

# Washington Water Supply Outlook Report February 1, 2013



1/28/2013 – January Inversion

Looking South from Deer Park Snow Course into Gray Wolf Creek Basin. : Picture by Olympic National Park snow survey team

# 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

February 2013

## General Outlook

Another month of extremes is what January amounted to. After near record dryness to record breaking temperatures (both high and low) Washington is still in pretty good shape for water-year snow and precipitation totals. A massive inversion brought mountain top temperatures in excess of 20 degrees above normal, breaking records for 4-5 day in a row. Thank goodness we had such a large surplus of snow to start the New Year since we lost 20-40 points last month, resulting in reduced forecasts for spring runoff as well. Climate forecasters are still having difficulties pinning down a long range forecast this season due to unstable tendencies with climate indices. Even the short term predictions seem to be a moving target from week to week and even day to day.

## Snowpack

The February 1 statewide SNOTEL readings were 120% of normal down by 28 points from last month. Conditions degraded drastically during the 2-week dry spell but started to make a comeback with a few end of month storms. So far we have received about 80% of our annual total snowfall. Normally January would yield about 25-30% of the total winter snowpack however last month we were lucky to get 20%. The Spokane River data reported the lowest readings at 83% of normal. Readings from the Olympic Peninsula reported the highest at 155% of normal. Westside medians from SNOTEL, and February 1 snow surveys, included the North Puget Sound river basins with 116% of normal, the Central 125%, South Puget river basins with 138%, and the Lewis-Cowlitz basins with 128% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 100% and the Wenatchee area with 92%. Snowpack in the Snake River River Basin was at 84% and the Walla Walla River Basin had 92% of the long term median. Maximum snow cover in Washington was at Easy Pass SNOTEL, with water content of 69.5 inches or approximately 16 feet deep. Easy Pass is only a few years old so a normal has yet to be established however neighboring sites are still reporting at above normal levels.

BASIN	PERCENT OF LAST YEAR	PERCENT OF MEDIAN
Spokane	100	83
Newman Lake	152	97
Pend Oreille	90	89
Okanogan	133	124
Methow	109	127
Conconully Lake	182	169
Central Columbia	97	92
Upper Yakima	85	93
Lower Yakima	100	106
Ahtanum Creek	98	104
Walla Walla	96	92
Lower Snake	93	84
Cowlitz	119	128
Lewis	149	129
White	111	116
Green	108	161
Puyallup	119	136
Cedar	92	107
Snoqualmie	141	133
Skykomish	148	114
Skagit	88	115
Nooksack	106	118
Olympic Peninsula	146	155

## Precipitation

During the month of January, the National Weather Service and Natural Resources Conservation Service climate stations reported dismal precipitation totals throughout Washington river basins, averaging only 42-79% of normal. The highest percent of average in the state was at Monroe which reported 129% of average for a total of 8.08 inches. The average for Monroe is 6.24 inches for January. The lowest percent of average was at Yakima Airport with only 9% of normal or .10 inches. The wettest spot in the state was reported at Skookum Creek SNOTEL in the Tolt River Basin with a January accumulation of 20.4inches or 95% of normal. February is already shaping up to be a dry month with below normal accumulations thus far and a sketchy forecast. Another month like January and we could see the state fall below average, negating the great start that we had.

RIVER BASIN	JANUARY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane .....	70.....	107
Pend Oreille .....	60.....	122
Upper Columbia .....	48.....	129
Central Columbia .....	48.....	106
Upper Yakima .....	50.....	99
Lower Yakima .....	42.....	107
Walla Walla .....	69.....	111
Lower Snake .....	79.....	107
Lower Columbia .....	60.....	119
South Puget Sound .....	74.....	111
Central Puget Sound .....	73.....	102
North Puget Sound .....	71.....	106
Olympic Peninsula .....	57.....	107

## 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 549,000-acre feet, 136% of average for the Upper Reaches and 145,000-acre feet or 118% of average for Rimrock and Bumping Lakes. Storage at the Okanogan reservoirs was 91% of average for February 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 66,000 acre feet, 69% of average and 28% of capacity; Chelan Lake, 274,000-acre feet, 80% of average and 40% of capacity; and the Skagit River reservoirs at 86% of average and 61% 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 .....	28 .....	69
Pend Oreille .....	57 .....	119
Upper Columbia .....	75 .....	91
Central Columbia .....	40 .....	80
Upper Yakima .....	66 .....	136
Lower Yakima .....	62 .....	118
Lower Snake .....	72 .....	108
North Puget Sound .....	61 .....	86

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

## Streamflow

Forecasts vary from 83% of average for the Spokane near Post Falls to 130% of average for S.F. Tolt River near Index. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 105%; White River, 112%; and Skagit River, 103%. Some Eastern Washington streams include the Yakima River near Parker, 95%; Wenatchee River at Plain, 93%; and Kettle near Laurier, 128%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions.

With an extremely dry month coupled with below average temperatures runoff was for the most part much below average. The Kettle River and the Upper Columbia had the highest reported flows with 101% of average. The Cle Elum near Roslyn with 43% of average was the lowest in the state however this stream is regulated by the Lake Cle Elum dam. Other streamflows were the following percentage of average as reported by the River Forecast Center: the Cowlitz at Castle Rock, 75%; the Stehekin at Stehekin, 54%; the Columbia below Rock Island Dam, 101%; and the Priest River, 112%.

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane .....	83-125
Pend Oreille .....	102-115
Upper Columbia .....	95-128
Central Columbia .....	93-96
Upper Yakima .....	86-93
Lower Yakima .....	91-110
Walla Walla .....	96
Lower Snake .....	93-106
Lower Columbia .....	92-111
South Puget Sound .....	110-112
Central Puget Sound .....	105-130
North Puget Sound .....	99-104
Olympic Peninsula .....	111-117

STREAM	PERCENT OF AVERAGE JANUARY STREAMFLOWS
Pend Oreille Below Box Canyon .....	92
Kettle at Laurier .....	101
Columbia at Birchbank .....	101
Spokane at Long Lake .....	69
Similkameen at Nighthawk .....	62
Okanogan at Tonasket .....	65
Methow at Pateros .....	87
Chelan at Chelan .....	61
Wenatchee at Pashastin .....	52
Cle Elum near Roslyn .....	43
Yakima at Parker .....	52
Naches at Naches .....	53
Grande Ronde at Troy .....	61
Snake below Lower Granite Dam .....	66
SF Walla Walla near Milton-Freewater, OR .....	61
Columbia River at The Dalles .....	88
Cowlitz below Mayfield Dam .....	66
Skagit at Concrete .....	65
Dungeness near Sequim .....	60

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## Soil Moisture

Current soil moisture data is available from a limited number of SNOTEL sites scattered throughout each basin. As the effort continues to install additional sensors and more years of data are acquired this information will become invaluable to the streamflow forecasting community. Warm temperatures and rain-on-snow events of January pushed most soils moisture levels up a few percentage points. With a solid snowpack over most of the mountainous regions of the state these numbers should hold and will help provide maximum runoff come spring.

BASIN	ESTIMATED PERCENT SATURATION
Spokane .....	60
Pend Oreille .....	69
Upper Columbia .....	55
Central Columbia .....	59
Upper Yakima .....	64
Lower Yakima .....	74
Walla Walla .....	74
Lower Snake .....	74
Lower Columbia .....	77
South Puget Sound .....	76
Central Puget Sound .....	N/A
North Puget Sound .....	75
Olympic Peninsula .....	44

## Western Snow Conference

The Western Snow Conference is an annual tradition which started in 1932 as an international forum for individuals and organizations to share scientific, management and socio-political information on snow and runoff. The principal aim of the Western Snow Conference is to advance snow and hydrological sciences. The North Continental Area Committee is making plans for the 81<sup>st</sup> Annual Western Snow Conference in 2013.

Mark your calendar and start thinking about submitting a paper to attend the 2013 Western Snow Conference:

**Dates:** April 15-18, 2013

**Location:** Snow King Resort Jackson Hole, Wyoming <http://www.snowking.com>

**Theme:** "Wild Weather in the Wild West"

A short course and panel discussion is being planned for Monday April 15<sup>th</sup> titled “**New Strategies and Techniques in Long Range Streamflow Forecasting**”. Many agencies use long range streamflow forecasts for hydropower planning, reservoir operation and marketing. This will provide a forum to discuss the current state of forecasting, the advancement of long range forecasting, additional needs of agencies, and more.

A Technical Tour is scheduled for Thursday, April 18<sup>th</sup> to discover how the local environment plays a critical role in the snowpack of the area. This will be an all day bus trip and a great opportunity to view the majestic landscape that so many have been studying and talking about.

Additional information about the conference and the Call for Papers will be posted on the WSC web page at <http://www.westernsnowconference.org/>

Also find Western Snow Conference on Facebook and Twitter.

BASIN SUMMARY OF  
SNOW COURSE DATA

FEBRUARY 2012

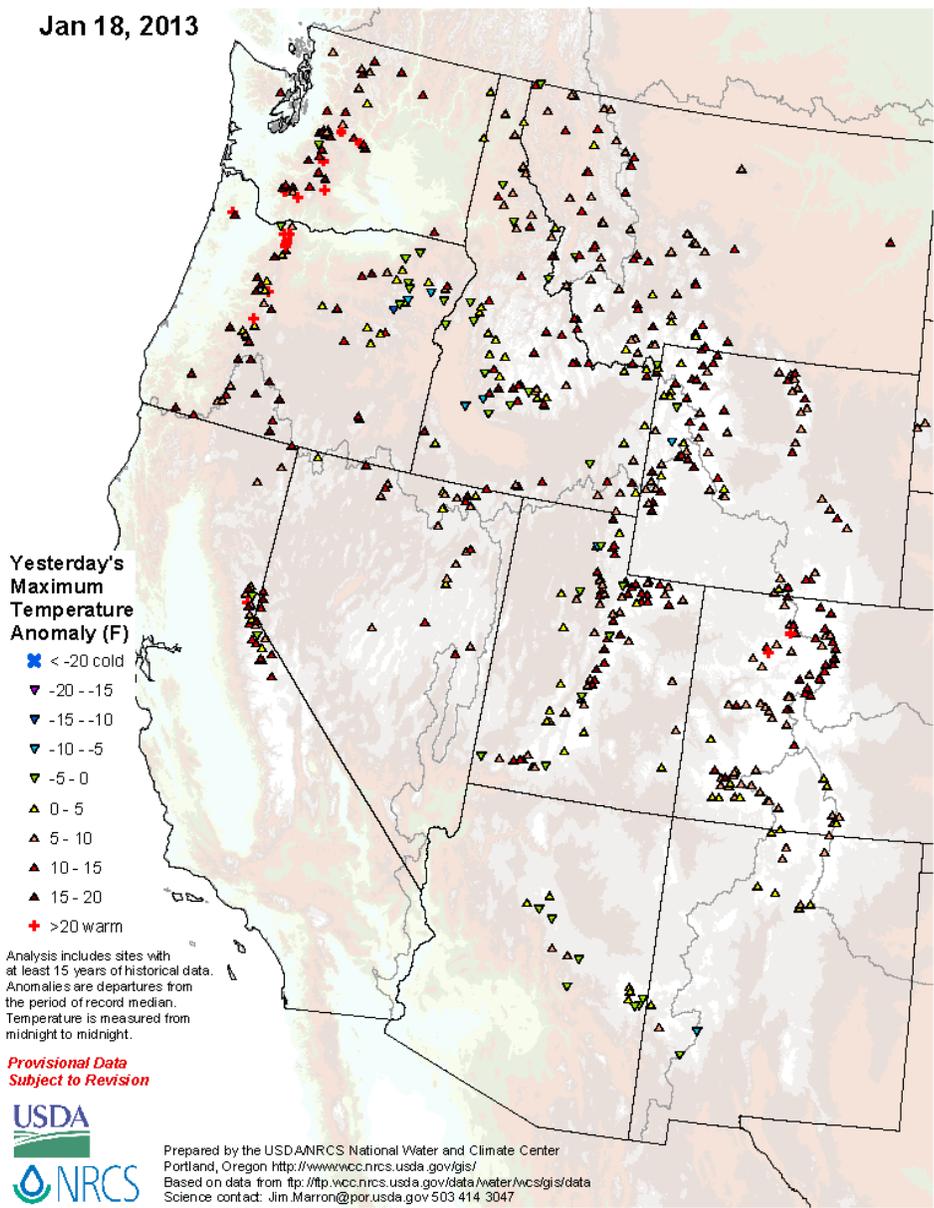
SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00	LOST LAKE LOST LAKE SNOW COURSE	SNOTEL ELEVATION	2/01/13 2/01/13	90 27	26.8 6.7	30.1 3.4	35.3 --
										SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
AHTANUM R.S.	3100	2/01/13	12	4.0	4.8	5.5							
ALPINE MEADOWS	3500	2/01/13	117	40.0	19.8	--							
ALPINE MEADOWS SNTL	3500	2/01/13	---	45.0	27.6	34.3	LOUP LOUP CAMPGROUND	5450	1/31/13	34	8.9	4.2	--
ASHLEY DIVIDE	4820	1/31/13	16	3.2	4.4	4.5	LUBRECHT FOREST NO 3	4650	1/31/13	14	2.5	4.2	3.2
BADGER PASS SNOTEL	6900	2/01/13	71	19.7	24.6	19.5	LUBRECHT FOREST NO 6	4040	1/31/13	8	1.4	2.8	1.8
BAIRD #2	3220	1/30/13	20	4.2	7.0	6.1	LUBRECHT FOREST NO 6	4200	2/01/13	13	2.6	5.0	2.0
BARKER LAKES SNOTEL	8250	2/01/13	37	8.9	6.8	8.0	LUBRECHT HYDROPLOT	4680	2/01/13	11	2.2	5.7	3.2
BASIN CREEK SNOTEL	7180	2/01/13	24	4.2	3.5	4.5	LUBRECHT SNOTEL	5980	2/01/13	12	3.0	6.5	3.8
BEAVER CREEK TRAIL	2200	2/01/13	42	11.6	16.2	10.4	LYNN LAKE SNOTEL	4000	2/01/13	---	40.7	40.3	40.1
BEAVER PASS	3680	2/01/13	71	25.8	27.2	18.2	LYNN LAKE	3900	2/01/13	72	25.2	18.4	13.2
BEAVER PASS SNOTEL	3630	2/01/13	91	33.8	35.6	23.2	LYNN LAKE SNOTEL	5250	2/01/13	72	25.2	18.4	--
BLACK PINE SNOTEL	7100	2/01/13	31	6.2	8.3	6.2	MARIAS PASS	3520	1/29/13	35	9.8	11.3	10.6
BLEWETT PASS#2SNOTEL	4240	2/01/13	28	10.4	11.6	11.8	MARTEN RIDGE SNOTEL	4200	2/01/13	116	50.2	42.3	--
BONAUPART SOUTH	4660	2/01/13	25	5.9	3.2	--	MAZAMA	1900	1/29/13	26	6.6	9.6	--
BRENDA MINE CAN.	4450	1/29/13	31	7.7	8.6	8.9	MCCULLOCH CAN.	3230	1/31/13	28	6.1	4.6	4.9
BROWN TOP AM	6000	2/02/13	116	41.9	46.7	41.4	MEADOWS CABIN	3230	2/01/13	23	7.4	5.1	3.6
BROWNS PASS	1/31/13	20	5.6	2.0	--	MEADOWS PASS SNOTEL	4970	2/01/13	62	21.1	25.3	18.6	
BUCKINGHORSE SNOTEL	4870	2/01/13	120	46.7	41.5	--	METEOR	4510	1/28/13	20	4.8	3.5	--
BUMPING LAKE (NEW)	3400	1/31/13	43	12.2	13.9	12.8	M F NOOKSACK SNOTEL	4510	2/01/13	116	42.0	43.6	34.4
BUMPING RIDGE SNOTEL	4610	2/01/13	60	17.8	20.7	17.8	MICA CREEK SNOTEL	5410	2/01/13	53	13.8	14.7	16.8
BUNCHGRASS MDWSNOTEL	5000	2/01/13	55	16.5	15.8	18.0	MORSE LAKE SNOTEL	4800	2/01/13	109	40.2	37.3	34.5
BURNT MOUNTAIN PIL	4170	2/01/13	55	17.7	14.1	9.9	MOSES MOUNTAIN (2)	5010	2/01/13	52	18.0	6.4	9.1
BUTTERMILK BUTTE	5250	1/31/13	37	12.2	9.4	--	MOSES MTN SNOTEL	6650	2/01/13	49	17.2	7.2	9.0
CALAMITY SNOTEL	2500	2/01/13	14	5.7	1.7	--	MOSES PEAK	5200	2/01/13	70	27.5	10.1	11.8
CAYUSE PASS SNOTEL	5240	2/01/13	129	43.7	37.3	--	MOSQUITO RESV SNOTEL	6850	2/01/13	71	21.9	24.4	25.1
CHEWALAH #2	4930	1/28/13	45	12.8	11.8	--	MOULTON RESERVOIR	3960	1/30/13	34	4.9	3.8	4.2
CHICKEN CREEK	4060	1/29/13	37	8.9	8.2	10.8	MOUNT CRAIG SNOTEL	5500	2/01/13	87	29.6	21.0	18.5
CHIWIAUKUM G.S.	2500	1/29/13	23	6.8	--	7.4	MT. KOBAU CAN.	2000	1/27/13	46	15.9	5.2	7.9
CITY CABIN	2390	2/01/13	33	12.3	13.9	--	MOUNT TOLMAN	3160	1/29/13	11	2.0	1.2	3.1
COLD CREEK STRIP	6020	1/30/13	39	9.9	5.4	5.5	MOWICH SNOTEL	3300	2/01/13	21	7.4	.5	.0
COMBINATION SNOTEL	5600	2/01/13	15	3.4	3.8	3.0	MOUNT GARDNER	2920	2/01/13	38	13.2	11.6	--
COPPER BOTTOM SNOTEL	5200	2/01/13	12	2.9	6.4	--	MOUNT GARDNER SNOTEL	5700	2/01/13	40	14.6	12.1	13.3
COPPER MOUNTAIN	7700	1/26/13	24	5.6	5.0	6.2	MUTTON CREEK #1	6250	1/28/13	47	15.6	9.4	8.4
CORRAL PASS SNOTEL	5800	2/01/13	72	24.3	24.0	23.0	N.F. ELK CR SNOTEL	7020	2/01/13	28	6.2	8.8	6.7
COUGAR MTN. SNOTEL	3200	2/01/13	53	17.5	13.5	13.3	NEVADA RIDGE SNOTEL	2800	2/01/13	32	7.6	12.8	8.6
COX VALLEY	4500	1/25/13	87	31.0	22.8	23.6	NEW HOZOMEEN LAKE	5650	2/03/13	22	7.6	--	7.2
COYOTE HILL	4200	2/01/13	23	4.8	6.6	6.0	NEZ PERCE CMP SNOTEL	6040	2/01/13	36	7.8	9.4	8.6
DALY CREEK SNOTEL	5780	2/01/13	30	7.0	7.8	6.6	NOISY BASIN SNOTEL	4030	2/01/13	89	27.8	16.9	25.4
DEER PARK	5200	1/28/13	57	20.1	14.8	10.6	OLALLIE MDWS SNOTEL	7150	2/01/13	95	37.2	40.2	33.0
DEVILS PARK	5900	2/01/13	77	27.6	37.2	28.2	OPHIR PARK	5130	1/25/13	25	6.8	11.3	8.7
DISAUTEL PASS	7050	1/29/13	24	5.9	3.0	--	PARADISE SNOTEL	4600	2/01/13	137	53.6	44.9	46.1
DISCOVERY BASIN	6400	1/30/13	32	5.4	6.4	5.9	PARK CK RIDGE SNOTEL	2140	2/01/13	96	35.5	35.2	31.6
DIX HILL	2200	1/31/13	14	4.5	7.6	6.1	PEPPER CREEK SNOTEL	7200	2/01/13	27	9.5	5.6	--
DOMMERIE FLATS	5370	1/30/13	29	6.3	3.7	3.9	PETERSON MDW SNOTEL	4300	2/01/13	30	6.2	5.8	5.5
DUNCAN RIDGE	4010	2/01/13	33	11.8	6.5	4.6	PETTITJOHN CREEK	5800	2/01/13	25	5.5	4.0	--
DUNGENESS SNOTEL	3200	2/01/13	94	31.4	25.4	27.9	PITGALL PEAK SNOTEL	5930	2/01/13	94	32.0	40.3	33.2
ELBOW LAKE SNOTEL	4350	2/01/13	---	9.2	7.8	9.5	PIKE CREEK SNOTEL	7200	2/01/13	30	5.3	8.7	16.0
EMERY CREEK SNOTEL	4000	1/29/13	29	7.5	5.9	8.7	PIPESTONE PASS	3590	1/26/13	14	2.8	2.2	2.4
FARRON CAN.	8000	1/31/13	31	6.1	4.6	5.5	POPE RIDGE SNOTEL	4510	2/01/13	45	12.7	15.0	13.6
FISH CREEK	3370	1/31/13	62	20.4	24.0	21.8	POTATO HILL SNOTEL	4700	2/01/13	77	22.6	19.0	18.3
FISH LAKE	3430	2/01/13	53	18.1	22.4	22.0	QUARTZ PEAK SNOTEL	4200	2/01/13	48	14.2	13.0	14.8
FISH LAKE SNOTEL	6300	2/01/13	107	32.1	28.8	28.5	RAGGED MOUNTAIN	4210	2/02/13	51	18.4	10.8	15.8
FLATTOP MTN SNOTEL	3200	1/31/13	26	7.2	5.6	7.5	RAGGED MTN SNOTEL	3330	2/01/13	47	15.2	13.8	17.1
FOURTH OF JULY SUM	3500	2/03/13	28	8.6	12.0	7.9	RAGGED RIDGE	4890	1/31/13	26	6.2	2.4	6.9
FREEZEOUT CK. TRAIL	6480	2/01/13	19	4.5	6.8	4.5	RAINY PASS SNOTEL	4780	2/01/13	73	25.2	33.3	24.5
FROHNER MDWS SNOTEL	3600	1/29/13	23	4.8	3.8	5.0	RAINY PASS	3810	2/02/13	76	24.4	29.9	--
GOAT CREEK	4300	1/30/13	39	11.5	7.1	--	REX RIVER SNOTEL	8000	2/01/13	69	27.3	29.8	23.7
GOLD MTN LOOKOUT	5920	2/01/13	57	18.8	18.2	14.9	ROCKER PEAK SNOTEL	4020	2/01/13	31	6.7	9.0	8.2
GRAVE CRK SNOTEL	4700	1/29/13	32	7.6	6.1	6.3	ROUND TOP MTN	4000	1/31/13	36	9.8	5.6	--
GREEN LAKE SNOTEL	5390	2/01/13	39	14.5	12.8	13.1	RUSTY CREEK	2200	1/28/13	25	6.7	2.9	4.2
GREYBACK RES CAN.	5030	2/01/13	26	5.9	6.8	7.7	SF THUNDER CK AM	7900	2/01/13	50	14.9	16.0	--
GROUSE CAMP SNOTEL	6490	2/01/13	81	33.1	32.6	27.8	SADDLE MTN SNOTEL	4460	2/01/13	51	14.1	16.2	15.8
HAND CREEK SNOTEL	6500	2/02/13	87	33.6	31.8	26.4	SALMON MDWS SNOTEL	4340	2/01/13	36	10.1	5.5	6.6
HARTS PASS SNOTEL	5770	1/28/13	61	19.4	17.4	19.9	SASSE RIDGE SNOTEL	4030	2/01/13	63	20.3	23.5	22.5
HERRIG JUNCTION	4850	1/29/13	54	14.3	13.2	17.6	SATUS PASS	6170	1/28/13	24	7.9	8.0	8.2
HIGH RIDGE SNOTEL	4920	2/01/13	55	14.6	16.6	16.1	SAVAGE PASS SNOTEL	4640	2/01/13	---	15.6	18.9	16.5
HOLBROOK	4530	1/30/13	20	3.5	5.5	6.0	SAWMILL RIDGE SNOTEL	4680	2/01/13	69	27.0	32.5	--
HOODOO BASIN SNOTEL	2250	2/01/13	13	4.9	3.7	2.2	SENTINEL BT SNOTEL	3990	2/01/13	31	7.2	3.7	6.2
HUCKLEBERRY SNOTEL	4250	2/01/13	31	6.9	11.4	8.6	SHEEP CANYON SNOTEL	3200	2/01/13	106	37.7	22.0	23.0
HUMBOLDT GLCH SNOTEL	4500	2/01/13	---	18.5	9.0	10.0	SHERWIN SNOTEL	7260	2/01/13	---	6.0	8.4	7.7
HURRICANE	5360	2/01/13	57	23.2	22.5	--	SKALKAHO SNOTEL	3310	2/01/13	50	12.7	15.7	14.0
INDIAN ROCK SNOTEL	5530	1/30/13	35	8.2	7.2	6.8	SKOOKUM CREEK SNOTEL	4230	2/01/13	85	34.6	23.6	20.3
IRENE'S CAMP	5100	1/29/13	25	4.2	4.3	5.2	SKOOKUM LAKES	4000	1/29/13	36	9.7	7.4	--
ISINTOK LAKE CAN.	3440	2/01/13	102	40.2	23.4	26.9	SOURDOUGH GUL SNOTEL	4920	2/01/13	4	1.7	1.5	.9
JUNE LAKE SNOTEL	3700	1/30/13	21	5.2	3.0	--	SOUTH BALDY	3400	1/29/13	49	14.6	11.3	--
KELLOGG PEAK	5560	1/31/13	40	11.6	12.2	19.0	SPENCER MDW SNOTEL	3520	2/01/13	68	24.6	17.2	21.4
KRAFT CREEK SNOTEL	4750	2/01/13	30	6.8	9.4	--	SPIRIT LAKE SNOTEL	7000	2/01/13	26	17.4	4.8	4.2
LAMB BUTTE	5240	1/29/13	42	14.8	12.1	--	SPOTTED BEAR MTN.	5700	1/31/13	28	7.0	9.4	8.7
LOLO PASS SNOTEL	3930	2/01/13	99	40.3	21.9	24.4	SPRUCE SPGS SNOTEL	6750	2/01/13	34	7.2	9.6	11.9
LONE PINE SNOTEL	5140	2/01/13	61	14.9	19.0	19.4	STARVATION MOUNTAIN	6030	1/30/13	52	17.9	12.0	--
LOOKOUT	5120	2/01/13	41	12.6	13.3	13.8	STAHL PEAK SNOTEL	3950	2/01/13	76	20.0	19.2	22.1
LOST HORSE SNOTEL							STEVENS PASS SNOTEL	7780	2/01/13	87	26.9	28.0	28.6
							STORM LAKE	6180	1/30/13	36	7.0	7.8	7.4
							STRYKER BASIN	4200	1/29/13	65	19.2	14.7	19.6
							SUMMERLAND RES CAN.		1/29/13	27	6.3	5.8	6.9

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
SUMMIT G.S. #2	4600	1/30/13	34	8.1	4.3	6.1
SUNSET SNOTEL	5540	2/01/13	43	11.2	13.0	15.5
SURPRISE LKS SNOTEL	4290	2/01/13	104	37.4	29.2	33.3
SWAMP CREEK SNOTEL	3930	2/01/13	44	12.9	18.9	11.7
SWIFT CREEK SNOTEL	4440	2/01/13	138	53.0	34.9	36.4
TEN MILE LOWER	6600	2/01/13	24	5.2	5.8	4.0
TEN MILE MIDDLE	6800	2/01/13	27	5.8	7.0	6.0
THUNDER BASIN SNOTEL	4320	2/01/13	67	22.5	22.9	21.3
THUNDER BASIN	4200	2/01/13	50	14.9	16.4	13.6
THOMPSON CREEK	2500	1/31/13	21	4.7	1.9	4.2
TINKHAM CREEK SNOTEL	2990	2/01/13	63	19.0	24.3	20.8
TOATS COULEE	2850	1/30/13	18	3.6	1.9	2.4
TOUCHET SNOTEL	5530	2/01/13	55	18.8	18.1	20.4
TRINKUS LAKE	6100	2/02/13	85	25.7	23.7	25.2
TROUGH #2 SNOTEL	5480	2/01/13	27	7.6	7.1	8.0
TRUMAN CREEK	4060	1/31/13	11	3.2	4.4	2.9
TUNNEL AVENUE	2450	2/01/13	29	8.8	15.2	13.5

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
TWELVEMILE SNOTEL	5600	2/01/13	38	9.1	15.1	11.0
TWIN LAKES SNOTEL	6400	2/01/13	72	19.8	25.8	24.9
TWIN SPIRIT DIVIDE	3480	2/02/13	24	7.8	3.9	9.8
UPPER HOLLAND LAKE	6200	2/02/13	65	17.6	19.1	20.6
UPPER WHEELER SNOTEL	4330	2/01/13	23	6.8	6.3	9.2
VASEUX CREEK CAN.	4250	1/31/13	20	3.9	3.5	4.3
VULCAN MTN	4660	1/29/13	38	10.1	5.8	--
VULCAN ROAD	3840	1/29/13	27	6.1	4.0	--
WARM SPRINGS SNOTEL	7800	2/01/13	46	10.9	13.6	12.3
WATERHOLE SNOTEL	5010	2/01/13	90	36.8	26.8	28.0
WEASEL DIVIDE	5450	1/30/13	64	18.9	20.2	20.6
WEST SMAY CREEK	3600	2/04/13	60	22.2	22.4	--
WHITE PASS ES SNOTEL	4440	2/01/13	49	15.5	19.1	15.3

### SNOTEL Yesterday's Maximum Temperature Anomaly (Degrees F)

Jan 18, 2013



Prepared by the USDA/NRCS National Water and Climate Center  
 Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>  
 Based on data from <ftp://ftp.wcc.nrcs.usda.gov/data/water/wccs/gis/data>  
 Science contact: Jim.Marron@por.usda.gov 503 414 3047



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**

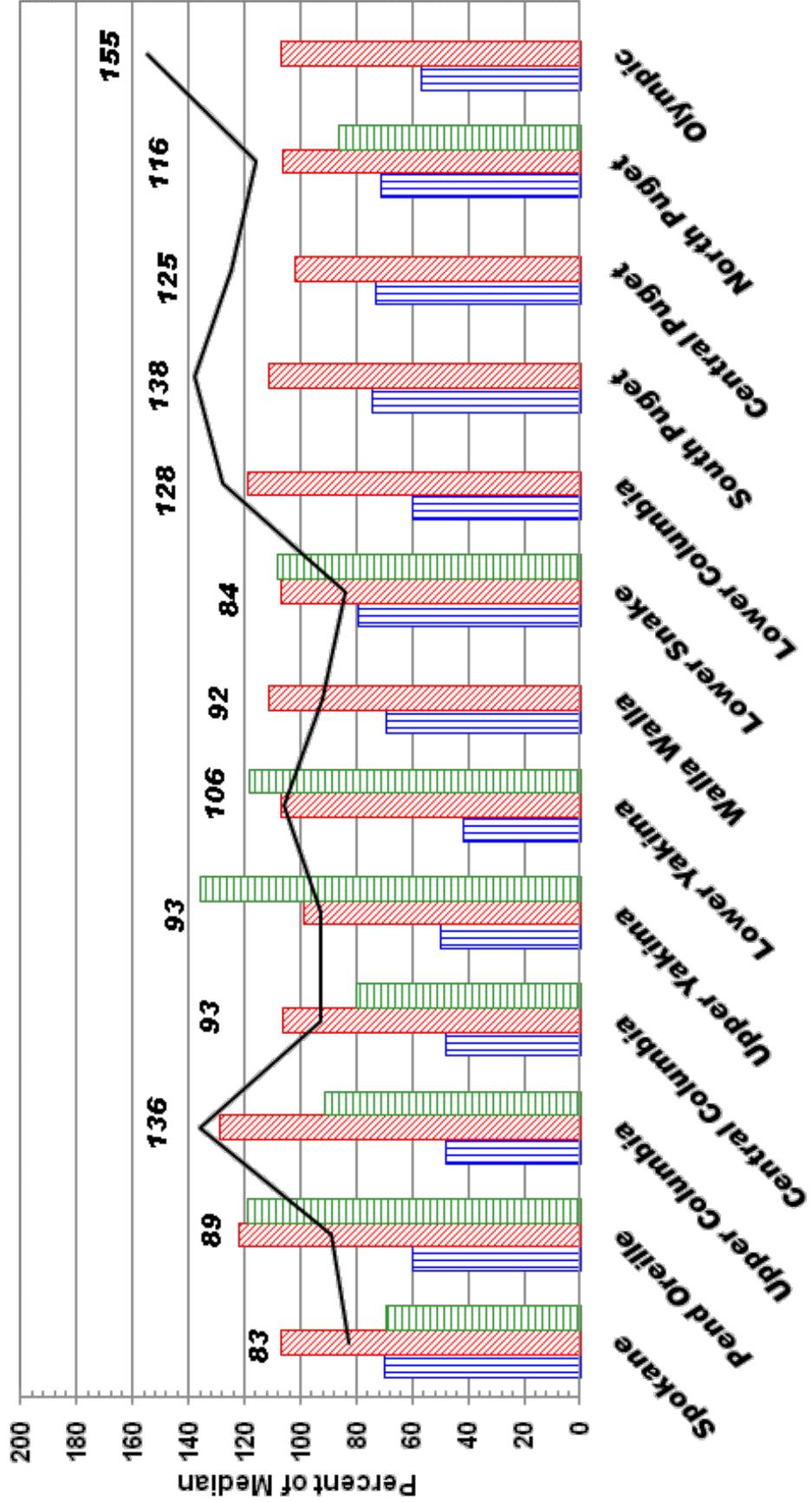
Washington:  
<http://www.wa.nrcs.usda.gov>

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



## February 1, 2013 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2012 - Current Date)

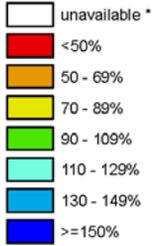


▒ Jan Precipitation    
 ▒ Water-Year Precipitation    
 ▒ Jan Reservoir    
 — 100% Water Year Snowpack

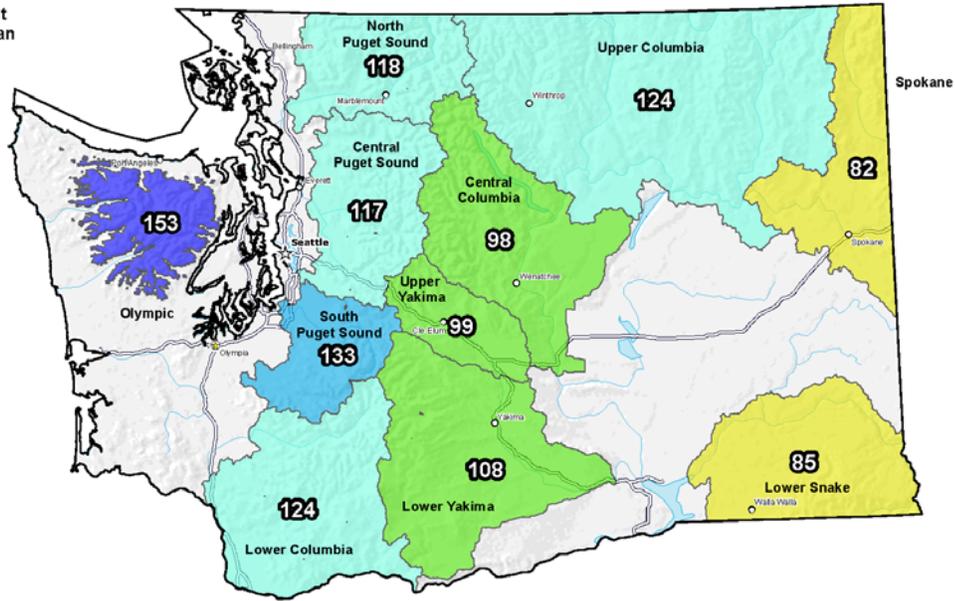
## Washington SNOTEL Current Snow Water Equivalent (SWE) % of Normal

**Feb 01, 2013**

Current Snow Water Equivalent (SWE)  
Basin-wide Percent  
of 1981-2010 Median



\* 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 snow water 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).

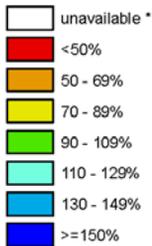


Prepared by the USDANRCS National Water and Climate Center  
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>  
Based on data from <http://www.wcc.nrcs.usda.gov/reports/>  
Science contact: Jim.Marron@por.usda.gov 503 414 3047

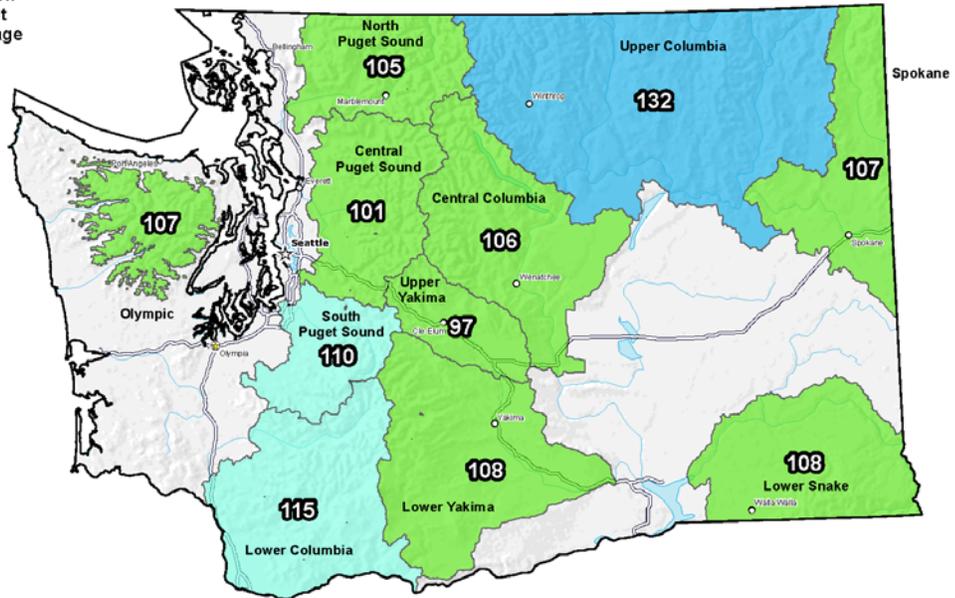
## Washington SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal

**Feb 01, 2013**

Water Year (Oct 1)  
to Date Precipitation  
Basin-wide Percent  
of 1981-2010 Average



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



Provisional Data  
Subject to Revision

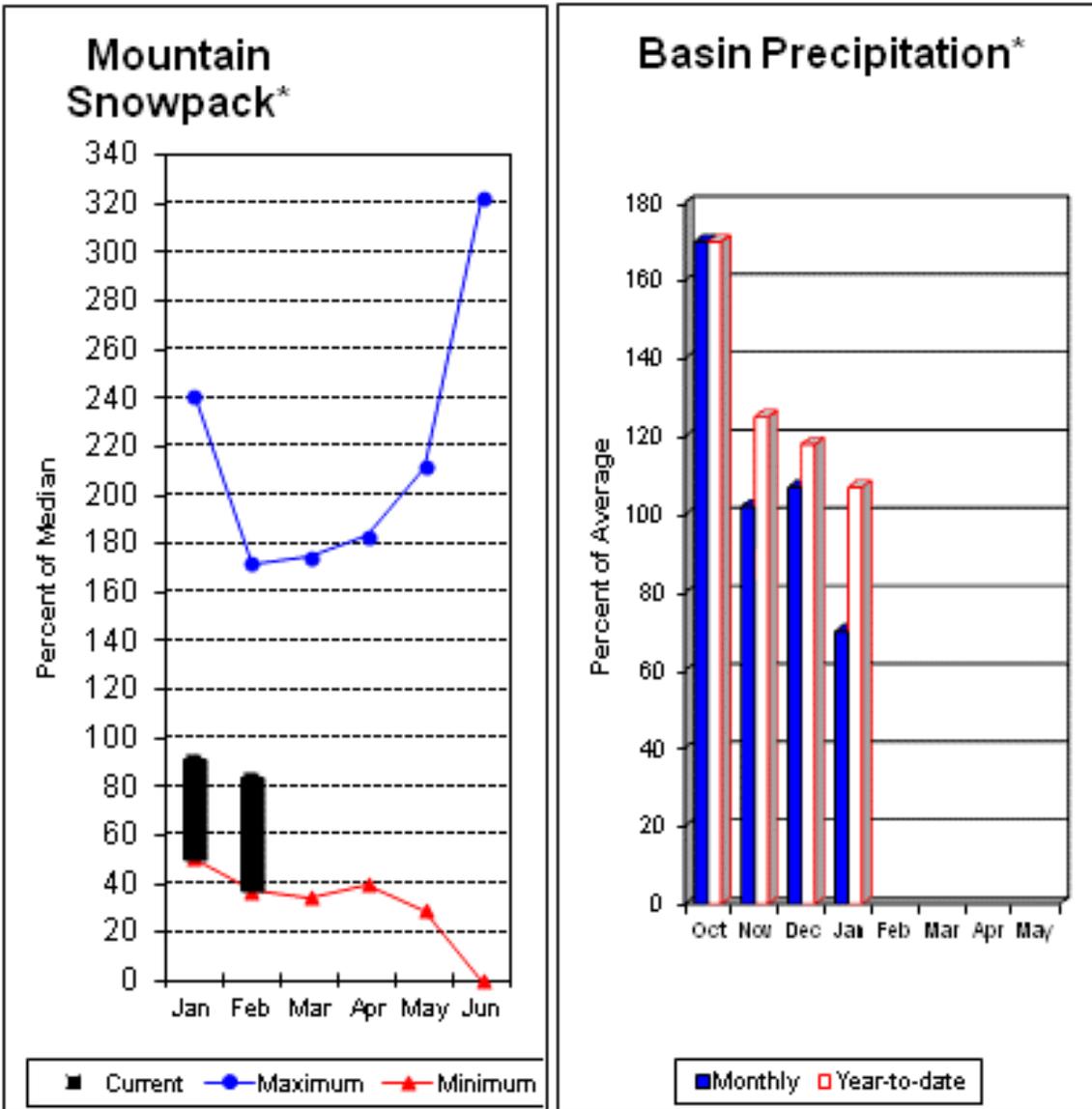


The water year to date precipitation percent of normal represents the accumulated precipitation found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).



Prepared by the USDANRCS National Water and Climate Center  
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>  
Based on data from <http://www.wcc.nrcs.usda.gov/reports/>  
Science contact: Jim.Marron@por.usda.gov 503 414 3047

# Spokane River Basin



\*Based on selected stations

The February 1 forecasts for summer runoff within the Spokane River Basin are 83% of average near Post Falls and 86% at Long Lake. The Chamokane River near Long Lake forecasted to have 125% of average flows for the May-August period. The forecast is based on a basin snowpack that is 83% of normal and precipitation that is 107% of average for the water year. Precipitation for January was below normal at 70% of average. Streamflow on the Spokane River at Long Lake was 69% of average for January. February 1 storage in Coeur d'Alene Lake was 66,000 acre feet, 69% of average and 28% of capacity. Snowpack at Quartz Peak SNOTEL site was 96% of normal with 14.2 inches of water content. Average temperatures in the Spokane basin were 2-4 degrees below normal for January and slightly above normal for the water year.

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

# Spokane River Basin

## Streamflow Forecasts - February 1, 2012

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	1360	1730	1980	83	2230	2600	2390
	APR-SEP	1440	1810	2060	83	2310	2680	2480
Spokane R at Long Lake (2)	APR-JUL	1560	1960	2240	86	2520	2920	2620
	APR-SEP	1750	2160	2440	86	2720	3130	2850
Chamokane Ck nr Long Lake	MAY-AUG	5.9	9.3	11.6	125	13.9	17.3	9.3

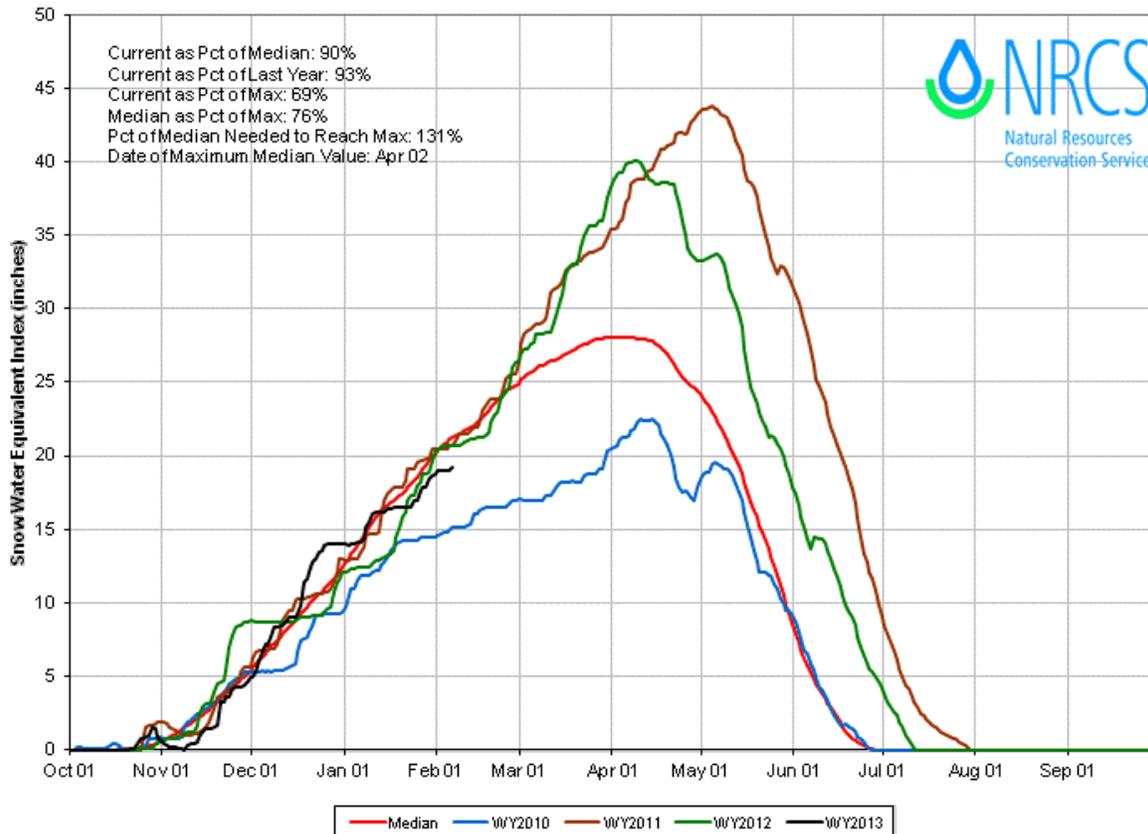
SPOKANE RIVER BASIN Reservoir Storage (1000 AF) - End of January					SPOKANE RIVER BASIN Watershed Snowpack Analysis - February 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
Coeur d'Alene	238.5	66.2	49.6	96.3	SPOKANE RIVER	14	100	83
					NEWMAN LAKE			

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

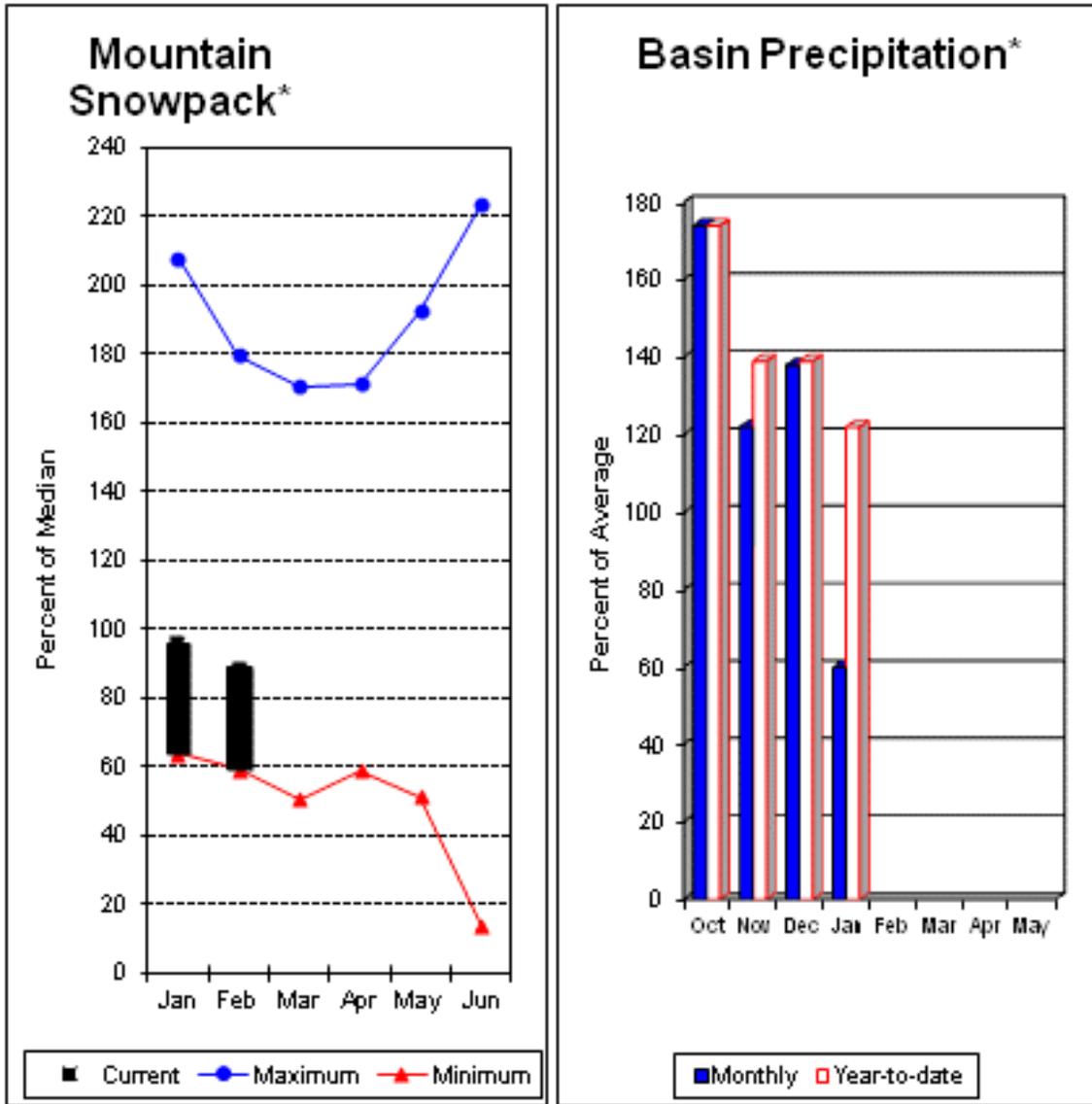
The average is computed for the 1981-2010 base period.

- (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.

PREIST, COEUR D'ALENE, ST. JOE, SPOKANE, PALOUSE Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Feb 06, 2013



# Pend Oreille River Basins



\*Based on selected stations

The April – September average forecast for the Priest River near the town of Priest River is 115% and the Pend Oreille below Box Canyon is 102%. January streamflow was 92% of average on the Pend Oreille River and 101% on the Columbia Birchbank. February 1 snow cover was 89% of normal in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 16.5 inches of snow water on the snow pillow. Normally Bunchgrass would have 18 inches on February 1. Precipitation during January was 60% of average, keeping the year-to-date precipitation at 122% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 119% of normal. Average temperatures were 4-6 degrees above normal for January and 1-2 degrees above normal for the water year.

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

# Pend Oreille River Basins

## Streamflow Forecasts - February 1, 2012

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)	
Pend Oreille Lake Inflow (2)	APR-JUL	9823	11060	11900	101	12740	13977	11800
	APR-SEP	10910	12214	13100	102	13986	15290	12800
Priest R nr Priest River (1,2)	APR-JUL	735	833	900	115	967	1065	780
	APR-SEP	770	877	950	115	1023	1130	830
Pend Oreille R bl Box Canyon (2)	APR-JUL	9980	11200	12100	102	13000	14200	11900
	APR-SEP	11100	12400	13300	102	14200	15500	13000

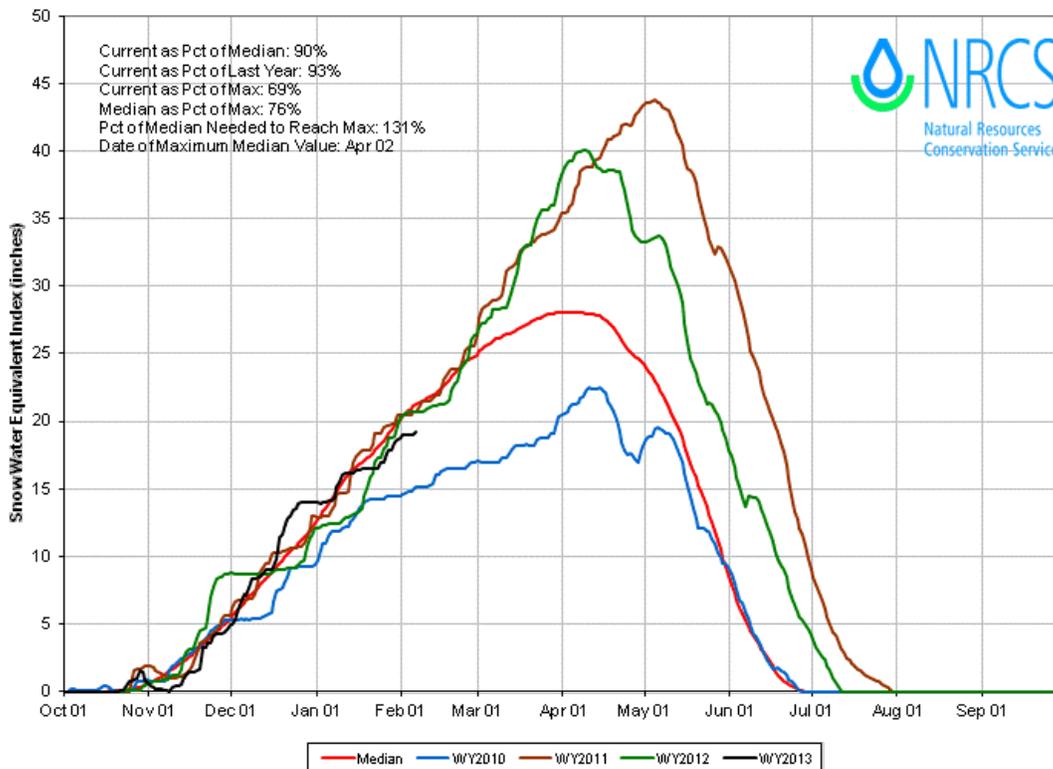
PEND OREILLE RIVER BASINS Reservoir Storage (1000 AF) - End of January					PEND OREILLE RIVER BASINS Watershed Snowpack Analysis - February 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
Pend Oreille	1561.3	914.7	632.2	753.9	COLVILLE RIVER	1	90	69
Priest Lake	119.3	50.4	55.5	56.7	PEND OREILLE RIVER	9	90	82
					KETTLE RIVER	4	159	106

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

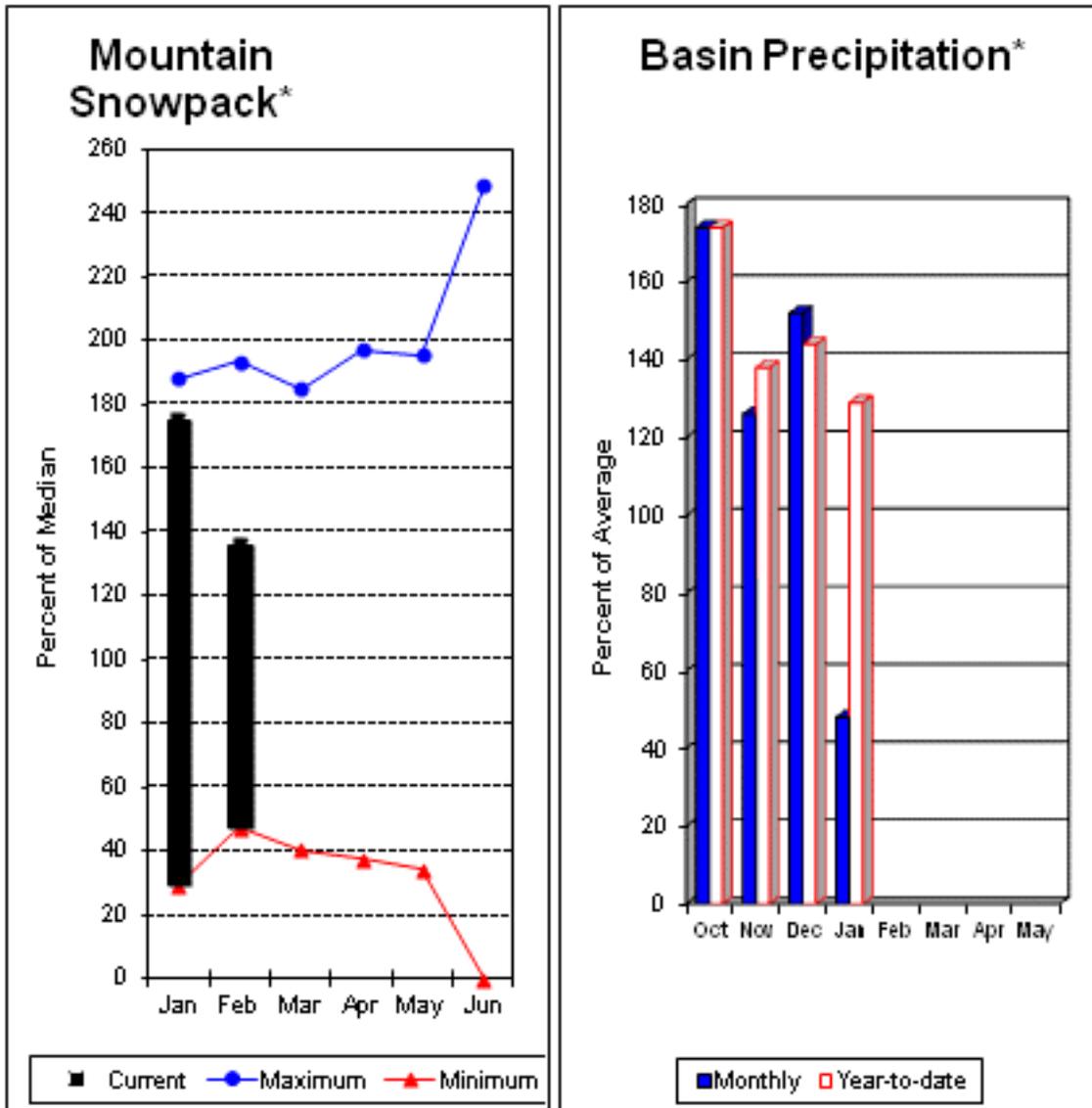
The average is computed for the 1981-2010 base period.

- (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.

*PREIST, COEUR D'ALENE, ST. JOE, SPOKANE, PALOUSE Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Feb 06, 2013*



# Upper Columbia River Basins



\*Based on selected stations

Summer runoff average forecast for the Okanogan River is 104%, Similkameen River is 108%, Kettle River 128% and Methow River is 120%. February 1 snow cover on the Okanogan was 127% of normal, Omak Creek was 210% and the Methow was 127%. January precipitation in the Upper Columbia was 48% of average, with precipitation for the water year at 129% of average. January streamflow for the Methow River was 87% of average, 65% for the Okanogan River and 62% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 10.1 inches. Median for this site is 6.6 inches on February 1. Combined storage in the Conconully Reservoirs was 18,000-acre feet, which is 75% of capacity and 91% of the February 1 average. Temperatures were 4-6 degrees below normal for January and slightly below for the water year.

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

# Upper Columbia River Basins

## Streamflow Forecasts - February 1, 2012

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		Wetter		Chance Of Exceeding *		
		90% (1000AF)	70% (1000AF)	30% (1000AF)	10% (1000AF)	50% (1000AF) (% AVG.)	50% (% AVG.)	
Colville R at Kettle Falls	APR-JUL	55	96	124	104	152	193	119
	APR-SEP	60	105	136	104	167	210	131
Kettle R nr Laurier	APR-JUL	1940	2160	2300	128	2440	2660	1800
	APR-SEP	2030	2250	2410	128	2570	2790	1880
Columbia R at Birchbank (1,2)	APR-JUL	25700	29700	31500	93	33300	37300	33840
	APR-SEP	32700	37600	39900	96	42200	47100	41750
Columbia R at Grand Coulee (2)	APR-JUL	36900	44100	47300	93	50600	57800	51015
	APR-SEP	44800	53300	57200	95	61100	69700	60110
Similkameen R nr Nighthawk (1)	APR-JUL	909	1164	1280	107	1396	1651	1200
	APR-SEP	1007	1263	1380	108	1497	1753	1280
Okanogan R nr Tonasket (1)	APR-JUL	907	1287	1460	99	1633	2013	1480
	APR-SEP	1027	1442	1630	99	1818	2233	1650
Okanogan R at Malott (1)	APR-JUL	925	1330	1510	104	1690	2100	1450
	APR-SEP	1040	1480	1680	104	1880	2320	1620
Methow R nr Pateros	APR-SEP	896	1000	1070	120	1140	1244	895
	APR-JUL	838	934	1000	120	1066	1162	835

UPPER COLUMBIA RIVER BASINS Reservoir Storage (1000 AF) - End of January					UPPER COLUMBIA RIVER BASINS Watershed Snowpack Analysis - February 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
SALMON LAKE	10.5	8.4	8.3	8.3	OKANOGAN RIVER	12	125	127
CONCONULLY RESERVOIR	13.0	9.2	11.0	11.0	OMAK CREEK	3	259	210
					SANPOIL RIVER	1	159	65
					SIMILKAMEEN RIVER	0	0	0
					TOATS COULEE CREEK	4	154	151
					CONCONULLY LAKE	3	182	169
					METHOW RIVER	6	109	127

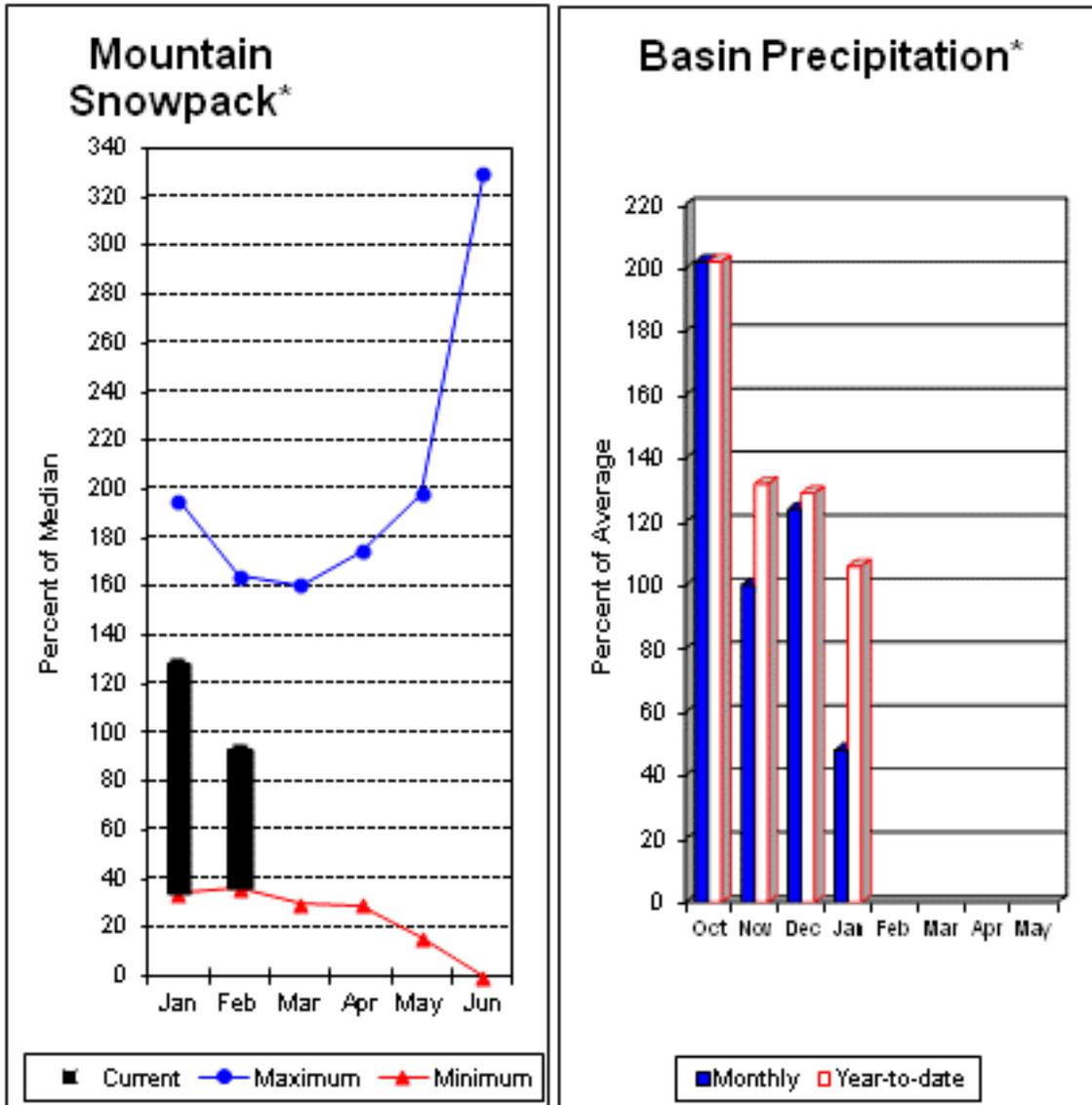
\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 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 January was 48% of average in the basin and 106% for the year-to-date. Runoff for Entiat River is forecast to be 93% of average for the summer. The April-September average forecast for Chelan River is 96%, Wenatchee River at Plain is 93%, Stehekin River is 99% and Icicle Creek is 83%. January average streamflows on the Chelan River were 61% and on the Wenatchee River 52%. February 1 snowpack in the Wenatchee River Basin was 92% of normal; the Chelan, 111%; the Entiat, 93%; Stemilt Creek, 74% and Colockum Creek, 95%. Reservoir storage in Lake Chelan was 274,000-acre feet, 80% of February 1 average and 40% of capacity. Lyman Lake SNOTEL had the most snow water with 40.7 inches of water. This site would normally have 40.1 inches on February 1. Temperatures were 2-4 degrees below normal for January and near normal for the water year.

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

# Central Columbia River Basins

## Streamflow Forecasts - February 1, 2012

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		Wetter		Chance Of Exceeding *		
		90% (1000AF)	70% (1000AF)	30% (1000AF)	10% (1000AF)	50% (% AVG.)	50% (% AVG.)	
Stehekin R at Stehekin	APR-JUL	571	636	680	100	724	789	680
	APR-SEP	672	739	785	99	831	898	790
Chelan R at Chelan (2)	APR-JUL	849	915	960	96	1005	1071	1000
	APR-SEP	930	1014	1070	96	1126	1210	1120
Entiat R nr Ardenvoir	APR-JUL	157	175	187	94	199	215	200
	APR-SEP	172	192	205	93	220	240	220
Wenatchee R at Plain	APR-JUL	795	870	920	93	970	1050	990
	APR-SEP	850	940	1000	93	1060	1150	1080
Icicle Ck nr Leavenworth	APR-JUL	198	217	230	84	243	262	275
	APR-SEP	211	234	250	83	266	289	300
Wenatchee R at Peshastin	APR-JUL	1090	1190	1260	92	1330	1430	1370
	APR-SEP	1150	1270	1360	91	1450	1570	1490
Columbia R bl Rock Island Dam (2)	APR-JUL	43596	49195	53000	95	56805	62404	55770
	APR-SEP	50823	57418	61900	95	66382	72977	65200

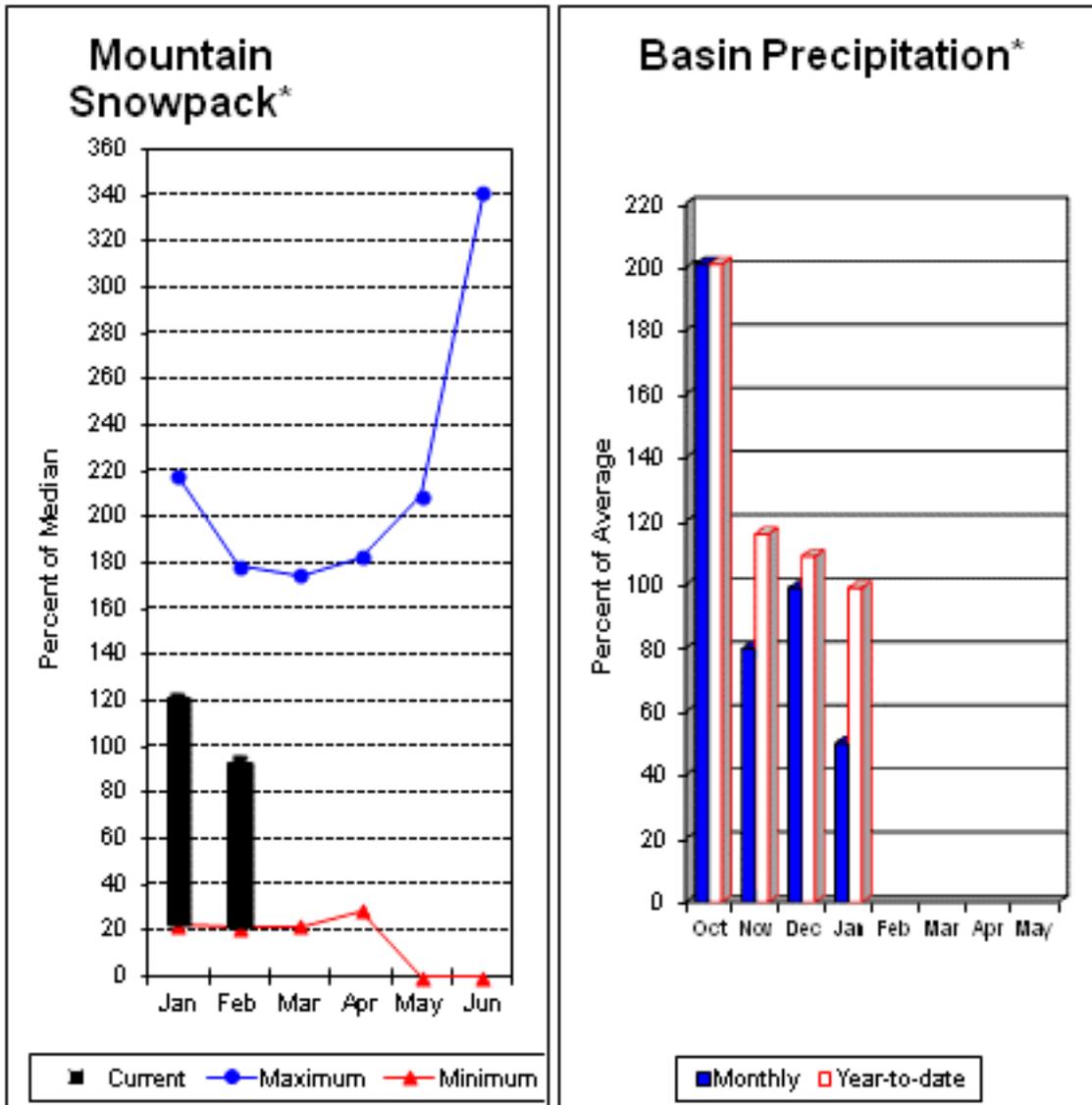
CENTRAL COLUMBIA RIVER BASINS Reservoir Storage (1000 AF) - End of January					CENTRAL COLUMBIA RIVER BASINS Watershed Snowpack Analysis - February 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
CHELAN LAKE	676.1	273.6	272.6	343.1	CHELAN LAKE BASIN	4	100	111
					ENTIAT RIVER	1	85	93
					WENATCHEE RIVER	8	94	92
					STEMILT CREEK	1	108	74
					COLOCKUM CREEK	1	107	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 1981-2010 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

February 1 reservoir storage for the Upper Yakima reservoirs was 549,000-acre feet, 136% of average. Forecasts for the Yakima River at Cle Elum are 91% of average and the Teanaway River near Cle Elum is at 86%. Lake inflows are all forecasted to be slightly below average this summer. January streamflows within the basin were Cle Elum River near Roslyn at 44%. February 1 snowpack was 93% based upon 8 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 50% of average for January and 99% 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 - February 1, 2012

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)			
Keechelus Reservoir Inflow (2)	APR-JUL	74	94	107	92	120	140	116
	APR-SEP	83	103	117	93	131	151	126
Kachess Reservoir Inflow (2)	APR-JUL	69	85	96	92	107	123	104
	APR-SEP	76	92	103	91	114	130	113
Cle Elum Lake Inflow (2)	APR-JUL	280	325	355	92	385	430	385
	APR-SEP	300	350	385	93	420	470	415
Yakima R at Cle Elum (2)	APR-JUL	490	610	690	91	770	890	755
	APR-SEP	530	665	755	91	845	980	830
Teanaway R bl Forks nr Cle Elum	APR-JUL	72	95	111	85	127	150	130
	APR-SEP	75	98	114	86	130	153	133

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

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
KEECHELUS	157.8	96.8	102.4	82.1
KACHESS	239.0	176.9	158.6	130.8
CLE ELUM	436.9	275.4	306.2	191.5

### UPPER YAKIMA RIVER BASIN Watershed Snowpack Analysis - February 1, 2013

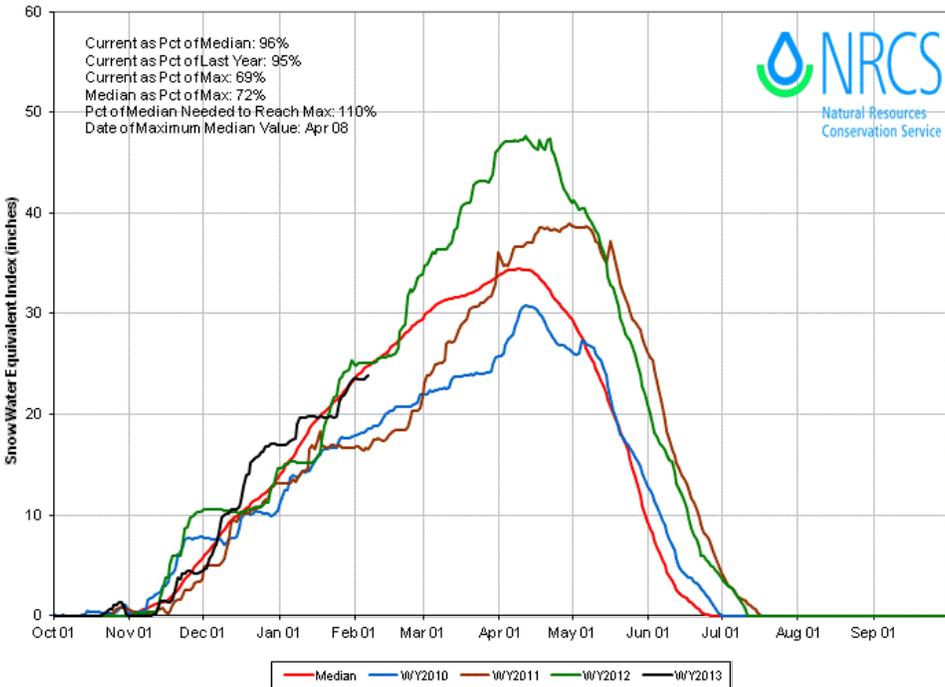
Reservoir	Watershed	Number of Data Sites	This Year as % of	
			Last Yr	Median
KEECHELUS	UPPER YAKIMA RIVER	8	85	93

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

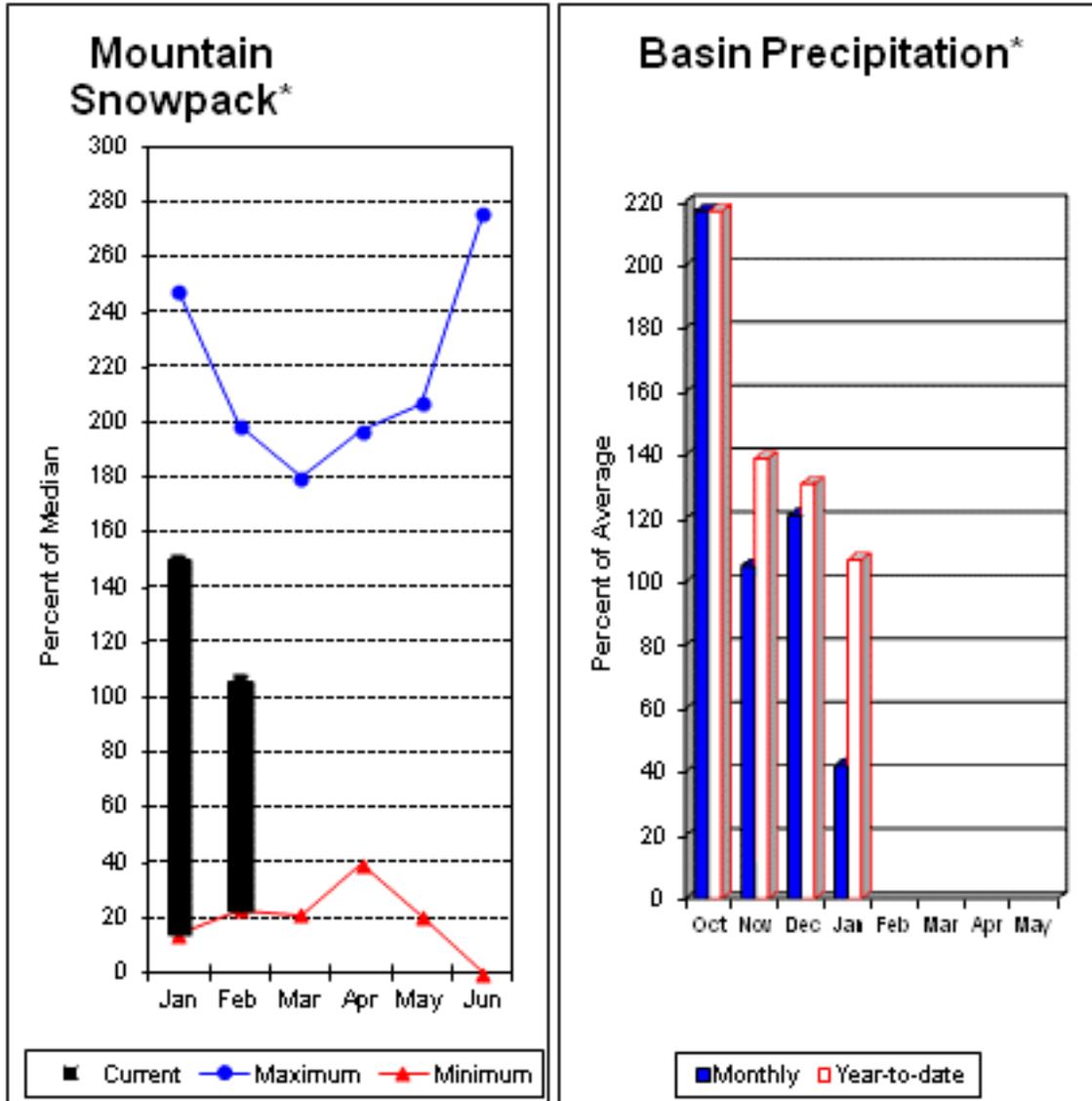
The average is computed for the 1981-2010 base period.

- (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 Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Feb 06, 2013



# Lower Yakima River Basin



\*Based on selected stations

January average streamflows within the basin were: Yakima River near Parker, 52%; Naches River near Naches, 53%; and Yakima River at Kiona, 67%. February 1 reservoir storage for Bumping and Rimrock reservoirs was 145,000-acre feet, 118% of average. Forecast averages for Yakima River near Parker are 95%; American River near Nile, 99%; Ahtanum Creek, 110%; and Klickitat River near Glenwood, 92%. February 1 snowpack was 106% based upon 8 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 104% of normal. Precipitation was 42% of average for January and 107% year-to-date for water. Temperatures were 2-4 degrees below normal for January and near normal for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they February 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 - February 1, 2012

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	82	96	105	92	114	128	114
	APR-SEP	88	103	113	92	123	138	123
American R nr Nile	APR-JUL	81	93	101	99	109	121	102
	APR-SEP	86	100	109	99	118	132	110
Rimrock Lake Inflow (2)	APR-JUL	151	166	176	94	186	200	187
	APR-SEP	174	192	205	93	220	235	220
Naches R nr Naches (2)	APR-JUL	515	590	645	92	700	775	700
	APR-SEP	545	635	695	91	755	845	760
Ahtanum Ck at Union Gap	APR-JUL	20	26	30	111	34	40	27
	APR-SEP	22	28	32	110	36	42	29
Yakima R nr Parker (2)	APR-JUL	1250	1440	1570	95	1700	1890	1660
	APR-SEP	1370	1580	1720	95	1860	2070	1820
Klickitat R nr Glenwood	APR-JUL	94	107	116	92	125	138	126
	APR-SEP	102	118	128	92	138	154	139
Klickitat R nr Pitt	APR-JUL	345	395	425	98	455	505	435
	APR-SEP	420	475	515	99	555	610	520

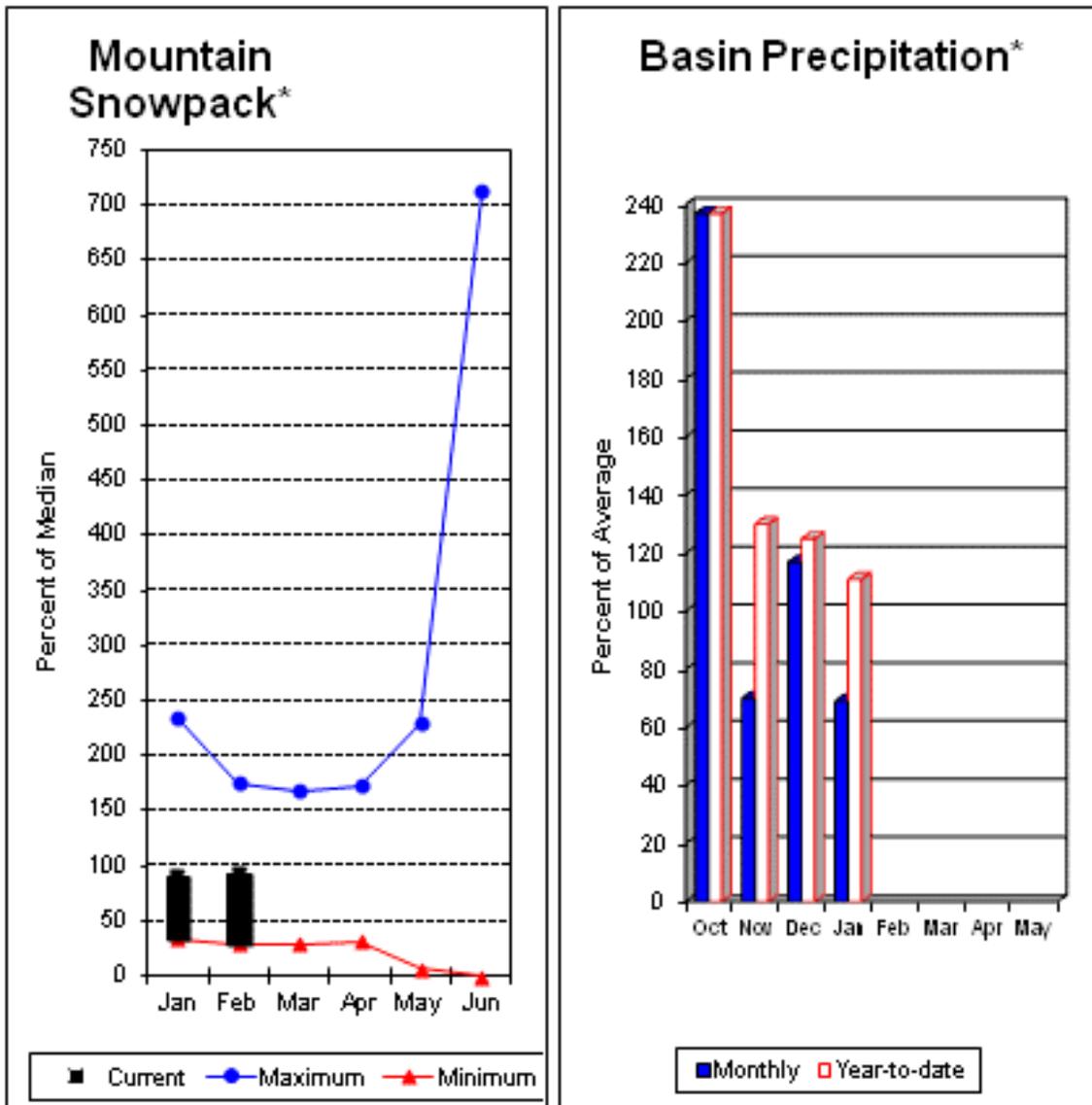
LOWER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of January					LOWER YAKIMA RIVER BASIN Watershed Snowpack Analysis - February 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
BUMPING LAKE	33.7	12.5	20.5	12.7	LOWER YAKIMA RIVER	8	100	106
RIMROCK	198.0	132.2	142.1	109.6	AHTANUM CREEK	3	98	104

\* 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 1981-2010 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

January precipitation was 69% of average, maintaining the year-to-date precipitation at 111% of average. Snowpack in the basin was 92% of normal. Streamflow forecasts are 96% of average for both Mill Creek and for the SF Walla Walla near Milton-Freewater. January streamflow was 61% of average for the SF Walla Walla River. Average temperatures were 2-4 degrees below normal for January and 1-2 degrees above average for the water year.

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

# Walla Walla River Basin

## Streamflow Forecasts - February 1, 2012

Forecast Point	Forecast Period	<<----- Drier ----->>		Future Conditions		----- Wetter ----->>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	
SF Walla Walla R nr Milton-Freewater	MAR-SEP	62	70	76	95	82	90	80
	APR-JUL	39	46	50	93	54	61	54
	APR-SEP	51	58	63	96	68	75	66
Mill Ck nr Walla Walla	APR-JUL	16.8	21	23	96	26	29	24
	APR-SEP	19.4	23	26	96	29	33	27

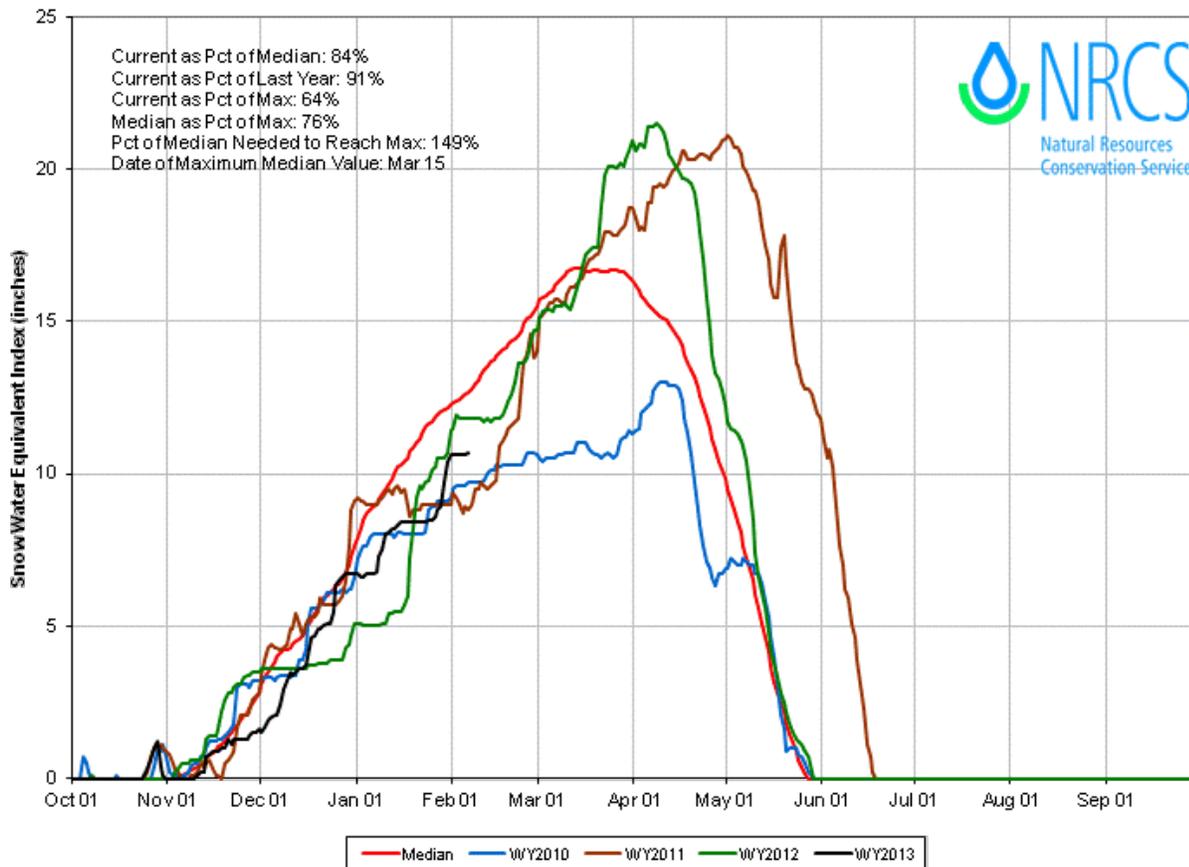
WALLA WALLA RIVER BASIN Reservoir Storage (1000 AF) - End of January					WALLA WALLA RIVER BASIN Watershed Snowpack Analysis - February 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
					WALLA WALLA RIVER	2	96	92

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

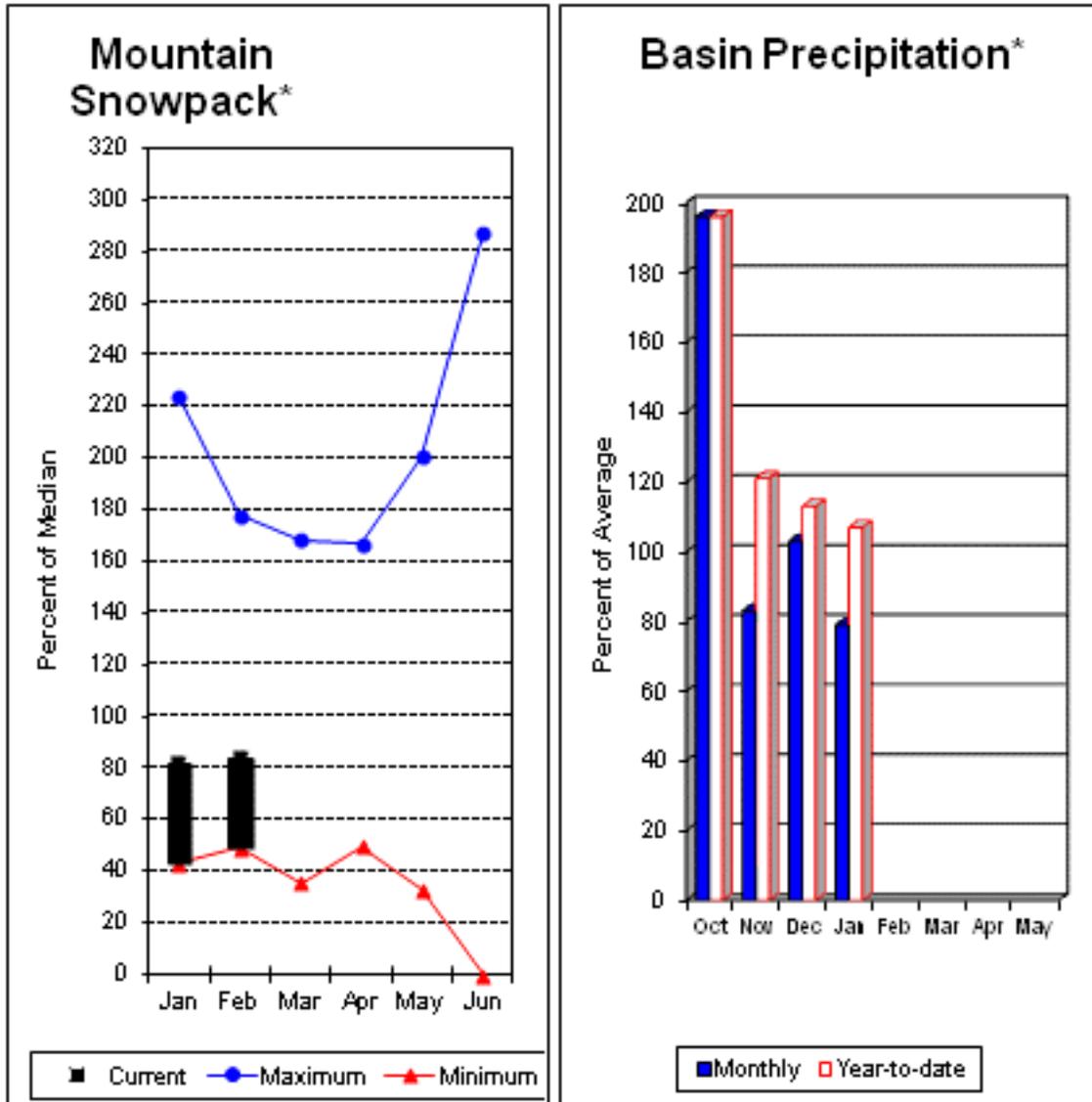
The average is computed for the 1981-2010 base period.

- (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, TOUCHET Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Feb 06, 2013*



# Lower Snake River Basin



\*Based on selected stations

The Snake and Grande Ronde rivers can expect summer flows to be about 93% and 100% of normal respectively. The forecast for Asotin Creek at Asotin predicts 106% of average flows for the April – July runoff period. January precipitation was 79% of average, bringing the year-to-date precipitation to 107% of average. February 1 snowpack readings averaged 84% of normal. January streamflow was 66% of average for Snake River below Lower Granite Dam and 61% for Grande Ronde River near Troy. Dworshak Reservoir storage was 108% of average. Average temperatures were 2-4 degrees below normal for January and 1-2 degrees above for the water year.

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

# Lower Snake River Basin

## Streamflow Forecasts - February 1, 2012

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	1100	1390	1520	101	1650	1940	1510				
	APR-SEP	900	1180	1310	100	1440	1720	1310				
Asotin Ck at Asotin	APR-JUL	22	31	37	106	43	52	35				
Clearwater R at Spalding (1,2)	APR-JUL	3590	5640	6570	95	7500	9550	6890				
	APR-SEP	4000	6050	6980	96	7910	9960	7270				
Snake R bl Lower Granite Dam (1,2)	APR-JUL	8790	15200	18100	91	21000	27400	19850				
	APR-SEP	10200	17400	20700	93	24000	31200	22280				

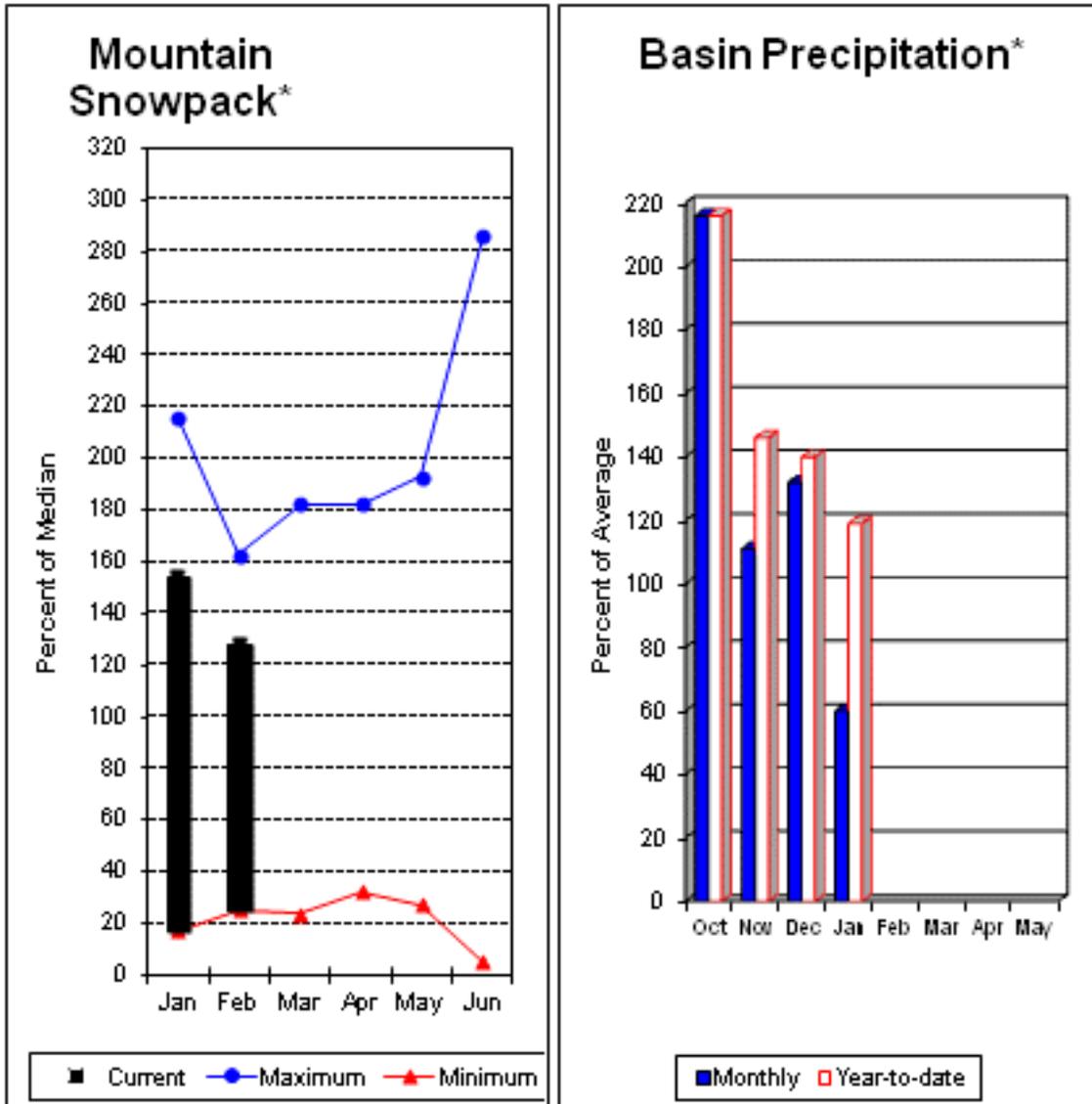
LOWER SNAKE RIVER BASIN Reservoir Storage (1000 AF) - End of January					LOWER SNAKE RIVER BASIN Watershed Snowpack Analysis - February 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
Dworshak	3468.0	2511.4	2288.9	2335.0	LOWER SNAKE, GRANDE RONDE	12	92	84

\* 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 1981-2010 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, 106% and Cowlitz River at Castle Rock, 111% of average. The Columbia at The Dalles is forecasted to have 101% of average flows this summer according to the River Forecast Center. January average streamflow for Cowlitz River was 66%. The Columbia River at The Dalles was 88% of average. January precipitation was 60% of average and the water-year average was 119%. February 1 snow cover for Cowlitz River was 128%, and Lewis River was 129% of normal. Paradise SNOTEL reported the most snow in the basin with 53.6 inches of water and 137 inches of depth. Temperatures were 2-4 degrees above normal during January and near normal for the water year.

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

# Lower Columbia River Basins

## Streamflow Forecasts - February 1, 2012

Forecast Point	Forecast Period	Future Conditions <<==== Drier ===== 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	58000	66900	73000	0	79100	88000	0.0
	APR-SEP	69400	79800	86900	0	94000		0.0
Klickitat R nr Glenwood	APR-JUL	94	107	116	92	125	138	126
	APR-SEP	102	118	128	92	138	154	139
Klickitat R nr Pitt	APR-JUL	345	395	425	98	455	505	435
	APR-SEP	420	475	515	99	555	610	520
Lewis R at Ariel (2)	APR-JUL	751	923	1040	107	1157	1329	970
	APR-SEP	882	1065	1190	106	1315	1498	1120
Cowlitz R bl Mayfield Dam (2)	APR-JUL	1444	1644	1780	110	1916	2116	1620
	APR-SEP	1649	1882	2040	111	2198	2431	1840
Cowlitz R at Castle Rock (2)	APR-JUL	2014	2244	2400	108	2556	2786	2230
	APR-SEP	2521	2639	2720	108	2801	2919	2520

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

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
MOSSYROCK	---	1123.7	1277.4	1206.0
SWIFT	---	594.5	661.6	624.9
YALE	0.0	352.3	394.0	---
MERWIN	---	400.1	412.3	400.4

### LOWER COLUMBIA RIVER BASINS Watershed Snowpack Analysis - February 1, 2013

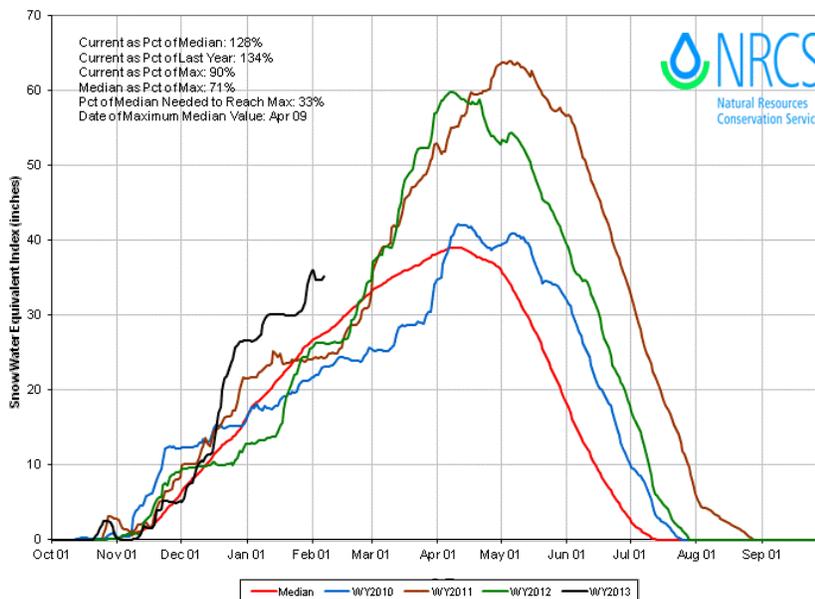
Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Median
LEWIS RIVER	5	149	129
COWLITZ RIVER	6	119	128

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

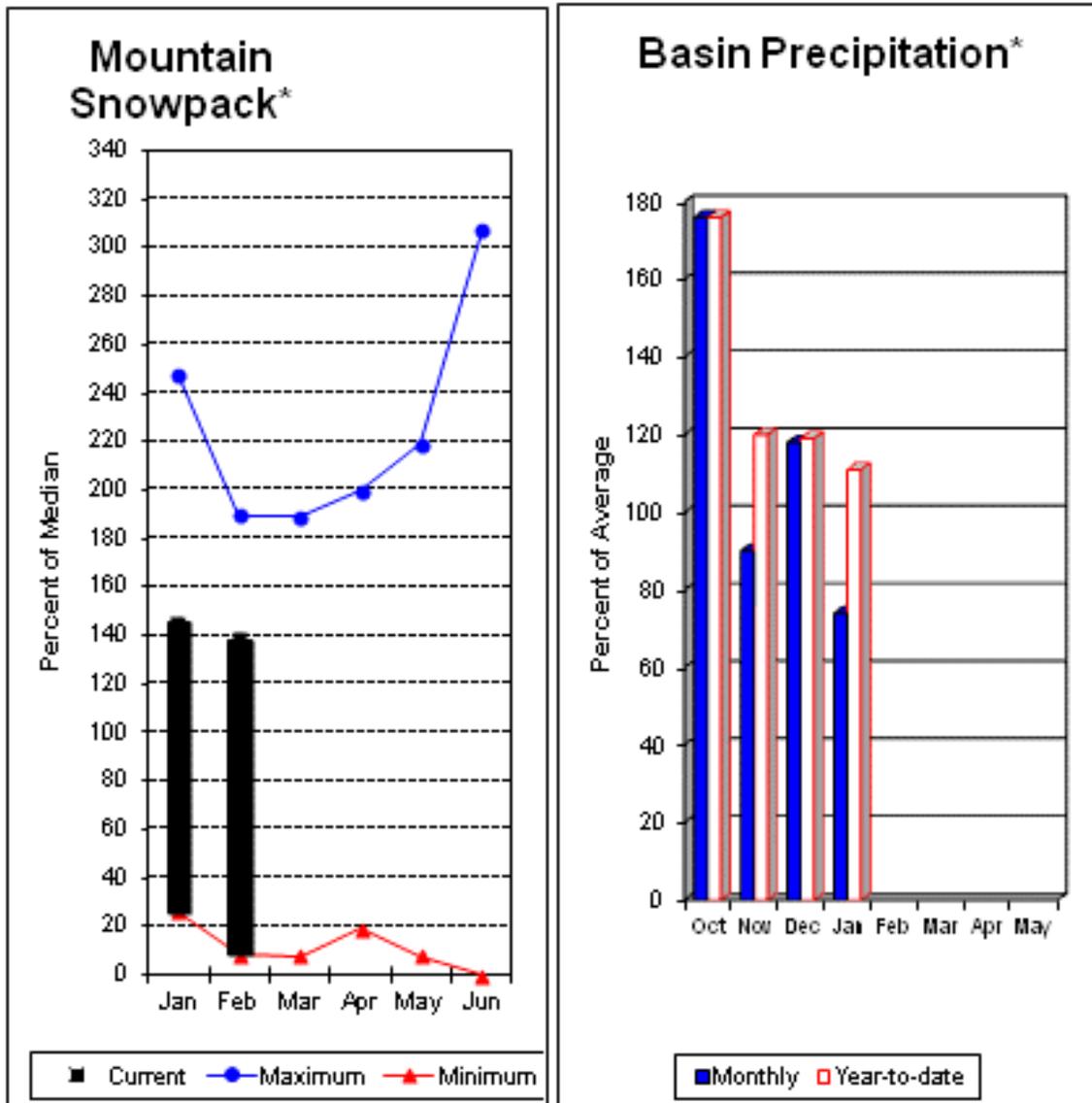
The average is computed for the 1981-2010 base period.

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

LEWIS, COWLITZ Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Feb 06, 2013



# South Puget Sound River Basins



\*Based on selected stations

Summer runoff is forecast to be 110% of normal for the Green River below Howard Hanson Dam and 112% for the White River near Buckley. February 1 snowpack was 116% of normal for the White River, 136% for Puyallup River and 161% in the Green River Basin. Water content on February 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 24.3 inches. This site has a February 1 median of 23 inches. January precipitation was 74% of average, bringing the water year-to-date to 111% of average for the basins. Average temperatures in the area were near 2-4 above normal for January and slightly below normal for the water-year.

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

# South Puget Sound River Basins

## Streamflow Forecasts - February 1, 2012

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		50%		Wetter		
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
White R nr Buckley (1)	APR-JUL	370	445	480	112	515	590	430
	APR-SEP	445	535	575	112	615	705	515
Green R bl Howard Hanson Dam (1,2)	APR-JUL	164	230	260	111	290	355	235
	APR-SEP	188	255	285	110	315	380	260

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

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

### SOUTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - February 1, 2013

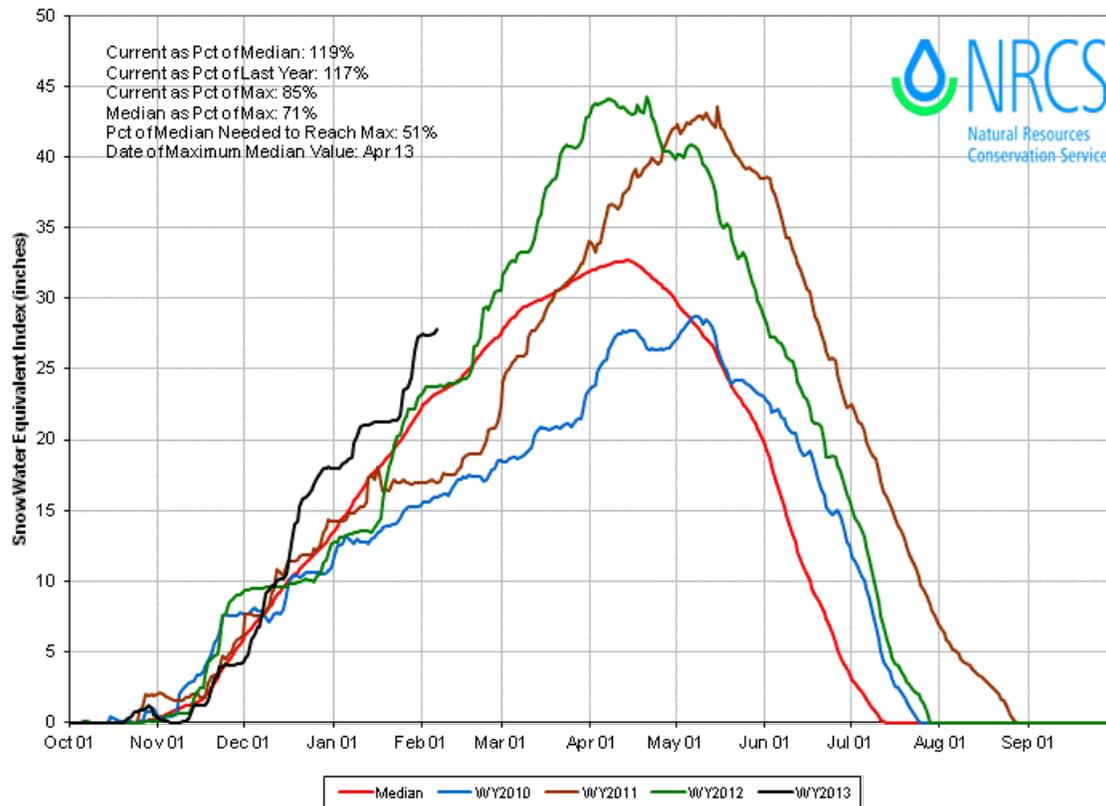
Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Median
WHITE RIVER	3	111	116
GREEN RIVER	2	108	161
PUYALLUP RIVER	5	119	136

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

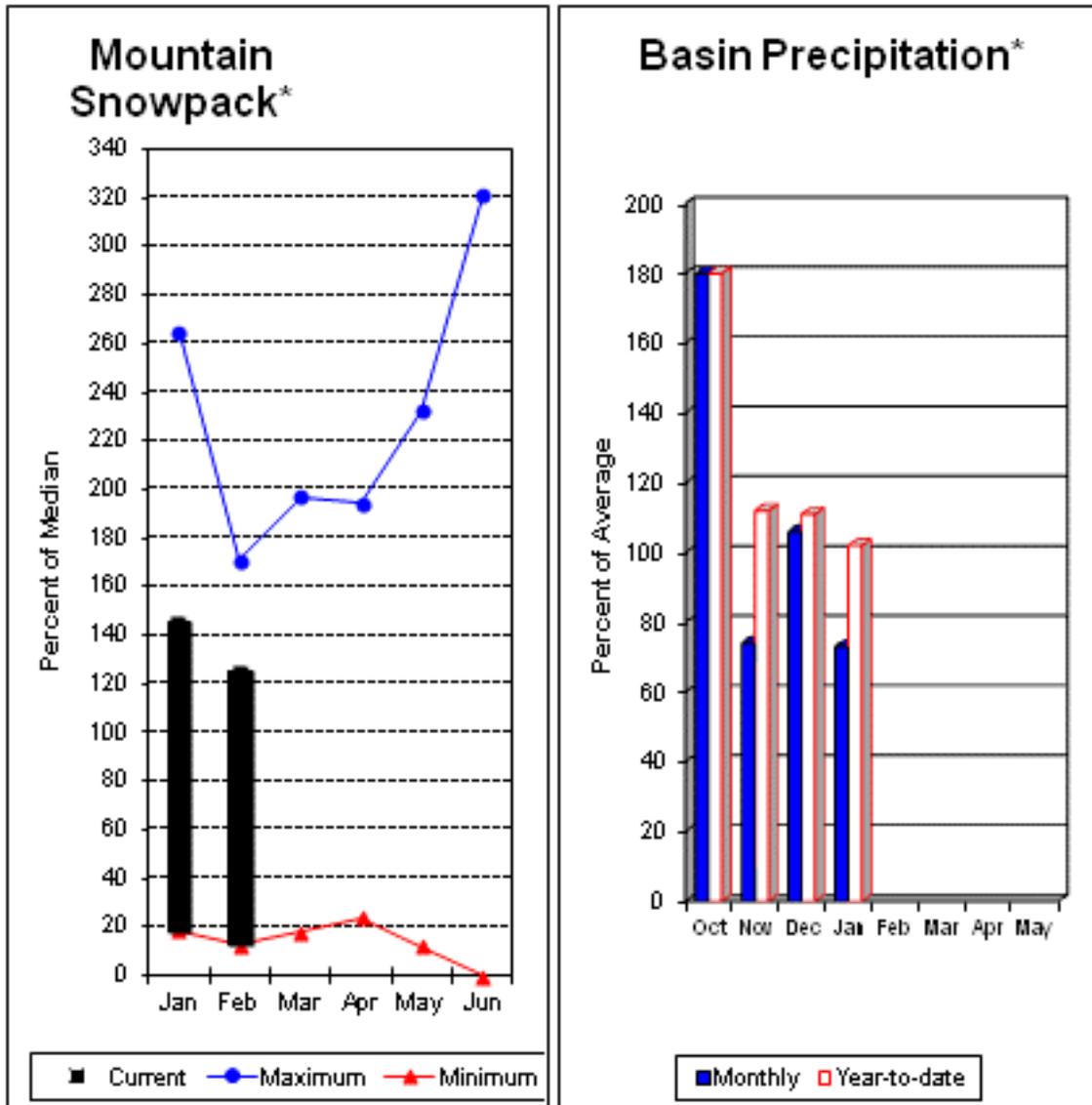
The average is computed for the 1981-2010 base period.

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

*WHITE, GREEN, PUYALLUP Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Feb 06, 2013*



# Central Puget Sound River Basins



\*Based on selected stations

Forecast for spring and summer flows are: 105% for Cedar River near Cedar Falls; 107% for Rex River; 130% for South Fork of the Tolt River; and 100% for Taylor Creek near Selleck. Basin-wide precipitation for January was 73% of average, bringing water-year-to-date to 102% of average. February 1 median snow cover in Cedar River Basin was 107%, Tolt River Basin was 146%, Snoqualmie River Basin was 133%, and Skykomish River Basin was 114%. Olallie Meadows SNOTEL site, at 3960 feet, had 37.2 inches of water content. February 1 median water content is 33 inches at Olallie Meadows. Temperatures were 2 degrees below normal for January and for the water-year.

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

# Central Puget Sound River Basins

## Streamflow Forecasts - February 1, 2012

Forecast Point	Forecast Period	Future Conditions					30-Yr Avg. (1000AF)	
		<<==== Drier =====>>		==== Wetter =====>>				
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (% AVG.)		30% (1000AF)	10% (1000AF)	
Cedar R nr Cedar Falls	APR-JUL	55	66	73	104	80	91	70
	APR-SEP	61	72	80	105	88	99	76
Rex R nr Cedar Falls	APR-JUL	17.7	23	26	108	29	34	24
	APR-SEP	21	26	29	107	32	37	27
Taylor Creek Near Selleck	APR-JUL	14.8	17.9	20	100	22	25	20
	APR-SEP	18.4	22	24	100	26	30	24
SF Tolt R nr Index	APR-JUL	14.5	16.8	18.4	130	20	22	14.2
	APR-SEP	16.8	19.3	21	130	23	25	16.1

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

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

### CENTRAL PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - February 1, 2013

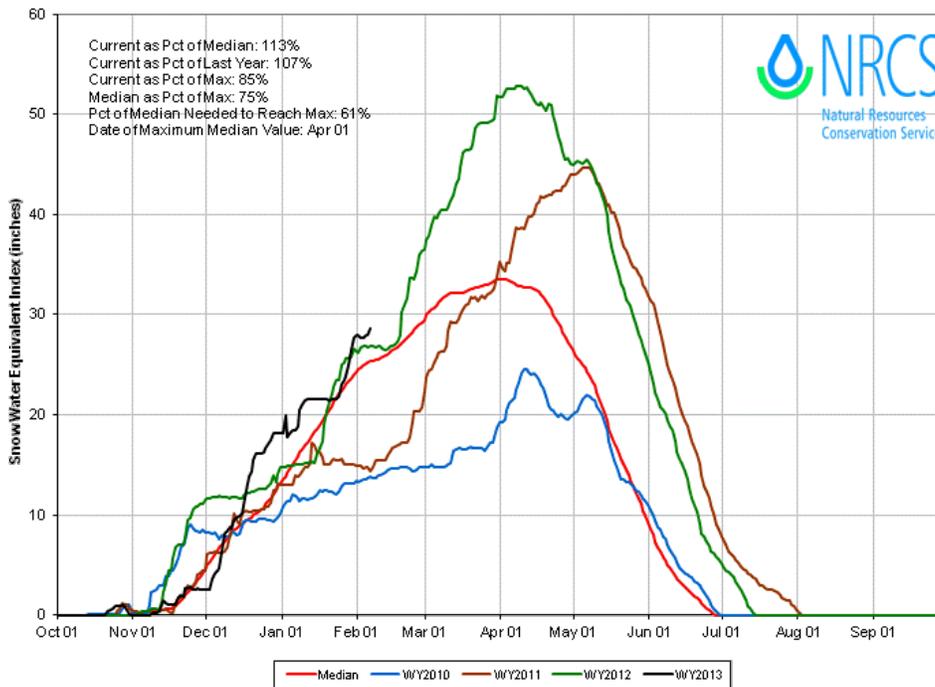
Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Median
CEDAR RIVER	4	92	107
TOLT RIVER	2	168	146
SNOQUALMIE RIVER	3	141	133
SKYKOMISH RIVER	2	148	114

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

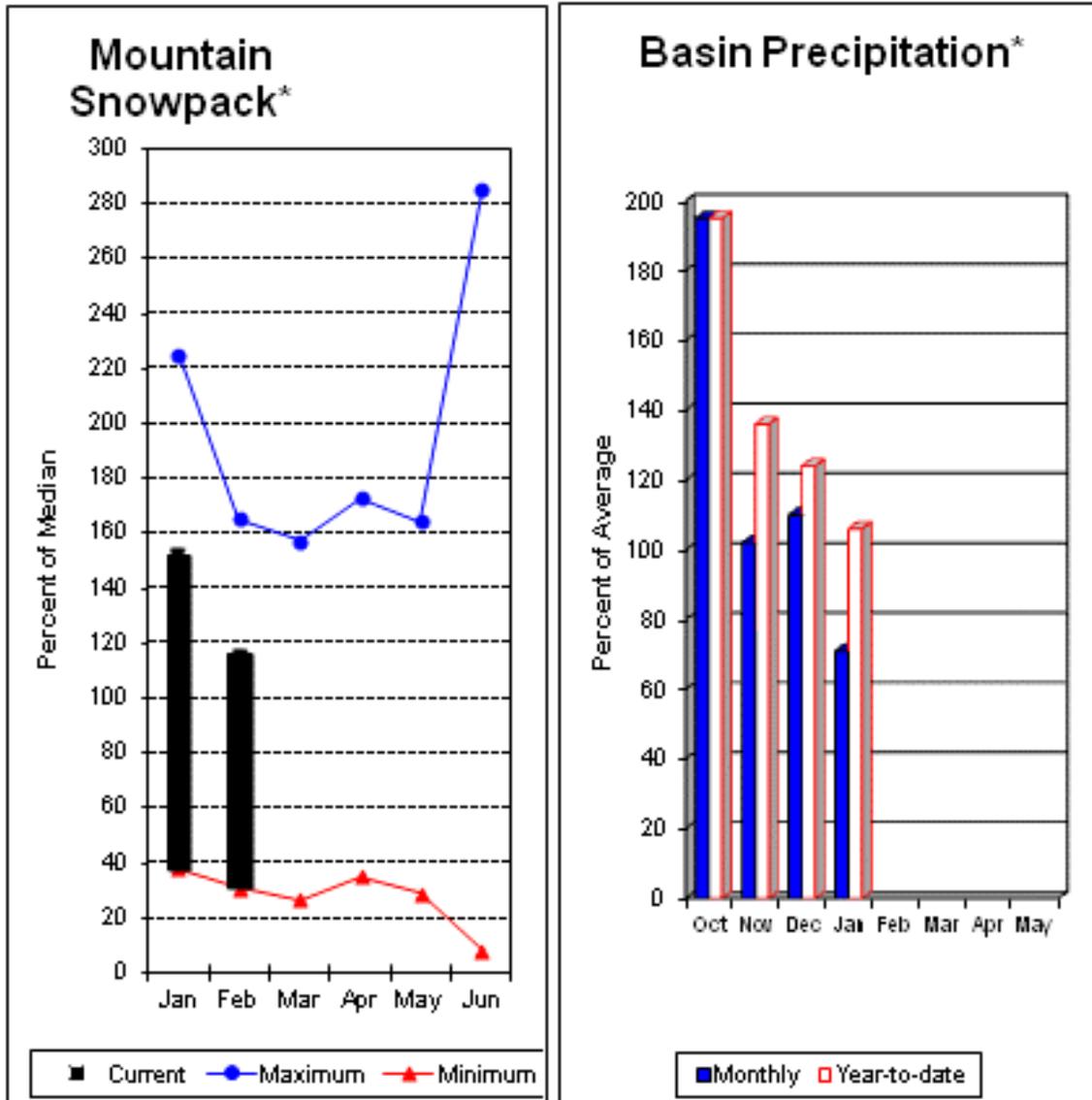
The average is computed for the 1981-2010 base period.

- (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.

CEDAR, SNOQUALMIE, SKYKOMISH Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Feb 06, 2013



# North Puget Sound River Basins



\*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 103% of average for the spring and summer period. January streamflow in Skagit River was 65% of average. Other forecast points included Baker River at 104% and Thunder Creek at 99% of average. Basin-wide precipitation for January was 71% of average, bringing water-year-to-date to 106% of average. February 1 median snow cover in Skagit River Basin was 115% and Nooksack River Basin was 118% of normal. Baker River Basin data was not available at this time. The most snow measured in the basins and in the state was at Easy Pass SNOTEL with 69.8 inches of water content, almost 30% more than any other site in the area. February 1 Skagit River reservoir storage was 86% of average and 61% of capacity. Average temperatures for were 2 degrees below normal for January and for the water year.

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

# North Puget Sound River Basins

## Streamflow Forecasts - February 1, 2012

Forecast Point	Forecast Period	Drier		Future Conditions		Wetter		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	
Thunder Ck Nr Newhalem	APR-JUL	200	220	230	98	240	260	235
	APR-SEP	290	310	325	99	340	360	330
Skagit R At Newhalem	APR-JUL	1540	1680	1770	105	1860	2000	1680
	APR-SEP	1830	1990	2090	103	2190	2350	2030
Baker R nr Concrete (2)	APR-JUL	665	750	805	103	860	945	780
	APR-SEP	865	960	1020	104	1080	1170	980

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

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
ROSS	1404.1	856.7	1003.9	996.3
DIABLO RESERVOIR	90.6	85.6	85.7	---

### NORTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - February 1, 2013

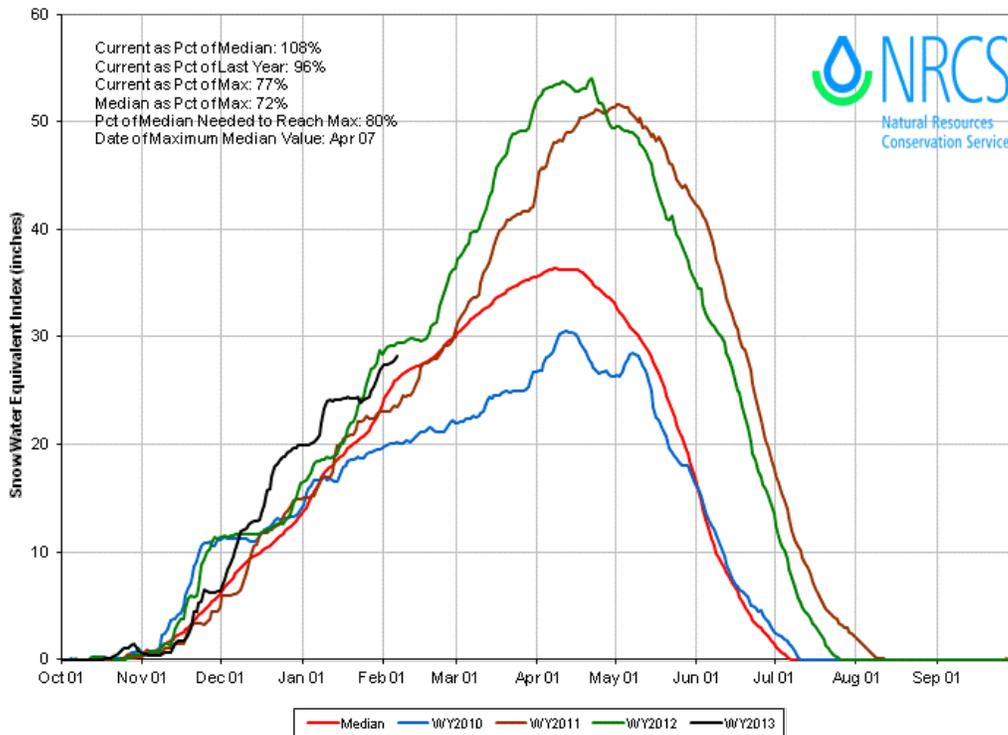
Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Median
SKAGIT RIVER	14	88	115
BAKER RIVER	0	112	0
NOOKSACK RIVER	2	106	118

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

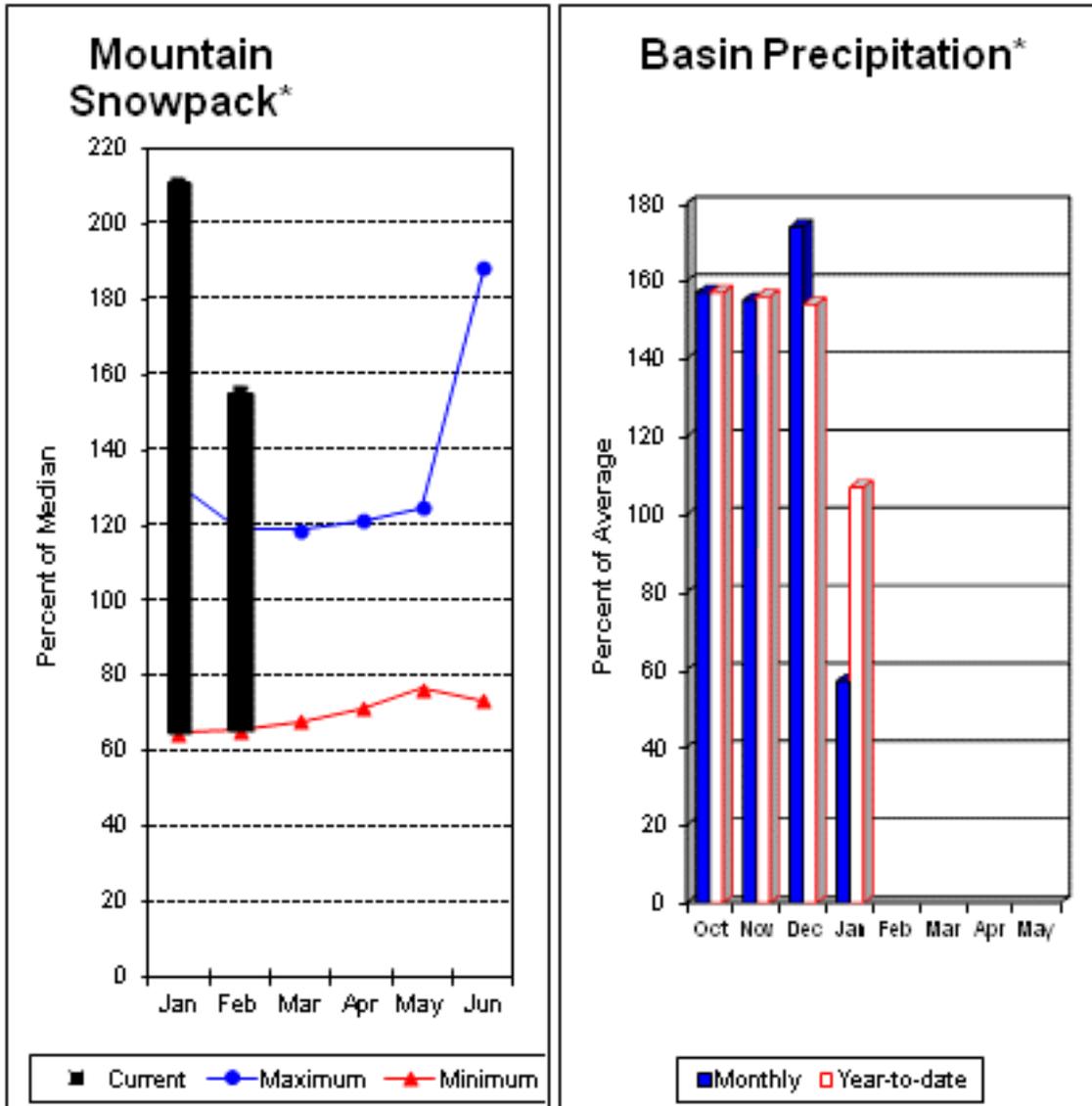
The average is computed for the 1981-2010 base period.

- (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.

**BAKER, SKAGIT, NOOKSACK Time Series Snowpack Summary**  
Based on Provisional SNOTEL data as of Feb 06, 2013



# Olympic Peninsula River Basins



\*Based on selected stations

Forecasted average runoff for streamflow for the Dungeness River is 111% and Elwha River is 117%. January runoff in the Dungeness River was 60% of normal. Big Quilcene and Wynoochee rivers should expect above average runoff this summer as well. January precipitation was 57% of average. Precipitation has accumulated at 107% of average for the water year. January precipitation at Quillayute was 10.34 inches. The 1981-2010 average for January is 14.61 inches. Olympic Peninsula snowpack averaged a whopping 155% of normal on February 1, the highest in the state but still 55% lower than last month. Temperatures were 2 degrees below average for January and closer to normal for the water year.

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

# Olympic Peninsula River Basins

## Streamflow Forecasts - February 1, 2012

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		Drier		50%		Wetter		
		90% (1000AF)	70% (1000AF)	134 (1000AF)	112 (% AVG.)	142 (1000AF)	154 (1000AF)	
Dungeness R Nr Sequim	APR-JUL	114	126	134	112	142	154	120
	APR-SEP	135	151	161	111	171	187	145
Elwha R At McDonald Bridge	APR-JUL	395	435	465	116	495	535	400
	APR-SEP	470	515	550	117	585	630	470

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

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

### OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - February 1, 2013

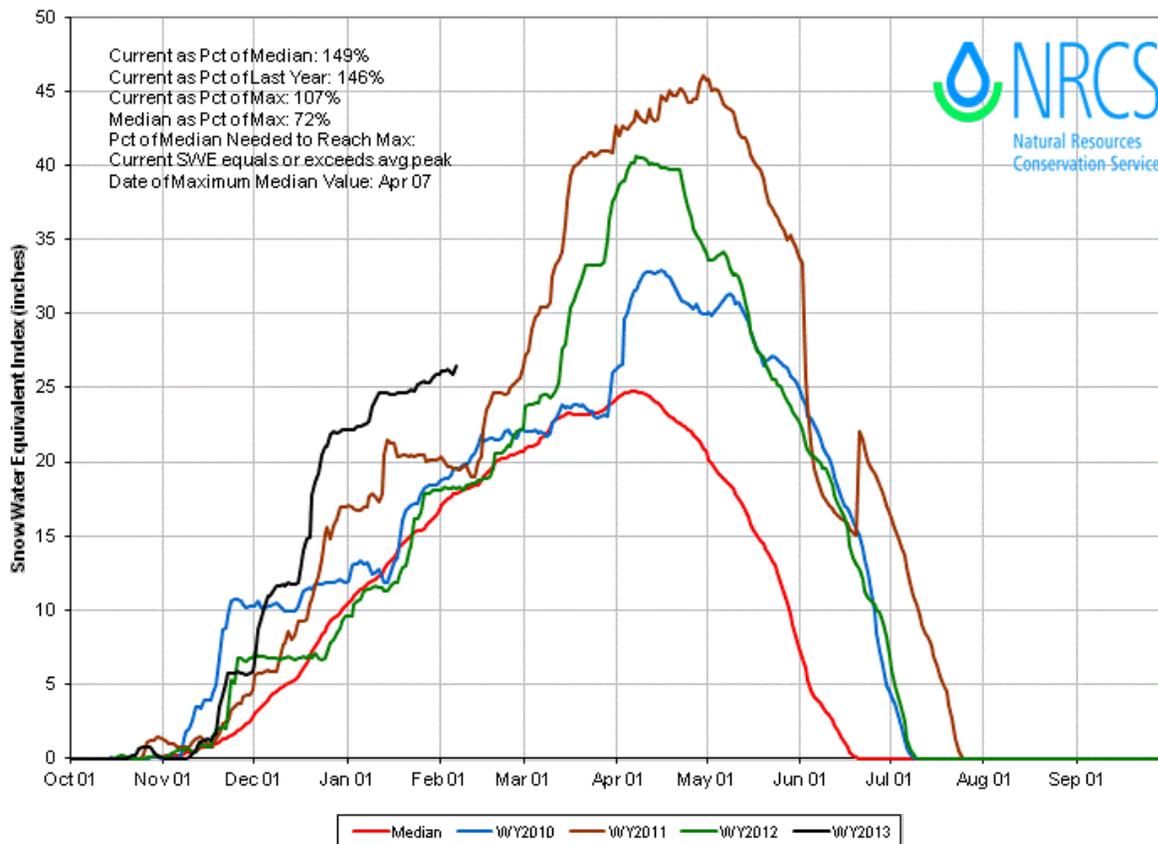
Reservoir	Watershed	Number of Data Sites	This Year as % of	
			Last Yr	Median
	OLYMPIC PENINSULA	6	146	155

\* 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 1981-2010 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.

*OLYMPIC Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Feb 06, 2013*



*Issued by*

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**U.S. Department of Agriculture**

*Released by*

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

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

<b>Canada</b>	Ministry of Sustainable Resources Snow Survey, River Forecast Centre, Victoria, British Columbia
<b>State</b>	Washington State Department of Ecology Washington State Department of Natural Resources
<b>Federal</b>	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
<b>Local</b>	City of Tacoma City of Seattle Chelan County P.U.D. Pacific Power and Light Company Puget Sound Energy 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
<b>Private</b>	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

