United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
April 1, 2014

Pilot, Mike Nehring with Northwest Helicopters. Mt. Baker in the back ground.
Photo by Scott Pattee

Water Supply Outlook Reports
and
Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

Local Natural Resources Conservation Service Field Office

or

Scott Pattee
Water Supply Specialist
Natural Resources Conservation Service
2021 E. College Way, Suite 214
Mt. Vernon, WA 98273-2873
(360) 428-7684

or

Larry Johnson
State Conservation Engineer
Natural Resources Conservation Service
W 316 Boone Ave., Suite 450
Spokane, WA 99201
(509) 323-2955

How forecasts are made

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

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

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

Washington
Water Supply Outlook

April 2014

General Outlook

Washington seems to have averted what could have been a disastrous drought just to fall into the lap of one of the states' worst natural disasters to ever hit, one that came with no real warning to the good folks of Oso, WA. As we march into another sunny spring the grass will grow and the flowers will bloom but those affected by the Snohomish County landslide will not forget or be forgotten. Warmer mountain temperatures seem to have advanced the ripening of this years' snowpack with measured densities coming in higher than normal, effectively pushing the snowpack 2-3 weeks ahead of schedule. Weather forecasts continue to trend towards warm and dry which could facilitate an early start to the spring melt, potentially causing rivers to rise higher and quicker than normally expected.

Snowpack

The April 1 statewide SNOTEL readings were 100% of normal but vary across the state. Snowpack appeared to have increased at higher elevations however there was some indication of lower elevation snow courses having little to no snow due to rain on snow events as well as warmer than normal temperatures during the first half of the month. Readings from the Pend Orielle, including Idaho and Montana data, reported the highest at 140% of normal. Westside medians from SNOTEL, and April 1 snow surveys, included the North Puget Sound river basins with 117% of normal, the Central and South Puget river basins averaged 99%, and the Lewis-Cowlitz basins with 92% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima and Wenatchee areas with 101% and 105% respectively. Snowpack in the Spokane River Basin stood at 117% and the Walla Walla River Basin had 96% of the long term median.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane	130	117
Newman Lake	79	95
Pend Oreille	152	140
Okanogan	93	98
Methow	114	111
Conconully Lake	48	56
Central Columbia	120	105
Upper Yakima	110	104
Lower Yakima	103	98
Ahtanum Creek	85	80
Walla Walla	110	96
Lower Snake	141	115
Cowlitz	92	114
Lewis	57	71
White	98	115
Green	78	78
Puyallup	104	112
Cedar	70	91
Snoqualmie	76	99
Skykomish	72	94
Skagit	116	121
Nooksack	93	117
Olympic Peninsula	65	82

Precipitation

With nearly twice the normal rainfall in March most basins in the state have erased the previous deficits to come within striking distance of normal water year to date precipitation. Only a hand full of stations reported below average monthly precipitation. Basin precipitation amounts were pretty even throughout the state with a low of 112% in the Upper Columbia to a high of 212% in the North Puget Sound. The wettest spot in the state was reported at Alpine Meadows SNOTEL in the Tolt River Basin with a March accumulation of 34.8 inches, or 198% of average. The highest percent of average was at Darrington, WA, near the location of the devastating Oso landslide, which received 266% of average precipitation.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	178	93
Pend Oreille	168	89
Upper Columbia	112	77
Central Columbia	192	93
Upper Yakima	172	96
Lower Yakima	180	94
Walla Walla	163	105
Lower Snake	159	101
Lower Columbia	174	90
South Puget Sound	175	102
Central Puget Sound	191	104
North Puget Sound	212	94
Olympic Peninsula	148	73

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. However with the bulk of winter snow and precipitation already on the ground we will start to see reservoirs fill with spring runoff. Reservoir storage in the Yakima Basin was 610,000-acre feet, 119% of average for the Upper Reaches and 201,000-acre feet or 133% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 192,000 acre feet, 116% of average and 80% of capacity; and the Skagit River reservoirs at 57% of average and 30% 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	80	116
Pend Oreille	42	83
Upper Columbia	89	102
Central Columbia	34	89
Upper Yakima	73	119
Lower Yakima	87	133
Lower Snake	61	88
North Puget Sound	30	57

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

Streamflow

With the addition of more snow and above normal precipitation all forecasts increased by 5-20% this month. Forecasts vary from 78% of average for the Colville River at Kettle Falls to 124% of average for the Okanogan River at Malott. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 108%; White River, 109%; and Skagit River, 116%. Some Eastern Washington streams include the Yakima River near Parker, 102%: Wenatchee River at Plain, 105% and Spokane River near Post Falls, 115%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. March runoff varied greatly by basin and is often influenced this time of year by reservoir control which may cause sudden changes in daily flows. Caution should be taken when working or playing in or near streams influenced by spring snowmelt.

BASIN	PERCENT OF AVERAGE FORECAST (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	83-115
Pend Oreille	86-134
Upper Columbia	78-135
Central Columbia	95-105
Upper Yakima	96-110
Lower Yakima	97-110
Walla Walla	100
Lower Snake	102-134
Lower Columbia	87-107
South Puget Sound	85-109
Central Puget Sound	100-122
North Puget Sound	103-106
Olympic Peninsula	96-97

STREAM	PERCENT OF AVERAGE MARCH RUNOFF
Pend Oreille at Albeni Fall Dam	113
Kettle at Laurier	59
Columbia at Birchbank	97
Spokane at Spokane	185
Similkameen at Nighthawk	111
Okanogan at Tonasket	135
Methow at Pateros	75
Chelan at Chelan	112
Wenatchee at Pashastin	142
Cle Elum near Roslyn	168
Yakima at Parker	163
Naches at Naches	218
Grande Ronde at Troy	202
Snake below Lower Granite Dam	128
Columbia River at The Dalles	126
Cowlitz below Mayfield Dam	225
Skagit at Concrete	185
Dungeness near Sequim	178

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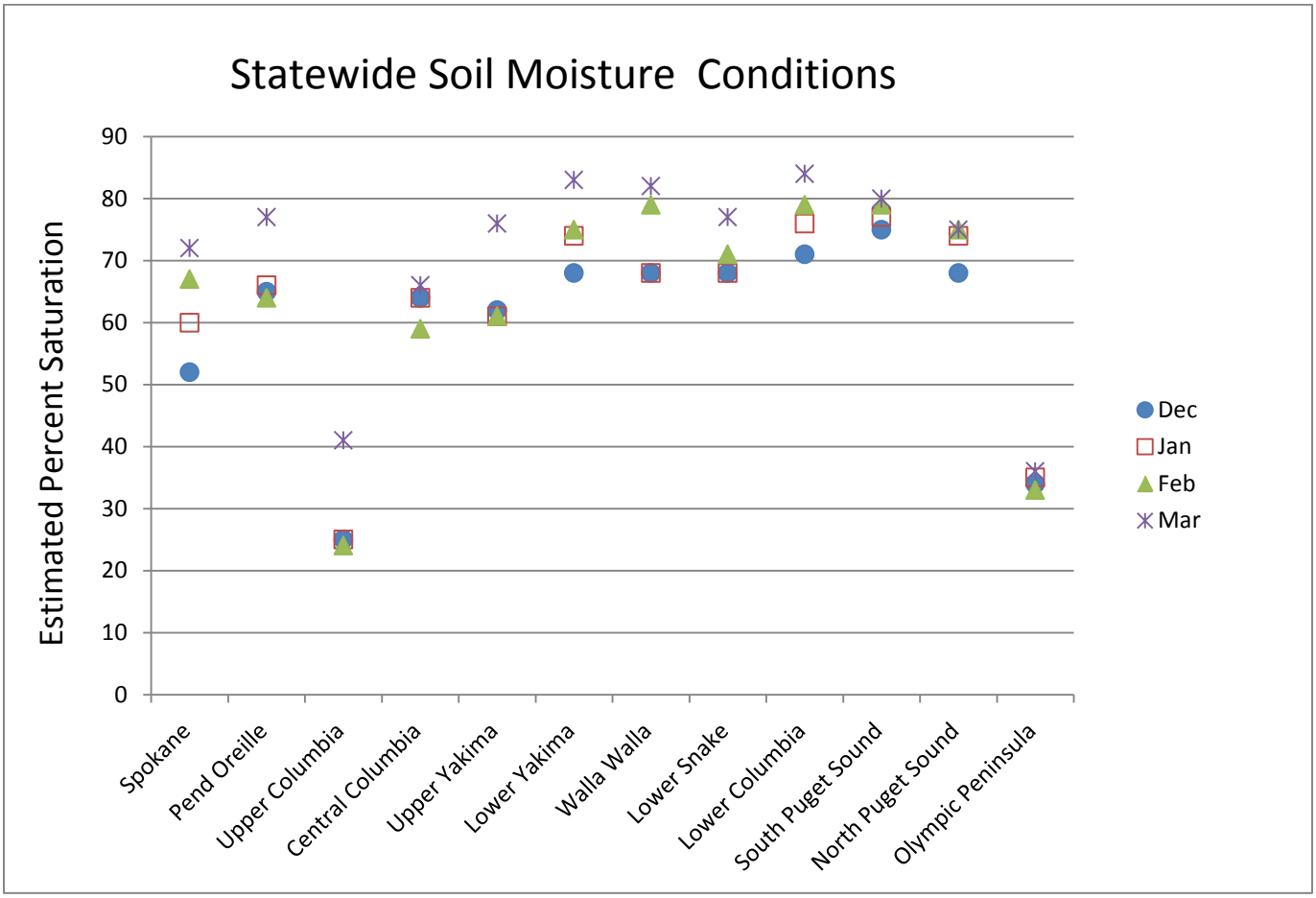
Soil Moisture

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. Light fall precipitation created drier than optimal soil moisture conditions coming into winter. However greater than normal precipitation during February and March helped buffer soil moisture levels back to near normal conditions for this time of year. Additional increases should be expected as the snow ripens and begins the normal spring melt phase. Having elevated soil moisture levels now is also a good indicator for increased runoff in the spring.

BASIN	ESTIMATED PERCENT SATURATION
Spokane	72
Pend Oreille	77
Upper Columbia	41
Central Columbia	66
Upper Yakima	76
Lower Yakima	83
Walla Walla	82
Lower Snake	77
Lower Columbia	84
South Puget Sound	80
Central Puget Sound	N/A
North Puget Sound	75
Olympic Peninsula	36



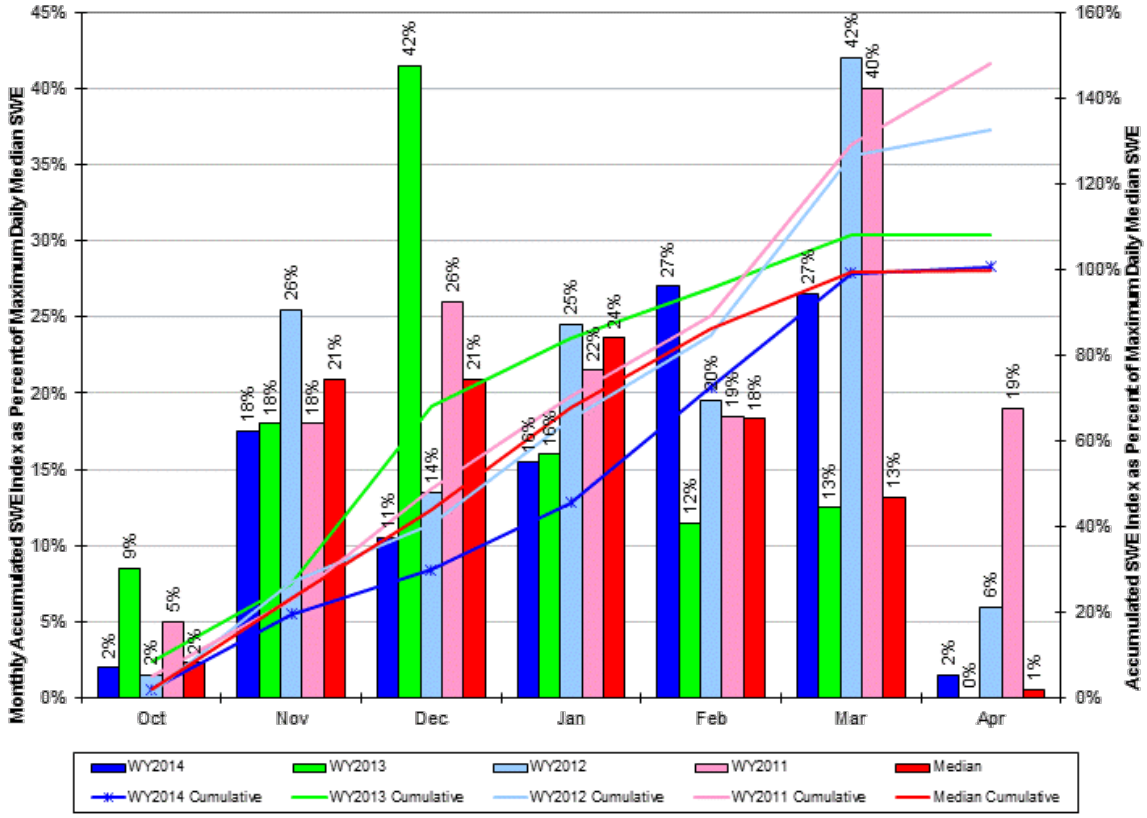
B A S I N S U M M A R Y O F
S N O W C O U R S E D A T A

APRIL 2014

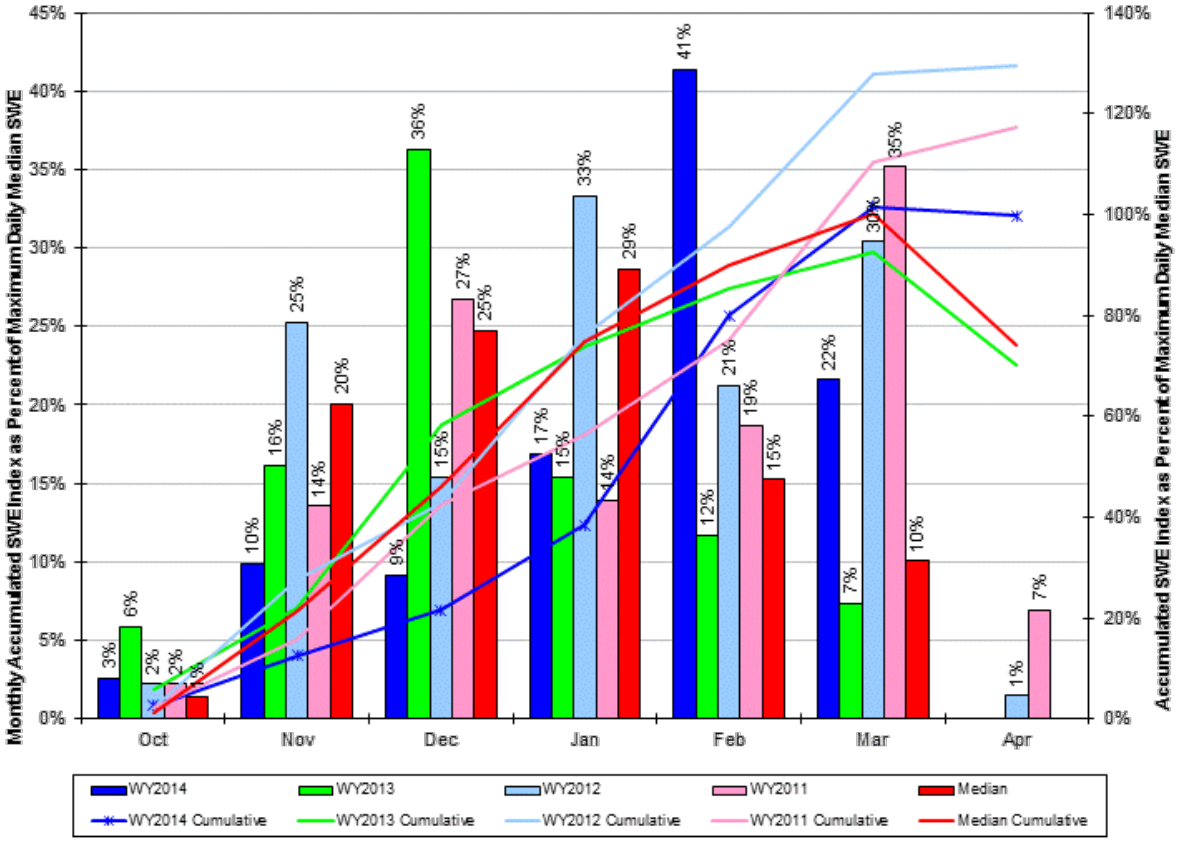
SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
ABERDEEN LAKE CAN.	4000	3/26/14	24	7.2	5.7	5.6
ALPINE MEADOWS	3500	4/01/14	88	37.0	59.8	40.2
ALPINE MEADOWS SNTL	3500	4/01/14	90	47.9	73.7	51.0
AMBROSE	6480	3/29/14	56	16.6	9.9	10.4
ASHLEY DIVIDE	4820	3/25/14	27	8.6	2.8	4.4
BADGER PASS SNOTEL	6900	4/01/14	104	41.7	32.3	29.8
BAIRD #2	3220	3/27/14	20	5.7	5.6	6.8
BAREE CREEK	5500	3/31/14	112	44.7	36.7	34.9
BAREE MIDWAY	4600	3/31/14	91	33.8	25.5	27.8
BAREE TRAIL	3800	3/31/14	26	9.1	7.8	7.2
BARKER LAKES SNOTEL	8250	4/01/14	70	20.0	12.0	13.9
BARNES CREEK CAN.	5320	4/01/14	65	22.2	18.8	20.4
BASIN CREEK SNOTEL	7180	4/01/14	47	12.3	6.0	7.5
BASSOO PEAK	5150	3/26/14	36	12.6	6.6	7.8
BEAVER CREEK TRAIL	2200	3/27/14	33	12.7	12.8	9.2
BEAVER PASS	3680	3/30/14	71	26.4	37.1	26.0
BEAVER PASS SNOTEL	3630	4/01/14	99	39.5	44.6	32.8
BIG WHITE MTN CAN.	5510	3/26/14	58	17.4	--	20.0
BLACK MOUNTAIN	7750	3/25/14	55	15.3	11.3	14.1
BLACK PINE SNOTEL	7100	4/01/14	55	17.9	7.9	9.6
BLACKWALL PILL CAN.	6370	3/31/14	108	37.4	28.3	35.1
BLEWETT PASS#2SNOTEL	4240	4/01/14	27	13.0	6.0	13.9
BONAUPART SOUTH	4660	3/28/14	10	2.3	5.6	--
BRENDA MINE CAN.	4450	3/27/14	39	11.0	10.0	12.5
BROOKMERE CAN.	3000	3/31/14	19	6.2	5.7	7.9
BROWN TOP AM	6000	3/31/14	170	58.9	54.4	53.4
BROWNS PASS		3/26/14	0	.0	1.5	--
BRUSH CREEK TIMBER	5000	3/27/14	50	19.7	10.0	6.1
BUCKINGHORSE SNOTEL	4870	4/01/14	109	44.9	64.5	--
BULL MOUNTAIN	6600	3/28/14	24	8.8	6.1	5.6
BUMPING LAKE (NEW)	3400	4/02/14	32	12.1	12.5	15.8
BUMPING RIDGE SNOTEL	4610	4/01/14	76	27.6	22.0	25.8
BUNCHGRASS MDWSNOTEL	5000	4/01/14	86	26.8	23.0	26.2
BURNT MOUNTAIN PIL	4170	4/01/14	44	17.2	21.7	16.3
BUTTE CREEK #2		3/26/14	22	5.8	7.4	--
BUTTERMILK BUTTE	5250	3/28/14	41	14.1	13.0	--
CALAMITY SNOTEL	2500	4/01/14	0	.0	.0	--
CARMI CAN.	4100	3/27/14	16	3.3	--	5.6
CAYUSE PASS SNOTEL	5240	4/01/14	141	50.3	59.1	--
CHESSMAN RESERVOIR	6200	3/25/14	33	10.0	4.8	2.6
CHEWALAH #2	4930	3/25/14	43	12.9	15.9	16.3
CHICKEN CREEK	4060	3/25/14	59	20.5	16.4	13.8
CITY CABIN	2390	4/01/14	10	3.2	8.4	8.5
COLD CREEK STRIP	6020	3/25/14	28	6.4	10.8	8.5
COMBINATION SNOTEL	5600	4/01/14	24	8.1	2.8	4.2
COPPER BOTTOM SNOTEL	5200	4/01/14	27	9.6	.0	--
COPPER MOUNTAIN	7700	3/25/14	44	12.9	7.0	9.9
CORRAL PASS SNOTEL	5800	4/01/14	100	38.8	31.9	33.7
COTTONWOOD CREEK	6400	3/27/14	32	9.1	6.1	7.3
COUGAR MTN. SNOTEL	3200	4/01/14	23	9.9	23.3	14.1
COX VALLEY	4500	3/28/14	72	27.3	42.4	36.0
COYOTE HILL	4200	3/27/14	32	12.7	6.5	7.0
DALY CREEK SNOTEL	5780	4/01/14	52	17.5	8.1	9.6
DEER PARK	5200	4/01/14	42	16.1	21.3	16.7
DESERT MOUNTAIN	5600	3/28/14	62	19.5	13.2	12.6
DEVILS PARK	5900	3/27/14	147	53.2	38.6	38.7
DISAUTEL PASS		3/26/14	8	2.1	5.1	--
DISCOVERY BASIN	7050	3/26/14	45	13.6	7.6	9.2
DIX HILL	6400	3/30/14	46	15.2	6.0	9.1
DOCK BUTTE AM	3800	4/02/14	150	67.5	84.0	53.5
DOMMERIE FLATS	2200	4/02/14	0	.0	.0	.0
DUNCAN RIDGE	5370	3/25/14	14	3.7	6.6	4.7
DUNGENESS SNOTEL	4010	4/01/14	15	5.7	11.8	5.4
EASY PASS AM	5200	4/02/14	180	81.0	93.0	73.8
EL DORADO MINE	7800	3/26/14	54	17.8	8.7	17.4
ELBOW LAKE SNOTEL	3200	4/01/14	75	33.7	44.9	36.9
EMERY CREEK SNOTEL	4350	4/01/14	56	20.5	13.3	13.7
ENDERBY CAN.	5800	3/31/14	121	45.3	46.5	40.1
ESPERON CK. MID CAN.	4250	3/26/14	37	10.0	13.6	14.6
ESPERON CK. UP CAN.	5050	3/26/14	43	13.0	16.3	17.1
FARRON CAN.	4000	3/31/14	33	10.9	10.2	12.5
FATTY CREEK	5500	3/31/14	99	34.6	21.1	21.2
FISH CREEK	8000	4/04/14	56	17.6	7.3	9.0
FISH LAKE	3370	4/01/14	76	32.8	27.6	27.4
FISH LAKE SNOTEL	3430	4/01/14	72	29.5	25.9	29.8
FLATTOP MTN SNOTEL	6300	4/01/14	158	52.8	48.1	42.0
FLEECER RIDGE	7500	3/28/14	44	14.4	7.8	9.5
FOURTH OF JULY SUM	3200	3/31/14	8	2.3	3.4	3.4
FREEZEOUT CK. TRAIL	3500	3/31/14	36	13.2E	11.3	9.6
FROHNER MDWS SNOTEL	6480	4/01/14	51	13.8	6.5	7.4
FROST MEADOWS	4630	4/02/14	59	22.0	17.0	16.5
GOAT CREEK	3600	3/26/14	12	3.2	4.9	2.8
GOLD MTN LOOKOUT		3/25/14	13	4.0	7.6	--
GRASS MOUNTAIN #2	2900	4/01/14	0	.0	--	1.1
GRAVE CRK SNOTEL	4300	4/01/14	60	21.9	14.3	13.8
GREEN LAKE SNOTEL	5920	4/01/14	70	22.2	24.2	22.3
GREYBACK RES CAN.	4700	3/28/14	37	10.1	10.0	9.2
GRIFFIN CR DIVIDE	5150	3/26/14	40	14.0	6.3	8.4
GROUSE CAMP SNOTEL	5390	4/01/14	41	18.9	12.6	18.0
HAMILTON HILL CAN.	4550	3/31/14	39	12.3	8.5	14.0
HAND CREEK SNOTEL	5030	4/01/14	44	15.0	7.2	11.1
HARTS PASS SNOTEL	6490	4/01/14	118	47.8	43.8	41.2
HARTS PASS	6500	3/27/14	124	44.4	41.7	36.7
HELL ROARING DIVIDE	5770	3/30/14	101	33.0	26.1	25.8
HERRIG JUNCTION	4850	3/25/14	88	31.0	22.8	24.1
HIGH RIDGE SNOTEL	4920	4/01/14	53	20.3	19.2	20.7
HOLBROOK	4530	3/25/14	30	10.7	4.1	6.8
HOODOO BASIN SNOTEL	6050	4/01/14	146	52.3	36.6	38.9
HUCKLEBERRY SNOTEL	2250	4/01/14	0	.0	.0	.0
HUMBOLDT GLCH SNOTEL	4250	4/01/14	53	18.0	9.5	9.1
HURRICANE	4500	3/28/14	31	10.7	23.1	15.0
INDIAN ROCK SNOTEL	5360	4/01/14	49	19.5	23.7	--
IRENE'S CAMP	5530	3/25/14	35	8.6	9.0	8.6
ISINTOK LAKE CAN.	5100	3/26/14	31	6.4	7.0	7.2
JASPER PASS AM	5400	4/02/14	197	88.6	97.0	77.0
JUNE LAKE SNOTEL	3440	4/01/14	58	22.5	53.7	34.5
KELLER RIDGE	3700	3/27/14	3	.5	3.8	--
KELLOGG PEAK	5560	3/31/14	66	24.2	18.3	24.7
KISHENEHN	3890	3/26/14	38	9.8	7.2	6.6
KLESILKWA CAN.	3450	4/01/14	33	13.5	12.0	11.5
KRAFT CREEK SNOTEL	4750	4/01/14	50	22.4	9.6	--
LAMB BUTTE		3/27/14	46	15.8	16.0	--
LIGHTNING LAKE CAN.	3700	3/26/14	39	12.1	11.0	12.0
LOGAN CREEK	4300	3/28/14	33	10.7	4.2	5.8
LOLO PASS SNOTEL	5240	4/01/14	111	39.0	21.9	27.1
LONE PINE SNOTEL	3930	4/01/14	67	25.0	49.3	35.2
LOOKOUT SNOTEL	5140	4/01/14	85	32.4	22.5	26.2
LOST HORSE MTN CAN.	6300	4/01/14	41	11.5	9.8	9.4
LOST HORSE SNOTEL	5120	4/01/14	34	10.5	14.4	18.6
LOST LAKE SNOTEL	6110	4/01/14	152	59.6	41.6	52.3
LOST LAKE	4070	3/28/14	17	4.3	6.1	--
LOUP LOUP CAMPGROUND		3/26/14	35	8.6	8.6	--
LOWER SANDS CREEK #2	3120	3/27/14	51	18.6	17.2	16.9
LUBRECHT FOREST NO 3	5450	3/28/14	26	8.4	2.3	4.6
LUBRECHT FOREST NO 4	4650	3/28/14	10	3.6	.0	.4
LUBRECHT FOREST NO 6	4040	3/28/14	15	5.6	.0	.6
LUBRECHT HYDROPLOT	4200	3/28/14	18	7.4	.0	.6
LUBRECHT SNOTEL	4680	4/01/14	19	7.1	.0	1.6
LYMAN LAKE SNOTEL	5980	4/01/14	156	59.8	54.4	57.6
LYNN LAKE	4000	4/01/14	---	19.8E	33.0	18.0
LYNN LAKE SNOTEL	3900	4/01/14	55	19.8	33.5	--
MARIAS PASS	5250	3/27/14	61	20.9	14.2	14.4
MARTEN LAKE AM	3600	4/02/14	156	70.2	96.0	70.0
MARTEN RIDGE SNOTEL	3520	4/01/14	129	56.9	71.5	--
MAZAMA		3/26/14	26	9.7	2.6	--
MCCULLOCH CAN.	4200	3/28/14	21	6.7	6.6	6.1
MEADOWS CABIN	1900	3/31/14	15	6.3	.0	.6
MEADOWS PASS SNOTEL	3230	4/01/14	63	25.8	33.1	20.6
METEOR		3/25/14	0	.0	.0	--
M F NOOKSACK SNOTEL	4970	4/01/14	157	75.7	70.3	59.1
MICA CREEK SNOTEL	4510	4/01/14	62	25.4	18.7	20.3
MINERAL CREEK	4000	3/25/14	49	17.2	11.0	15.4
MISSEZULA MTN CAN.	5080	4/01/14	38	11.6	6.6	9.5
MISSION CREEK CAN.	5840	3/31/14	63	21.8	21.5	20.0
MONASHEE PASS CAN.	4500	4/01/14	46	15.0	11.6	13.5
MORSE LAKE SNOTEL	5410	4/01/14	129	51.5	55.2	52.3
MOSES MOUNTAIN (2)	4800	4/01/14	21	7.3	17.9	13.4
MOSES MTN SNOTEL	5010	4/01/14	32	9.2	19.9	14.6
MOSES PEAK	6650	4/01/14	46	14.1	30.3	20.1
MOSQUITO RDG SNOTEL	5200	4/01/14	92	35.8	32.4	31.6
MOULTON RESERVOIR	6850	4/02/14	34	10.6	4.4	6.3
MOUNT BLUM AM	5800	4/02/14	156	70.2	75.0	61.0
MOUNT CRAG SNOTEL	3960	4/01/14	49	19.4	35.2	28.5
MT. KOBAU CAN.	5500	3/29/14	31	8.1	19.7	12.5
MOUNT TOLMAN	2000	3/25/14	0	.0	.0	.0
MOWICH SNOTEL	3160	4/01/14	0	.0	.0	.0
MOUNT GARDNER	3300	4/01/14	19	7.5	15.8	9.5
MOUNT GARDNER SNOTEL	2920	4/01/14	23	9.1	16.6	12.9
MUTTON CREEK #1	5700	3/24/14	26	7.3	15.8	12.8
N.F. ELK CR SNOTEL	6250	4/01/14	57	17.0	8.3	10.6
NEVADA RIDGE SNOTEL	7020	4/01/14	73	22.1	12.3	13.9
NEZ PERCE CMP SNOTEL	5650	4/01/14	65	19.9	11.9	13.0
NOISY BASIN SNOTEL	6040	4/01/14	135	47.8	40.9	39.3
NORTH FORK JOCKO	6330	3/31/14	136	51.0	40.4	38.4
OLALLIE MDWS SNOTEL	4030	4/01/14	123	55.8	56.0	50.0
OPHIR PARK	7150	3/30/14	66	20.5	9.6	14.8
OYAMA LAKE CAN.	4100	3/31/14	26	6.8	5.4	6.7
PARADISE SNOTEL	5130	4/01/14	166	81.1	78.2	67.0
PARK CK RIDGE SNOTEL	4600	4/01/14	107	48.8	47.1	44.4
PEPPER CREEK SNOTEL	2140	4/01/14	0	.0	5.5	--
PETERSON MDW SNOTEL	7200	4/01/14	54	14.9	8.5	9.6
PETTIJOHN CREEK	4300	3/28/14	12	3.0	5.4	--
PIGTAIL PEAK SNOTEL	5800	4/01/14	151	64.0	49.8	50.2
PIKE CREEK SNOTEL	5930	4/01/14	51	12.0	8.2	22.9

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
PIPESTONE PASS	7200	3/25/14	30	8.2	4.7	4.6
POPE RIDGE SNOTEL	3590	4/01/14	36	15.8	13.4	15.8
POSTILL LAKE CAN.	4200	3/31/14	29	8.7	7.5	8.8
POTATO HILL SNOTEL	4510	4/01/14	82	31.7	30.1	24.9
QUARTZ PEAK SNOTEL	4700	4/01/14	48	18.1	16.0	18.9
RAGGED MTN SNOTEL	4210	4/01/14	44	17.9	17.9	20.7
RAGGED RIDGE	3330	3/28/14	1	.2	4.4	1.0
RAINY PASS SNOTEL	4890	4/01/14	---	42.5	33.5	36.5
RAINY PASS	4780	4/01/14	115	53.3	31.2	--
REX RIVER SNOTEL	3810	4/01/14	75	33.5	43.3	34.7
ROCKER PEAK SNOTEL	8000	4/01/14	73	21.1	10.8	12.4
ROCKY CREEK AM	2100	4/02/14	60	27.0	60.0	--
ROLAND SUMMIT	5120	4/01/14	109	47.1	30.0	31.0
ROUND TOP MTN	4020	3/28/14	30	9.4	11.6	--
RUSTY CREEK	4000	3/24/14	3	1.0	5.7	4.9
SADDLE MTN SNOTEL	7900	4/01/14	106	36.4	20.1	22.9
SALMON MDWS SNOTEL	4460	4/01/14	19	6.6	9.7	9.1
SASSE RIDGE SNOTEL	4340	4/01/14	84	32.4	28.1	31.4
SATUS PASS	4030	3/28/14	12	4.9	7.1	7.0
SATUS PASS	3960	4/01/14	13	4.7	4.6	--
SAVAGE PASS SNOTEL	6170	4/01/14	102	36.7	23.3	24.4
SAWMILL RIDGE SNOTEL	4640	4/01/14	85	36.1	37.6	--
SCHREIBERS MDW AM	3400	4/02/14	90	40.5	65.0	45.0
SENTINEL BT SNOTEL	4680	4/01/14	35	8.7	8.8	8.1
SHEEP CANYON SNOTEL	3990	4/01/14	65	26.6	46.1	33.9
SHERWIN SNOTEL	3200	4/01/14	---	3.5	3.7	6.6
SILVER STAR MTN CAN.	5600	3/30/14	83	29.7	33.9	29.9
SKALKAHO SNOTEL	7260	4/01/14	90	30.5	17.9	21.4
SKITWISH RIDGE	5110	3/27/14	86	29.7	27.8	28.6
SKOOKUM CREEK SNOTEL	3310	4/01/14	59	35.3	54.0	29.3
SKOOKUM LAKES	4230	3/28/14	33	11.1	10.9	--
SLIDE ROCK MOUNTAIN	7100	3/26/14	61	20.2	13.6	12.9
SOURDOUGH GUL SNOTEL	4000	4/01/14	0	.0	.0	.0
SOUTH BALDY	4920	3/28/14	60	18.9	15.7	--
SPENCER MDW SNOTEL	3400	4/01/14	37	17.5	31.6	29.4
SPIRIT LAKE SNOTEL	3520	4/01/14	0	.1	15.6	1.2
SPOTTED BEAR MTN.	7000	3/28/14	56	18.8	8.8	12.2
SPRUCE SPGS SNOTEL	5700	4/01/14	43	16.8	9.0	13.8
STARVATION MOUNTAIN	6750	3/28/14	53	16.5	22.0	15.3
STAHL PEAK SNOTEL	6030	4/01/14	123	40.4	34.5	33.3
STAMPEDE PASS SNOTEL	3850	4/01/14	85	33.4	32.9	40.3
STEMPLE PASS	6600	3/27/14	48	13.0	8.1	8.3
STEVENS PASS SNOTEL	3950	4/01/14	113	36.1	34.9	37.0
STORM LAKE	7780	3/26/14	54	15.5	10.5	12.6
STRANGER MOUNTAIN	4230	3/25/14	19	6.4	11.0	10.5
STRYKER BASIN	6180	3/25/14	110	40.4	33.4	28.2
SUMMERLAND RES CAN.	4200	3/27/14	38	11.1	8.9	8.9
SUMMIT G.S. #2	4600	3/26/14	33	8.6	10.2	8.9
SUNSET SNOTEL	5540	4/01/14	73	24.7	17.9	21.4
SURPRISE LKS SNOTEL	4290	4/01/14	92	39.3	46.5	45.5
SWAMP CREEK SNOTEL	3930	4/01/14	61	26.6	15.4	17.4
SWIFT CREEK SNOTEL	4440	4/01/14	105	41.9	70.0	61.0
TEN MILE LOWER	6600	3/26/14	45	14.2	7.6	5.7
TEN MILE MIDDLE	6800	3/26/14	58	16.6	8.8	9.8
THUNDER BASIN SNOTEL	4320	4/01/14	78	31.0	28.9	29.7
THUNDER BASIN	4200	3/31/14	80	26.4	21.0	20.0
THOMPSON CREEK	2500	3/28/14	1	.6	3.7	.0
THOMPSON RIDGE	4650	3/28/14	37	12.6	11.0	--
TINKHAM CREEK SNOTEL	2990	4/01/14	58	22.7	28.8	26.2
TOATS COULEE	2850	3/25/14	1	.2	2.6	.1
TOUCHET SNOTEL	5530	4/01/14	66	28.6	25.4	30.1
TRINKUS LAKE	6100	3/31/14	138	51.0	39.4	37.2
TROUGH #2 SNOTEL	5480	4/01/14	25	9.7	8.2	8.2
TROUT CREEK CAN.	5650	3/26/14	35	10.1	8.2	7.2
TRUMAN CREEK	4060	3/25/14	0	.0	1.5	2.5
TUNNEL AVENUE	2450	3/31/14	37	14.5	10.3	16.4
TWELVEMILE SNOTEL	5600	4/01/14	66	25.5	9.2	14.5
TWIN LAKES SNOTEL	6400	4/01/14	132	54.5	31.5	35.4
UPPER HOLLAND LAKE	6200	3/31/14	116	40.8	30.3	29.6
UPPER WHEELER SNOTEL	4330	4/01/14	26	10.3	7.9	12.2
VASEUX CREEK CAN.	4250	3/29/14	28	7.1	4.1	6.2
VULCAN MTN	4660	3/26/14	32	8.0	11.5	--
VULCAN ROAD	3840	3/26/14	24	6.1	8.1	--
WARM SPRINGS SNOTEL	7800	4/01/14	98	28.3	16.0	19.0
WATSON LAKES AM	4500	4/02/14	144	64.8	72.0	57.0
WATERHOLE SNOTEL	5010	4/01/14	93	36.4	49.0	39.4
WEASEL DIVIDE	5450	3/27/14	101	33.6	27.5	29.0
WELLS CREEK SNOTEL	4030	4/01/14	85	36.3	41.9	29.0
WEST SMAY CREEK	3600	4/01/14	64	28.6	36.6	--
WHITE PASS ES SNOTEL	4440	4/01/14	59	23.4	21.3	21.6
WHITE ROCKS MTN CAN.	7200	3/26/14	56	17.8	23.9	23.1

COLUMBIA ABOVE METHOW Time Series Peak Snowpack Summary
Based on Provisional SNOTEL data as of Apr 07, 2014



CHELAN, ENTIAT, WENATCHEE Time Series Peak Snowpack Summary
Based on Provisional SNOTEL data as of Apr 07, 2014



Natural Resources Conservation Service

Washington State
Snow, Water and Climate Services

Program Contacts

Roylene Rides At The Door
State Conservationist
Spokane State Office
W. 316 Boone Ave., Suite 450
Spokane, WA 99201-2348
phone: 509-323-2961
fax: 509-323-2979
roylene.rides-at-the-door@wa.usda.gov

Melissa Webb
Hydrologist
Oregon Data Collection Office
101 SW Main St, Suite 1300
Portland, OR 97204
Phone: 503-414-3267
Fax: 503-414-3277
melissa.webb@or.usda.gov

Scott Pattee
Water Supply Specialist
Washington Snow Survey Office
2021 E. College Way, Suite 214
Mount Vernon, WA 98273-2873
phone: 360-428-7684
fax: 360-424-6172
scott.pattee@wa.usda.gov

Rashawn Tama
Forecast Hydrologist
National Water and Climate Center
101 SW Main St., Suite 1600
Portland, OR 97204-3224
phone: 503-414-3010
fax: 503-414-3101
rashawn.tama@por.usda.gov

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

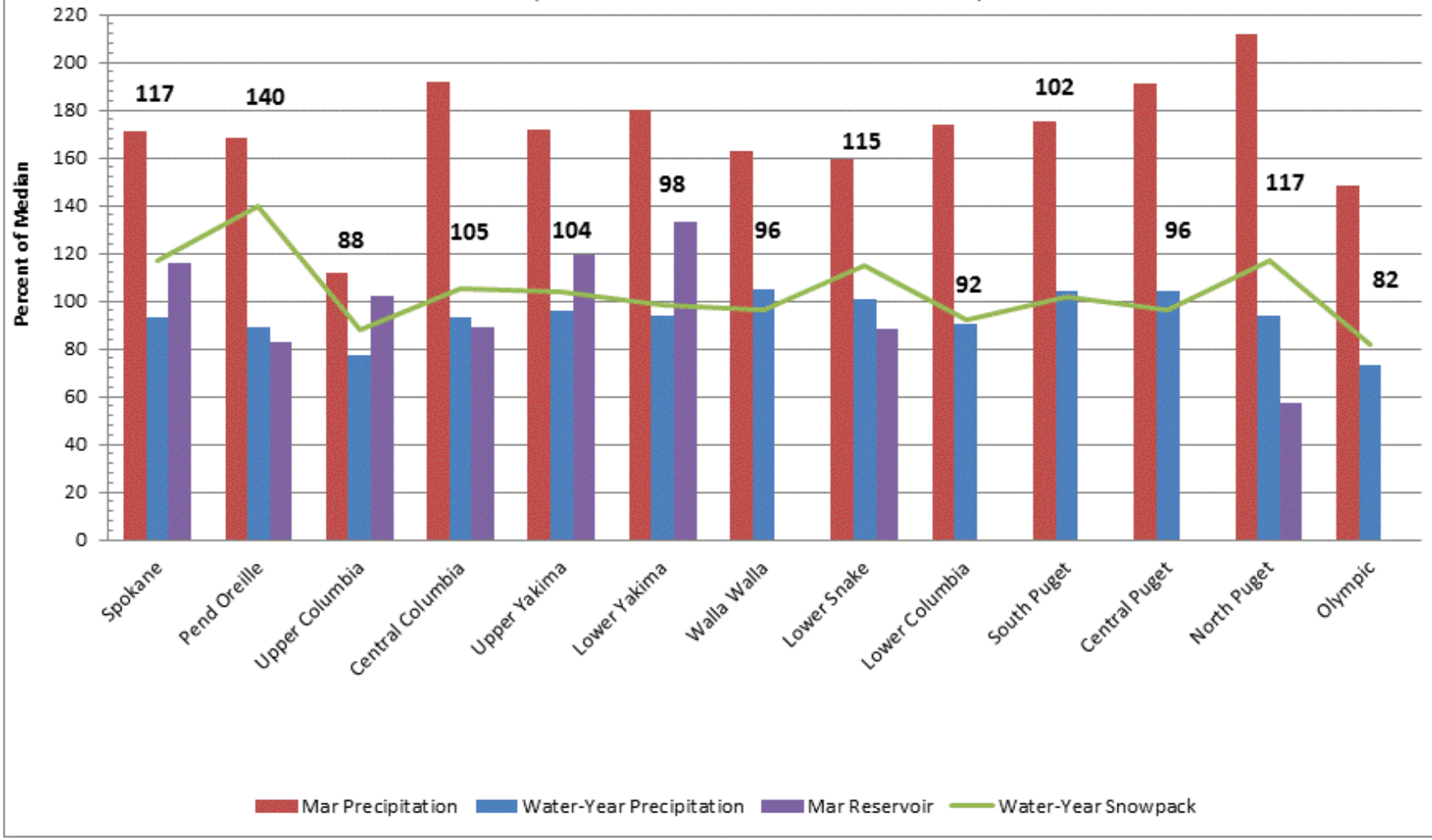
Washington:
http://www.wa.nrcs.usda.gov

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

NRCS Natural Resources Conservation Service

April 1, 2014 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2013 - Current Date)



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 South Continental Area Committee is making plans for the 82nd Annual Western Snow Conference in 2014.

Mark your calendar and start thinking about submitting a paper to attend the 2014 Western Snow Conference:

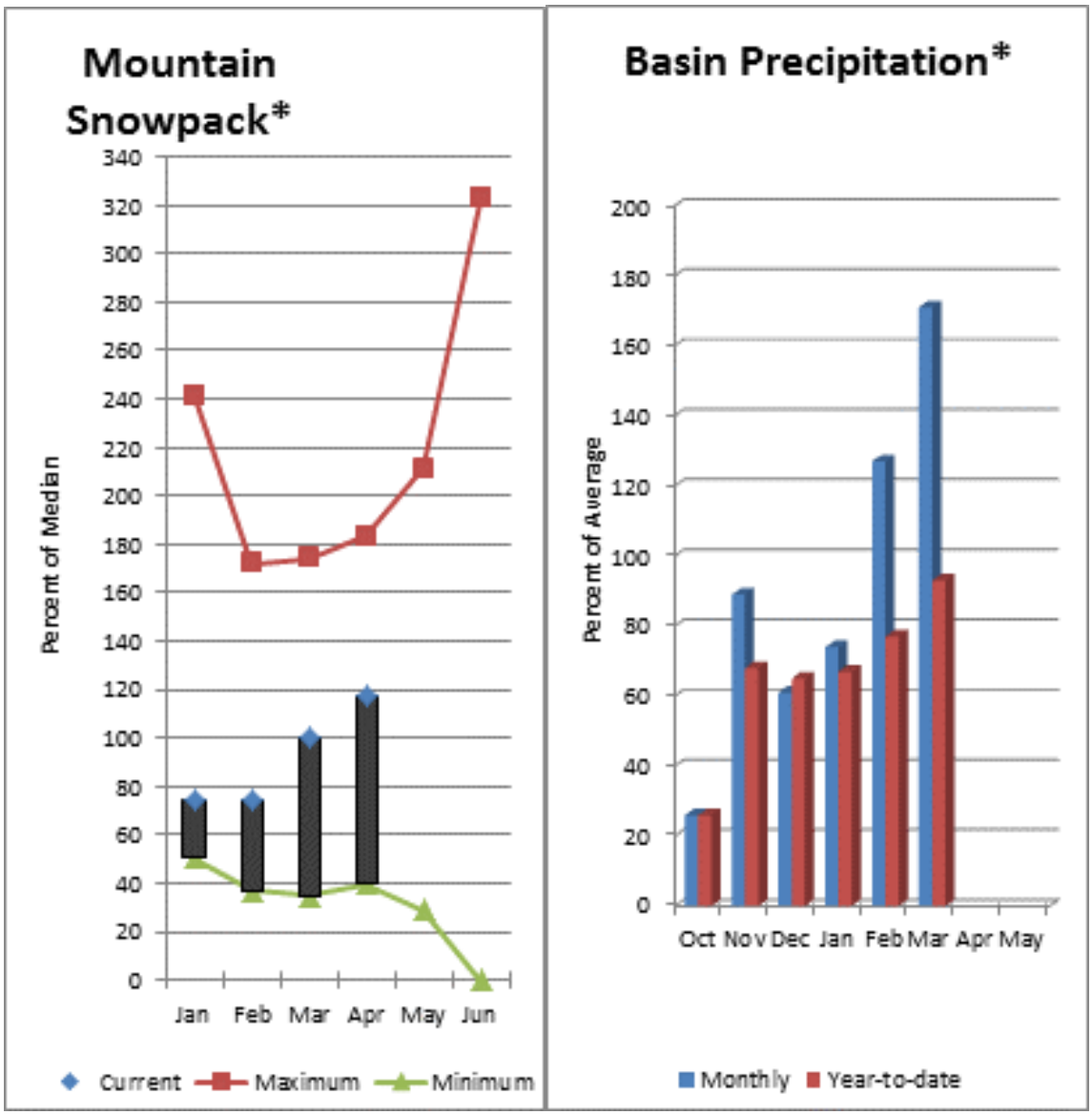
Dates: April 14-17, 2014
Location: Durango, Colorado

The Technical Tour is scheduled for Thursday, April 17th, to explore current research activities in the Durango/Silverton area led by personnel of the Center for Snow and Avalanche Studies in Silverton. One of their projects is the issue of dust on snow, changes in albedo, accelerated melt, and the subsequent impact on stream flow.

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.

Spokane River Basin



*Based on selected stations

The April 1 forecasts for summer runoff within the Spokane River Basin are 115% of average near Post Falls and 114% at Long Lake. The Chamokane River near Long Lake forecasted to have 83% of average flows for the May-August period. The forecast is based on a basin snowpack that is 117% of normal and precipitation that is 89% of average for the water year. Precipitation for March was above normal at 171% of average. Streamflow on the Spokane River at Spokane was 185% of average for March. April 1 storage in Coeur d'Alene Lake was 192,000 acre feet, 116% of average and 80% of capacity. Snowpack at Quartz Peak SNOTEL site was 96% of average with 18.1 inches of water content. Average temperatures in the Spokane basin were slightly above normal for March and 1-2 degrees below for the water year.

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

Streamflow Forecasts - April 1, 2014

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	2180	2510	2740	115	2970	3300	2390
	APR-SEP	2260	2610	2840	115	3070	3420	2480
Spokane R at Long Lake (2)	APR-JUL	2370	2730	2980	114	3230	3590	2620
	APR-SEP	2610	2990	3250	114	3510	3890	2850
Chamokane Ck nr Long Lake	MAY-AUG	4.0	6.2	7.7	83	9.2	11.4	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	191.6	138.1	165.5

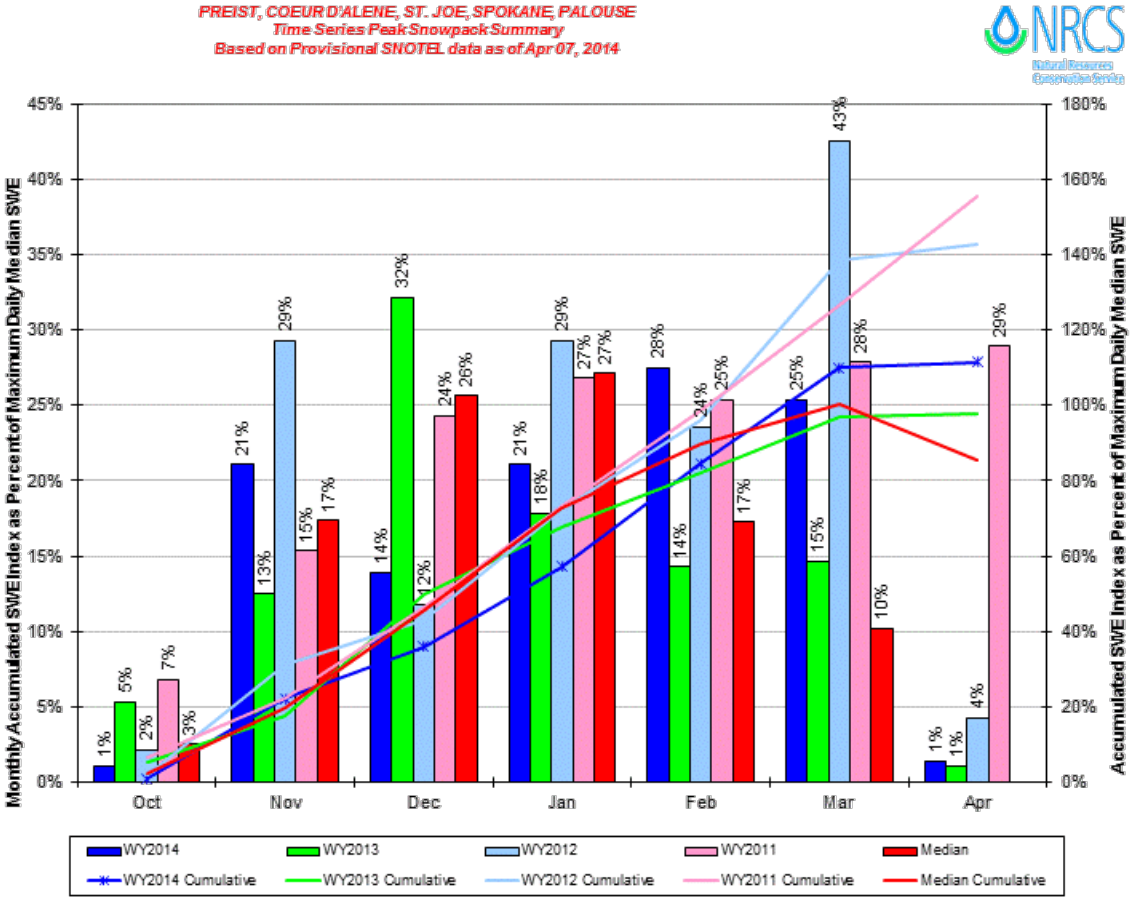
SPOKANE RIVER BASIN
Watershed Snowpack Analysis - April 1, 2014

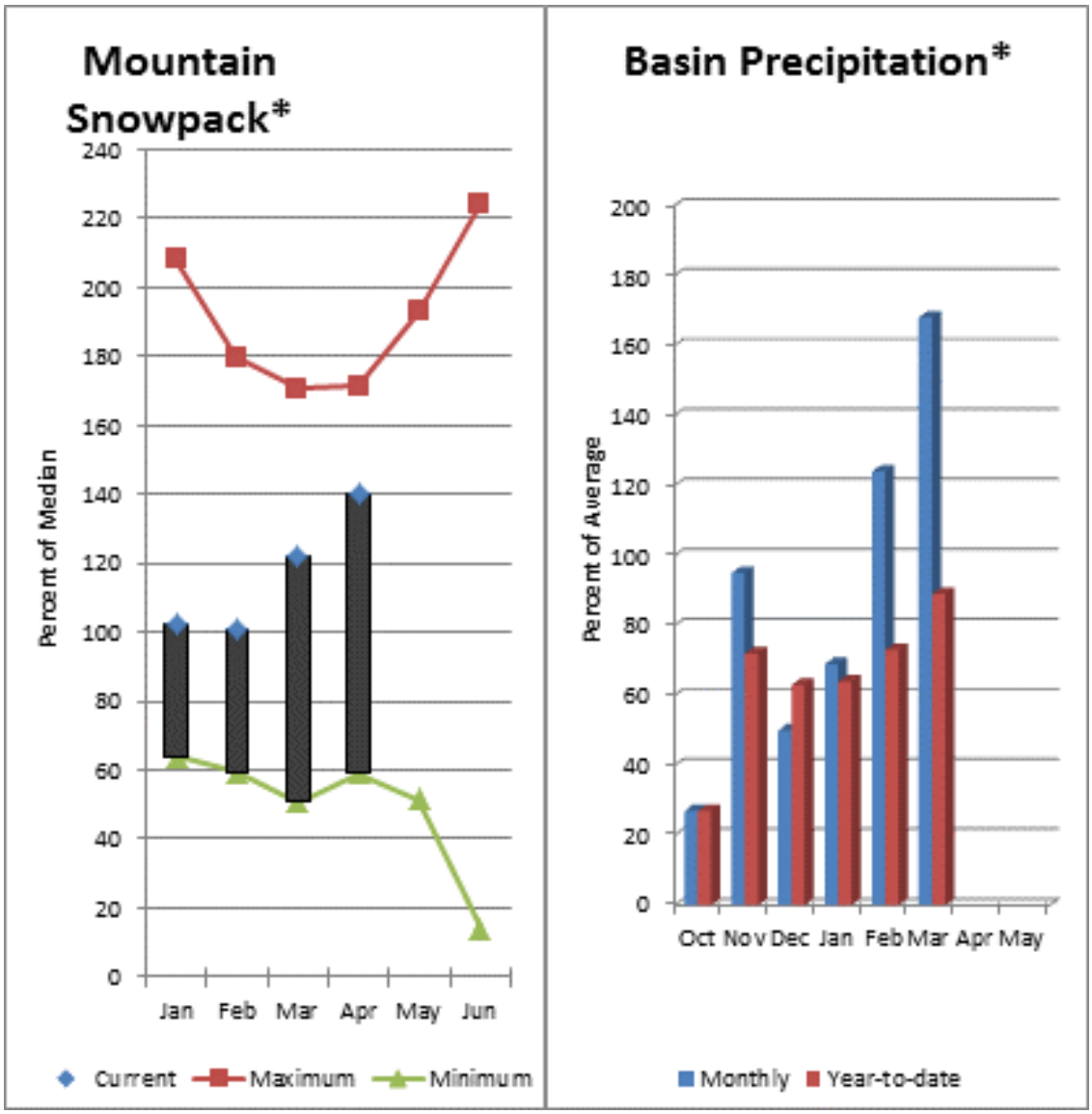
Watershed	Number of Data Sites	This Year as % of Last Yr	Median
SPOKANE RIVER	16	130	117
NEWMAN LAKE	2	90	92

* 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.





*Based on selected stations

The April – September average forecast for the Priest River near the town of Priest River is 86% and the Pend Orielle below Box Canyon is 133%. March streamflow was 133% of average on the Pend Oreille River and 97% on the Columbia Birchbank. April 1 snow cover was 140% of normal in the Pend Oreille River Basin. Bunchgrass Meadows SNOTEL site had 26.8 inches of snow water on the snow pillow. Normally Bunchgrass would have 26.2 inches on April 1. Precipitation during March was 168% of average, keeping the year-to-date precipitation at 89% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 83% of normal. Average temperatures were 1-2 degrees above normal 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, 2014

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	14100	15100	15800	134	16500	17500	11800
	APR-SEP	15100	16300	17100	134	17900	19100	12800
Priest R nr Priest River (1,2)	APR-JUL	510	625	675	87	725	840	780
	APR-SEP	530	660	715	86	770	900	830
Pend Oreille R bl Box Canyon (2)	APR-JUL	14200	15300	16000	134	16700	17800	11900
	APR-SEP	15300	16500	17300	133	18100	19300	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.	632.2	888.0	773.0
Priest Lake Nr Coolin	119.3	65.6	62.7	67.6

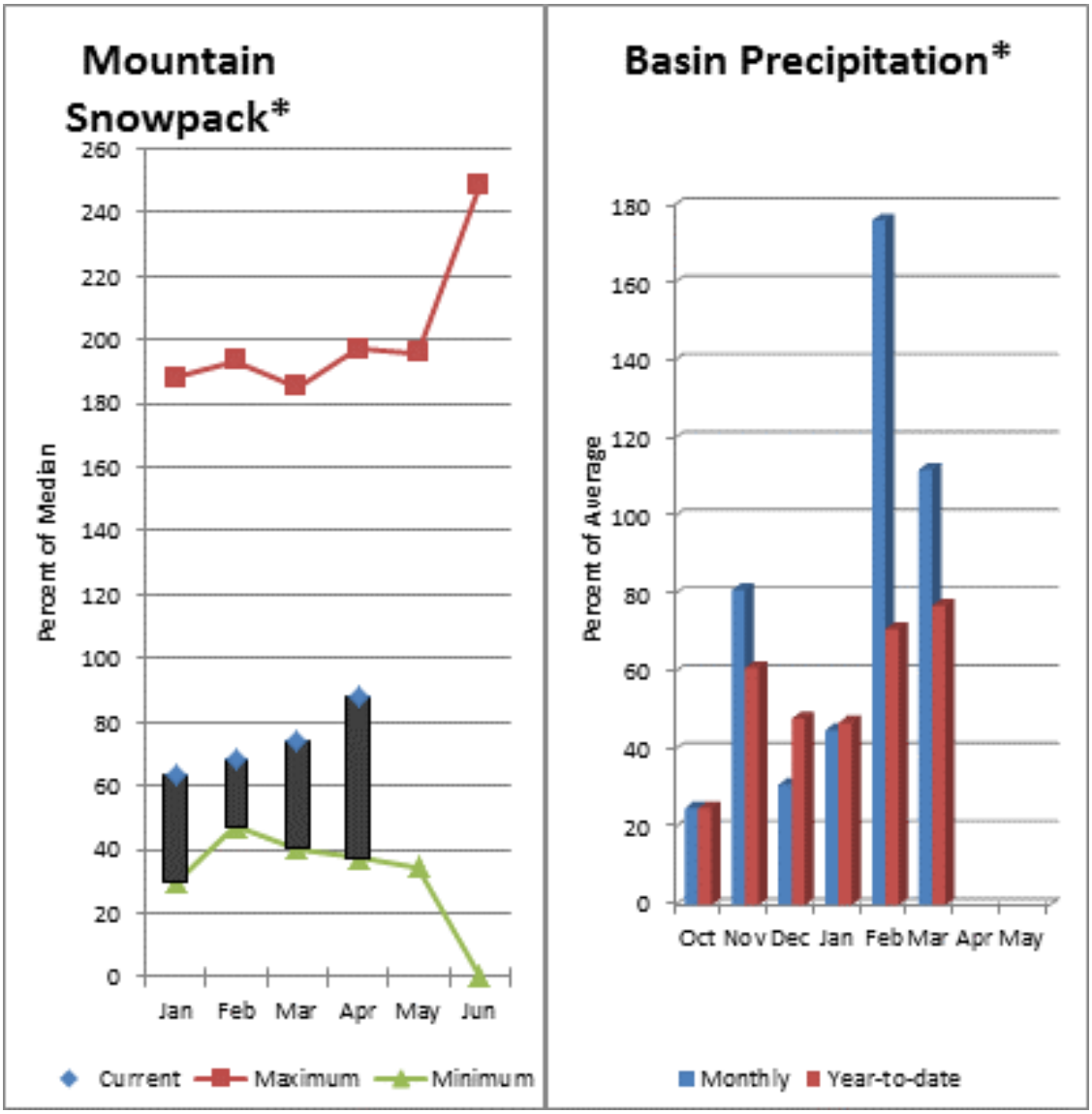
PEND OREILLE RIVER BASINS
Watershed Snowpack Analysis - April 1, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
COLVILLE RIVER	3	77	74
PEND OREILLE RIVER	80	150	140
KETTLE RIVER	3	86	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.



*Based on selected stations

Summer runoff average forecast for the Okanogan River is 135%, Similkameen River is 116%, Kettle River 95% and Methow River is 83%. April 1 snow cover on the Okanogan was 98% of normal, Omak Creek was 64% and the Methow was 111%. March precipitation in the Upper Columbia was 112% of average, with precipitation for the water year at 77% of average. March streamflow for the Methow River was 75% of average, 135% for the Okanogan River and 111% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 6.6 inches. Average for this site is 9.1 inches on April 1. Combined storage in the Conconully Reservoirs was 102% of normal and 89% of capacity. Temperatures were 1-2 degrees below normal for March and 1-3 below for the water year.

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

Streamflow Forecasts - April 1, 2014

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	32	68	93	78	118	154	119
	APR-SEP	35	75	102	78	129	169	131
Kettle R nr Laurier	APR-JUL	1390	1570	1700	94	1830	2010	1800
	APR-SEP	1440	1640	1780	95	1920	2120	1880
Columbia R at Birchbank (1,2)	APR-JUL	30700	33600	34900	103	36200	39100	33840
	APR-SEP	37600	41300	43000	103	44700	48400	41750
Columbia R at Grand Coulee (2)	APR-JUL	47900	52900	55100	108	57300	62300	51015
	APR-SEP	56400	62200	64900	108	67600	73400	60110
Similkameen R nr Nighthawk (1)	APR-JUL	1120	1300	1380	115	1460	1640	1200
	APR-SEP	1210	1400	1480	116	1560	1750	1280
Okanogan R nr Tonasket (1)	APR-JUL	1490	1770	1900	128	2030	2310	1480
	APR-SEP	1650	1970	2120	128	2270	2590	1650
Okanogan R at Malott (1)	APR-JUL	1550	1830	1960	135	2090	2370	1450
	APR-SEP	1710	2030	2180	135	2330	2650	1620
Methow R nr Pateros	APR-JUL	545	630	685	82	740	825	835
	APR-SEP	590	680	740	83	800	890	895

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Conconully Lake (salmon Lake Dam)	0.0	9.3	8.6	7.3
Conconully Reservoir	13.0	11.6	10.0	7.8

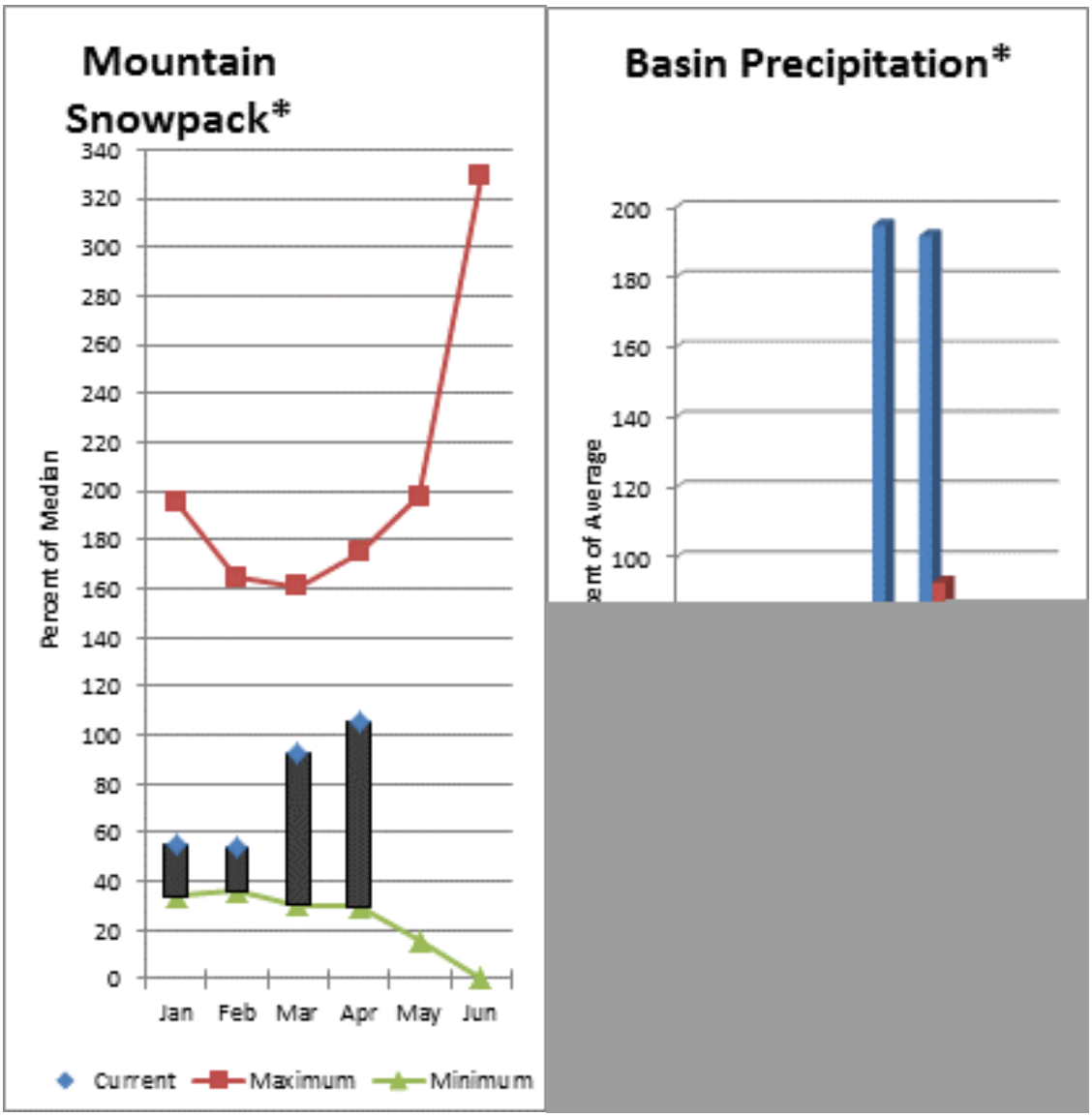
UPPER COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Median
OKANOGAN RIVER	5	88	98
OMAK CREEK	3	45	64
SANPOIL RIVER	0		
SIMILKAMEEN RIVER	0		
TOATS COULEE CREEK	4	65	86
CONCONULLY LAKE	3	48	56
METHOW RIVER	7	96	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.



*Based on selected stations

Precipitation during March was 192% of average in the basin and 93% for the water-year-to-date. Runoff for Entiat River is forecast to be 95% of average for 105%, Stehekin River is 102% and Icicle Creek is 103%. March average streamflows on the Chelan River were 112% and on the Wenatchee River 142%. April 1 snowpack in the Wenatchee River Basin was 102% of normal; the Chelan, 109%; the Entiat, 100%; Stemilt Creek, 98% and Colockum Creek, 118%. Reservoir storage in Lake Chelan was 89% of average and 34% of capacity. Lyman Lake SNOTEL had the most snow water with 59.8 inches of water. This site would normally have 57.6 inches on April 1. Temperatures were near normal 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, 2014

Forecast Point	Forecast Period	<<====== Drier ====== 90% (1000AF)	70% (1000AF)	Future Conditions 50% (1000AF)	50% (% AVG.)	======= Wetter =====>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Stehekin R at Stehekin	APR-JUL	585	650	690	101	730	795	680
	APR-SEP	705	765	805	102	845	905	790
Chelan R at Chelan (2)	APR-JUL	905	960	995	100	1030	1090	1000
	APR-SEP	1020	1070	1110	99	1150	1200	1120
Entiat R nr Ardenvoir	APR-JUL	170	185	195	98	205	220	200
	APR-SEP	184	199	210	95	220	235	220
Wenatchee R at Plain	APR-JUL	920	985	1030	104	1080	1140	990
	APR-SEP	1010	1080	1130	105	1180	1250	1080
Icicle Ck nr Leavenworth	APR-JUL	250	270	285	104	300	320	275
	APR-SEP	270	295	310	103	325	350	300
Wenatchee R at Peshastin	APR-JUL	1270	1360	1420	104	1480	1570	1370
	APR-SEP	1390	1480	1550	104	1620	1710	1490
Columbia R bl Rock Island Dam (2)	APR-JUL	52900	56600	59100	106	61600	65300	55770
	APR-SEP	63100	67500	70400	108	73300	77700	65200

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Lake Chelan	676.1	227.6		256.1

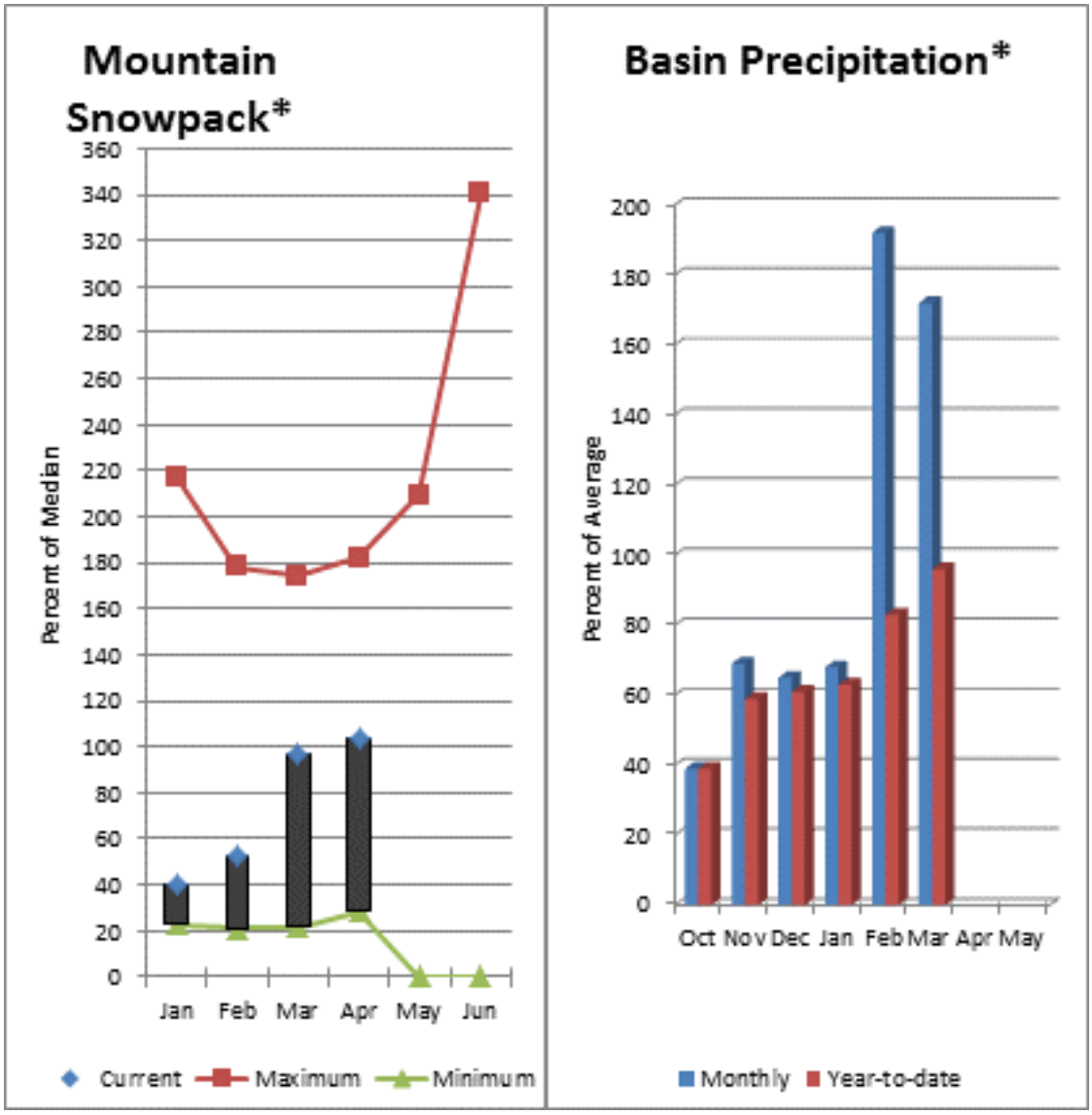
CENTRAL COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
CHELAN LAKE BASIN	3	112	109
ENTIAT RIVER	1	118	100
WENATCHEE RIVER	7	116	103
STEMILT CREEK	1	130	84
COLOCKUM CREEK	1	118	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.



*Based on selected stations

April 1 reservoir storage for the Upper Yakima reservoirs was 610,000-acre feet, 119% of average. Forecasts for the Yakima River at Cle Elum are 96% of average and the Teanaway River near Cle Elum is at 110%. Lake inflows are all forecasted to be near average this summer as well. March streamflows within the basin were Cle Elum River near Roslyn at 168%. April 1 snowpack was 104% based upon 10 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 172% of average for March and 96% 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, 2014

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	94	105	113	97	121	132	116
	APR-SEP	103	115	123	98	131	143	126
Kachess Reservoir Inflow (2)	APR-JUL	87	96	102	98	108	117	104
	APR-SEP	94	103	109	96	115	124	113
Cle Elum Lake Inflow (2)	APR-JUL	340	360	375	97	390	410	385
	APR-SEP	360	385	405	98	425	450	415
Yakima R at Cle Elum (2)	APR-JUL	605	675	725	96	775	845	755
	APR-SEP	650	735	795	96	855	940	830
Teanaway R bl Forks nr Cle Elum	APR-JUL	114	131	143	110	155	172	130
	APR-SEP	117	134	146	110	158	175	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	137.3	117.4	106.3
Kachess	239.0	218.6	198.5	159.8
Cle Elum	436.9	254.4	308.4	246.3

UPPER YAKIMA RIVER BASIN
Watershed Snowpack Analysis - April 1, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Median
UPPER YAKIMA RIVER	8	115	103

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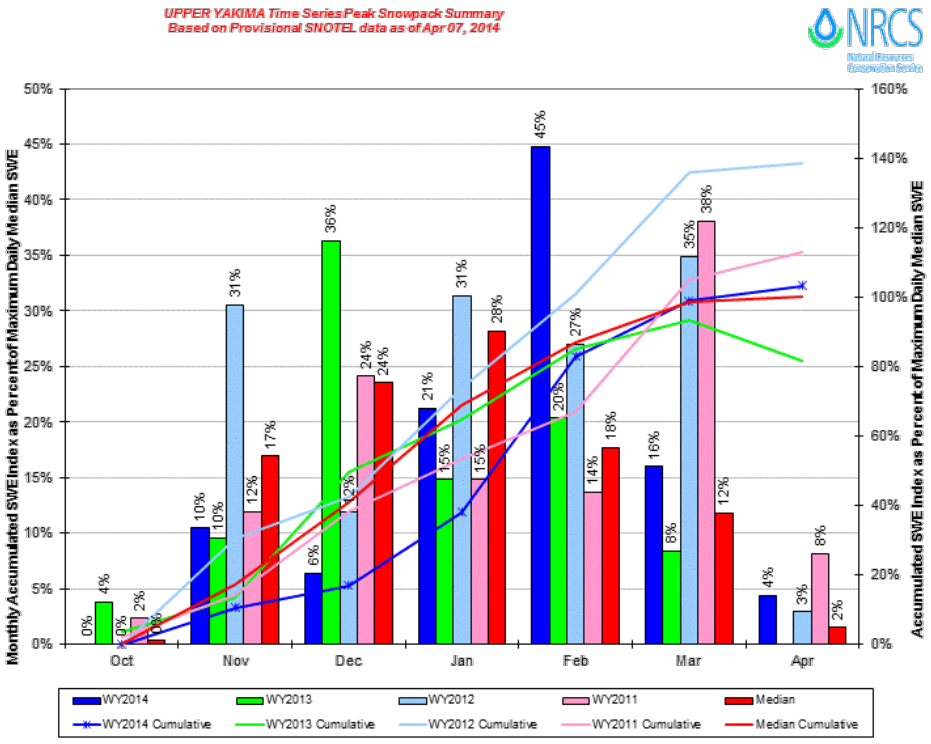
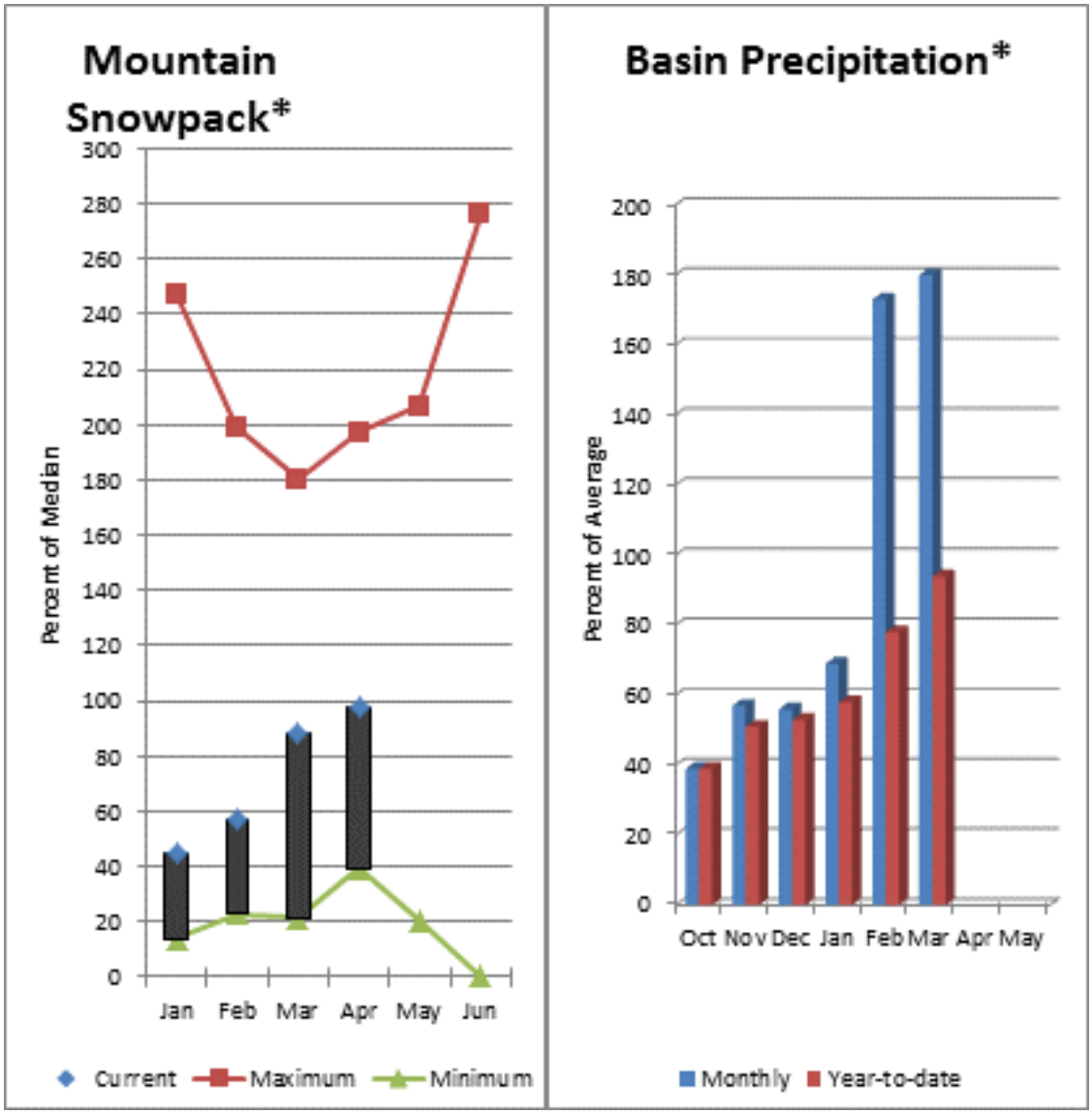
(2) - The value is natural volume - actual volume may be affected by upstream water management.





*Based on selected stations

March average streamflows within the basin were: Yakima River near Parker, 163%; Naches River near Naches, 218%; and Yakima River at Kiona, 132%. April 1 reservoir storage for Bumping and Rimrock reservoirs was 201,000-acre feet, 133% of average. Forecast averages for Yakima River near Parker are 102%; American River near Nile, 97%; Ahtanum Creek, 97%; and Klickitat River near Glenwood, 101%. April 1 snowpack was 98% based upon 7 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 80% of normal. Precipitation was 180% of average for March and 94% year-to-date for water. Temperatures were near normal for March and for 1-2 degrees below normal for the water year. Volume forecasts for 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, 2014

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	106	117	124	109	131	142	114
	APR-SEP	116	127	135	110	143	154	123
American R nr Nile	APR-JUL	85	93	99	97	105	113	102
	APR-SEP	93	101	107	97	113	121	110
Rimrock Lake Inflow (2)	APR-JUL	175	188	197	105	205	220	187
	APR-SEP	205	220	230	105	240	255	220
Naches R nr Naches (2)	APR-JUL	620	675	715	102	755	810	700
	APR-SEP	670	735	775	102	815	880	760
Ahtanum Ck at Union Gap	APR-JUL	18.7	23	26	96	29	33	27
	APR-SEP	21	25	28	97	31	35	29
Yakima R nr Parker (2)	APR-JUL	1480	1610	1690	102	1770	1900	1660
	APR-SEP	1630	1760	1850	102	1940	2070	1820
Klickitat R nr Glenwood	APR-JUL	107	119	127	101	135	147	126
	APR-SEP	117	131	140	101	149	163	139
Klickitat R nr Pitt	APR-JUL	380	425	460	106	495	540	435
	APR-SEP	460	515	555	107	595	650	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	20.0	11.5	14.6
Rimrock	198.0	181.4	154.4	136.6

LOWER YAKIMA RIVER BASIN
Watershed Snowpack Analysis - April 1, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
LOWER YAKIMA RIVER	7	103	98
AHTANUM CREEK	2	85	80

* 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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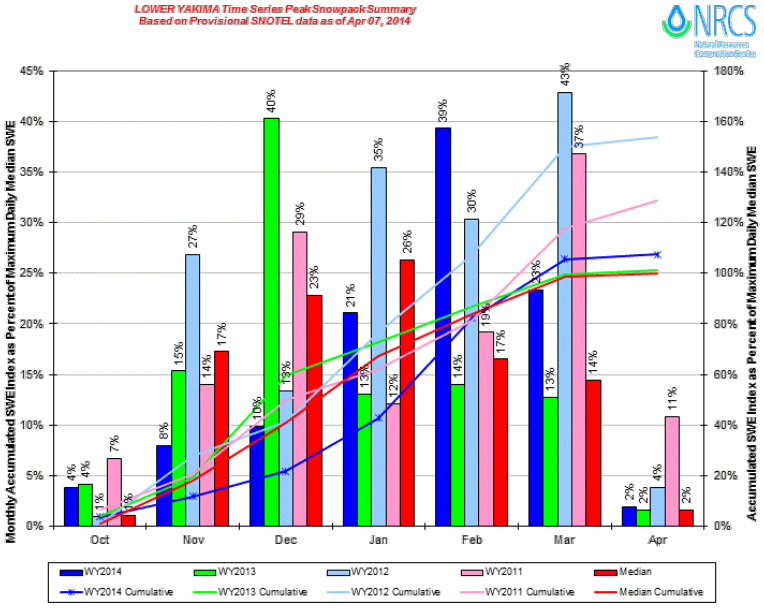

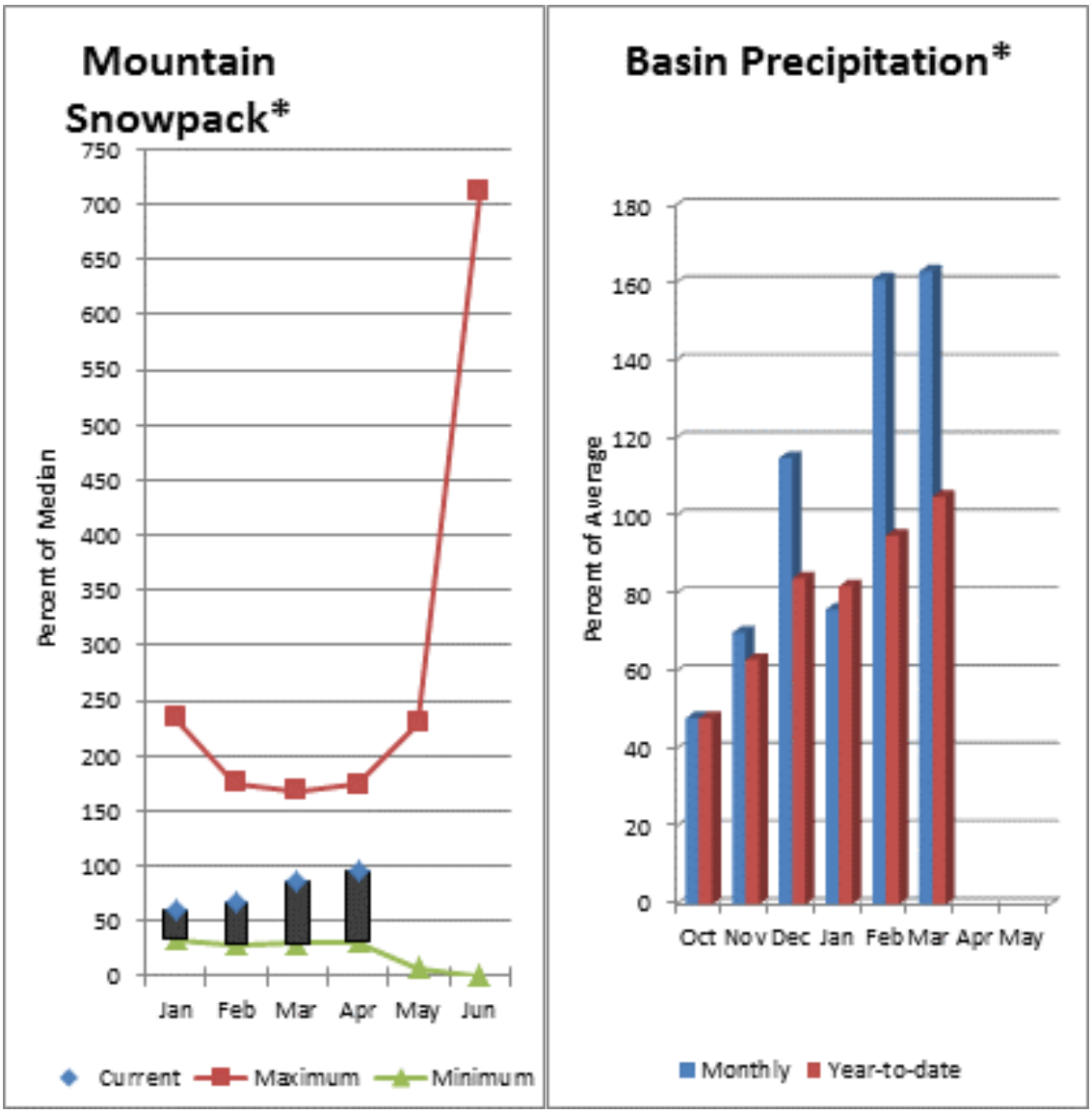

*Based on selected stations

March precipitation was 163% of average, maintaining the year-to-date precipitation at 105% of average. Snowpack in the basin was 96% of normal. Streamflow forecasts are average runoff for both Mill Creek and SF Walla Walla River near Milton-Freewater. Average temperatures were 1-2 degrees above normal for March and 1-3 below normal for the water year.

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

Streamflow Forecasts - April 1, 2014

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)
SF Walla Walla R nr Milton-Freewater	APR-JUL	44	50	54	100	58	64	54
	APR-SEP	54	61	66	100	71	78	66
Mill Ck nr Walla Walla	APR-JUL	17.4	21	23	96	25	29	24
	APR-SEP	21	25	27	100	29	33	27

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, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
WALLA WALLA RIVER	2	110	96

* 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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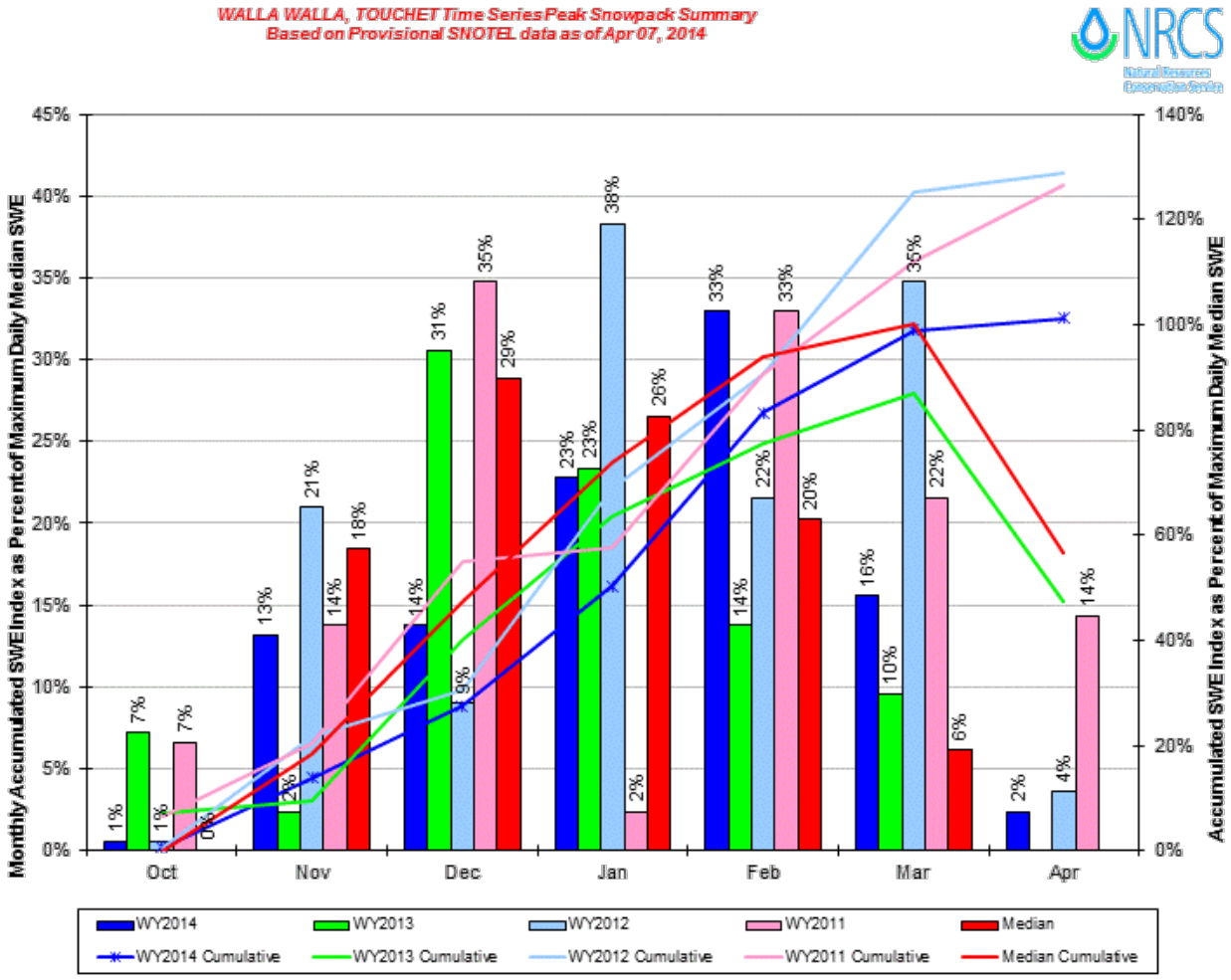

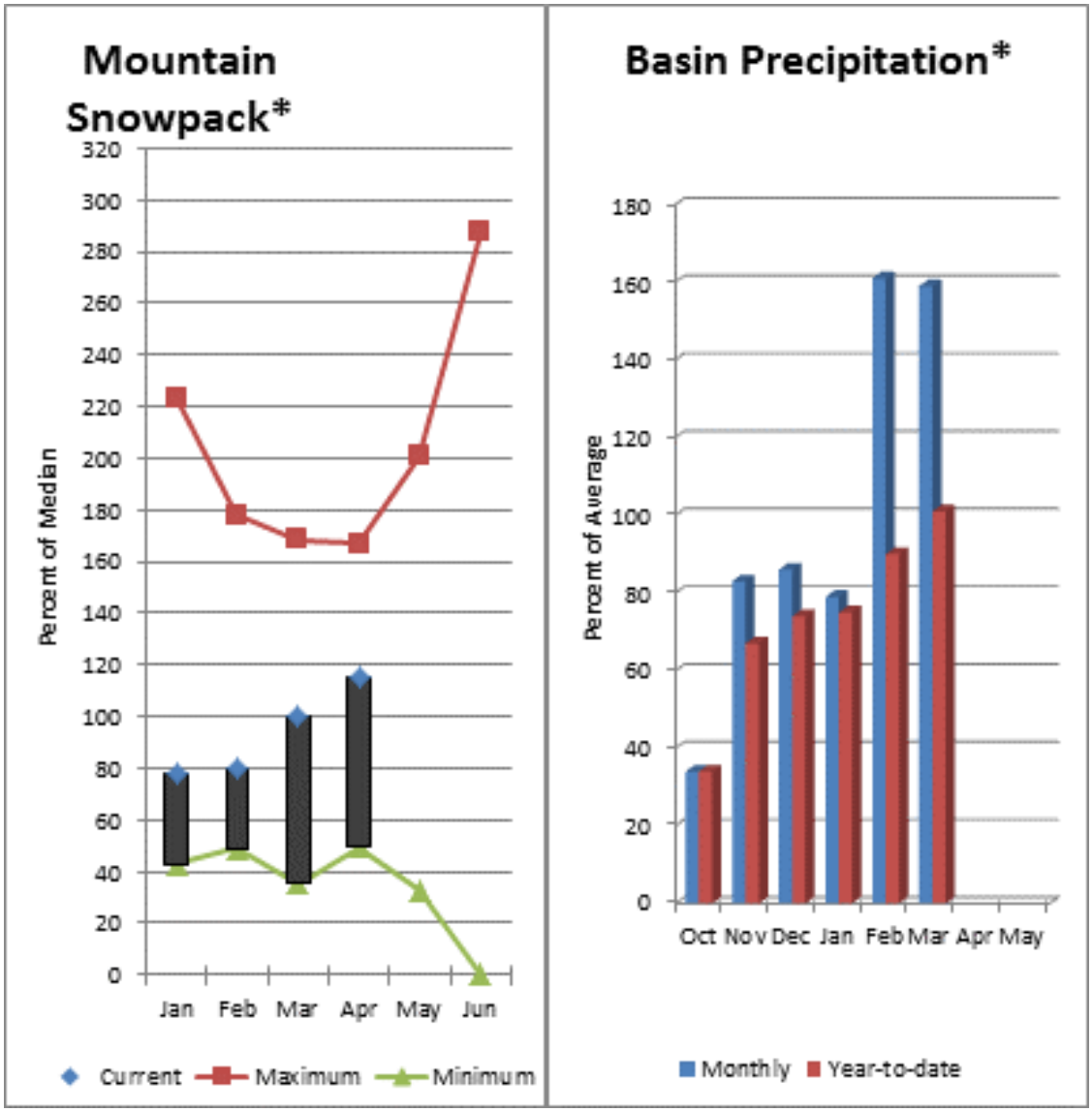

*Based on selected stations

The Grande Ronde River can expect summer flows to be about 102% of normal. The forecast for Asotin Creek at Asotin predicts 103% of average flows for the April – July runoff period. March precipitation was 159% of average, bringing the year-to-date precipitation to 101% of average. April 1 snowpack readings averaged 115% of normal. March streamflow was 128% of average for Snake River below Lower Granite Dam and 202% for Grande Ronde River near Troy. Dworshak Reservoir storage was 88% of average. Average temperatures were 1-2 degrees above normal for March and 2-3 degrees below for the water year.

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

Streamflow Forecasts - April 1, 2014

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-JUL	855	1120	1240	102	1360	1630	1220
	APR-SEP	935	1210	1330	102	1450	1730	1310
Asotin Ck at Asotin	APR-JUL	23	31	36	103	41	49	35
Clearwater R at Spalding (1,2)	APR-JUL	7600	8760	9280	135	9800	11000	6890
	APR-SEP	7960	9180	9730	134	10300	11500	7270
Snake R bl Lower Granite Dam (1,2)	APR-JUL	17300	20700	22200	112	23700	27100	19848
	APR-SEP	19500	23300	25000	112	26700	30500	22280

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Dworshak	3468.	2124.	2807.	2417.

LOWER SNAKE RIVER BASIN
Watershed Snowpack Analysis - April 1, 2014

Watershed	Number of Data Sites	This Year as % of: Last Yr	Median
LOWER SNAKE, GRANDE RON	11	147	117

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

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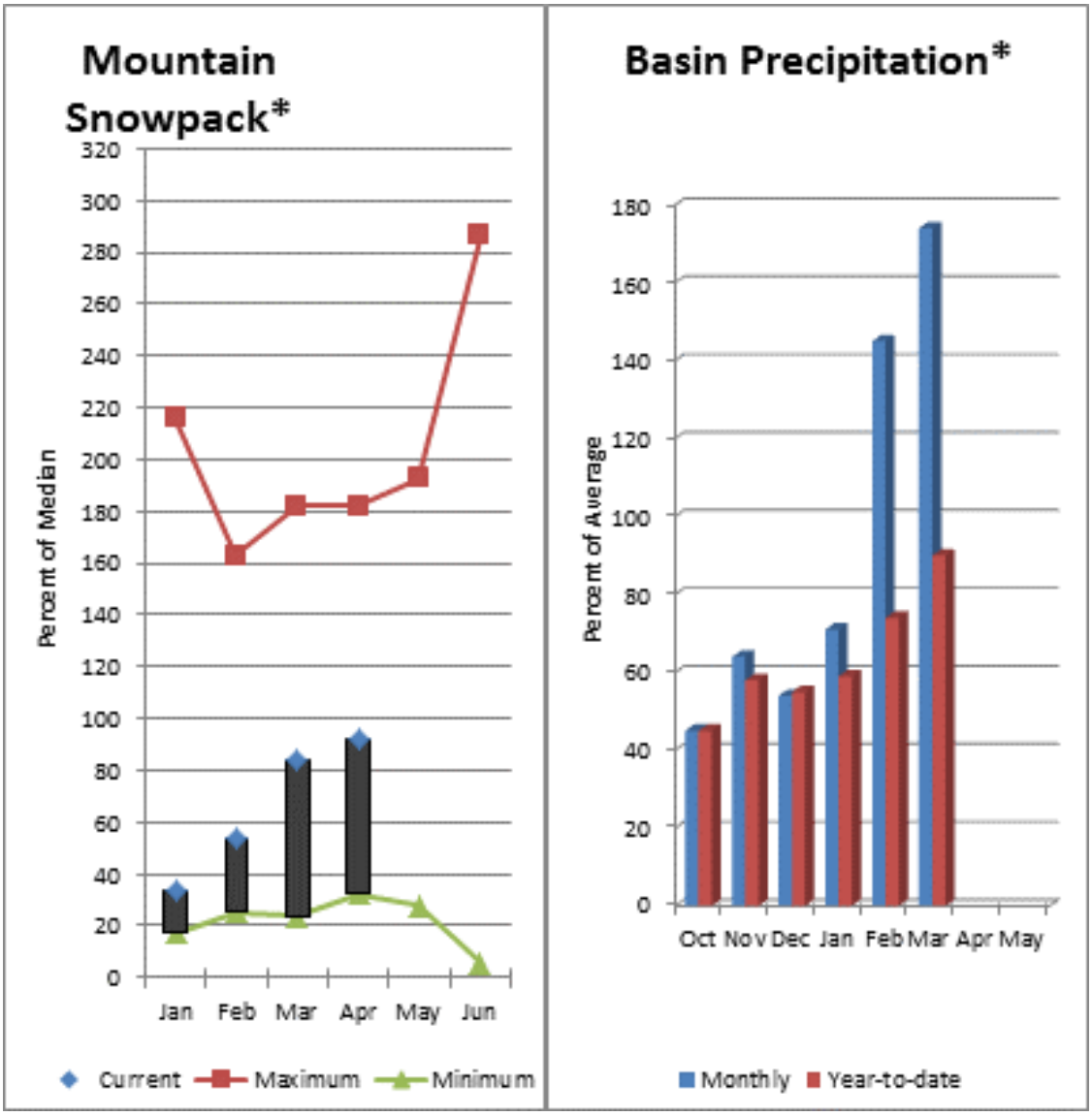

*Based on selected stations

Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 87% and Cowlitz River at Castle Rock, 98% of average. The Columbia at The Dalles is forecasted to have 93% of average flows this summer according to the River Forecast Center. March average streamflow for Cowlitz River was 208%. The Columbia River at The Dalles was 126% of average. March precipitation was 174% of average and the water-year average was 90%. April 1 snow cover for Cowlitz River was 114%, and Lewis River was 71% of normal. Temperatures were 1-2 degrees below normal during March and 2-4 below normal for the water year.

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

Streamflow Forecasts - April 1, 2014

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	74700	80100	83800	105	87500	92900	79855
	APR-SEP	88500	94900	99200	107	104000	110000	92704
Klickitat R nr Glenwood	APR-JUL	107	119	127	101	135	147	126
	APR-SEP	117	131	140	101	149	163	139
Klickitat R nr Pitt	APR-JUL	380	425	460	106	495	540	435
	APR-SEP	460	515	555	107	595	650	520
Lewis R at Ariel (2)	APR-JUL	590	755	865	89	975	1140	970
	APR-SEP	680	855	970	87	1090	1260	1120
Cowlitz R bl Mayfield Dam (2)	APR-JUL	1040	1290	1460	90	1630	1880	1620
	APR-SEP	1280	1580	1780	97	1980	2280	1840
Cowlitz R at Castle Rock (2)	APR-JUL	1620	1900	2090	94	2280	2560	2230
	APR-SEP	1970	2270	2480	98	2690	2990	2520

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

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Swift	0.0			644.2
Yale	0.0	167.8	186.5	
Merwin	0.0			399.5
Mossyrock Dam (riffe Lk)	0.0			1270.

LOWER COLUMBIA RIVER BASINS
Watershed Snowpack Analysis - April 1, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
LEWIS RIVER	4	58	72
COWLITZ RIVER	6	94	114

* 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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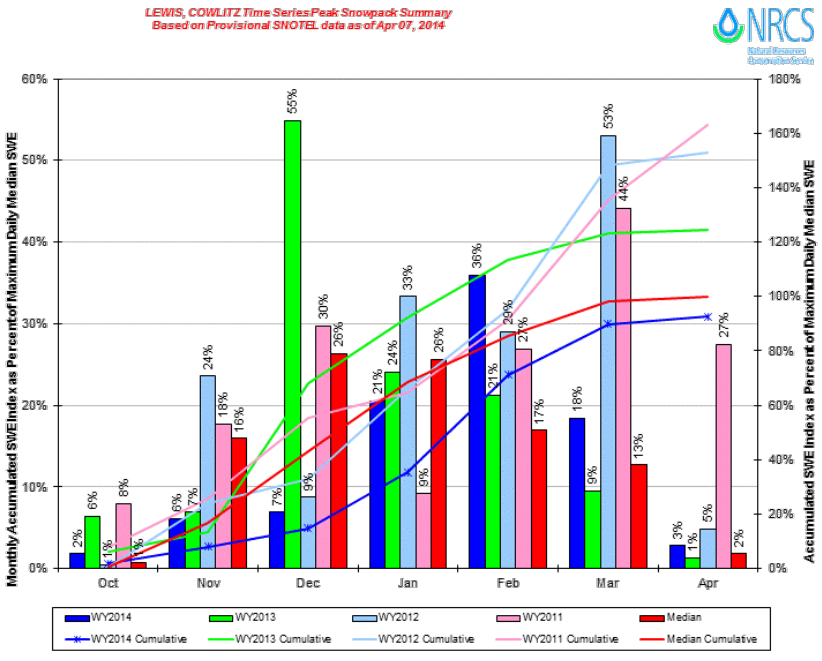

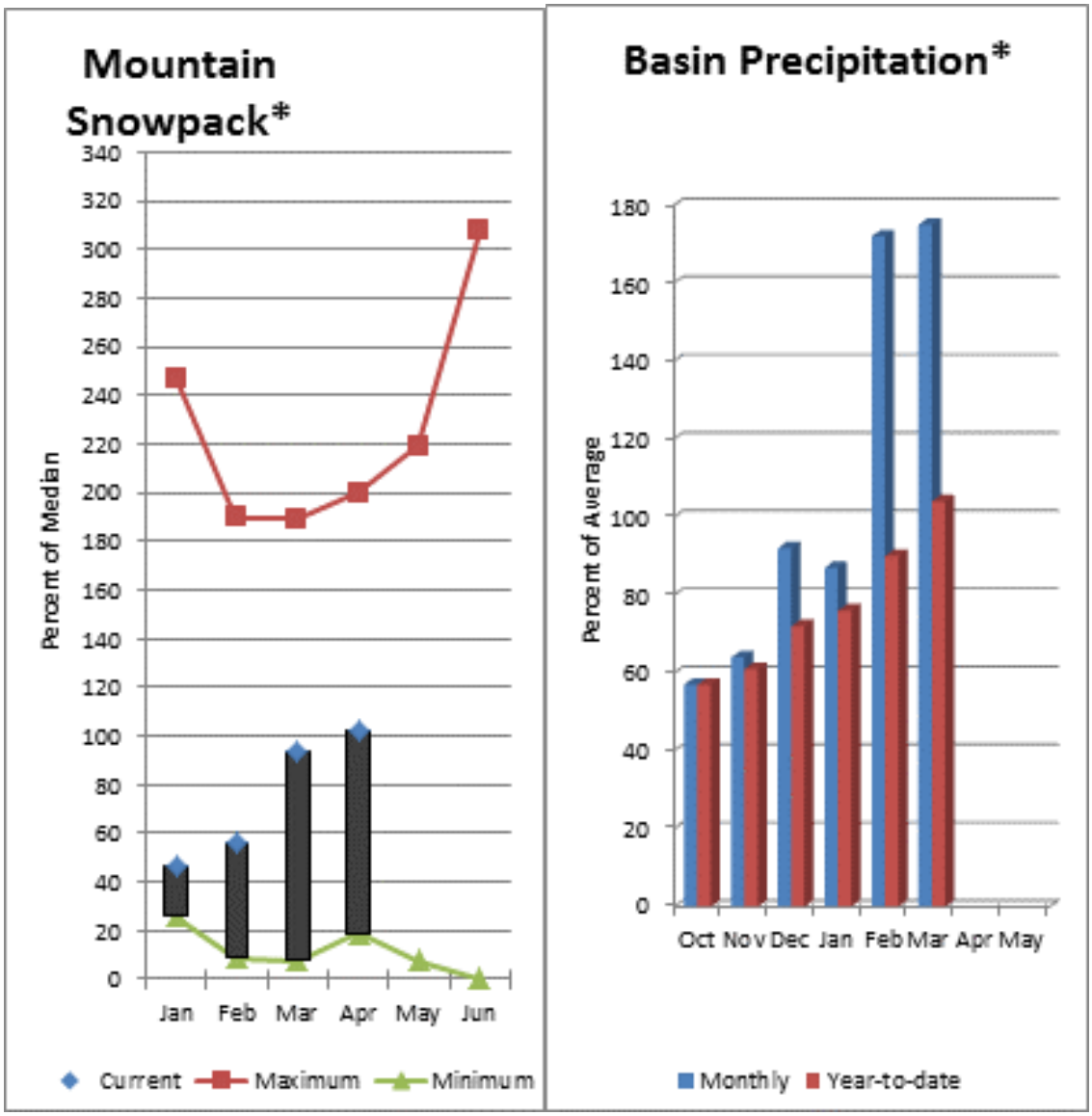

*Based on selected stations

Summer runoff is forecast to be 85% of normal for the Green River below Howard Hanson Dam and 109% for the White River near Buckley. April 1 snowpack was 115% of average for the White River, 112% for Puyallup River and 78% in the Green River Basin. March precipitation was 175% of average, bringing the water year-to-date to 104% of average for the basins. Average temperatures in the area were 1-2 degrees below normal for March and 1-2 below average for the water-year.

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

Streamflow Forecasts - April 1, 2014

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	360	430	465	108	500	570	430
	APR-SEP	435	520	560	109	600	685	515
Green R bl Howard Hanson Dam (1,2)	APR-JUL	123	172	194	83	215	265	235
	APR-SEP	144	196	220	85	245	295	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, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
WHITE RIVER	2	104	105
GREEN RIVER	3	71	87
PUYALLUP RIVER	3	99	105

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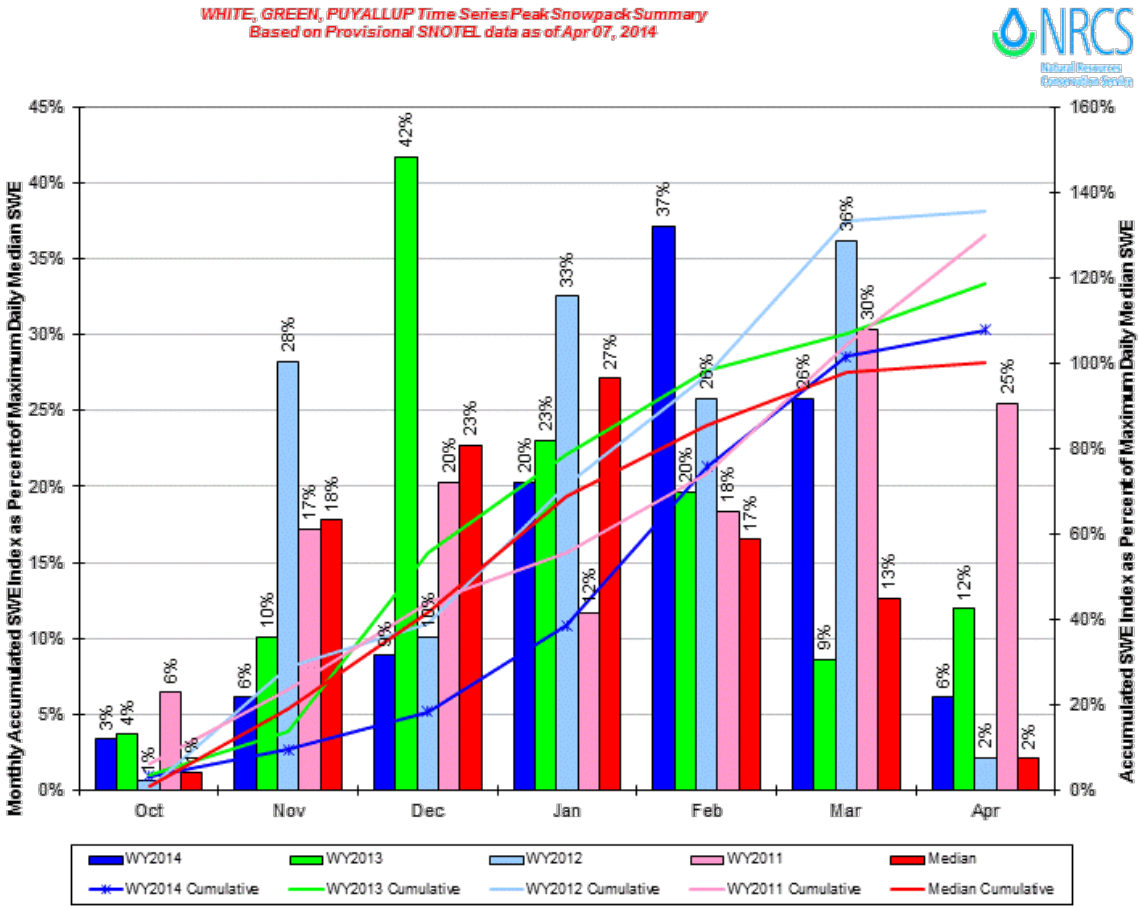
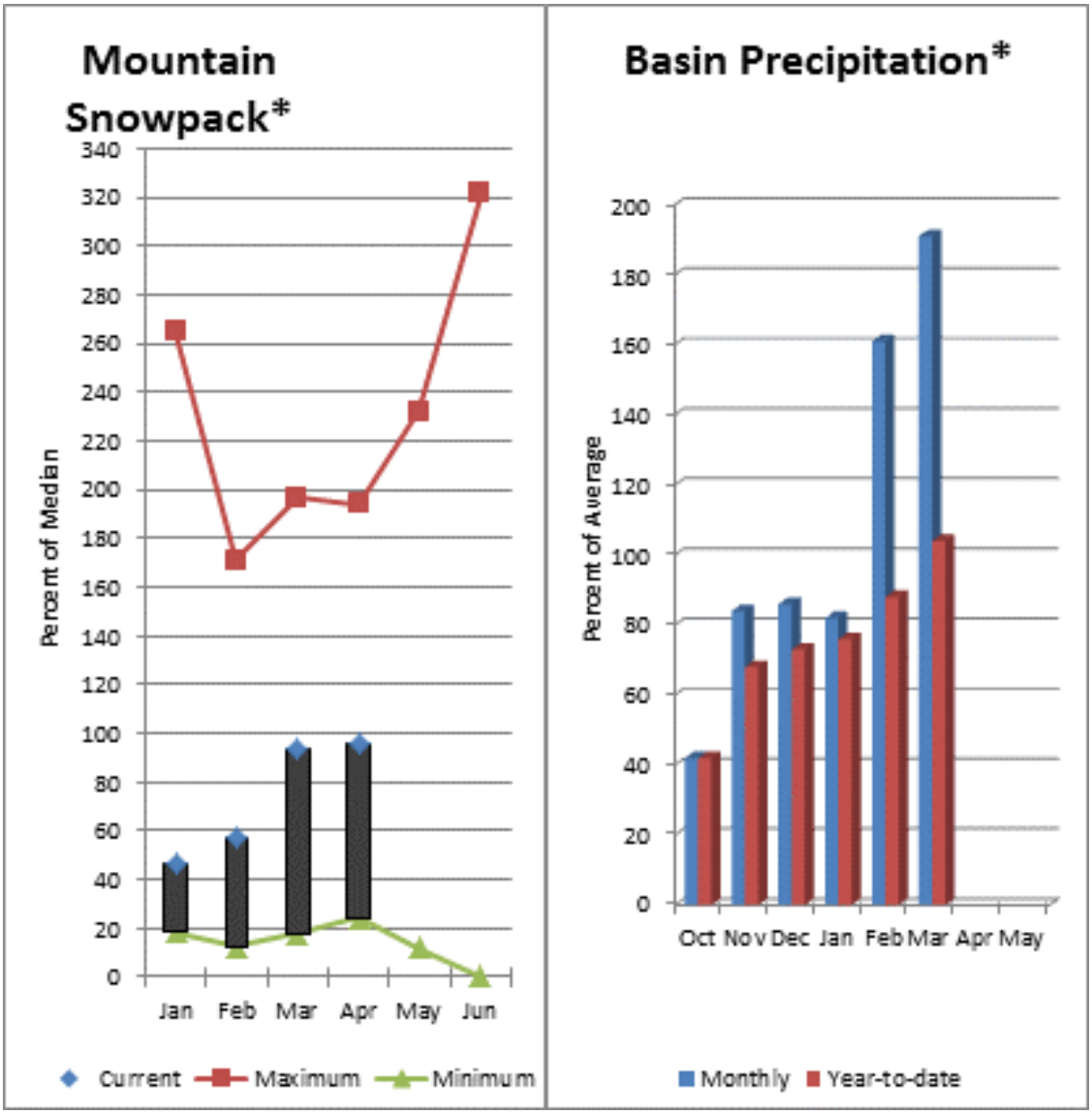
(2) - The value is natural volume - actual volume may be affected by upstream water management.



Central Puget Sound River Basins



*Based on selected stations

Forecast for spring and summer flows are: 108% for Cedar River near Cedar Falls; 104% for Rex River; 122% for South Fork of the Tolt River; and 100% for Taylor Creek near Selleck. Basin-wide precipitation for March was 191% of average, bringing water-year-to-date to 104% of average. April 1 median snow cover in Cedar River Basin was 91%, Tolt River Basin was 100%, Snoqualmie River Basin was 99%, and Skykomish River Basin was 94%. Temperatures were 1-2 degrees below normal for March and for the water-year.

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

Streamflow Forecasts - April 1, 2014

Forecast Point	Forecast Period	<<====== Drier ====== 90% (1000AF)	70% (1000AF)	Future Conditions 50% (1000AF)	50% (% AVG.)	======= Wetter =====>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Cedar R nr Cedar Falls	APR-JUL	61	69	75	107	81	89	70
	APR-SEP	67	76	82	108	88	97	76
Rex R nr Cedar Falls	APR-JUL	19.5	23	26	108	29	32	24
	APR-SEP	21	25	28	104	31	35	27
Taylor Creek nr Selleck	APR-JUL	16.8	19.3	21	105	23	25	20
	APR-SEP	19.3	22	24	100	26	29	24
SF Tolt R nr Index	APR-JUL	13.9	16.0	17.4	123	18.8	21	14.2
	APR-SEP	15.5	18.0	19.7	122	21	24	16.1

* 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.

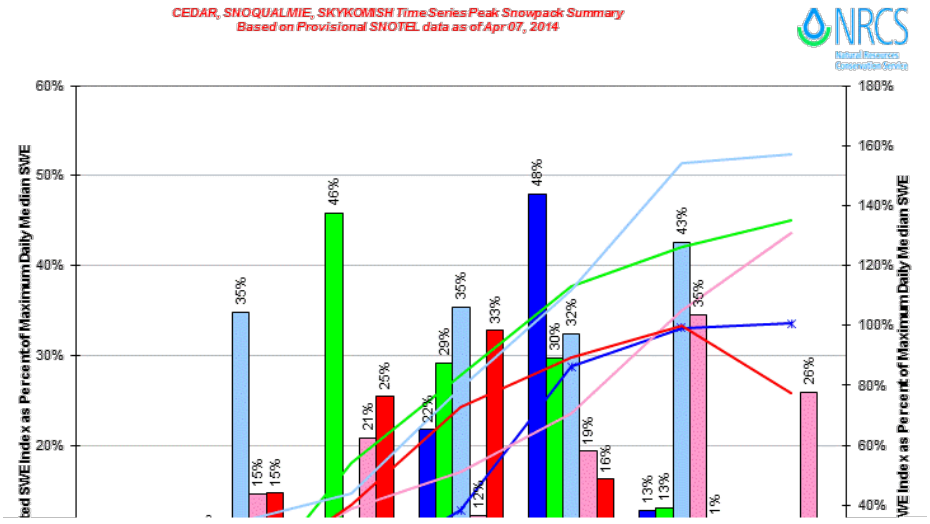
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

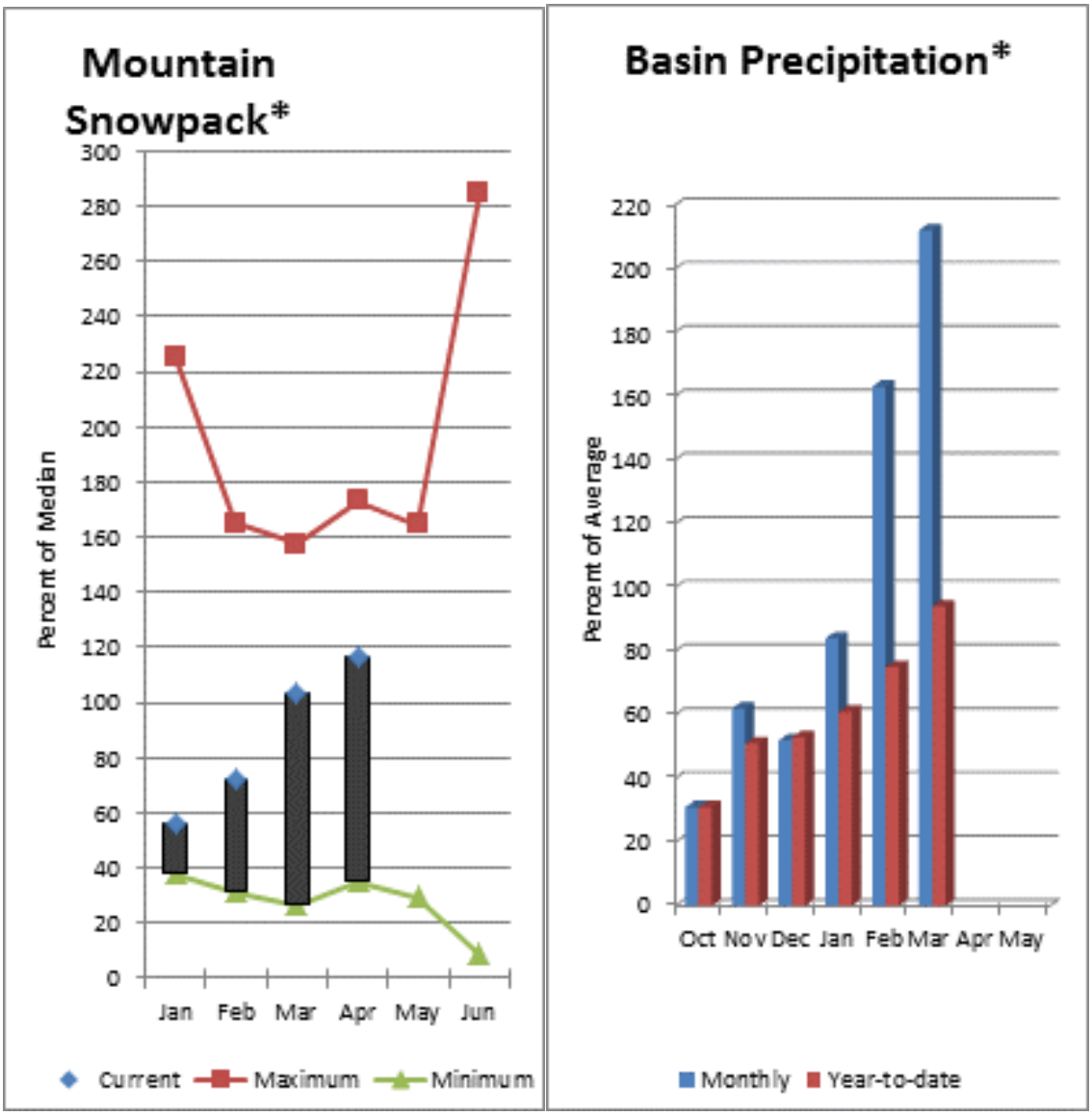
CENTRAL PUGET SOUND RIVER BASINS
Reservoir Storage (1000 AF) - End of March

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

CENTRAL PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - April 1, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
CEDAR RIVER	6	70	91
TOLT RIVER	3	64	100
SNOQUALMIE RIVER	5	76	99
SKYKOMISH RIVER	3	72	94





*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 116% of average for the spring and summer period. March streamflow in Skagit River was 185% of average. Other forecast points included Baker River at 110% and Thunder Creek at 104% of average. Basin-wide precipitation for March was 212% of average, bringing water-year-to-date to 94% of average. April 1 average snow cover in Skagit River Basin was 121%, Nooksack River Basin was 117% and the Baker River was 112%. April 1 Skagit River reservoir storage was 57% of average and 30% of capacity in anticipation of a strong runoff season. Average temperatures were 1-2 degrees below normal for March and 1-2 below for the water year.

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

Streamflow Forecasts - April 1, 2014

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	210	225	240	102	255	270	235
	APR-SEP	305	325	340	103	355	375	330
Skagit R at Newhalem	APR-JUL	1830	1940	2010	120	2080	2190	1680
	APR-SEP	2150	2280	2360	116	2440	2570	2030
Baker R nr Concrete (2)	APR-JUL	700	785	840	108	895	980	780
	APR-SEP	865	995	1080	110	1170	1290	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.	417.5	211.5	730.5
Diablo Reservoir	90.6			86.0

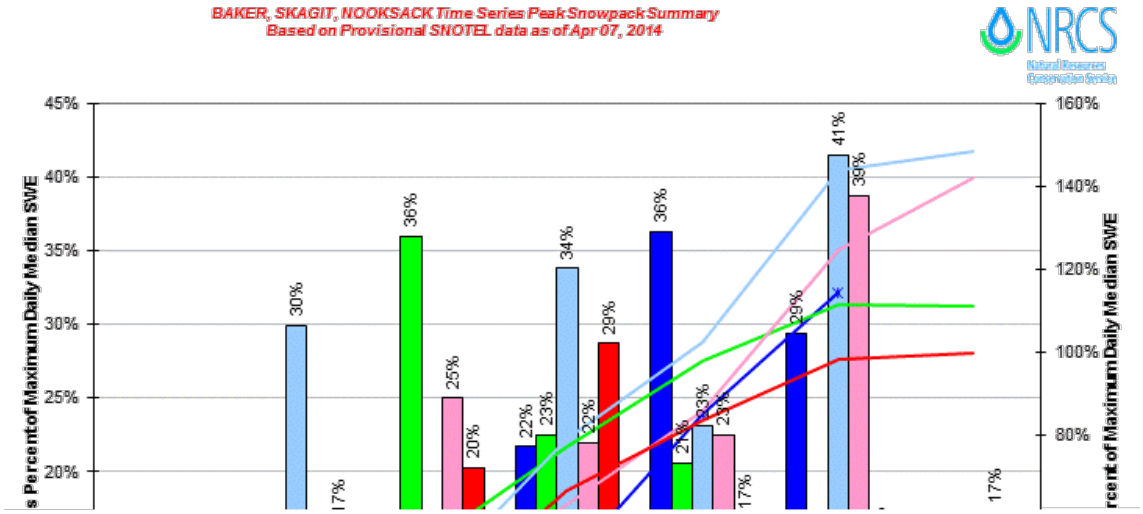
NORTH PUGET SOUND RIVER BASINS
Watershed Snowpack Analysis - April 1, 2014

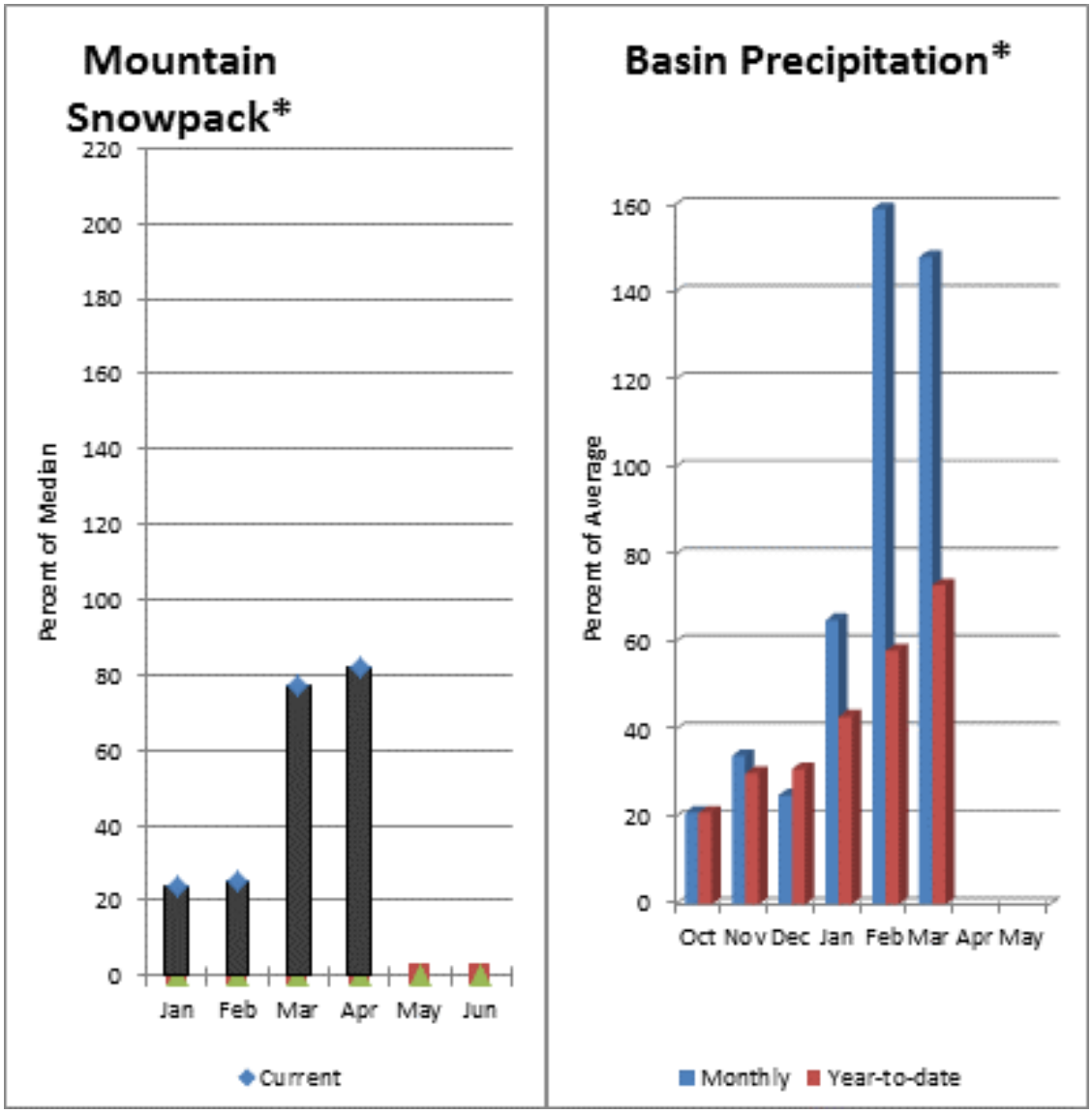
Watershed	Number of Data Sites	This Year as % of Last Yr	Median
SKAGIT RIVER	12	110	120
BAKER RIVER	0		
NOOKSACK RIVER	3	93	117

* 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.





*Based on selected stations

Forecasted average runoff for streamflow for the Dungeness River is 97% and Elwha River is 96%. March runoff in the Dungeness River was 178% of normal. Big Quilcene and Wynoochee rivers may expect near to slightly below average runoff this summer as well. March precipitation was 148% of average. Precipitation has accumulated at 73% of average for the water year. March precipitation at Quillayute was 15.81 inches. The 1981-2010 average for March is 10.83 inches. Olympic Peninsula snowpack was still low at 82% of normal on April 1. Temperatures were 1-2 degrees above average for March and close to normal for the water year.

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

Streamflow Forecasts - April 1, 2014

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)
Dungeness R nr Sequim	APR-JUL	93	107	116	97	125	139	120
	APR-SEP	111	128	140	97	152	169	145
Elwha R at Mcdonald Bridge	APR-JUL	320	360	385	96	410	450	400
	APR-SEP	370	415	450	96	485	530	470

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, 2014

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
OLYMPIC PENINSULA	6	63	82

* 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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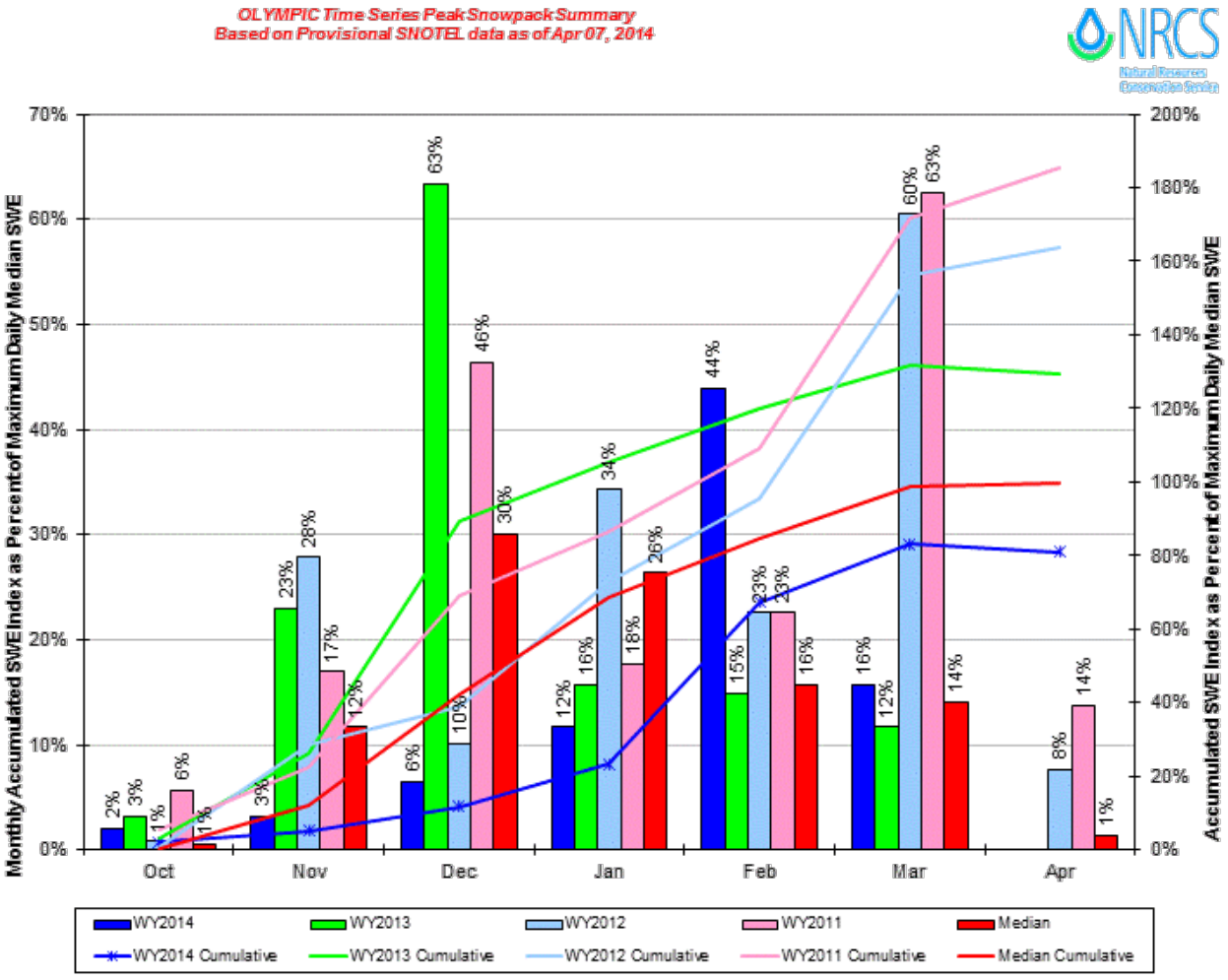

Issued by

Jason Weller
Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

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

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

Canada	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.**

Washington Snow Survey Office
2021 E. College Way, Suite 214
Mount Vernon, WA 98273-2873

Washington Water Supply Outlook Report

Natural Resources Conservation Service
Spokane, WA