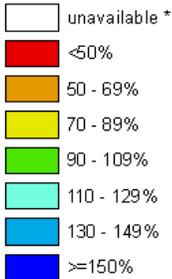


Washington Water Supply Outlook Report February 1, 2011

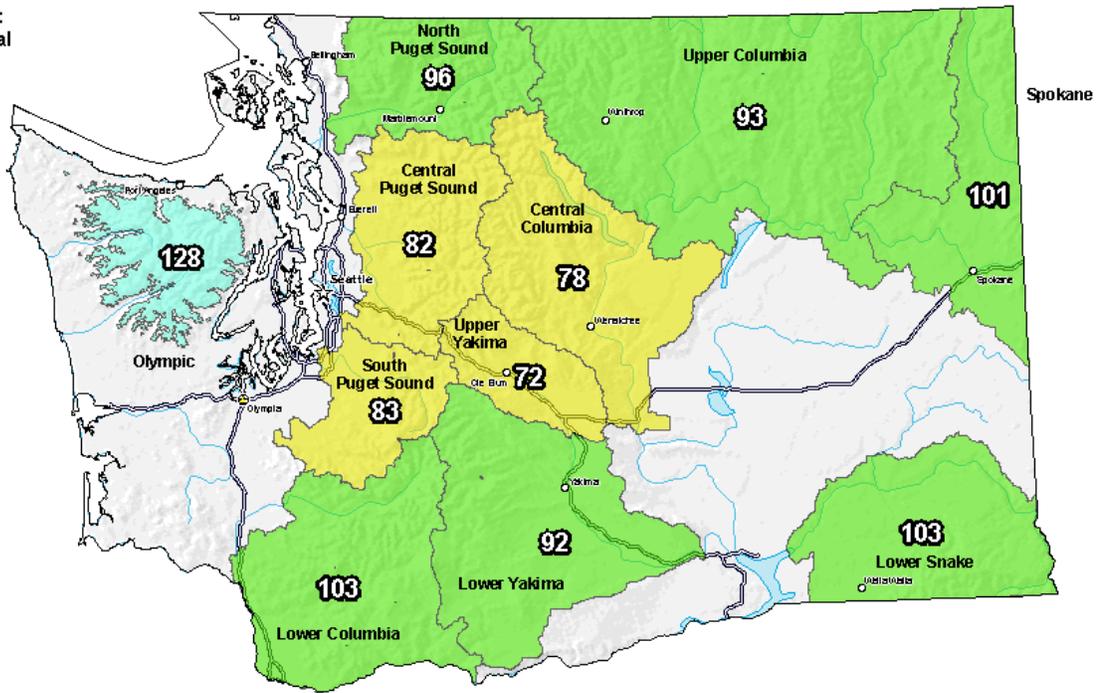
Washington SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Mar 07, 2011

**Current Snow Water
 Equivalent (SWE)
 Basin-wide Percent
 of 1971-2000 Normal**



* Data unavailable at time of posting or measurement is not representative at this time of year



**Provisional Data
 Subject to Revision**



The snow water equivalent percent of normal represents the current snowwater equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).



Prepared by the USDA/NRCS National Water and Climate Center
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 Based on data from <http://www.wcc.nrcs.usda.gov/reports/>
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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.

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Washington Water Supply Outlook

March 2011

General Outlook

Another one for the record books is all that really can be said about the month of February. Just when we all thought that near record high temperatures were to be the early demise of winter the old man stepped up to the plate and delivered a homerun with record low temperatures and what would appear to be near record snowfall, which was measured in feet not inches. Snowpack averages increased in some basins by as much as 20%, lifting them just out of the range of potential disaster. What happens next is anyone's guess but the forecasters are predicting above average precipitation and below average temperatures for the rest of this month. Spring forecasts appear to be cooler than normal with equal chances for precipitation. With only a month to go before reaching the average peak snow accumulation date of April 1, even a "normal" month would be nice.

Snowpack

The March 1 statewide SNOTEL readings were 89% of average, up 9% from last month. The Green River snow survey data reported the lowest readings at 60% of average, a 15% increase from last month. Readings from the Pend Oreille Basin reported the highest at 112% of average. Westside averages from SNOTEL, and March 1 snow surveys, included the North Puget Sound river basins with 90% of average, the Central Puget river basins with 78%, and the Lewis-Cowlitz basins with 100% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 78% and the Wenatchee area with 77%. Snowpack in the Spokane River Basin was at 94% and the Walla Walla River Basin had 87% of average. Maximum confirmed snow cover in Washington was at Paradise SNOTEL, with water content of 56.6 inches. The 30-year average for Paradise on March 1 is 59.7 inches leaving the site at 95% of average, up 9% from last month.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane	182	94
Newman Lake	190	90
Pend Oreille	172	112
Okanogan	112	90
Methow	106	87
Conconully Lake	75	80
Wenatchee	100	75
Chelan	108	80
Upper Yakima	110	72
Lower Yakima	109	84
Ahtanum Creek	82	77
Walla Walla	128	87
Lower Snake	150	95
Cowlitz	145	99
Lewis	139	102
White	119	90
Green	184	60
Puyallup	121	89
Cedar	230	85
Snoqualmie	160	73
Skykomish	145	71
Skagit	135	90
Baker	n/a	90e
Nooksack	143	89
Olympic Peninsula	121	107

Precipitation

During the month of February, the National Weather Service and Natural Resources Conservation Service climate stations reported near average precipitation in all river basins excluding the Lower Yakima where they only received 77% of average. Precipitation came in two main storm systems, mid-month and again at the end of the month, being mostly dry in between. The highest percent of average in the state was at Elbow Lake SNOTEL in the South Fork Nooksack which reported 172% of average for a total of 25.3 inches. The average for Elbow Lake is 14.7 inches for February. Elbow lake SNOTEL was also the wettest spot in the state last month. Though basin averages were near normal some notable dry spots include Wenatchee at 32%, Walla Walla at 36% and Moses Mountain SNOTEL at 47% of average for the month.

RIVER BASIN	FEBRUARY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	112	117
Pend Oreille	97	106
Upper Columbia	95	102
Central Columbia	95	98
Upper Yakima	96	100
Lower Yakima	77	97
Walla Walla	96	92
Lower Snake	106	110
Lower Columbia	89	101
South Puget Sound	89	103
Central Puget Sound	104	107
North Puget Sound	108	104
Olympic Peninsula	93	120

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 700,000-acre feet, 140% of average for the Upper Reaches and 179,000-acre feet or 130% of average for Rimrock and Bumping Lakes. Storage at the Okanogan reservoirs was 124% of average for March 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 87,000-acre feet, 60% of average and 37% of capacity; Chelan Lake, 239,000-acre feet, 95% of average and 35 of capacity; and the Skagit River reservoirs at 110% of average and 67% 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	37	60
Pend Oreille	53	106
Upper Columbia	90	124
Central Columbia	35	95
Upper Yakima	84	140
Lower Yakima	77	130
Lower Snake	59	90
North Puget Sound	67	110

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

Streamflow

Forecasts vary from 79% of average for the Icicle Creek near Leavenworth to 109% of average for the Clearwater River. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 96%; White River, 102%; and Skagit River, 93%. Some Eastern Washington streams include the Yakima River near Parker, 84%; Wenatchee River at Plain, 88%; and Spokane River near Post Falls, 108%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS.

Statewide February streamflows varied by region and by the extent of the warm spell early in the month. It appears that the north central part of the state was effected the most showing above average runoff for most of the month on many streams. The Stehekin River had the highest reported natural flows with 188% of average. The Okanogan at Tonasket with 74% of average was the lowest in the state however that could be due to reservoir control or ice influence. Other streamflows were the following percentage of average as reported by the River Forecast Center: the Cowlitz at Castle Rock, 82%; the Spokane at Spokane, 91%; the Columbia below Rock Island Dam, 92%; and the Cle Elum near Roslyn, 123%.

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	90-108
Pend Oreille	102-110
Upper Columbia	90-103
Central Columbia	79-104
Upper Yakima	83-89
Lower Yakima	84-101
Walla Walla	96-103
Lower Snake	94-109
Lower Columbia	94-101
South Puget Sound	82-102
Central Puget Sound	95-100
North Puget Sound	92-96
Olympic Peninsula	100-102

STREAM	PERCENT OF AVERAGE FEBRUARY STREAMFLOWS
Pend Oreille Below Box Canyon	94
Kettle at Laurier	86
Columbia at Birchbank	88
Spokane at Long Lake	82
Similkameen at Nighthawk	127
Okanogan at Tonasket	74
Methow at Pateros	145
Chelan at Chelan	146
Wenatchee at Pashastin	135
Yakima at Cle Elum	140
Yakima at Parker	108
Naches at Naches	112
Grande Ronde at Troy	76
Snake below Lower Granite Dam	79
SF Walla Walla near Milton Freewater	75
Columbia River at The Dalles	92
Cowlitz below Mayfield Dam	89
Skagit at Concrete	97
Dungeness near Sequim	85

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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/>

BASIN SUMMARY OF
SNOW COURSE DATA

MARCH 2011

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00	HAMILTON HILL SNOW COURSE	CAN. ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
AHTANUM R.S.	3100	2/25/11	10	4.2	6.1	7.0	HAMILTON HILL SNOW COURSE	4550	2/27/11	39	8.8	6.5	12.7
ALPINE MEADOWS	3500	2/25/11	72	22.0	12.2	33.8	HAND CREEK SNOTEL	5030	3/01/11	52	12.4	7.0	9.9
ALPINE MEADOWS SNTL	3500	3/01/11	85	30.3	16.9	36.5							
AMBROSE	6480	2/25/11	45	12.6	6.2	10.5							
ASHLEY DIVIDE	4820	3/03/11	38	10.1	3.6	6.2	HARTS PASS SNOTEL	6490	3/01/11	110	42.4	26.5	39.7
BADGER PASS SNOTEL	6900	3/01/11	96	30.4	21.0	29.7	HELL ROARING DIVIDE	5770	2/23/11	90	28.5	19.6	25.8
BAIRD #2	3220	3/01/11	34	8.4	4.9	--	HERRIG JUNCTION	4850	3/03/11	82	26.9	16.3	22.2
BAREE MIDWAY	4600	3/02/11	111	34.4	15.8	28.7	HIGH RIDGE SNOTEL	4920	3/01/11	75	21.8	15.3	21.2
BAREE TRAIL	3800	3/02/11	49	12.3	3.4	8.2	HOLBROOK	4530	2/28/11	33	8.9	5.2	8.3
BARKER LAKES SNOTEL	8250	3/01/11	44	11.2	12.1	11.1	HOODOO BASIN SNOTEL	6050	3/01/11	144	40.5	17.7	38.6
BASIN CREEK SNOTEL	7180	3/01/11	27	6.4	5.2	6.1	HUCKLEBERRY SNOTEL	2250	3/01/11	24	3.4	.0	1.8
BASSOO PEAK	5150	2/22/11	44	11.2	4.8	9.0	HUMBOLDT GLCH SNOTEL	4250	3/01/11	---	13.6	5.5	11.7
BEAVER CREEK TRAIL	2200	3/01/11	56	15.3	4.6	13.0	HURRICANE	4500	2/24/11	50	13.8	8.8	15.6
BEAVER PASS	3680	2/26/11	69	22.1	18.4	24.9	INDIAN ROCK SNOTEL	5360	3/01/11	74	29.0	26.8	--
BEAVER PASS SNOTEL	3630	3/01/11	110	33.2	25.4	33.9	INTERGAARD	6450	2/26/11	27	5.9	3.5	6.2
BIG WHITE MTN CAN.	5510	3/01/11	53	14.2	15.1	16.8	IRENE'S CAMP	5530	2/28/11	40	7.6	7.8	--
BLACK MOUNTAIN	7750	2/24/11	42	10.3	9.4	11.4	ISINTOK LAKE CAN.	5100	2/25/11	26	6.1	4.6	6.5
BLACK PINE SNOTEL	7100	3/01/11	43	11.8	6.2	10.1	JUNE LAKE SNOTEL	3440	3/01/11	127	39.3	20.1	33.9
BLACKWALL PILL CAN.	6370	3/01/11	97	29.7	22.2	30.0	KELLER RIDGE	3700	2/24/11	22	3.7	2.7	--
BLEWETT PASS#2SNOTEL	4240	3/01/11	39	9.5	12.8	15.7	KELLOGG PEAK	5560	3/03/11	83	23.2	14.2	25.8
BLUE LAKE	5900	2/26/11	67	19.2	11.0	21.1	KISHENEHN	3890	2/28/11	40	8.8	3.3	7.3
BRENDA MINE CAN.	4450	3/01/11	43	9.4	10.1	11.3	KIT CARSON PASTURE	4950	2/22/11	25	6.9	4.6	8.2
BROOKMERE CAN.	3000	2/27/11	28	7.0	4.3	7.6	KRAFT CREEK SNOTEL	4750	3/01/11	54	15.3	8.4	13.6
BROWN TOP AM	6000	2/26/11	132	50.4	44.9	53.4	LAMB BUTTE	5100	2/24/11	41	11.5	14.6	--
BROWNS PASS	2/28/11	21	3.0	3.1	--	LIGHTNING LAKE CAN.	3700	2/27/11	37	9.9	7.2	10.3	
BRUSH CREEK TIMBER	5000	2/22/11	49	15.1	6.2	7.5	LOGAN CREEK	4300	2/22/11	32	8.1	4.0	6.2
BUCKINGHORSE SNOTEL	4870	3/01/11	162	56.7	53.7	--	LOLO PASS SNOTEL	5240	3/01/11	103	27.2	13.3	26.8
BULL MOUNTAIN	6600	2/28/11	28	5.4	2.6	5.1	LONE PINE SNOTEL	3930	3/01/11	122	36.3	24.2	31.7
BUMPING RIDGE SNOTEL	4610	3/01/11	94	22.2	18.8	24.9	LOOKOUT SNOTEL	5140	3/01/11	100	26.0	13.5	27.2
BUNCHGRASS MDWSNOTEL	5000	3/01/11	72	20.1	20.1	24.4	LOST HORSE SNOTEL	5120	3/01/11	46	13.0	17.6	18.3
BURNT MOUNTAIN PIL	4170	3/01/11	47	10.0	4.6	13.4	LOST LAKE SNOTEL	6110	3/01/11	160	48.7	25.1	50.7
BUTTERMILK BUTTE	5250	2/28/11	51	12.1	13.6	--	LOST LAKE	4070	2/25/11	28	5.9	6.6	--
CALAMITY SNOTEL	2500	3/01/11	40	7.4	.0	--	LOUP LOUP CAMPGROUND	2/23/11	28	6.4	8.6	--	
CARMI CAN.	4100	3/01/11	25	4.6	--	5.8	LUBRECHT FOREST NO 3	5450	3/01/11	32	7.3	2.8	5.6
CAYUSE PASS SNOTEL	5240	3/01/11	159	51.0	38.7	--	LUBRECHT FOREST NO 4	4650	3/01/11	15	3.5	1.4	2.7
CHAMOKANE 2	3520	2/23/11	19	5.6	3.5	--	LUBRECHT FOREST NO 6	4040	3/01/11	22	6.2	1.5	3.2
CHESSMAN RESERVOIR	6200	2/24/11	23	4.8	3.3	3.1	LUBRECHT HYDROPLOT	4200	3/01/11	30	7.5	2.7	5.1
CHEWALAH #2	4930	2/28/11	54	14.0	13.9	--	LUBRECHT SNOTEL	4680	3/01/11	29	7.1	3.3	5.3
CHICKEN CREEK	4060	2/28/11	63	15.8	9.8	14.4	LYNN LAKE SNOTEL	5980	3/01/11	146	46.4	41.1	55.1
CHIWAUKUM G.S.	2500	2/25/11	25	8.2	6.9	10.8	LYNN LAKE	4000	3/01/11	---	12.1E	--	16.1
CITY CABIN	2390	2/25/11	22	3.3	.0	10.2	LYNN LAKE SNOTEL	3900	3/01/11	57	12.5	6.1	--
CLOUDY PASS AM	6500	2/25/11	98	32.3	--	39.4	MARIAS PASS	5250	2/27/11	57	16.1	7.8	14.9
COLD CREEK STRIP	6020	2/28/11	31	6.1	7.0	--	MARTEN RIDGE SNOTEL	3520	3/01/11	126	47.1	34.8	--
COLOCKUM PASS	5370	2/28/11	44	11.6	12.6	14.6	MAZAMA	2/23/11	25	7.4	6.5	--	
COMBINATION SNOTEL	5600	3/01/11	20	4.4	3.6	4.5	MCCULLOCH CAN.	4200	2/28/11	28	6.5	5.0	6.2
COPPER BOTTOM SNOTEL	5200	3/01/11	28	7.1	4.6	9.9	MEADOWS CABIN	1900	3/01/11	18	2.5	.0	5.5
COPPER CREEK	5700	2/25/11	37	10.0	4.2	12.5	MEADOWS PASS SNOTEL	3230	3/01/11	84	19.2	10.9	19.8
COPPER MOUNTAIN	7700	2/26/11	33	8.0	6.7	8.9	METEOR	2/23/11	17	3.1	.0	--	
CORRAL PASS SNOTEL	5800	3/01/11	92	26.0	19.5	29.5	M F NOOKSACK SNOTEL	4970	3/01/11	120	47.0	35.0	52.8
COTTONWOOD CREEK	6400	2/24/11	25	5.2	3.8	6.0	MICA CREEK SNOTEL	4510	3/01/11	90	19.5	13.7	23.2
COUGAR MTN. SNOTEL	3200	3/01/11	51	9.7	.0	17.1	MINERAL CREEK	4000	2/23/11	53	16.6	12.0	15.8
COX VALLEY	4500	2/25/11	98	30.0	25.7	31.7	MISSEZULA MTN CAN.	5080	2/28/11	33	7.9	5.0	8.4
COYOTE HILL	4200	2/28/11	37	11.3	5.9	9.1	MISSION CREEK CAN.	5840	3/01/11	---	13.0	12.1	17.1
DALY CREEK SNOTEL	5780	3/01/11	38	9.9	5.7	9.4	MISSION RIDGE	5000	2/25/11	41	11.5	13.8	15.2
DEER PARK	5200	2/28/11	53	14.4	13.1	15.1	MORSE LAKE SNOTEL	5410	3/01/11	138	41.0	44.1	47.0
DESERT MOUNTAIN	5600	3/01/11	---	15.7E	7.9	12.6	MOSES MOUNTAIN (2)	4800	2/28/11	35	8.0	12.6	17.5
DEVILS PARK	5900	3/01/11	116	38.1	25.7	37.9	MOSES MTN SNOTEL	5010	3/01/11	37	10.1	11.5	13.4
DISAUTEL PASS	2/28/11	22	3.2	2.8	--	MOSES PEAK	6650	2/28/11	56	16.1	20.8	11.7	
DISCOVERY BASIN	7050	2/28/11	38	10.2	5.8	8.4	MOSQUITO RDG SNOTEL	5200	3/01/11	---	33.1	21.3	31.1
DIX HILL	6400	2/27/11	37	10.8	6.9	10.0	MOULTON RESERVOIR	6850	3/04/11	31	9.8	3.8	6.2
DOMMERIE FLATS	2200	2/28/11	30	5.3	1.1	7.2	MOUNT CRAG SNOTEL	3960	3/01/11	110	32.1	26.4	26.8
DUNCAN RIDGE	5370	2/28/11	26	4.9	5.4	--	MT. KOBAY CAN.	5500	2/27/11	35	8.5	12.1	10.2
DUNGENESS SNOTEL	4010	3/01/11	37	10.1	5.2	8.9	MOUNT TOLMAN	2000	2/23/11	6	1.1	.0	3.3
EAST FORK R.S.	5400	2/23/11	21	5.0	3.2	5.6	MOWICH SNOTEL	3160	3/01/11	17	2.4	.0	1.5
EL DORADO MINE	7800	2/26/11	37	11.4	7.6	15.8	MOUNT GARDNER	3300	2/25/11	33	7.8	.2	13.0
ELBOW LAKE SNOTEL	3200	3/01/11	---	25.0	15.0	32.5	MOUNT GARDNER SNOTEL	2920	3/01/11	55	11.9	1.4	14.1
EMERY CREEK SNOTEL	4350	3/01/11	57	16.7	9.0	13.3	MUTTON CREEK #1	5700	2/24/11	41	10.2	12.6	12.0
ESPERON CK. UP CAN.	5050	2/28/11	44	10.9	10.2	14.6	N.F. ELK CR SNOTEL	6250	3/01/11	52	13.6	5.8	10.2
FARRON CAN.	4000	2/24/11	37	9.8	8.8	11.3	NEVADA RIDGE SNOTEL	7020	3/01/11	52	14.9	8.5	13.2
FATTY CREEK	5500	2/26/11	84	24.9	16.8	20.4	NEW HOZOMEEN LAKE	2800	2/26/11	---	2.2E	.0	10.3
FISH CREEK	8000	3/04/11	34	9.2	8.1	7.8	NEZ PERCE CMP SNOTEL	5650	3/01/11	43	12.1	7.0	12.7
FISH LAKE	3370	3/01/11	84	23.4	21.2	29.9	NEZ PERCE PASS	6570	2/22/11	50	15.4	7.2	15.7
FISH LAKE SNOTEL	3430	3/01/11	77	21.6	19.2	30.6	NOISY BASIN SNOTEL	6040	3/01/11	146	53.0	29.5	33.8
FLATTOP MTN SNOTEL	6300	3/01/11	139	42.5	28.4	39.2	NORTH FORK JOCKO	6330	2/26/11	130	47.5	--	36.5
FLEECER RIDGE	7500	2/28/11	36	9.4	4.0	9.2	OLALLIE MDWS SNOTEL	4030	3/01/11	117	36.3	35.0	48.9
FOURTH OF JULY SUM	3200	2/28/11	32	6.8	.0	8.2	OPHIR PARK	7150	2/27/11	49	15.0	9.6	14.1
FREEZEOUT CK. TRAIL	3500	2/26/11	34	9.1	5.2	11.3	OYAMA LAKE CAN.	4100	3/01/11	22	3.5	4.3	6.2
FROHNER MDWS SNOTEL	6480	3/01/11	30	7.1	4.9	6.3	PARADISE SNOTEL	5130	3/01/11	167	56.6	43.4	59.7
GOAT CREEK	3600	2/25/11	24	4.9	5.8	6.1	PARK CK RIDGE SNOTEL	4600	3/01/11	97	32.3	36.6	44.1
GOLD MTN LOOKOUT	4300	2/25/11	41	8.7	11.1	--	PEPPER CREEK SNOTEL	2140	3/01/11	50	9.8	.0	--
GRAVE CRK SNOTEL	4300	3/01/11	62	16.8	10.4	14.5	PETERSON MDW SNOTEL	7200	3/01/11	34	7.7	6.1	7.8
GREEN LAKE SNOTEL	5920	3/01/11	71	17.3	18.5	19.7	PIGTAIL PEEK SNOTEL	5800	3/01/11	141	41.7	32.2	44.6
GRIFFIN CR DIVIDE	5150	3/0											

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
QUARTZ PEAK SNOTEL	4700	3/01/11	64	19.9	14.6	19.5
RAGGED MOUNTAIN	4200	2/27/11	59	18.6	13.5	17.5
RAGGED MTN SNOTEL	4210	3/01/11	62	19.1	13.1	--
RAGGED RIDGE	3330	2/23/11	17	4.8	.0	7.8
RAINY PASS SNOTEL	4890	3/01/11	95	29.5	24.6	38.2
RAINY PASS	4780	3/02/11	95	27.1	23.3	33.8
REX RIVER SNOTEL	3810	3/01/11	86	27.3	15.2	23.9
ROCKER PEAK SNOTEL	8000	3/01/11	47	12.7	9.3	11.2
ROLAND SUMMIT	5120	3/01/11	---	29.2E	16.6	29.2
ROUND TOP MTN	4020	2/23/11	39	12.2	8.0	--
RUSTY CREEK	4000	2/24/11	20	4.1	6.6	6.2
SADDLE MTN SNOTEL	7900	3/01/11	72	23.5	11.4	21.8
SALMON MDWS SNOTEL	4460	3/01/11	35	8.4	10.9	10.1
SASSE RIDGE SNOTEL	4340	3/01/11	37	20.2	22.2	30.3
SATUS PASS	4030	2/22/11	24	8.7	8.6	9.6
SAVAGE PASS SNOTEL	6170	3/01/11	90	25.7	11.9	22.5
SENTINEL BT SNOTEL	4680	3/01/11	33	7.9	8.1	8.4
SHEEP CANYON SNOTEL	3990	3/01/11	115	35.0	14.2	31.6
SHERWIN SNOTEL	3200	3/01/11	---	12.9	2.7	10.8
SILVER STAR MTN CAN.	5600	2/27/11	74	24.2	22.1	25.0
SKALKAHO SNOTEL	7260	3/01/11	72	21.7	9.8	20.2
SKOOKUM CREEK SNOTEL	3310	3/01/11	---	19.9	.0	18.9
SKOOKUM LAKES	4230	2/28/11	52	12.7	6.8	--
SLIDE ROCK MOUNTAIN	7100	2/26/11	46	13.2	6.4	12.6
SOURDOUGH GUL SNOTEL	4000	3/01/11	22	3.9	.0	--
SOUTH BALDY	4920	2/28/11	75	20.0	15.2	--
SPENCER MDW SNOTEL	3400	3/01/11	85	23.7	16.2	28.6
SPIRIT LAKE SNOTEL	3520	3/01/11	33	8.1	.0	6.2
SPOTTED BEAR MTN.	7000	3/01/11	---	15.8E	9.2	12.7
SPRUCE SPGS SNOTEL	5700	3/01/11	52	11.1	8.1	15.9
STARVATION MOUNTAIN	6750	2/25/11	51	15.2	15.1	16.6
STAHL PEAK SNOTEL	6030	3/01/11	117	37.2	24.7	29.9
STAMPEDE PASS SNOTEL	3850	3/01/11	87	22.1	17.3	39.8
STEMPLE PASS	6600	2/28/11	39	10.0	5.1	8.3
STEVENS PASS SNOTEL	3950	3/01/11	102	24.9	24.0	38.3
STORM LAKE	7780	2/28/11	42	11.2	9.2	10.2
STRYKER BASIN	6180	3/03/11	100	33.6	21.8	26.9
STUART MOUNTAIN	7400	2/26/11	112	3.9	--	--
SUMMERLAND RES CAN.	4200	2/25/11	34	8.5	7.5	8.4

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
SUMMIT G.S. #2	4600	2/25/11	36	7.8	8.8	8.1
SUNSET SNOTEL	5540	3/01/11	---	24.1	10.6	26.0
SURPRISE LKS SNOTEL	4290	3/01/11	131	39.2	33.6	40.1
SWAMP CREEK SNOTEL	3930	3/01/11	60	16.9	9.9	17.2
SWIFT CREEK SNOTEL	4440	3/01/11	150	51.8	48.5	47.1
TEN MILE LOWER	6600	2/24/11	33	7.5	4.9	5.9
TEN MILE MIDDLE	6800	2/24/11	38	7.9	6.5	8.9
THUNDER BASIN SNOTEL	4320	3/01/11	75	24.2	22.8	29.7
THOMPSON CREEK	2500	2/23/11	17	6.0	.0	--
THOMPSON RIDGE	4650	2/28/11	46	10.5	10.7	--
TINKHAM CREEK SNOTEL	2990	3/01/11	83	22.3	12.2	26.7
TOATS COULEE	2850	2/28/11	15	2.9	1.8	3.4
TOGO	3370	2/23/11	22	6.6	4.2	8.6
TOUCHET SNOTEL	5530	3/01/11	77	21.5	18.4	28.5
TRINKUS LAKE	6100	2/26/11	121	41.8	32.2	36.4
TROUGH #2 SNOTEL	5480	3/01/11	34	9.1	13.8	9.3
TROUT CREEK CAN.	5650	2/27/11	33	7.5	6.8	6.7
TRUMAN CREEK	4060	3/03/11	27	7.3	2.6	4.4
TUNNEL AVENUE	2450	3/02/11	62	17.5	8.9	18.6
TV MOUNTAIN	6800	3/01/11	---	20.2E	8.9	15.0
TWELVEMILE SNOTEL	5600	3/01/11	53	14.6	8.4	16.0
TWIN CREEKS	3580	2/26/11	34	9.9	5.1	10.2
TWIN LAKES SNOTEL	6400	3/01/11	105	36.2	17.7	34.7
TWIN SPIRIT DIVIDE	3480	2/27/11	24	5.8	2.8	13.1
UPPER HOLLAND LAKE	6200	3/01/11	---	34.3E	17.3	30.0
UPPER WHEELER SNOTEL	4330	3/01/11	38	8.8	10.5	11.7
VULCAN MTN	4660	2/25/11	35	8.3	10.2	--
VULCAN ROAD	3840	2/25/11	28	6.2	6.7	--
WARM SPRINGS SNOTEL	7800	3/01/11	67	19.7	13.8	17.0
WATERHOLE SNOTEL	5010	3/01/11	110	37.1	34.5	30.0
WEASEL DIVIDE	5450	3/03/11	103	35.0	20.4	28.7
WELLS CREEK SNOTEL	4030	3/01/11	98	28.8	20.4	28.4
WHITE PASS ES SNOTEL	4440	3/01/11	69	18.1	13.5	21.8
WHITE ROCKS MTN CAN.	7200	2/28/11	57	17.2	--	19.6



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>

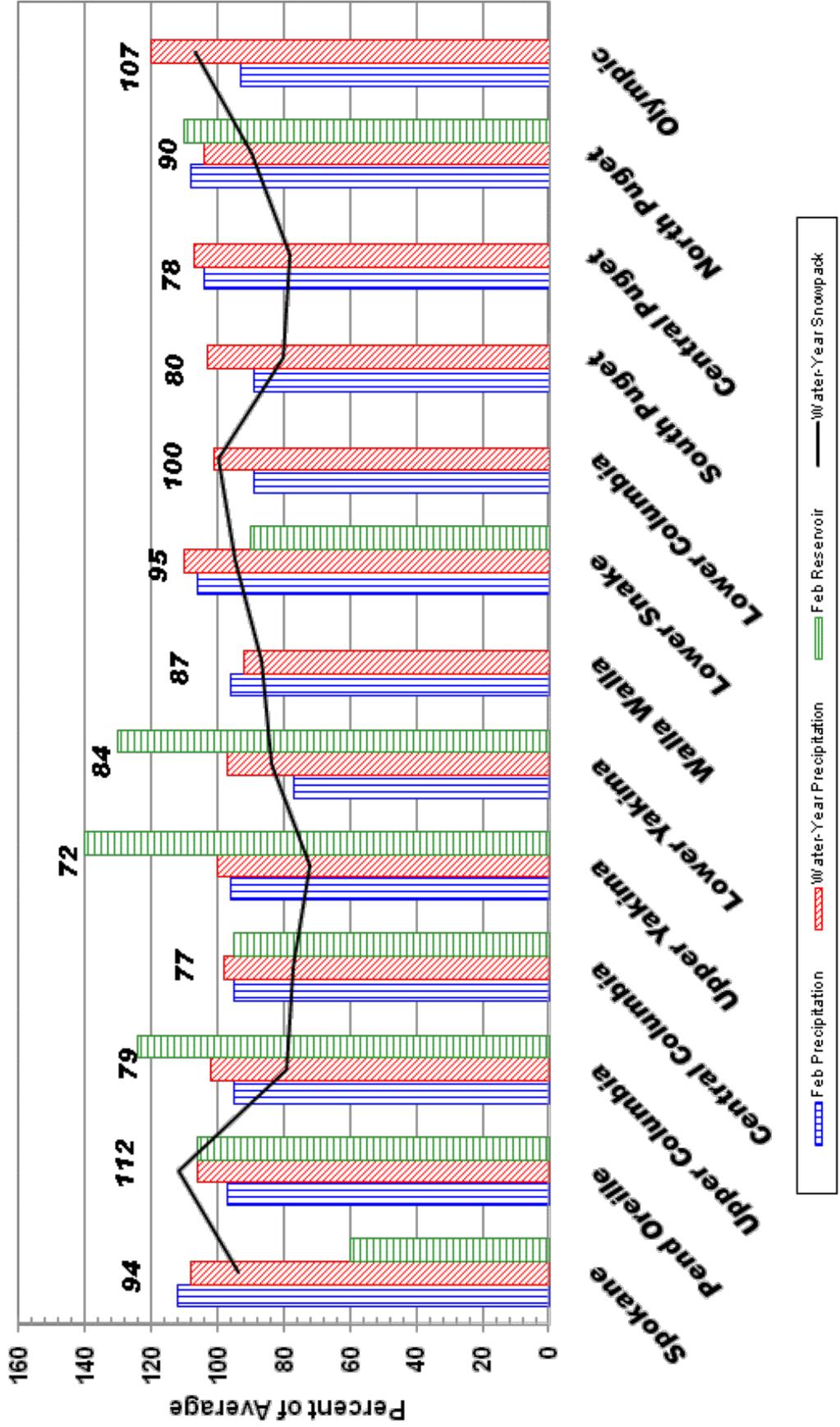
USDA-NRCS Agency Homepages

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

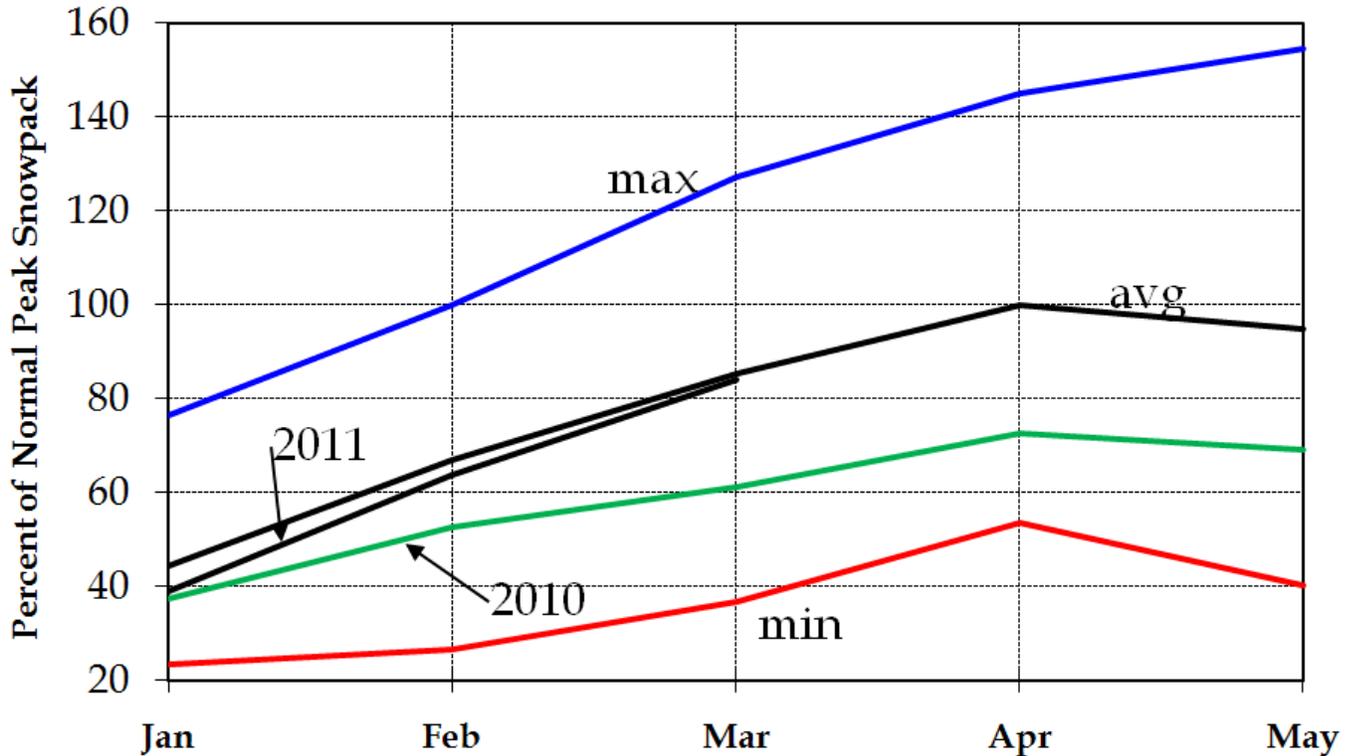
NRCS National:
<http://www.nrcs.usda.gov>

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

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



Columbia above The Dalles



March 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 99 percent of average, compared to 95 percent of average last month and 72 percent last year. This increase in the snowpack was due largely to increases in the British Columbia and Spokane basins that more than offset snowpack losses to normal in the Upper Snake, Boise, Salmon, and Clearwater basins.

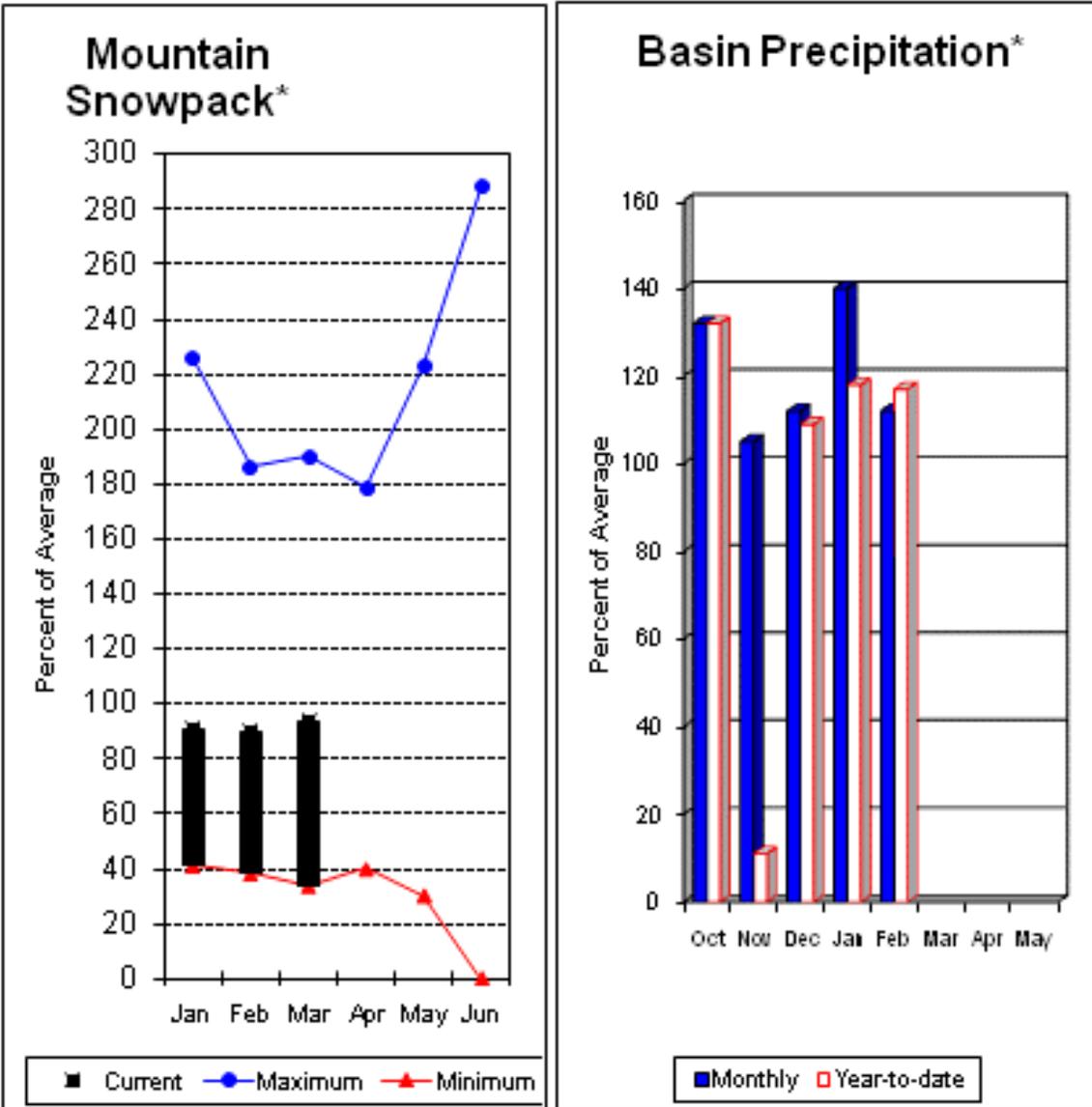
The Canadian portion of Columbia mainstem and the Spokane Basin were both up 7 percent over last month. As mentioned previously, those increases were offset by losses in the Upper Snake (9%), Boise (6%), Salmon (6%), and Clearwater (4%). The Deschutes Basin snowpack in the Oregon Cascades increased 14 percent over last month. All other basins remained near the same as last month.

The overall snowpack above The Dalles is at 84 percent of the average peak accumulation. This compares to 61 percent last year. Normal for this time of year is 85 percent of the peak accumulation.

The snowpack in the Columbia Basin above Castlegar is at 98 percent of average. This compares to 91 percent last month and 82 percent last year. For the basin above Grand Coulee, the snowpack is at 102 percent of average, compared to 96 percent last month and 76 percent last year. The Snake River snowpack above Ice Harbor is at 98 percent of average, compared to 100 percent last month and 60 percent last year.

Long lead climate forecasts are suggesting a rather cooler than average March through May period for much of the West. Abundant moisture is expected over the Columbia Basin during March, especially over the Coastal and Cascade Ranges in Washington and Oregon. The Pacific Northwest will see a great deal of SWE catch-up.

Spokane River Basin



*Based on selected stations

The March 1 forecasts for summer runoff within the Spokane River Basin are 108% of average near Post Falls and 108% at Long Lake. The Chamokane River near Long Lake forecasted to have 90% of average flows for the May-August period. The forecast is based on a basin snowpack that is 94% of average and precipitation that is 117% of average for the water year. Precipitation for February was above normal at 112% of average. Streamflow on the Spokane River at Long Lake was 82% of average for February. March 1 storage in Coeur d'Alene Lake was 87,000 acre feet, 60% of average and 37% of capacity. Snowpack at Quartz Peak SNOTEL site was 102% of average with 19.9 inches of water content. Average temperatures in the Spokane basin were 4-5 degrees below normal for February and slightly below for the water year.

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

Spokane River Basin

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	Future Conditions				Wetter		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
Spokane R nr Post Falls (2)	APR-JUL	2060	2480	2760	108	3040	3460	2550
	APR-SEP	2160	2580	2870	108	3160	3580	2650
Spokane R at Long Lake (2)	APR-JUL	2310	2760	3070	108	3380	3830	2850
	APR-SEP	2540	3010	3320	108	3630	4100	3070
Chamokane Ck nr Long Lake	MAY-AUG	4.0	7.1	9.2	90	11.3	14.4	10.2

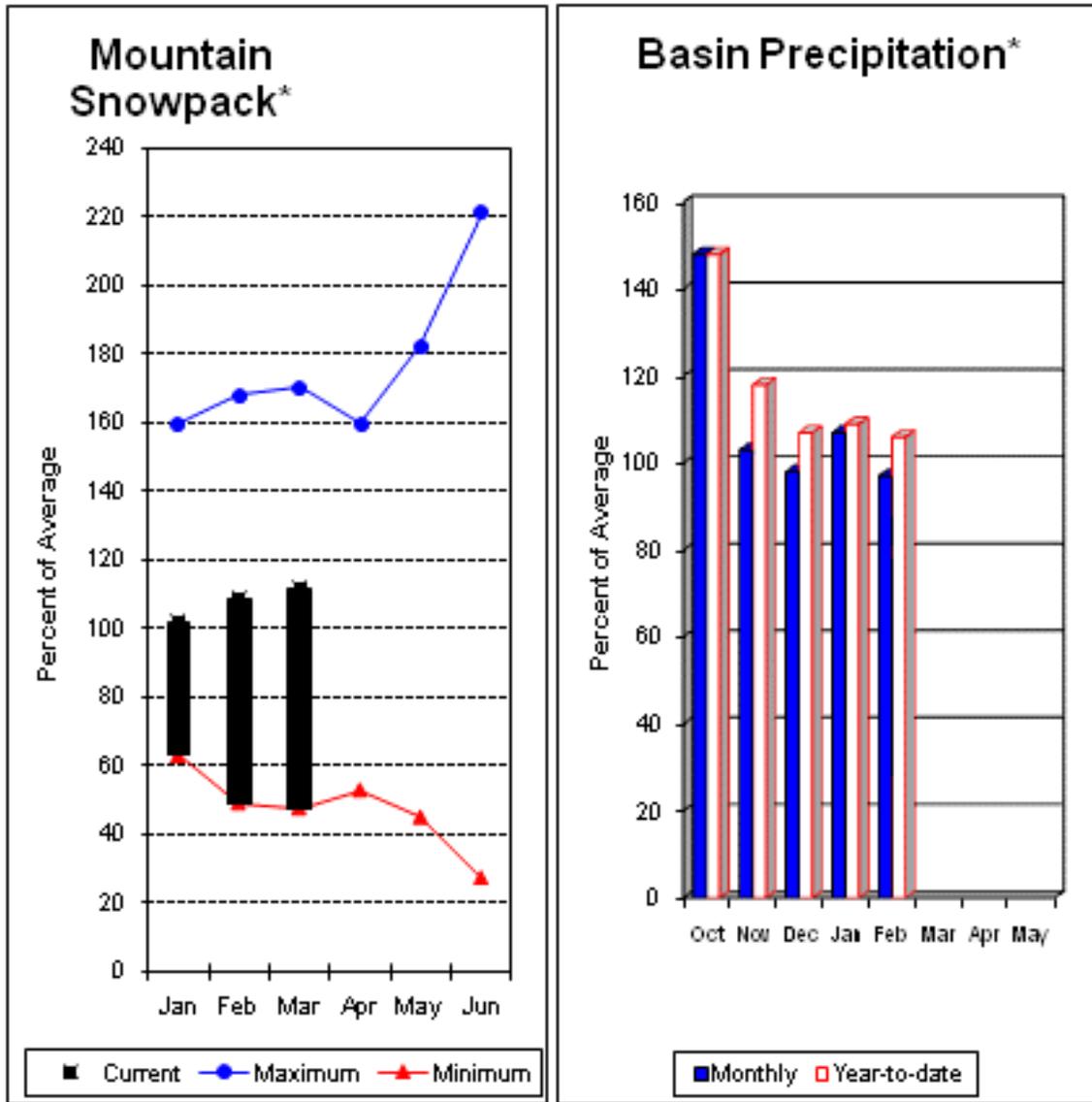
SPOKANE RIVER BASIN Reservoir Storage (1000 AF) - End of February					SPOKANE RIVER BASIN Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
COEUR D'ALENE	238.5	87.1	58.9	144.9	SPOKANE RIVER	15	182	94
					NEWMAN LAKE	2	190	90

* 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 102% and the Pen Orielle below Box Canyon is 110%. February streamflow was 135% of average on the Pend Oreille River and 88% on the Columbia Birchbank. March 1 snow cover was 112% of average in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 20.1 inches of snow water on the snow pillow. Normally Bunchgrass would have 24.4 inches on March 1. Precipitation during February was 97% of average, bringing the year-to-date precipitation to 106% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 106% of normal. Average temperatures were 4-5 degrees below normal for February and near normal for the water year.

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

Pend Oreille River Basins

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	<<===== Drier =====>>		Future Conditions		===== Wetter =====>>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
Pend Oreille Lake Inflow (2)	APR-JUL	11900	13200	14000	110	14800	16100	12700
	APR-SEP	13100	14400	15300	110	16200	17500	13900
Priest R nr Priest River (1,2)	APR-JUL	645	770	830	102	890	1010	815
	APR-SEP	685	820	885	102	950	1090	870
Pend Oreille R bl Box Canyon (2)	APR-JUL	12100	13400	14200	110	15000	16300	12900
	APR-SEP	13200	14600	15500	110	16400	17800	14100

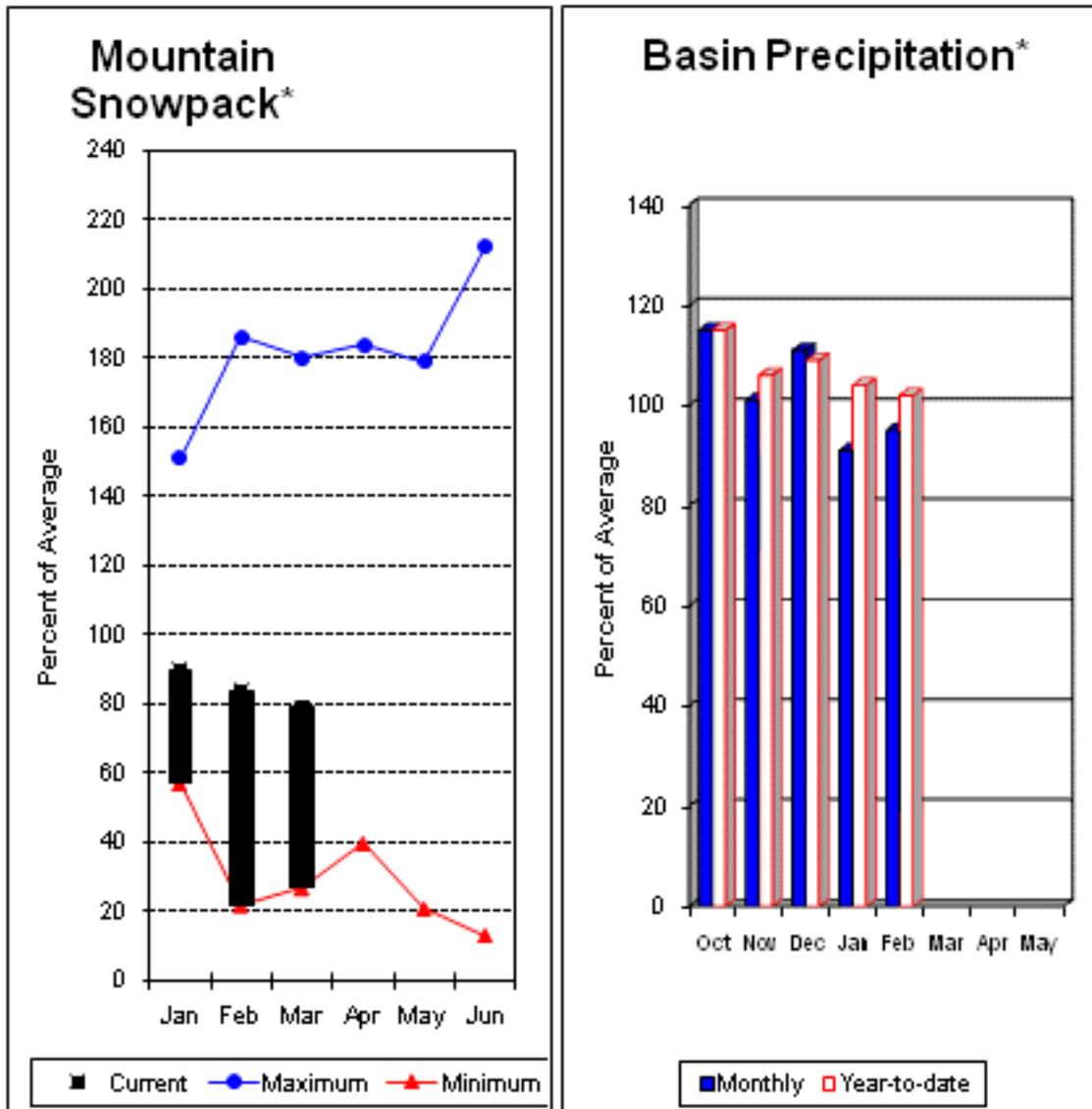
PEND OREILLE RIVER BASINS Reservoir Storage (1000 AF) - End of February					PEND OREILLE RIVER BASINS Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
PEND OREILLE	1561.3	835.9	551.7	778.8	COLVILLE RIVER	0	119	0
PRIEST LAKE	119.3	48.9	49.4	56.8	PEND OREILLE RIVER	9	166	100
					KETTLE RIVER	3	89	91

* 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 94%, Similkameen River is 94%, Kettle River 93% and Methow River is 90%. March 1 snow cover on the Okanogan was 90% of average, Omak Creek was 80% and the Methow was 87%. February precipitation in the Upper Columbia was 95% of average, with precipitation for the water year at 102% of average. February streamflow for the Methow River was 145% of average, 74% for the Okanogan River and 127% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 8.4 inches. Average for this site is 10.1 inches on March 1. Combined storage in the Conconully Reservoirs was 21,000-acre feet, which is 90% of capacity and 124% of the March 1 average. Temperatures were 2-4 degrees below normal for February and 1-2 degrees above for the water year.

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

Upper Columbia River Basins

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		90%		50%		10%		
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)	
Colville R at Kettle Falls	APR-JUL	57	94	119	93	144	181	128
	APR-SEP	63	103	131	93	159	199	141
Kettle R nr Laurier	APR-JUL	1390	1600	1750	94	1900	2110	1870
	APR-SEP	1440	1680	1840	93	2000	2240	1970
Columbia R at Grand Coulee (2)	APR-JUL	46900	52800	55500	103	58200	64100	53800
	APR-SEP	55800	62900	66100	103	69300	76400	64000
Similkameen R nr Nighthawk (1)	APR-JUL	925	1160	1270	94	1380	1610	1350
	APR-SEP	1010	1250	1360	94	1470	1710	1450
Okanogan R nr Tonasket (1)	APR-JUL	1010	1340	1490	94	1640	1970	1580
	APR-SEP	1130	1500	1660	94	1820	2190	1770
Okanogan R at Malott (1)	APR-JUL	1040	1380	1530	94	1680	2020	1630
	APR-SEP	1170	1550	1720	94	1890	2270	1830
Methow R nr Pateros	APR-SEP	725	820	885	90	950	1050	985
	APR-JUL	665	760	820	90	880	975	910

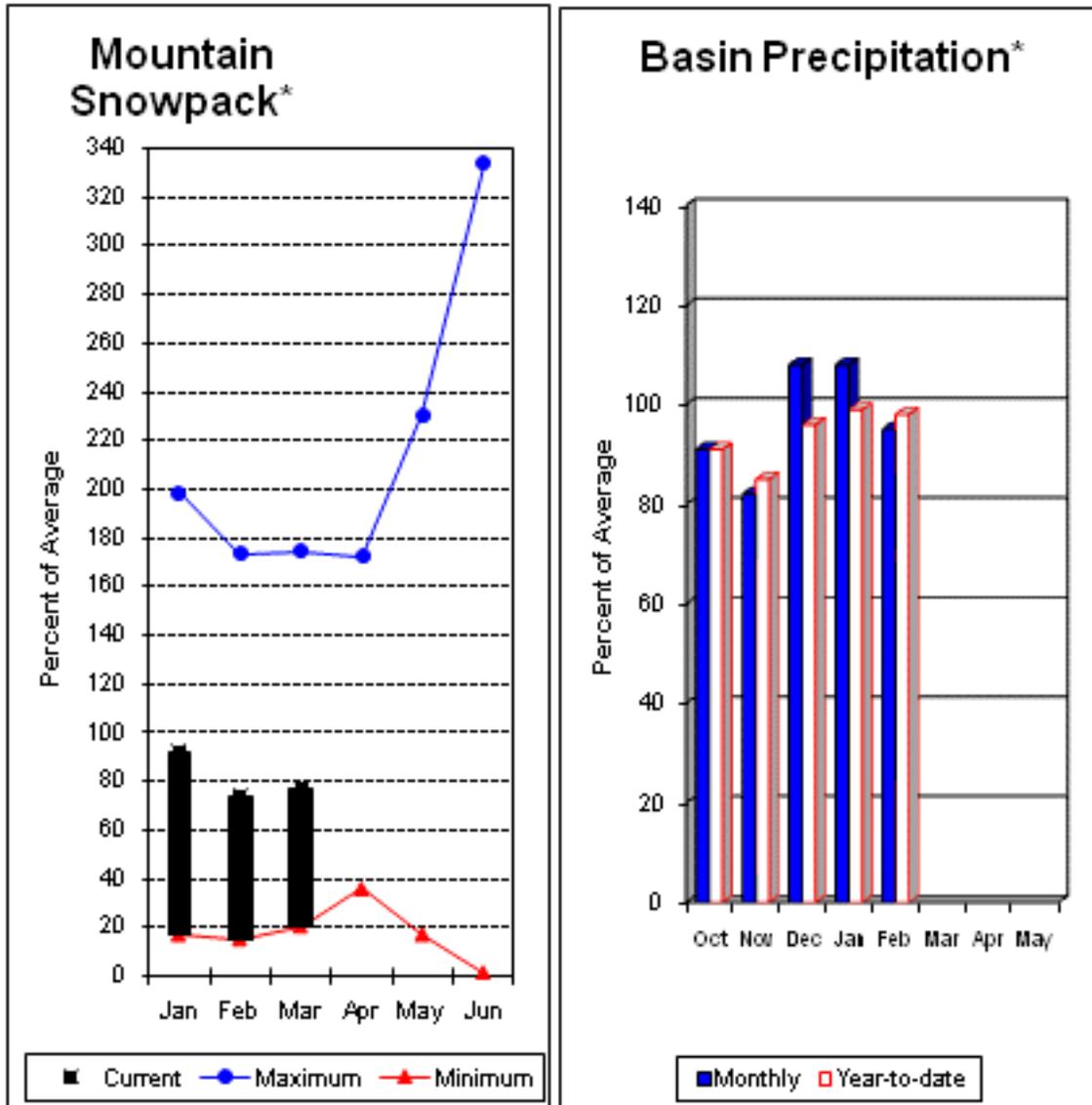
UPPER COLUMBIA RIVER BASINS Reservoir Storage (1000 AF) - End of February					UPPER COLUMBIA RIVER BASINS Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
SALMON LAKE	10.5	8.6	5.8	8.4	OKANOGAN RIVER	5	120	94
CONCONULLY RESERVOIR	13.0	12.6	5.2	8.7	OMAK CREEK	3	80	80
					SANPOIL RIVER	1	120	33
					SIMILKAMEEN RIVER	0	0	0
					TOATS COULEE CREEK	1	98	85
					CONCONULLY LAKE	3	75	80
					METHOW RIVER	7	106	87

* 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.

Central Columbia River Basins



*Based on selected stations

Precipitation during February was 95% of average in the basin and 98% for the year-to-date. Runoff for Entiat River is forecast to be 83% of average for the summer. The April-September average forecast for Chelan River is 87%, Wenatchee River at Plain is 88%, Stehekin River is 92% and Icicle Creek is 79%. February average streamflows on the Chelan River were 146% and on the Wenatchee River 135%. March 1 snowpack in the Wenatchee River Basin was 75% of average; the Chelan, 80%; the Entiat, 68%; Stemilt Creek, 75% and Colockum Creek, 87%. Reservoir storage in Lake Chelan was 237,000-acre feet, 95% of March 1 average and 35% of capacity. Lyman Lake SNOTEL had the most snow water with 46.4 inches of water. This site would normally have 55.1 inches on March 1. Temperatures were 2-4 degrees below normal for February and 1-2 degrees above for the water year.

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

Central Columbia River Basins

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	Future Conditions					30-Yr Avg. (1000AF)	
		Drier		Wetter		Chance Of Exceeding * 50% (1000AF) (% AVG.)		
		90% (1000AF)	70% (1000AF)	30% (1000AF)	10% (1000AF)			
Stehekin R at Stehekin	APR-JUL APR-SEP	525 635	595 710	645 760	92 92	695 810	765 885	700 830
Chelan R at Chelan (2)	APR-JUL APR-SEP	770 875	855 965	910 1030	87 87	965 1090	1050 1190	1050 1190
Entiat R nr Ardenvoir	APR-JUL APR-SEP	145 166	165 185	178 199	83 83	191 215	210 230	215 240
Wenatchee R at Plain	APR-JUL APR-SEP	785 880	880 975	940 1040	88 88	1000 1110	1090 1200	1070 1180
Icicle Ck nr Leavenworth	APR-JUL APR-SEP	205 225	230 250	245 270	79 79	260 290	285 315	310 340
Wenatchee R at Peshastin	APR-JUL APR-SEP	1110 1230	1240 1360	1320 1450	89 89	1400 1540	1530 1670	1480 1630
Columbia R bl Rock Island Dam (2)	APR-JUL APR-SEP	53300 63000	58000 68400	61100 72100	104 104	64200 75800	68900 81200	59000 69500

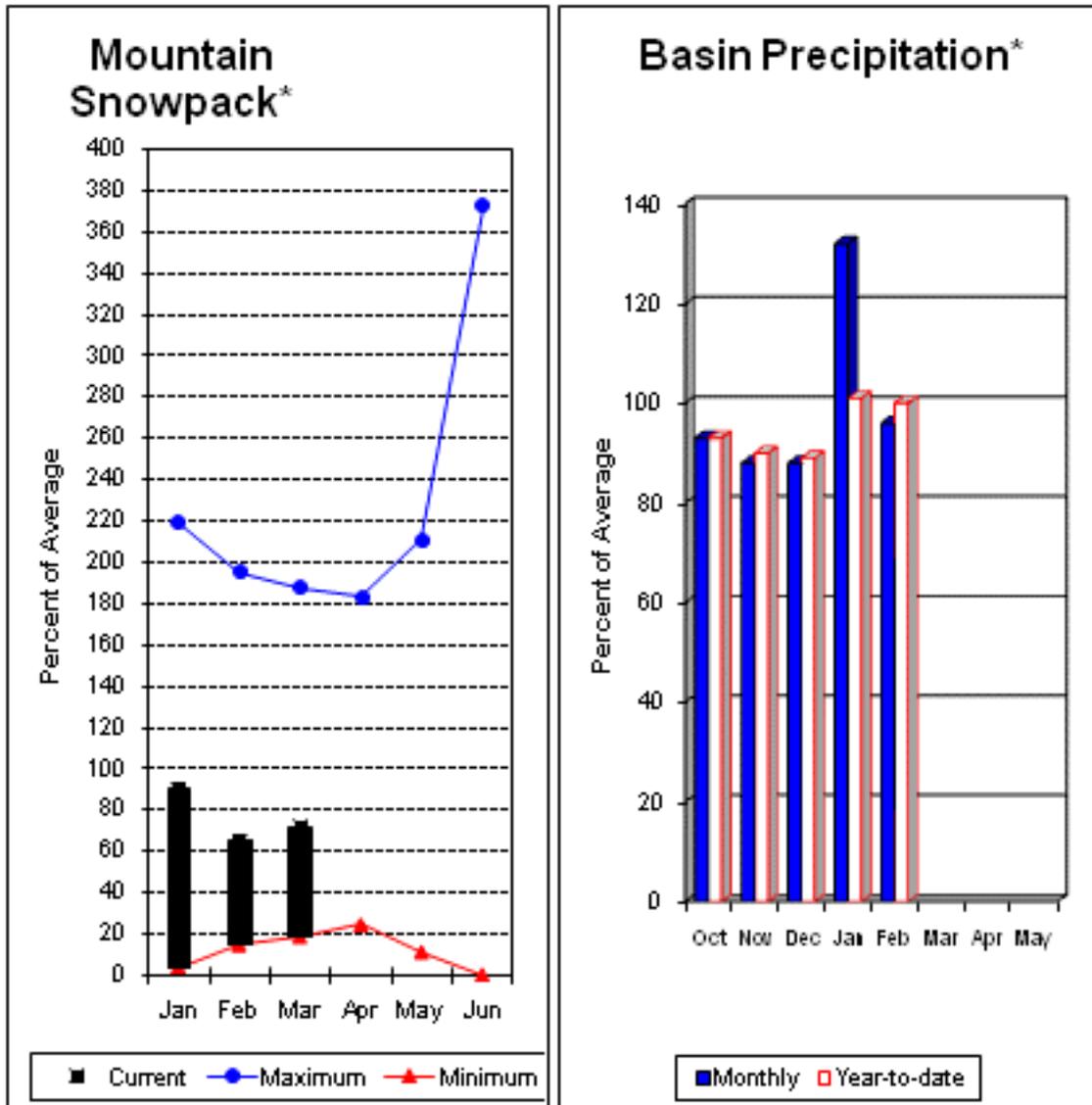
CENTRAL COLUMBIA RIVER BASINS Reservoir Storage (1000 AF) - End of February					CENTRAL COLUMBIA RIVER BASINS Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
CHELAN LAKE	676.1	236.8	378.7	250.1	CHELAN LAKE BASIN	6	108	80
					ENTIAT RIVER	1	86	68
					WENATCHEE RIVER	9	100	75
					STEMILT CREEK	2	84	75
					COLOCKUM CREEK	2	78	87

* 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

March 1 reservoir storage for the Upper Yakima reservoirs was 700,000-acre feet, 140% of average. Forecasts for the Yakima River at Cle Elum are 87% of average and the Teanaway River near Cle Elum is at 83%. Lake inflows are all forecasted to be slightly below average this summer as well. February streamflows within the basin were Yakima at Cle Elum at 140% and Cle Elum River near Roslyn at 123%. March 1 snowpack was 72% based upon 10 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 96% of average for February and 100% 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.

Upper Yakima River Basin

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	Future Conditions <<==== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)				
		90% (1000AF)		70% (1000AF)		50% (1000AF) (% AVG.)			30% (1000AF)		10% (1000AF)	
		Chance Of Exceeding *		Chance Of Exceeding *		Chance Of Exceeding *			Chance Of Exceeding *		Chance Of Exceeding *	
Keechelus Reservoir Inflow (2)	APR-JUL	76	93	105	87	117	134	121				
	APR-SEP	86	104	116	87	128	146	133				
Kachess Reservoir Inflow (2)	APR-JUL	74	88	98	88	108	122	111				
	APR-SEP	82	96	106	88	116	130	120				
Cle Elum Lake Inflow (2)	APR-JUL	305	340	365	89	390	425	410				
	APR-SEP	335	375	400	89	425	465	450				
Yakima R at Cle Elum (2)	APR-JUL	530	640	715	87	790	900	820				
	APR-SEP	575	695	780	87	865	985	900				
Teanaway R bl Forks nr Cle Elum	APR-JUL	88	106	119	83	132	150	143				
	APR-SEP	90	108	121	83	134	152	146				

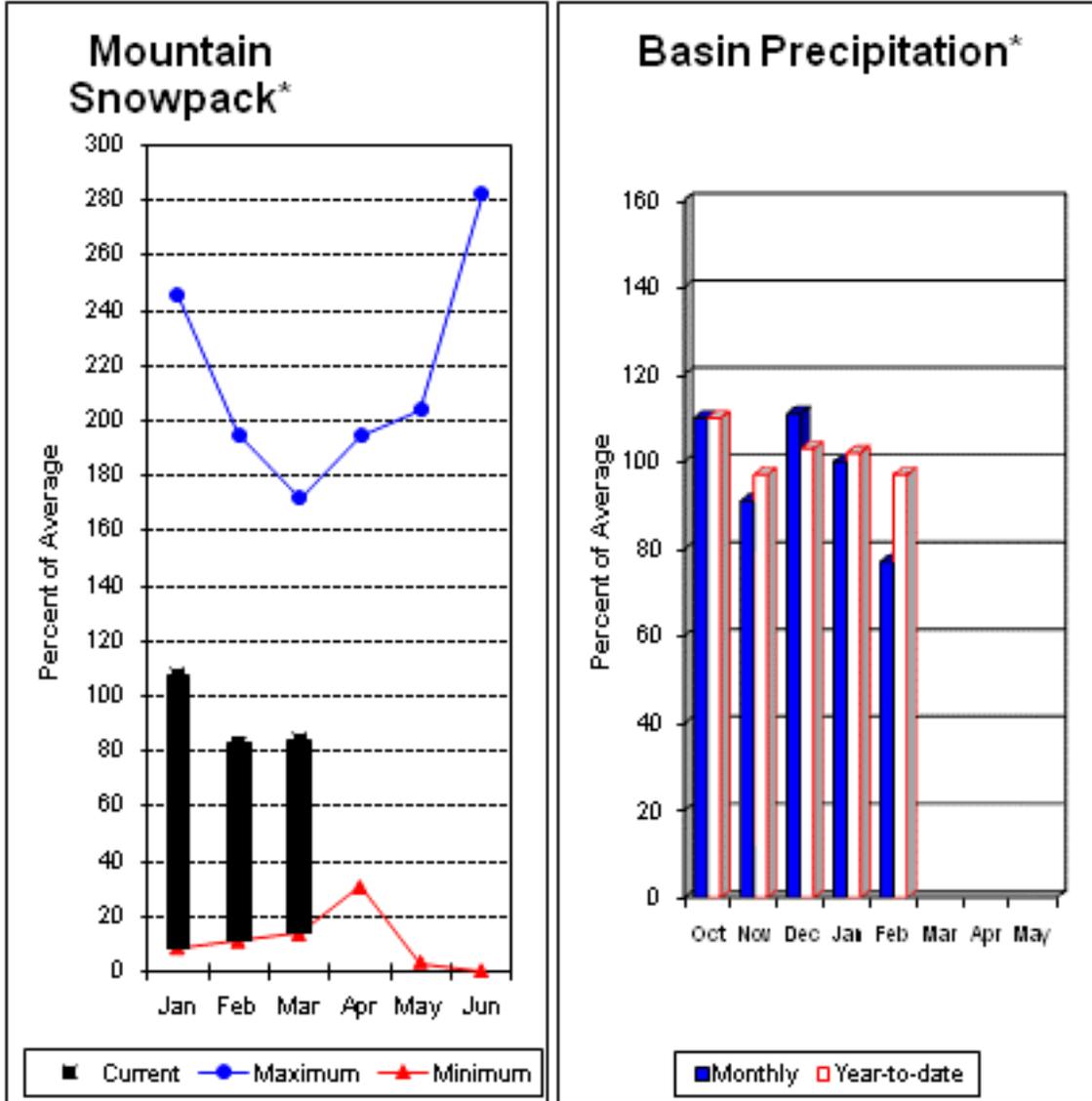
UPPER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of February					UPPER YAKIMA RIVER BASIN Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
KEECHELUS	157.8	142.7	86.9	102.4	UPPER YAKIMA RIVER	10	110	72
KACHESS	239.0	211.5	150.6	154.7				
CLE ELUM	436.9	345.7	174.6	241.4				

* 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

February average streamflows within the basin were: Yakima River near Parker, 108%; Naches River near Naches, 112%; and Yakima River at Kiona, 102%. March 1 reservoir storage for Bumping and Rimrock reservoirs was 179,000-acre feet, 130% of average. Forecast averages for Yakima River near Parker are 84%; American River near Nile, 93%; Ahtanum Creek, 84%; and Klickitat River near Glenwood, 100%. March 1 snowpack was 84% based upon 7 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 77% of average. Precipitation was 77% of average for February and 97% year-to-date for water. Temperatures were 2-4 degrees below normal for February and slightly above for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they March 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.

Lower Yakima River Basin

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	Future Conditions					30-Yr Avg. (1000AF)	
		Drier		Wetter		Chance Of Exceeding * 50% (% AVG.)		
		90% (1000AF)	70% (1000AF)	30% (1000AF)	10% (1000AF)			
Bumping Lake Inflow (2)	APR-JUL	97	111	120	98	129	143	122
	APR-SEP	105	119	129	98	139	153	132
American R nr Nile	APR-JUL	80	92	100	93	108	120	108
	APR-SEP	89	101	110	93	119	131	118
Rimrock Lake Inflow (2)	APR-JUL	165	182	193	94	205	220	205
	APR-SEP	193	210	225	94	240	255	240
Naches R nr Naches (2)	APR-JUL	580	660	715	99	770	850	720
	APR-SEP	625	710	770	99	830	915	780
Ahtanum Ck at Union Gap	APR-JUL	15.4	21	25	83	29	35	30
	APR-SEP	17.3	23	27	84	31	37	32
Yakima R nr Parker (2)	APR-JUL	1160	1370	1510	84	1650	1860	1800
	APR-SEP	1310	1520	1670	84	1820	2030	1980
Klickitat R nr Glenwood	APR-JUL	103	117	127	101	137	151	126
	APR-SEP	137	152	163	100	174	189	163
Klickitat R nr Pitt	APR-JUL	380	425	460	100	495	540	460
	APR-SEP	460	515	555	101	595	650	550

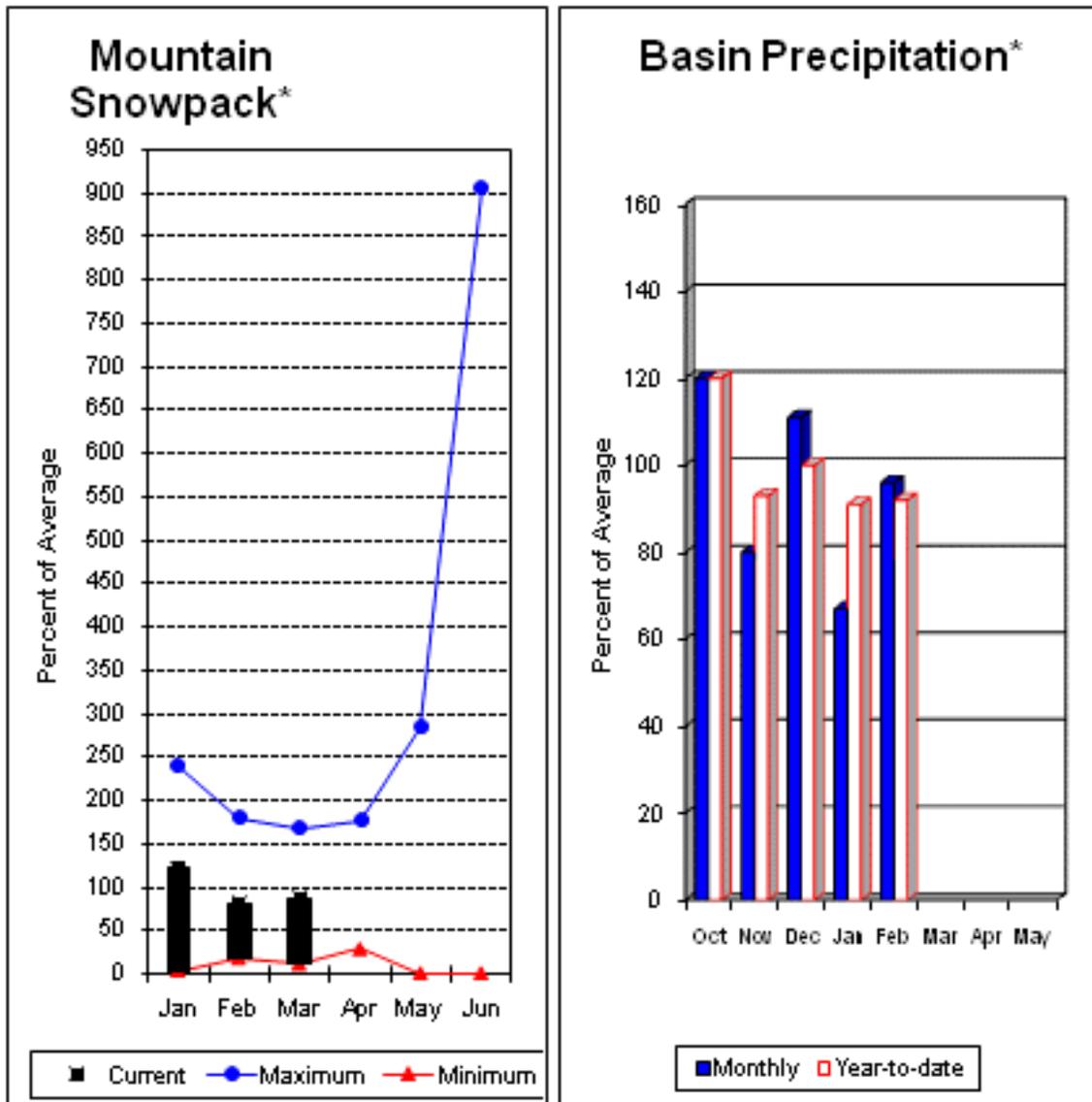
LOWER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of February					LOWER YAKIMA RIVER BASIN Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
BUMPING LAKE	33.7	16.0	11.8	11.5	LOWER YAKIMA RIVER	7	109	84
RIMROCK	198.0	162.8	101.2	126.1	AHTANUM CREEK	3	82	77

* 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.

Walla Walla River Basin



*Based on selected stations

February precipitation was 96% of average, maintaining the year-to-date precipitation at 92% of average. Snowpack in the basin was 87% of average. Streamflow forecasts are 96% of average for Mill Creek and 103% for the SF Walla Walla near Milton-Freewater. February streamflow was 75% of average for the SF Walla Walla River. Average temperatures were 2-4 degrees below normal for February but near average for the water year.

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

Walla Walla River Basin

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	<<==== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)		
		90%		70%		50%			30%	
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)		(1000AF)	(1000AF)
SF Walla Walla R nr Milton-Freewater	MAR-SEP	70	78	83	103	88	96	81		
	APR-JUL	46	52	56	104	60	66	54		
	APR-SEP	58	64	69	103	74	80	67		
Mill Ck nr Walla Walla	APR-JUL	16.1	20	23	96	26	30	24		
	APR-SEP	19.7	24	27	96	30	34	28		

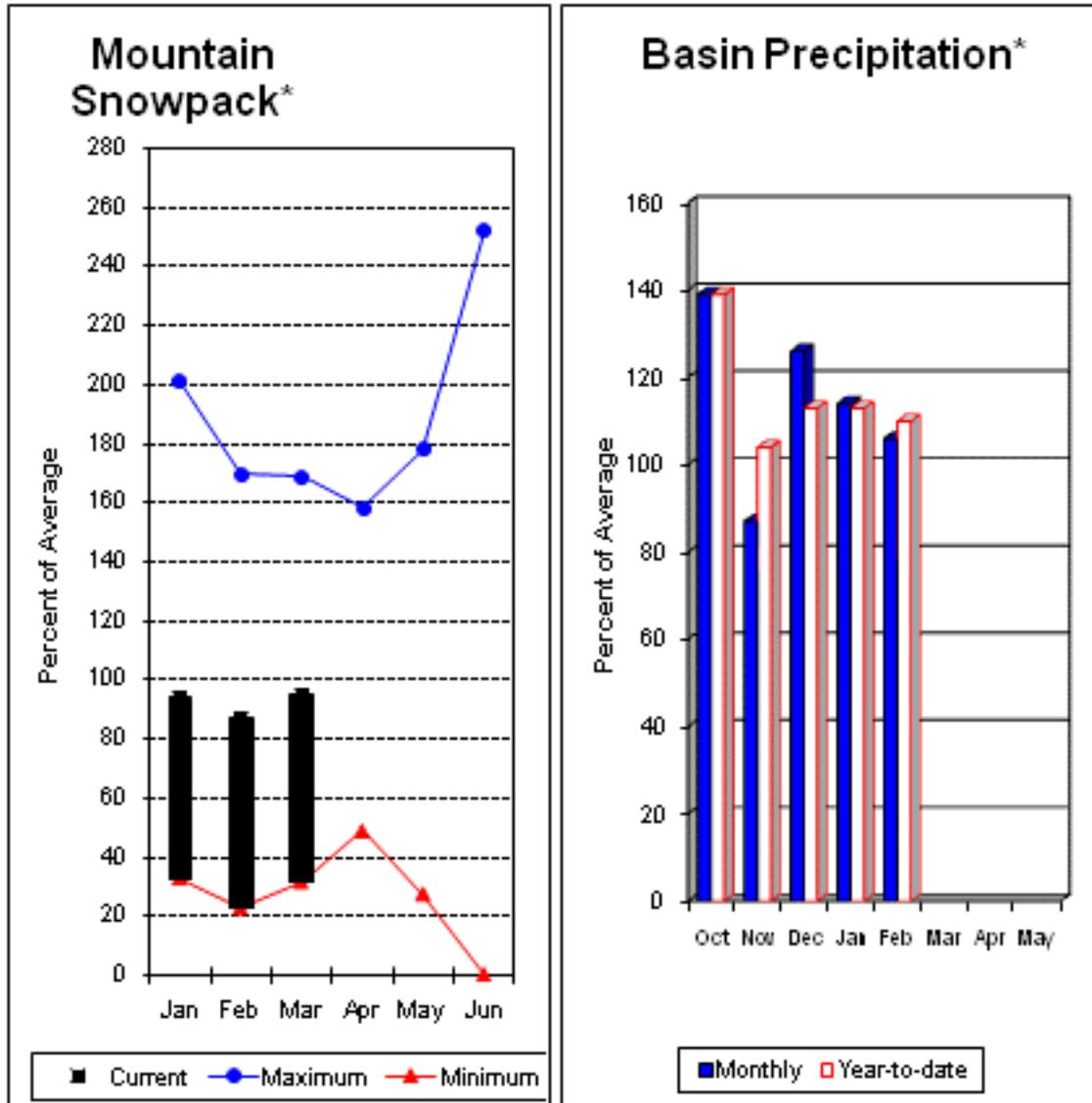
WALLA WALLA RIVER BASIN					WALLA WALLA RIVER BASIN			
Reservoir Storage (1000 AF) - End of February					Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					WALLA WALLA RIVER	2	128	87

* 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 Snake River Basin



*Based on selected stations

The April - September forecast is for 109% for Clearwater River at Spalding. The Snake and Grande Ronde rivers can expect summer flows to be about 100% and 101% of normal respectively. A newly developed forecast point for Asotin Creek at Asotin predicts 94% of average flows for the April – July runoff period. February precipitation was 106% of average, bringing the year-to-date precipitation to 110% of average. March 1 snowpack readings averaged 95% of average. February streamflow was 98% of average for Snake River below Lower Granite Dam and 76% for Grande Ronde River near Troy. Dworshak Reservoir on the Clearwater River is at 90% of average. Average temperatures were 2-4 degrees below normal for February and near normal for the water year.

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

Lower Snake River Basin

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)				
		90%		70%		50%			30%		10%	
		(1000AF)	(1000AF)	(1000AF)	(1000AF)	(1000AF)	(1000AF)		(1000AF)	(1000AF)	(1000AF)	(1000AF)
Grande Ronde R at Troy (1)	MAR-JUL	1170	1470	1600	101	1730	2030	1580				
	APR-SEP	945	1240	1380	101	1520	1810	1370				
Asotin Ck at Asotin	APR-JUL	18.2	27	33	94	39	48	35				
Clearwater R at Spalding (1,2)	APR-JUL	6260	7520	8090	109	8660	9920	7430				
	APR-SEP	6640	7970	8570	109	9170	10500	7850				
Snake R bl Lower Granite Dam (1,2)	APR-JUL	14300	19300	21600	100	23900	28900	21600				
	APR-SEP	16000	21600	24200	100	26800	32400	24100				

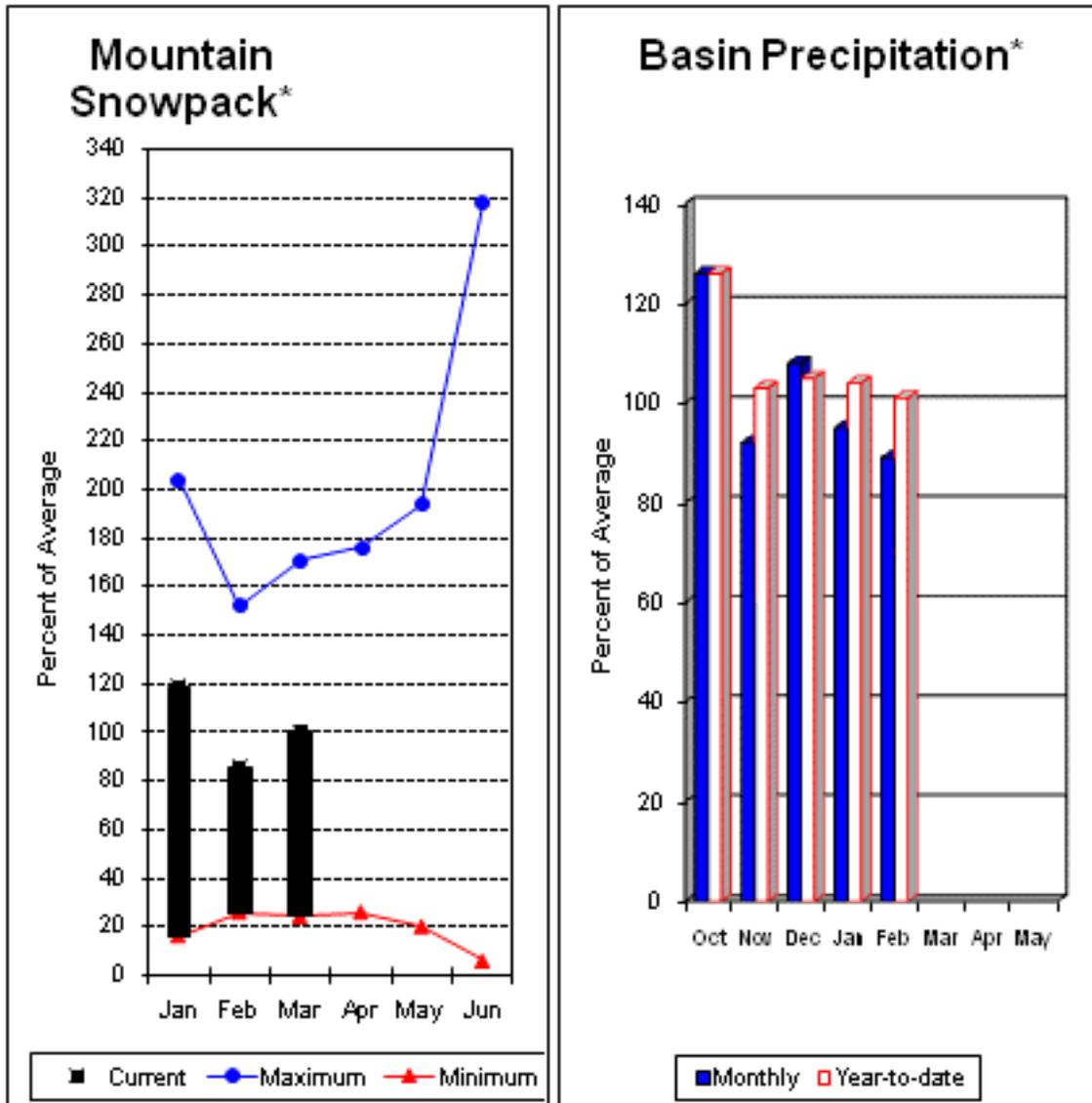
LOWER SNAKE RIVER BASIN Reservoir Storage (1000 AF) - End of February					LOWER SNAKE RIVER BASIN Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
DWORSHAK	3468.0	2043.4	2210.6	2281.7	LOWER SNAKE, GRANDE RONDE	11	150	95

* 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 Columbia River Basins



*Based on selected stations

Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 96% and Cowlitz River at Castle Rock, 96% of average. The Columbia at The Dalles is forecasted to have 99% of average flows this summer. February average streamflow for Cowlitz River was 89%. The Columbia River at The Dalles was 92% of average. February precipitation was 89% of average and the water-year average was 101%. March 1 snow cover for Cowlitz River was 99%, and Lewis River was 102% of average. Average temperatures were 4-8 degrees below normal during February and 1-3 degrees below for the water year.

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

Lower Columbia River Basins

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>					30-Yr Avg. (1000AF)		
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)
Columbia R at The Dalles (2)	APR-JUL	72100	79100	83900	99	88700	95700	84600	
	APR-SEP	84000	92200	97800	99	103000	112000	98600	
Klickitat R nr Glenwood	APR-JUL	103	117	127	101	137	151	126	
	APR-SEP	137	152	163	100	174	189	163	
Klickitat R nr Pitt	APR-JUL	380	425	460	100	495	540	460	
	APR-SEP	460	515	555	101	595	650	550	
Lewis R at Ariel (2)	APR-JUL	710	875	990	96	1100	1270	1031	
	APR-SEP	835	1010	1130	96	1250	1420	1176	
Cowlitz R bl Mayfield Dam (2)	APR-JUL	1170	1420	1590	94	1760	2010	1689	
	APR-SEP	1300	1600	1800	94	2000	2300	1922	
Cowlitz R at Castle Rock (2)	APR-JUL	1710	1990	2180	95	2370	2650	2295	
	APR-SEP	2010	2310	2520	96	2730	3030	2639	

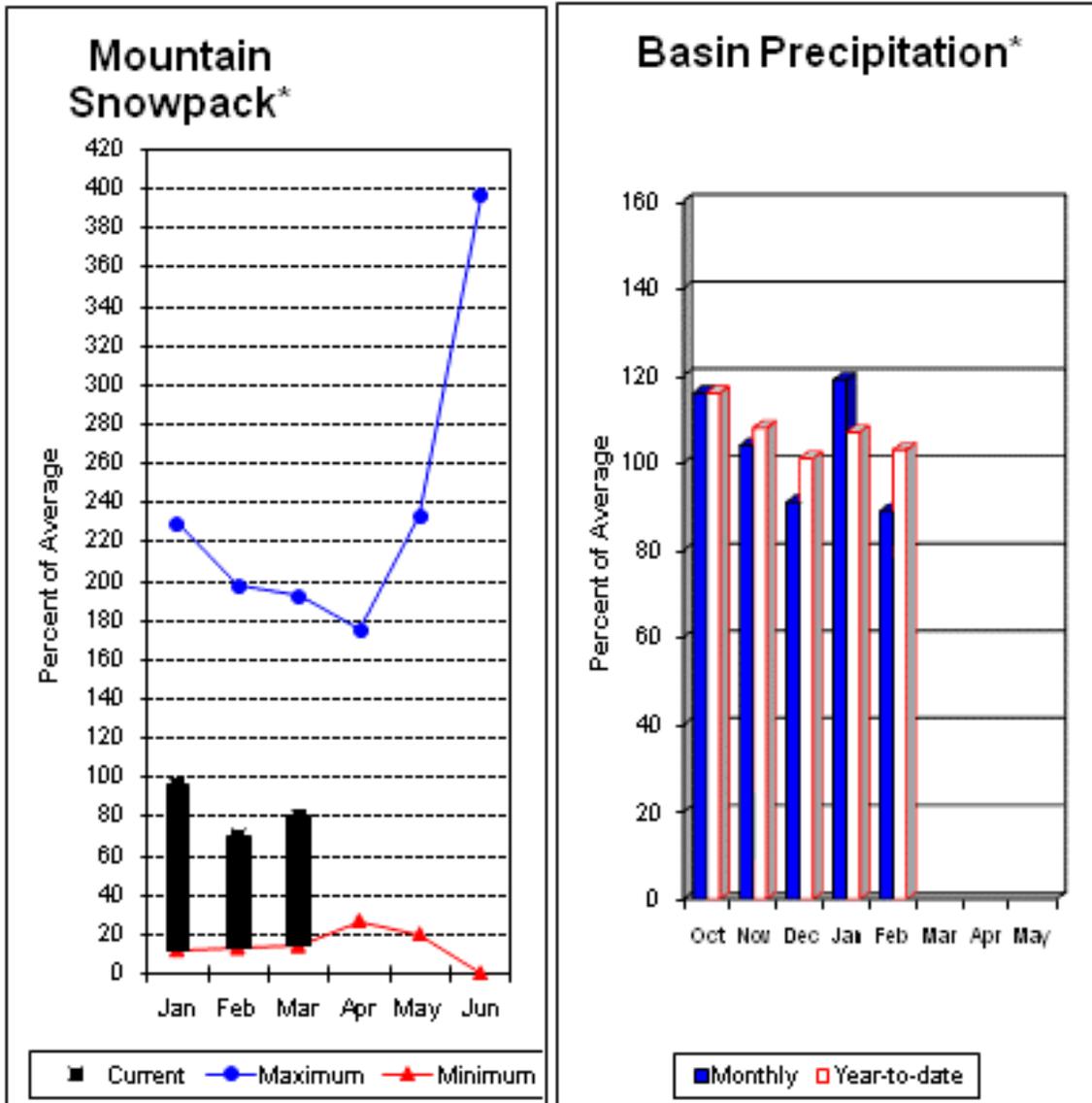
LOWER COLUMBIA RIVER BASINS Reservoir Storage (1000 AF) - End of February					LOWER COLUMBIA RIVER BASINS Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
MOSSYROCK	0.0	1243.2	1141.4	---	LEWIS RIVER	5	139	102
SWIFT		NO REPORT			COWLITZ RIVER	6	145	99
YALE		NO REPORT						
MERWIN		NO REPORT						

* 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.

South Puget Sound River Basins



*Based on selected stations

Summer runoff is forecast to be 82% of normal for the Green River below Howard Hanson Dam and 102% for the White River near Buckley. March 1 snowpack was 90% of average for the White River, 89% for Puyallup River and 60% in the Green River Basin. Water content on March 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 26 inches. This site has a March 1 average of 29.5 inches. February precipitation was 89% of average, bringing the water year-to-date to 103% of average for the basins. Average temperatures in the area were 2-4 degrees below normal for February and slightly below for the water-year.

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

South Puget Sound River Basins

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<===== Drier =====>>		Chance Of Exceeding *		===== Wetter =====>>		
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
White R nr Buckley (1)	APR-JUL	335	415	450	102	485	565	440
	APR-SEP	415	505	545	102	585	675	534
Green R bl Howard Hanson Dam (1,2)	APR-JUL	102	169	200	82	230	300	245
	APR-SEP	120	189	220	82	250	320	268

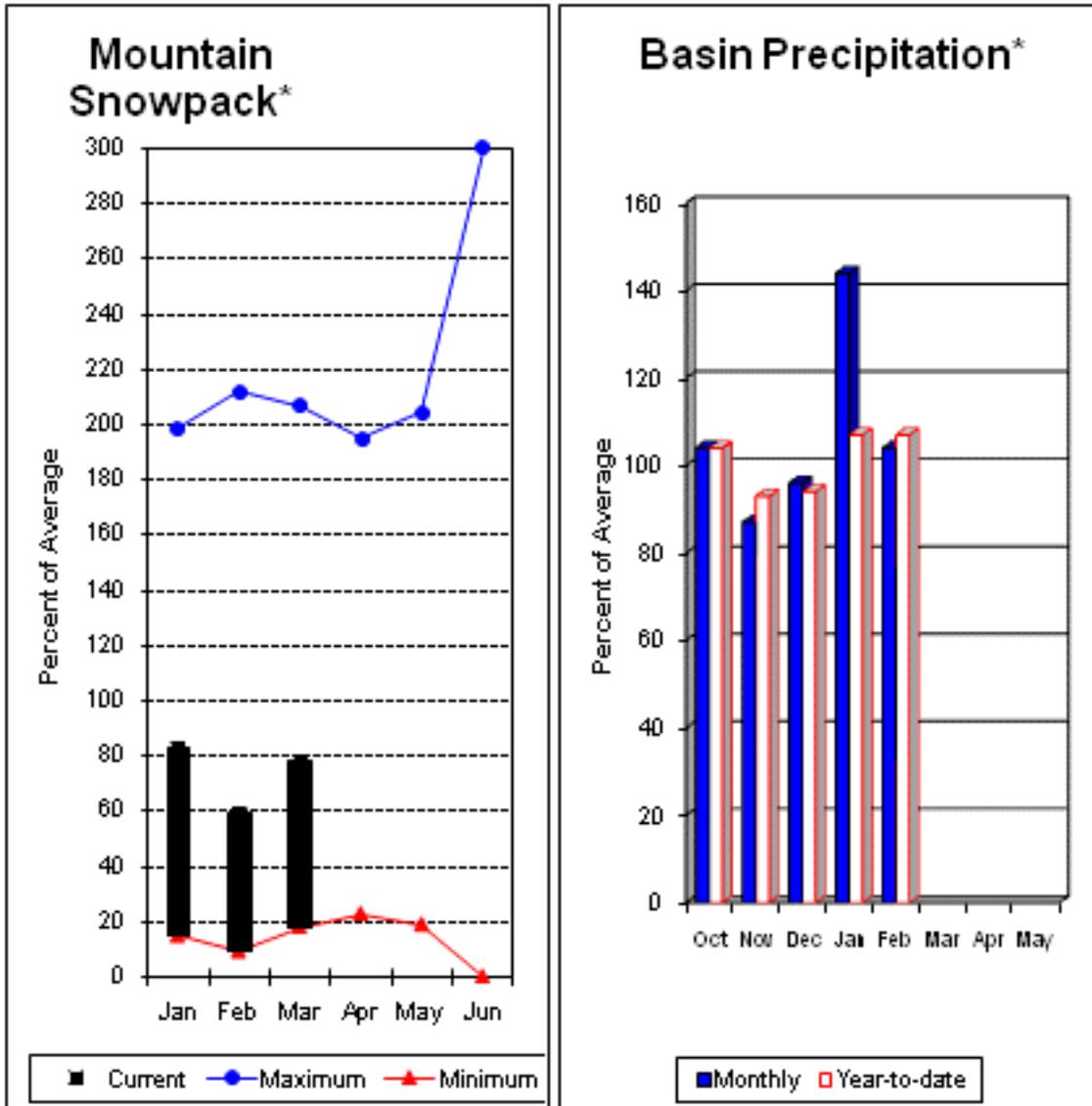
SOUTH PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of February					SOUTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					WHITE RIVER	3	119	90
					GREEN RIVER	3	184	60
					PUYALLUP RIVER	5	121	89

* 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.

Central Puget Sound River Basins



*Based on selected stations

Forecast for spring and summer flows are: 95% for Cedar River near Cedar Falls; 96% for Rex River; 100% for South Fork of the Tolt River; 96% for Taylor Creek near Selleck, and 96% for Cedar River at Cedar Falls. Basin-wide precipitation for February was 104% of average, bringing water-year-to-date to 107% of average. March 1 average snow cover in Cedar River Basin was 85%, Tolt River Basin was 79%, Snoqualmie River Basin was 73%, and Skykomish River Basin was 71%. Stevens Pass SNOTEL site, at 3950 feet, had 24.9 inches of water content. Average March 1 water content is 38.3 inches at Stevens Pass. Temperatures were 2-4 degrees below normal for February and slightly below for the water-year.

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

Central Puget Sound River Basins

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	Future Conditions					30-Yr Avg. (1000AF)	
		Drier		Wetter		Chance Of Exceeding * 50% (1000AF) (% AVG.)		
		90% (1000AF)	70% (1000AF)	30% (1000AF)	10% (1000AF)			
Cedar R nr Cedar Falls	APR-JUL APR-SEP	53 58	63 69	70 76	96 95	77 83	87 94	73 80
Rex R nr Cedar Falls	APR-JUL APR-SEP	16.4 19.2	21 24	24 27	96 96	27 30	32 35	25 28
Cedar R at Cedar Falls (2)	APR-JUL APR-SEP	44 43	60 59	71 70	96 96	82 81	98 97	74 73
Taylor Ck nr Selleck	APR-JUL APR-SEP	14.0 17.4	17.1 21	19.2 23	96 96	21 25	24 29	20 24
SF Tolt R nr Index	APR-JUL APR-SEP	10.7 12.4	13.1 15.1	14.7 16.9	100 100	16.3 18.7	18.7 21	14.7 16.9

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

CENTRAL PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - March 1, 2011

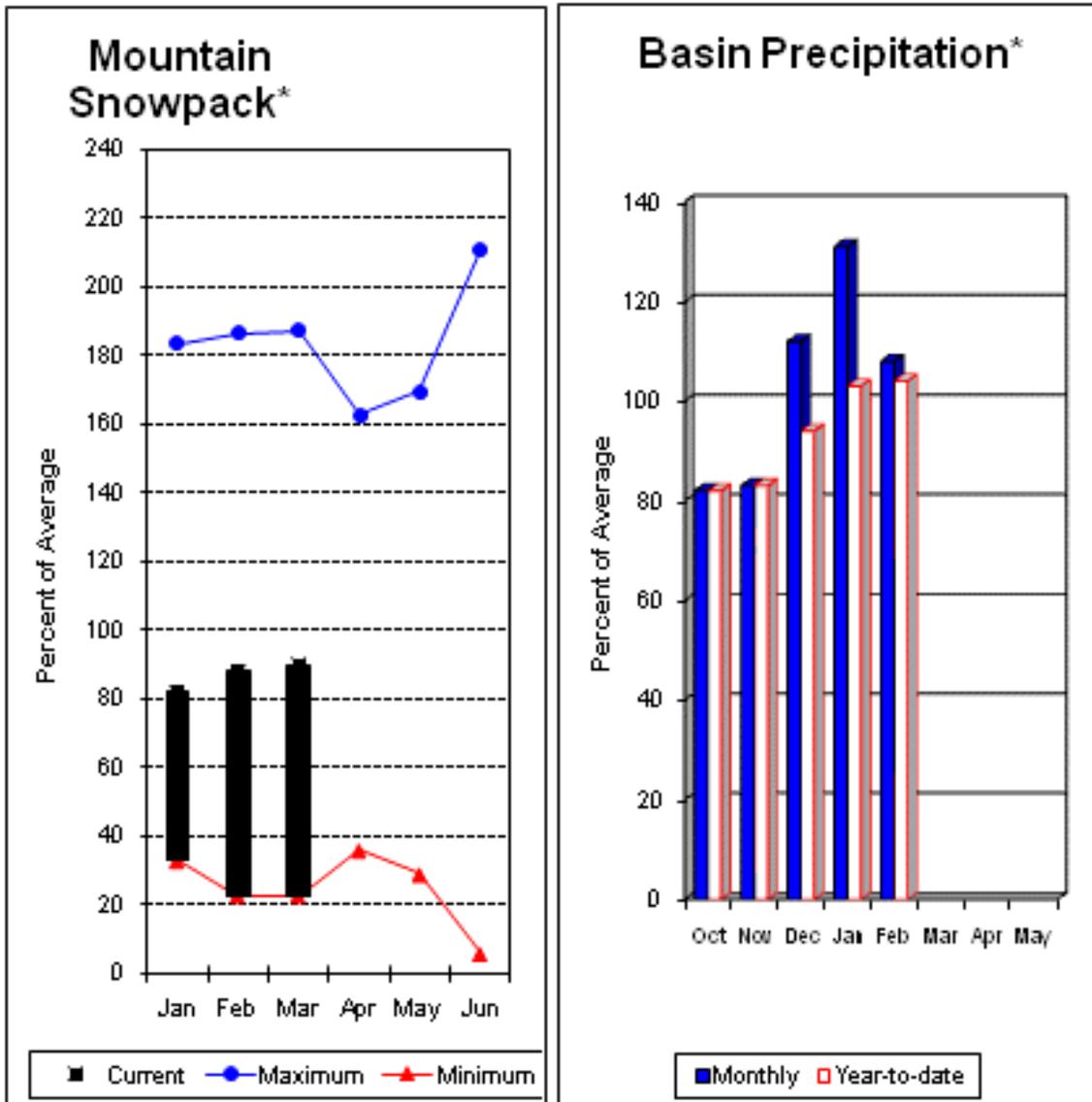
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					CEDAR RIVER	6	230	85
					TOLT RIVER	3	248	81
					SNOQUALMIE RIVER	5	160	73
					SKYKOMISH RIVER	3	145	71

* 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.

North Puget Sound River Basins



*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 93% of average for the spring and summer period. February streamflow in Skagit River was 97% of average. Other forecast points included Baker River at 92% and Thunder Creek at 96% of average. Basin-wide precipitation for February was 108% of average, bringing water-year-to-date to 104% of average. March 1 average snow cover in Skagit River Basin was 90%, Nooksack River Basin was 89% and Baker River Basin is estimated to have about 90% of average as well. Rainy Pass SNOTEL, at 4,780 feet, had 29.5 inches of water content. Average March 1 water content is 38.2 inches at Rainy Pass. March 1 Skagit River reservoir storage was 110% of average and 67% of capacity. Average temperatures for February were 4-5 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.

North Puget Sound River Basins

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)				
		90% (1000AF)		70% (1000AF)		50% (1000AF) (% AVG.)			30% (1000AF)		10% (1000AF)	
		Chance Of Exceeding *										
Thunder Ck nr Newhalem	APR-JUL	191	210	225	96	240	260	234				
	APR-SEP	280	305	320	96	335	360	333				
Skagit R at Newhalem (2)	APR-JUL	1490	1630	1730	93	1830	1970	1864				
	APR-SEP	1820	1960	2060	93	2160	2300	2217				
Baker R nr Concrete (2)	APR-JUL	605	700	765	92	830	925	828				
	APR-SEP	750	880	965	92	1050	1180	1050				

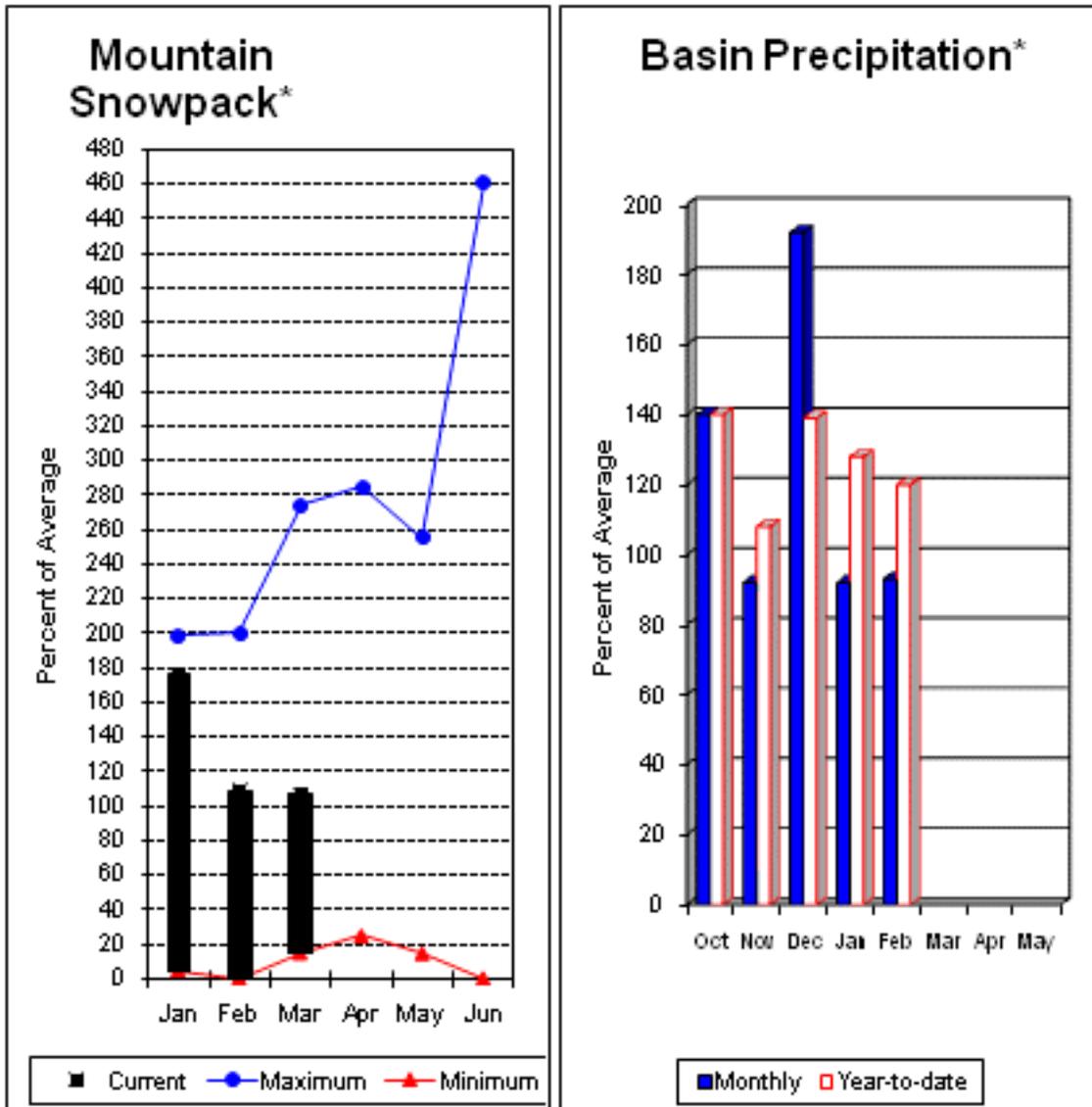
NORTH PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of February					NORTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ROSS	1404.1	907.9	953.5	818.3	SKAGIT RIVER	13	135	90
DIABLO RESERVOIR	90.6	86.2	85.5	85.7	BAKER RIVER	0	135	0
					NOOKSACK RIVER	3	143	89

* 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.

Olympic Peninsula River Basins



*Based on selected stations

Forecasted average runoff for streamflow for the Dungeness River is 102% and Elwha River is 100%. February runoff in the Dungeness River was 85% of normal. Big Quilcene and Wynoochee rivers should expect near average runoff this summer also. February precipitation was 93% of average. Precipitation has accumulated at 120% of average for the water year. February precipitation at Quillayute was 10.47 inches. The thirty-year average for February is 12.35 inches. Olympic Peninsula snowpack averaged 107% of normal on March 1. Temperatures were 2-6 degrees below average for February and slightly above normal for the water year.

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

Olympic Peninsula River Basins

Streamflow Forecasts - March 1, 2011

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		50%		Wetter		
		90% (1000AF)	70% (1000AF)	126 (1000AF)	102 (% AVG.)	136 (1000AF)	150 (1000AF)	
Dungeness R nr Sequim	APR-JUL	102	116	126	102	136	150	124
	APR-SEP	124	142	155	102	168	186	152
Elwha R at McDonald Bridge	APR-JUL	350	390	420	100	450	490	419
	APR-SEP	415	470	505	100	540	595	503

OLYMPIC PENINSULA RIVER BASINS Reservoir Storage (1000 AF) - End of February					OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - March 1, 2011			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					OLYMPIC PENINSULA	6	121	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.

- (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

Dave White
Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

Roylene Rides At The Door
State Conservationist
Natural Resources Conservation Service
Spokane, Washington

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

