER RIVER	3	73	95
NOOKSACK RIVER	2	55	79

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

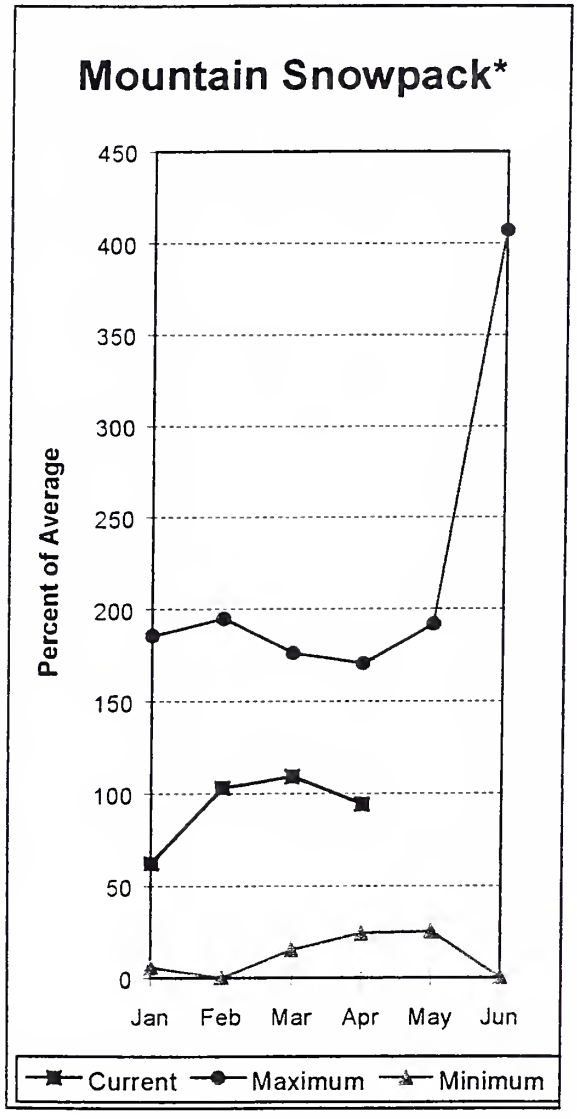
The average is computed for the 1961-1990 base period.

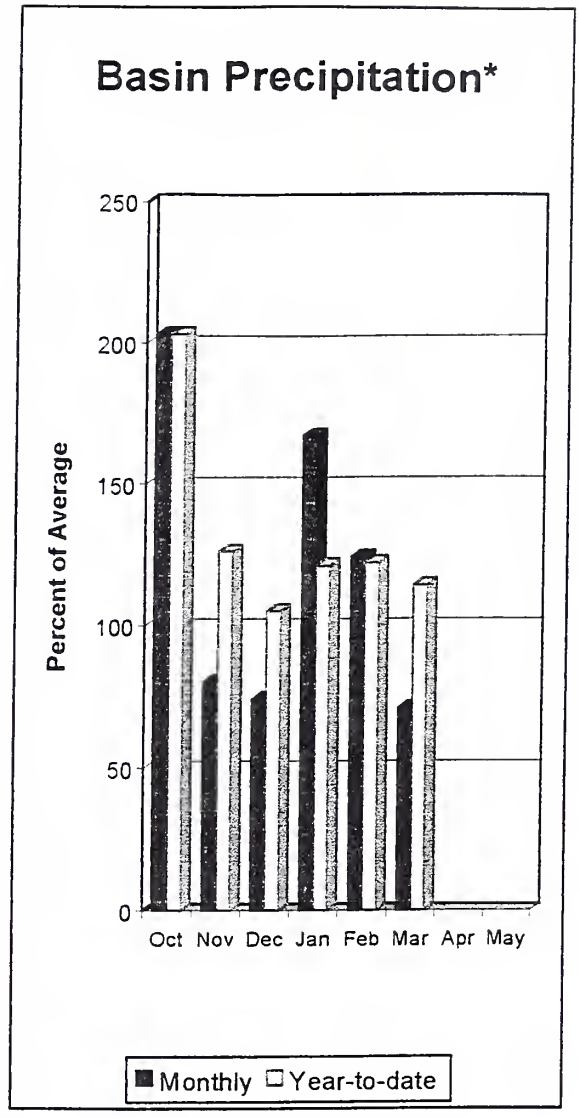
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Rainy Pass SNOTEL
Elevation 4780 ft.



Olympic Peninsula River Basins





*Based on selected stations

April forecasts of runoff for streamflow in the Dungeness River Basin are 96% of average and 94% of average for the Elwha River. The Big Quilcene and Wynoochee rivers can expect near to above average runoff this summer. March precipitation was only 71% of average. Precipitation accumulated at 114% of average for the water year. March precipitation at Quillayute was 6.82 inches. The thirty-year average for April 1 is 11.05 inches. Average April 1 snow cover in the Olympic Basin was at 94% of average. The Mount Crag SNOTEL near Quilcene had 39 inches of snow-water-equivalent on April 1. Average for this site is 31.5 inches. Temperatures were 2-3 degree above average for the month.

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

Streamflow Forecasts - April 1, 1998

Forecast Point	Forecast Period	<<=== Drier === Future Conditions === Wetter ===>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
DUNGENESS near Sequim	APR-SEP	129	140	147	96	154	165	153
	APR-JUL	105	114	120	96	126	135	125
	APR-JUN	75	84	90	96	97	106	94
ELWHA near Port Angeles	APR-SEP	419	455	480	94	505	541	510
	APR-JUL	350	382	403	95	424	456	424

OLYMPIC PENINSULA RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

OLYMPIC PENINSULA RIVER BASINS
Watershed Snowpack Analysis - April 1, 1998

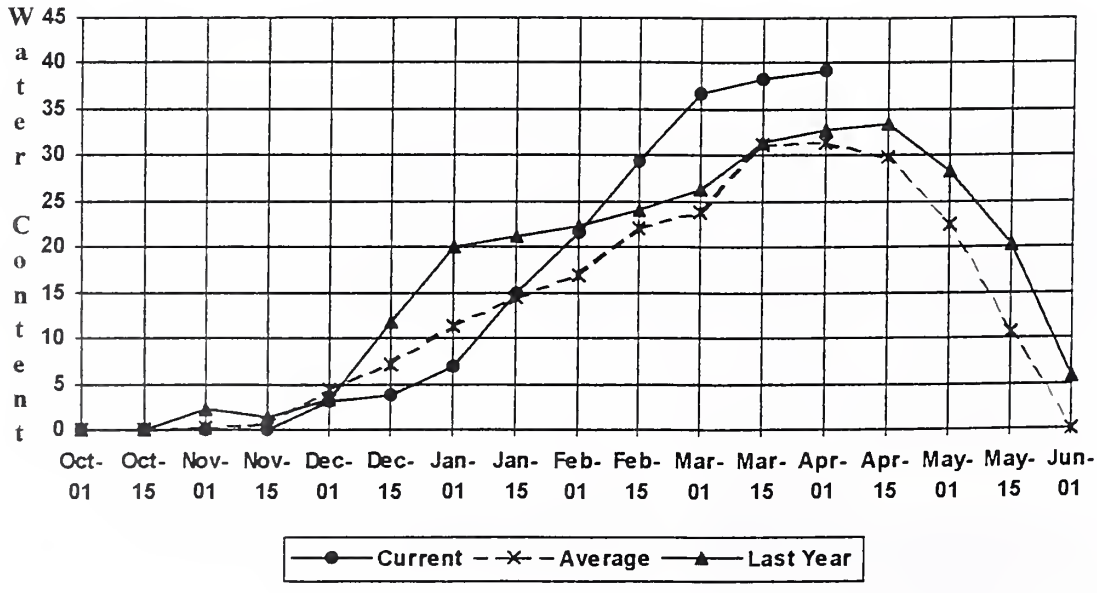
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
ELWHA RIVER	1	61	68
MORSE CREEK	1	81	101
DUNGENESS RIVER	1	101	84
QUILCENE RIVER	0	0	0
WYNOOCHEE RIVER	0	0	0

* 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.



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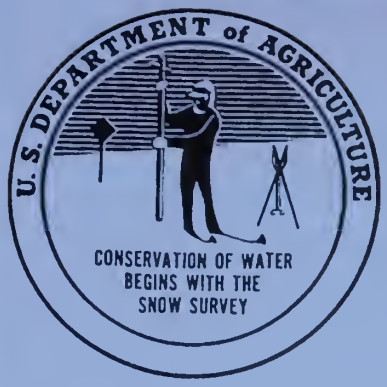
The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

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 Whatcom County Pierce County
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District

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



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Washington Basin Outlook Report

Natural Resources Conservation Service
Spokane, WA