United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
April 1, 2011

Photo by Corey Bonsen, NRCS Yakima, WA Quartz Mountain, WA 3/28/11

Water Supply 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

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General Outlook

The average peak snow accumulation date of April 1 has come and gone for most basins in Washington with a forecast of more snow to come. Way above average precipitation and near to below average temperatures brought tons of mountain snow in March, lifting all basins to near if not above average snowpack. With the good comes the bad in that all of this great snow caused considerable avalanche warnings and activity both natural and human triggered. Even with much above average precipitation most streams stayed within minimum flood stage causing very little damage. Rain on snow events were captured and stored in the snowpack as well. Short term weather forecasts indicate a continuation of below normal temperatures and above average precipitation however long term predictions show a trend toward a hot and dry summer.

Snowpack

The April 1 statewide SNOTEL readings were 115% of average, up 26% from last month. The Green River snow survey data reported the lowest readings at 82% of average, a 22% increase from last month. Readings from the Olympic Peninsula reported the highest at 152% of average. Westside averages from SNOTEL, and April 1 snow surveys, included the North Puget Sound river basins with 118% of average, the Central Puget river basins with 102%, and the Lewis-Cowlitz basins with 128% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 100% and the Wenatchee area with 105%. Snowpack in the Spokane River Basin was at 115% and the Walla Walla River Basin had 100% of average. Maximum confirmed snow cover in Washington was at Brown Top snow course in the Skagit River Basin, with water content of 86.4 inches, a 36 inch increase over the last month. The 30-year average for Brown Top on April 1 is 60.8 inches.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane	220	115
Newman Lake	241	125
Pend Oreille	191	117
Okanogan	146	115
Methow	153	117
Conconully Lake	139	137
Wenatchee	136	98
Chelan	137	100
Upper Yakima	145	93
Lower Yakima	133	108
Ahtanum Creek	118	108
Walla Walla	153	100
Lower Snake	157	109
Cowlitz	153	118
Lewis	153	137
White	132	107
Green	216	82
Puyallup	127	107
Cedar	245	110
Snoqualmie	143	95
Skykomish	141	97
Skagit	175	118
Baker	n/a	N/A
Nooksack	155	117
Olympic Peninsula	157	152

Precipitation

During the month of March, the National Weather Service and Natural Resources Conservation Service climate stations reported much above average precipitation in all river basins in the state. Bringing all basins to near or well above normal for the water-year. The highest percent of average in the state was at Winthrop in north central Washington which reported 432% of average for a total of 4.52 inches. The average for Winthrop is 1.05 inches for March. June Lake SNOTEL was the wettest spot in the state last month with 28.9 inches.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	168	124
Pend Oreille	164	116
Upper Columbia	212	119
Central Columbia	236	215
Upper Yakima	188	111
Lower Yakima	195	111
Walla Walla	129	98
Lower Snake	155	118
Lower Columbia	170	110
South Puget Sound	154	110
Central Puget Sound	174	115
North Puget Sound	188	112
Olympic Peninsula	214	134

Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. Reservoir storage in the Yakima Basin was 743,000-acre feet, 134% of average for the Upper Reaches and 181,000-acre feet or 119% of average for Rimrock and Bumping Lakes. Storage at the Okanogan reservoirs was 115% of average for April 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 178,000-acre feet, 105% of average and 75% of capacity; Chelan Lake, 171,000-acre feet, 79% of average and 25% of capacity; and the Skagit River reservoirs at 97% of average and 51% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	75	105
Pend Oreille	52	105
Upper Columbia	86	115
Central Columbia	25	79
Upper Yakima	89	134
Lower Yakima	78	119
Lower Snake	47	72
North Puget Sound	51	97

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

Streamflow

Forecasts vary from 90% of average for the Green River below Howard Hanson Dam to 127% of average for the Dungeness. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 115%; White River, 106%; and Skagit River, 107%. Some Eastern Washington streams include the Yakima River near Parker, 101%: Wenatchee River at Plain, 102%; and Spokane River near Post Falls, 124%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS.

Statewide March streamflows varied by region but were surprisingly low considering the amount of precipitation that we had The Walla Walla River had the highest reported natural flows with 140% of average. The kettle at Laurier with 51% of average was the lowest in the state. Other streamflows were the following percentage of average as reported by the River Forecast Center: the Cowlitz at Castle Rock, 118%; the Spokane at Spokane, 103%; the Columbia below Rock Island Dam, 110%; and the Cle Elum near Roslyn, 86%.

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	105-124
Pend Oreille	106-122
Upper Columbia	105-116
Central Columbia	96-109
Upper Yakima	98-105
Lower Yakima	101-120
Walla Walla	106-107
Lower Snake	109-126
Lower Columbia	108-120
South Puget Sound	90-106
Central Puget Sound	113-121
North Puget Sound	105-111
Olympic Peninsula	125-127

STREAM	PERCENT OF AVERAGE MARCH STREAMFLOWS
Pend Oreille Below Box Canyon	95
Kettle at Laurier	51
Columbia at Birchbank	91
Spokane at Long Lake	102
Similkameen at Nighthawk	80
Okanogan at Tonasket	65
Methow at Pateros	95
Chelan at Chelan	105
Wenatchee at Pashastin	78
Yakima at Cle Elum	106
Yakima at Parker	87
Naches at Naches	88
Grande Ronde at Troy	92
Snake below Lower Granite Dam	93
SF Walla Walla near Milton Freewater	140
Columbia River at The Dalles	104
Cowlitz below Mayfield Dam	101
Skagit at Concrete	82
Dungeness near Sequim	120

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2011 WESTERN SNOW CONFERENCE

The 79th Western Snow Conference (WSC) annual meeting will be held in Lake Tahoe at Stateline, Nevada/California April 18-21. The theme for this year is “Satellites and smart instruments - the trend from established instrumentation toward distributed SWE estimation in watersheds”. The training course on Monday is 'Forecasting with the PRMS Model’. Additional information about the conference, registration and short course is available on the WSC web page at:
http://www.westernsnowconference.org/

B A S I N S U M M A R Y O F
S N O W C O U R S E D A T A

APRIL 2011

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
AHTANUM R.S.	3100	4/01/11	14	4.8	.0	5.3
ALPINE MEADOWS SNTL	3500	4/01/11	98	46.3	31.6	43.6
AMBROSE	6480	3/27/11	50	16.5	8.2	12.4
ASHLEY DIVIDE	4820	3/30/11	34	11.0	1.8	6.0
BADGER PASS SNOTEL	6900	4/01/11	97	37.7	24.7	35.3
BAIRD #2	3220	3/30/11	27	8.4	2.6	--
BAREE CREEK	5500	4/01/11	---	51.7E	22.7	43.1
BAREE MIDWAY	4600	4/01/11	95	35.2	17.7	33.0
BAREE TRAIL	3800	3/30/11	42	14.3	1.8	7.7
BARKER LAKES SNOTEL	8250	4/01/11	57	15.3	15.4	14.6
BARNES CREEK CAN.	5320	4/01/11	63	20.7	15.8	20.4
BASIN CREEK SNOTEL	7180	4/01/11	33	8.2	7.1	8.7
BASSOO PEAK	5150	3/29/11	46	14.3	4.3	9.7
BEAVER CREEK TRAIL	2200	4/02/11	50	18.3	.0	11.7
BEAVER PASS	3680	4/03/11	98	35.8	21.6	28.8
BEAVER PASS SNOTEL	3630	4/01/11	121	50.3	33.0	38.6
BIG WHITE MTN CAN.	5510	3/30/11	69	20.0	17.1	20.0
BLACK MOUNTAIN	7750	3/31/11	56	16.2	11.8	14.6
BLACK PINE SNOTEL	7100	4/01/11	48	15.1	8.0	12.5
BLACKWALL PILL CAN.	6370	4/01/11	100	37.2	27.1	35.1
BLEWETT PASS#2SNOTEL	4240	4/01/11	32	13.8	8.9	16.4
BLUE LAKE	5900	4/01/11	---	24.0E	13.4	23.7
BROOKMERE CAN.	3000	3/30/11	32	16.5	4.7	7.9
BROWN TOP AM	6000	4/02/11	195	86.4	47.4	60.8
BROWNS PASS		3/29/11	20	6.1	.0	--
BRUSH CREEK TIMBER	5000	3/28/11	49	19.9	3.8	8.1
BUCKINGHORSE SNOTEL	4870	4/01/11	208	83.3	66.6	--
BULL MOUNTAIN	6600	3/29/11	32	7.6	2.6	5.9
BUMPING LAKE (NEW)	3400	3/31/11	56	21.5	10.2	17.6
BUMPING RIDGE SNOTEL	4610	4/01/11	94	32.6	24.6	28.6
BUNCHGRASS MDWSNOTEL	5000	4/01/11	92	29.2	26.2	30.2
BURNT MOUNTAIN PIL	4170	4/01/11	47	15.4	7.6	13.7
BUTTE CREEK #2		3/29/11	36	9.1	7.0	--
BUTTERMILK BUTTE	5250	3/28/11	69	15.8	14.0	--
CALAMITY SNOTEL	2500	4/01/11	10	5.1	.4	--
CARMI CAN.	4100	3/31/11	23	5.2	2.5	5.6
CAYUSE PASS SNOTEL	5240	4/01/11	193	72.4	47.9	--
CEDAR GROVE	3760	3/30/11	38	13.4	4.9	11.4
CHESSMAN RESERVOIR	6200	3/28/11	24	6.4	3.5	3.5
CHEWALAH #2	4930	3/28/11	68	21.0	17.0	--
CHICKEN CREEK	4060	3/29/11	57	20.8	9.7	15.2
CHIWAUKUM G.S.	2500	4/04/11	28	9.8	5.1	9.2
COLD CREEK STRIP	6020	3/31/11	52	12.0	8.4	--
COLOCKUM PASS	5370	3/28/11	64	19.1	--	16.3
COMBINATION SNOTEL	5600	4/01/11	17	6.0	3.9	4.9
COPPER BOTTOM SNOTEL	5200	4/01/11	19	7.0	.0	11.0
COPPER CAMP	6950	3/26/11	88	35.2	11.7	--
COPPER CREEK	5700	3/26/11	37	11.2	2.9	13.3
COPPER MOUNTAIN	7700	3/29/11	49	14.0	8.7	11.2
CORRAL PASS SNOTEL	5800	4/01/11	108	36.9	25.4	34.9
COTTONWOOD CREEK	6400	3/31/11	29	8.0	4.8	8.3
COUGAR MTN. SNOTEL	3200	4/01/11	39	15.4	1.2	17.7
COX VALLEY	4500	4/01/11	129	49.3	34.4	38.7
COYOTE HILL	4200	3/31/11	31	11.2	5.4	8.7
DALY CREEK SNOTEL	5780	4/01/11	38	12.4	7.4	11.1
DEER PARK	5200	4/01/11	72	27.6	17.3	18.8
DESERT MOUNTAIN	5600	3/30/11	58	17.7	8.9	14.7
DEVILS PARK	5900	4/03/11	144	50.6	28.1	44.2
DISAUTEL PASS		4/01/11	18	4.0	.0	--
DISCOVERY BASIN	7050	3/28/11	47	12.7	7.9	10.4
DIX HILL	6400	3/27/11	36	12.1	5.8	10.3
DOMMERIE FLATS	2200	4/01/11	0	.0	.0	3.8
DUNCAN RIDGE	5370	3/31/11	36	9.0	5.0	--
DUNGENESS SNOTEL	4010	4/01/11	51	21.9	4.8	8.6
EAST FORK R.S.	5400	3/30/11	19	4.9	1.3	4.7
EL DORADO MINE	7800	3/25/11	46	12.1	7.4	20.2
EMERY CREEK SNOTEL	4350	4/01/11	52	19.4	9.1	15.3
ENDERBY CAN.	5800	3/31/11	126	59.1	36.5	40.1
ESPERON CK. MID CAN.	4250	3/29/11	42	12.7	9.5	14.6
ESPERON CK. UP CAN.	5050	3/29/11	49	14.8	11.8	17.1
FARRON CAN.	4000	3/29/11	44	14.0	9.6	12.5
FATTY CREEK	5500	4/01/11	---	31.6E	17.1	24.3
FISH CREEK	8000	3/31/11	42	10.7	9.4	9.9
FISH LAKE	3370	3/29/11	77	31.1	19.9	31.5
FISH LAKE SNOTEL	3430	4/01/11	72	30.8	20.1	34.5
FLATTOP MTN SNOTEL	6300	4/01/11	157	53.5	34.3	45.1
FLEECER RIDGE	7500	3/29/11	45	12.3	5.1	10.9
FOURTH OF JULY SUM	3200	3/31/11	20	7.9	.0	5.7
FREEZEOUT CK. TRAIL	3500	4/05/11	42	12.9	4.6	11.3
FROHNER MDWS SNOTEL	6480	4/01/11	30	8.5	6.5	8.0
FROST MEADOWS	4630	3/28/11	61	18.3	15.0	--
GOAT CREEK	3600	3/29/11	27	7.6	2.0	3.6
GOLD CREEK LAKE	7200	3/25/11	66	20.1	16.2	14.7
GOLD MTN LOOKOUT		3/28/11	48	13.8	--	--
GRASS MOUNTAIN #2	2900	4/04/11	28	10.5	--	10.0
GRAVE CRK SNOTEL	4300	4/01/11	61	21.1	10.7	15.6
GREEN LAKE SNOTEL	5920	4/01/11	82	25.6	22.2	23.0
GREYBACK RES CAN.	4700	3/30/11	33	11.0	9.0	9.2
GRIFFIN CR DIVIDE	5150	3/29/11	48	14.1	5.5	10.3
GROUSE CAMP SNOTEL	5390	4/01/11	67	21.9	17.3	19.8
GUNSIGHT LAKE	6300	4/01/11	---	47.2E	26.5	39.3
HAMILTON HILL CAN.	4550	3/30/11	43	11.6	6.3	14.0
HAND CREEK SNOTEL	5030	4/01/11	47	14.9	7.0	11.7
HARTS PASS SNOTEL	6490	4/01/11	137	57.3	32.3	46.3
HARTS PASS	6500	4/01/11	145	51.4	35.2	42.0
HELL ROARING DIVIDE	5770	3/25/11	99	35.1	21.0	29.5
HERRIG JUNCTION	4850	3/29/11	86	30.9	16.9	26.0
HIGH RIDGE SNOTEL	4920	4/01/11	75	27.4	16.3	23.1
HOLBROOK	4530	3/31/11	28	9.6	1.5	8.2
HOODOO BASIN SNOTEL	6050	4/01/11	135	49.7	23.3	45.3
HUCKLEBERRY SNOTEL	2250	4/01/11	0	.2	.0	.4
HUMBOLDT GLCH SNOTEL	4250	4/01/11	---	15.8	4.0	11.2
HURRICANE	4500	3/28/11	75	26.6	14.8	19.1
INDIAN ROCK SNOTEL	5360	4/01/11	96	40.6	32.7	--
INTERGAARD	6450	3/26/11	30	8.1	3.9	7.7
IRENE'S CAMP	5530	3/31/11	50	12.8	9.1	--
ISINTOK LAKE CAN.	5100	3/30/11	34	6.7	4.4	7.2
JUNE LAKE SNOTEL	3440	4/01/11	125	60.1	29.4	35.7
KELLER RIDGE	3700	4/01/11	14	2.8	.0	--
KELLOGG PEAK	5560	4/01/11	89	34.4	12.6	29.2
KISHENEHN	3890	3/31/11	35	10.5	2.2	6.8
KIT CARSON PASTURE	4950	3/29/11	21	5.8	2.2	8.1
KRAFT CREEK SNOTEL	4750	4/01/11	42	16.3	6.5	14.1
LAMB BUTTE		3/30/11	59	17.0	14.2	--
LIGHTNING LAKE CAN.	3700	3/31/11	43	13.6	8.6	12.0
LOGAN CREEK	4300	3/28/11	37	11.4	4.3	6.7
LOLO PASS SNOTEL	5240	4/01/11	87	32.3	15.6	30.3
LONE PINE SNOTEL	3930	4/01/11	126	55.2	34.5	36.4
LOOKOUT SNOTEL	5140	4/01/11	94	33.4	15.6	31.8
LOST HORSE MTN CAN.	6300	4/01/11	31	11.5	7.5	9.4
LOST HORSE SNOTEL	5120	4/01/11	55	19.7	20.3	18.3
LOST LAKE SNOTEL	6110	4/01/11	161	61.4	31.6	60.0
LOST LAKE	4070	3/29/11	31	7.9	7.0	--
LOUP LOUP CAMPGROUND		3/28/11	46	11.8	9.0	--
LOWER SANDS CREEK #2	3120	4/01/11	61	23.6	9.6	18.9
LUBRECHT FOREST NO 3	5450	3/30/11	24	7.1	2.4	5.7
LUBRECHT FOREST NO 4	4650	3/30/11	7	2.5	.0	1.3
LUBRECHT FOREST NO 6	4040	3/30/11	16	4.9	.0	1.6
LUBRECHT HYDROPLOT	4200	3/30/11	21	6.7	.0	2.9
LUBRECHT SNOTEL	4680	4/01/11	20	6.8	.0	3.6
LYMAN LAKE SNOTEL	5980	4/01/11	190	66.8	48.6	65.4
LYNN LAKE	4000	4/01/11	55	18.3e	--	20.4
LYNN LAKE SNOTEL	3900	4/01/11	55	18.3	8.2	--
MARIAS PASS	5250	4/01/11	63	22.3	7.0	16.8
MARTEN RIDGE SNOTEL	3520	4/01/11	155	74.6	43.6	--
MAZAMA		3/28/11	26	8.3	.8	--
MCCULLOCH CAN.	4200	3/31/11	27	8.0	3.3	6.1
MEADOWS CABIN	1900	4/03/11	6	1.8	.0	4.0
MEADOWS PASS SNOTEL	3230	4/01/11	60	29.6	11.3	23.9
METEOR		3/28/11	0	.0	.0	--
M F NOOKSACK SNOTEL	4970	4/01/11	147	68.9	46.3	64.6
MICA CREEK SNOTEL	4510	4/01/11	71	24.7	14.4	25.1
MINERAL CREEK	4000	3/29/11	52	21.2	5.6	17.4
MISSEZULA MTN CAN.	5080	3/31/11	33	9.2	5.1	9.5
MISSION CREEK CAN.	5840	4/01/11	---	20.0E	16.2	20.0
MISSION RIDGE	5000	4/04/11	58	19.2	15.2	17.4
MONASHEE PASS CAN.	4500	4/01/11	46	14.4	8.7	13.5
MORSE LAKE SNOTEL	5410	4/01/11	163	60.3	55.5	55.5
MOSES MOUNTAIN (2)	4800	3/31/11	49	13.9	16.0	22.7
MOSES MTN SNOTEL	5010	4/01/11	52	16.8	14.9	15.9
MOSES PEAK	6650	3/31/11	85	27.9	--	15.0
MOSQUITO RDG SNOTEL	5200	4/01/11	---	44.4	26.4	35.8
MOULTON RESERVOIR	6850	4/01/11	---	10.3E	3.8	6.9
MOUNT CRAG SNOTEL	3960	4/01/11	136	47.6	32.6	30.8
MT. KOBAU CAN.	5500	3/29/11	61	15.9	13.5	12.5
MOUNT TOLMAN	2000	4/01/11	0	.0	.0	--
MOWICH SNOTEL	3160	4/01/11	0	.0	.5	.6
MOUNT GARDNER SNOTEL	2920	4/01/11	39	15.6	.8	13.0
MUTTON CREEK #1	5700	3/30/11	72	19.2	14.0	13.9
N.F. ELK CR SNOTEL	6250	4/01/11	50	15.9	7.7	12.4
NEVADA RIDGE SNOTEL	7020	4/01/11	57	19.4	9.5	15.5
NEW HOZOMEEN LAKE	2800	4/05/11	---	8.4e	.0	10.0
NEZ PERCE CMP SNOTEL	5650	4/01/11	45	15.0	8.3	14.7
NEZ PERCE PASS	6570	3/29/11	84	16.0	8.3	17.8
NOISY BASIN	6040	3/30/11	162	63.2	42.3	--
NOISY BASIN SNOTEL	6040	4/01/11	155	62.4	34.9	40.9
NORTH FORK JOCKO	6330	4/01/11	---	52.4E	28.4	42.3
OLALLIE MDWS SNOTEL	4030	4/01/11	117	58.9	44.0	55.9
OPHIR PARK	7150	3/27/11	54	18.2	10.8	16.7
OYAMA LAKE CAN.	4100	4/01/11	23	6.4	4.7	6.7

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
PARADISE SNOTEL	5130	4/01/11	175	76.0	54.9	71.9
PARK CK RIDGE SNOTEL	4600	4/01/11	106	48.2	41.1	47.6
PEPPER CREEK SNOTEL	2140	4/01/11	20	9.2	.3	--
PETERSON MDW SNOTEL	7200	4/01/11	41	10.5	9.3	10.5
PIGTAIL PEAK SNOTEL	5800	4/01/11	155	57.8	41.3	53.2
PIKE CREEK SNOTEL	5930	4/01/11	58	21.7	8.9	27.5
PIPESTONE PASS	7200	3/29/11	28	7.8	4.3	5.7
POPE RIDGE SNOTEL	3590	4/01/11	54	17.9	13.6	18.4
POSTILL LAKE CAN.	4200	3/31/11	30	8.0	6.1	8.8
POTATO HILL SNOTEL	4510	4/01/11	109	37.7	27.2	25.3
QUARTZ PEAK SNOTEL	4700	4/01/11	71	26.3	15.4	21.2
RAGGED MTN SNOTEL	4210	4/01/11	64	26.1	14.1	--
RAGGED RIDGE	3330	3/31/11	13	5.3	.0	4.1
RAINY PASS SNOTEL	4890	4/01/11	106	44.0	28.2	44.0
RAINY PASS	4780	4/02/11	110	37.7	25.6	39.2
REX RIVER SNOTEL	3810	4/01/11	76	35.4	19.1	31.2
ROCKER PEAK SNOTEL	8000	4/01/11	57	16.4	11.4	14.3
ROLAND SUMMIT	5120	3/30/11	117	43.6	16.4	36.4
ROUND TOP MTN	4020	3/31/11	46	16.3	5.8	--
RUSTY CREEK	4000	3/30/11	29	8.8	5.0	5.5
SADDLE MTN SNOTEL	7900	4/01/11	84	29.4	13.4	25.8
SALMON MDWS SNOTEL	4460	4/01/11	45	13.7	11.0	11.1
SASSE RIDGE SNOTEL	4340	4/01/11	80	32.8	26.5	37.3
SATUS PASS	4030	3/29/11	43	14.9	5.8	--
SAVAGE PASS SNOTEL	6170	4/01/11	84	32.2	15.6	26.5
SENTINEL BT SNOTEL	4680	4/01/11	42	11.9	10.0	9.0
SHEEP CANYON SNOTEL	3990	4/01/11	120	50.2	24.7	37.8
SHERWIN SNOTEL	3200	4/01/11	---	9.9	.0	10.1
SILVER STAR MTN CAN.	5600	3/30/11	89	31.3	26.6	29.9
SKALKAHO SNOTEL	7260	4/01/11	76	26.7	12.8	24.3
SKITWISH RIDGE	5110	4/01/11	111	43.6	23.5	30.2
SKOOKUM LAKES	4230	3/30/11	55	17.7	5.4	--
SLIDE ROCK MOUNTAIN	7100	3/27/11	52	15.2	7.2	15.5
SOURDOUGH GUL SNOTEL	4000	4/01/11	0	.0	.0	--
SOUTH BALDY	4920	3/30/11	86	28.0	16.5	--
SPENCER MDW SNOTEL	3400	4/01/11	76	36.9	23.6	30.8
SPIRIT LAKE SNOTEL	3520	4/01/11	12	11.4	1.5	3.9
SPOTTED BEAR MTN.	7000	4/01/11	---	18.6E	8.1	14.1
SPRUCE SPGS SNOTEL	5700	4/01/11	47	15.7	7.8	19.7
STARVATION MOUNTAIN	6750	3/28/11	90	26.1	15.0	19.5
STAHL PEAK SNOTEL	6030	4/01/11	137	47.9	29.8	35.3
STAMPEDE PASS SNOTEL	3850	4/01/11	83	32.6	21.0	45.3
STEMPLE PASS	6600	3/30/11	47	12.7	5.4	10.2
STEVENS PASS SNOTEL	3950	4/01/11	112	37.0	27.4	42.6
STORM LAKE	7780	3/29/11	52	14.8	11.1	13.3
STRANGER MOUNTAIN	4230	3/28/11	40	12.0	8.6	12.2
STRYKER BASIN	6180	3/29/11	112	40.9	24.1	31.9
SUMMERLAND RES CAN.	4200	3/29/11	36	12.0	6.6	8.9
SUMMIT G.S. #2	4600	3/29/11	49	12.4	8.9	8.4
SUNSET SNOTEL	5540	4/01/11	---	30.2	12.9	31.5
SURPRISE LKS SNOTEL	4290	4/01/11	140	57.4	43.3	46.1
SWAMP CREEK SNOTEL	3930	4/01/11	65	25.2	8.6	16.2
SWIFT CREEK SNOTEL	4440	4/01/11	182	80.1	67.3	56.1
TEN MILE LOWER	6600	3/29/11	34	8.6	5.4	7.0
TEN MILE MIDDLE	6800	3/29/11	43	11.0	9.2	11.4
THUNDER BASIN SNOTEL	4320	4/01/11	80	32.8	26.8	33.7
THUNDER BASIN	4200	4/03/11	68	22.7	14.7	21.9
THOMPSON CREEK	2500	3/31/11	9	3.2	.0	--
THOMPSON RIDGE	4650	3/30/11	52	16.1	9.9	--
TINKHAM CREEK SNOTEL	2990	4/01/11	67	27.7	13.0	30.0
TOATS COULEE	2850	3/31/11	4	1.0	.0	1.4
TOUCHET SNOTEL	5530	4/01/11	74	30.4	21.5	34.7
TRINKUS LAKE	6100	4/01/11	---	51.4E	33.4	42.0
TROUGH #2 SNOTEL	5480	4/01/11	43	13.8	15.7	10.0
TRUMAN CREEK	4060	3/30/11	22	7.0	.6	3.7
TUNNEL AVENUE	2450	3/29/11	47	19.8	6.5	19.2
TV MOUNTAIN	6800	4/01/11	---	23.1E	10.5	18.3
TWELVEMILE SNOTEL	5600	4/01/11	49	17.7	10.3	17.5
TWIN CREEKS	3580	4/01/11	---	9.6E	6.7	9.6
TWIN LAKES SNOTEL	6400	4/01/11	107	41.9	23.2	39.7
UPPER HOLLAND LAKE	6200	4/01/11	---	41.6E	19.9	34.6
UPPER WHEELER SNOTEL	4330	4/01/11	42	13.2	11.8	13.1
VASEUX CREEK CAN.	4250	3/30/11	20	6.1	--	6.2
VULCAN MTN	4660	3/29/11	46	12.7	11.6	--
VULCAN ROAD	3840	3/29/11	28	8.1	6.0	--
WARM SPRINGS SNOTEL	7800	4/01/11	83	25.3	17.4	21.2
WATERHOLE SNOTEL	5010	4/01/11	130	56.6	42.0	35.3
WEASEL DIVIDE	5450	3/31/11	111	40.5	21.1	32.9
WELLS CREEK SNOTEL	4030	4/01/11	107	45.7	27.4	33.6
WHITE PASS ES SNOTEL	4440	4/01/11	75	22.5	16.5	23.9
WHITE ROCKS MTN CAN.	7200	3/29/11	65	21.7	19.4	23.1

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://www.wa.nrcs.usda.gov/snow

Oregon:
http://www.or.nrcs.usda.gov/snow

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

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

USDA-NRCS Agency Homepages

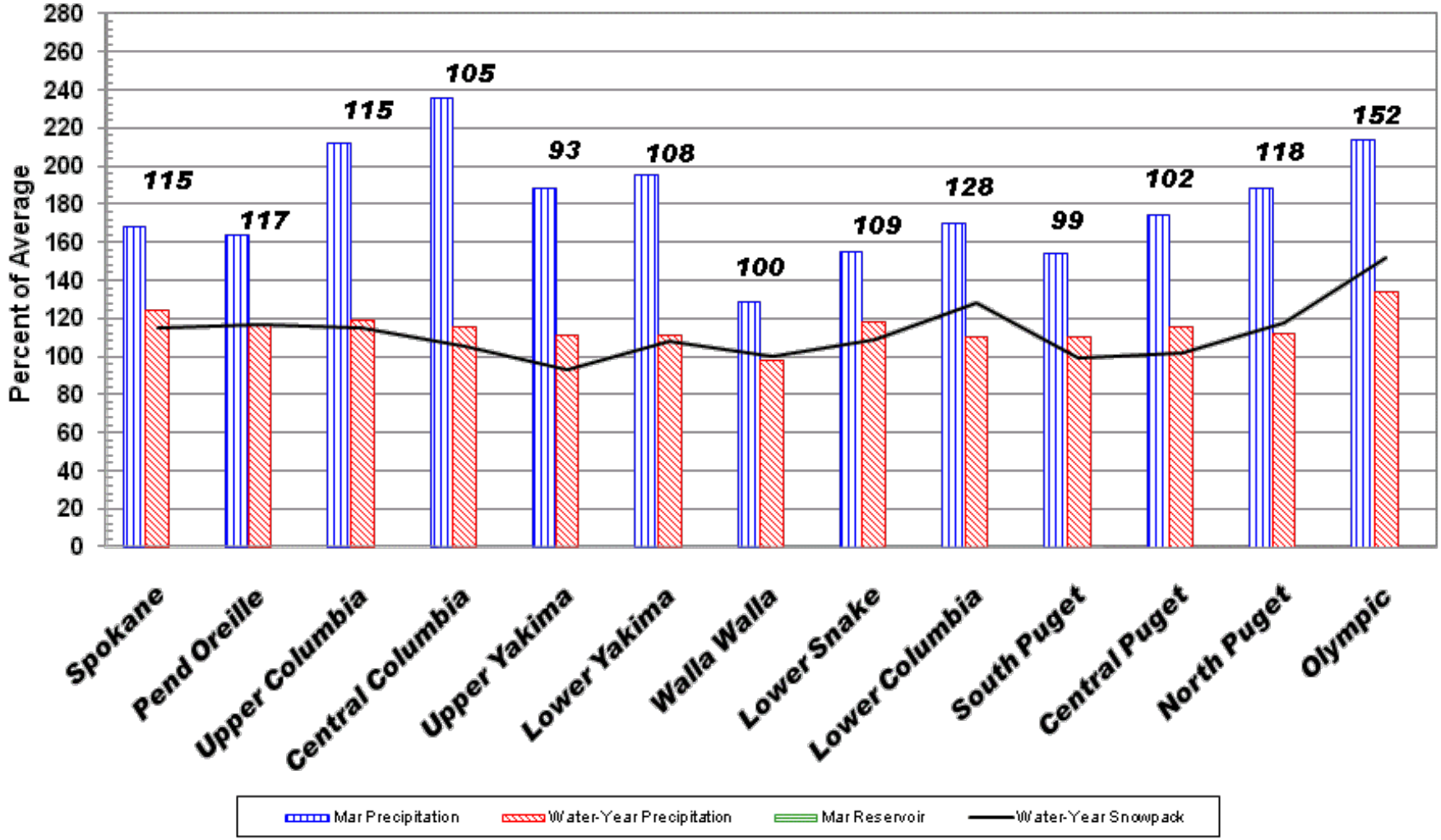
Washington:
http://www.wa.nrcs.usda.gov

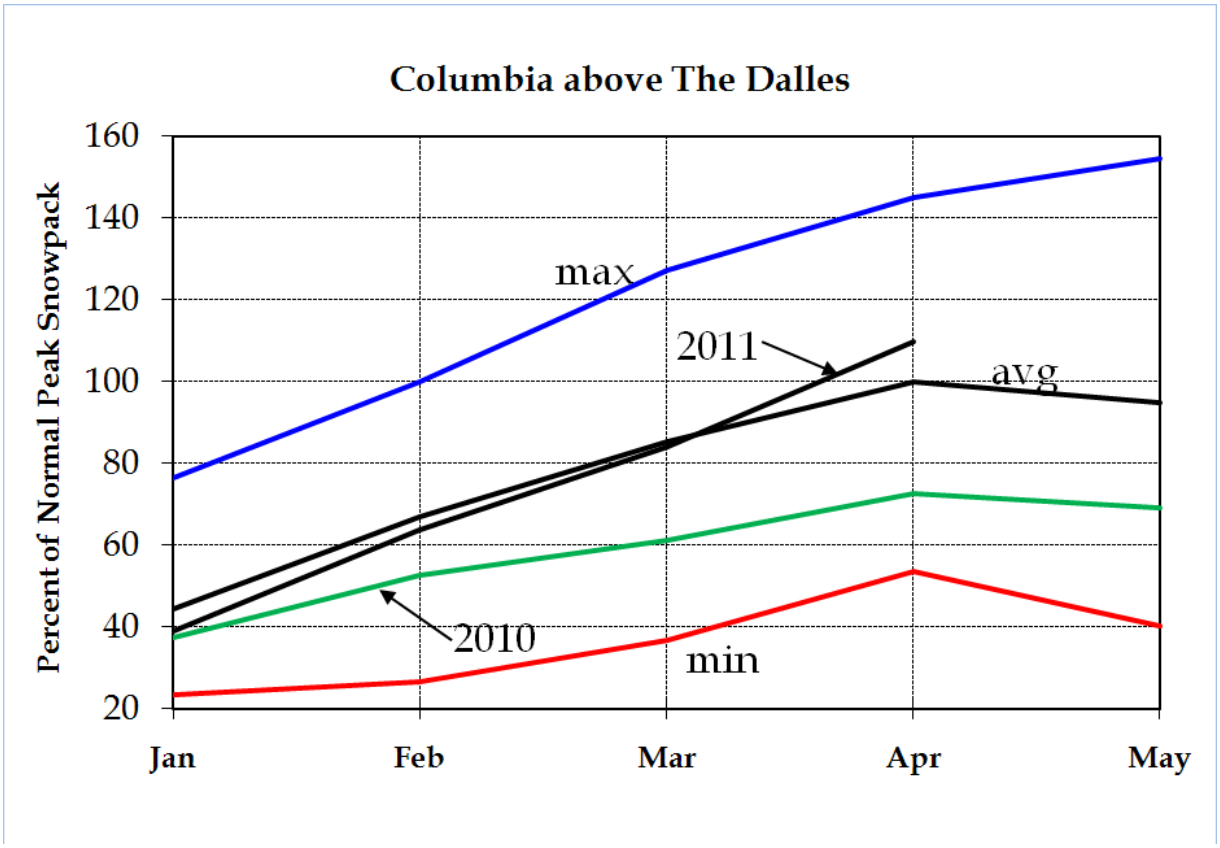
NRCS National:
http://www.nrcs.usda.gov

NRCS Natural Resources Conservation Service

April 1, 2011 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2010 - Current Date)





April 1, 2011

The Columbia Basin snowpack charts are produced, using only automated data. These data are telemetered via remote collection sites in Canada and the United States. The data are provisional, until they are officially released by the responsible data collection agency.

The combined Columbia Basin snowpack above The Dalles is currently at 110 percent of average, compared to 99 percent of average last month and 73 percent last year. This increase in the snowpack was due to heavy precipitation over the basin, combined with temperatures that were 3 to 6 degrees below normal. Snow was especially heavy over the Oregon and Washington Cascades. There wasn't a watershed within the basin that escaped the onslaught of cold, wet weather.

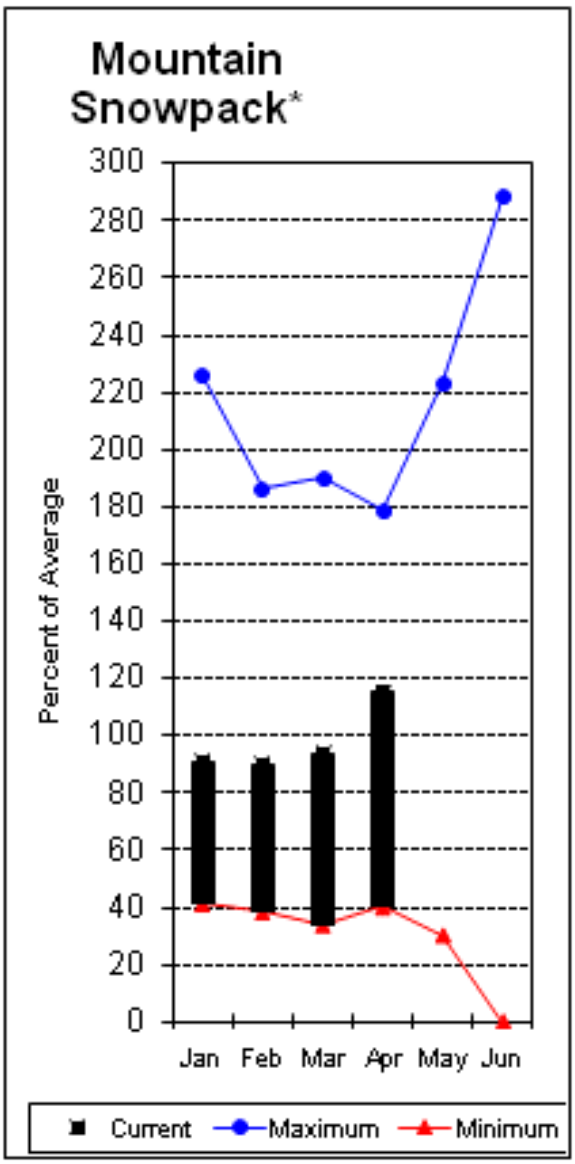
The northern portion of Columbia Basin snowpack was up 6 to 12 percent over last month. The Oregon and Washington Cascade snowpacks increased 21 to 23 percent over the same period. The central and southern sections of the basin, comprising the Snake headwaters, Boise/southern Snake tribs, Salmon, eastern Oregon, and the John Day watersheds, experienced snowpack increases of 15 to 35 percent.

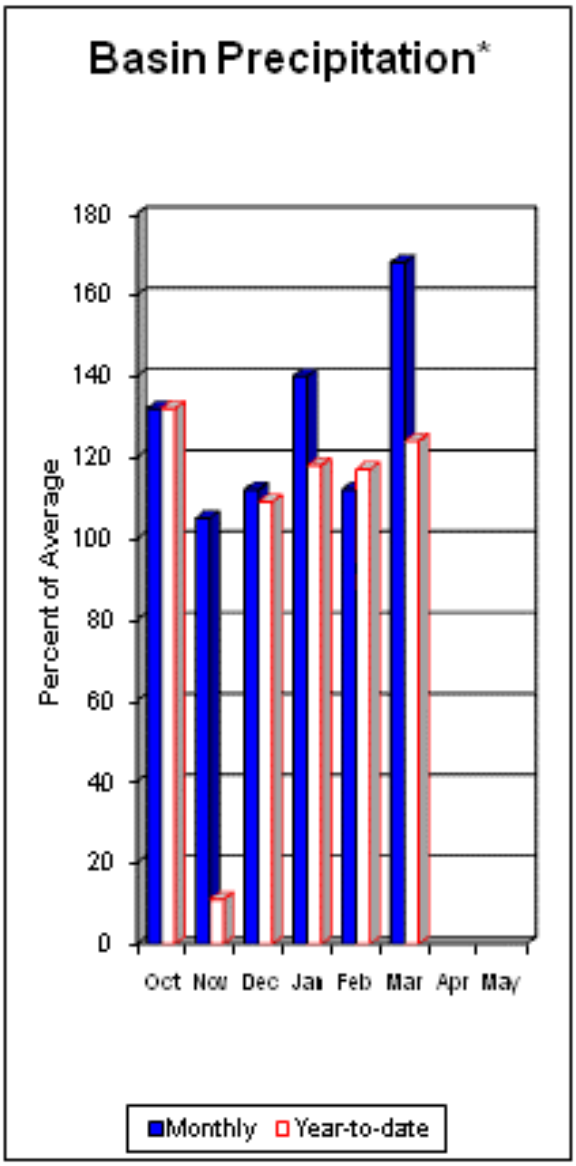
The overall snowpack above The Dalles is at 110 percent of the average peak accumulation. This compares to 73 percent last year. April 1 is usually near the time of peak accumulation for the basin. There are indications that the timing of the peak accumulation may be delayed this year.

The snowpack in the Columbia Basin above Castlegar is at 106 percent of average. This compares to 98 percent last month and 81 percent last year. For the basin above Grand Coulee, the snowpack is at 109 percent of average, compared to 102 percent last month and 76 percent last year. The Snake River snowpack above Ice Harbor is at 112 percent of average, compared to 98 percent last month and 63 percent last year.

Long lead climate forecasts are suggesting cool and wet weather for much of the Columbia Basin during April. Last month's forecast of abundant moisture over the Columbia Basin; especially over the Cascade Ranges in Washington and Oregon was right on target. The Pacific Northwest mountains could see a great deal more snow in April.

Spokane River Basin





*Based on selected stations

The April 1 forecasts for summer runoff within the Spokane River Basin are 124% of average near Post Falls and 122% at Long Lake. The Chamokane River near Long Lake forecasted to have 105% of average flows for the May-August period. The forecast is based on a basin snowpack that is 115% of average and precipitation that is 124% of average for the water year. Precipitation for March was above normal at 168% of average. Streamflow on the Spokane River at Long Lake was 109% of average for March. April 1 storage in Coeur d'Alene Lake was 178,000acre feet, 105% of average and 75% of capacity. Snowpack at Quartz Peak SNOTEL site was 124% of average with 26.3 inches of water content. Average temperatures in the Spokane basin were slightly below normal for March and near normal for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Spokane R nr Post Falls (2)	APR-JUL	2600	2930	3160	124	3390	3720	2550
	APR-SEP	2700	3050	3280	124	3510	3860	2650
Spokane R at Long Lake (2)	APR-JUL	2860	3220	3470	122	3720	4080	2850
	APR-SEP	3110	3490	3750	122	4010	4390	3070
Chamokane Ck nr Long Lake	MAY-AUG	7.0	9.2	10.7	105	12.2	14.4	10.2

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	178.1	93.3	169.5

SPOKANE RIVER BASIN
Watershed Snowpack Analysis - April 1, 2011

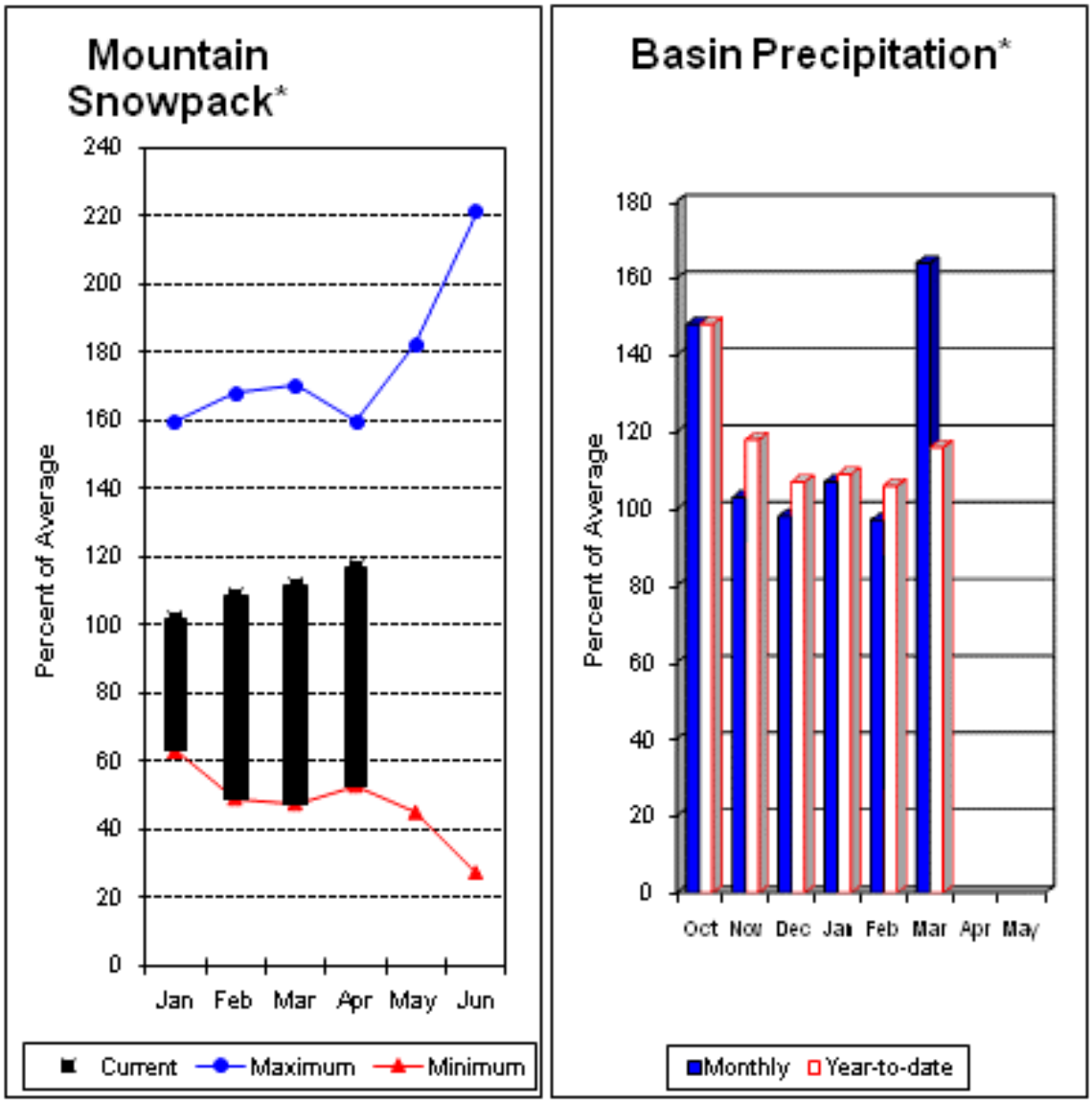
Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
SPOKANE RIVER	15	220	115
NEWMAN LAKE	2	241	125

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 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 volume - actual volume may be affected by upstream water management.

Pend Oreille River Basins



*Based on selected stations

The April – September average forecast for the Priest River near the town of Priest River is 106% and the Pen Orielle below Box Canyon is 122%. March streamflow was 95% of average on the Pend Oreille River and 91% on the Columbia at Birchbank. April 1 snow cover was 117% of average in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 29.2 inches of snow water on the snow pillow. Normally Bunchgrass would have 30.2 inches on April 1. Precipitation during March was 164% of average, bringing the year-to-date precipitation to 116% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 105% of normal. Average temperatures were slightly below normal for March and near normal for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Pend Oreille Lake Inflow (2)	APR-JUL	13800	14800	15500	122	16200	17200	12700
	APR-SEP	14900	16100	16900	122	17700	18900	13900
Priest R nr Priest River (1,2)	APR-JUL	700	815	865	106	915	1030	815
	APR-SEP	735	865	920	106	975	1100	870
Pend Oreille R bl Box Canyon (2)	APR-JUL	14000	15100	15800	123	16500	17600	12900
	APR-SEP	15200	16400	17200	122	18000	19200	14100

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
PEND OREILLE	1561.3	818.1	553.4	763.6
PRIEST LAKE	119.3	54.1	49.5	65.5

PEND OREILLE RIVER BASINS
Watershed Snowpack Analysis - April 1, 2011

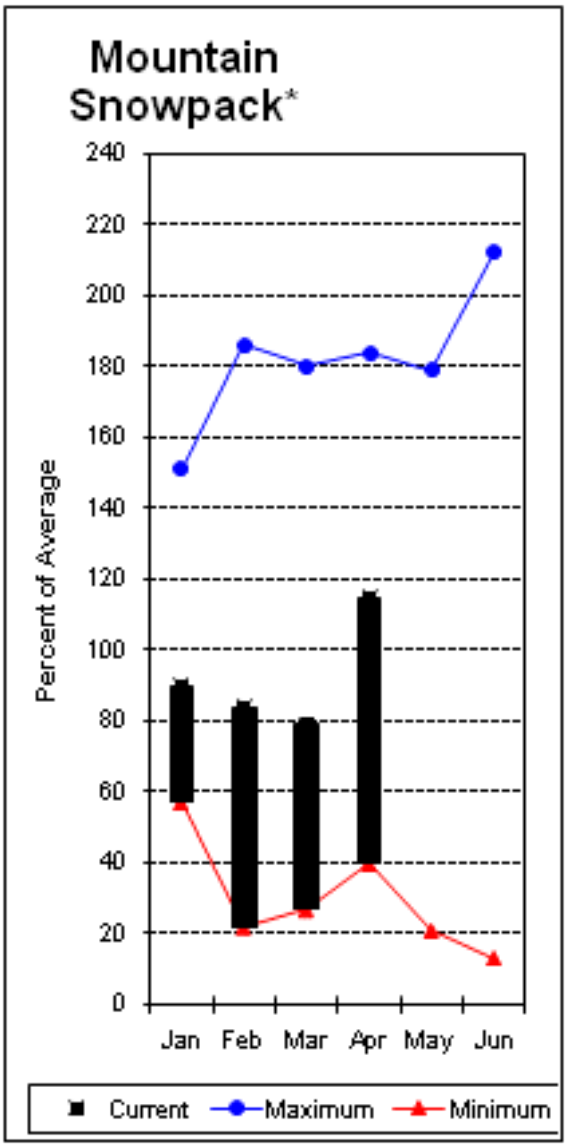
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
COLVILLE RIVER	1	147	98
PEND OREILLE RIVER	10	187	108
KETTLE RIVER	3	136	152

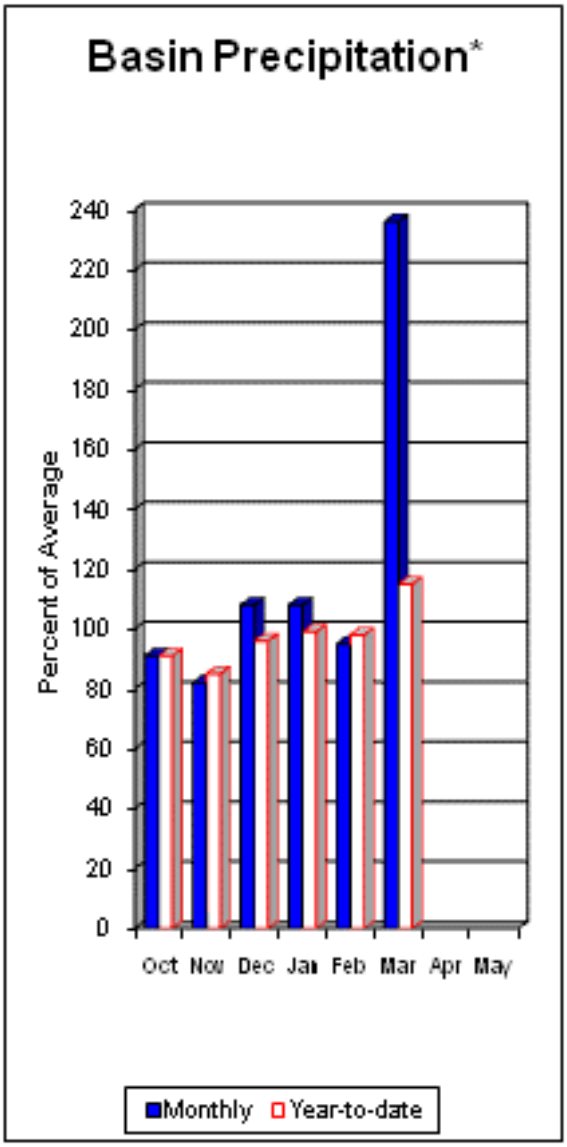
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 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 volume - actual volume may be affected by upstream water management.

Upper Columbia River Basins





*Based on selected stations

Summer runoff average forecast for the Okanogan River is 108%, Similkameen River is 105%, Kettle River 105% and Methow River is 116%. April 1 snow cover on the Okanogan was 115% of average, Omak Creek was 109% and the Methow was 117%. March precipitation in the Upper Columbia was 212% of average, with precipitation for the water year at 119% of average. March streamflow for the Methow River was 95% of average, 65% for the Okanogan River and 80% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 13.7 inches. Average for this site is 11.1 inches on April 1. Combined storage in the Conconully Reservoirs was 20,000-acre feet, which is 86% of capacity and 115% of the April 1 average. Temperatures were near normal for March and 1-2 degrees above for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Kettle R nr Laurier	APR-JUL	1660	1840	1970	105	2100	2280	1870
	APR-SEP	1730	1930	2070	105	2210	2410	1970
Columbia R at Birchbank (1,2)	APR-JUL	32100	35000	36300	104	37600	40500	34900
	APR-SEP	39900	43600	45200	104	46800	50500	43500
Columbia R at Grand Coulee (2)	APR-JUL	52300	56000	57600	107	59200	62900	53800
	APR-SEP	58900	65500	68500	107	71500	78100	64000
Similkameen R nr Nighthawk (1)	APR-JUL	1200	1380	1460	108	1540	1720	1350
	APR-SEP	1300	1490	1570	108	1650	1840	1450
Okanogan R nr Tonasket (1)	APR-JUL	1300	1580	1710	108	1840	2120	1580
	APR-SEP	1450	1770	1920	109	2070	2390	1770
Okanogan R at Malott (1)	APR-JUL	1350	1630	1760	108	1890	2170	1630
	APR-SEP	1510	1830	1980	108	2130	2450	1830
Methow R nr Pateros	APR-SEP	990	1080	1140	116	1200	1290	985
	APR-JUL	920	1000	1060	117	1120	1200	910

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 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 volume - actual volume may be affected by upstream water management.

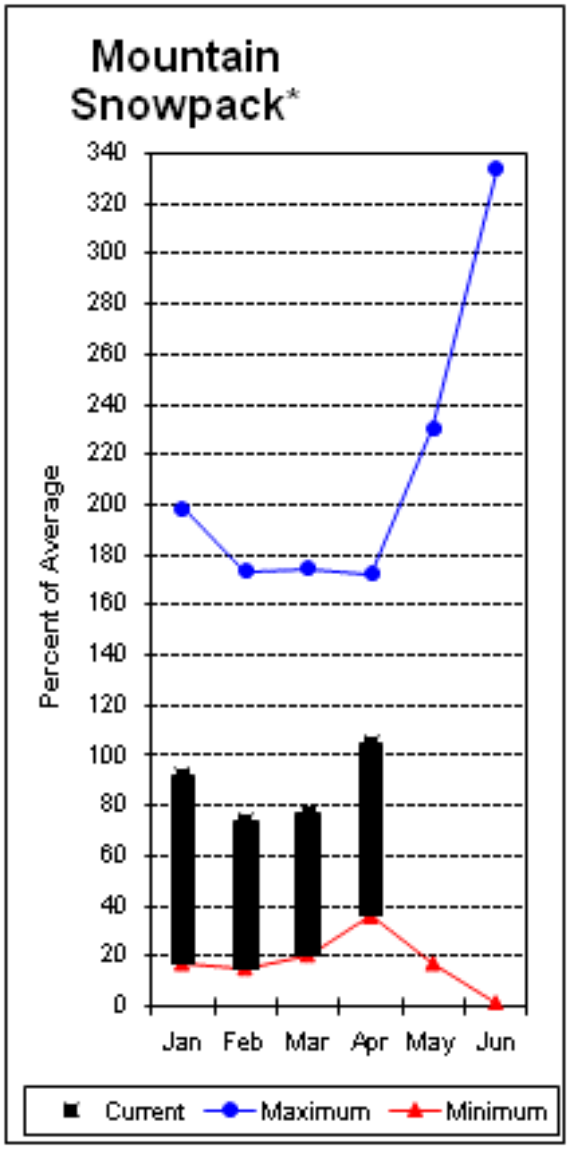
UPPER COLUMBIA RIVER BASINS
Reservoir Storage (1000 AF) - End of March

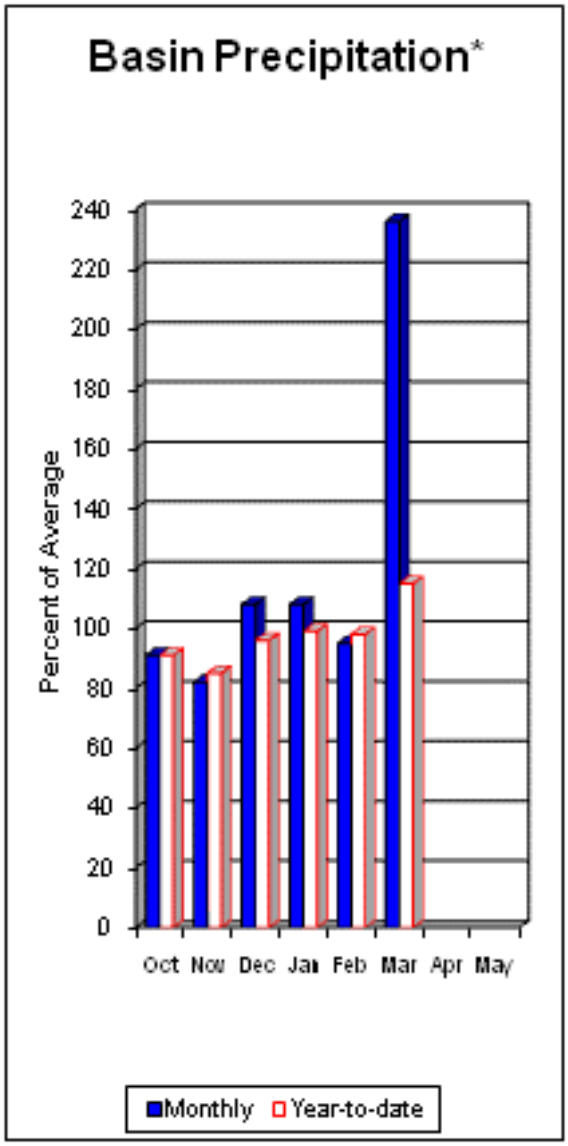
Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
SALMON LAKE	10.5	8.7	6.0	8.4
CONCONULLY RESERVOIR	13.0	11.5	5.4	9.2

UPPER COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
OKANOGAN RIVER	5	167	127
OMAK CREEK	3	132	109
SANPOIL RIVER	0	0	0
SIMILKAMEEN RIVER	0	0	0
TOATS COULEE CREEK	1	155	71
CONCONULLY LAKE	3	139	137
METHOW RIVER	8	153	117

Central Columbia River Basins





*Based on selected stations

Precipitation during March was 236% of average in the basin and 115% for the year-to-date. Runoff for Entiat River is forecast to be 106% of average for the summer. The April-September average forecast for Chelan River is 102%, Wenatchee River at Plain is 102%, Stehekin River is 105% and Icicle Creek is 96%. March average streamflows on the Chelan River were 105% and on the Wenatchee River 78%. April 1 snowpack in the Wenatchee River Basin was 98% of average; the Chelan, 100%; the Entiat, 97%; Stemilt Creek, 106% and Colockum Creek, 125%. Reservoir storage in Lake Chelan was 171,000-acre feet, 79% of April 1 average and 25% of capacity. Lyman Lake SNOTEL had the most snow water with 66.8 inches of water. This site would normally have 65.4 inches on April 1. Temperatures were 1-2 degrees below normal for March and near normal for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Stehekin R at Stehekin	APR-JUL	635	700	740	106	780	845	700
	APR-SEP	775	835	875	105	915	975	830
Chelan R at Chelan (2)	APR-JUL	980	1030	1070	102	1110	1160	1050
	APR-SEP	1120	1170	1210	102	1250	1300	1190
Entiat R nr Ardenvoir	APR-JUL	205	220	230	107	240	255	215
	APR-SEP	230	245	255	106	265	280	240
Wenatchee R at Plain	APR-JUL	980	1040	1090	102	1140	1200	1070
	APR-SEP	1080	1150	1200	102	1250	1320	1180
Icicle Ck nr Leavenworth	APR-JUL	265	285	300	97	315	335	310
	APR-SEP	285	310	325	96	340	365	340
Wenatchee R at Peshastin	APR-JUL	1400	1490	1550	105	1610	1700	1480
	APR-SEP	1550	1640	1710	105	1780	1870	1630
Columbia R bl Rock Island Dam (2)	APR-JUL	58100	61800	64300	109	66800	70500	59000
	APR-SEP	68600	73000	75900	109	78800	83200	69500

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CHELAN LAKE	676.1	171.0	350.5	216.3

CENTRAL COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2011

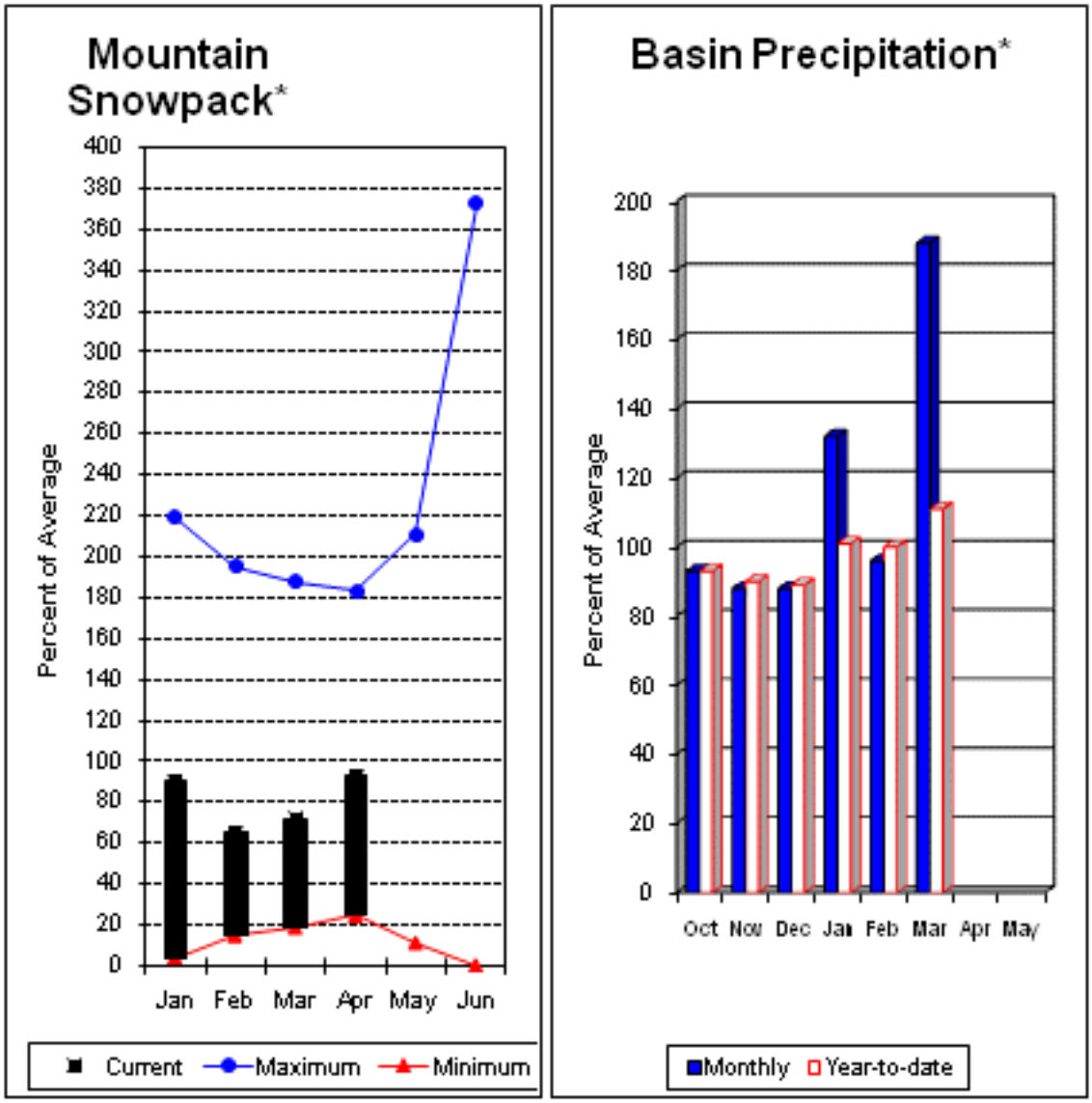
Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CHELAN LAKE BASIN	4	137	100
ENTIAT RIVER	1	132	97
WENATCHEE RIVER	9	136	98
STEMILT CREEK	2	120	106
COLOCKUM CREEK	2	88	125

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 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 volume - actual volume may be affected by upstream water management.

Upper Yakima River Basin



*Based on selected stations

April 1 reservoir storage for the Upper Yakima reservoirs was 743,000-acre feet, 134% of average. Forecasts for the Yakima River at Cle Elum are 98% of average and the Teanaway River near Cle Elum is at 105%. Lake inflows are all forecasted to be near average this summer as well. March streamflows within the basin were Yakima at Cle Elum at 106% and Cle Elum River near Roslyn at 86%. April 1 snowpack was 93% based upon 10 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 188% of average for March and 111% year-to-date for water. 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.

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Keechelus Reservoir Inflow (2)	APR-JUL	103	114	122	101	130	141	121
	APR-SEP	114	126	134	101	142	154	133
Kachess Reservoir Inflow (2)	APR-JUL	94	103	109	98	115	124	111
	APR-SEP	102	111	117	98	123	132	120
Cle Elum Lake Inflow (2)	APR-JUL	365	385	400	98	415	435	410
	APR-SEP	395	420	440	98	460	485	450
Yakima R at Cle Elum (2)	APR-JUL	685	755	805	98	855	925	820
	APR-SEP	740	825	885	98	945	1030	900
Teanaway R bl Forks nr Cle Elum	APR-JUL	121	138	150	105	162	179	143
	APR-SEP	124	141	153	105	165	182	146

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
KEECHELUS	157.8	146.7	97.8	114.1
KACHESS	239.0	226.7	163.4	169.4
CLE ELUM	436.9	369.9	196.5	270.1

UPPER YAKIMA RIVER BASIN
Watershed Snowpack Analysis - April 1, 2011

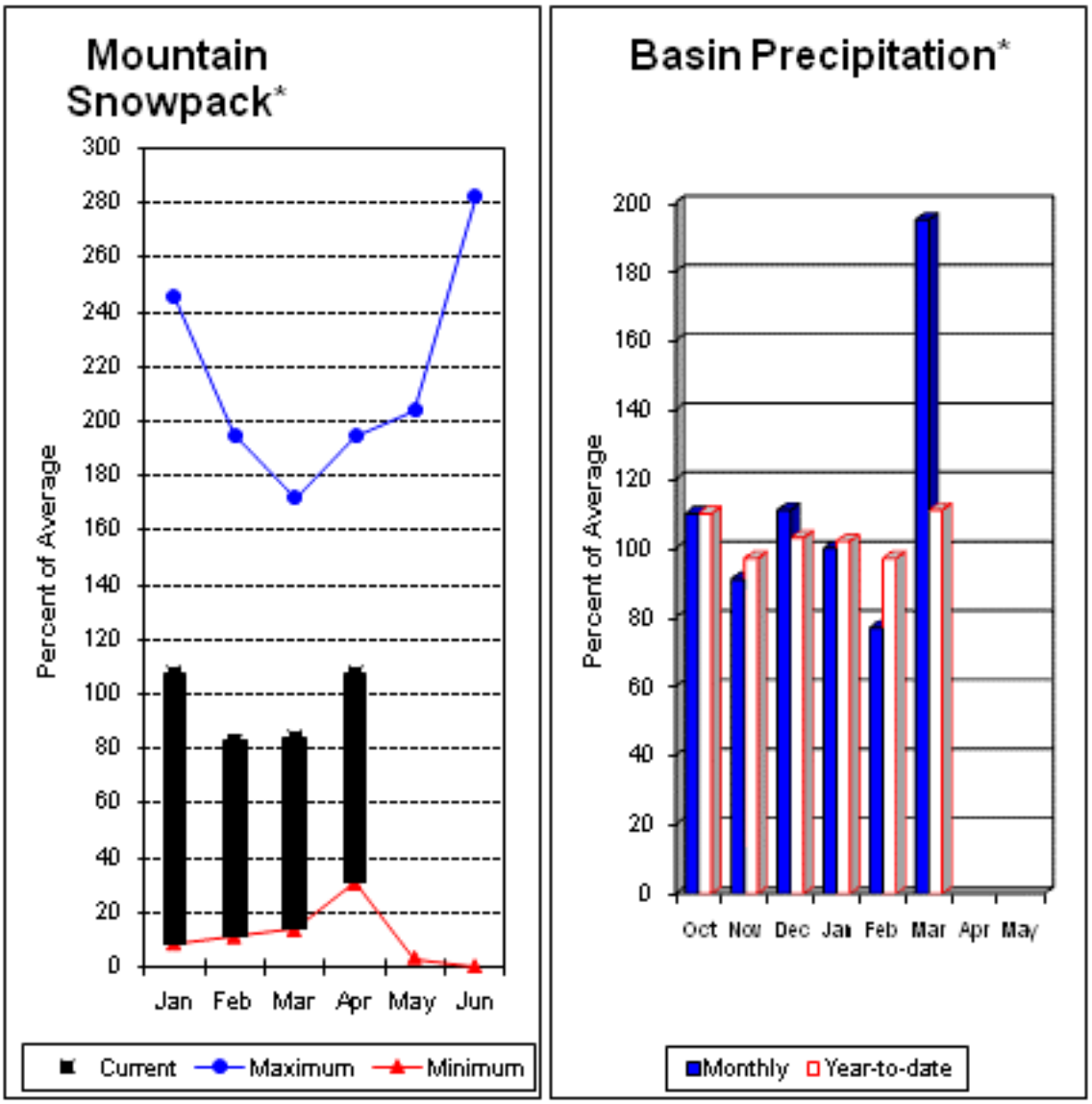
Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
UPPER YAKIMA RIVER	10	145	93

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 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 volume - actual volume may be affected by upstream water management.

Lower Yakima River Basin



*Based on selected stations

March average streamflows within the basin were: Yakima River near Parker, 87%; Naches River near Naches, 88%; and Yakima River at Kiona, 91%. April 1 reservoir storage for Bumping and Rimrock reservoirs was 181,000-acre feet, 119% of average. Forecast averages for Yakima River near Parker are 101%; American River near Nile, 110%; Ahtanum Creek, 103%; and Klickitat River near Glenwood, 120%. April 1 snowpack was 108% based upon 8 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 108%of average. Precipitation was 195% of average for March and 111% year-to-date for water. Temperatures were 1-3degrees below normal for March and slightly above for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they April 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.

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Bumping Lake Inflow (2)	APR-JUL	117	128	135	111	142	153	122
	APR-SEP	128	139	147	111	155	166	132
American R nr Nile	APR-JUL	105	113	119	110	125	133	108
	APR-SEP	116	124	130	110	136	144	118
Rimrock Lake Inflow (2)	APR-JUL	210	220	230	112	240	250	205
	APR-SEP	245	260	270	113	280	295	240
Naches R nr Naches (2)	APR-JUL	745	800	840	117	880	935	720
	APR-SEP	805	870	910	117	950	1010	780
Ahtanum Ck at Union Gap	APR-JUL	24	28	31	103	34	38	30
	APR-SEP	26	30	33	103	36	40	32
Yakima R nr Parker (2)	APR-JUL	1610	1740	1820	101	1900	2030	1800
	APR-SEP	1770	1900	1990	101	2080	2210	1980
Klickitat R nr Glenwood	APR-JUL	131	143	151	120	159	171	126
	APR-SEP	173	187	196	120	205	220	163
Klickitat R nr Pitt	APR-JUL	465	510	545	119	580	625	460
	APR-SEP	555	610	650	118	690	745	550

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
BUMPING LAKE	33.7	14.7	11.8	13.1
RIMROCK	198.0	165.8	113.0	138.5

LOWER YAKIMA RIVER BASIN
Watershed Snowpack Analysis - April 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
LOWER YAKIMA RIVER	8	133	108
AHTANUM CREEK	3	118	108

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

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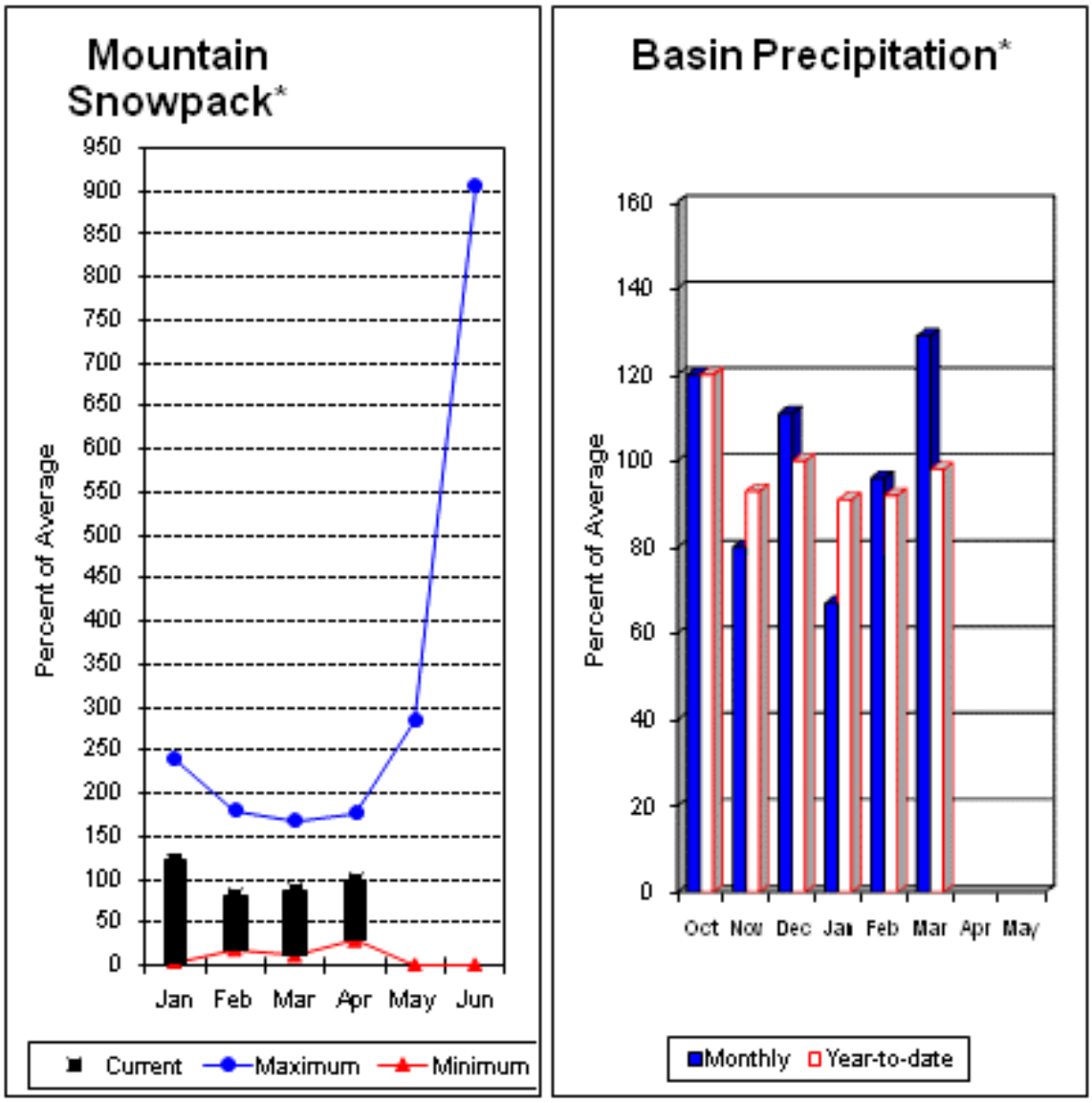
Walla Walla River Basin



*Based on selected stations

March precipitation was 129% of average, maintaining the year-to-date precipitation at 98% of average. Snowpack in the basin was 100% of average. Streamflow forecasts are 107% of average for Mill Creek and 106% for the SF Walla Walla near Milton-Freewater. March streamflow was 140% of average for the SF Walla Walla River. Average temperatures were near normal for March and for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SF Walla Walla R nr Milton-Freewater	APR-JUL	47	53	57	106	61	67	54
	APR-SEP	59	66	71	106	76	83	67
Mill Ck nr Walla Walla	APR-JUL	20	24	26	108	28	32	24
	APR-SEP	24	28	30	107	32	36	28

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, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WALLA WALLA RIVER	2	153	100

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

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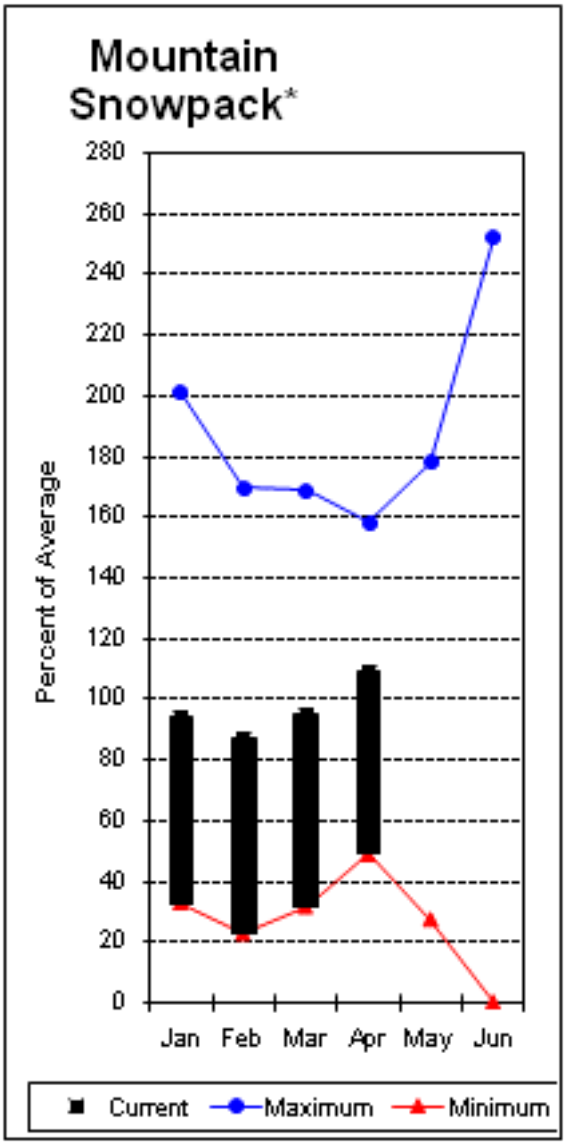
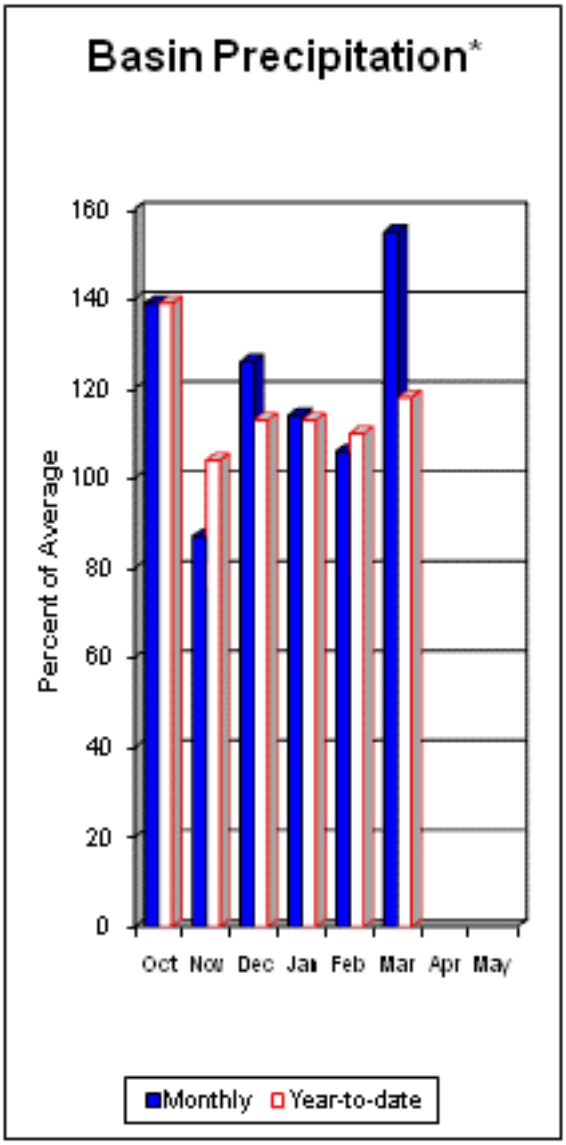
Lower Snake River Basin





*Based on selected stations

The April - September forecast is for 116% for Clearwater River at Spalding. The Snake and Grande Ronde rivers can expect summer flows to be about 116% and 126% of normal respectively. A newly developed forecast point for Asotin Creek at Asotin predicts 109% of average flows for the April – July runoff period. March precipitation was 155% of average, bringing the year-to-date precipitation to 118% of average. April 1 snowpack readings averaged 109% of average. March streamflow was 93% of average for Snake River below Lower Granite Dam and 92% for Grande Ronde River near Troy. Dworshak Reservoir on the Clearwater River is at 72% of average. Average temperatures were near normal for March and for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Grande Ronde R at Troy (1)	APR-SEP	1320	1600	1720	126	1840	2120	1370
Asotin Ck at Asotin	APR-JUL	25	33	38	109	43	51	35
Clearwater R at Spalding (1,2)	APR-JUL	7200	8190	8640	116	9090	10100	7430
	APR-SEP	7610	8660	9140	116	9620	10700	7850
Snake R bl Lower Granite Dam (1,2)	APR-JUL	20200	23600	25100	116	26600	30000	21600
	APR-SEP	22400	26200	27900	116	29600	33400	24100

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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

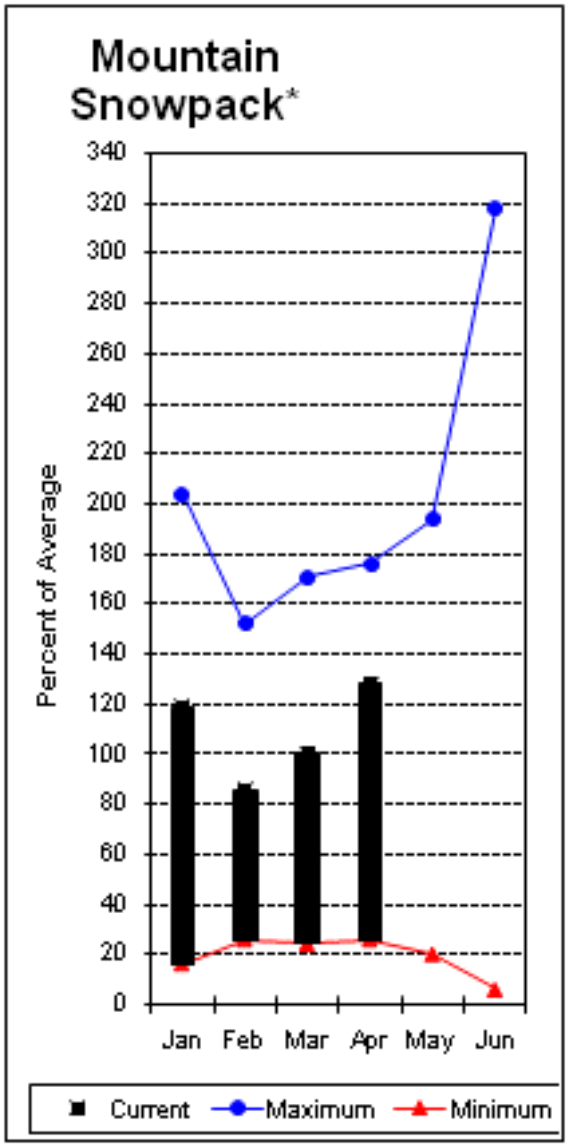
LOWER SNAKE RIVER BASIN
Reservoir Storage (1000 AF) - End of March

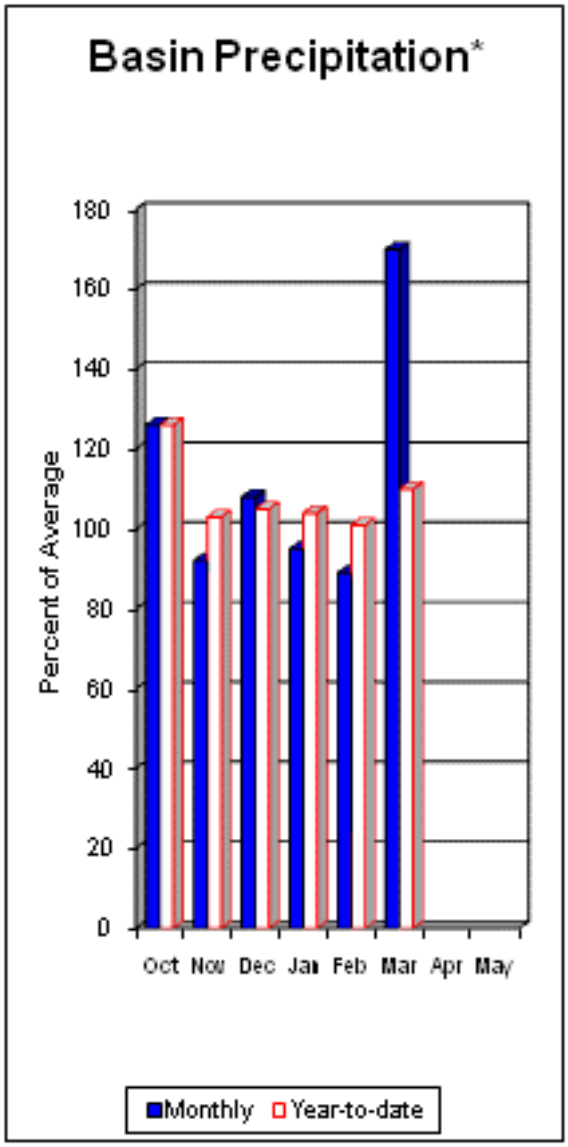
Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
DWORSHAK	3468.0	1619.2	2308.7	2244.1

LOWER SNAKE RIVER BASIN
Watershed Snowpack Analysis - April 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
LOWER SNAKE, GRANDE RONDE	15	157	109

Lower Columbia River Basins





*Based on selected stations

Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 112% and Cowlitz River at Castle Rock, 108% of average. The Columbia at The Dalles is forecasted to have 108% of average flows this summer. March average streamflow for Cowlitz River below Mayfield Dam was 101%. The Columbia River at The Dalles was 104% of average. March precipitation was 170% of average and the water-year average was 110%. April 1 snow cover for Cowlitz River was 118%, and Lewis River was 137% of average. Average temperatures were 2-5 degrees below normal during March and 1-3 degrees below for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Columbia R at The Dalles (2)	APR-JUL	82600	88000	91700	108	95400	101000	84600
	APR-SEP	96300	103000	107000	108	111000	118000	98600
Klickitat R nr Glenwood	APR-JUL	131	143	151	120	159	171	126
	APR-SEP	173	187	196	120	205	220	163
Klickitat R nr Pitt	APR-JUL	465	510	545	119	580	625	460
	APR-SEP	555	610	650	118	690	745	550
Lewis R at Ariel (2)	APR-JUL	875	1040	1150	112	1260	1430	1031
	APR-SEP	1030	1200	1320	112	1440	1610	1176
Cowlitz R bl Mayfield Dam (2)	APR-JUL	1420	1670	1840	109	2010	2260	1689
	APR-SEP	1600	1900	2100	109	2300	2600	1922
Cowlitz R at Castle Rock (2)	APR-JUL	2010	2290	2480	108	2670	2950	2295
	APR-SEP	2330	2630	2840	108	3050	3350	2639

LOWER COLUMBIA RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
MOSSYROCK	0.0	1333.2	1123.3	---
SWIFT	0.0	715.9	729.2	---
YALE	0.0	381.6	369.3	---
MERWIN	0.0	384.9	408.2	---

LOWER COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
LEWIS RIVER	5	153	137
COWLITZ RIVER	6	153	118

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

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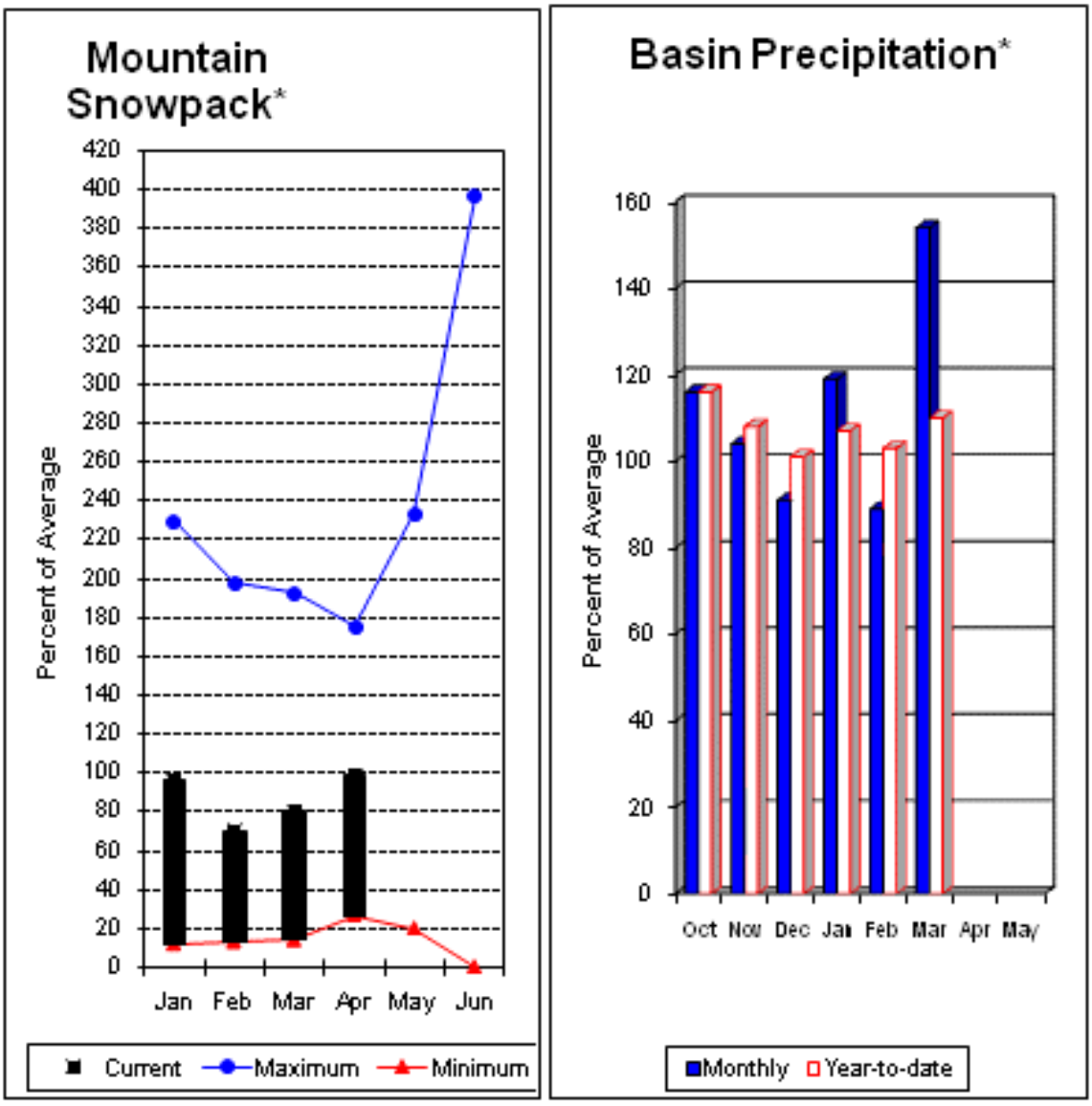
South Puget Sound River Basins



*Based on selected stations

Summer runoff is forecast to be 90% of normal for the Green River below Howard Hanson Dam and 106% for the White River near Buckley. April 1 snowpack was 107% of average for the White River, 107% for Puyallup River and 82% in the Green River Basin. Water content on April 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 36.9 inches. This site has an April 1 average of 34.9 inches. March precipitation was 154% of average, bringing the water year-to-date to 110% of average for the basins. Average temperatures in the area were 2-4 degrees below normal for March and slightly below for the water-year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
White R nr Buckley (1)	APR-JUL	365	435	470	107	505	575	440
	APR-SEP	440	525	565	106	605	690	534
Green R bl Howard Hanson Dam (1,2)	APR-JUL	149	198	220	90	240	290	245
	APR-SEP	164	215	240	90	265	315	268

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

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

SOUTH PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - April 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
WHITE RIVER	3	132	107
GREEN RIVER	4	216	82
PUYALLUP RIVER	5	127	107

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

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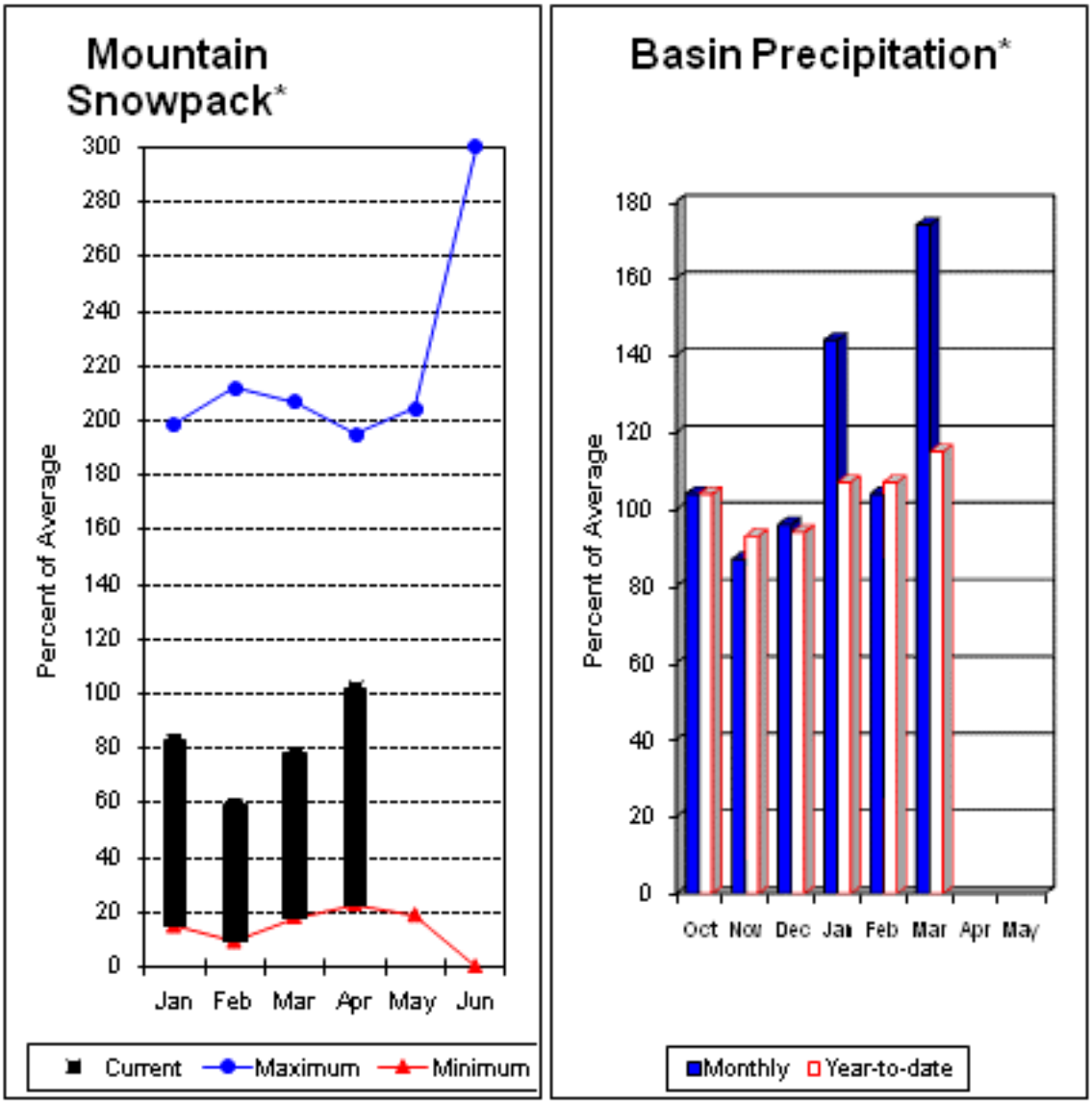
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Central Puget Sound River Basins



*Based on selected stations

Forecast for spring and summer flows are: 115% for Cedar River near Cedar Falls; 121% for Rex River; 118% for South Fork of the Tolt River; 113% for Taylor Creek near Selleck, and 118% for Cedar River at Cedar Falls. Basin-wide precipitation for March was 174% of average, bringing water-year-to-date to 115% of average. April 1 average snow cover in Cedar River Basin was 110%, Tolt River Basin was 106%, Snoqualmie River Basin was 95%, and Skykomish River Basin was 97%. Stevens Pass SNOTEL site, at 3950 feet, had 37 inches of water content. Average April 1 water content is 42.6 inches at Stevens Pass. Temperatures were 1-2 degrees below normal for March and slightly below for the water-year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Cedar R nr Cedar Falls	APR-JUL	70	78	84	115	90	98	73
	APR-SEP	77	86	92	115	98	107	80
Rex R nr Cedar Falls	APR-JUL	24	27	30	120	33	36	25
	APR-SEP	27	31	34	121	37	41	28
Cedar R at Cedar Falls (2)	APR-JUL	62	77	87	118	97	112	74
	APR-SEP	58	75	86	118	97	114	73
Taylor Ck nr Selleck	APR-JUL	18.3	21	23	115	25	28	20
	APR-SEP	22	25	27	113	29	32	24
SF Tolt R nr Index	APR-JUL	13.9	16.0	17.4	118	18.8	21	14.7
	APR-SEP	15.7	18.2	19.9	118	22	24	16.9

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, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
CEDAR RIVER	4	245	110
TOLT RIVER	1	147	106
SNOQUALMIE RIVER	3	143	95
SKYKOMISH RIVER	2	141	97

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

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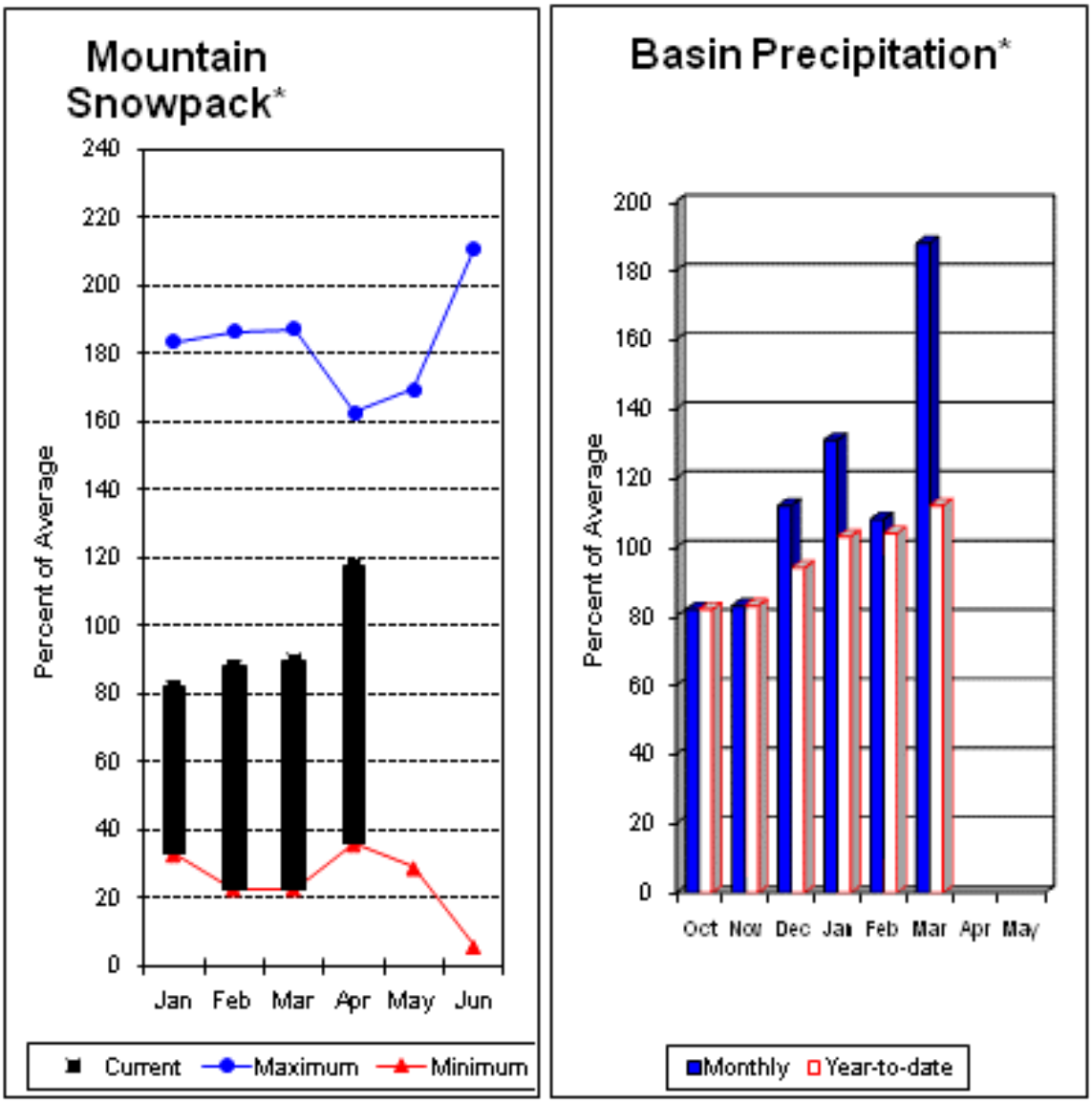
North Puget Sound River Basins



*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 107% of average for the spring and summer period. March streamflow in Skagit River was 82% of average. Other forecast points included Baker River at 111% and Thunder Creek at 105% of average. Basin-wide precipitation for March was 188% of average, bringing water-year-to-date to 112% of average. April 1 average snow cover in Skagit River Basin was 118% and Nooksack River Basin was 117%. Brown Top snow course, at 6,000 feet, had 86.4 inches of water content. Average April 1 water content is 60.8 inches at Brown Top. April 1 Skagit River reservoir storage was 97% of average and 51% of capacity. Average temperatures for March were 1-3 degrees below normal for the basin and 1-2 degrees below average for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Thunder Ck nr Newhalem	APR-JUL	215	230	245	105	260	275	234
	APR-SEP	315	335	350	105	365	385	333
Skagit R at Newhalem (2)	APR-JUL	1800	1920	2000	107	2080	2200	1864
	APR-SEP	2180	2290	2370	107	2450	2560	2217
Baker R nr Concrete (2)	APR-JUL	770	855	910	110	965	1050	828
	APR-SEP	945	1070	1160	111	1250	1370	1050

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	675.0	865.0	693.0
DIABLO RESERVOIR	90.6	84.0	85.0	86.2

NORTH PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - April 1, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
SKAGIT RIVER	15	175	118
BAKER RIVER	0	171	0
NOOKSACK RIVER	2	155	117

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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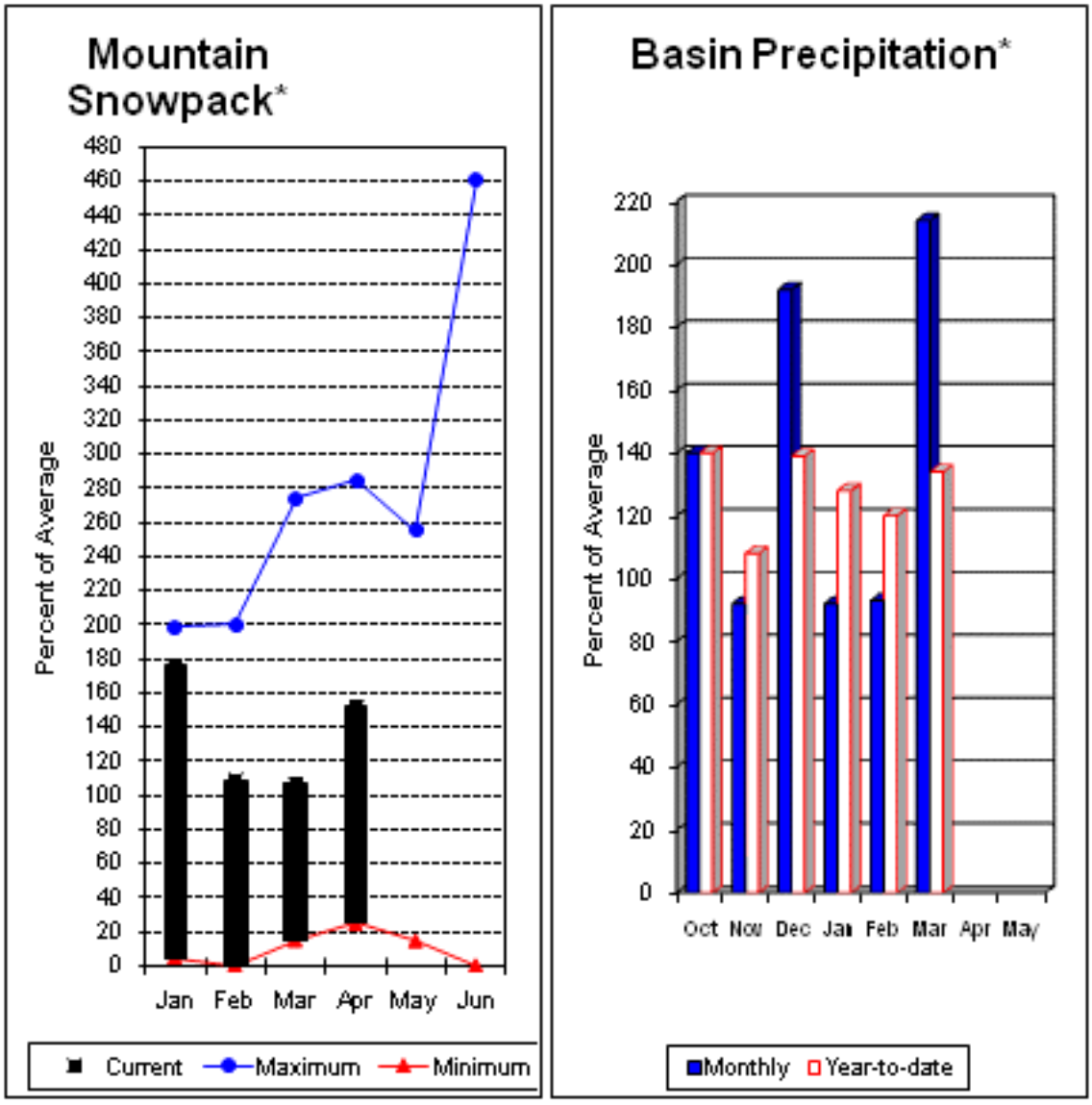
Olympic Peninsula River Basins



*Based on selected stations

Forecasted average runoff for streamflow for the Dungeness River is 127% and Elwha River is 125%. March runoff in the Dungeness River was 120% of normal. Big Quilcene and Wynoochee rivers should expect near to above average runoff this summer also. March precipitation was 214% of average. Precipitation has accumulated at 134% of average for the water year. March precipitation at Quillayute was 17.95 inches. The thirty-year average for March is 10.98 inches. Olympic Peninsula snowpack averaged 152% of normal on April 1. Temperatures were slightly below average for March and near normal for the water year.

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

Streamflow Forecasts - April 1, 2011

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Dungeness R nr Sequim	APR-JUL	134	148	157	127	166	180	124
	APR-SEP	163	181	193	127	205	225	152
Elwha R at Mcdonald Bridge	APR-JUL	460	500	525	125	550	590	419
	APR-SEP	550	600	630	125	660	710	503

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, 2011

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
OLYMPIC PENINSULA	6	157	152

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 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 volume - actual volume may be affected by upstream water management.

Issued by

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

Canada	Ministry of Sustainable Resources
	Snow Survey, River Forecast Centre, 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
	Recourse Conservation & Development Councils
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
	Kalispel Tribe of Indians
	Spokane Indian Tribe
	Jamestown S'klallum Tribe
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 Water Supply Outlook Report

Natural Resources Conservation Service
Spokane, WA