United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
April 1, 2013

Rimed Old Snag on Naneum Ridge, Kittitas Co. WA Corey Bonsen, Yakima, WA, 2/25/2013

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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General Outlook

Washington received normal mountain snowfall for much of March however come the final week of the month above normal temperatures dominated the region. Snow pack appears to have reached its' apex in most areas and has begun to melt and fill rivers and streams. The general rule is that April 1 usually marks the peak of snow accumulation however as with all averages we once again broke the rules with heavy mountain snowfall on April 7-8. Accumulations of up to 21 inches were reported in the south-central Cascade Range. Weather forecasts are calling for slightly below normal temperatures but equal chances of below, normal or above average precipitation over the next few months. The Climate Prediction Center has announced the continuation of Enso neutral conditions for the foreseeable future. Cooler temperatures will be good news for a slow sustainable melt cycle.

Snowpack

The April 1 statewide SNOTEL readings were 112%, down slightly from last month. Manual snow surveys found a very ripe snowpack this month with snow densities near to well above 40%, which is slightly ahead of normal. Snow typically begins the full melt phase at 47-50% density. The Lower Snake Basin reported the lowest readings at 81% of normal. Readings from the Central Puget Sound and Olympics reported the highest at 130% of normal. Westside medians from SNOTEL, and April 1 snow surveys, included the North Puget Sound river basins with 122% of normal, the Olympics 130%, South Puget river basins with 110%, and the Lewis-Cowlitz basins with 120% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 92% and the Wenatchee area with 88%. Snowpack in the Spokane and Pend Oreille basin reported 90% and 93% of the long term median respectfully. Maximum snow cover in Washington was at Easy Pass SNOTEL, with water content of 100 inches or approximately 20 feet deep. Easy Pass is only a few years old so a normal has yet to be established.

BASIN	PERCENT OF LAST YEAR	PERCENT OF MEDIAN
Spokane	65	90
Newman Lake	65	121
Pend Oreille	76	93
Okanogan	93	105
Methow	76	110
Conconully Lake	91	116
Central Columbia	69	88
Upper Yakima	64	89
Lower Yakima	68	94
Ahtanum Creek	58	88
Walla Walla	72	88
Lower Snake	66	81
Cowlitz	78	121
Lewis	81	120
White	75	101
Green	75	123
Puyallup	73	106
Cedar	68	130
Snoqualmie	90	131
Skykomish	96	131
Skagit	67	108
Baker	95	133
Nooksack	84	128
Olympic Peninsula	83	130

Precipitation

During the month of March, the National Weather Service and Natural Resources Conservation Service climate stations reported below normal precipitation in all river basins with the exception of the northwest corner and the western Olympics which reported slightly above normal. Another relatively dry month has caused water year averages to shrink further. The highest percent of average in the state was at Quillayute Airport which reported 148% of average for a total of 15.99 inches. The average for this site is 10.83 inches for March. The driest location was at Yakima Airport which received .77 inches which is still above normal. The wettest spot in the state was reported at Skookum Creek SNOTEL in the Tolt River Basin with a March accumulation of 19.2 inches or 127% of normal. April started dry and warm but soon switched gears to cool and rainy.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	85	99
Pend Oreille	92	111
Upper Columbia	64	107
Central Columbia	81	97
Upper Yakima	89	94
Lower Yakima	67	96
Walla Walla	78	102
Lower Snake	66	95
Lower Columbia	64	105
South Puget Sound	75	101
Central Puget Sound	106	104
North Puget Sound	111	106
Olympic Peninsula	90	105

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 624,000-acre feet, 122% of average for the Upper Reaches and 166,000-acre feet or 110% of average for Rimrock and Bumping Lakes. Storage at the Okanogan reservoirs was 96% of average for April 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 138,000 acre feet, 83% of average and 58% of capacity; and the Skagit River reservoirs at 42% of average and 80% 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	58	83
Pend Oreille	57	113
Upper Columbia	79	92
Central Columbia	N/A	N/A
Upper Yakima	75	122
Lower Yakima	72	110
Lower Snake	81	116
North Puget Sound	42	80

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

Streamflow

Forecasts vary from 80% of average for streams in the Spokane and Central Columbia basins to 137% of average for S.F. Tolt River near Index. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 109%; White River, 99%; and Skagit River, 98%. Some Eastern Washington streams include the Yakima River near Parker, 87%: Wenatchee River at Plain, 88%; and Kettle near Laurier, 109%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS.

For the most part runoff was near normal as temperatures began to rise and snowmelt began to fill streams. The Skagit River had the highest reported flows with 115% of average. The Grand Ronde at Troy with 81% of average had the least non-regulated runoff. Other streamflows were the following percentage of average as reported by the River Forecast Center: the Cowlitz at Castle Rock, 90%; the Columbia below Rock Island Dam, 94%; the Priest River, 81% and the Dungeness River, 77%.

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	80-91
Pend Oreille	93-99
Upper Columbia	82-109
Central Columbia	80-97
Upper Yakima	84-88
Lower Yakima	86-97
Walla Walla	91-93
Lower Snake	79-94
Lower Columbia	90-114
South Puget Sound	99-102
Central Puget Sound	100-137
North Puget Sound	97-98
Olympic Peninsula	108-112

STREAM	PERCENT OF AVERAGE MARCH STREAMFLOWS
Pend Oreille Below Box Canyon	77
Kettle at Laurier	65
Columbia at Birchbank	95
Spokane at Long Lake	65
Similkameen at Nighthawk	74
Okanogan at Tonasket	110
Methow at Pateros	105
Chelan at Chelan	66
Wenatchee at Pashastin	59
Cle Elum near Roslyn	49
Yakima at Parker	54
Naches at Naches	46
Grande Ronde at Troy	61
Snake below Lower Granite Dam	68
SF Walla Walla near Milton-Freewater, OR	82
Columbia River at The Dalles	78
Cowlitz below Mayfield Dam	71
Skagit at Concrete	64
Dungeness near Sequim	83

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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 March 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	70
Pend Oreille	79
Upper Columbia	73
Central Columbia	74
Upper Yakima	86
Lower Yakima	85
Walla Walla	80
Lower Snake	80
Lower Columbia	86
South Puget Sound	82
Central Puget Sound	N/A
North Puget Sound	91
Olympic Peninsula	45

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 81st 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 15th 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 18th 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.

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

APRIL 2013

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
ABERDEEN LAKE CAN.	4000	3/26/13	18	5.7	6.0	5.6
AHTANUM R.S.	3100	3/26/13	0	.0	.0	2.8
ALPINE MEADOWS	3500	4/01/13	133	59.8	60.2	40.2
ALPINE MEADOWS SNTL	3500	4/01/13	135	73.7	67.4	51.0
AMBROSE	6480	3/24/13	41	9.9	14.2	10.4
ASHLEY DIVIDE	4820	3/25/13	12	2.8	6.6	4.4
BADGER PASS SNOTEL	6900	4/01/13	80	32.3	42.3	29.8
BAIRD #2	3220	3/28/13	17	5.6	6.4	6.8
BAREE CREEK	5500	3/26/13	93	36.7	42.7	34.9
BAREE MIDWAY	4600	3/26/13	70	25.5	36.0	27.8
BAREE TRAIL	3800	3/26/13	23	7.8	12.2	7.2
BARKER LAKES SNOTEL	8250	4/01/13	42	12.0	13.6	13.9
BARNES CREEK CAN.	5320	3/28/13	52	18.8	22.3	20.4
BASIN CREEK SNOTEL	7180	4/01/13	25	6.0	6.4	7.5
BASSOO PEAK	5150	3/28/13	20	6.6	10.5	7.8
BEAVER CREEK TRAIL	2200	3/31/13	34	12.8	25.2	9.2
BEAVER PASS	3680	3/29/13	86	37.0	42.2	26.0
BEAVER PASS SNOTEL	3630	4/01/13	101	44.6	60.4	32.8
BLACK MOUNTAIN	7750	3/22/13	43	11.3	15.5	14.1
BLACK PINE SNOTEL	7100	4/01/13	25	7.9	13.2	9.6
BLEWETT PASS#2SNOTEL	4240	4/01/13	11	6.0	19.5	13.9
BONAUPART SOUTH	4660	3/29/13	18	5.6	5.7	--
BRENDA MINE CAN.	4450	3/27/13	33	10.0	11.6	12.5
BROOKMERE CAN.	3000	3/31/13	18	5.7	8.8	7.9
BROWN TOP AM	6000	3/29/13	131	54.4	73.1	53.4
BROWNS PASS		3/27/13	4	1.5	2.1	--
BRUSH CREEK TIMBER	5000	3/28/13	30	10.0	15.7	6.1
BUCKINGHORSE SNOTEL	4870	4/01/13	137	64.5	84.3	--
BULL MOUNTAIN	6600	3/28/13	17	6.1	4.4	5.6
BUMPING LAKE (NEW)	3400	4/01/13	30	12.5	23.9	15.8
BUMPING RIDGE SNOTEL	4610	4/01/13	57	22.0	37.8	25.8
BUNCHGRASS MDWSNOTEL	5000	4/01/13	63	23.0	33.6	26.2
BURNT MOUNTAIN PIL	4170	4/01/13	55	21.7	28.9	16.3
BUTTE CREEK #2		3/27/13	23	7.4	7.9	--
BUTTERMILK BUTTE	5250	3/26/13	40	13.0	15.4	--
CALAMITY SNOTEL	2500	4/01/13	0	.0	3.9	--
CAYUSE PASS SNOTEL	5240	4/01/13	135	59.1	75.7	--
CHESSMAN RESERVOIR	6200	3/27/13	14	4.8	5.5	2.6
CHEWALAH #2	4930	3/25/13	46	15.9	20.5	16.3
CHICKEN CREEK	4060	3/28/13	42	16.4	18.6	13.8
CHIWAUKUM G.S.	2500	3/26/13	15	4.2	--	7.9
CITY CABIN	2390	4/01/13	17	8.5	21.0	8.5
COLD CREEK STRIP	6020	3/27/13	36	10.8	9.5	8.5
COLOCKUM PASS	5370	3/26/13	37	13.0	16.2	15.0
COMBINATION SNOTEL	5600	4/01/13	8	2.8	2.9	4.2
COPPER BOTTOM SNOTEL	5200	4/01/13	0	.0	5.5	--
COPPER MOUNTAIN	7700	3/25/13	33	7.0	8.7	9.9
CORRAL PASS SNOTEL	5800	4/01/13	78	31.9	44.0	33.7
COTTONWOOD CREEK	6400	3/22/13	23	6.1	8.0	7.3
COUGAR MTN. SNOTEL	3200	4/01/13	47	23.3	27.3	14.1
COX VALLEY	4500	3/28/13	99	42.4	51.1	36.0
DALY CREEK SNOTEL	5780	4/01/13	24	8.1	11.2	9.6
DEER PARK	5200	3/29/13	53	21.3	--	16.7
DESERT MOUNTAIN	5600	3/26/13	42	13.2	14.8	12.6
DEVILS PARK	5900	3/30/13	90	38.6	57.9	38.7
DISAUTEL PASS		3/26/13	16	5.1	5.8	--
DISCOVERY BASIN	7050	3/27/13	27	7.6	11.8	9.2
DIX HILL	6400	3/30/13	18	6.0	10.4	9.1
DOMMERIE FLATS	2200	4/01/13	0	.0	6.1	.0
DUNCAN RIDGE	5370	3/27/13	20	6.6	7.0	4.7
DUNGENESS SNOTEL	4010	4/01/13	25	11.8	15.6	5.4
EL DORADO MINE	7800	3/26/13	32	8.7	16.3	17.4
ELBOW LAKE SNOTEL	3200	4/01/13	---	48.0	57.7	36.9
EMERY CREEK SNOTEL	4350	4/01/13	---	13.3	14.6	13.7
ESPERON CK. MID CAN.	4250	3/31/13	37	13.6	11.6	14.6
ESPERON CK. UP CAN.	5050	3/31/13	46	16.3	15.1	17.1
FARRON CAN.	4000	3/28/13	31	10.2	12.2	12.5
FATTY CREEK	5500	3/27/13	64	21.1	26.8	21.2
FISH LAKE	3370	4/01/13	62	27.6	39.1	27.4
FISH LAKE SNOTEL	3430	4/01/13	63	25.9	41.1	29.8
FLATTOP MTN SNOTEL	6300	4/01/13	125	48.1	53.4	42.0
FLEECER RIDGE	7500	3/28/13	27	7.8	10.2	9.5
FOURTH OF JULY SUM	3200	3/29/13	9	3.4	10.6	3.4
FREEZEOUT CK. TRAIL	3500	3/29/13	28	11.3	21.9	9.6
FROHNER MDWS SNOTEL	6480	4/01/13	19	6.5	9.1	7.4
FROST MEADOWS	4630	3/29/13	44	17.0	24.4	16.5
GOAT CREEK	3600	3/27/13	17	4.9	6.4	2.8
GOLD MTN LOOKOUT		3/28/13	20	7.6	15.2	--
GRAVE CRK SNOTEL	4300	4/01/13	37	14.3	18.3	13.8
GREEN LAKE SNOTEL	5920	4/01/13	66	24.2	38.1	22.3
GREYBACK RES CAN.	4700	3/26/13	36	10.0	--	9.2
GRIFFIN CR DIVIDE	5150	3/28/13	22	6.3	9.7	8.4
GROUSE CAMP SNOTEL	5390	4/01/13	24	12.6	26.4	18.0
HAMILTON HILL CAN.	4550	3/30/13	25	8.5	14.4	14.0
HAND CREEK SNOTEL	5030	4/01/13	19	7.2	12.9	11.1
HARTS PASS SNOTEL	6490	4/01/13	83	43.8	52.7	41.2
HARTS PASS	6500	3/30/13	96	41.7	--	36.7
HELL ROARING DIVIDE	5770	3/26/13	72	26.1	29.8	25.8
HERRIG JUNCTION	4850	3/28/13	60	22.8	27.1	24.1
HIGH RIDGE SNOTEL	4920	4/01/13	49	19.2	24.9	20.7
HOLBROOK	4530	3/30/13	12	4.1	5.9	6.8
HOODOO BASIN SNOTEL	6050	4/01/13	105	36.6	48.6	38.9
HUCKLEBERRY SNOTEL	2250	4/01/13	0	.0	3.4	.0
HUMBOLDT GLCH SNOTEL	4250	4/01/13	30	9.5	18.4	9.1
HURRICANE	4500	3/26/13	59	23.1	--	15.0
INDIAN ROCK SNOTEL	5360	4/01/13	54	23.7	42.6	--
IRENE'S CAMP	5530	3/27/13	33	9.0	10.2	8.6
ISINTOK LAKE CAN.	5100	3/28/13	23	7.0	7.9	7.2
JUNE LAKE SNOTEL	3440	4/01/13	106	53.7	60.2	34.5
KELLER RIDGE	3700	3/27/13	10	3.8	4.7	--
KELLOGG PEAK	5560	3/29/13	47	18.3	25.7	24.7
KISHENEHN	3890	3/27/13	22	7.2	9.5	6.6
KLESILKWA CAN.	3450	3/27/13	35	12.0	--	11.5
KRAFT CREEK SNOTEL	4750	4/01/13	26	9.6	13.4	--
LAMB BUTTE		3/25/13	42	16.0	20.5	--
LIGHTNING LAKE CAN.	3700	3/29/13	33	11.0	17.5	12.0
LOGAN CREEK	4300	3/28/13	19	4.2	7.8	5.8
LOLO PASS SNOTEL	5240	4/01/13	58	21.9	31.8	27.1
LONE PINE SNOTEL	3930	4/01/13	97	49.3	57.2	35.2
LOOKOUT SNOTEL	5140	4/01/13	59	22.5	34.0	26.2
LOST HORSE MTN CAN.	6300	3/31/13	33	9.8	9.6	9.4
LOST HORSE SNOTEL	5120	4/01/13	36	14.4	27.9	18.6
LOST LAKE SNOTEL	6110	4/01/13	107	41.8	58.7	52.3
LOST LAKE	4070	3/29/13	20	6.1	6.4	--
LOUP LOUP CAMPGROUND		3/28/13	25	8.6	8.2	--
LOWER SANDS CREEK #2	3120	3/29/13	46	17.2	23.8	16.9
LUBRECHT FOREST NO 3	5450	3/29/13	8	2.3	4.8	4.6
LUBRECHT FOREST NO 4	4650	3/29/13	0	.0	.6	.4
LUBRECHT FOREST NO 6	4040	3/29/13	0	.0	1.1	.6
LUBRECHT HYDROPLOT	4200	3/29/13	0	.0	3.7	.6
LUBRECHT SNOTEL	4680	4/01/13	0	.0	4.0	1.6
LYMAN LAKE SNOTEL	5980	4/01/13	130	54.4	66.2	57.6
LYNN LAKE	4000	4/01/13	78	33.0	37.6	18.0
LYNN LAKE SNOTEL	3900	4/01/13	78	33.5	37.6	--
MARIAS PASS	5250	3/30/13	38	14.2	19.2	14.4
MARTEN RIDGE SNOTEL	3520	4/01/13	136	71.5	88.2	--
MAZAMA		3/28/13	6	2.6	9.6	--
MCCULLOCH CAN.	4200	3/28/13	21	6.6	7.4	6.1
MEADOWS CABIN	1900	3/31/13	0	.0	8.4	.6
MEADOWS PASS SNOTEL	3230	4/01/13	70	33.1	46.5	20.6
METEOR		3/28/13	0	.0	3.3	--
M F NOOKSACK SNOTEL	4970	4/01/13	140	70.3	84.8	59.1
MICA CREEK SNOTEL	4510	4/01/13	45	18.7	25.5	20.3
MINERAL CREEK	4000	4/01/13	29	11.0	15.4	15.4
MISSEZULA MTN CAN.	5080	3/31/13	25	6.6	9.7	9.5
MISSION RIDGE	5000	3/26/13	40	14.2	15.6	15.4
MONASHEE PASS CAN.	4500	3/28/13	35	11.6	--	13.5
MORSE LAKE SNOTEL	5410	4/01/13	108	55.2	70.8	52.3
MOSES MOUNTAIN (2)	4800	3/28/13	49	17.9	21.0	13.4
MOSES MTN SNOTEL	5010	4/01/13	46	19.9	18.5	14.6
MOSES PEAK	6650	3/28/13	75	30.3	29.3	20.1
MOSQUITO RDG SNOTEL	5200	4/01/13	77	32.4	47.8	31.6
MOUNT CRAG SNOTEL	3960	4/01/13	89	35.2	45.3	28.5
MT. KOBAU CAN.	5500	3/27/13	50	19.7	12.3	12.5
MOUNT TOLMAN	2000	3/29/13	0	.0	.0	.0
MOWICH SNOTEL	3160	4/01/13	0	.0	1.3	.0
MOUNT GARDNER	3300	4/01/13	35	15.8	24.7	9.5
MOUNT GARDNER SNOTEL	2920	4/01/13	41	16.6	24.5	12.9
MUTTON CREEK #1	5700	3/26/13	44	15.8	16.6	12.8
N.F. ELK CR SNOTEL	6250	4/01/13	28	8.3	14.2	10.6
NEVADA RIDGE SNOTEL	7020	4/01/13	40	12.3	20.3	13.9
NEW HOZOMEEN LAKE	2800	3/29/13	12	5.2E	16.7	7.0
NEZ PERCE CMP SNOTEL	5650	4/01/13	36	11.9	14.4	13.0
NOISY BASIN SNOTEL	6040	4/01/13	102	40.9	39.5	39.3
NORTH FORK JOCKO	6330	3/27/13	100	40.4	40.4	38.4
OLALLIE MDWS SNOTEL	4030	4/01/13	115	56.0	75.1	50.0
OPHIR PARK	7150	3/30/13	32	9.6	15.8	14.8
OYAMA LAKE CAN.	4100	3/28/13	19	5.4	6.8	6.7
PARADISE SNOTEL	5130	4/01/13	146	78.2	82.2	67.0
PARK CK RIDGE SNOTEL	4600	4/01/13	87	47.1	59.1	44.4
PEPPER CREEK SNOTEL	2140	4/01/13	12	5.5	9.9	--
PETERSON MDW SNOTEL	7200	4/01/13	32	8.5	10.2	9.6
PETTIJOHN CREEK	4300	3/29/13	16	5.4	6.1	--
PIGTAIL PEAK SNOTEL	5800	4/01/13	112	49.8	75.8	50.2
PIKE CREEK SNOTEL	5930	4/01/13	29	8.2	15.0	22.9
PIPESTONE PASS	7200	3/25/13	18	4.7	3.8	4.6
POPE RIDGE SNOTEL	3590	4/01/13	35	13.4	23.2	15.8
POTATO HILL SNOTEL	4510	4/01/13	78	30.1	43.6	24.9
QUARTZ PEAK SNOTEL	4700	4/01/13	41	16.0	28.0	18.9
RAGGED MTN SNOTEL	4210	4/01/13	43	17.9	29.8	20.7
RAGGED RIDGE	3330	3/26/13	11	4.4	6.9	1.0
RAINY PASS SNOTEL	4890	4/01/13	73	33.5	50.3	36.5
RAINY PASS	4780	3/30/13	71	31.2	51.1	--
REX RIVER SNOTEL	3810	4/01/13	92	43.3	58.0	34.7

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
ROCKER PEAK SNOTEL	8000	4/01/13	40	10.8	15.2	12.4
ROLAND SUMMIT	5120	3/28/13	77	30.0	42.7	31.0
ROUND TOP MTN	4020	3/26/13	30	11.6	17.0	--
RUSTY CREEK	4000	3/26/13	17	5.7	5.5	4.9
SADDLE MTN SNOTEL	7900	4/01/13	57	20.1	26.1	22.9
SALMON MDWS SNOTEL	4460	4/01/13	25	9.7	12.1	9.1
SASSE RIDGE SNOTEL	4340	4/01/13	67	28.1	43.1	31.4
SATUS PASS	4030	3/26/13	19	7.1	12.0	7.0
SAVAGE PASS SNOTEL	6170	4/01/13	---	23.3	30.6	24.4
SAWMILL RIDGE SNOTEL	4640	4/01/13	78	37.6	57.6	--
SENTINEL BT SNOTEL	4680	4/01/13	28	8.8	9.8	8.1
SHEEP CANYON SNOTEL	3990	4/01/13	105	46.1	55.6	33.9
SHERWIN SNOTEL	3200	4/01/13	---	3.7	10.4	6.6
SILVER STAR MTN CAN.	5600	3/29/13	81	33.9	29.1	29.9
SKALKAHO SNOTEL	7260	4/01/13	50	17.9	24.7	21.4
SKITWISH RIDGE	5110	3/29/13	68	27.8	39.6	28.6
SKOOKUM CREEK SNOTEL	3310	4/01/13	93	54.0	57.2	29.3
SKOOKUM LAKES	4230	3/28/13	30	10.9	17.6	--
SLIDE ROCK MOUNTAIN	7100	3/26/13	45	13.6	18.4	12.9
SOURDOUGH GUL SNOTEL	4000	4/01/13	0	.0	.0	.0
SOUTH BALDY	4920	3/28/13	45	15.7	25.0	--
SPENCER MDW SNOTEL	3400	4/01/13	69	31.6	43.0	29.4
SPIRIT LAKE SNOTEL	3520	4/01/13	---	15.6	17.8	1.2
SPOTTED BEAR MTN.	7000	4/02/13	24	8.8	15.0	12.2
SPRUCE SPGS SNOTEL	5700	4/01/13	24	9.0	20.3	13.8
STARVATION MOUNTAIN	6750	3/26/13	55	22.0	22.1	15.3
STAHL PEAK SNOTEL	6030	4/01/13	93	34.5	38.9	33.3
STAMPEDE PASS SNOTEL	3850	4/01/13	79	32.9	47.6	40.3
STEMPLE PASS	6600	3/28/13	31	8.1	12.7	8.3
STEVENS PASS SNOTEL	3950	4/01/13	96	34.9	48.1	37.0
STORM LAKE	7780	3/25/13	40	10.5	13.1	12.6
STRANGER MOUNTAIN	4230	3/25/13	28	11.0	14.7	10.5
STRYKER BASIN	6180	3/28/13	86	33.4	35.9	28.2
SUMMERLAND RES CAN.	4200	3/28/13	27	8.9	9.4	8.9
SUMMIT G.S. #2	4600	3/27/13	34	10.2	10.2	8.9
SUNSET SNOTEL	5540	4/01/13	47	17.9	27.2	21.4
SURPRISE LKS SNOTEL	4290	4/01/13	105	46.5	60.6	45.5
SWAMP CREEK SNOTEL	3930	4/01/13	34	15.4	30.7	17.4
SWIFT CREEK SNOTEL	4440	4/01/13	144	70.0	81.5	61.0
TEN MILE LOWER	6600	3/25/13	27	7.6	8.9	5.7
TEN MILE MIDDLE	6800	3/25/13	35	8.8	11.4	9.8
THUNDER BASIN SNOTEL	4320	4/01/13	65	28.9	39.6	29.7
THUNDER BASIN	4200	3/31/13	51	21.0	29.6	20.0
THOMPSON CREEK	2500	3/26/13	12	3.7	3.3	.0
THOMPSON RIDGE	4650	3/25/13	30	11.0	14.6	--
TINKHAM CREEK SNOTEL	2990	4/01/13	70	28.8	41.0	26.2
TOATS COULEE	2850	3/27/13	8	2.6	2.6	.1
TOUCHET SNOTEL	5530	4/01/13	55	25.4	37.3	30.1
TRINKUS LAKE	6100	4/01/13	---	39.4E	42.6	37.2
TROUGH #2 SNOTEL	5480	4/01/13	22	8.2	16.6	8.2
TROUT CREEK CAN.	5650	3/27/13	26	8.2	9.8	7.2
TRUMAN CREEK	4060	3/25/13	6	1.5	5.9	2.5
TUNNEL AVENUE	2450	4/02/13	26	10.3	21.7	16.4
TWELVEMILE SNOTEL	5600	4/01/13	28	9.2	21.5	14.5
TWIN LAKES SNOTEL	6400	4/01/13	74	31.5	43.0	35.4
UPPER HOLLAND LAKE	6200	3/27/13	83	30.3	30.5	29.6
UPPER WHEELER SNOTEL	4330	4/01/13	21	7.9	11.6	12.2
VASEUX CREEK CAN.	4250	3/27/13	16	4.1	--	6.2
VULCAN MTN	4660	3/27/13	38	11.5	11.4	--
VULCAN ROAD	3840	3/27/13	26	8.1	8.2	--
WARM SPRINGS SNOTEL	7800	4/01/13	53	16.0	23.6	19.0
WATERHOLE SNOTEL	5010	4/01/13	100	49.0	55.3	39.4
WEASEL DIVIDE	5450	3/28/13	84	27.5	37.9	29.0
WELLS CREEK SNOTEL	4030	4/01/13	94	41.9	49.0	29.0
WHITE PASS ES SNOTEL	4440	4/01/13	52	21.3	34.4	21.6
WHITE ROCKS MTN CAN.	7200	3/31/13	62	23.9	22.2	23.1

Natural Resources Conservation Service

Washington State
Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

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

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

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

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

USDA-NRCS Agency Homepages

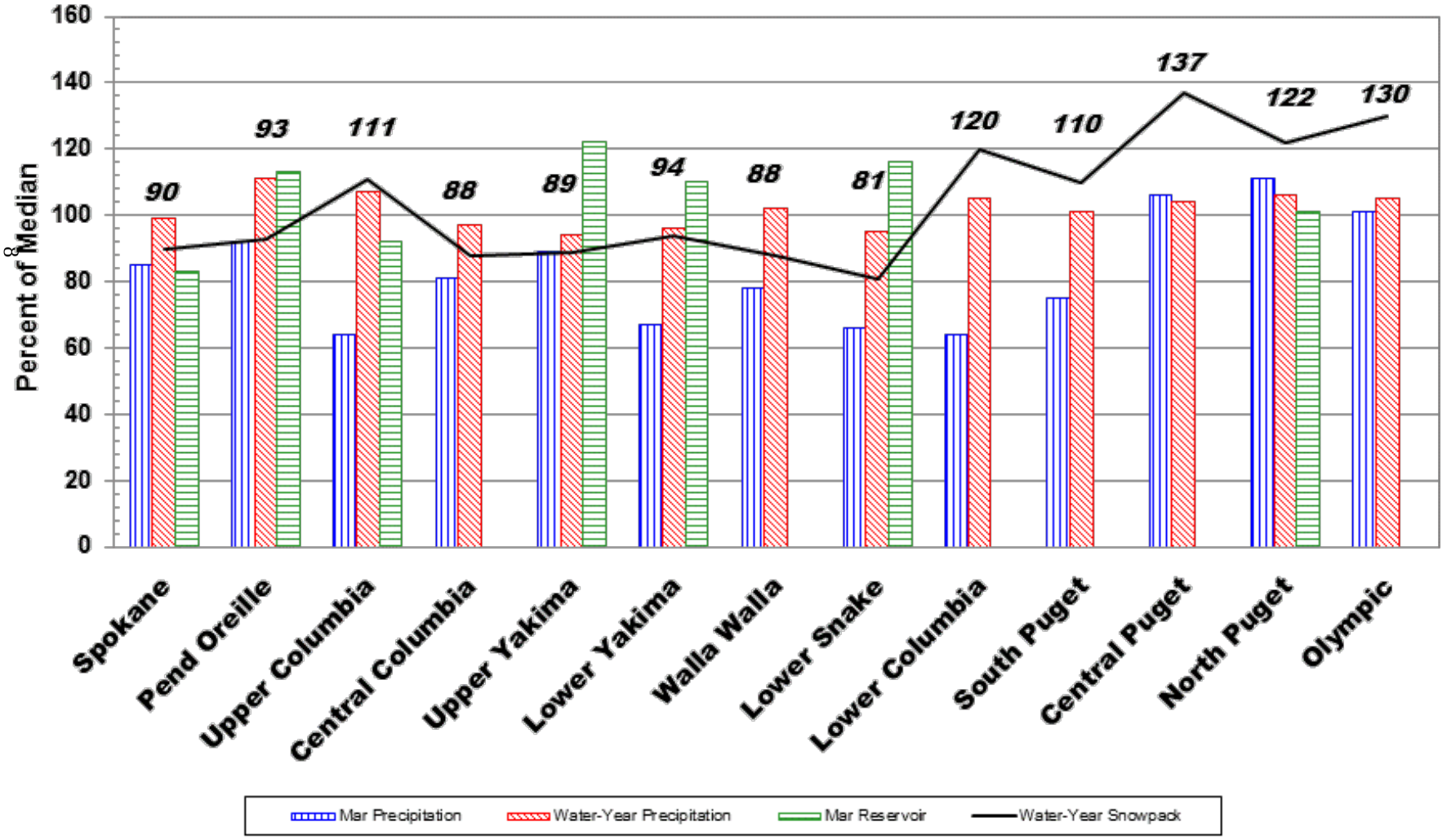
Washington:
http://www.wa.nrcs.usda.gov

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

NRCS Natural Resources Conservation Service

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

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



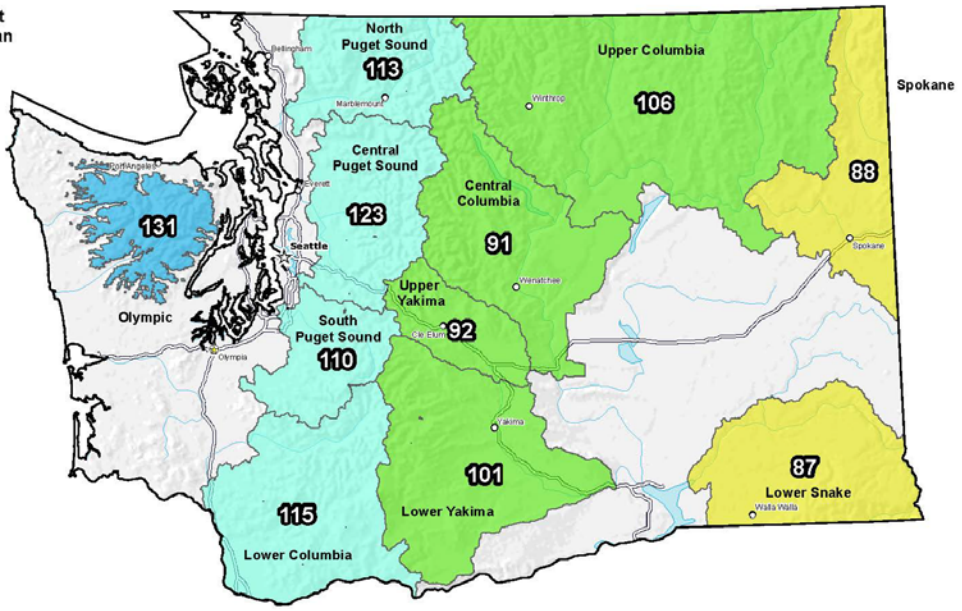
Washington SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Apr 01, 2013

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

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >=150%

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



Provisional Data Subject to Revision

USDA NRCS

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 USDA/NRCS 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

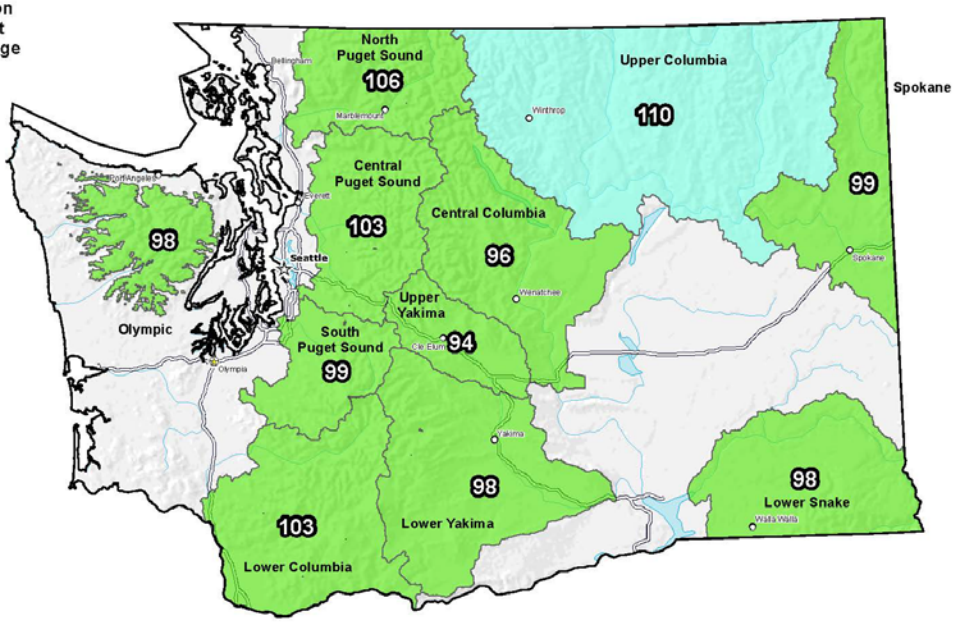
Washington SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal

Apr 01, 2013

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

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >=150%

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



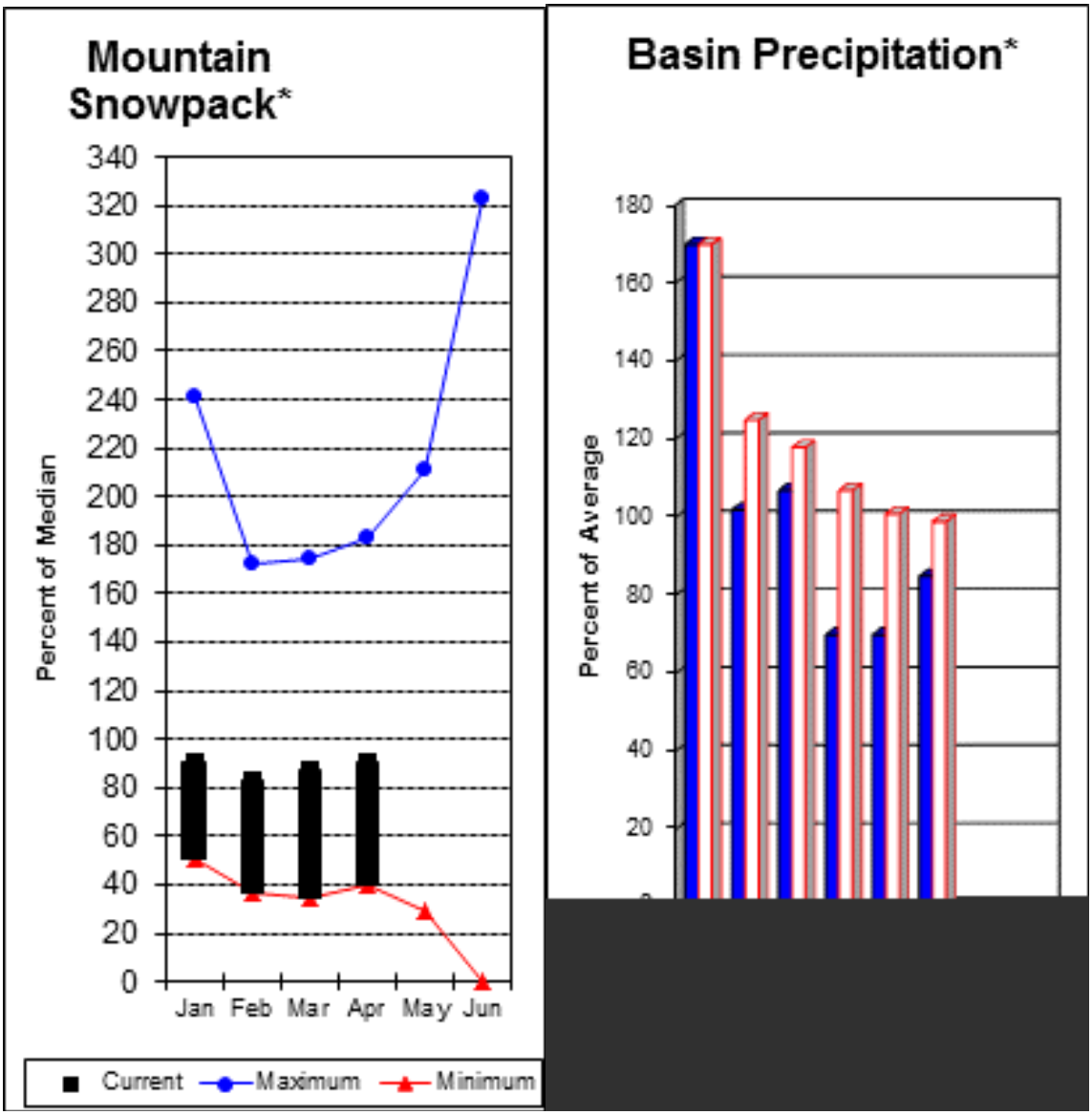
Provisional Data Subject to Revision

USDA NRCS

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 USDA/NRCS 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 April 1 forecasts for summer runoff within the Spokane River Basin are 80% of average near Post Falls and 81% at Long Lake. The Chamokane River near Long Lake forecast is 91% for the May-August period. The forecast is based on a basin snowpack that is 90% of normal and precipitation that is 92% of average for the water year. Precipitation for March was below normal at 85% of average. Streamflow on the Spokane River at Long Lake was 91% of average for March. April 1 storage in Coeur d'Alene Lake was 138,000 acre feet, 83% of average and 58% of capacity. Snowpack at Quartz Peak SNOTEL site was 85% of normal with 16 inches of water content. Average temperatures in the Spokane basin were near normal for March and 1-2 degrees above normal for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Spokane R nr Post Falls (2)	APR-JUL	1340	1670	1900	80	2130	2460	2390
	APR-SEP	1400	1750	1980	80	2210	2560	2480
Spokane R at Long Lake (2)	APR-JUL	1460	1820	2070	79	2320	2680	2620
	APR-SEP	1660	2040	2300	81	2560	2940	2850
Chamokane Ck nr Long Lake	MAY-AUG	4.8	7.0	8.5	91	10.0	12.2	9.3

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Coeur d'Alene	238.5	138.1	302.7	165.5

SPOKANE RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

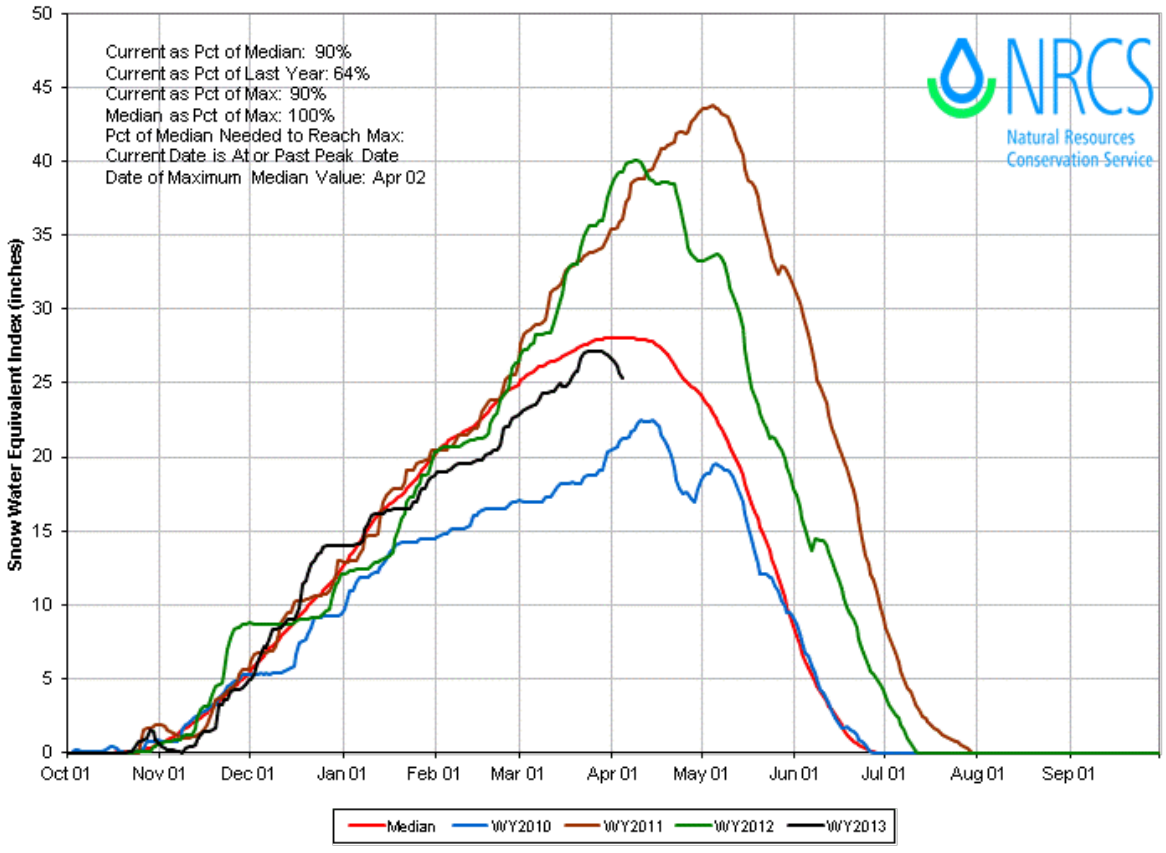
Watershed	Number of Data Sites	This Year as % of Last Yr	Median
SPOKANE RIVER	16	65	90
NEWMAN LAKE	3	65	121

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

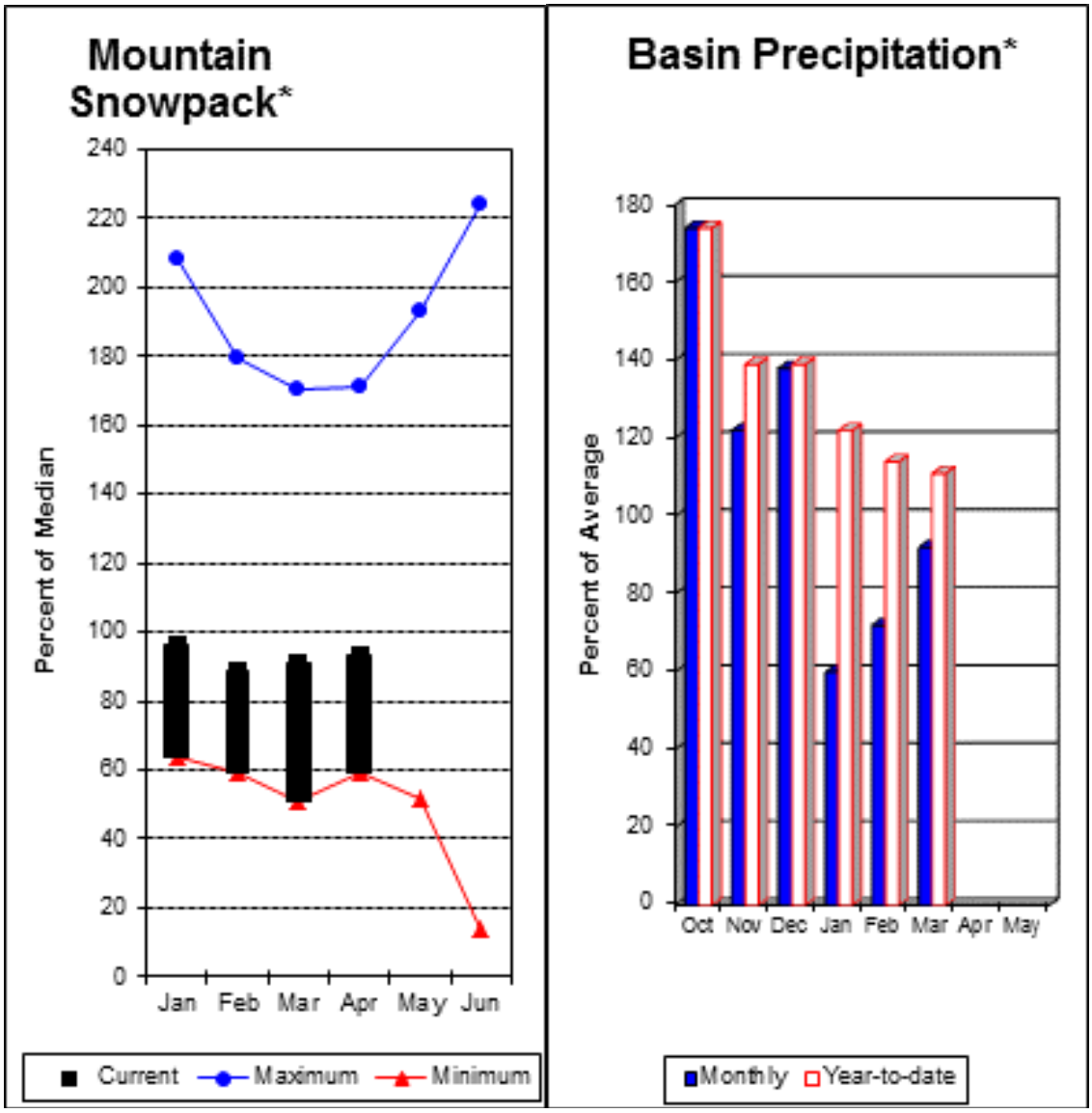
The average is computed for the 1981-2010 base period.

(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 Apr 04, 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 93% and the Pend Orielle below Box Canyon is 98%. March streamflow was 91% of average on the Pend Oreille River and 118% on the Columbia Birchbank. April 1 snow cover was 93% of normal in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 23 inches of snow water on the snow pillow. Normally Bunchgrass would have 26.2 inches on April 1. Precipitation during March was 92% of average, keeping the year-to-date precipitation at 111% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 113% of normal. Average temperatures were near normal for March and 1-2 degrees above normal for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Pend Oreille Lake Inflow (2)	APR-JUL	9860	10900	11600	98	12300	13300	11800
	APR-SEP	10600	11800	12600	98	13400	14600	12800
Priest R nr Priest River (1,2)	APR-JUL	605	680	730	94	780	855	780
	APR-SEP	635	720	775	93	830	915	830
Pend Oreille R bl Box Canyon (2)	APR-JUL	10000	11100	11800	99	12500	13600	11900
	APR-SEP	10800	12000	12800	99	13600	14800	13000

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Pend Oreille	1561.3	888.0	711.4	773.0
Priest Lake	119.3	62.7	69.1	67.6

PEND OREILLE RIVER BASINS
Watershed Snowpack Analysis - April 1, 2013

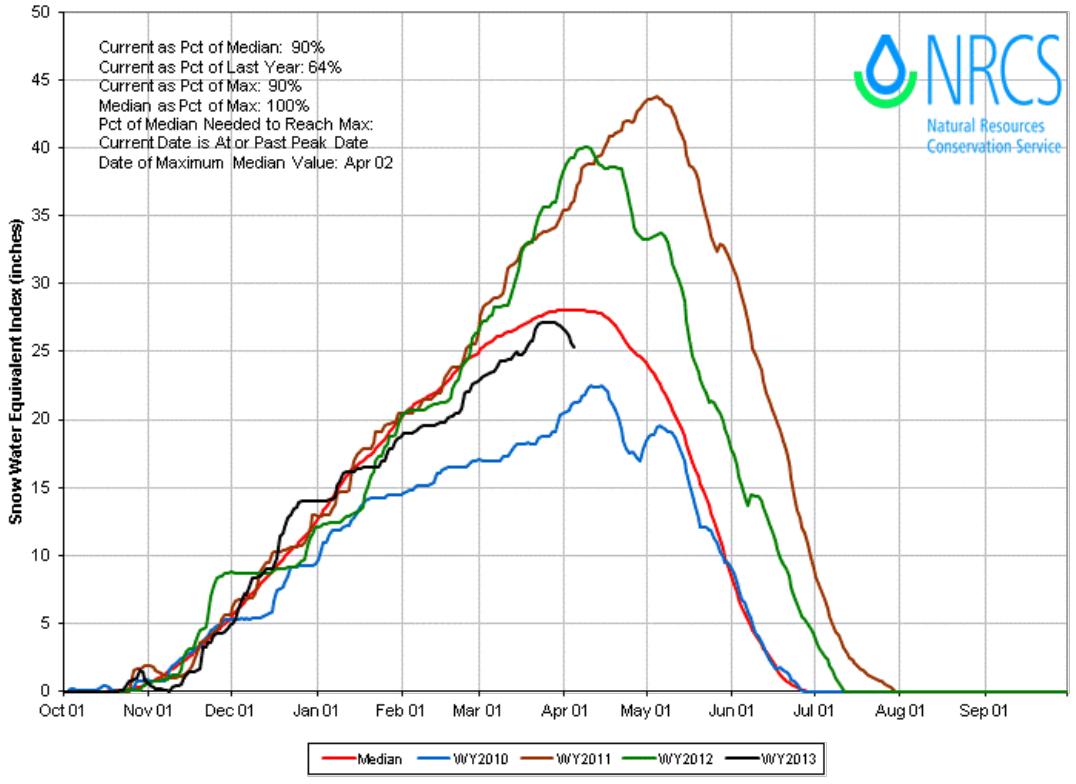
Watershed	Number of Data Sites	This Year as % of Last Yr	Median
COLVILLE RIVER	3	78	97
PEND OREILLE RIVER	12	70	92
KETTLE RIVER	6	90	97

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

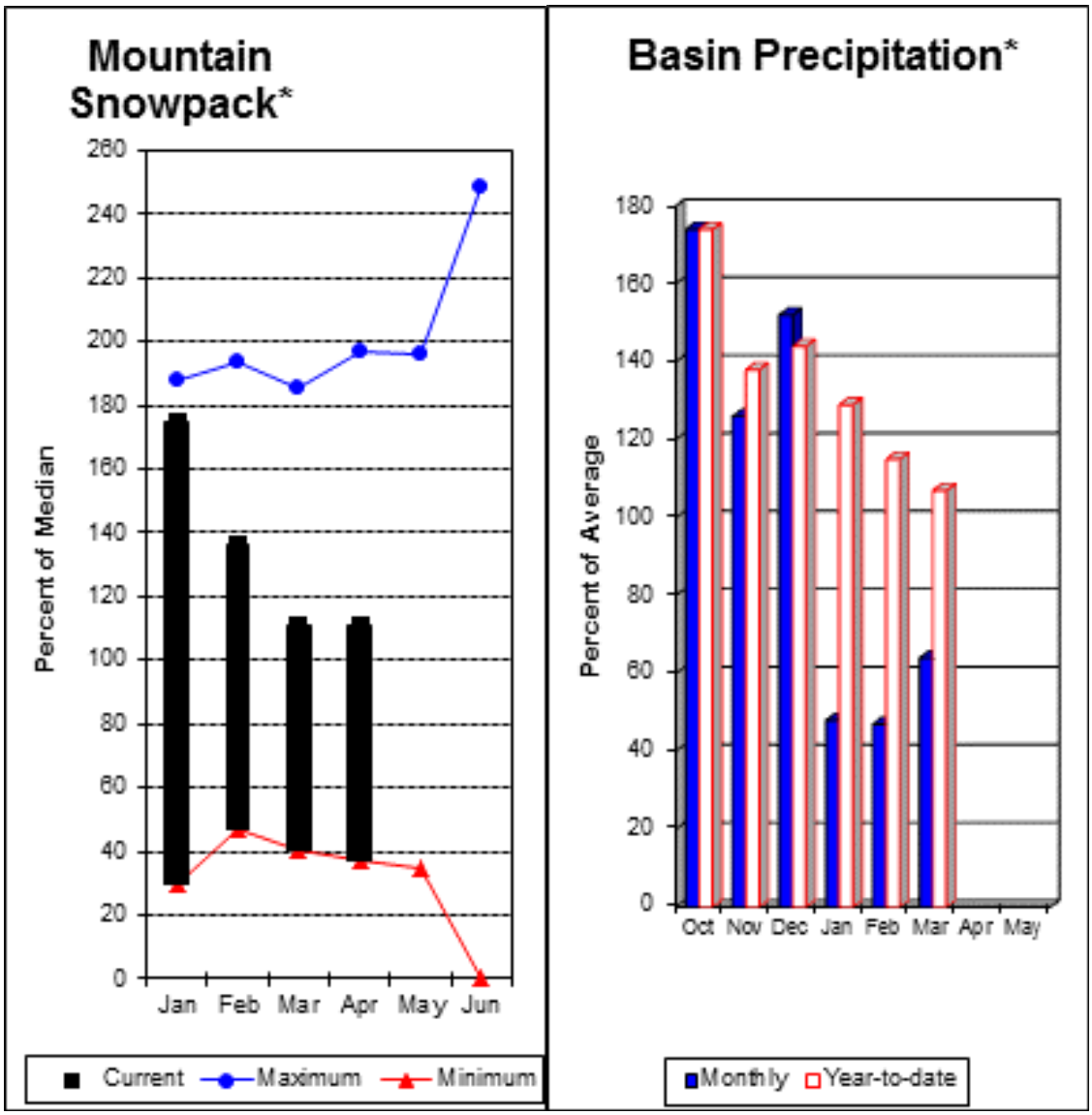
The average is computed for the 1981-2010 base period.

(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 Apr 04, 2013



Upper Columbia River Basins



*Based on selected stations

Summer runoff average forecast for the Okanogan River is 100-105%, Similkameen River is 95%, Kettle River 109% and Methow River is 97%. April 1 snow cover on the Okanogan was 105% of normal, Omak Creek was 142% and the Methow was 110%. March precipitation in the Upper Columbia was 64% of average, with precipitation for the water year at 107% of average. March streamflow for the Methow River was 108% of average, 114% for the Okanogan River and 96% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 9.7 inches. Median for this site is 9.1 inches on April 1. Combined storage in the Conconully Reservoirs was 19,000-acre feet, which is 81% of capacity and 92% of the April 1 average. Temperatures were near normal for March and for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Colville R at Kettle Falls	APR-JUL	37	73	98	82	123	159	119
	APR-SEP	41	81	108	82	135	175	131
Kettle R nr Laurier	APR-JUL	1630	1810	1940	108	2070	2250	1800
	APR-SEP	1700	1900	2040	109	2180	2380	1880
Columbia R at Birchbank (1,2)	APR-JUL	30000	32900	34200	101	35500	38400	33840
	APR-SEP	36700	40300	42000	101	43600	47200	41750
Columbia R at Grand Coulee (2)	APR-JUL	42300	47300	49500	97	51700	56700	51015
	APR-SEP	50000	55900	58600	98	61200	67100	60110
Similkameen R nr Nighthawk (1)	APR-JUL	880	1060	1140	95	1220	1400	1200
	APR-SEP	950	1140	1220	95	1300	1490	1280
Okanogan R nr Tonasket (1)	APR-JUL	1070	1350	1480	100	1610	1890	1480
	APR-SEP	1180	1500	1650	100	1800	2120	1650
Okanogan R at Malott (1)	APR-JUL	1120	1400	1530	106	1660	1940	1450
	APR-SEP	1230	1550	1700	105	1850	2170	1620
Methow R nr Pateros	APR-SEP	720	810	870	97	930	1020	895
	APR-JUL	670	755	810	97	865	950	835

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
SALMON LAKE		NO REPORT		
CONCONULLY RESERVOIR		NO REPORT		

UPPER COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2013

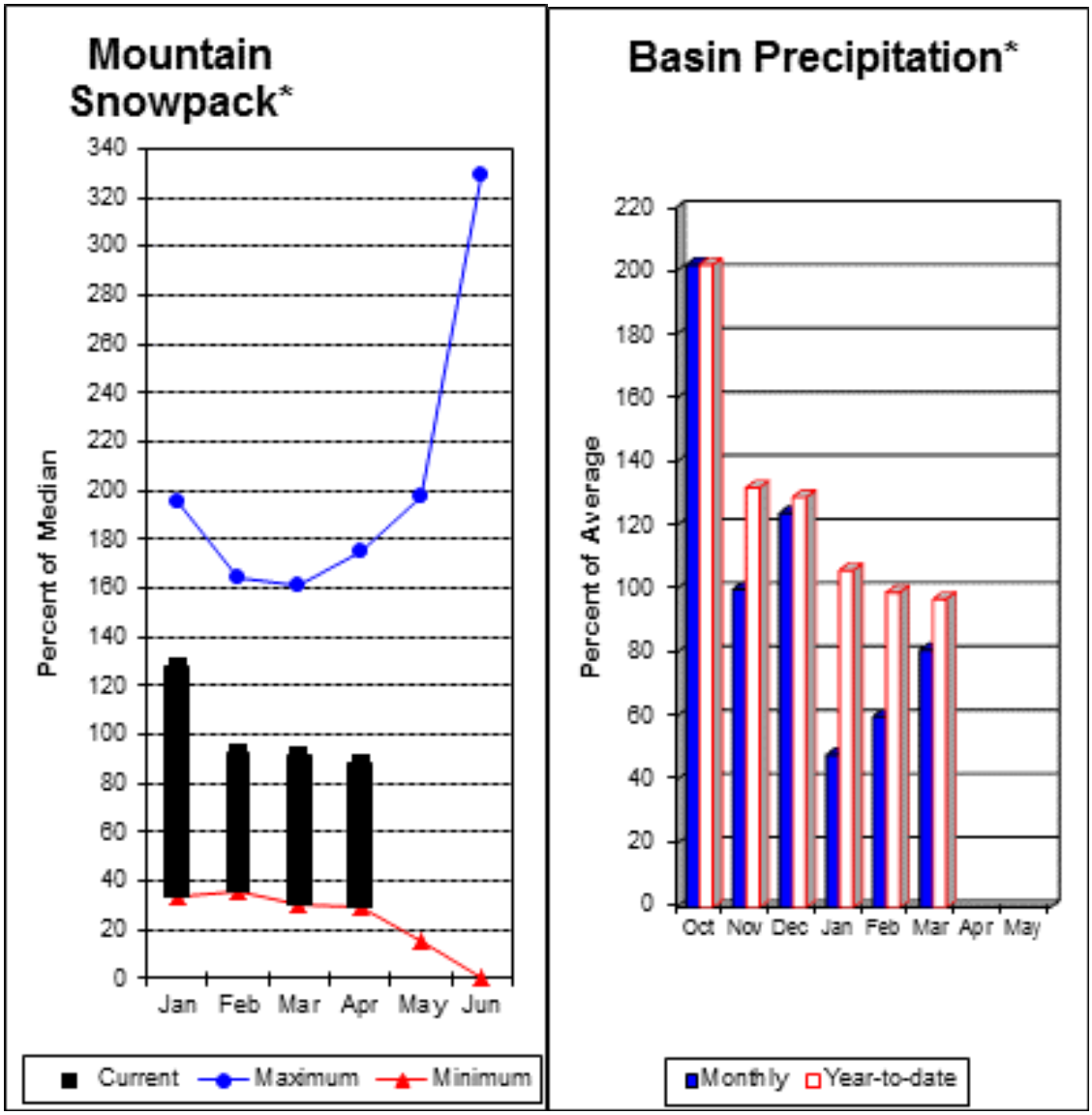
Watershed	Number of Data Sites	This Year as % of Last Yr	Median
OKANOGAN RIVER	21	93	105
OMAK CREEK	3	97	142
SANPOIL RIVER	1	49	0
SIMILKAMEEN RIVER	4	72	75
TOATS COULEE CREEK	4	99	132
CONCONULLY LAKE	3	91	116
METHOW RIVER	7	76	110

* 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 March was 81% of average in the basin and 97% for the year-to-date. Runoff for Entiat River is forecast to be 80% of average for the summer. The April-September average forecast for Chelan River is 88%, Wenatchee River at Plain is 88%, Stehekin River is 94% and Icicle Creek is 80%. March average streamflows on the Chelan River were 95% and on the Wenatchee River 91%. April 1 snowpack in the Wenatchee River Basin was 88% of normal; the Chelan, 97%; the Entiat, 85%; Stemilt Creek, 80% and Colockum Creek, 91%. Reservoir storage in Lake Chelan was 226,000-acre feet, 81% of April 1 average and 33% of capacity. Lyman Lake SNOTEL had the most snow water with 54.4 inches of water. This site would normally have 57.6 inches on April 1. Temperatures were near normal for March and 1-2 degrees above normal for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Stehekin R at Stehekin	APR-JUL	535	600	640	94	680	745	680
	APR-SEP	640	700	740	94	780	840	790
Chelan R at Chelan (2)	APR-JUL	805	860	895	90	930	985	1000
	APR-SEP	900	955	990	88	1030	1080	1120
Entiat R nr Ardenvoir	APR-JUL	136	151	161	81	171	186	200
	APR-SEP	149	164	175	80	186	200	220
Wenatchee R at Plain	APR-JUL	760	825	870	88	915	980	990
	APR-SEP	825	895	945	88	995	1070	1080
Icicle Ck nr Leavenworth	APR-JUL	187	205	220	80	235	255	275
	APR-SEP	200	225	240	80	255	280	300
Wenatchee R at Peshastin	APR-JUL	1040	1130	1190	87	1250	1340	1370
	APR-SEP	1130	1220	1290	87	1360	1450	1490
Columbia R bl Rock Island Dam (2)	APR-JUL	46200	49900	52400	94	54900	58600	55770
	APR-SEP	55900	60300	63200	97	66100	70500	65200

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CHELAN LAKE		NO REPORT		

CENTRAL COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2013

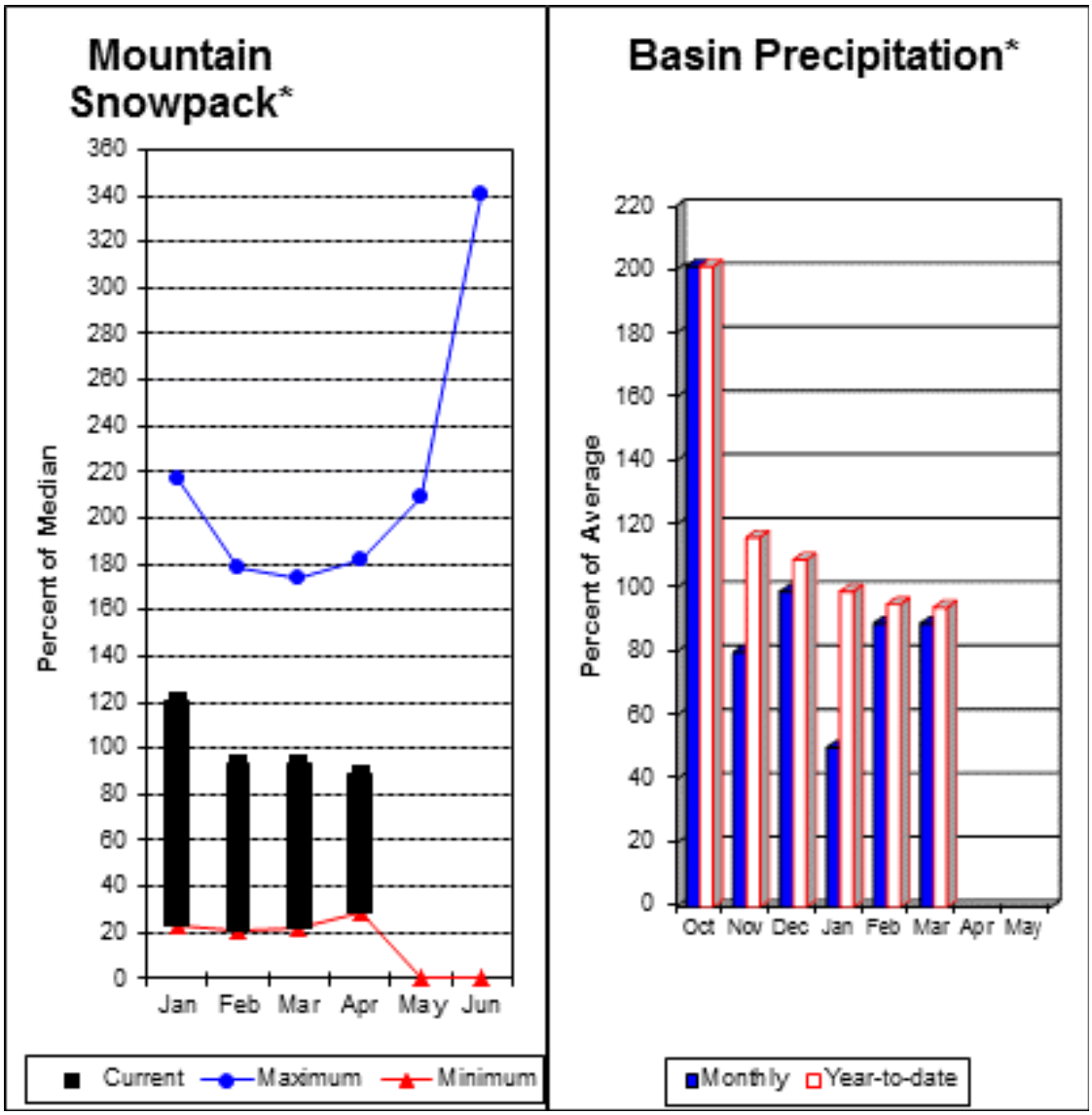
Watershed	Number of Data Sites	This Year as % of Last Yr	Median
CHELAN LAKE BASIN	3	73	97
ENTIAT RIVER	1	58	85
WENATCHEE RIVER	9	69	88
STEMILT CREEK	2	81	80
COLOCKUM CREEK	2	65	91

* 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 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

April 1 reservoir storage for the Upper Yakima reservoirs was 624,000-acre feet, 122% of average. Forecasts for the Yakima River at Cle Elum are 85% of average and the Teanaway River near Cle Elum is at 84%. Lake inflows are all forecasted to be slightly below average this summer. March streamflows within the basin were Cle Elum River near Roslyn at 101%. April 1 snowpack was 89% based upon 11 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 89% of average for March and 94% year-to-date for water. Volume forecasts for the Yakima Basin are for natural flow. As such, they may differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Keechelus Reservoir Inflow (2)	APR-JUL	81	92	100	86	108	119	116
	APR-SEP	89	101	109	87	117	129	126
Kachess Reservoir Inflow (2)	APR-JUL	74	83	89	86	95	104	104
	APR-SEP	82	91	97	86	103	112	113
Cle Elum Lake Inflow (2)	APR-JUL	300	320	335	87	350	370	385
	APR-SEP	320	345	365	88	385	410	415
Yakima R at Cle Elum (2)	APR-JUL	525	595	645	85	695	765	755
	APR-SEP	560	645	705	85	765	850	830
Teanaway R bl Forks nr Cle Elum	APR-JUL	79	96	108	83	120	137	130
	APR-SEP	82	99	111	84	123	140	133

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
KEECHELUS	157.8	117.4	118.4	106.3
KACHESS	239.0	198.5	181.9	159.8
CLE ELUM	436.9	308.4	338.3	246.3

UPPER YAKIMA RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

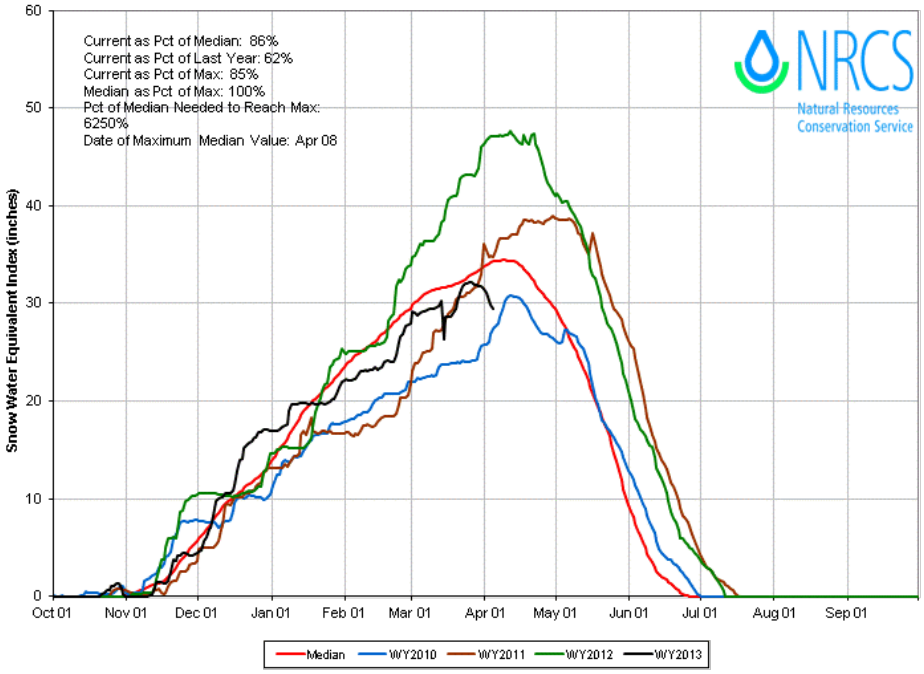
Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Median
UPPER YAKIMA RIVER	11	64	89

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

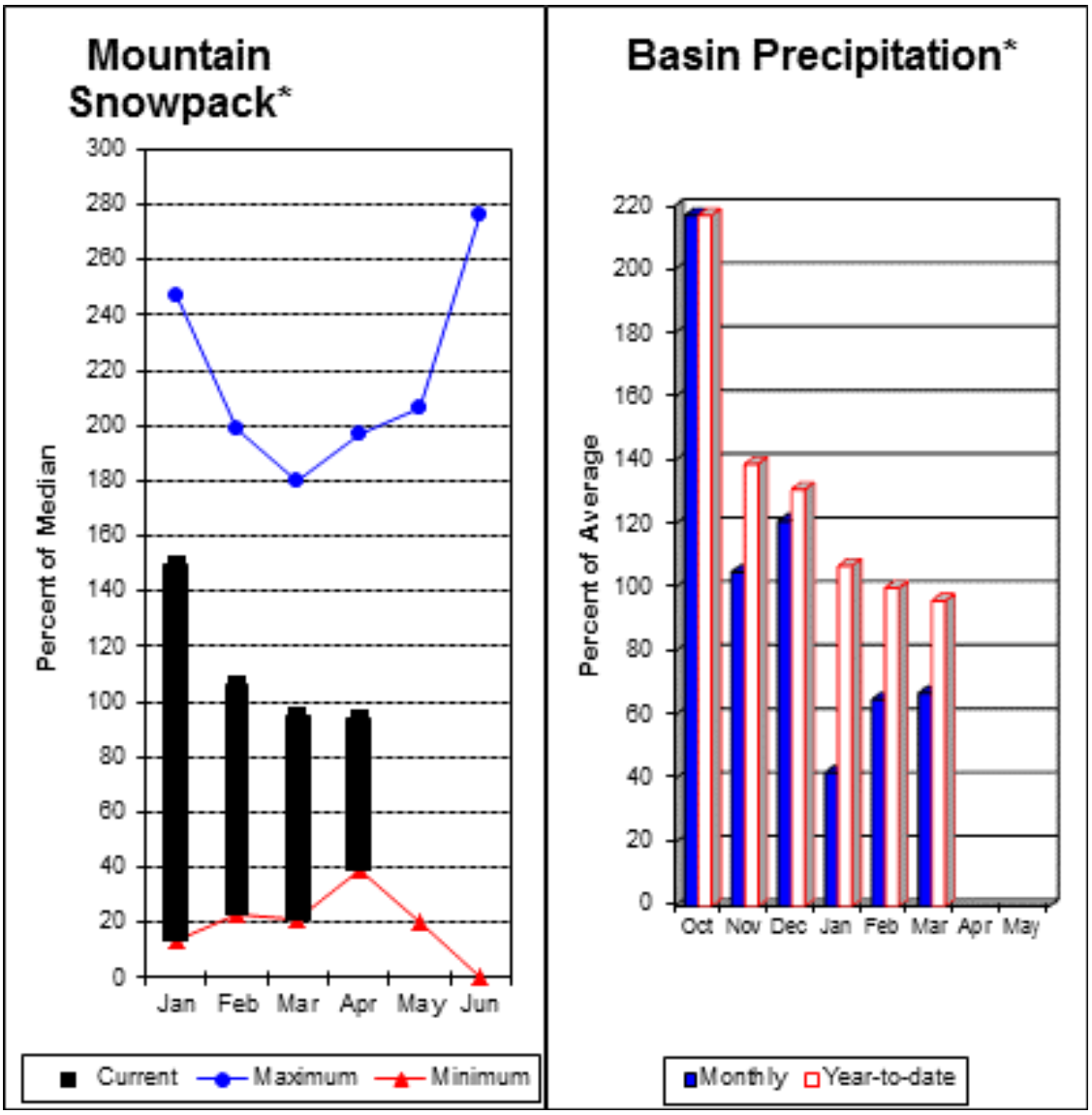
The average is computed for the 1981-2010 base period.

(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 Apr 04, 2013



Lower Yakima River Basin



*Based on selected stations

March average streamflows within the basin were: Yakima River near Parker, 88%; Naches River near Naches, 80%; and Yakima River at Kiona, 90%. April 1 reservoir storage for Bumping and Rimrock reservoirs was 166,000-acre feet, 110% of average. Forecast averages for Yakima River near Parker are 87%; American River near Nile, 90%; Ahtanum Creek, 93%; and Klickitat River near Glenwood, 90%. April 1 snowpack was 94% based upon 8 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 88% of normal. Precipitation was 67% of average for March and 96% year-to-date for water. Temperatures were near normal for March and 1-2 degrees above normal for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they April differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Bumping Lake Inflow (2)	APR-JUL	83	94	101	89	108	119	114
	APR-SEP	90	101	109	89	117	128	123
American R nr Nile	APR-JUL	78	86	92	90	98	106	102
	APR-SEP	85	93	99	90	105	113	110
Rimrock Lake Inflow (2)	APR-JUL	148	161	170	91	179	192	187
	APR-SEP	175	190	200	91	210	225	220
Naches R nr Naches (2)	APR-JUL	510	565	605	86	645	700	700
	APR-SEP	550	615	655	86	695	760	760
Ahtanum Ck at Union Gap	APR-JUL	17.7	22	25	93	28	32	27
	APR-SEP	19.7	24	27	93	30	34	29
Yakima R nr Parker (2)	APR-JUL	1240	1370	1450	87	1530	1660	1660
	APR-SEP	1370	1500	1590	87	1680	1810	1820
Klickitat R nr Glenwood	APR-JUL	93	105	113	90	121	133	126
	APR-SEP	102	116	125	90	134	148	139
Klickitat R nr Pitt	APR-JUL	338	387	420	97	453	502	435
	APR-SEP	408	466	505	97	544	602	520

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
BUMPING LAKE	33.7	11.5	14.5	14.6
RIMROCK	198.0	154.4	164.2	136.6

LOWER YAKIMA RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
LOWER YAKIMA RIVER	8	68	94
AHTANUM CREEK	3	58	88

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

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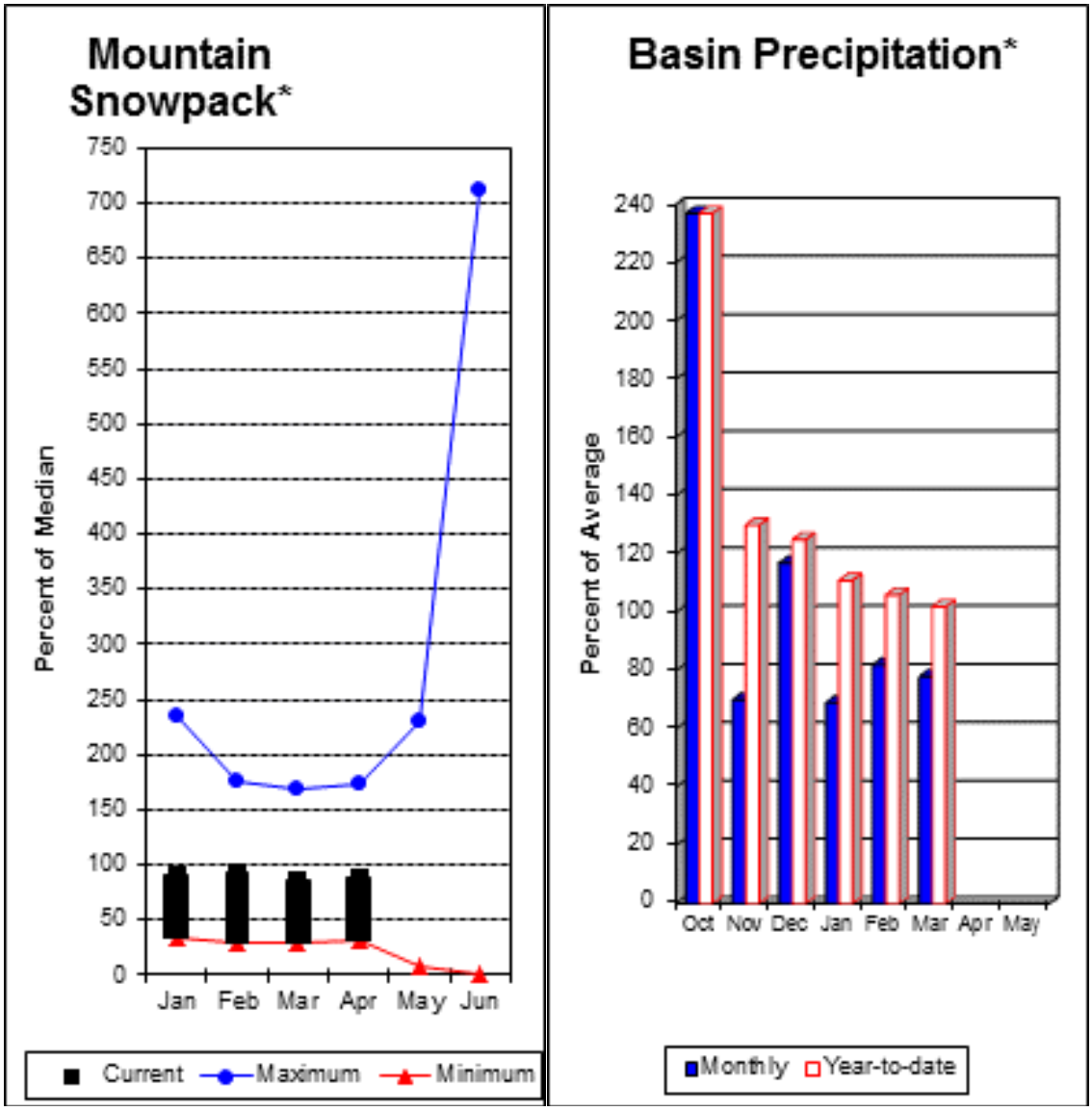
Walla Walla River Basin



*Based on selected stations

March precipitation was 78% of average, maintaining the year-to-date precipitation at 102% of average. Snowpack in the basin was 88% of normal. Streamflow forecasts are 93% of average for Mill Creek and 91% for the SF Walla Walla near Milton-Freewater. March streamflow was 162% of average for the SF Walla Walla River. Average temperatures were near normal for March and 1-2 degrees above for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SF Walla Walla R nr Milton-Freewater	APR-JUL	39	45	49	91	53	59	54
	APR-SEP	48	55	60	91	65	72	66
Mill Ck nr Walla Walla	APR-JUL	16.4	19.7	22	92	24	28	24
	APR-SEP	19.1	23	25	93	27	31	27

* 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.

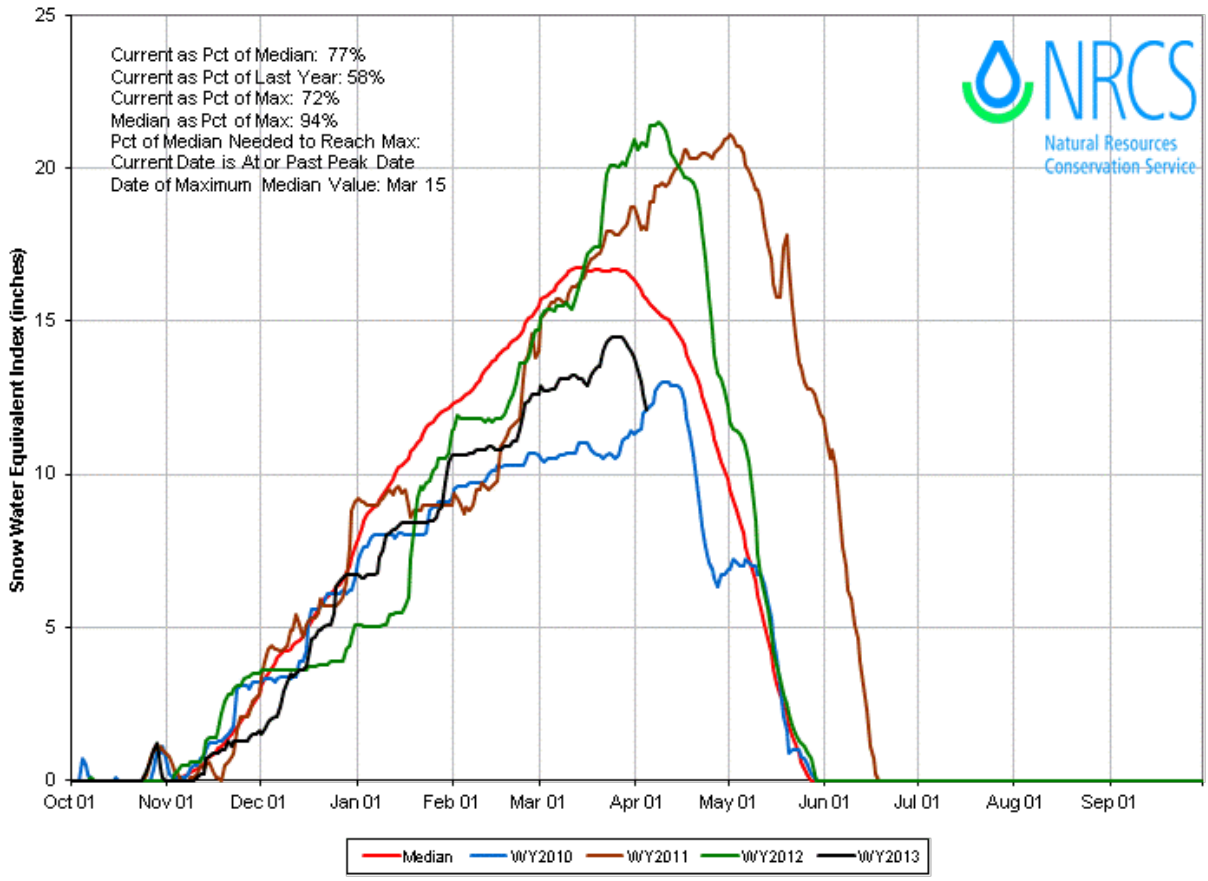
WALLA WALLA RIVER BASIN
Reservoir Storage (1000 AF) - End of March

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

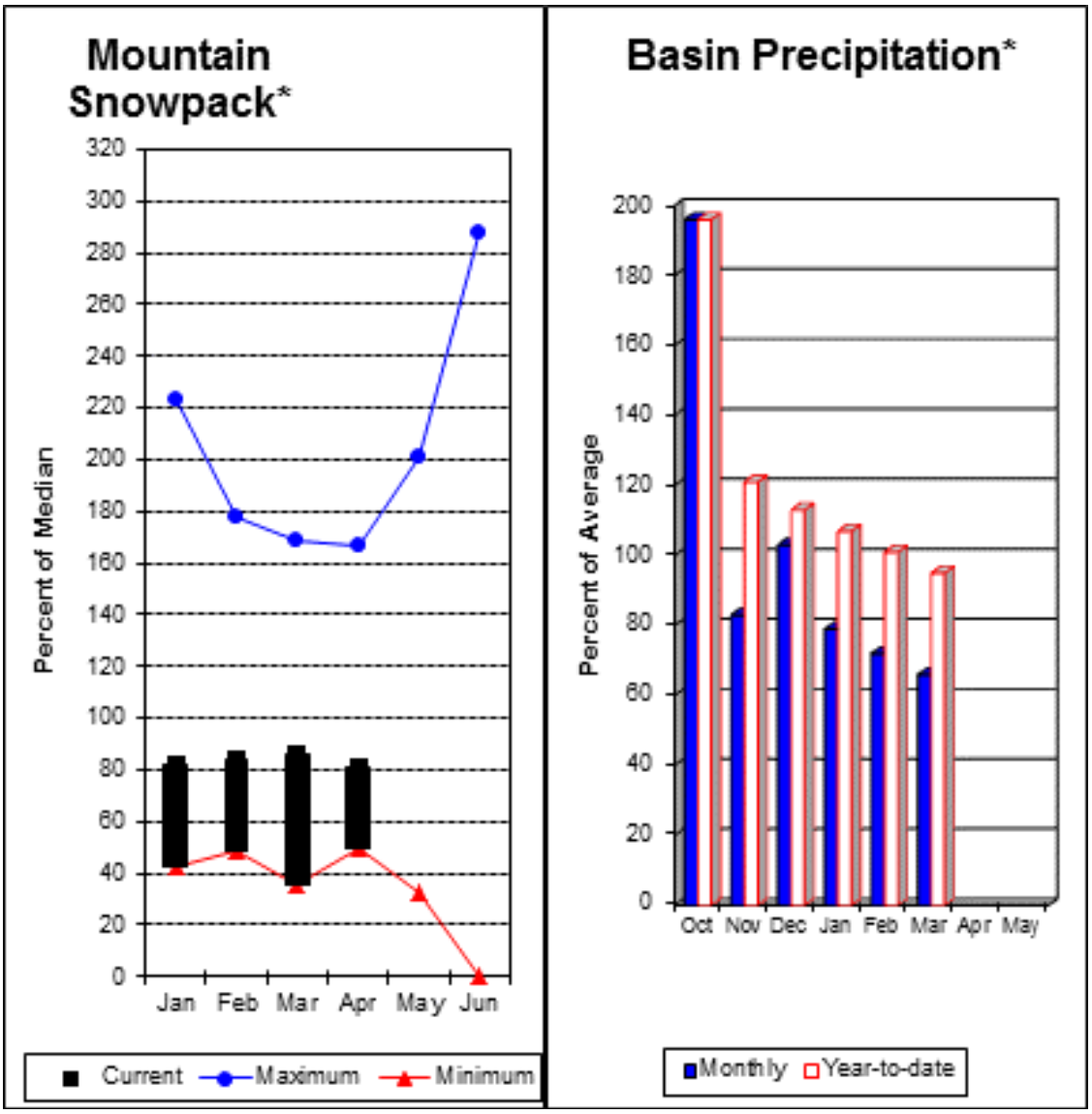
WALLA WALLA RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
WALLA WALLA RIVER	2	72	88

WALLA WALLA, TOUCHET Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 04, 2013



Lower Snake River Basin



*Based on selected stations

The Snake and Grande Ronde rivers can expect summer flows to be about 79% and 90% of normal respectively. The forecast for Asotin Creek at Asotin predicts 91% of average flows for the April – July runoff period. March precipitation was 66% of average, bringing the year-to-date precipitation to 95% of average. April 1 snowpack readings averaged 81% of normal. March streamflow was 66% of average for Snake River below Lower Granite Dam and 81% for Grande Ronde River near Troy. Dworshak Reservoir storage was 116% of average. Average temperatures were near normal for March and 1-2 degrees above for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>>					30-Yr Avg. (1000AF)
		Chance Of Exceeding *					
		90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	
Grande Ronde R at Troy (1)	APR-SEP	785	1060	1180	90	1300	1580	1310
Asotin Ck at Asotin	APR-JUL	19.3	27	32	91	37	45	35
Clearwater R at Spalding (1,2)	APR-JUL	4780	5940	6460	94	6980	8140	6890
	APR-SEP	5080	6300	6850	94	7400	8620	7270
Snake R bl Lower Granite Dam (1,2)	APR-JUL	10400	13800	15300	77	16800	20200	19850
	APR-SEP	12100	15900	17700	79	19400	23200	22280

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Dworshak	3468.0	2807.5	2305.0	2417.0

LOWER SNAKE RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Median
LOWER SNAKE, GRANDE RONDE	12	67	80

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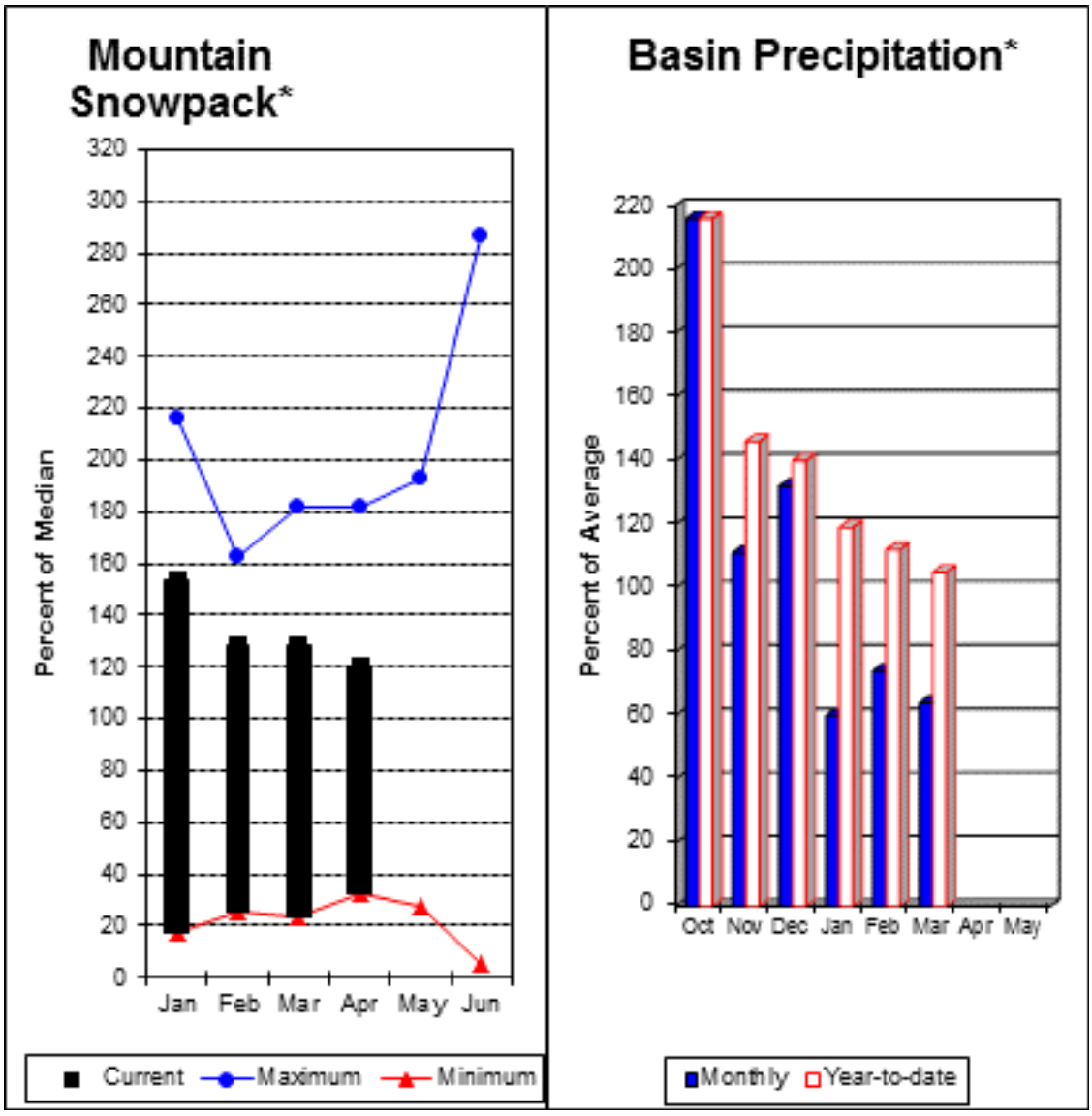
Lower Columbia River Basins



*Based on selected stations

Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 99% and Cowlitz River at Castle Rock, 110% of average. The Columbia at The Dalles is forecasted to have 92% of average flows this summer according to the River Forecast Center. March average streamflow for Cowlitz River was 102%. The Columbia River at The Dalles was 85% of average. March precipitation was 64% of average and the water-year average was 105%. April 1 snow cover for Cowlitz River was 121%, and Lewis River was 120% of normal. Paradise SNOTEL reported the most snow in the basin with 78.2 inches of water and 146 inches of depth. Temperatures were slightly below normal during March and for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Columbia R at The Dalles (2)	APR-JUL	61500	66900	70600	88	74300	79700	79855
	APR-SEP	74100	80400	84800	92	89100	95400	92704
Klickitat R nr Glenwood	APR-JUL	93	105	113	90	121	133	126
	APR-SEP	102	116	125	90	134	148	139
Klickitat R nr Pitt	APR-JUL	338	387	420	97	453	502	435
	APR-SEP	408	466	505	97	544	602	520
Lewis R at Ariel (2)	APR-JUL	700	865	975	101	1090	1250	970
	APR-SEP	820	995	1110	99	1230	1400	1120
Cowlitz R bl Mayfield Dam (2)	APR-JUL	1410	1660	1830	113	2000	2250	1620
	APR-SEP	1600	1900	2100	114	2300	2600	1840
Cowlitz R at Castle Rock (2)	APR-JUL	1990	2270	2460	110	2650	2930	2230
	APR-SEP	2260	2560	2770	110	2980	3280	2520

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
MOSSYROCK		NO REPORT		
SWIFT		NO REPORT		
YALE	0.0	186.5	353.2	---
MERWIN		NO REPORT		

LOWER COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
LEWIS RIVER	5	81	120
COWLITZ RIVER	6	78	121

* 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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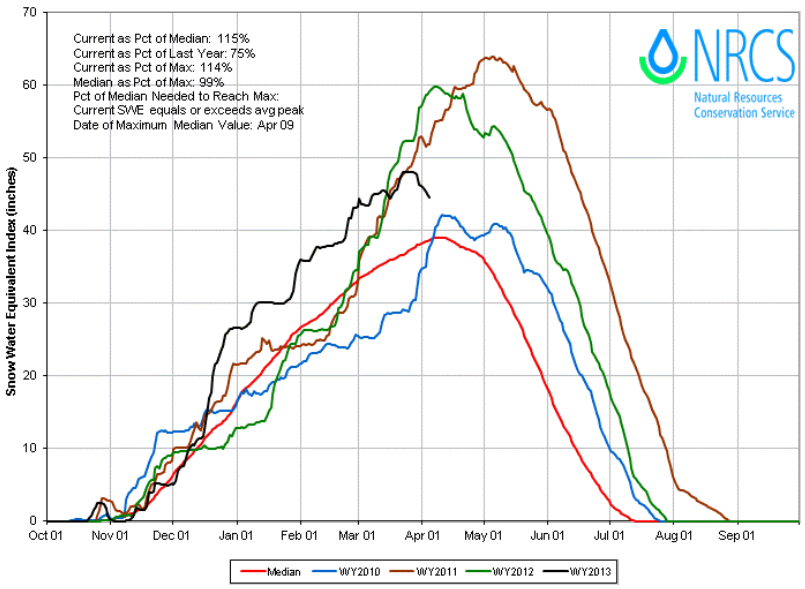
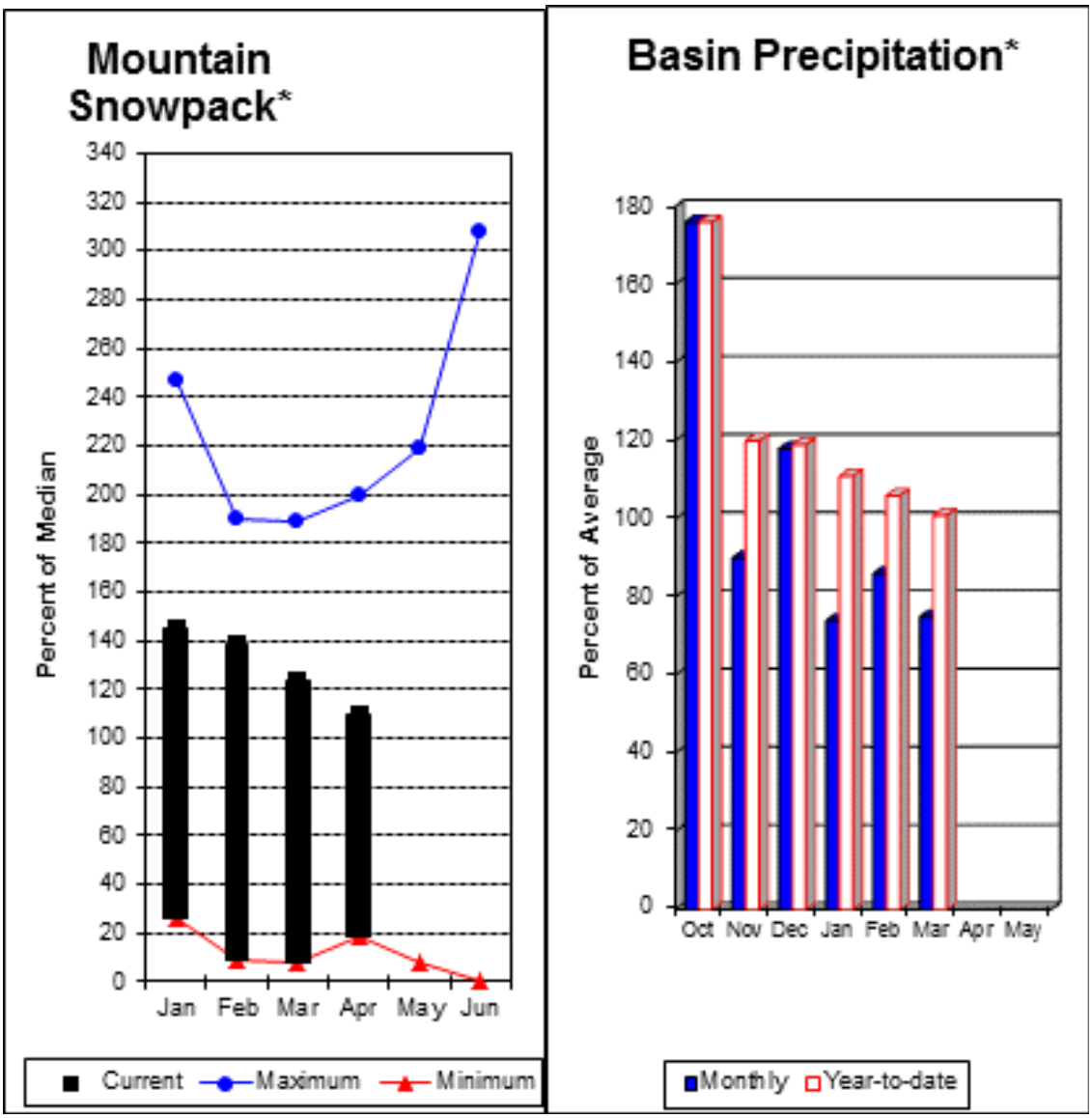
LEWIS, COWLITZ Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 04, 2013



South Puget Sound River Basins



*Based on selected stations

Summer runoff is forecast to be 102% of normal for the Green River below Howard Hanson Dam and 99% for the White River near Buckley. April 1 snowpack was 101% of normal for the White River, 106% for Puyallup River and 123% in the Green River Basin. Water content on April 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 31.9 inches. This site has a April 1 median of 33.7 inches. March precipitation was 75% of average, bringing the water year-to-date to 101% of average for the basins. Average temperatures in the area were 1 degree below for March and 1-2 degrees below normal for the water-year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
White R nr Buckley (1)	APR-JUL	320	390	425	99	460	530	430
	APR-SEP	385	470	510	99	550	635	515
Green R bl Howard Hanson Dam (1,2)	APR-JUL	169	220	240	102	260	310	235
	APR-SEP	189	240	265	102	290	340	260

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

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

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

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
WHITE RIVER	3	75	101
GREEN RIVER	3	75	123
PUYALLUP RIVER	5	73	106

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

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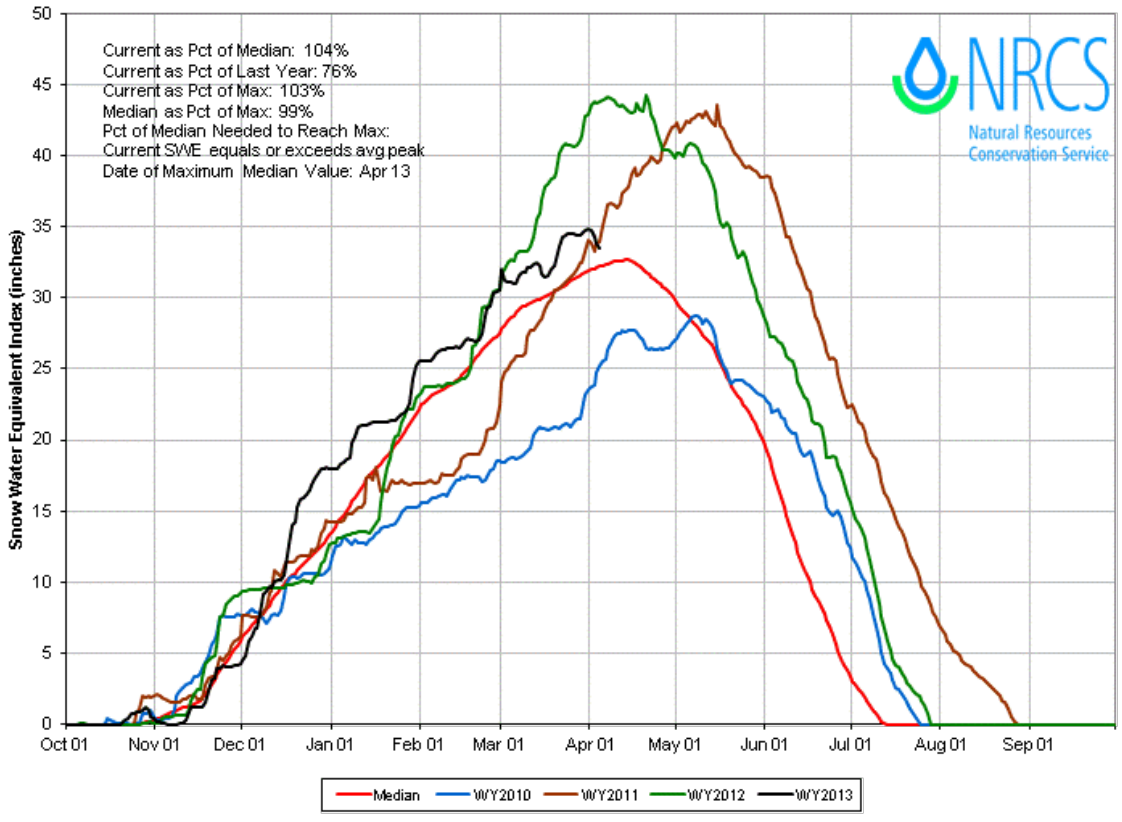
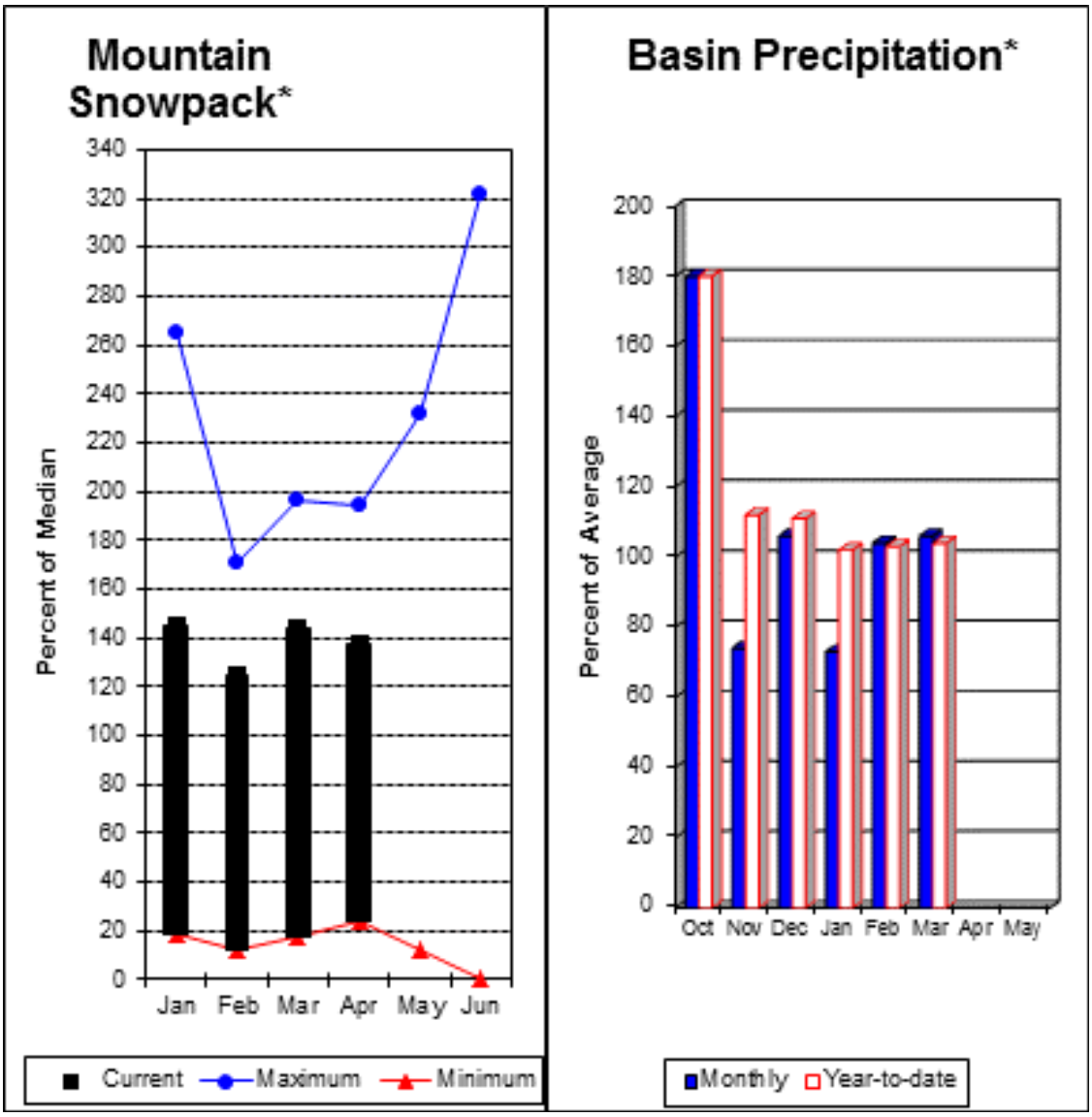
(2) - The value is natural volume - actual volume may be affected by upstream water management.

WHITE, GREEN, PUYALLUP Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 04, 2013



Central Puget Sound River Basins



*Based on selected stations

Forecast for spring and summer flows are: 109% for Cedar River near Cedar Falls; 107% for Rex River; 137% for South Fork of the Tolt River; and 100% for Taylor Creek near Selleck. Basin-wide precipitation for March was 106% of average, bringing water-year-to-date to 104% of average. April 1 median snow cover in Cedar River Basin was 130%, Tolt River Basin was 156%, Snoqualmie River Basin was 131%, and Skykomish River Basin was 131%. Alpine Meadows SNOTEL site in the Tolt Basin, at 3500 feet, had 73.7 inches of water content. April 1 median water content is 51 inches at Alpine Meadows. Temperatures were 1 degree below normal for March and for the water-year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Cedar R nr Cedar Falls	APR-JUL	62	70	76	109	82	90	70
	APR-SEP	68	77	83	109	89	98	76
Rex R nr Cedar Falls	APR-JUL	19.5	23	26	108	29	32	24
	APR-SEP	22	26	29	107	32	36	27
Taylor Creek Near Selleck	APR-JUL	15.8	18.3	20	100	22	24	20
	APR-SEP	19.3	22	24	100	26	29	24
SF Tolt R nr Index	APR-JUL	16.4	18.5	19.9	140	21	23	14.2
	APR-SEP	17.8	20	22	137	24	26	16.1

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

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

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

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
CEDAR RIVER	6	68	130
TOLT RIVER	3	101	156
SNOQUALMIE RIVER	5	90	131
SKYKOMISH RIVER	3	96	131

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

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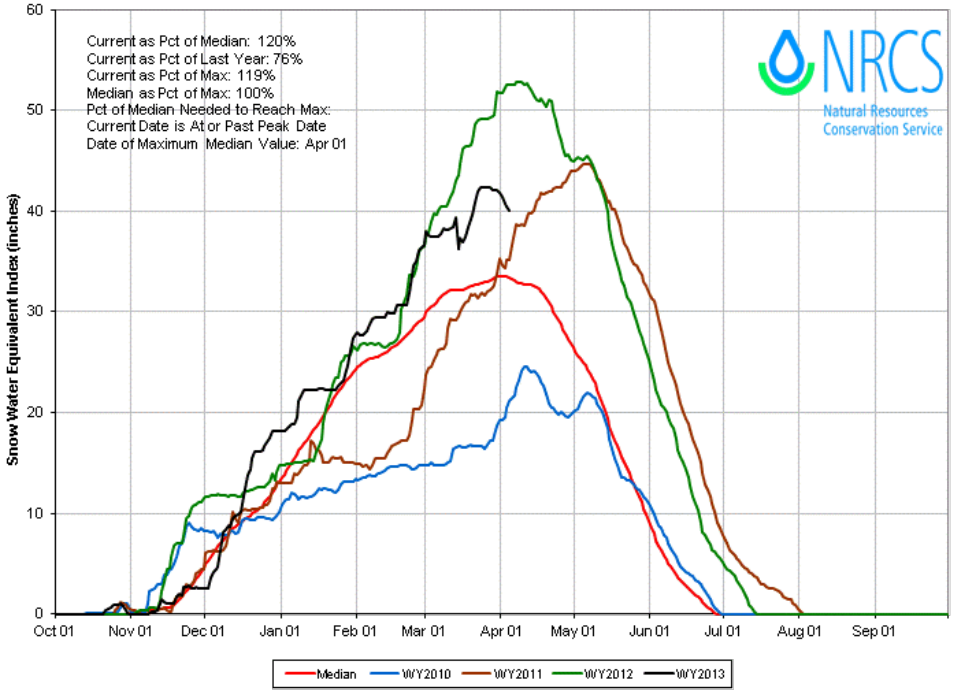
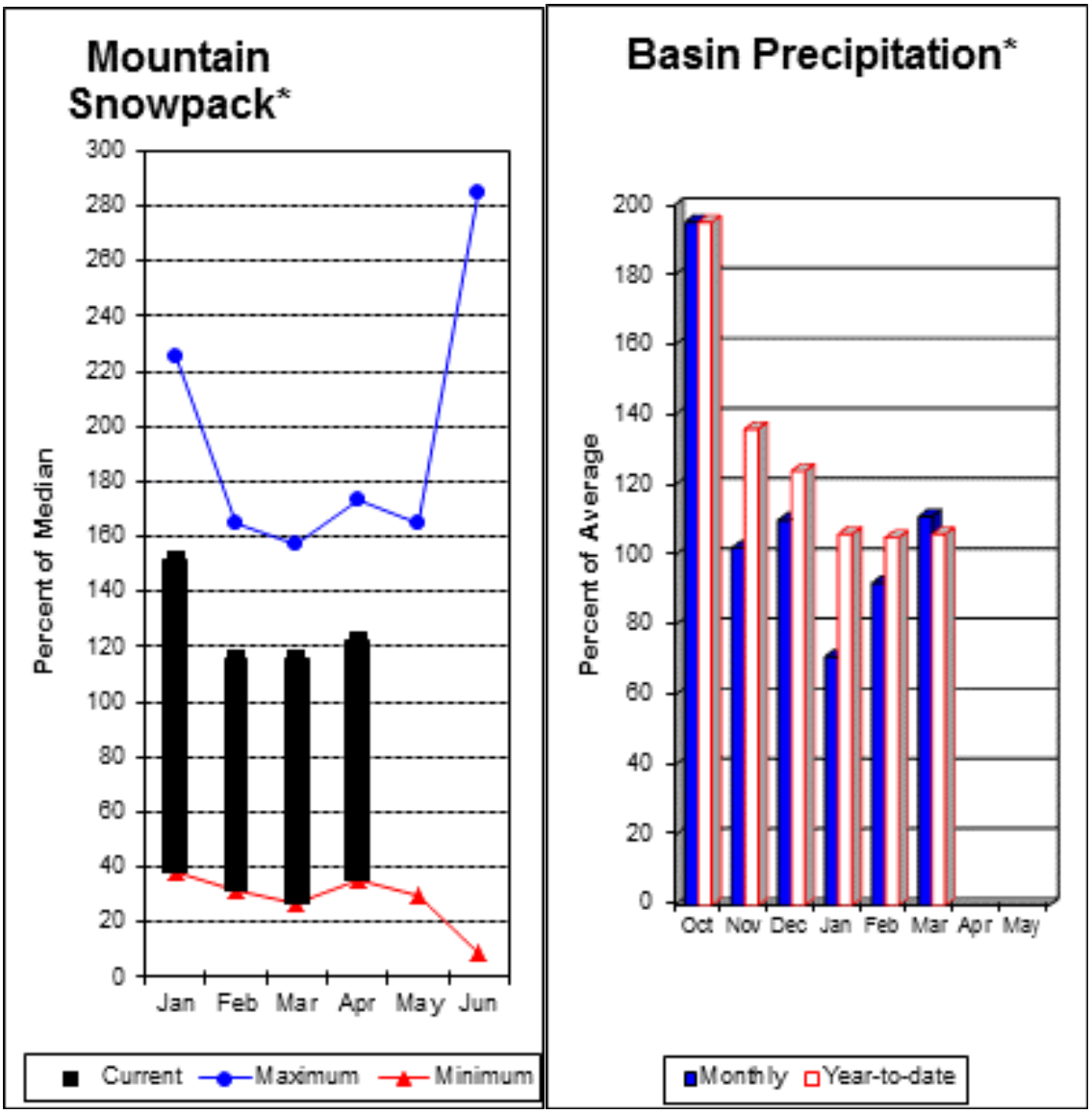
CEDAR, SNOQUALMIE, SKYKOMISH Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 04, 2013



North Puget Sound River Basins



*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 98% of average for the spring and summer period. March streamflow in Skagit River was 115% of average. Other forecast points included Baker River at 97% and Thunder Creek at 97% of average. Basin-wide precipitation for March was 111% of average, bringing water-year-to-date to 106% of average. April 1 median snow cover in Skagit River Basin was 108% and Nooksack River Basin was 128% of normal. Baker River Basin data was 133% of the long term median. The most snow measured in the basins and in the state was at Easy Pass SNOTEL in the Baker River Basin with 100 inches of water content. April 1 Skagit River reservoir storage was 80% of average and 42% of capacity. Average temperatures were 1 degree below normal for March and for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Thunder Ck Nr Newhalem	APR-JUL	194	210	225	96	240	255	235
	APR-SEP	285	305	320	97	335	355	330
Skagit R At Newhalem	APR-JUL	1500	1610	1680	100	1750	1860	1680
	APR-SEP	1780	1910	1990	98	2070	2200	2030
Baker R nr Concrete (2)	APR-JUL	610	695	750	96	805	890	780
	APR-SEP	735	865	950	97	1040	1160	980

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
ROSS	1404.1	586.5	583.2	730.5
DIABLO RESERVOIR		NO REPORT		

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

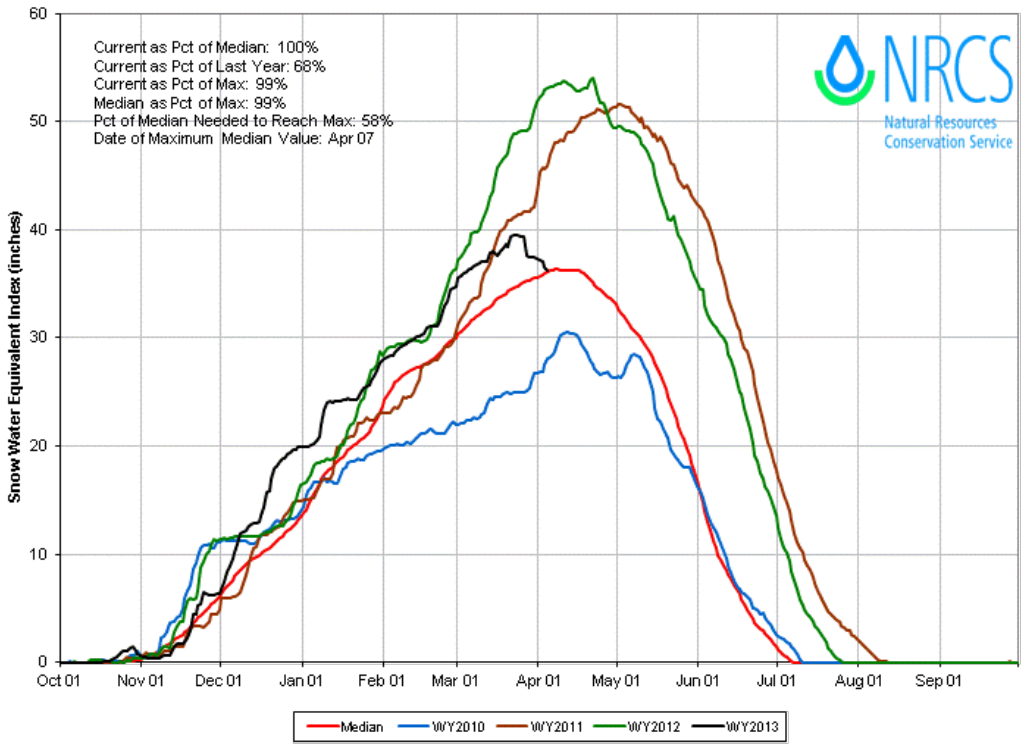
Watershed	Number of Data Sites	This Year as % of Last Yr	Median
SKAGIT RIVER	16	67	108
BAKER RIVER	0	81	0
NOOKSACK RIVER	3	84	128

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

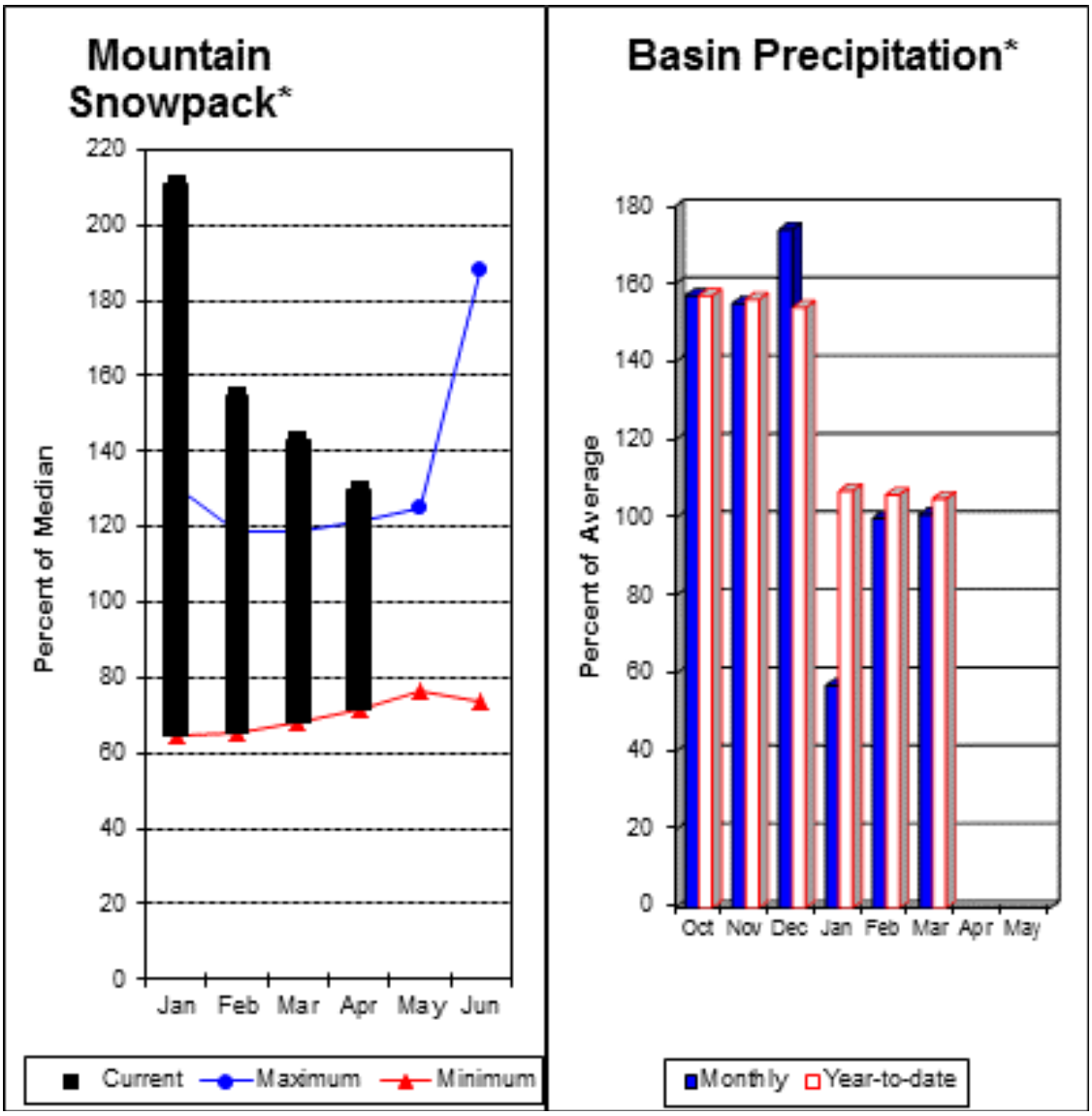
The average is computed for the 1981-2010 base period.

(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 Apr 04, 2013



Olympic Peninsula River Basins



*Based on selected stations

Forecasted average runoff for streamflow for the Dungeness River is 108% and Elwha River is 112%. March runoff in the Dungeness River was 77% of normal. Big Quilcene and Wynoochee rivers should expect above average runoff this summer as well. March precipitation was 90% of average. Precipitation has accumulated at 105% of average for the water year. March precipitation at Quillayute was 15.99 inches. The 1981-2010 average for March is 10.83 inches. Olympic Peninsula snowpack averaged 130% of normal on April 1. Temperatures were near average for March and slightly below normal for the water year.

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

Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Dungeness R Nr Sequim	APR-JUL	106	120	129	108	138	152	120
	APR-SEP	127	144	156	108	168	185	145
Elwha R At Mcdonald Bridge	APR-JUL	380	420	445	111	470	510	400
	APR-SEP	445	490	525	112	560	605	470

* 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.

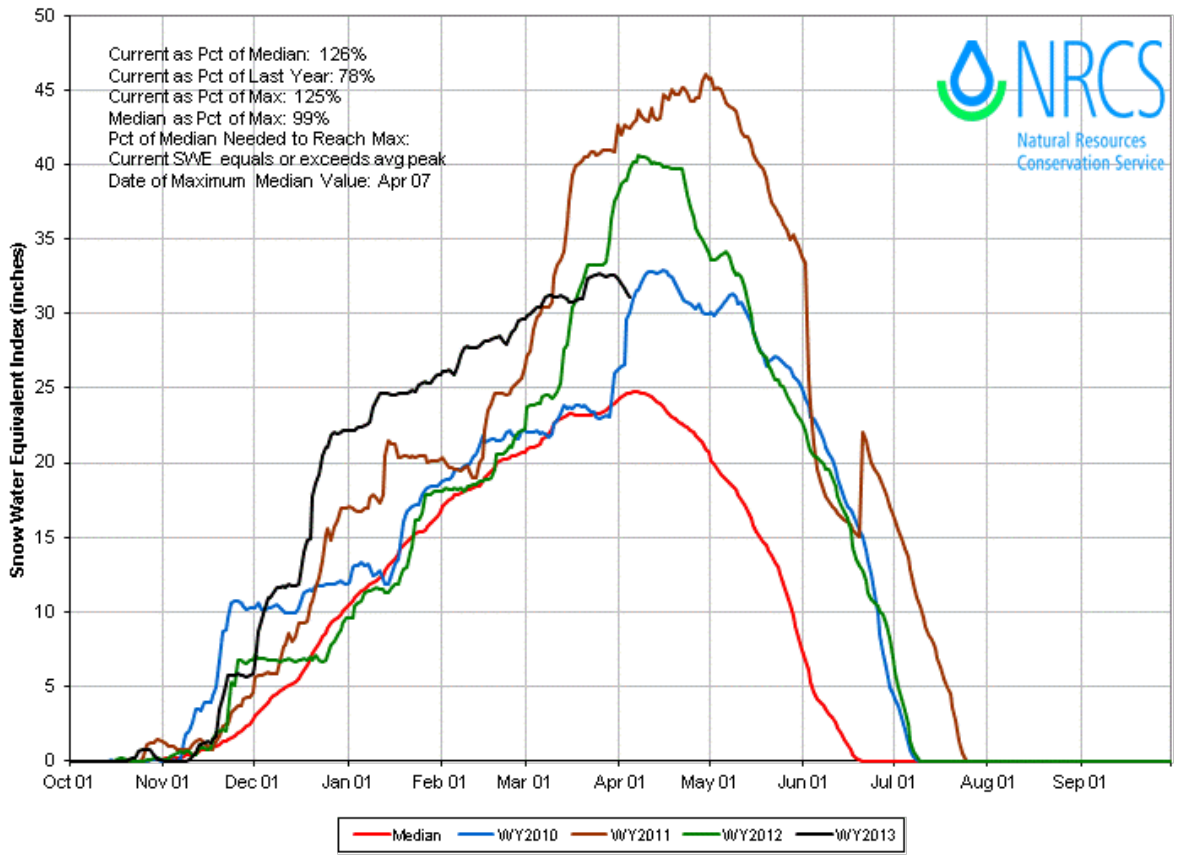
OLYMPIC PENINSULA RIVER BASINS Reservoir Storage (1000 AF) - End of March

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

OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
OLYMPIC PENINSULA	6	83	130

OLYMPIC Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 04, 2013



Issued by

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Released by

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State Conservationist
Natural Resources Conservation Service
Spokane, Washington

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

Canada	Snow Survey Network Program – British Columbia Ministry of Environment
	River Forecast Center – British Columbia Ministry of Forests, Lands and Natural Resource Operations
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 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
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