United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
January 1, 2015

Snow Surveyors making the first survey of the season at Rainy Pass snow course.

Date: 12/29/14
Taken by: Scott Pattee

Reminder: We are soliciting field work photos from our snow surveyors again this year. Each month we pick one to grace the cover of this report. The photographer will be given proper credit of course. Please include all specific information when submitting photos.

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

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How forecasts are made

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

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

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

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Washington
Water Supply Outlook

January 2015

General Outlook

More rain than snow is the current state of affairs in Washington State. A couple of nice cold snaps back in November and December brought a couple of good shots of mountain snow but not enough to cover all the rocks. So with barely enough snow on the ground to open local ski areas by Christmas, folks were leaving that shiny new equipment under the tree and opting for the old beat up skis and boards just to get the first turns of the season. Warm and wet has been the pattern for most of the first three months of water-year 2015. The latest forecasts provided by the National Weather Service indicates a high probability that the warm temperatures will continue to dominate the region whereas the only real change to recent conditions is a forecasted chance of below normal precipitation for the next several months. Currently mountain temperatures continue to soar to new highs at 15-20 degrees above normal. http://www.cpc.ncep.noaa.gov/

Snowpack

The January 1 statewide SNOTEL readings were 51% of normal but vary across the state. So far we should have received about 50% of our annual total snowfall however we fall well short of that with most areas measuring roughly 25% of annual totals. The Tolt River data reported the lowest readings at 26% of the 30-year median for January 1 followed closely by the Baker River with 27%. Readings from the Methow River Basin reported the highest at 114% of normal for January 1. Westside medians from SNOTEL, and January 1 snow surveys, included the North Puget Sound river basins with 67% of normal, the Central and South Puget river basins with 42% and 58% respectively, and the Lower Columbia basins with 41% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 52% and the Wenatchee area with 82%. Snowpack in the Spokane River Basin was at 57% and the Walla Walla River Basin had 67% of the long term median.

BASIN	PERCENT OF AVERAGE	PERCENT OF LAST YEAR
Spokane	57	72
Newman Lake	57	72
Pend Oreille	110	104
Okanogan	104	92
Methow	114	59
Conconully Lake	100	38
Central Columbia	82	50
Upper Yakima	49	38
Lower Yakima	56	45
Ahtanum Creek	61	55
Walla Walla	67	59
Lower Snake	80	80
Cowlitz	49	50
Lewis	30	18
White	63	52
Green	37	16
Puyallup	66	51
Cedar	30	29
Snoqualmie	35	44
Skykomish	31	58
Skagit	80	44
Nooksack	37	69
Olympic Peninsula	30	24

Precipitation

The first three months of the water-year 2015 delivered some of the wettest conditions on record throughout Washington river basins. However the new-year began with near average precipitation throughout the state with the exception of the Olympic Peninsula with 130% of normal. The Central Puget Sound and Upper Yakima were the driest at 88-87%, which also shows in the lack of snowpack. The wettest spot in the state was reported at Elbow Lake SNOTEL in the South Fork Nooksack River Basin with a water-year accumulation of 77.4 inches, 16 inches above normal or 126% of average.

RIVER BASIN	DECEMBER PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	93	96
Pend Oreille	101	116
Upper Columbia	101	130
Central Columbia	110	124
Upper Yakima	87	100
Lower Yakima	108	116
Walla Walla	120	110
Lower Snake	110	105
Lower Columbia	106	121
South Puget Sound	106	113
Central Puget Sound	88	104
North Puget Sound	110	123
Olympic Peninsula	130	127

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. For the most part water year 2014 ended with decent reservoir carry over. In fact several had to be drawn down in anticipation for winter runoff and flood control storage. January 1 Reservoir storage in the Yakima Basin was 558,000-acre feet, 161% of average for the Upper Reaches and 140,000-acre feet or 135% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 140,000 acre feet, 149% of average and 59% of capacity; and the Skagit River reservoirs at 79% of average and 64% 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	59	149
Pend Oreille	34	76
Upper Columbia	117	111
Central Columbia		
Upper Yakima	67	161
Lower Yakima	61	135
Lower Snake	70	101
North Puget Sound	64	79

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

Streamflow

April to September runoff forecasts vary from 80% of average in the Wenatchee River and Lower Yakima River basins to 113% of average in the Pend Oreille River and Lower Snake River basins. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 86%; White River, 102%; and Skagit River, 97%. Some Eastern Washington streams include the Yakima River near Parker 80%, Wenatchee River at Plain 84%; and Spokane River near Post Falls 85%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions since governing conditions are likely to change for the better or the worse.

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	80-88
Pend Oreille	82-113
Upper Columbia	75-109
Central Columbia	80-97
Upper Yakima	70-77
Lower Yakima	80-97
Walla Walla	93-96
Lower Snake	97-113
Lower Columbia	86-96
South Puget Sound	88-102
Central Puget Sound	74-88
North Puget Sound	93-98
Olympic Peninsula	99-101

STREAM	PERCENT OF AVERAGE DECEMBER STREAMFLOWS
Pend Oreille at Albeni Fall Dam	138
Kettle at Laurier	103
Columbia at Birchbank	150
Spokane at Spokane	106
Similkameen at Nighthawk	165
Okanogan at Tonasket	138
Methow at Pateros	188
Chelan at Chelan	202
Wenatchee at Pashastin	201
Cle Elum near Roslyn	166
Yakima at Parker	177
Naches at Naches	209
Grande Ronde at Troy	168
Snake below Lower Granite Dam	111
Columbia River at The Dalles	124
Lewis at Merwin Dam	116
Cowlitz below Mayfield Dam	137
Skagit at Concrete	165
Dungeness near Sequim	208

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

Soil Moisture

Near to above normal fall precipitation provided for wet and nearly saturated soils (60-70% saturation) as the snow finally began to accumulate in mid-December. Great fall soil conditions can help buffer low snowpack runoff come spring however it is too early in the season to count those chickens. 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

Washington Snow Measurement Summary: January 1, 2015

Station Name	Elevation (ft)	Date	Snow Depth (in)	SWE (in)	Last Yr SWE (in)	Median SWE (1981-2010) (in)
Aberdeen Lake	4140	30-Dec	21	2.4	2.8	
Alpine Meadows	3500	1-Jan	17	4.2	12.2	19.8
Azure River Pillow	4298	1-Jan	68	24		
Barnes Creek	5243	30-Dec	37	8.3	12.1	
Barnes Creek Pillow	5315	1-Jan		8.7	9.9	
Beaver Creek Trail	2200	30-Dec	2	0.4	0.3	4.2
Beaver Pass	3621	30-Dec	17	3.7	1.7	10.5
Beaver Pass	3630	1-Jan	31	8.4	5.9	15.5
Beaverfoot	6312	5-Jan	19	3.7	4.1	
Blackwall Peak Pillo	6365	1-Jan	54	14.2	12	
Blewett Pass	4240	1-Jan	15	4.2	2.4	6.6
Brenda Mine Pillow	4790	1-Jan		4.8	4.9	
Brown Top	5830	1-Jan	68	21.9	18.2	
Brown Top Ridge AI	6000	30-Dec	69	18.4	7.7	26.2
Buckinghorse	4870	1-Jan	20	6.9	4.2	
Bumping Lake New	3400	29-Dec	16	3.3	0	6.6
Bumping Ridge	4610	1-Jan	15	3.1	4	10.4
Bunchgrass Mdw	5000	1-Jan	28	6.7	9.3	11.6
Burnt Mountain	4170	1-Jan	14	3	2	4.5
Calamity	2500	1-Jan	1	0.3	0	
Cayuse Pass	5240	1-Jan	36	9.3	7.5	
Chamokane 2	3550	2-Jan	2	0.2		
Char Creek	4232	1-Jan	24	6.5	7.3	
Corral Pass	5800	1-Jan	39	10.1	10.1	14.8
Cougar Mountain	3200	1-Jan	7	2	0	6.6
Devils Park	5900	31-Dec	55	15.2	13.9	
Dock Butte AM	3800	29-Dec	24	4.9		29.6
Dommerie Flats	2200	30-Dec	2	0.2	0	4.1
Dungeness	4010	1-Jan	6	1.1	0.4	3.2
East Creek Pillow	6660	1-Jan		14.5	13.2	
Easy Pass	5270	1-Jan	56	13.4		
Elbow Lake	3040	1-Jan	15	3	4.9	13.9
Farron	4032	31-Dec	19	4	4.6	
Ferguson	3048	2-Jan	40	10.1	10.7	
Fernie East	3980	1-Jan	21	4.4	4.2	
Fidelity Mountain	6076	28-Dec	70	20.2	19.7	
Fish Lake	3430	1-Jan	28	6.7	5.3	13
Fish Lake	3300	29-Dec	38	8.9	7.8	12
Floe Lake Pillow	6857	1-Jan		12.6	10.8	
Freezeout Cr. Tr.	3500	31-Dec	20	4.1		

Gold Axe Camp	5360	1-Jan	11	3	2.7	
Gold Mountain	4390	1-Jan	5	1.8		
Granite Creek	3500	29-Dec	34	7	4.4	
Green Lake	5920	1-Jan	32	7.1	6.7	9.4
Greyback Reservoir	5079	31-Dec	21	4.7	6.5	
Grouse Camp	5390	1-Jan	24	5.6	4.7	
Harts Pass	6490	1-Jan	71	23.6	12.6	17.7
Harts Pass	6200	31-Dec	71	20.4	11.5	
Hozomeen Camp	1690		2			
Huckleberry Creek	2250	1-Jan	5	1	0	0.9
Indian Rock	5360	1-Jan	14	3.7	2.5	
Jasper Pass AM	5400	29-Dec	60	12.2		34.7
June Lake	3440	1-Jan	15	3.4	2.4	16.6
Kirbyville Lake	5705	30-Dec	45	10.8	20.5	
Lone Pine	3930	1-Jan	21	4.9	1.8	15.3
Lost Horse	5120	1-Jan	15	2.8	2.2	6.8
Lyman Lake	5980	1-Jan	79	21.7	12.7	26.4
Lynn Lake	3900	1-Jan	15	3.6	3.1	
Marten Lake	3600	29-Dec	40	8.2		30.4
Marten Ridge	3520	1-Jan	24	5.7	8.3	
Meadow Cabins	1900	31-Dec	2	0.4	0.4	
Meadows Pass	3230	1-Jan	16	3.6	3.3	9.3
MF Nooksack	4970	1-Jan	26	7.8	17.5	16.6
Mission Creek Pillov	5840	1-Jan	29	7.1	11.2	
Monashee Pass	4551	30-Dec	26	5	9	
Morrissey Ridge Pill	5906	1-Jan		6.7	11.5	
Morse Lake	5410	1-Jan	47	12.8	9.5	22
Moses Mtn	5010	1-Jan	13	3.5	2.6	6.3
Mount Abbot	6663	28-Dec	69	20.5	16.9	
Mount Blum AM	5800	29-Dec	36	7.3		20.7
Mount Cook Pillow	5085	1-Jan	74	24.1	19.5	
Mount Crag	3960	1-Jan	10	2.6	1.8	11.3
Mount Gardner	2920	1-Jan	5	1.3	0	6.3
Mount Kobau	5961	28-Dec	20	4.3	2.6	
Mowich	3160	1-Jan	3	0.9	0	0
Moyie Mountain Pil	6332	1-Jan	19	5.1	6.9	
Muckamuck	4470	1-Jan	16	4.2		
Nelson	3123	2-Jan	16	3.8	4	
New Lake Hozomee	2800	29-Dec	2	0.4	0.6	
Olallie Meadows	4030	1-Jan	23	8.6	9.8	19.5
Paradise	5130	1-Jan	43	13	15.7	29
Park Creek Ridge	4600	1-Jan	49	12	7.8	19.2
Pepper Creek	2140	1-Jan	3	0.9	0	
Pigtail Peak	5800	1-Jan	42	12.4	15.9	21
Pinto Rock	4440	1-Jan	22	5		
Pope Ridge	3590	1-Jan	24	6.8	2.2	8.8
Potato Hill	4510	1-Jan	28	7	6.7	11.5

Quartz Peak	4700	1-Jan	21	5.5	7	9.7
Rainy Pass	4780	29-Dec	57	13.4	8.6	
Rainy Pass	4890	1-Jan	49	15.2	8	15.7
Rex River	3810	1-Jan	14	4	4.6	12.9
Rocky Creek	2100	29-Dec	12	2.4		
Salmon Meadows	4460	1-Jan	17	4.7	1.8	4.7
Sasse Ridge	4340	1-Jan	30	7.3	5.5	11.7
Satus Pass	3960	1-Jan	10	1.6	1.8	
Sawmill Ridge	4640	1-Jan	25	6.5	5.8	
Schreibers Meadow	3400	29-Dec	24	4.9		24
Sentinel Butte	4680	1-Jan	12	2	3.7	3.7
Sheep Canyon	3990	1-Jan	16	3.6	3.4	15.1
Skate Creek	3770	1-Jan	15	3		
Skookum Creek	3310	1-Jan	13	3.3	3.4	9.6
Sourdough Gulch	4000	1-Jan	3	0.7	0.5	0.6
Spencer Meadow	3400	1-Jan	11	2.4	2	12.4
Spirit Lake	3520	1-Jan	10	2.9	0	3.1
Spruce Springs	5700	1-Jan	21	4.5	3.6	7.1
St. Leon Creek Pillow	5906	1-Jan		18.7	17.4	
St. Leon River	5997	30-Dec	70	20.7	23.5	
Stampede Pass	3850	1-Jan	33	6.8	3.9	17.4
Stevens Pass	3950	1-Jan	33	7.2	9.3	17
Sullivan Mine	5184	1-Jan	12	3.1	5.2	
Surprise Lakes	4290	1-Jan	27	8.3	5.2	19.9
Swamp Creek	3930	1-Jan	29	7.9	6.6	5.8
Swift Creek	4440	1-Jan	25	8.4	7.5	23.4
Thunder Basin	4320	1-Jan	33	9.7	5.8	14.2
Thunder Creek	6765	5-Jan	20	5.5		
Tinkham Creek	2990	1-Jan	13	2.6	3.2	9.8
Togo	3370	2-Jan	2	0.2		
Touchet	5530	1-Jan	28	7.7	8.2	12.9
Trinity	2930	1-Jan	40	10.6	4	
Trough	5480	1-Jan	21	4.7	4.6	5.2
Tunnel Avenue	2433	30-Dec	4	1.3	0	6.3
Upper Wheeler	4330	1-Jan	20	4.8	2.3	5
Vermont Creek	5030	5-Jan	27	4.8	7.1	
Waterhole	5010	1-Jan	22	5.8	5.5	17
Watson Lakes	4500	29-Dec	30	6.1		23
Wells Creek	4030	1-Jan	19	5	7.1	12.5
Whatshan Upper	4843	30-Dec	39	8.8	13.9	
White Pass E.S.	4440	1-Jan	18	4.7	2.9	9
Yellowhead Pillow	6102	1-Jan	35	9.7	10	

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/

Oregon:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/

Idaho:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/

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

USDA-NRCS Agency Homepages

Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/

NRCS National:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

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 Pacific Area Committee is making plans for the 83rd Annual Western Snow Conference in 2015.

Mark your calendar and start thinking about submitting a paper to attend the 2015 Western Snow Conference:

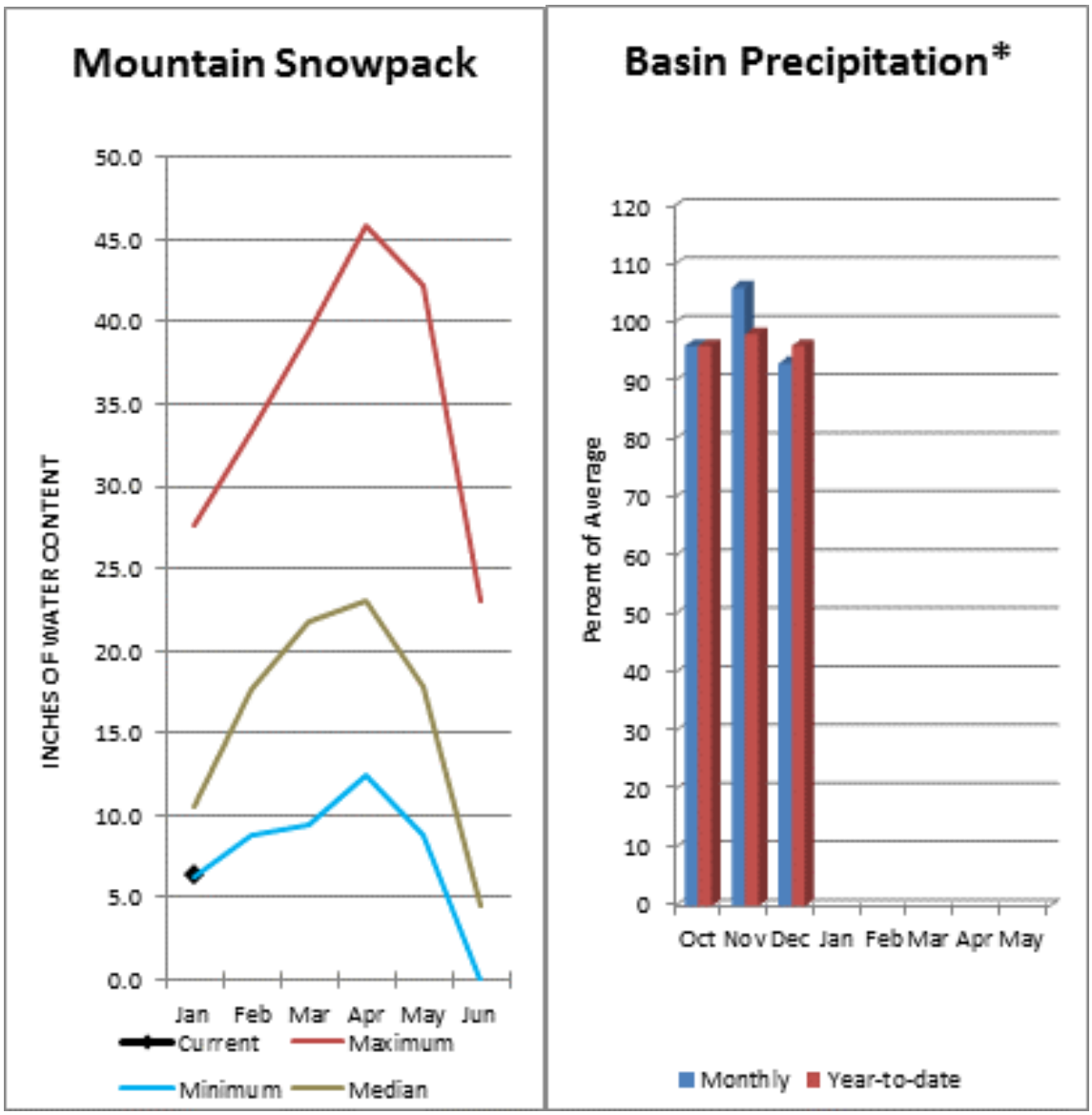
Dates: April 20-24, 2015
Location: Grass Valley, California

The Conference will begin Monday, April 20th with a short course and panel discussion on " LIDAR Basics, Applications, and Use in Snow Hydrology and Field Studies " with several invited experts in the field. Tuesday and Wednesday will include formal paper and poster presentations on a variety of topics, including climate variability, climate change impacts on snow and runoff, water management, water supply forecasting, and modeling and climatology of snow. Thursday will include a technical tour to visit hydrologic and gold mining points of interest around Grass Valley

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



The January 1 forecasts for summer runoff within the Spokane River Basin are 85% of average near Post Falls and 88% at Long Lake. The Chamokane River near Long Lake forecasted to have 80% of average flows for the May-August period. The forecast is based on a basin snowpack that is 57% of normal and precipitation that is 96% of average for the water year. Precipitation for December was near normal at 93% of average. Streamflow on the Spokane River at Spokane was 106% of average for December. January 1 storage in Coeur d'Alene Lake was 140,000 acre feet, 149% of average and 59% of capacity. Snowpack at Quartz Peak SNOTEL site was 57% of average with 5.5 inches of water content. Average temperatures in the Spokane basin were 4-6 degrees above normal for December and 3-5 degrees above normal for the water year.

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

Data Current as of: 1/8/2015 11:23:28 AM

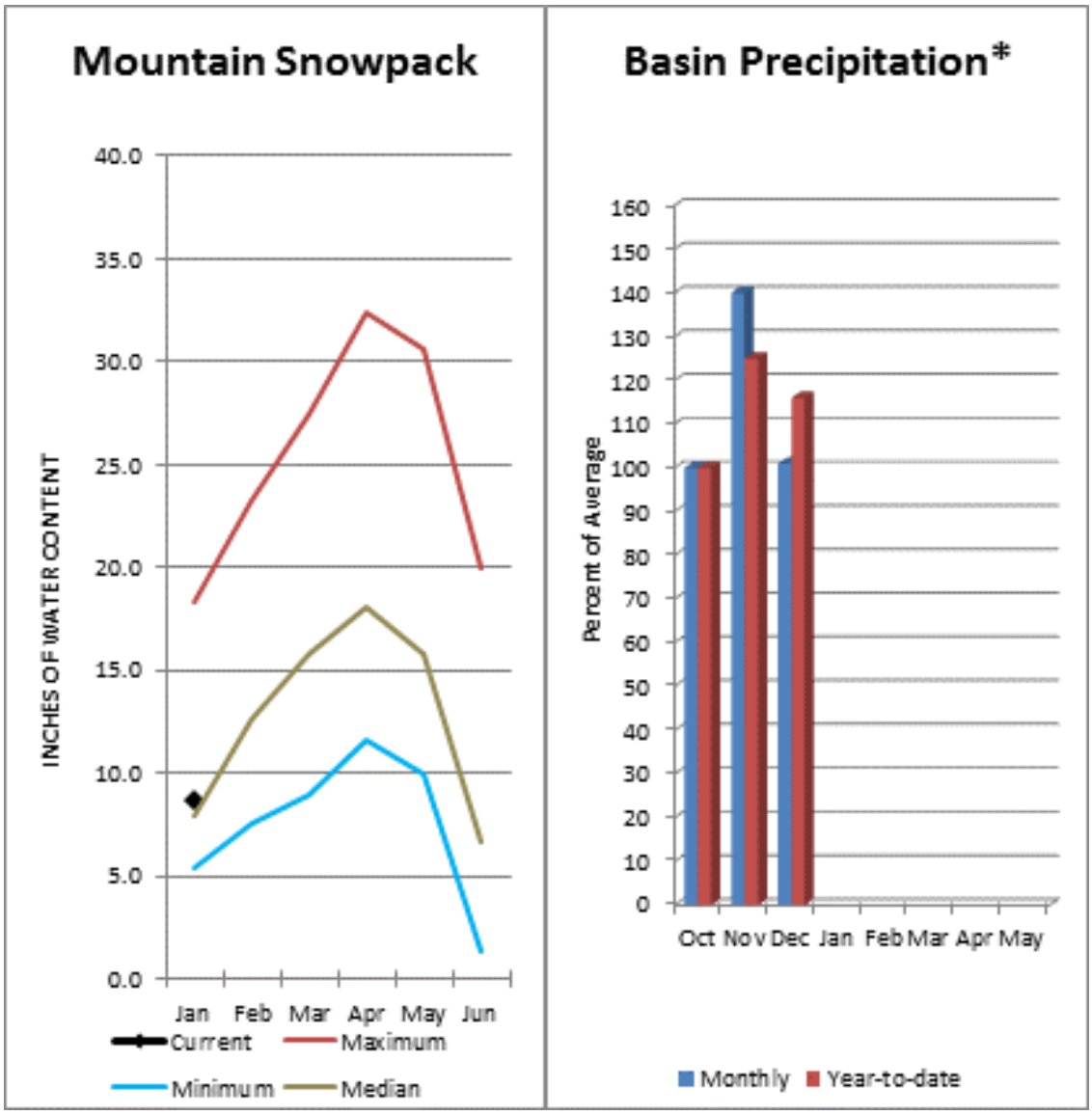
Spokane
Streamflow Forecasts - January 1, 2015

Spokane	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Spokane R nr Post Falls[2]								
	APR-JUL	1130	1670	2040	85%	2400	2940	2390
	APR-SEP	1190	1740	2110	85%	2480	3030	2480
Spokane R at Long Lake[2]								
	APR-JUL	1280	1890	2300	88%	2720	3330	2620
	APR-SEP	1440	2070	2500	88%	2920	3550	2850
Chamokane Ck nr Long Lake								
	MAY-AUG	4	6	7.4	80%	8.8	10.8	9.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of December, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Coeur d' Alene	139.7	50.4	93.7	238.5
Basin-wide Total	139.7	50.4	93.7	238.5
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Spokane	13	57%	72%
Newman Lake	1	57%	72%



The April – September average forecast for the Priest River near the town of Priest River is 82% and the Pend Orielle below Box Canyon is 112%. December streamflow was 138% of average on the Pend Oreille River and 150% on the Columbia Birchbank. January 1 snow cover was 110% of normal in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 6.7 inches of snow water on the snow pillow. Normally Bunchgrass would have 11.6 inches on January 1. Precipitation during December was 101% of average, pushing the year-to-date precipitation at 116% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 76% of normal. Average temperatures were 4-6 degrees above normal for December and 3-5 degrees above normal for the water year.

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

Data Current as of: 1/8/2015 11:23:31 AM

Pend Oreille Basins
Streamflow Forecasts - January 1, 2015

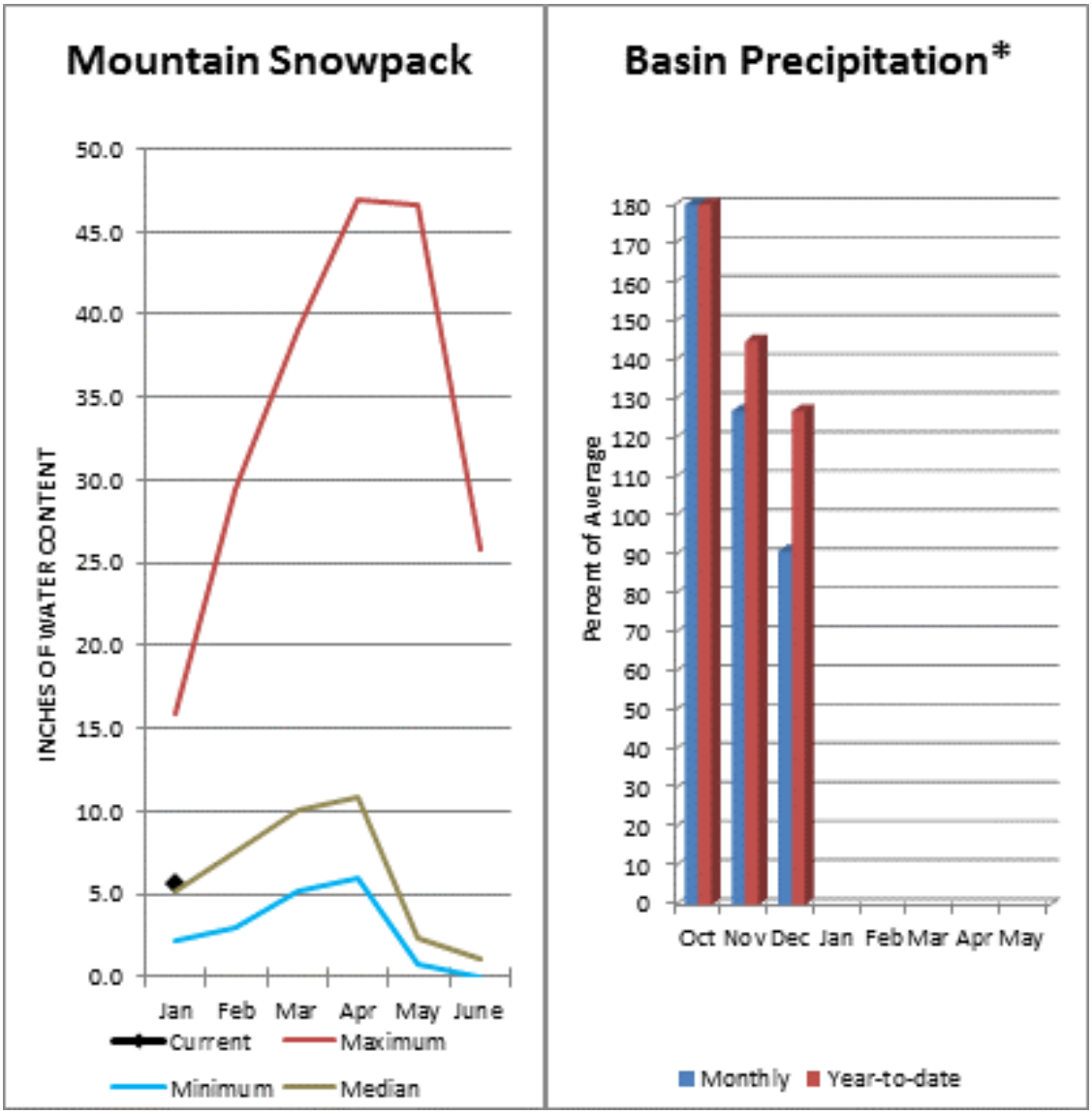
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Pend Oreille Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Pend Oreille Lake Inflow[2]								
	APR-JUL	10400	12100	13300	113%	14400	16100	11800
	APR-SEP	11400	13200	14400	113%	15600	17400	12800
Priest R nr Priest River[1,2]								
	APR-JUL	335	545	640	82%	735	945	780
	APR-SEP	355	580	680	82%	780	1000	830
Pend Oreille R bl Box Canyon[2]								
	APR-JUL	10600	12300	13500	113%	14600	16400	11900
	APR-SEP	11600	13400	14600	112%	15800	17600	13000

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of December, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Pend Oreille	520.8	522.6	708.2	1561.3
Priest Lake	57.5	54.9	56.5	119.3
Basin-wide Total	578.3	577.4	764.7	1680.6
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Pend Oreille Basins	52	110%	104%
Colville River	0		
Pend Oreille River	52	110%	104%
Kettle River	4	75%	114%



Summer runoff average forecast for the Okanogan River is 91%, Similkameen River is 109%, Kettle River 96% and Methow River is 113%. January 1 snow cover on the Okanogan was 104% of normal, Omak Creek was 56% and the Methow was 114%. December precipitation in the Upper Columbia was 101% of average, with precipitation for the water year at 130% of average. December streamflow for the Methow River was 188% of average, 138% for the Okanogan River and 165% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 47 inches which normal for January 1. Combined storage in the Conconully Reservoirs was 15,000 acre-feet or 111% of normal. Temperatures were 4-6 degrees above normal for December and 3-5 degrees above for the water year.

Worth mentioning was the installation of two new SNOTEL sites within the basin. First in was Muckamuck SNOTEL within the West Fork Salmon Creek in support of Conconully Reservoir operations. Next came Gold Mtn. SNOTEL which will provide additional forecasting opportunities for the Sanpoil River and Upper reaches of the Columbia River as well as support for the Colville Tribe.

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

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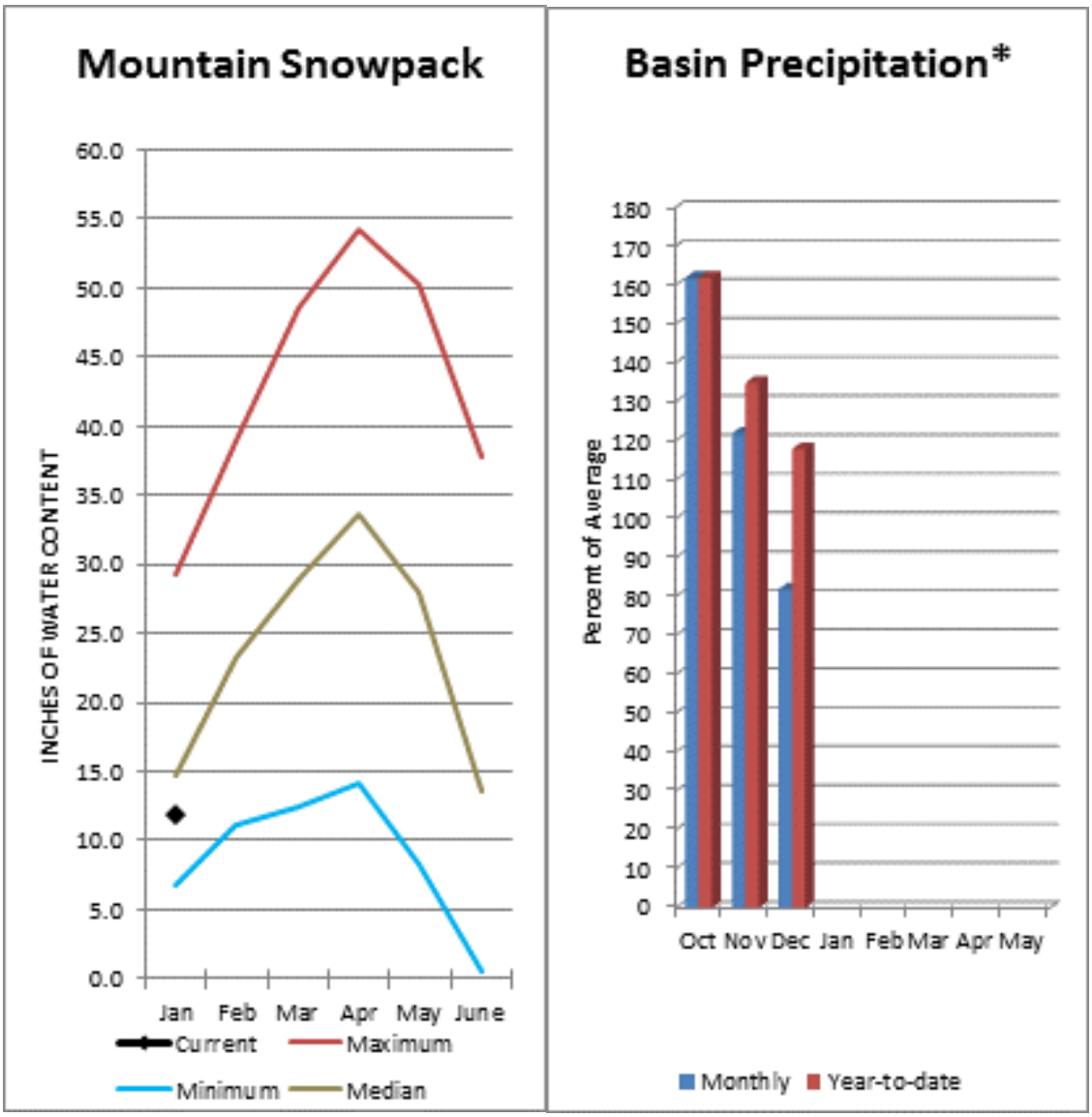
Upper Columbia Basins
Streamflow Forecasts - January 1, 2015

Upper Columbia Basins	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Kettle R nr Laurier								
	APR-JUL	1200	1510	1720	96%	1930	2250	1800
	APR-SEP	1230	1570	1800	96%	2020	2360	1880
Colville R at Kettle Falls								
	APR-JUL	15	59	89	75%	119	163	119
	APR-SEP	17.3	65	98	75%	130	178	131
Columbia R at Grand Coulee[1,2]								
	APR-JUL	34300	44700	49500	97%	54300	64700	51015
Similkameen R nr Nighthawk[1]								
	APR-JUL	850	1160	1300	108%	1440	1750	1200
	APR-SEP	910	1240	1390	109%	1540	1880	1280
Okanogan R nr Tonasket[1]								
	APR-JUL	545	1060	1290	87%	1520	2030	1480
	APR-SEP	585	1170	1430	87%	1700	2280	1650
Okanogan R at Malott[1]								
	APR-JUL	555	1090	1330	92%	1580	2110	1450
	APR-SEP	590	1200	1480	91%	1750	2360	1620
Methow R nr Pateros								
	APR-JUL	660	825	940	113%	1050	1220	835
	APR-SEP	715	890	1010	113%	1130	1300	895
Columbia R at Birchbank[1,2]								
	APR-JUL	23500	29200	31800	94%	34400	40100	33840
	APR-SEP	28900	36100	39300	94%	42500	49700	41750

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of December, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	6.9	9.3	7.3	10.5
Conconully Reservoir	8.3	11.3	6.5	13.0
Basin-wide Total	15.3	20.7	13.8	23.5
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Upper Columbia Basins	7	98%	77%
Okanogan River	6	104%	92%
Omak Creek	1	56%	41%
Sanpoil River	0		
Similkameen River	1	95%	81%
Toats Coulee Creek	0		
Conconully Lake	1	100%	38%
Methow River	3	114%	59%



Precipitation during December was 110% of average in the basin and 124% for the year-to-date. Runoff for Entiat River is forecast to be 90% of average for the summer. The April-September average forecast for Chelan River is 89%, Wenatchee River at Plain is 84%, Stehekin River is 97% and Icicle Creek is 80%. December average streamflows on the Chelan River were 188% and on the Wenatchee River 201%. January 1 snowpack in the Wenatchee River Basin was 68% of normal; the Chelan, 80%; the Entiat, 77%; Stemilt Creek, 96% and Colockum Creek, 90%. Reservoir storage in Lake Chelan was not available. Lyman Lake SNOTEL had the most snow water with 21.7 inches of water. This site would normally have 26.4 inches on January 1. Temperatures were 2-4 degrees above normal for December and 2-3 degrees above normal for the water year.

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

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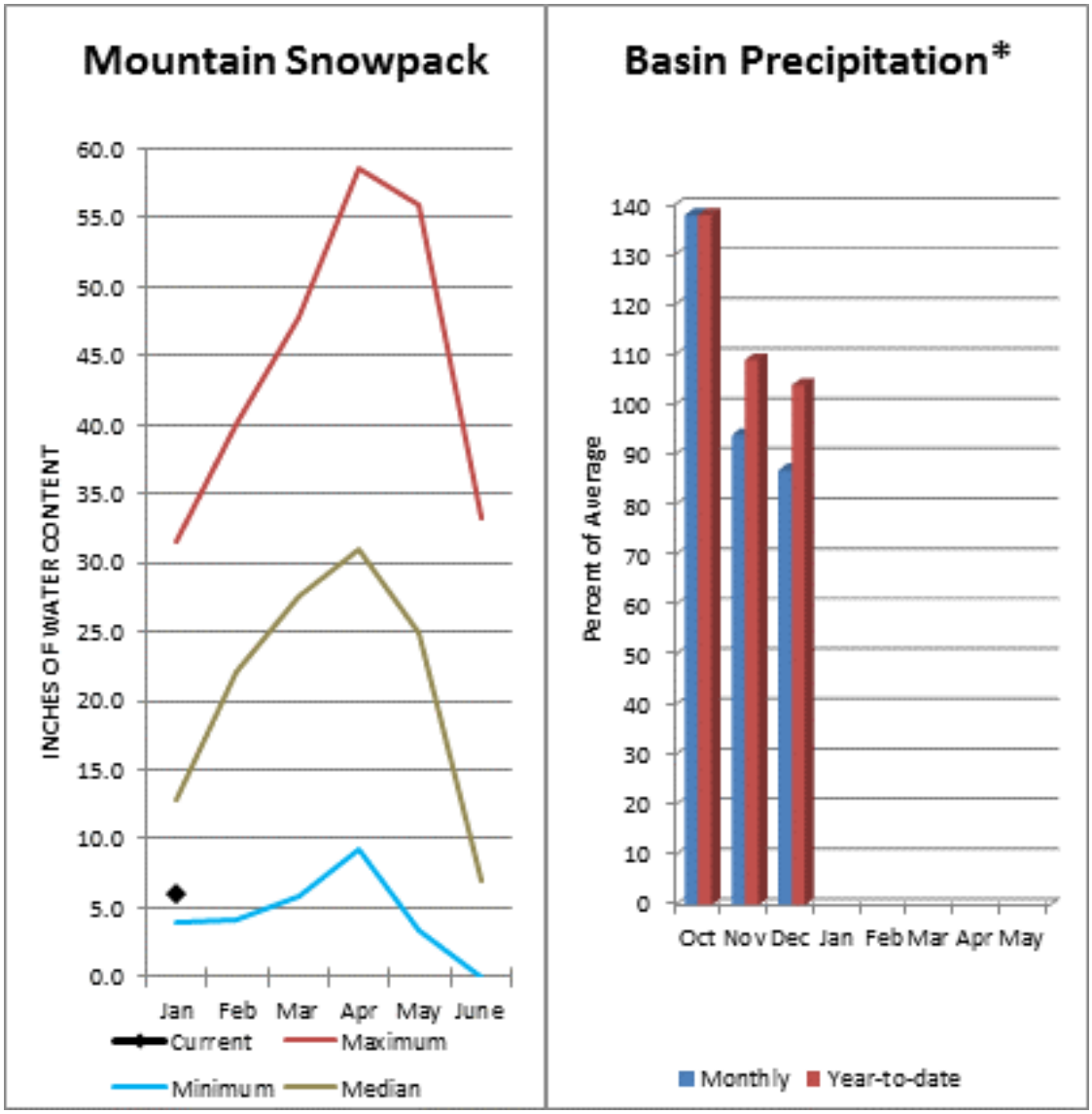
Central Columbia Basins
Streamflow Forecasts - January 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Central Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Stehekin R at Stehekin								
	APR-JUL	510	605	665	98%	730	825	680
	APR-SEP	600	705	770	97%	840	940	790
Chelan R at Chelan								
	APR-JUL	700	820	905	91%	985	1100	1000
	APR-SEP	765	905	1000	89%	1100	1240	1120
Entiat R nr Ardenvoir								
	APR-JUL	125	160	183	92%	205	240	200
	APR-SEP	137	173	198	90%	225	260	220
Wenatchee R at Plain								
	APR-JUL	595	745	845	85%	945	1090	990
	APR-SEP	635	800	910	84%	1020	1180	1080
Icicle Ck nr Leavenworth								
	APR-JUL	156	196	225	82%	250	290	275
	APR-SEP	171	215	240	80%	270	310	300
Wenatchee R at Peshastin								
	APR-JUL	825	1030	1160	85%	1300	1500	1370
	APR-SEP	875	1100	1250	84%	1400	1620	1490
Columbia R bl Rock Island Dam[2]								
	APR-JUL	41700	49600	55000	99%	60400	68300	55770
	APR-SEP	49800	59100	65500	100%	71800	81200	65200

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of December, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Chelan			411.3	676.1
Basin-wide Total			0.0	0.0
# of reservoirs	0	0	0	0

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Central Columbia Basins	3	80%	46%
Chelan Lake Basin	3	80%	46%
Entiat River	1	77%	25%
Wenatchee River	7	68%	52%
Stemilt Creek	1	96%	46%
Colockum Creek	1	90%	88%



January 1 reservoir storage for the Upper Yakima reservoirs was 558,000-acre feet, 161% of average. Forecasts for the Yakima River at Cle Elum are 73% of average and the Teanaway River near Cle Elum is at 70%. Lake inflows are all forecasted to be slightly below average this summer as well. December streamflows within the basin were Cle Elum River near Roslyn at 166%. January 1 snowpack was 49% based upon 8 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 87% of average for December and 100% for the water-year. 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.

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Upper Yakima River
Streamflow Forecasts - January 1, 2015

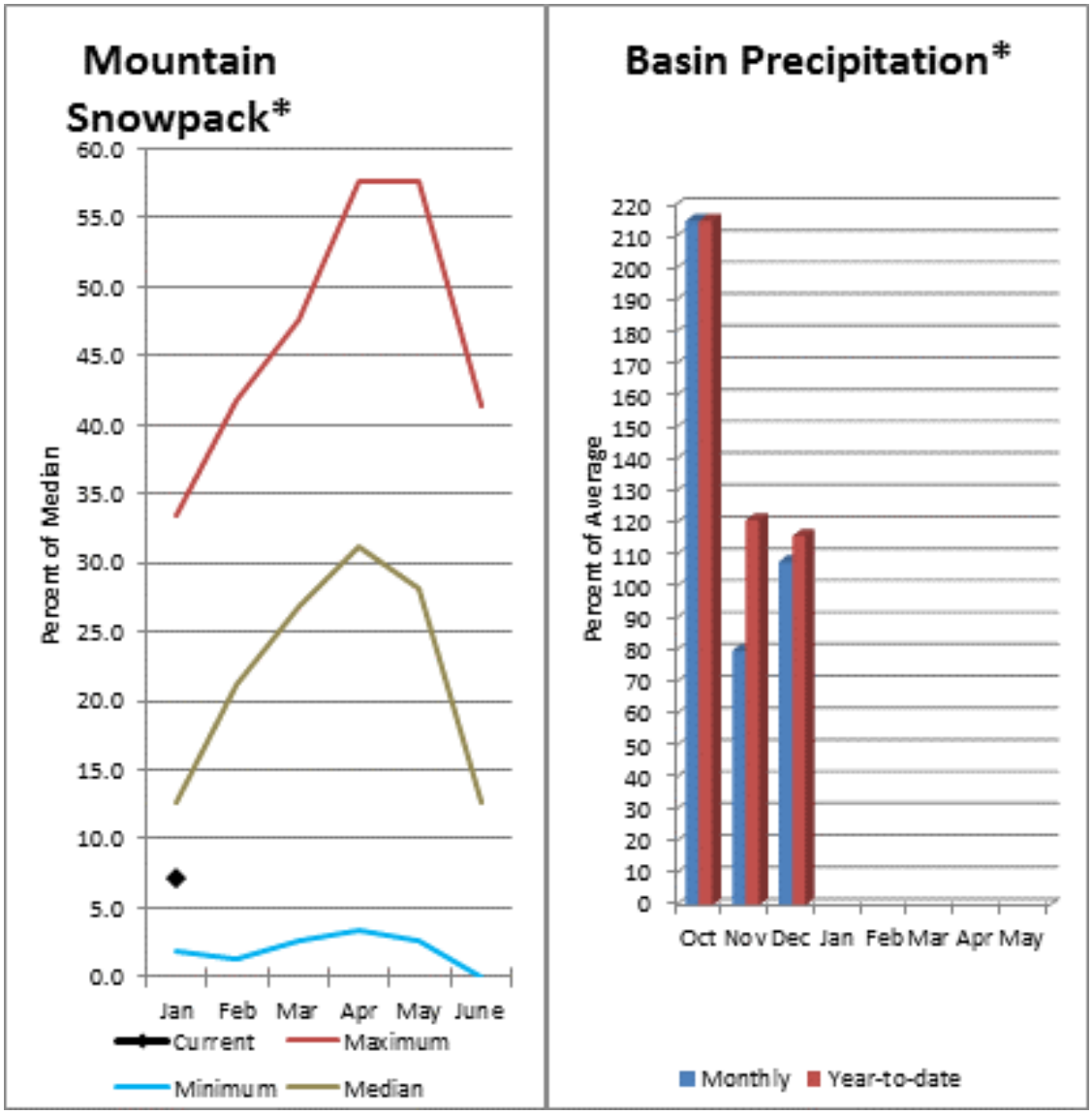
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Keechelus Reservoir Inflow[2]								
	APR-JUL	49	72	87	75%	103	125	116
	APR-SEP	56	79	95	75%	110	133	126
Kachess Reservoir Inflow [2]								
	APR-JUL	42	64	78	75%	93	114	104
	APR-SEP	48	69	83	73%	98	119	113
Cle Elum Lake Inflow [2]								
	APR-JUL	192	260	300	78%	345	410	385
	APR-SEP	205	275	320	77%	370	440	415
Yakima R at Cle Elum [2]								
	APR-JUL	320	465	560	74%	655	795	755
	APR-SEP	360	505	605	73%	705	855	830
Teanaway R bl Forks nr Cle Elum								
	APR-JUL	35	68	91	70%	114	148	130
	APR-SEP	36	70	93	70%	116	150	133

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of December, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Keechelus	109.1	85.9	68.5	157.8
Kachess	171.8	162.3	113.4	239.0
Cle Elum	277.1	163.0	164.0	436.9
Basin-wide Total	558.1	411.1	345.9	833.7
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Upper Yakima River	8	49%	38%



December average streamflows within the basin were: Yakima River near Parker, 177% and the Naches River near Naches, 209%. January 1 reservoir storage for Bumping and Rimrock reservoirs was 140,000-acre feet, 135% of average. Forecast averages for Yakima River near Parker are 80%; American River near Nile, 80%; Ahtanum Creek, 97%; and Klickitat River near Glenwood, 120%. January 1 snowpack was 56% based upon 7 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 61% of normal. Precipitation was 108% of average for December and 116% for the water-year. Temperatures were 4-6 degrees above normal for December and for 2-4 degrees above normal for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they January 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.

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Lower Yakima River
Streamflow Forecasts - January 1, 2015

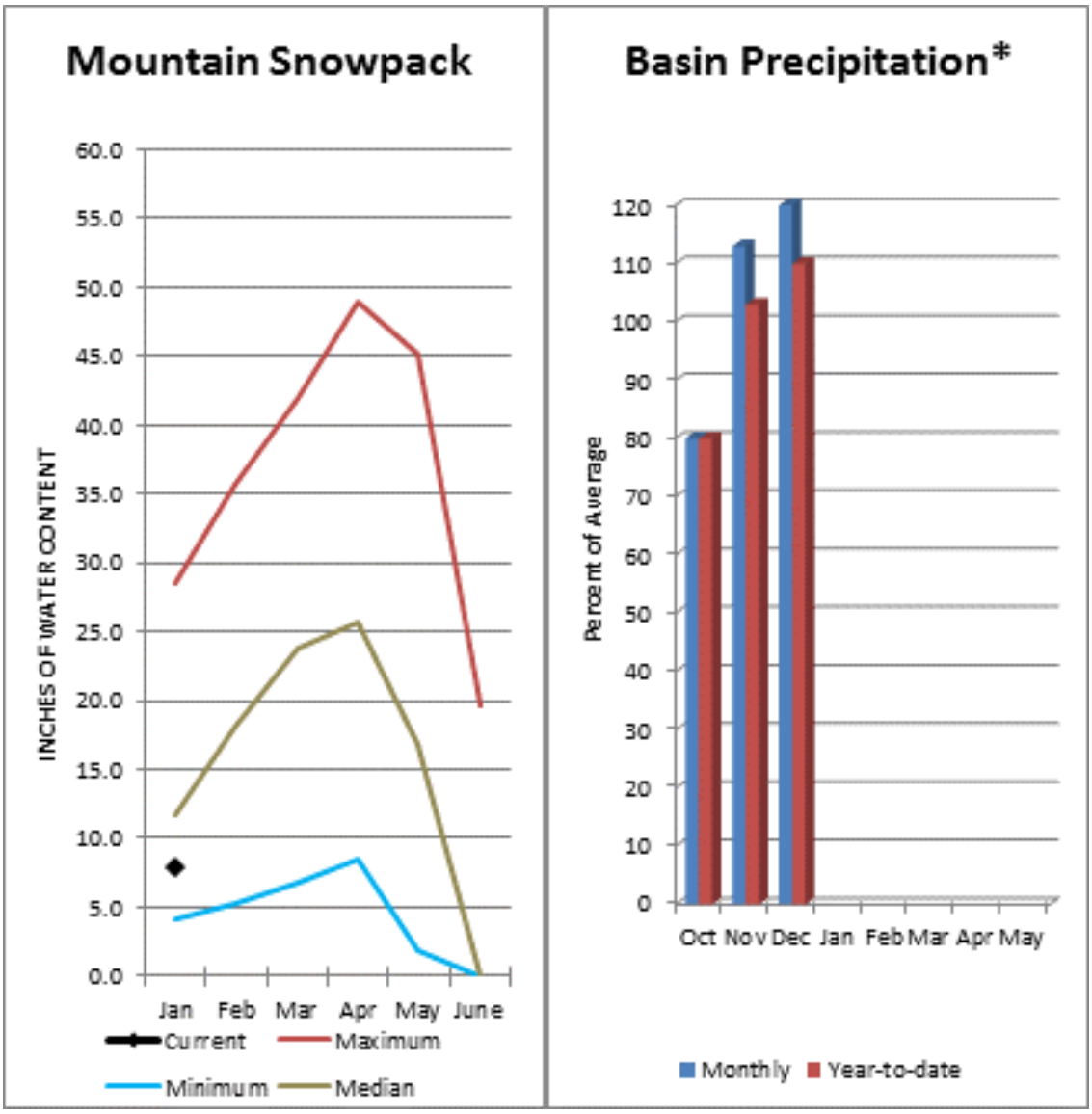
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bumping Lake Inflow [2]								
	APR-JUL	68	86	99	87%	111	129	114
	APR-SEP	73	93	106	86%	120	139	123
American R nr Nile								
	APR-JUL	55	71	82	80%	93	109	102
	APR-SEP	58	76	88	80%	100	118	110
Rimrock Lake Inflow [2]								
	APR-JUL	122	148	165	88%	183	210	187
	APR-SEP	144	174	194	88%	215	245	220
Naches R nr Naches								
	APR-JUL	375	490	570	81%	650	765	700
	APR-SEP	400	525	615	81%	700	830	760
Ahtanum Ck at Union Gap								
	APR-JUL	10.7	19.8	26	96%	32	41	27
	APR-SEP	12.4	22	28	97%	34	44	29
Yakima R nr Parker [2]								
	APR-JUL	820	1120	1330	80%	1540	1840	1660
	APR-SEP	900	1230	1450	80%	1670	2000	1820
Klickitat R nr Glenwood								
	APR-JUL	71	93	108	86%	122	144	126
	APR-SEP	81	104	120	86%	136	159	139
Klickitat R nr Pitt								
	APR-JUL	290	360	405	93%	450	515	435
	APR-SEP	365	440	490	94%	545	620	520

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of December, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bumping Lake	19.1	21.3	11.5	33.7
Rimrock	121.1	123.9	92.4	198.0
Basin-wide Total	140.2	145.2	103.9	231.7
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Lower Yakima River	7	56%	45%
Ahtanum Creek	2	61%	55%



December precipitation was 120% of average, maintaining the year-to-date precipitation at 110% of average. Snowpack in the basin was 67% of normal. Streamflow forecasts are 93% of average for Mill Creek and 98% for the SF Walla Walla near Milton-Freewater. Average temperatures were 6-8 degrees above normal for December and 3-5 degrees above normal for the water year.

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

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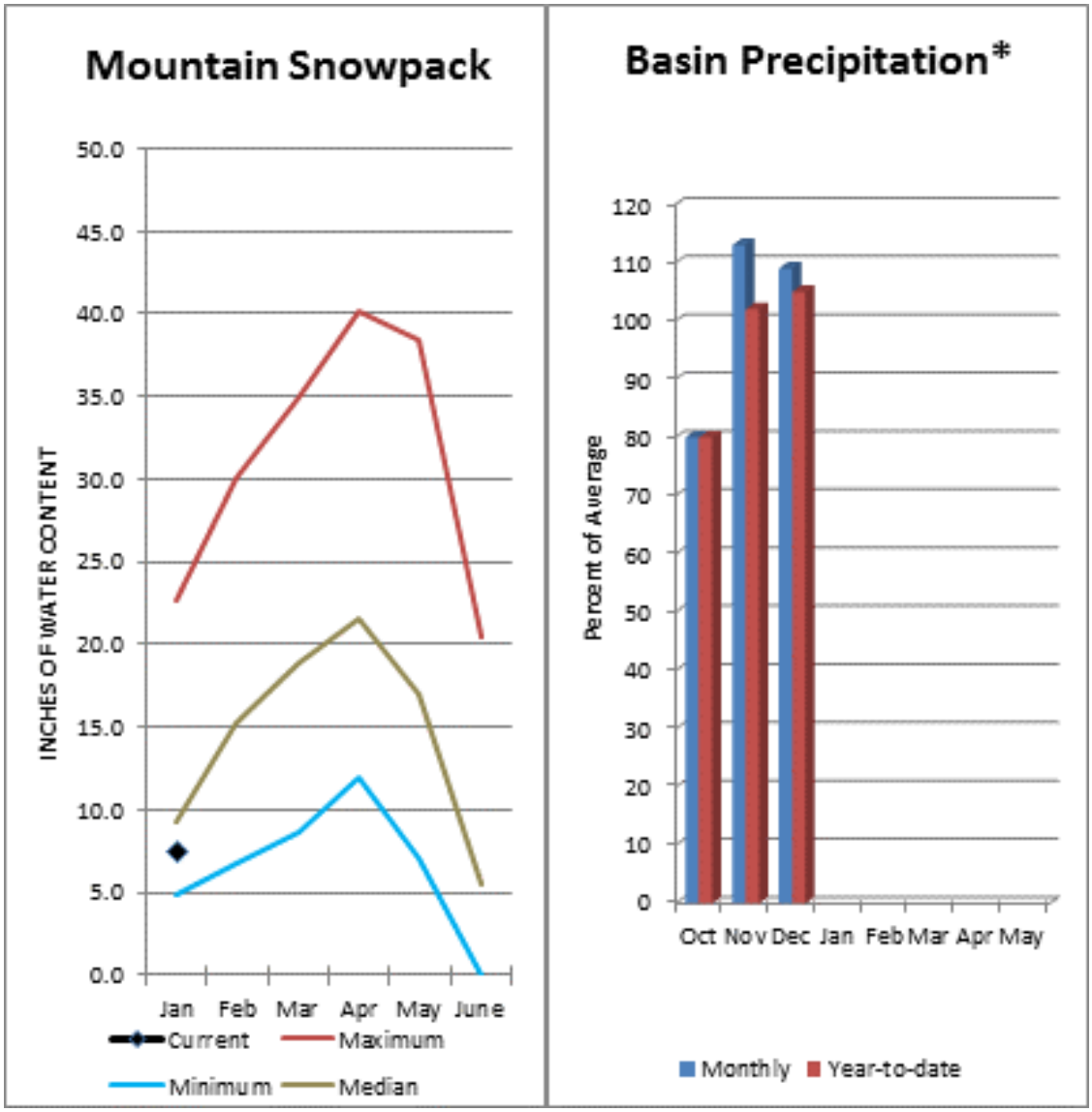
Walla Walla River
Streamflow Forecasts - January 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Walla Walla River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
SF Walla Wall R nr Milton-Freewater								
	MAR-SEP	65	73	79	99%	84	92	80
	APR-JUL	42	48	52	96%	56	62	54
	APR-SEP	53	60	65	98%	69	76	66
Mill Ck nr Walla Walla								
	APR-JUL	15.4	19.4	22	92%	25	29	24
	APR-SEP	17.8	22	25	93%	28	32	27

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Walla Walla River	2	67%	59%



The Grande Ronde River can expect summer flows to be about 107% of normal. The forecast for Asotin Creek at Asotin predicts 97% of average flows for the April – July runoff period. December precipitation was 110% of average, bringing the year-to-date precipitation to 105% of average. January 1 snowpack readings averaged 80% of normal. December streamflow was 111% of average for Snake River below Lower Granite Dam and 168% for Grande Ronde River near Troy. Dworshak Reservoir storage was 101% of average. Average temperatures were 4-6 degrees above normal for December and 3-4 degrees above for the water year.

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

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Lower Snake, Grande Ronde, Clearwater Basins
Streamflow Forecasts - January 1, 2015

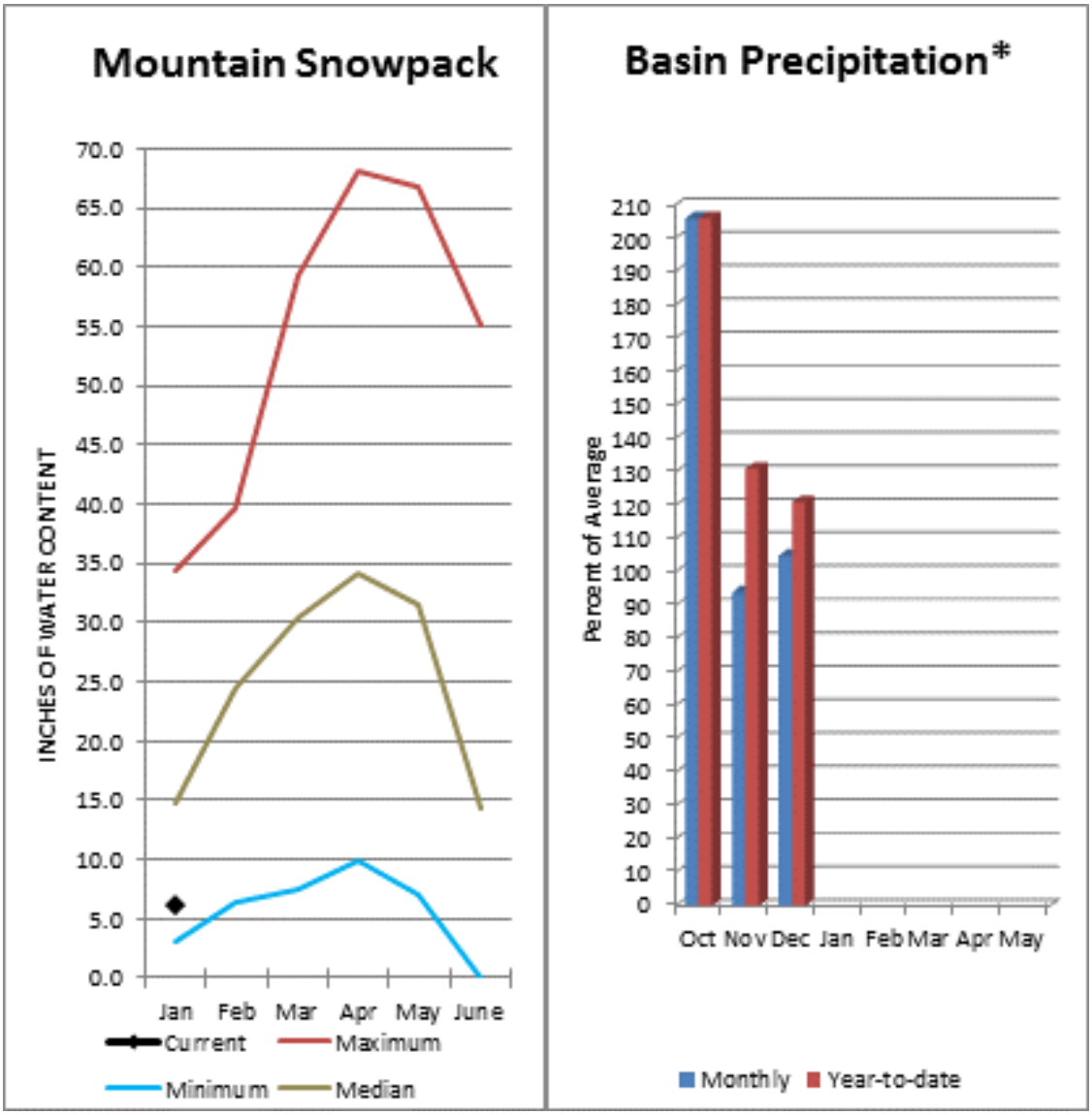
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake, Grande Ronde, Clearwater Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Grande Ronde R at Troy[1]								
	MAR-JUL	1080	1450	1620	107%	1790	2160	1510
	APR-SEP	880	1240	1400	107%	1560	1910	1310
Asotin Ck at Asotin								
	APR-JUL	15.6	27	34	97%	41	52	35
Clearwater R at Spalding[1,2]								
	APR-JUL	5000	6920	7790	113%	8660	10600	6890
	APR-SEP	5340	7300	8190	113%	9070	11000	7270
Snake R bl Lower Granite Dam[1,2]								
	APR-JUL	15200	17900	20500	103%	22800	25000	19848

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of December, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	2431.1	2298.7	2403.0	3468.0
Basin-wide Total	2431.1	2298.7	2403.0	3468.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Lower Snake, Grande Ronde, Clearwater Basins	12	80%	80%



Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 92% and Cowlitz River at Castle Rock, 95% of average. The Columbia at The Dalles is forecasted to have 100% of average flows this summer according to the River Forecast Center. December average streamflow for Cowlitz River was 137%. The Columbia River at The Dalles was 124% of average. December precipitation was 106% of average and the water-year average was 121%. January 1 snow cover for Cowlitz River was 49%, and Lewis River was 30% of normal. Temperatures were 2-4 degrees above normal during December and for the water year.

October brought the installation of two new SNOTEL sites within the Cowlitz River Basin. In cooperation with Tacoma Power we installed both Skate Creek and Pinto Rock SNOTEL sites during one of the rainiest weeks of the month. Both of these sites will support the ongoing work of Tacoma Power as well as providing a wealth of information to year round recreationists.

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

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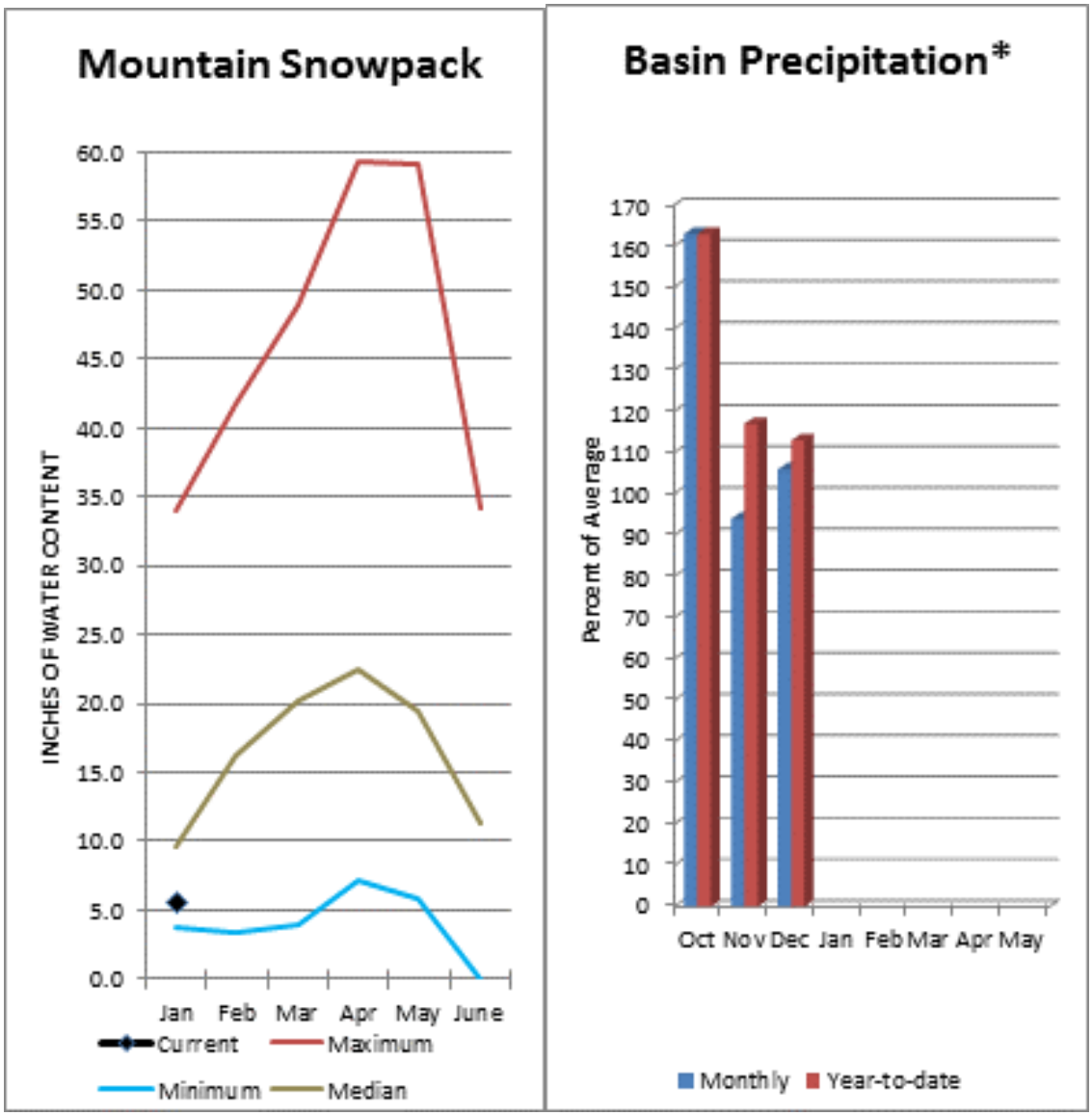
Lower Columbia Basins
Streamflow Forecasts - January 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Columbia R at The Dalles[2]								
	APR-JUL	60000	71700	79600	100%	87500	99200	79855
	APR-SEP	70000	83600	92900	100%	102000	116000	92704
Klickitat R nr Glenwood								
	APR-JUL	71	93	108	86%	122	144	126
	APR-SEP	81	104	120	86%	136	159	139
Klickitat R nr Pitt								
	APR-JUL	290	360	405	93%	450	515	435
	APR-SEP	365	440	490	94%	545	620	520
Lewis R at Ariel								
	APR-JUL	615	790	910	94%	1030	1200	970
	APR-SEP	720	905	1030	92%	1150	1340	1120
Cowlitz R bl Mayfiled[2]								
	APR-JUL	1030	1330	1540	95%	1750	2050	1620
	APR-SEP	1110	1500	1760	96%	2020	2400	1840
Cowlitz R at Castle Rock[2]								
	APR-JUL	1610	1910	2120	95%	2330	2630	2230
	APR-SEP	1810	2160	2390	95%	2630	2970	2520

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Lower Columbia Basins	10	41%	37%
Lewis River	4	30%	18%
Cowlitz River	6	49%	50%



Summer runoff is forecast to be 88% of normal for the Green River below Howard Hanson Dam and 102% for the White River near Buckley. January 1 snowpack was 63% of average for the White River, 66% for Puyallup River and 37% in the Green River Basin. December precipitation was 106% of average, bringing the water year-to-date to 113% of average for the basins. Average temperatures in the area were 2-4 degrees above normal for December and for the water-year.

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

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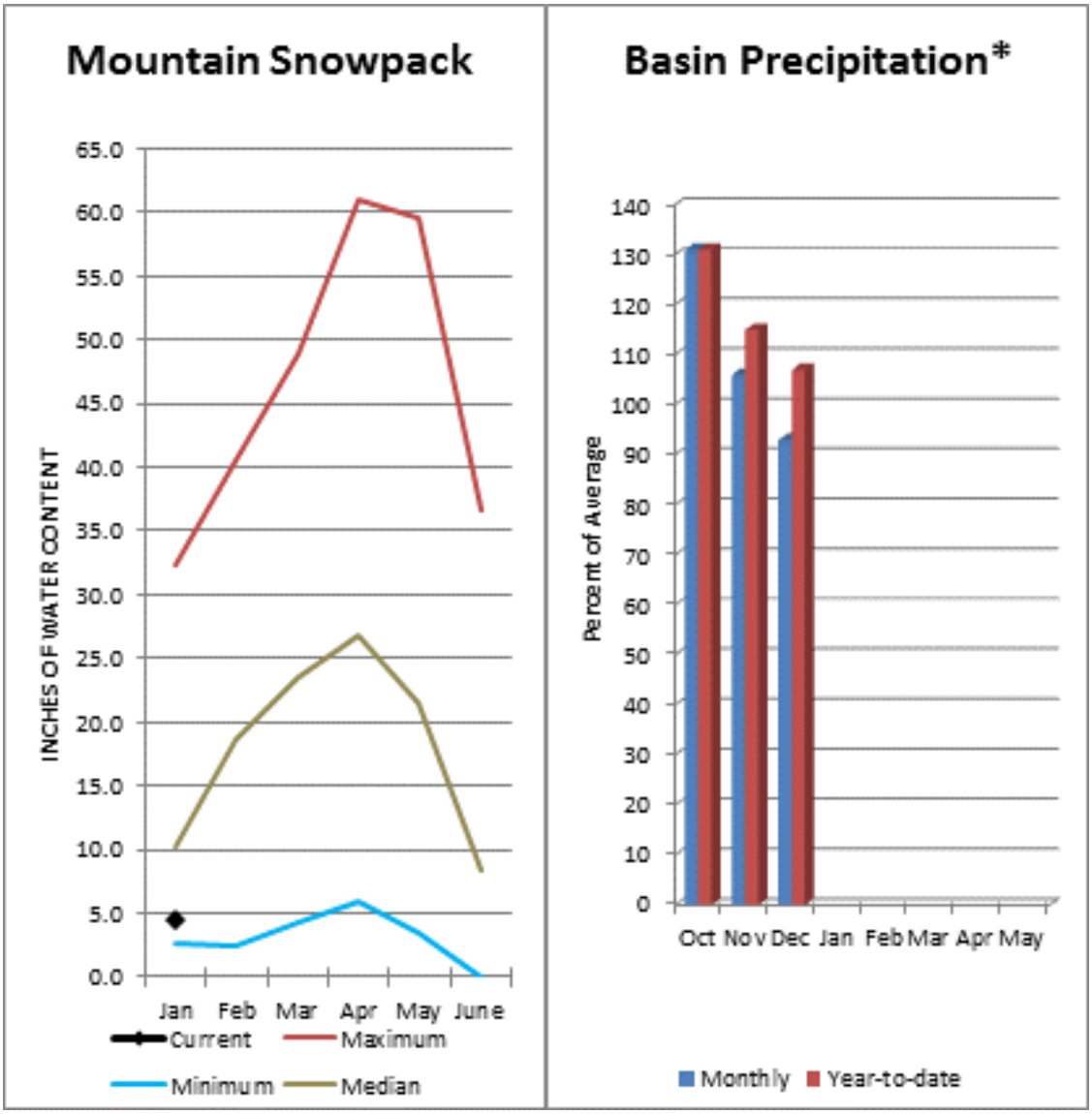
South Puget Sound Basins
Streamflow Forecasts - January 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

South Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
White R nr Buckley[1,2]								
	APR-JUL	325	405	440	102%	475	555	430
	APR-SEP	395	485	525	102%	570	660	515
Green R bl Howard A Hanson Dam[1,2]								
	APR-JUL	122	182	210	89%	235	295	235
	APR-SEP	145	205	230	88%	260	320	260

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
South Puget Sound Basins	10	58%	43%
White River	3	63%	52%
Green River	2	37%	16%



Forecast for spring and summer flows are: 67% for Cedar River near Cedar Falls; 23% for Rex River; 74% for South Fork of the Tolt River; and 88% for Taylor Creek near Selleck. Basin-wide precipitation for December was 88% of average, bringing water-year-to-date to 104% of average. January 1 median snow cover in Cedar River Basin was 30%, Tolt River Basin was 26%, Snoqualmie River Basin was 35%, and Skykomish River Basin was 31%. Temperatures were 2-4 degrees above normal for December and for the water-year.

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

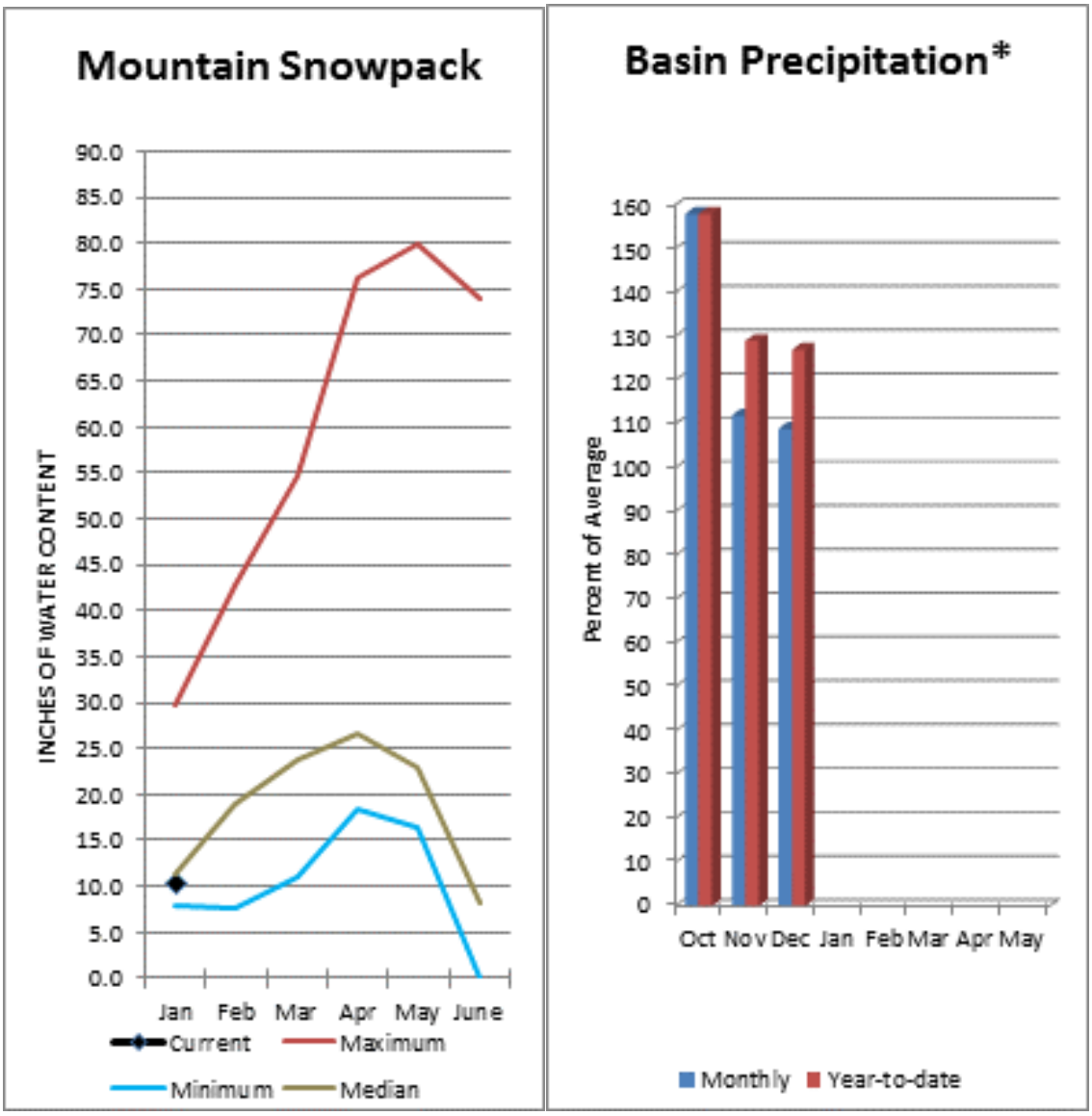
Data Current as of: 1/8/2015 11:23:57 AM

Central Puget Sound Basins
Streamflow Forecasts - January 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Central Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Cedar R nr Cedar Falls								
	APR-JUL	36	50	60	86%	70	85	70
	APR-SEP	41	56	67	88%	77	92	76
Rex R nr Cedar Falls								
	APR-JUL	10	16.1	20	83%	25	31	24
	APR-SEP	12.4	18.6	23	85%	27	33	27
Taylor Ck nr Selleck								
	APR-JUL	11.9	15.3	17.6	88%	20	23	20
	APR-SEP	15.2	18.9	21	88%	24	27	24
SF Tolt R nr Index								
	APR-JUL	5.8	8.5	10.4	73%	12.3	15	14.2
	APR-SEP	7.2	10	11.9	74%	13.8	16.7	16.1

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Central Puget Sound Basins	14	42%	44%
Puyallup River	5	66%	51%
Cedar River	4	30%	29%
Tolt River	2	26%	53%
Snoqualimie River	4	35%	44%
Skykomish River	2	31%	58%



Forecast for Skagit River streamflow at Newhalem is 97% of average for the spring and summer period. December streamflow in Skagit River was 165% of average. Other forecast points included Baker River at 93% and Thunder Creek at 98% of average. Basin-wide precipitation for December was 110% of average, bringing water-year-to-date to 123% of average. January 1 average snow cover in Skagit River Basin was 80%, Nooksack River Basin was 37% and Baker River Basin 27% of normal. January 1 Skagit River reservoir storage was 79% of average and 64% of capacity. Average temperatures were 204 degrees above normal for December and 1-3 degrees above for the water year.

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

Data Current as of: 1/8/2015 11:24:00 AM

North Puget Sound Basins
Streamflow Forecasts - January 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

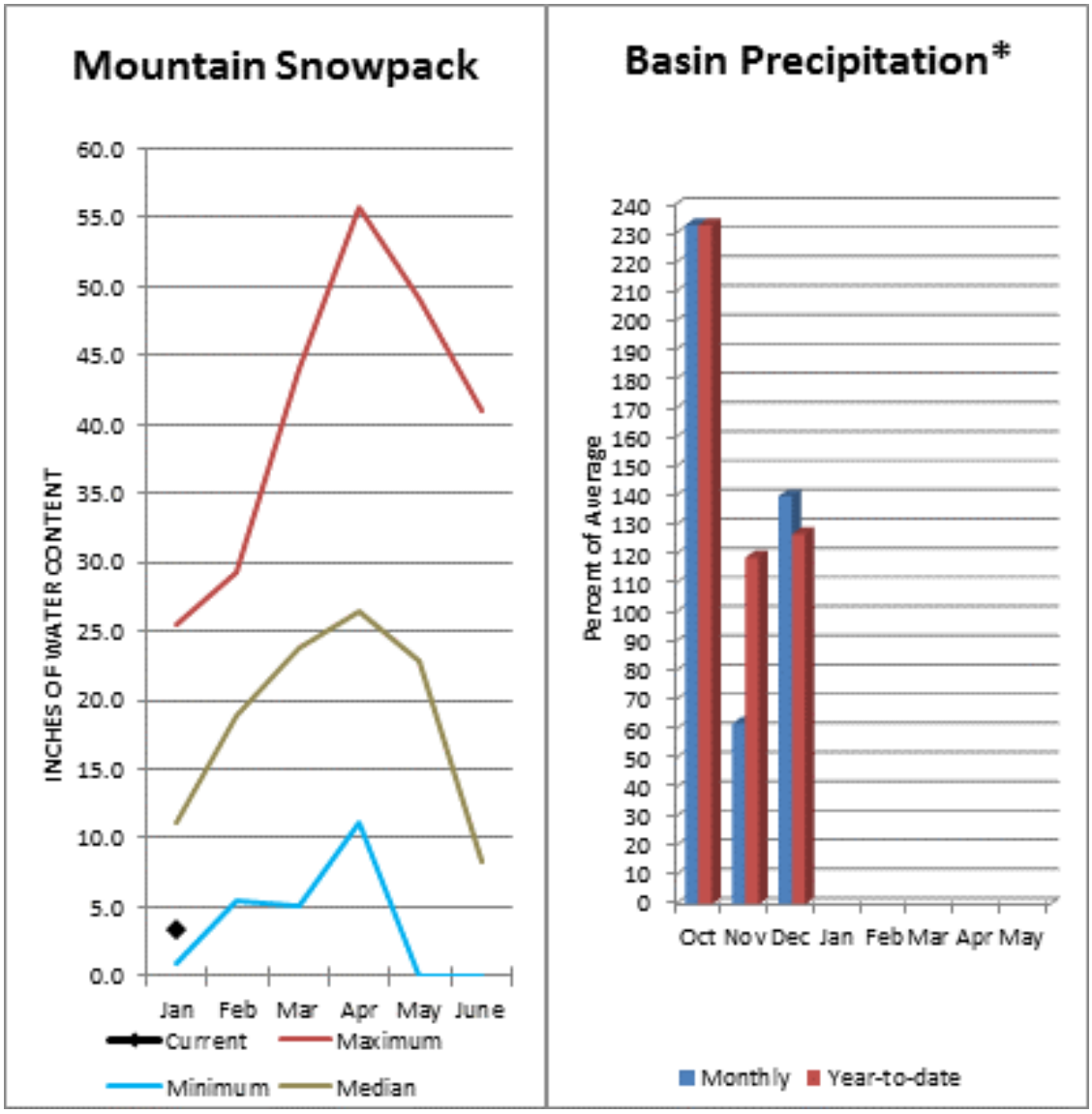
North Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Thunder Ck nr Newhalem								
	APR-JUL	194	215	230	98%	240	260	235
	APR-SEP	280	305	325	98%	340	365	330
Skagit R at Newhalem[2]								
	APR-JUL	1330	1520	1650	98%	1780	1970	1680
	APR-SEP	1590	1810	1960	97%	2100	2320	2030
Baker R at Concrete								
	APR-JUL	520	625	695	89%	765	870	780
	APR-SEP	675	815	910	93%	1000	1140	980

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of December, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ross	892.8	672.4	1135.0	1404.1
Diablo Reservoir			85.8	90.6
Basin-wide Total	892.8	672.4	1135.0	1404.1
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
North Puget Sound Basins	11	67%	51%
Skagit River	8	80%	44%
Baker River	0		
Nooksack River	3	37%	69%

Olympic Peninsula River Basins



Forecasted average runoff for streamflow for the Dungeness River is 101% and Elwha River is 99% December runoff in the Dungeness River was 208% of normal. Big Quilcene and Wynoochee rivers may expect near average runoff this summer as well. December precipitation was 130% of average. Precipitation has accumulated at 127% of average for the water year. December precipitation at Quillayute was 14.2 inches. The 1981-2010 average for December is 12.99 inches. Olympic Peninsula snowpack averaged a whopping 30% of normal on January 1, the lowest region in the state. Temperatures were 2-4 degrees above average for December and 2-3 degrees above normal for the water year.

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

Data Current as of: 1/8/2015 11:24:03 AM

Olympic Penninsula
Streamflow Forecasts - January 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Olympic Penninsula	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Dungeness R nr Sequim								
	APR-JUL	95	111	122	102%	133	149	120
	APR-SEP	113	132	146	101%	159	178	145
Elwha R at McDonald Bridge nr Port Angeles								
	APR-JUL	300	355	390	98%	430	480	400
	APR-SEP	360	420	465	99%	505	565	470

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis January 1, 2015	# of Sites	% Median	Last Year % Median
Olympic Penninsula	3	30%	24%

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

United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
February 1, 2015

Photo taken of the Olympic Mountain range from Hurricane Ridge on January 27th. Hurricane Ridge snow course reported zero snow which has only happened twice since 1960 (1977 & 2005). Photo by Bill Baccus, Olympic National Park.

Reminder: We are soliciting field work photos from our snow surveyors again this year. Each month we pick one to grace the cover of this report. The photographer will be given proper credit of course. Please include all specific information when submitting photos.

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

For more water supply and resource management information, contact:

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or

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Natural Resources Conservation Service
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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.

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Washington
Water Supply Outlook

February 2015

General Outlook

Again rain and warm temperatures dominated the region over the oh-so desired snow. With mountain temperatures once again reaching new highs and setting new records our already meager snowpack took a crushing sack in the backfield for a net loss of over 15% from last month. Streamflow forecasts also took a 10-20% hit. Snow Surveyors from around the state were reporting grim conditions with many long term snow sites showing little or no snow during last week's field campaign. Several sites that would normally have 5-8 feet of snow and only be accessible by helicopter were driven or walked to by surveyors. We would have to receive well over 200% of normal snowfall between now and April 1 to even have a chance of catching up. Short term forecasts call for warm and wet through the middle of February however the trend of warm and dry is still forecasted for several months beyond that. http://www.cpc.ncep.noaa.gov/

Snowpack

The February 1 statewide SNOTEL readings were 39% of normal but vary across the state. So far we should have received about 70% of our annual total snowfall however we fall well short of that with most areas measuring roughly 25% of annual totals. The Tolt River data reported the lowest readings at 3% of the 30-year median for February 1, the lowest year on record since 1977. Several other basins follow closely behind including a new record low snowpack in the Olympics. Readings from the Methow River Basin reported the highest at 98% of normal for February 1. Westside medians from SNOTEL, and February 1 snow surveys, included the North Puget Sound river basins with 58% of normal, the Central and South Puget river basins with 14% and 35% respectively, and the Lower Columbia basins with 27% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 42% and the Wenatchee area with 65%. Snowpack in the Spokane River Basin was at 56% and the Walla Walla River Basin had 54% of the long term median.

BASIN	PERCENT OF NORMAL	PERCENT OF LAST YEAR
Spokane	56	72
Newman Lake	52	58
Pend Oreille	99	103
Okanogan	93	78
Methow	98	70
Conconully Lake	92	33
Central Columbia	65	54
Upper Yakima	42	55
Lower Yakima	42	57
Ahtanum Creek	37	52
Walla Walla	55	68
Lower Snake	68	78
Cowlitz	36	70
Lewis	15	33
White	47	58
Green	16	30
Puyallup	41	60
Cedar	13	40
Snoqualmie	17	59
Skykomish	21	61
Skagit	67	62
Nooksack	21	72
Olympic Peninsula	11	32

Washington Snow Measurement Summary
February 1, 2015

Station Name	Elevation (ft)	Date	Snow Depth (in)	SWE (in)	Last Yr SWE(in)	Median SWE (1981-2010) (in)
Aberdeen Lake	4140	3-Feb	25	7.1	4.9	
Alpine Meadow	3500	28-Jan	4	1.4	17.9	
Azure River Pillow	4298	1-Feb	83	31.4	23.1	
Baird #2	3159	30-Jan	16	3.3		6.1
Barnes Creek Pillow	5315	1-Feb		13.6	14.6	
Beaver Creek Trail	2200	31-Jan	0	0	2.6	10.4
Beaver Pass	3621	31-Jan	22	6.3	4.5	18.2
Beaverfoot	6312	3-Feb	22	5.6	5.9	
Big White Mountain	5486	3-Feb	44	11.1	12	
Blackwall Peak Pillow	6365	1-Feb	54	18.5	18.5	
Bonaupart South	4740	30-Jan	10	2.2		
Boyer Mountain	5250	27-Jan	22	6.5		
Brenda Mine Pillow	4790	1-Feb		8.1	6.8	
Brown Top Ridge AM	6000	30-Jan	71	27	25.4	41.4
Browns Pass	3940	30-Jan	8	1	0.4	
Bumping Lake New	3400	2-Feb	17	5.6		12.8
Bush River	6503	4-Feb	66	21	16.6	
Buttermilk Butte	5250	28-Jan	28	7.6		
Char Creek	4232	1-Feb	33	8.8	10.2	
Chewelah 2	4925	27-Jan	15	3.4		
City Cabin	2390	27-Jan	0	0	0	
Cold Creek Strip	6020	27-Jan	20	4.8		5.5
Cox Valley	4500	26-Jan	7	2.4	3.9	23.6
Deer Park	5346	29-Jan	0	0	2.2	10.6
Devils Park	5900	30-Jan	61	21	24.8	28.2
Disautel Pass	3310	28-Jan	10	2.3	0.4	
Duncan Lake No. 2	2172	30-Jan	18	5.6	4.1	
Duncan Ridge	5370	27-Jan	18	4		3.9
East Creek Pillow	6660	1-Feb		20.8	18.7	
Farron	4032	29-Jan	26	6.9	7.2	
Ferguson	3048	26-Jan	66	15.8	14.3	
Fernie East	3980	29-Jan	11	6.6	7.3	
Fidelity Mountain	6076	28-Jan	88	28	29.2	
Field	4298	29-Jan	21	5.7	5.2	
Fish Lake	3300	29-Jan	44	13.8	14.2	21.8
Floe Lake	6847	4-Feb	64	18.8	16.6	

Floe Lake Pillow	6857	1-Feb		16.2	16.2	
Freezeout Cr. Tr.	3500	29-Jan	13	3.6	5.8	7.9
Goat Creek	3600	29-Jan	17	3.9		5
Gold Mtn Lookout	4650	2-Feb	18	3	2	
Granite Creek	3500	30-Jan	37	10.8	9.9	12.6
Grass Mtn. No. 2	2900	27-Jan	0	0		4.2
Gray Creek Lower	5112	29-Jan	33	9.2	13.7	
Gray Creek Upper	6319	29-Jan	54	16.3	19.9	
Hamilton Hill	4846	29-Jan	23	6.9	4.2	
Harts Pass	6200	30-Jan	71	23.8	20.8	26.4
Hurricane	5228	26-Jan	0	0	0.2	10
Irene's Camp	5530	27-Jan	25	6.3		6.8
Islaht Lake	4895	30-Jan	27	7.2	4.9	
Keller Ridge	3700	28-Jan	7	1.7	0.7	
Keystone Creek	6033	29-Jan	59	21.8	15.7	
Kicking Horse	5407	30-Jan	29	8	8.8	
Kirbyville Lake	5705	29-Jan	89	33.5	25.4	
Klesilkwa	3720	29-Jan	2	0.4	2.4	
Lamb Butte	4900	29-Jan	29	8		
Lost Horse Mountain	6522	30-Jan	25	7	6	
Lost Lake	4077	30-Jan	17	3.5		
Loup Loup Campground (N	4120	28-Jan	22	4.7		
Lynn Lake	3885	30-Jan	0	0		13.2
Mazama	2180	28-Jan	28	7.6		
Mc Culloch	4154	1-Feb	21	5.7	6.6	
Meadow Cabins	1900	31-Jan	0	0	0.5	3.6
Meteor	2220	26-Jan	11	2	1	
Missezula Mountain	5256	30-Jan	20	5.2	5.3	
Mission Creek Pillow	5840	1-Feb	34	11.2	16.1	
Mission Ridge Pillow	6070	1-Feb		9.4	11.5	
Morrissey Ridge Pillow	5906	1-Feb		11.1	15.9	
Moses Mtn #2	4800	29-Jan	15	3.8		9.1
Moses Peak	6650	29-Jan	29	7.1	5	11.8
Mount Abbot	6663	27-Jan	81	27.2	27.2	
Mount Assiniboine	7316	4-Feb	52	14.7		
Mount Cook Pillow	5085	1-Feb	90	33.3	31.1	
Mount Joffre	5784	3-Feb	33	8.5	8.9	
Mount Kobau	5961	31-Jan	24	7.2	3.3	
Mount Tolman	2400	27-Jan	4	1.2	0	3.1
Moyie Mountain Pillow	6332	1-Feb	24	7.5	11.4	
Mt. Gardner	3300	27-Jan	0	0	0	
Mutton Creek No. 1	5700	26-Jan	26	7.2		8.4
Nelson	3123	28-Jan	24	6.6	6.4	
New Lake Hozomeen	2800	29-Jan	3	0.9	1.7	7.2
Oyama Lake	4478	2-Feb	24	3.6	1.7	
Pettijohn Creek	4309	30-Jan	17	4		
Postill Lake	4455	29-Jan	20	5.6	4.8	

Ragged Ridge	3333	26-Jan	8	2.4	2.5	6.9
Rainy Pass	4780	29-Jan	62	20	13.8	
Record Mountain	6253	27-Jan	41	12.1	9.4	
Round Top Mtn	4020	26-Jan	16	5	6.8	
Rusty Creek	4000	26-Jan	14	3.5		4.2
Satus Pass	4030	30-Jan	0	0	2.6	8.2
Shovelnose Mountain	4777	30-Jan	21	5.8	4.8	
Skookum Lakes	4227	28-Jan	15	4.4	6.4	
South Baldy	4920	28-Jan	25	6.6	10.2	
St. Leon Creek Pillow	5906	1-Feb		27.4	25.9	
Sullivan Mine	5184	31-Jan	15	4.3	7.5	
Sumallo River West	2628	29-Jan	4	1.2	2.3	
Summit G.S. #2	4600	29-Jan	22	5.1		6.1
Summit Trail	3840	26-Jan	9	1	0.9	4.6
Sunbeam Lake	6778	4-Feb	80	24.3	21.9	
Thompson Creek	2500	26-Jan	9	2.5	1.5	4.2
Thompson Ridge	4650	28-Jan	30	7.7		
Thunder Basin	2400	31-Jan	30	9.6		13.6
Thunder Creek	6765	3-Feb	22	5.4	7.7	
Toats Coulee	2845	27-Jan	12	2.8		2.4
Tunnel Avenue	2433				3.3	13.5
Vaseux Creek	4603	31-Jan	17	4.1	4.4	
Vermont Creek	5030	3-Feb	32	8.6	9.1	
Vulcan Mtn	4660	29-Jan	23	5.8		
Vulcan Road	3840	29-Jan	19	4.6		
West Smay Creek	3600	27-Jan	10	3.5		
Whiterocks Mountain	5869	27-Jan	36	10.9		
Yellowhead Pillow	6102	1-Feb	46	13.3	14.3	

Precipitation

Except for a few individual sites all river basins reported below normal precipitation for the month of January. Even so the water-year to date precipitation remain near to slightly above normal in all basins. The Olympic Peninsula was the by far the driest at only 46% of normal precipitation for January. Quillayute State Airport only measured 79% of normal rainfall. Elbow Lake SNOTEL in the South Fork Nooksack River Basin continues to rein over the entire SNOTEL network with a water-year accumulation of 96.8 inches, 14 inches above normal or 117% of average for the water-year.

RIVER BASIN	JANUARY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	77	90
Pend Oreille	83	107
Upper Columbia	68	114
Central Columbia	74	106
Upper Yakima	71	92
Lower Yakima	62	101
Walla Walla	56	94
Lower Snake	71	95
Lower Columbia	62	104
South Puget Sound	71	101
Central Puget Sound	81	100
North Puget Sound	82	112
Olympic Peninsula	46	104

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. More rainfall than snow has helped buffer many reservoirs to above normal levels for this time of year. In most cases managers are electing to hold this excess water due to the uncertainty of the snowpack. February 1 Reservoir storage in the Yakima Basin was 678,000-acre feet, 168% of average for the Upper Reaches and 194,000-acre feet or 159% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 154,000 acre feet, 160% of average and 65% of capacity; and the Skagit River reservoirs at 79% of average and 56% 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	65	160
Pend Oreille	35	72
Upper Columbia	125	113
Central Columbia		
Upper Yakima	81	168
Lower Yakima	84	159
Lower Snake	75	111
North Puget Sound	56	79

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

Streamflow

April to September runoff forecasts for February 1 dropped considerably since the January forecasts were issued due to the obvious lack of snowfall. However January streamflows were mostly well above normal due to heavy rains and snow melt. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 64%; White River, 88%; and Skagit River, 90%. Some Eastern Washington streams include the Yakima River near Parker 61%, Wenatchee River at Plain 71%; and Spokane River near Post Falls 67%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions since governing conditions are likely to change for the better or the worse. **The 50% chance of exceedance of average flows is normally used for planning purposes however with the current uncertainty in weather forecasts and the current lack of snow in most locations it may be advisable to use the 70-90% chance of exceedance to ensure adequate water supply this summer.**

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	66-70
Pend Oreille	69-105
Upper Columbia	62-100
Central Columbia	65-98
Upper Yakima	44-58
Lower Yakima	59-76
Walla Walla	81-85
Lower Snake	74-104
Lower Columbia	59-95
South Puget Sound	63-88
Central Puget Sound	59-79
North Puget Sound	88-91
Olympic Peninsula	73-77

STREAM	PERCENT OF AVERAGE JANUARY STREAMFLOWS
Pend Oreille at Albeni Fall Dam	128
Kettle at Laurier	187
Columbia at Birchbank	120
Spokane at Spokane	137
Similkameen at Nighthawk	200
Okanogan at Tonasket	135
Methow at Pateros	189
Chelan at Chelan	190
Wenatchee at Pashastin	201
Cle Elum near Roslyn	191
Yakima at Parker	192
Naches at Naches	209
Grande Ronde at Troy	174
Snake below Lower Granite Dam	106
Columbia River at The Dalles	112
Lewis at Merwin Dam	97
Cowlitz below Mayfield Dam	126
Skagit at Concrete	143
Dungeness near Sequim	118

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

Soil Moisture

Near to above normal fall precipitation provided for wet and nearly saturated soils (60-70% saturation) as the snow finally began to accumulate in mid-January. Great fall soil conditions can help buffer low snowpack runoff come spring however it is too early in the season to count those chickens. 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.

Natural Resources Conservation Service

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Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/

Oregon:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/

Idaho:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/

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

USDA-NRCS Agency Homepages

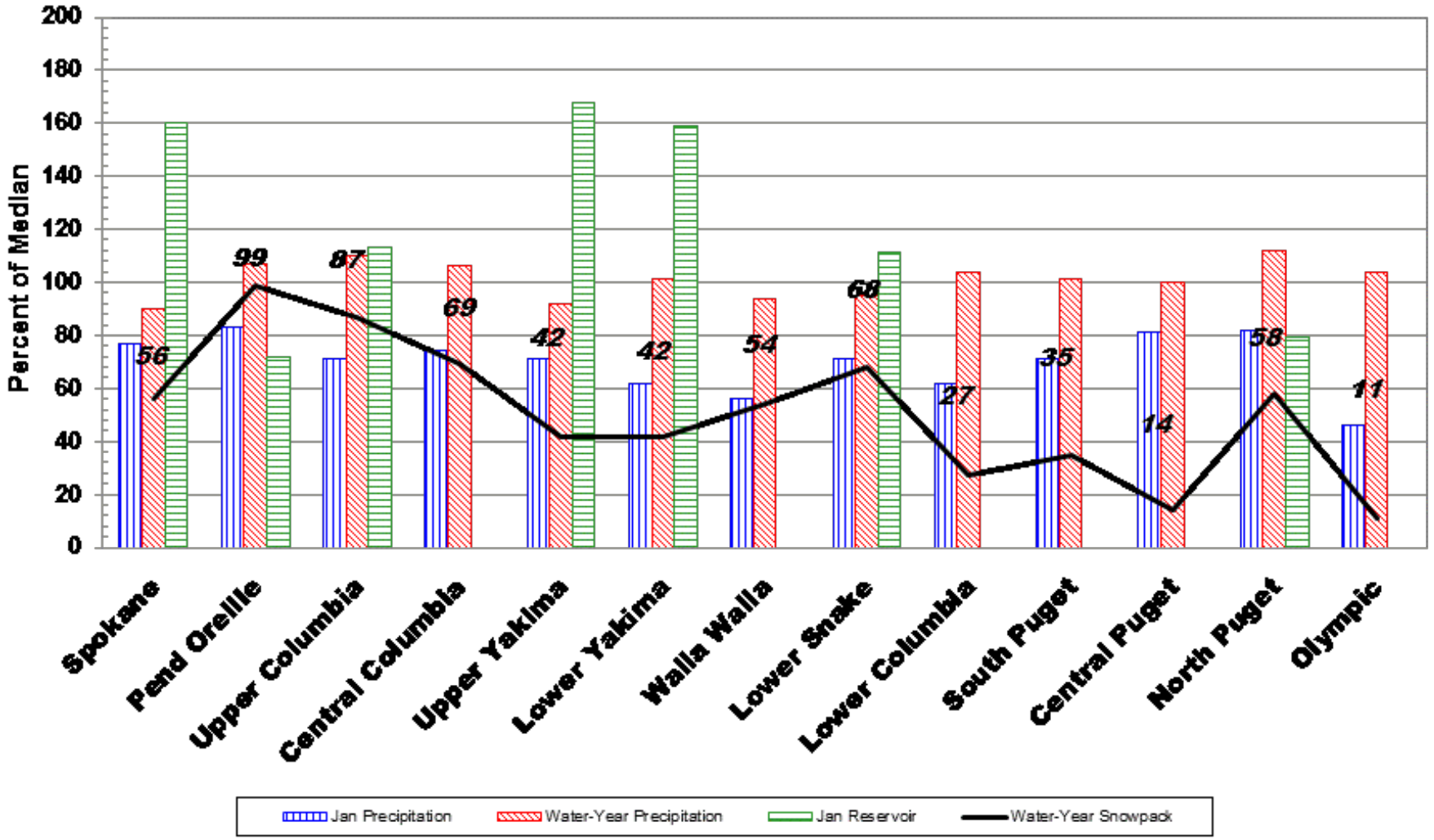
Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/

NRCS National:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

NRCS Natural Resources Conservation Service

February 1, 2015 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2014 - 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 Pacific Area Committee is making plans for the 83rd Annual Western Snow Conference in 2015.

Mark your calendar and start thinking about submitting a paper to attend the 2015 Western Snow Conference:

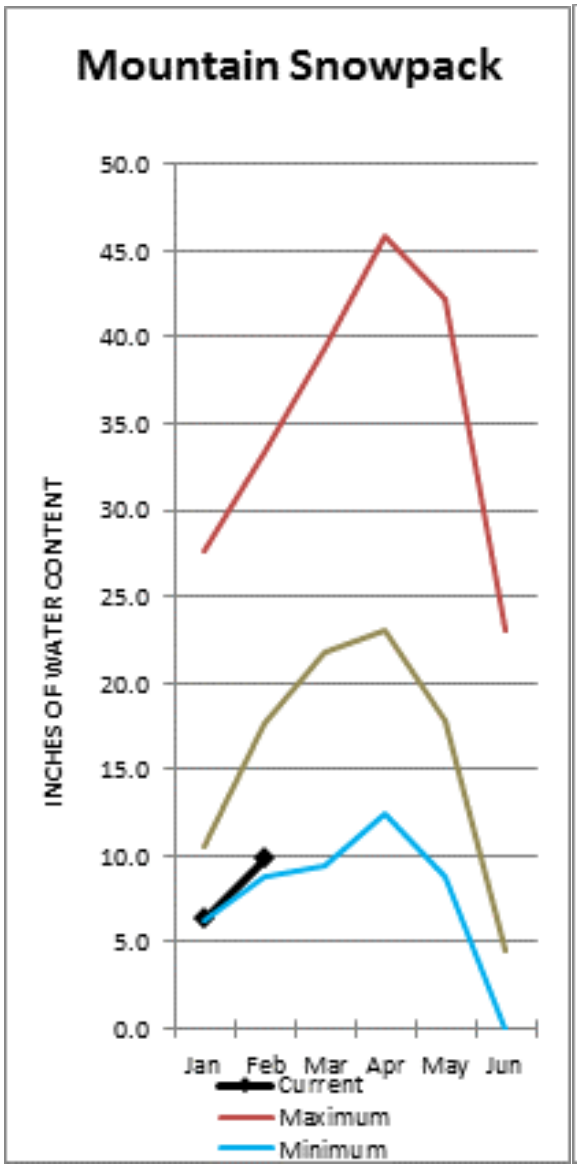
Dates: April 20-24, 2015
Location: Grass Valley, California

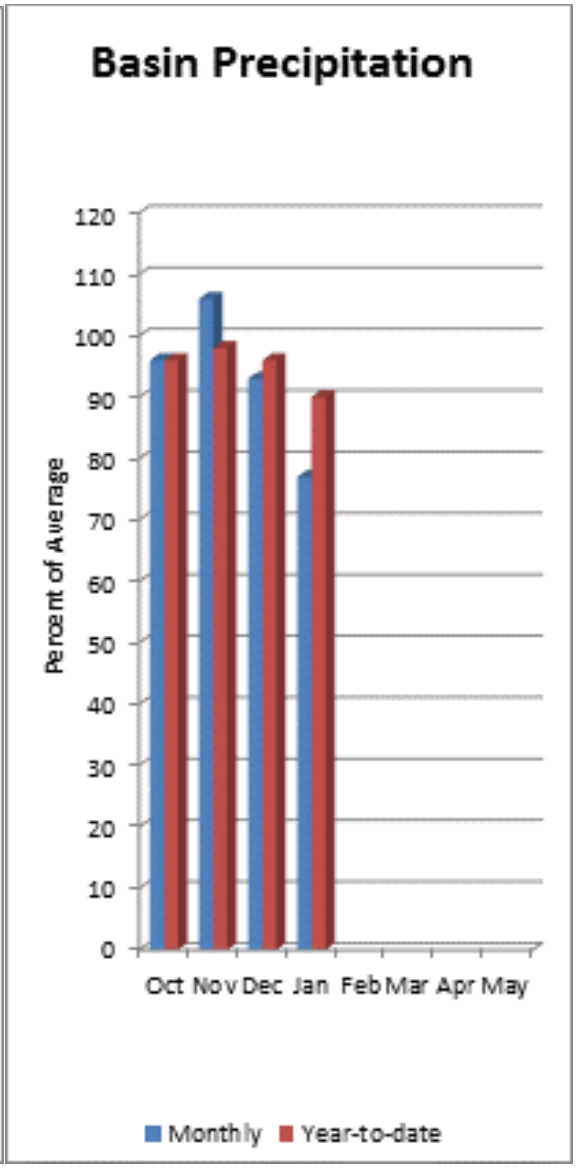
The Conference will begin Monday, April 20th with a short course and panel discussion on " LIDAR Basics, Applications, and Use in Snow Hydrology and Field Studies " with several invited experts in the field. Tuesday and Wednesday will include formal paper and poster presentations on a variety of topics, including climate variability, climate change impacts on snow and runoff, water management, water supply forecasting, and modeling and climatology of snow. Thursday will include a technical tour to visit hydrologic and gold mining points of interest around Grass Valley

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





The February 1 forecasts for summer runoff within the Spokane River Basin are 67% of average near Post Falls and 70% at Long Lake. The Chamokane River near Long Lake forecasted to have 66% of average flows for the May-August period. The forecast is based on a basin snowpack that is 54% of normal and precipitation that is 90% of average for the water year. Precipitation for January was near normal at 77% of average. Streamflow on the Spokane River at Spokane was 137% of average for January. February 1 storage in Coeur d'Alene Lake was 154,000 acre feet, 160% of average and 65% of capacity. Snowpack at Quartz Peak SNOTEL site was 58% of average with 8.6 inches of water content. Average temperatures in the Spokane basin were 4-6 degrees above normal for January and 3-5 degrees above normal for the water year.

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

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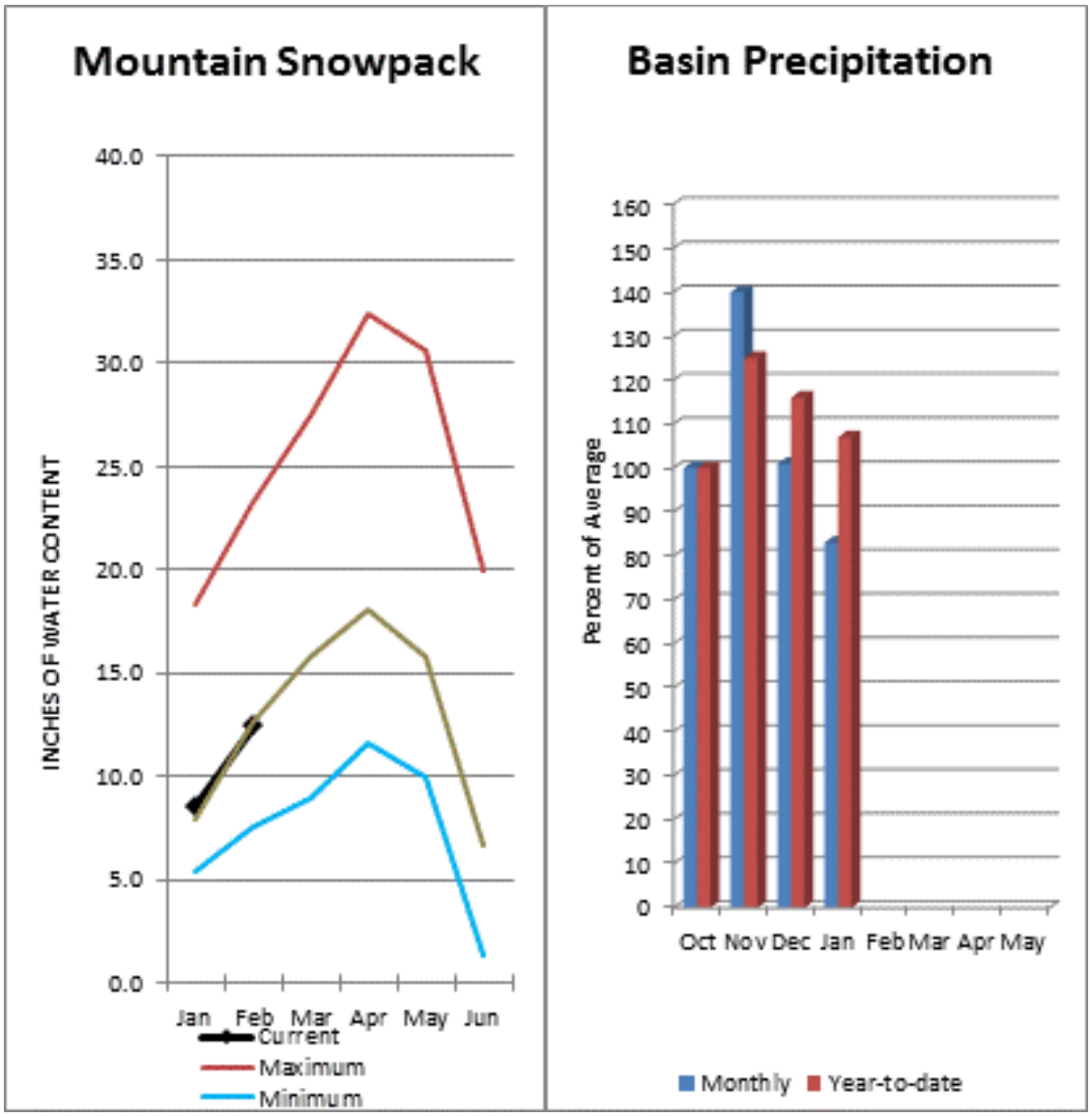
Spokane
Streamflow Forecasts - February 1, 2015

Spokane	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Spokane R nr Post Falls[2]								
	APR-JUL	985	1350	1600	67%	1850	2220	2390
	APR-SEP	1040	1410	1660	67%	1910	2280	2480
Spokane R at Long Lake[2]								
	APR-JUL	1150	1550	1830	70%	2110	2510	2620
	APR-SEP	1310	1720	2000	70%	2280	2690	2850
Chamokane Ck nr Long Lake								
	MAY-AUG	0.4	3.8	6.1	66%	8.4	11.8	9.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of January, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Coeur d' Alene	154.1	43.4	96.3	238.5
Basin-wide Total	154.1	43.4	96.3	238.5
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Spokane	13	54%	73%
Newman Lake	3	52%	58%



The April – September average forecast for the Priest River near the town of Priest River is 69% and the Pend Orielle below Box Canyon is 105%. January streamflow was 128% of average on the Pend Oreille River and 120% on the Columbia at Birchbank. February 1 snow cover was 99% of normal in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 10.4 inches of snow water on the snow pillow. Normally Bunchgrass would have 18 inches on February 1. Precipitation during January was 83% of average, dropping the year-to-date precipitation at 107% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 72% of normal. Average temperatures were 4-6 degrees above normal for January and 3-5 degrees above normal for the water year.

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

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Pend Oreille Basins
Streamflow Forecasts - February 1, 2015

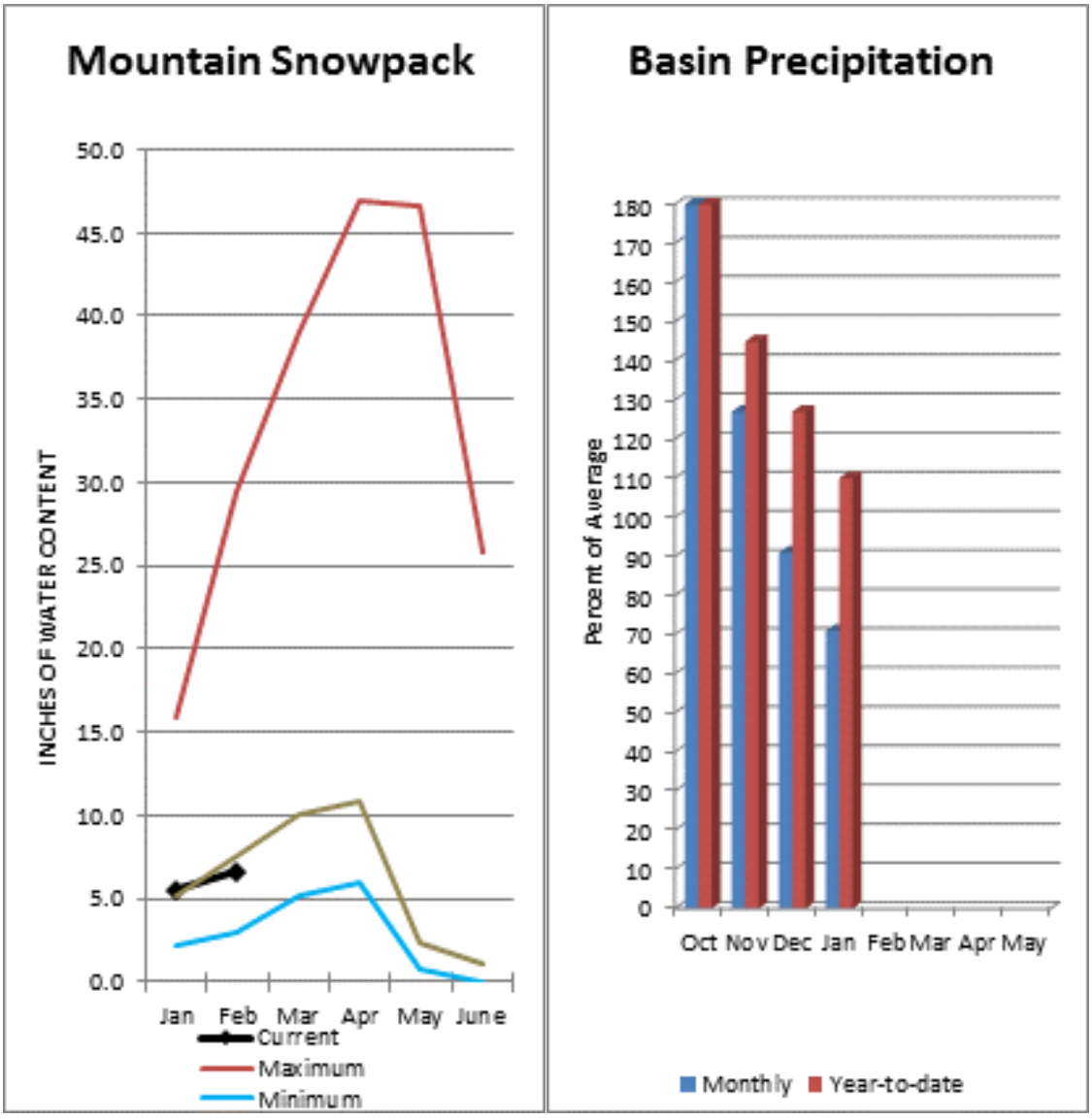
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Pend Oreille Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Pend Oreille Lake Inflow[2]								
	APR-JUL	10400	11600	12500	106%	13300	14600	11800
	APR-SEP	11300	12600	13500	105%	14400	15700	12800
Priest R nr Priest River[1,2]								
	APR-JUL	330	475	540	69%	610	755	780
	APR-SEP	345	505	575	69%	650	810	830
Pend Oreille R bl Box Canyon[2]								
	APR-JUL	10500	11800	12700	107%	13500	14800	11900
	APR-SEP	11400	12800	13700	105%	14600	15900	13000

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of January, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Pend Oreille	534.8	569.9	753.9	1561.3
Priest Lake	50.4	60.6	56.7	119.3
Basin-wide Total	585.1	630.5	810.6	1680.6
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Pend Oreille Basins	57	99%	103%
Colville River	0		
Pend Oreille River	57	99%	103%
Kettle River	3	80%	87%



Summer runoff average forecast for the Okanogan River is 85%, Similkameen River is 91%, Kettle River 95% and Methow River is 100%. February 1 snow cover on the Okanogan was 93% of normal, Omak Creek was 58% and the Methow was 98%. January precipitation in the Upper Columbia was 68% of average, with precipitation for the water year at 114% of average. January streamflow for the Methow River was 189% of average, 135% for the Okanogan River and 200% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 6.1 inches or 92% of normal for February 1. Combined storage in the Conconully Reservoirs was 16.2,000 acre-feet or 113% of normal. Temperatures were 4-6 degrees above normal for January and 3-5 degrees above for the water year.

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Upper Columbia Basins
Streamflow Forecasts - February 1, 2015

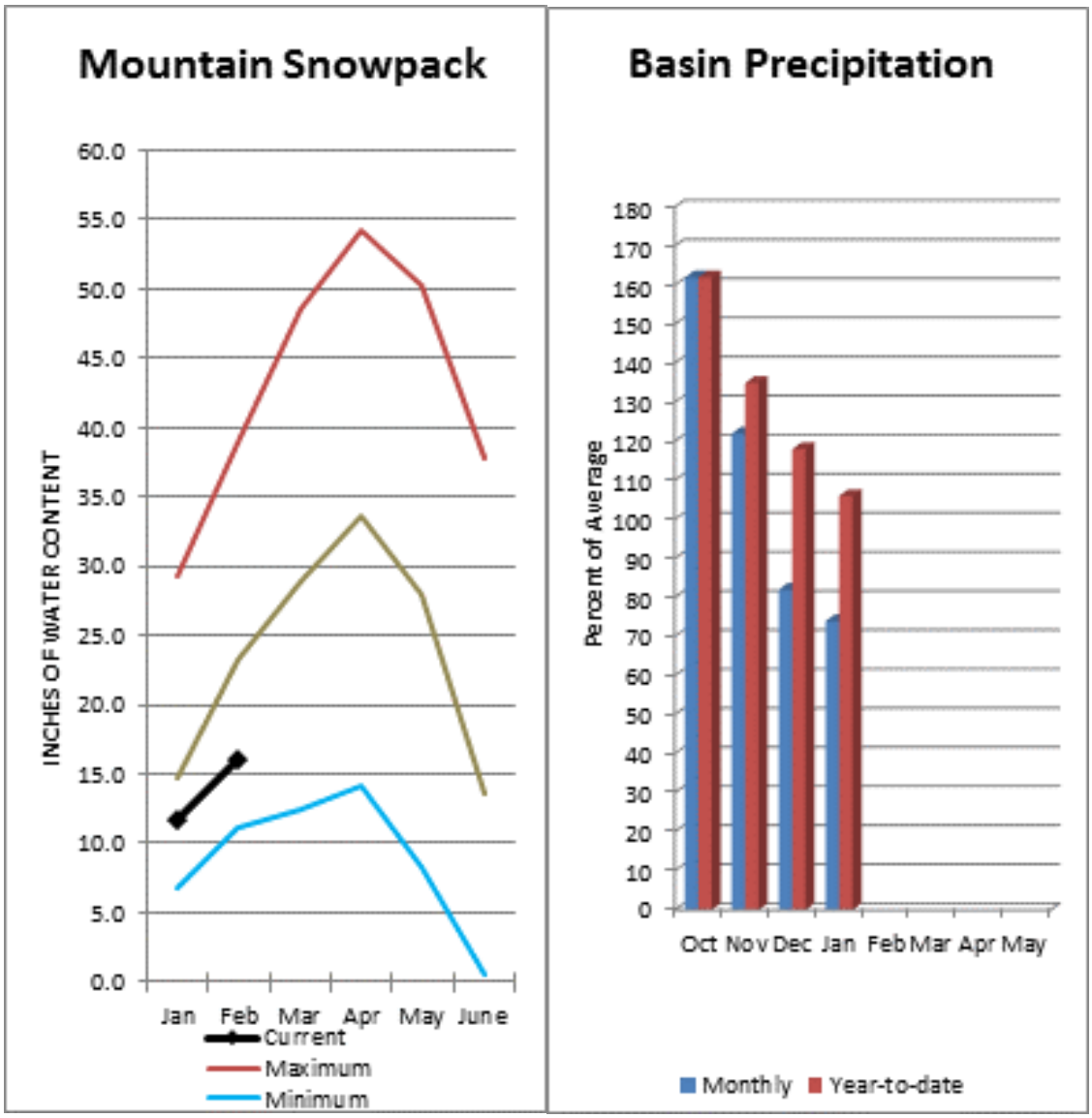
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Kettle R nr Laurier								
	APR-JUL	1350	1560	1700	94%	1850	2060	1800
	APR-SEP	1400	1630	1790	95%	1940	2170	1880
Colville R at Kettle Falls								
	APR-JUL	3.1	44	72	61%	100	141	119
	APR-SEP	5.4	50	81	62%	112	157	131
Columbia R at Grand Coulee[1,2]								
	APR-JUL	39000	46200	49500	97%	52800	60000	51015
	APR-SEP	45800	54400	58300	97%	62200	70800	60110
Similkameen R nr Nighthawk[1]								
	APR-JUL	710	965	1080	90%	1200	1450	1200
	APR-SEP	780	1040	1160	91%	1270	1530	1280
Okanogan R nr Tonasket[1]								
	APR-JUL	650	1030	1200	81%	1380	1760	1480
	APR-SEP	725	1140	1330	81%	1520	1930	1650
Okanogan R at Malott[1]								
	APR-JUL	655	1060	1240	86%	1420	1830	1450
	APR-SEP	735	1170	1370	85%	1570	2010	1620
Methow R nr Pateros								
	APR-JUL	675	770	835	100%	900	995	835
	APR-SEP	720	825	895	100%	965	1070	895
Columbia R at Birchbank[1,2]								
	APR-JUL	26700	30700	32500	96%	34300	38300	33840
	APR-SEP	32900	37800	40100	96%	42400	47300	41750

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of January, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	6.9	9.3	7.3	10.5
Conconully Reservoir	9.3	11.7	7.0	13.0
Basin-wide Total	16.2	20.9	14.3	23.5
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Upper Columbia Basins	15	87%	73%
Okanogan River	7	93%	78%
Omak Creek	2	58%	41%
Sanpoil River	1	39%	0%
Similkameen River	4	91%	82%
Toats Coulee Creek	0		
Conconully Lake	1	92%	33%
Methow River	4	98%	70%



Precipitation during January was 74% of average in the basin and 106% for the year-to-date. Runoff for Entiat River is forecast to be 79% of average for the summer. The April-September average forecast for Chelan River is 81%, Wenatchee River at Plain is 71%, Stehekin River is 91% and Icicle Creek is 65%. January average streamflows on the Chelan River were 190% and on the Wenatchee River 201%. February 1 snowpack in the Wenatchee River Basin was 60% of normal; the Chelan, 76%; the Entiat, 70%; Stemilt Creek, 68% and Colockum Creek, 55%. Reservoir storage in Lake Chelan was not available. Lyman Lake SNOTEL had the most snow water with 31.6 inches of water. This site would normally have 40.1 inches on February 1. Temperatures were 4-6 degrees above normal for January and 2-3 degrees above normal for the water year.

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

Data Current as of: 2/4/2015 10:38:47 PM

Central Columbia Basins
Streamflow Forecasts - February 1, 2015

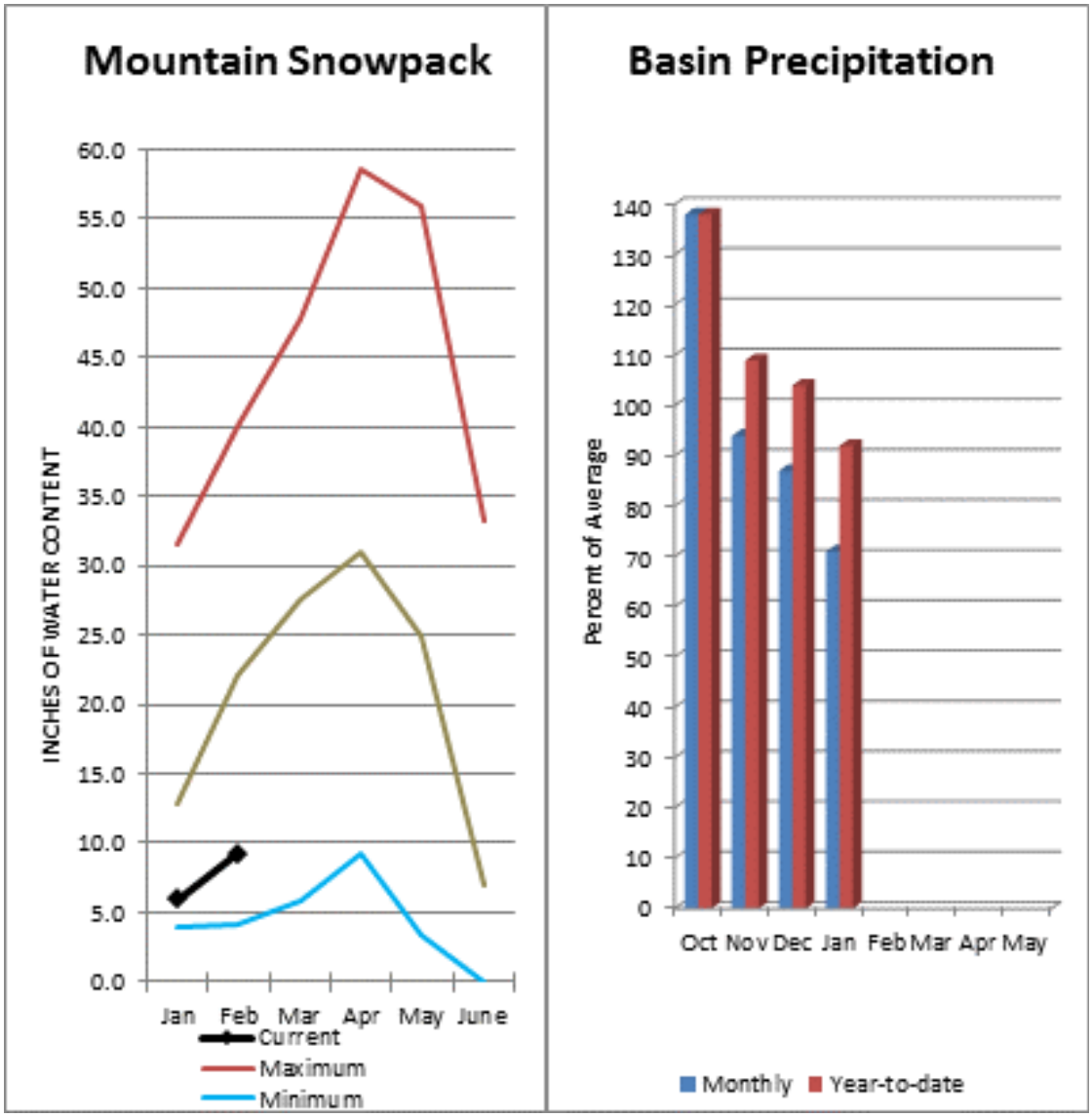
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Stehekin R at Stehekin								
	APR-JUL	515	580	625	92%	665	730	680
	APR-SEP	605	675	720	91%	765	830	790
Chelan R at Chelan								
	APR-JUL	710	775	820	82%	865	930	1000
	APR-SEP	765	845	905	81%	960	1040	1120
Entiat R nr Ardenvoir								
	APR-JUL	129	147	160	80%	172	190	200
	APR-SEP	140	160	173	79%	187	205	220
Wenatchee R at Plain								
	APR-JUL	585	660	710	72%	760	840	990
	APR-SEP	610	700	765	71%	825	915	1080
Icicle Ck nr Leavenworth								
	APR-JUL	148	167	180	65%	193	210	275
	APR-SEP	155	178	194	65%	210	235	300
Wenatchee R at Peshastin								
	APR-JUL	800	905	975	71%	1050	1150	1370
	APR-SEP	835	960	1050	70%	1130	1260	1490
Columbia R bl Rock Island Dam[2]								
	APR-JUL	45300	50900	54700	98%	58500	64100	55770
	APR-SEP	52800	59400	63900	98%	68400	75000	65200

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of January, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Chelan			343.1	676.1
Basin-wide Total			0.0	0.0
# of reservoirs	0	0	0	0

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Central Columbia Basins	3	76%	56%
Chelan Lake Basin	3	76%	56%
Entiat River	1	70%	36%
Wenatchee River	7	60%	56%
Stemilt Creek	1	68%	43%
Colockum Creek	1	55%	69%



February 1 reservoir storage for the Upper Yakima reservoirs was 678,000-acre feet, 168% of average. Forecasts for the Yakima River at Cle Elum are 56% of average and the Teanaway River near Cle Elum is at 44%. Lake inflows are all forecasted to be below average this summer as well. January streamflows within the basin were Cle Elum River near Roslyn at 191%. February 1 snowpack was 42% based upon 6 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 71% of average for January and 92% for the water-year. 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.

Data Current as of: 2/4/2015 10:38:50 PM

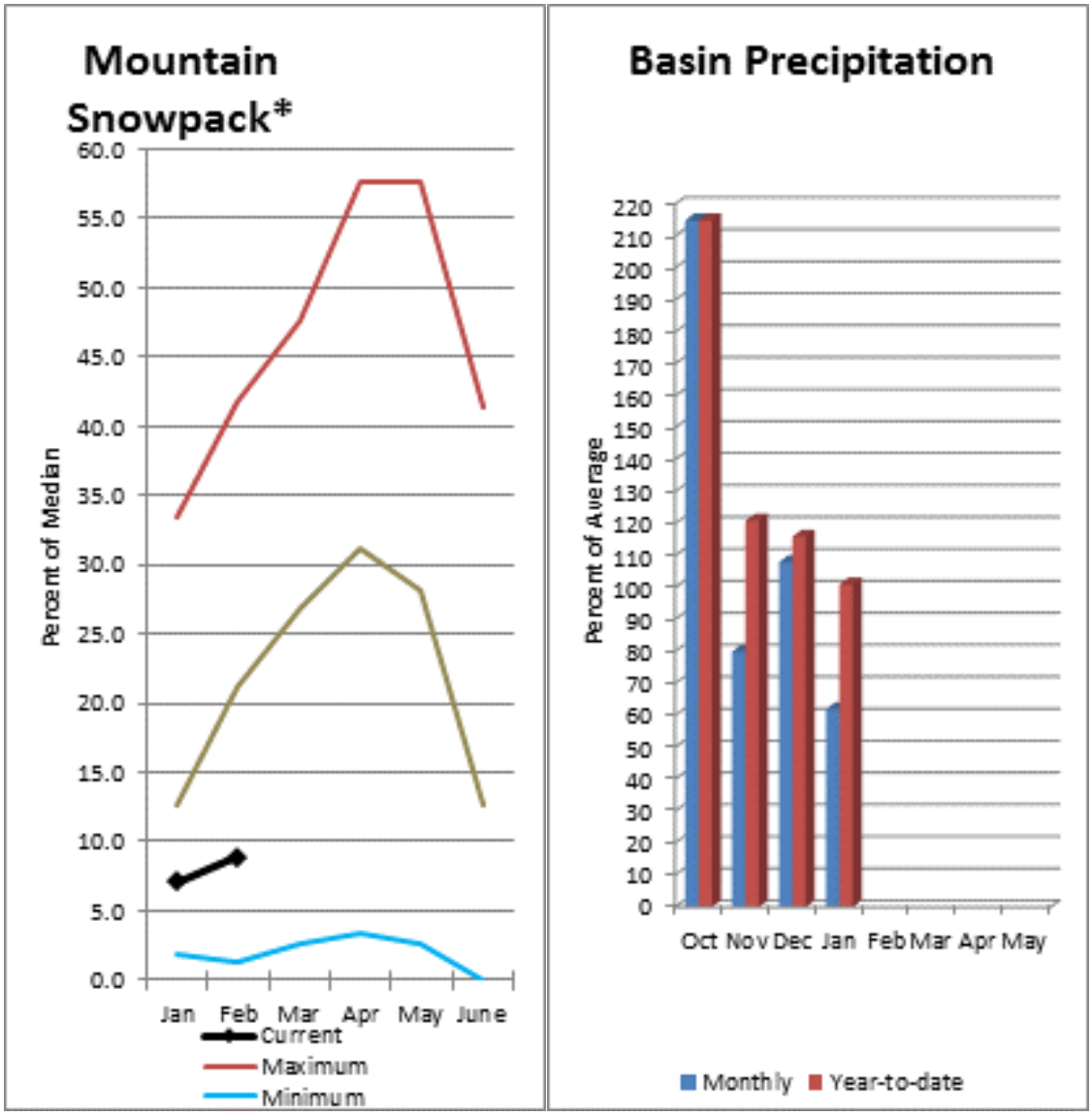
Upper Yakima River
Streamflow Forecasts - February 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Upper Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Keechelus Reservoir Inflow[2]								
	APR-JUL	32	52	65	56%	79	98	116
	APR-SEP	38	58	72	57%	86	106	126
Kachess Reservoir Inflow [2]								
	APR-JUL	27	44	54	52%	65	82	104
	APR-SEP	33	49	60	53%	71	88	113
Cle Elum Lake Inflow [2]								
	APR-JUL	149	192	220	57%	250	295	385
	APR-SEP	155	205	240	58%	275	325	415
Yakima R at Cle Elum [2]								
	APR-JUL	215	335	420	56%	500	620	755
	APR-SEP	240	375	465	56%	555	690	830
Teanaway R bl Forks nr Cle Elum								
	APR-JUL	18.5	42	58	45%	73	97	130
	APR-SEP	20	43	59	44%	75	98	133

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of January, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Keechelus	139.6	99.8	82.1	157.8
Kachess	201.2	176.8	130.8	239.0
Cle Elum	337.6	185.6	191.5	436.9
Basin-wide Total	678.4	462.2	404.4	833.7
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Upper Yakima River	6	42%	55%



January average streamflows within the basin were: Yakima River near Parker, 192% and the Naches River near Naches, 209%. February 1 reservoir storage for Bumping and Rimrock reservoirs was 194,000-acre feet, 159% of average. Forecast averages for Yakima River near Parker are 61%; American River near Nile, 65%; Ahtanum Creek, 76%; and Klickitat River near Glenwood, 59%. February 1 snowpack was 42% based upon 6 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 54% of normal. Precipitation was 62% of average for January and 101% for the water-year. Temperatures were 4-6 degrees above normal for January and for 2-4 degrees above normal for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they February differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

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

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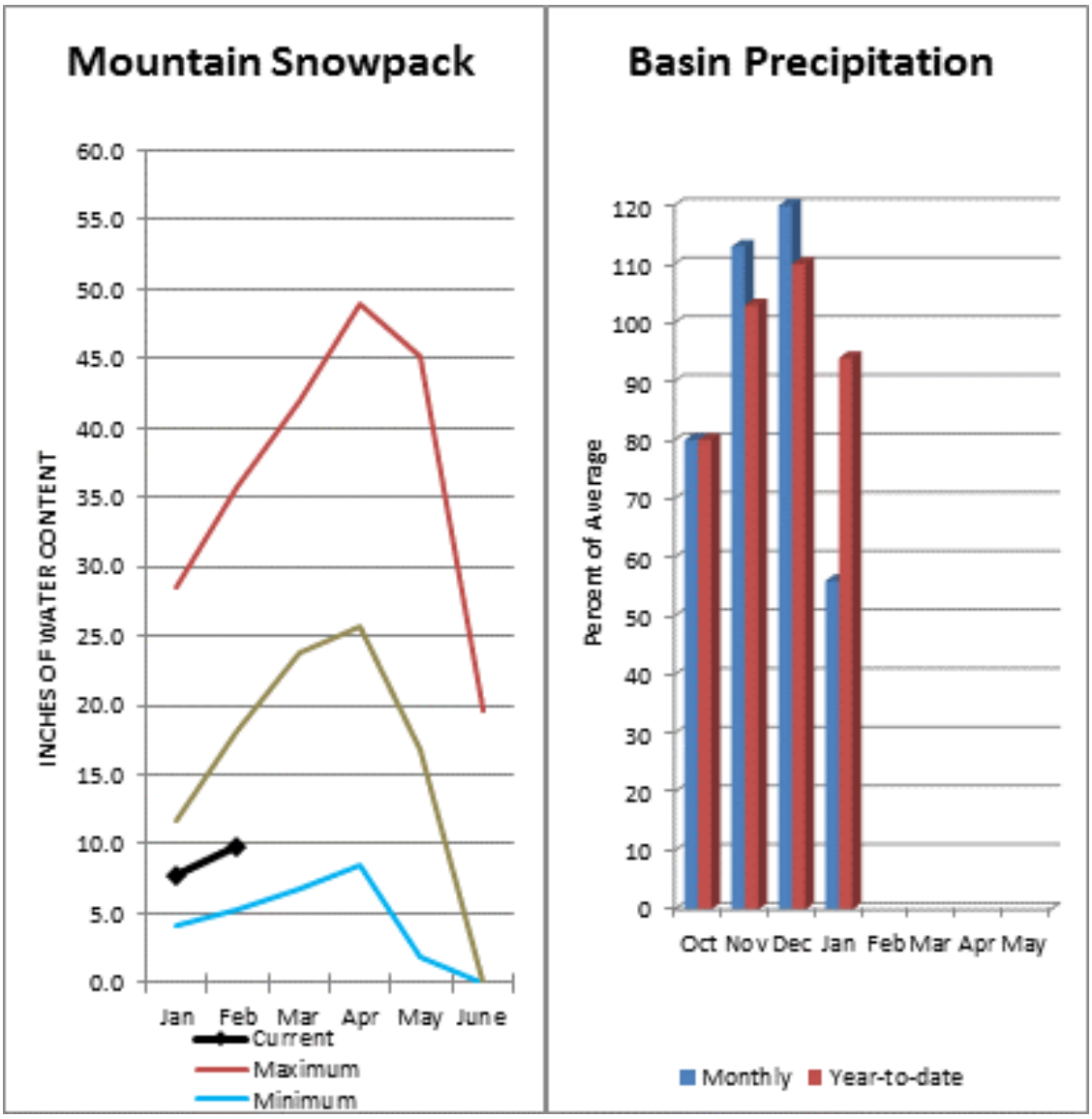
Lower Yakima River
Streamflow Forecasts - February 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Lower Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bumping Lake Inflow [2]								
	APR-JUL	61	75	84	74%	93	107	114
	APR-SEP	65	80	90	73%	100	115	123
American R nr Nile								
	APR-JUL	48	60	68	67%	76	88	102
	APR-SEP	49	63	72	65%	82	96	110
Rimrock Lake Inflow [2]								
	APR-JUL	116	130	140	75%	150	165	187
	APR-SEP	134	153	165	75%	178	196	220
Naches R nr Naches								
	APR-JUL	335	410	465	66%	520	595	700
	APR-SEP	350	440	500	66%	560	650	760
Ahtanum Ck at Union Gap								
	APR-JUL	10.6	16.3	20	74%	24	30	27
	APR-SEP	12.3	18.1	22	76%	26	32	29
Yakima R nr Parker [2]								
	APR-JUL	685	880	1010	61%	1140	1330	1660
	APR-SEP	755	965	1110	61%	1250	1460	1820
Klickitat R nr Glenwood								
	APR-JUL	50	64	73	58%	82	95	126
	APR-SEP	56	72	82	59%	92	108	139
Klickitat R nr Pitt								
	APR-JUL	220	265	295	68%	330	375	435
	APR-SEP	260	315	355	68%	395	450	520

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of January, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bumping Lake	26.3	18.6	12.7	33.7
Rimrock	168.2	129.7	109.6	198.0
Basin-wide Total	194.5	148.3	122.3	231.7
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Lower Yakima River	6	42%	57%
Ahtanum Creek	2	37%	52%



January precipitation was 56% of average, maintaining the year-to-date precipitation at 94% of average. Snowpack in the basin was 54% of normal. Streamflow forecasts are 81% of average for Mill Creek and 85% for the SF Walla Walla near Milton-Freewater. Average temperatures were 4-6 degrees above normal for January and 3-5 degrees above normal for the water year.

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

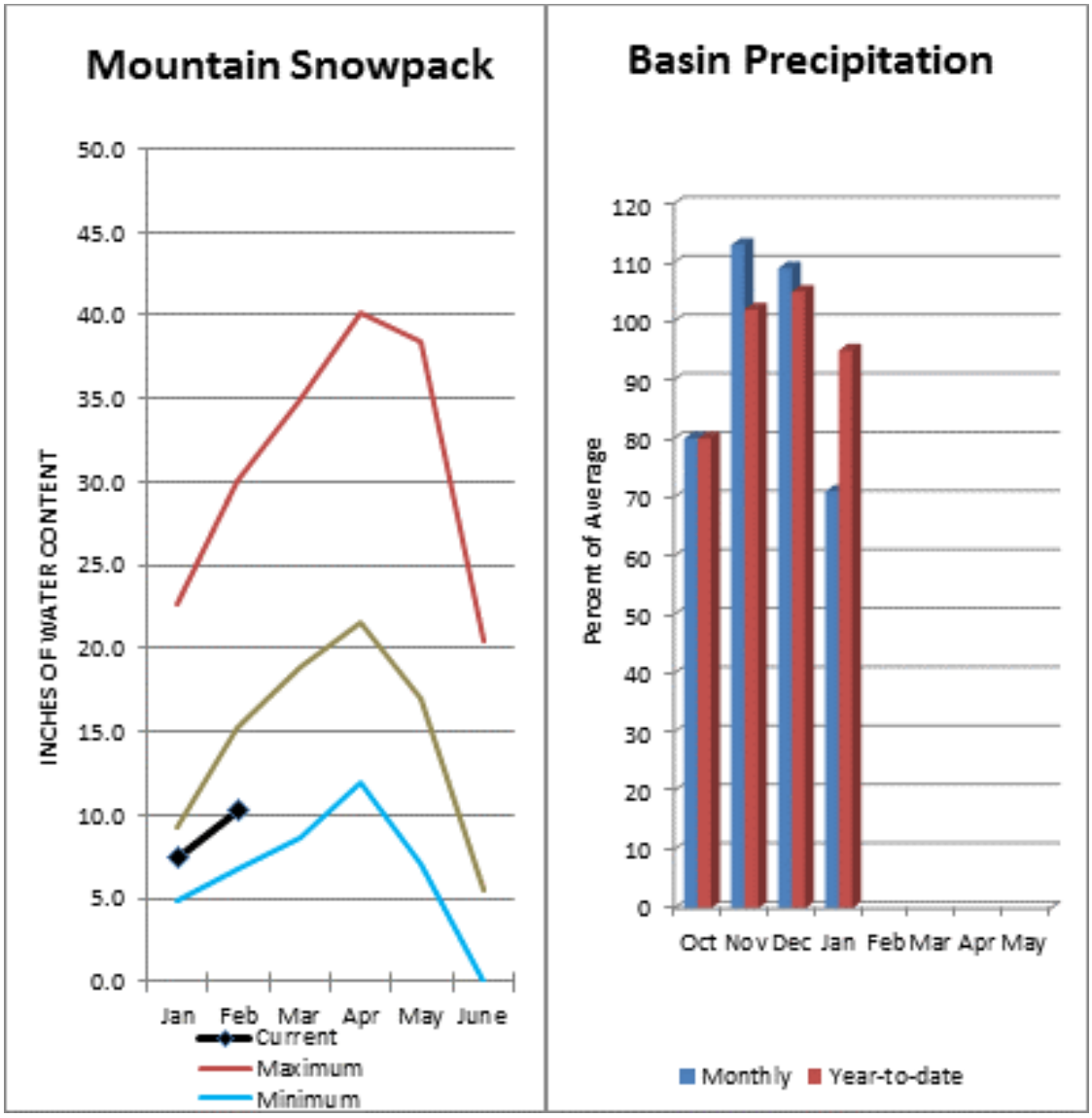
Data Current as of: 2/4/2015 10:38:55 PM

Walla Walla River
Streamflow Forecasts - February 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Walla Walla River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
SF Walla Wall R nr Milton-Freewater								
	MAR-SEP	54	62	68	85%	74	82	80
	APR-JUL	33	40	44	81%	48	55	54
	APR-SEP	44	51	56	85%	61	68	66
Mill Ck nr Walla Walla								
	APR-JUL	12.8	16.5	19	79%	22	25	24
	APR-SEP	15.8	19.8	22	81%	25	29	27

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Walla Walla River	2	54%	68%



The Grande Ronde River can expect summer flows to be about 92% of normal. The forecast for Asotin Creek at Asotin predicts 74% of average flows for the April – July runoff period. January precipitation was 71% of average, bringing the year-to-date precipitation to 95% of average. February 1 snowpack readings averaged 68% of normal. January streamflow was 106% of average for Snake River below Lower Granite Dam and 174% for Grande Ronde River near Troy. Dworshak Reservoir storage was 111% of average. Average temperatures were 4-6 degrees above normal for January and 3-4 degrees above for the water year.

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

Data Current as of: 2/4/2015 10:38:58 PM

Lower Snake, Grande Ronde, Clearwater Basins
Streamflow Forecasts - February 1, 2015

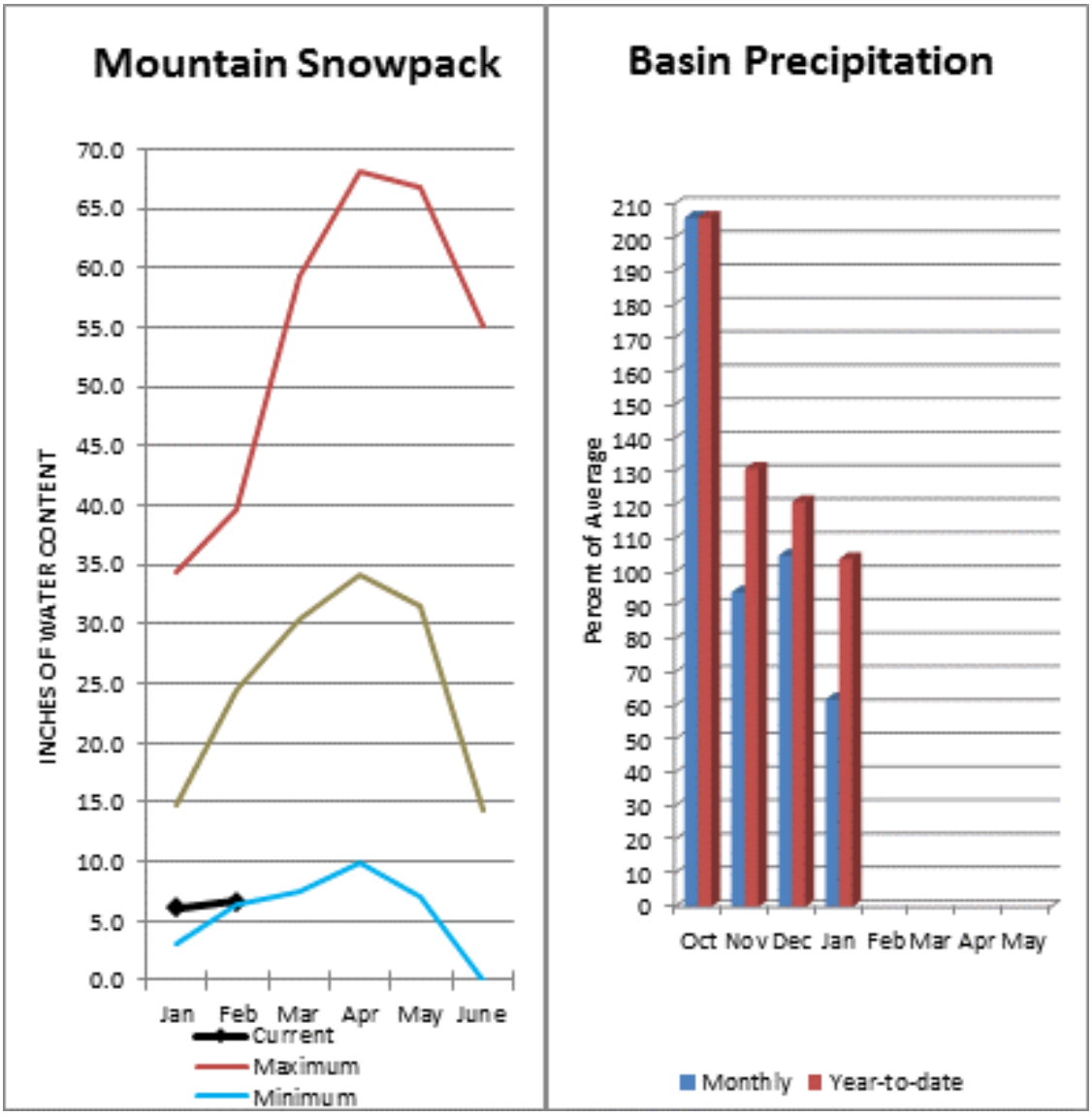
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake, Grande Ronde, Clearwater Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Grande Ronde R at Troy[1]								
Asotin Ck at Asotin								
	APR-JUL	11.2	20	26	74%	32	42	35
Clearwater R at Spalding[1,2]								
	APR-JUL	5190	6570	7200	104%	7830	9220	6890
	APR-SEP	5490	6910	7560	104%	8200	9630	7270
Snake R bl Lower Granite Dam[1,2]								
	APR-JUL	9990	16400	19300	97%	22200	28600	19848
	APR-SEP	11100	18300	21600	97%	24900	32100	22280

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of January, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	2599.9	2334.6	2335.0	3468.0
Basin-wide Total	2599.9	2334.6	2335.0	3468.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Lower Snake, Grande Ronde, Clearwater Basins	14	68%	78%



Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 73% and Cowlitz River at Castle Rock, 88% of average. The Columbia at The Dalles is forecasted to have 95% of average flows this summer according to the River Forecast Center. January average streamflow for Cowlitz River was 137%. The Columbia River at The Dalles was 112% of average. January precipitation was 62% of average and the water-year average was 104%. February 1 snow cover for Cowlitz River was 36%, and Lewis River was 15% of normal. Temperatures were 2-4 degrees above normal during January and for the water year.

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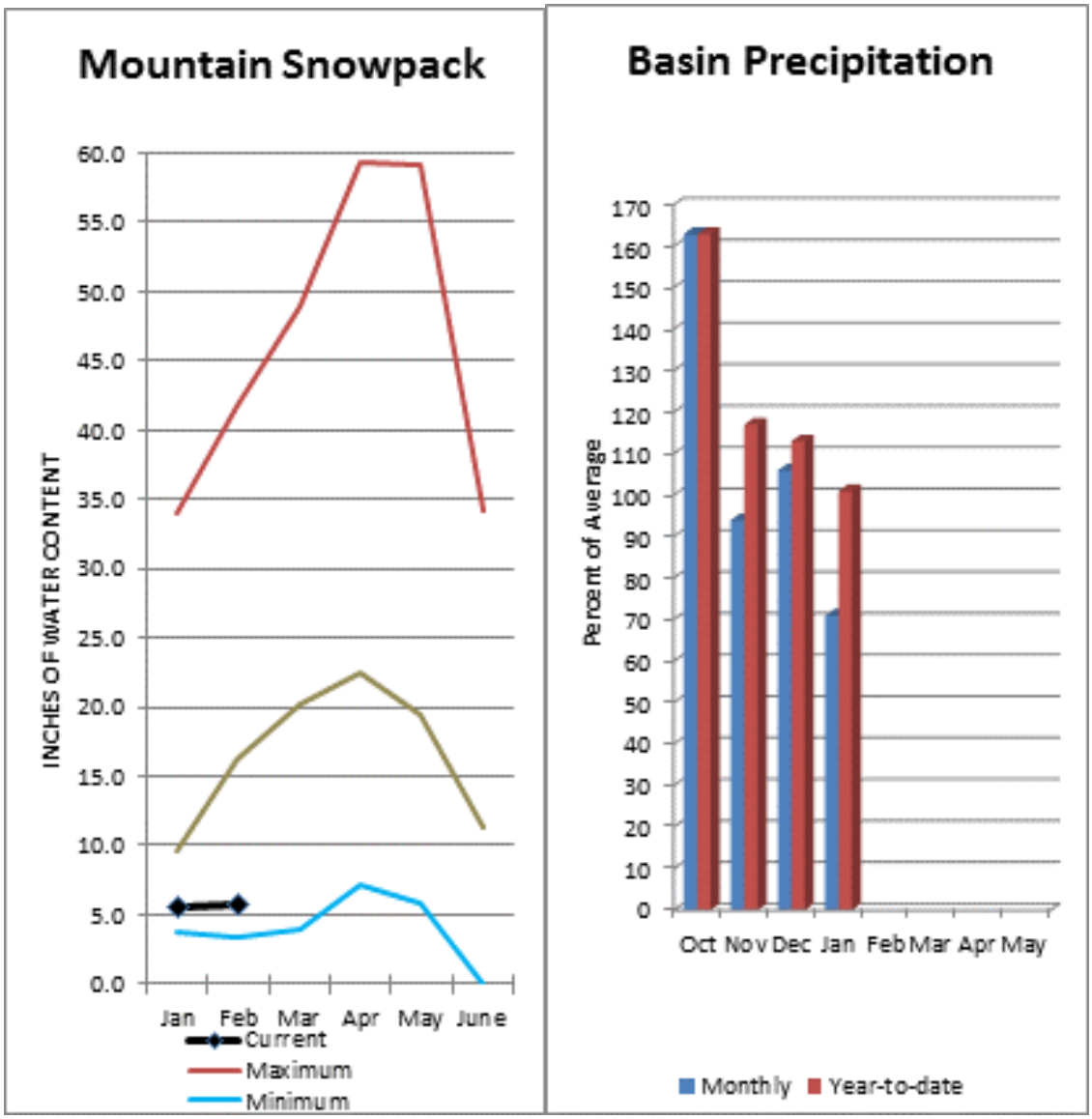
Lower Columbia Basins
Streamflow Forecasts - February 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Lower Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Columbia R at The Dalles[2]								
	APR-JUL	60900	69800	75900	95%	82000	90900	79855
	APR-SEP	70600	81000	88100	95%	95200	106000	92704
Klickitat R nr Glenwood								
	APR-JUL	50	64	73	58%	82	95	126
	APR-SEP	56	72	82	59%	92	108	139
Klickitat R nr Pitt								
	APR-JUL	220	265	295	68%	330	375	435
	APR-SEP	260	315	355	68%	395	450	520
Lewis R at Ariel								
	APR-JUL	425	600	715	74%	830	1000	970
	APR-SEP	510	695	820	73%	945	1130	1120
Cowlitz R bl Mayfiled[2]								
	APR-JUL	1010	1210	1350	83%	1490	1690	1620
	APR-SEP	1160	1390	1550	84%	1710	1940	1840
Cowlitz R at Castle Rock[2]								
	APR-JUL	1570	1800	1950	87%	2110	2340	2230
	APR-SEP	2020	2140	2220	88%	2300	2420	2520

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Lower Columbia Basins	10	27%	54%
Lewis River	4	15%	33%
Cowlitz River	6	36%	70%

South Puget Sound River Basins



Summer runoff is forecast to be 63% of normal for the Green River below Howard Hanson Dam and 88% for the White River near Buckley. February 1 snowpack was 47% of average for the White River, 41% for Puyallup River and 16% in the Green River Basin. January precipitation was 76% of average, bringing the water year-to-date to 99% of average for the basins. Average temperatures in the area were 2-4 degrees above normal for January and for the water-year.

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

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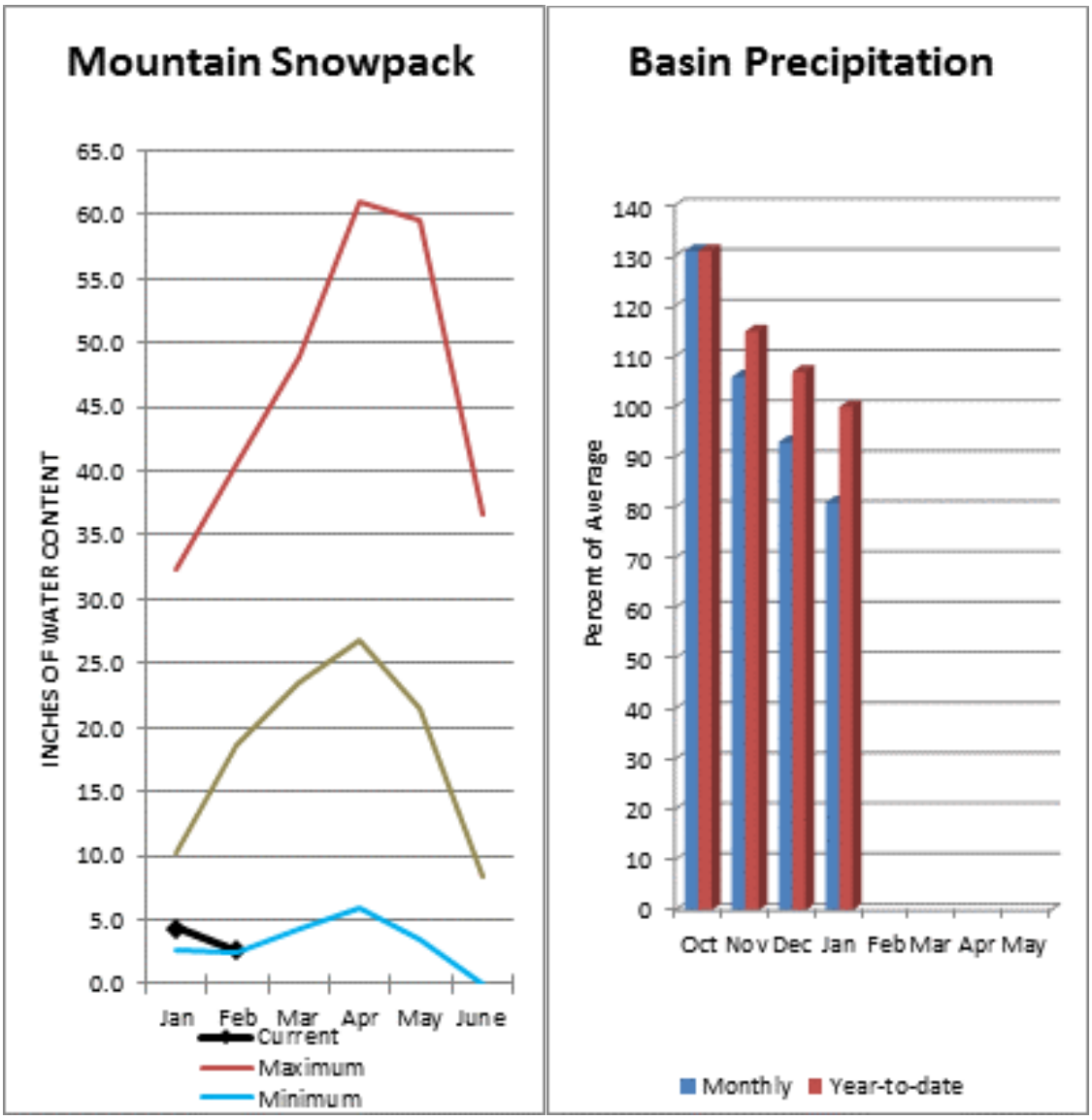
South Puget Sound Basins
Streamflow Forecasts - February 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
South Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
White R nr Buckley[1,2]								
	APR-JUL	265	340	375	87%	410	485	430
	APR-SEP	325	415	455	88%	495	585	515
Green R bl Howard A Hanson Dam[1,2]								
	APR-JUL	46	112	142	60%	172	240	235
	APR-SEP	67	134	164	63%	194	260	260

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
South Puget Sound Basins	10	37%	52%
White River	3	47%	58%
Green River	2	16%	30%



Forecast for spring and summer flows are: 64% for Cedar River near Cedar Falls; 62% for Rex River; 59% for South Fork of the Tolt River; and 79% for Taylor Creek near Selleck. Basin-wide precipitation for January was 81% of average, bringing water-year-to-date to 100% of average. February 1 median snow cover in Cedar River Basin was 13%, Tolt River Basin was 3%, Snoqualmie River Basin was 17%, and Skykomish River Basin was 21%. Temperatures were 2-4 degrees above normal for January and for the water-year.

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

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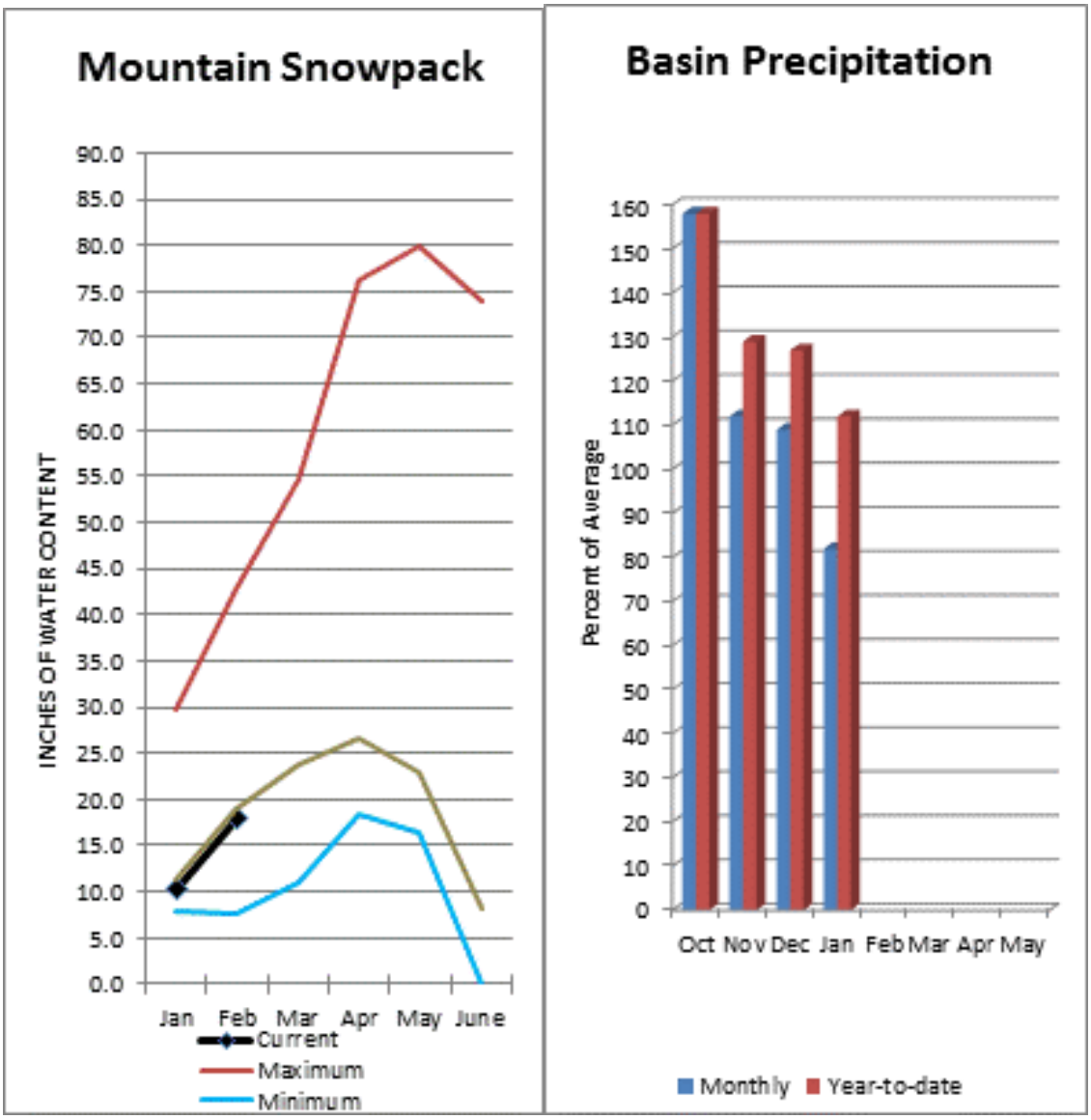
Central Puget Sound Basins
Streamflow Forecasts - February 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Central Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Cedar R nr Cedar Falls								
	APR-JUL	25	36	43	61%	50	61	70
	APR-SEP	30	41	49	64%	57	68	76
Rex R nr Cedar Falls								
	APR-JUL	6	10.9	14.3	60%	17.7	23	24
	APR-SEP	8.3	13.3	16.7	62%	20	25	27
Taylor Ck nr Selleck								
	APR-JUL	10.1	13.2	15.3	77%	17.4	21	20
	APR-SEP	13.4	16.7	19	79%	21	25	24
SF Tolt R nr Index								
	APR-JUL	4.1	6.4	8	56%	9.6	11.9	14.2
	APR-SEP	5.3	7.8	9.5	59%	11.2	13.7	16.1

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Central Puget Sound Basins	14	24%	54%
Puyallup River	5	41%	60%
Cedar River	4	13%	40%
Tolt River	2	3%	63%
Snoqualimie River	4	17%	59%
Skykomish River	2	21%	61%



Forecast for Skagit River streamflow at Newhalem is 90% of average for the spring and summer period. January streamflow in Skagit River was 143% of average. Other forecast points included Baker River at 88% and Thunder Creek at 91% of average. Basin-wide precipitation for January was 88% of average, bringing water-year-to-date to 112% of average. February 1 average snow cover in Skagit River Basin was 68%, Nooksack River Basin was 21% and Baker River Basin was not available. February 1 Skagit River reservoir storage was 79% of average and 56% of capacity. Average temperatures were 2-4 degrees above normal for January and 1-3 degrees above for the water year.

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

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North Puget Sound Basins
Streamflow Forecasts - February 1, 2015

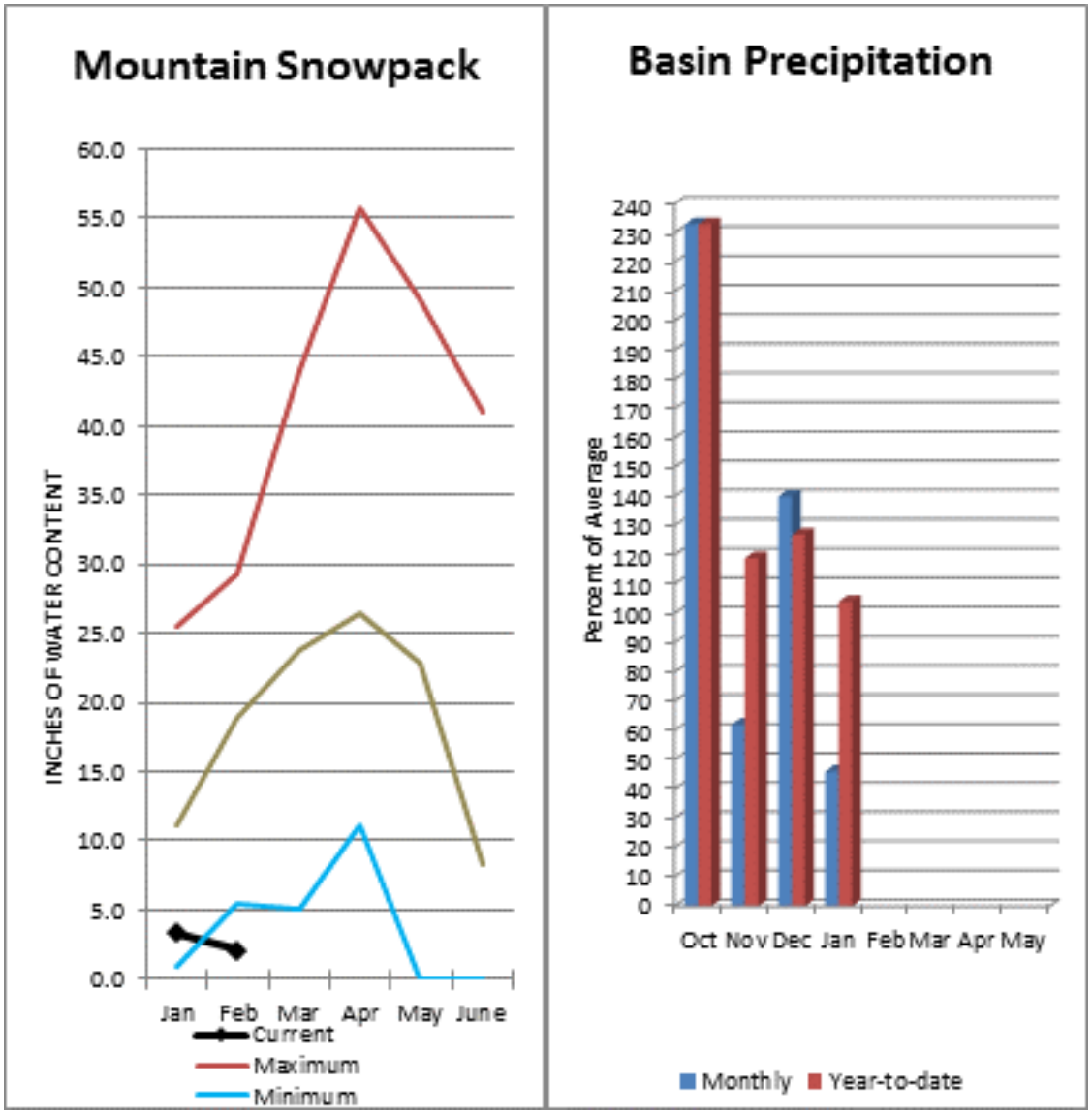
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

North Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Thunder Ck nr Newhalem								
	APR-JUL	186	205	215	91%	225	245	235
	APR-SEP	265	285	300	91%	315	335	330
Skagit R at Newhalem[2]								
	APR-JUL	1300	1440	1530	91%	1620	1760	1680
	APR-SEP	1570	1730	1830	90%	1930	2090	2030
Baker R at Concrete								
	APR-JUL	535	620	675	87%	730	815	780
	APR-SEP	710	805	865	88%	925	1020	980

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage End of January, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ross	787.6	581.1	996.3	1404.1
Diablo Reservoir			85.8	90.6
Basin-wide Total	787.6	581.1	996.3	1404.1
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
North Puget Sound Basins	15	59%	65%
Skagit River	13	69%	63%
Baker River	0		
Nooksack River	2	21%	72%



Forecasted average runoff for streamflow for the Dungeness River is 77% and Elwha River is 73% January runoff in the Dungeness River was 118% of normal. Big Quilcene and Wynoochee rivers may expect below average runoff this summer as well. January precipitation was 46% of average. Precipitation has accumulated at 104% of average for the water year. January precipitation at Quillayute was 79% of normal. Olympic Peninsula snowpack averaged a dismal 9% of normal on February 1, the lowest region in the state and falling within the driest 5% of data records. Temperatures were 4-6 degrees above average for January and 2-3 degrees above normal for the water year.

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

Data Current as of: 2/4/2015 10:39:11 PM

Olympic Penninsula
Streamflow Forecasts - February 1, 2015

Olympic Penninsula	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Dungeness R nr Sequim								
	APR-JUL	75	87	95	79%	103	115	120
	APR-SEP	86	102	112	77%	122	138	145
Elwha R at McDonald Bridge nr Port Angeles								
	APR-JUL	225	265	295	74%	325	365	400
	APR-SEP	265	310	345	73%	380	425	470

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis February 1, 2015	# of Sites	% Median	Last Year % Median
Olympic Penninsula	6	9%	25%

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

United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
March 1, 2015

Brown Top Aerial Marker
104% of normal 3/1/2008

Brown Top Aerial Marker
65% of normal 3/1/2015

Photos by Keith Kingslien

Reminder: We are soliciting field work photos from our snow surveyors again this year. Each month we pick one to grace the cover of this report. The photographer will be given proper credit of course. Please include all specific information when submitting photos. Scott.pattee@wa.usda.gov

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

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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.

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Washington
Water Supply Outlook

March 2015

General Outlook

Essentially no measureable snow accumulated throughout the month of February until the very last days of the month when areas above 4000 feet elevation received a light dusting. More than 27 percent of our SNOTEL and snow course network set new all-time record low or near record low snow water equivalent for March 1. Total precipitation was near normal for the month however temperatures were 4-10 degrees above normal. Short term weather forecasts are calling for a chance of warm rain however weather forecasters are sticking with the warm and dry scenario for the next several months. A continuation of current conditions will most certainly drive our snowpack into a deeper depression. http://www.cpc.ncep.noaa.gov/

Snowpack

The March 1 statewide SNOTEL readings were 29% of normal but vary across the state. The Cedar River was snow free followed closely by the Olympics at only 2% of the 30-year median for March 1, the lowest year on record in both basins since measurements began. Readings from the Methow River Basin reported the highest at 85% of normal for March 1. Westside medians from SNOTEL, and March 1 snow surveys, included the North Puget Sound river basins with 39% of normal, the Central and South Puget river basins with 14% and 34% respectively, and the Lower Columbia basins with 21% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 30% and the Wenatchee area with 51%. Snowpack in the Spokane River Basin was at 43% and the Walla Walla River Basin had 46% of the long term median.

BASIN	PERCENT OF NORMAL	PERCENT OF LAST YEAR
Spokane	43	100
Newman Lake	20	78
Pend Oreille	85	123
Okanogan	79	92
Methow	85	88
Conconully Lake	58	54
Central Columbia	51	92
Upper Yakima	25	97
Lower Yakima	34	88
Ahtanum Creek	30	86
Walla Walla	46	85
Lower Snake	60	100
Cowlitz	32	103
Lewis	7	66
White	46	87
Green	8	75
Puyallup	38	88
Cedar	0	97
Snoqualmie	6	96
Skykomish	11	93
Skagit	62	108
Nooksack	15	97
Baker	26	88
Olympic Peninsula	2	77

Precipitation

Precipitation fell in the form of rain only last month with near average rainfall over most of the state. Even so the water-year to date precipitation remains near to slightly above normal in all basins. The Upper Yakima area was the driest at 72% of normal precipitation for February. Waterhole SNOTEL near Hurricane Ridge measured 198% of normal rainfall. Elbow Lake SNOTEL in the South Fork Nooksack River Basin continues to rein over the entire SNOTEL network with a water-year accumulation of 113.7 inches, 19 inches above normal or 120% of average for the water-year.

RIVER BASIN	FEBRUARY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	81	89
Pend Oreille	85	104
Upper Columbia	75	107
Central Columbia	83	99
Upper Yakima	72	89
Lower Yakima	95	100
Walla Walla	94	94
Lower Snake	89	94
Lower Columbia	97	103
South Puget Sound	100	101
Central Puget Sound	102	100
North Puget Sound	129	114
Olympic Peninsula	158	110

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. More rainfall than snow has helped buffer many reservoirs to above normal levels for this time of year. In most cases managers are electing to hold this excess water due to the uncertainty of the snowpack. March 1 Reservoir storage in the Yakima Basin was 776,000-acre feet, 172% of average for the Upper Reaches and 232,000-acre feet or 170% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 144,000 acre feet, 109% of average and 60% of capacity; and the Skagit River reservoirs at 57% of average and 96% 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	60	109
Pend Oreille	41	81
Upper Columbia	75	120
Central Columbia		
Upper Yakima	93	172
Lower Yakima	100	170
Lower Snake	83	122
North Puget Sound	57	96

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

Streamflow

April to September runoff forecasts for March 1 continued to drop since the February forecasts were issued due to the obvious lack of snowfall and above normal temperatures. February streamflows were mostly well above normal due to heavy rains and snow melt. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 64%; White River, 81%; and Skagit River, 86%. Some Eastern Washington streams include the Yakima River near Parker 54%, Wenatchee River at Plain 69%; and Spokane River near Post Falls 53%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. **The 50% chance of exceedance of average flows is normally used for planning purposes however with the current uncertainty in weather forecasts and the current lack of snow in most locations it may be advisable to use the 70-90% chance of exceedance to ensure adequate water supply this summer.**

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	53-57
Pend Oreille	67-98
Upper Columbia	51-92
Central Columbia	63-89
Upper Yakima	37-49
Lower Yakima	54-72
Walla Walla	74-83
Lower Snake	69-97
Lower Columbia	58-84
South Puget Sound	70-81
Central Puget Sound	57-75
North Puget Sound	85-94
Olympic Peninsula	66-68

STREAM	PERCENT OF AVERAGE FEBRUARY STREAMFLOWS
Pend Oreille at Albeni Fall Dam	281
Kettle at Laurier	567
Columbia at Birchbank	220
Spokane at Spokane	197
Similkameen at Nighthawk	355
Okanogan at Tonasket	254
Methow at Pateros	309
Chelan at Chelan	282
Wenatchee at Pashastin	251
Cle Elum near Roslyn	200
Yakima at Parker	169
Naches at Naches	219
Grande Ronde at Troy	154
Snake below Lower Granite Dam	141
Columbia River at The Dalles	131
Lewis at Merwin Dam	96
Cowlitz below Mayfield Dam	108
Skagit at Concrete	187
Dungeness near Sequim	190

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

Soil Moisture

Near to above normal fall precipitation provided for wet and nearly saturated soils (60-70% saturation) as the snow finally began to accumulate in mid-December. Great fall soil moisture conditions can help buffer low snowpack runoff come spring. The recent dry spell has resulted in a slight reduction to stored soil moisture however levels are still in good shape. 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.

Natural Resources Conservation Service

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Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/

Oregon:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/

Idaho:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/

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

USDA-NRCS Agency Homepages

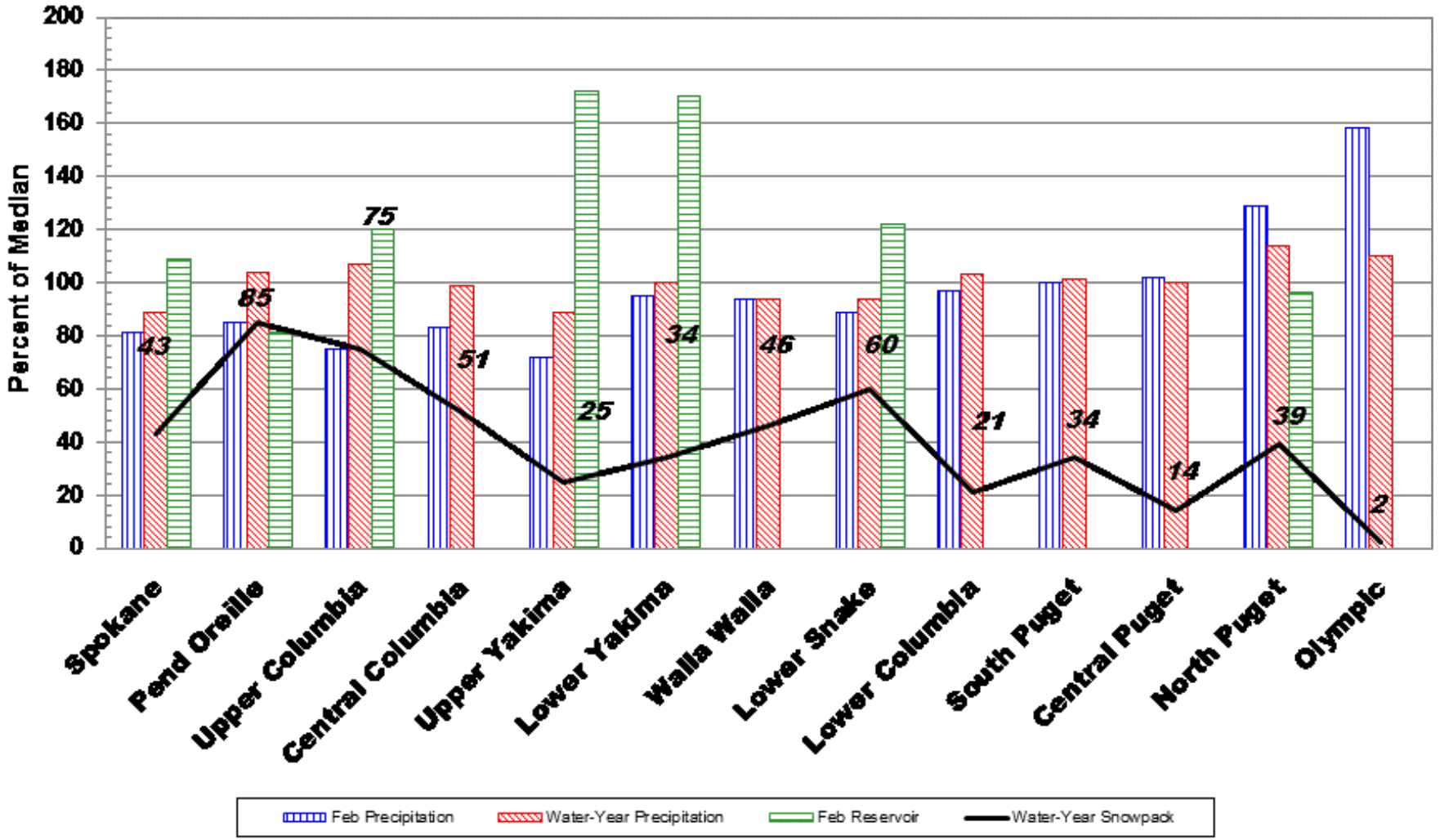
Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/

NRCS National:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

NRCS Natural Resources Conservation Service

March 1, 2015 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2014 - 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 Pacific Area Committee is making plans for the 83rd Annual Western Snow Conference in 2015.

Mark your calendar and start thinking about submitting a paper to attend the 2015 Western Snow Conference:

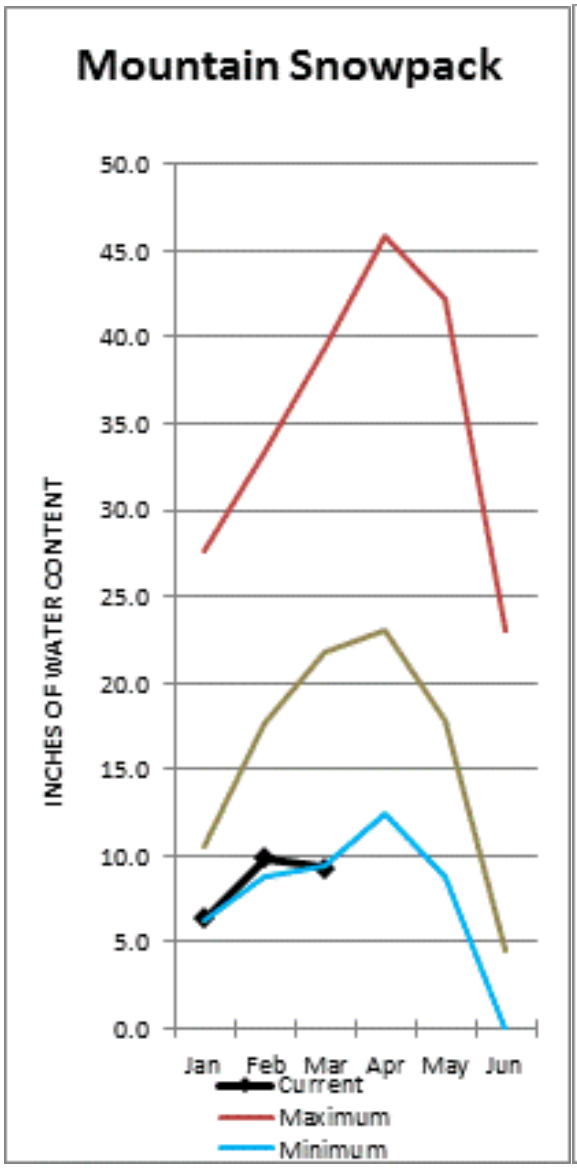
Dates: April 20-24, 2015
Location: Grass Valley, California

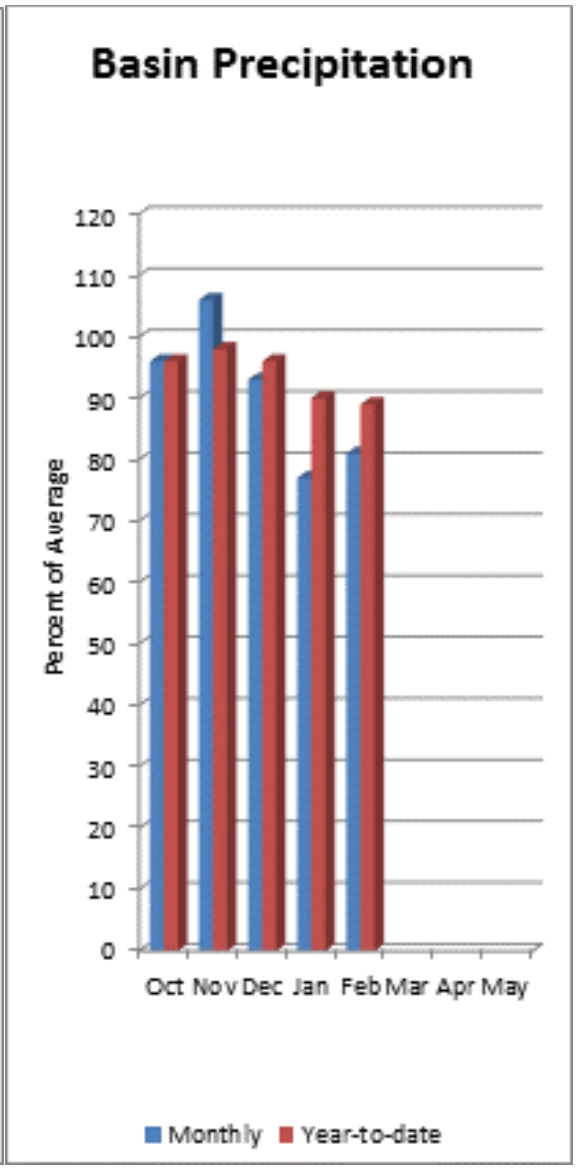
The Conference will begin Monday, April 20th with a short course and panel discussion on " LIDAR Basics, Applications, and Use in Snow Hydrology and Field Studies " with several invited experts in the field. Tuesday and Wednesday will include formal paper and poster presentations on a variety of topics, including climate variability, climate change impacts on snow and runoff, water management, water supply forecasting, and modeling and climatology of snow. Thursday will include a technical tour to visit hydrologic and gold mining points of interest around Grass Valley

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





The March 1 forecasts for summer runoff within the Spokane River Basin are 53% of average near Post Falls and 57% at Long Lake. The Chamokane River near Long Lake forecasted to have 54% of average flows for the May-August period. The forecast is based on a basin snowpack that is 32% of normal and precipitation that is 89% of average for the water year. Precipitation for February was slightly below normal at 81% of average. Streamflow on the Spokane River at Spokane was 137% of average for February. March 1 storage in Coeur d'Alene Lake was 144,000 acre feet, 109% of average and 60% of capacity. Snowpack at Quartz Peak SNOTEL site was 79% of average with 6.2 inches of water content, over 2 inches less than last month. Average temperatures in the Spokane basin were 4-6 degrees above normal for February and 3-5 degrees above normal for the water year.

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

Data Current as of: 3/5/2015 12:04:12 PM

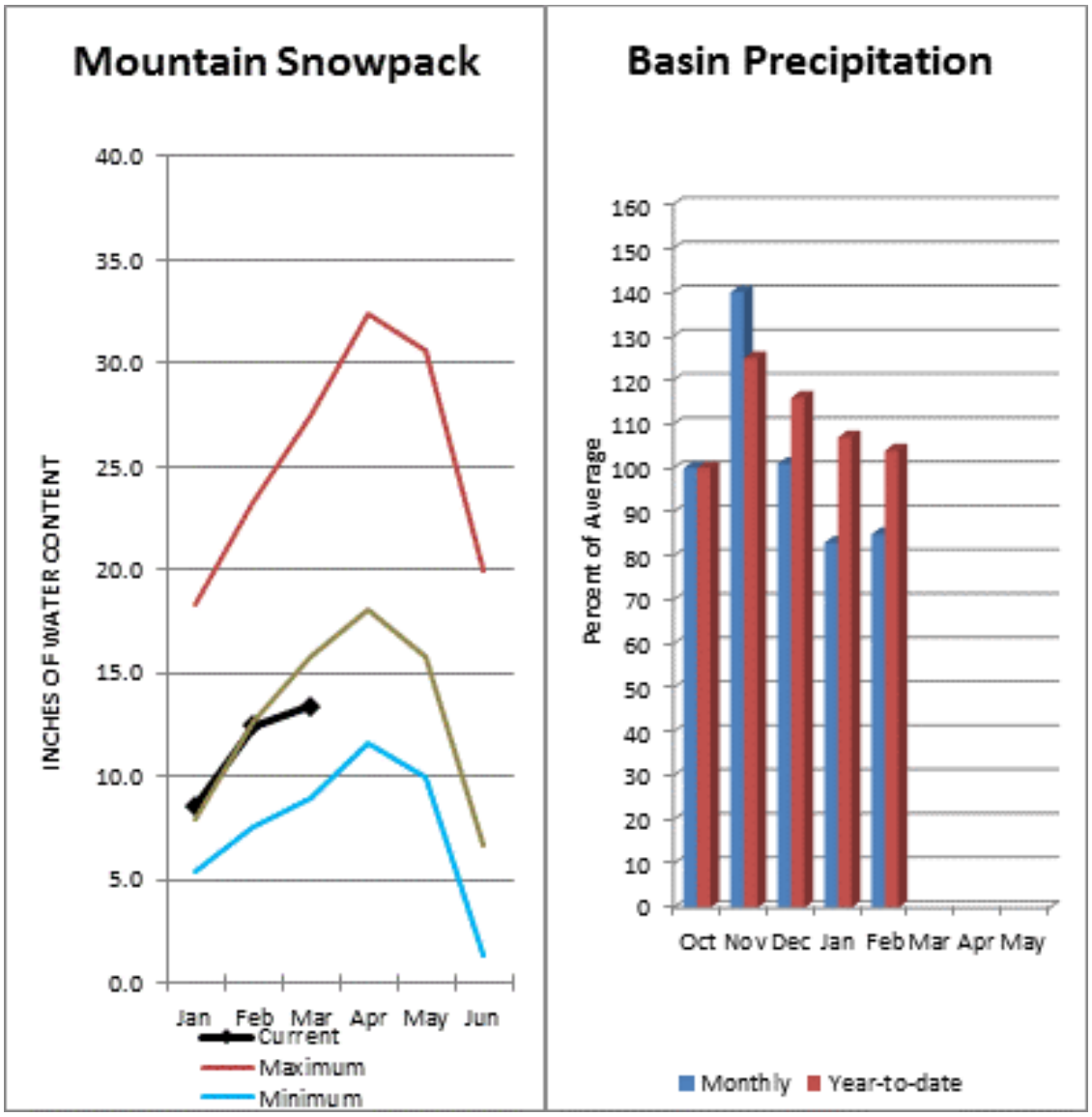
Spokane
Streamflow Forecasts - March 1, 2015

Spokane	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Spokane R nr Post Falls[2]								
	APR-JUL	560	975	1260	53%	1540	1960	2390
	APR-SEP	600	1020	1310	53%	1600	2020	2480
Spokane R at Long Lake[2]								
	APR-JUL	705	1160	1460	56%	1770	2220	2620
	APR-SEP	845	1310	1620	57%	1940	2400	2850
Chamokane Ck nr Long Lake								
	MAY-AUG	1.67	2.9	5	54%	7.1	10.2	9.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of February, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Coeur d' Alene	144.1	70.2	132.8	238.5
Basin-wide Total	144.1	70.2	132.8	238.5
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Spokane	15	43%	100%
Newman Lake	3	20%	78%



The April – September average forecast for the Priest River near the town of Priest River is 67% and the Pend Orielle below Box Canyon is 98%. February streamflow was 281% of average on the Pend Oreille River and 216% on the Columbia at Birchbank. March 1 snow cover was 85% of normal in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 11.9 inches of snow water on the snow pillow. Normally Bunchgrass would have 22.5 inches on March 1. Precipitation during February was 85% of average, dropping the year-to-date precipitation at 104% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 81% of normal. Average temperatures were 4-6 degrees above normal for February and 3-5 degrees above normal for the water year.

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

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Pend Oreille Basins
Streamflow Forecasts - March 1, 2015

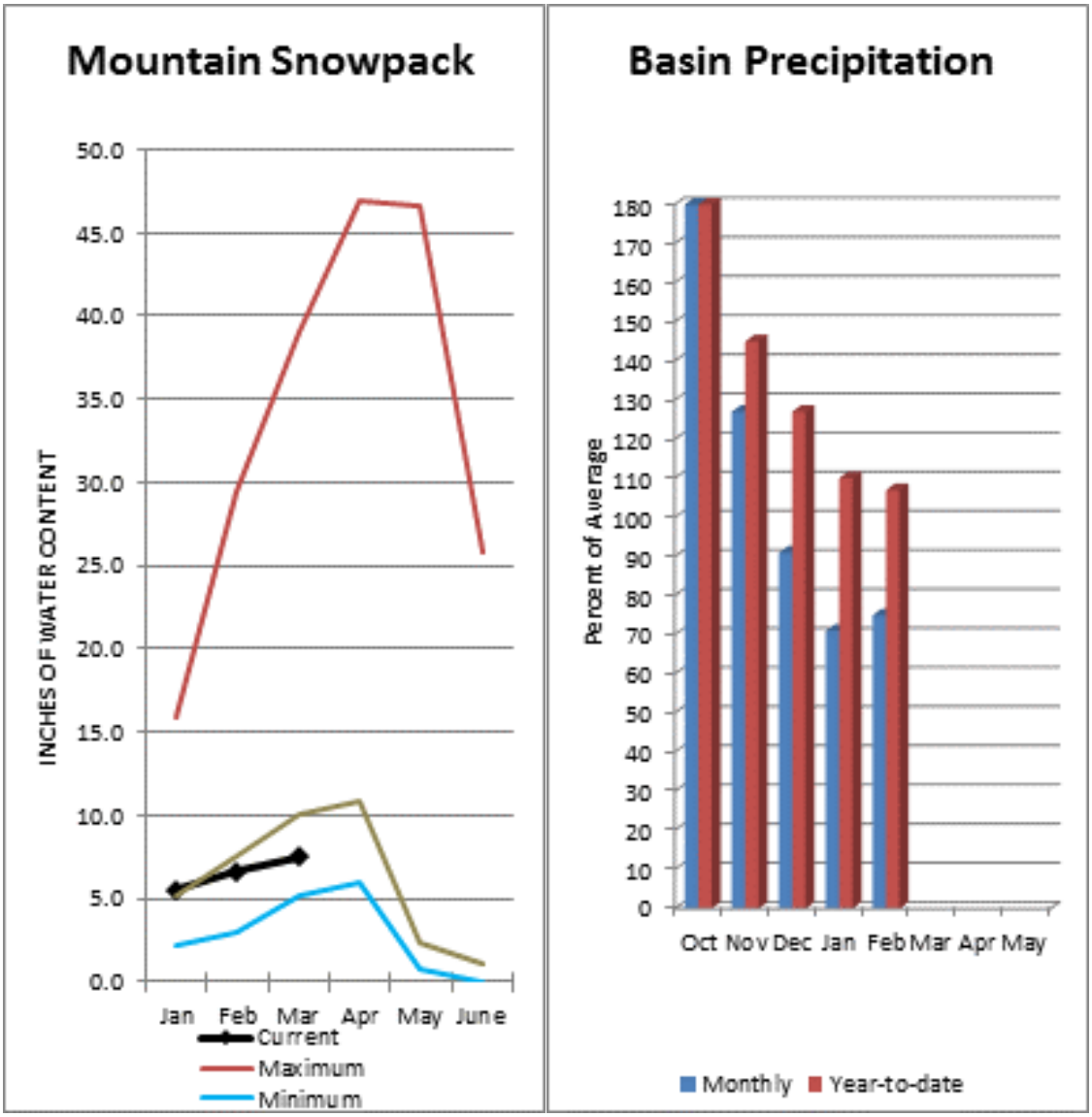
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Pend Oreille Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Pend Oreille Lake Inflow[2]								
	APR-JUL	9520	10700	11600	98%	12400	13600	11800
	APR-SEP	10400	11700	12600	98%	13500	14800	12800
Priest R nr Priest River[2]								
	APR-JUL	375	460	520	67%	580	665	780
	APR-SEP	400	490	555	67%	620	710	830
Pend Oreille R bl Box Canyon[2]								
	APR-JUL	9680	10900	11800	99%	12600	13800	11900
	APR-SEP	10500	11800	12800	98%	13700	15100	13000

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of February, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Pend Oreille	610.0	571.0	792.6	1561.3
Priest Lake	78.9	60.3	57.1	119.3
Basin-wide Total	688.8	631.3	849.7	1680.6
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Pend Oreille Basins	69	86%	124%
Colville River	2	28%	68%
Kettle River	5	74%	93%



Summer runoff average forecast for the Okanogan River is 71%, Similkameen River is 92%, Kettle River 91% and Methow River is 92%. March 1 snow cover on the Okanogan was 79% of normal, Omak Creek was 43% and the Methow was 85%. February precipitation in the Upper Columbia was 75% of average, with precipitation for the water year at 107% of average. February streamflow for the Methow River was 309% of average, 254% for the Okanogan River and 174% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 6.5 inches or 75% of normal for March 1. Combined storage in the Conconully Reservoirs was 17,600 acre-feet or 120% of normal. Temperatures were 4-6 degrees above normal for February and 2-4 degrees above for the water year.

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Upper Columbia Basins
Streamflow Forecasts - March 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Kettle R nr Laurier								
	APR-JUL	1260	1490	1650	92%	1810	2040	1800
	APR-SEP	1300	1550	1720	91%	1890	2140	1880
Colville R at Kettle Falls								
	APR-JUL	23	43	61	51%	82	117	119
	APR-SEP	26	48	67	51%	89	128	131
Columbia R at Grand Coulee[1,2]								
	APR-JUL	36300	42200	44900	88%	47600	53500	51015
	APR-SEP	42600	49700	52900	88%	56100	63200	60110
Similkameen R nr Nighthawk[1]								
	APR-JUL	765	1000	1110	93%	1210	1450	1200
	APR-SEP	835	1070	1180	92%	1290	1530	1280
Okanogan R nr Tonasket[1]								
	APR-JUL	580	910	1060	72%	1210	1530	1480
	APR-SEP	640	1000	1170	71%	1330	1690	1650
Okanogan R at Malott[1]								
	APR-JUL	600	940	1100	76%	1250	1590	1450
	APR-SEP	660	1040	1210	75%	1380	1750	1620
Methow R nr Pateros								
	APR-JUL	610	700	760	91%	825	915	835
	APR-SEP	660	755	820	92%	885	980	895
Columbia R at Birchbank[1,2]								
	APR-JUL	24800	28200	29800	88%	31400	34800	33840
	APR-SEP	30400	34700	36700	88%	38700	43000	41750

1) 90% and 10% exceedance probabilities are actually 95% and 5%
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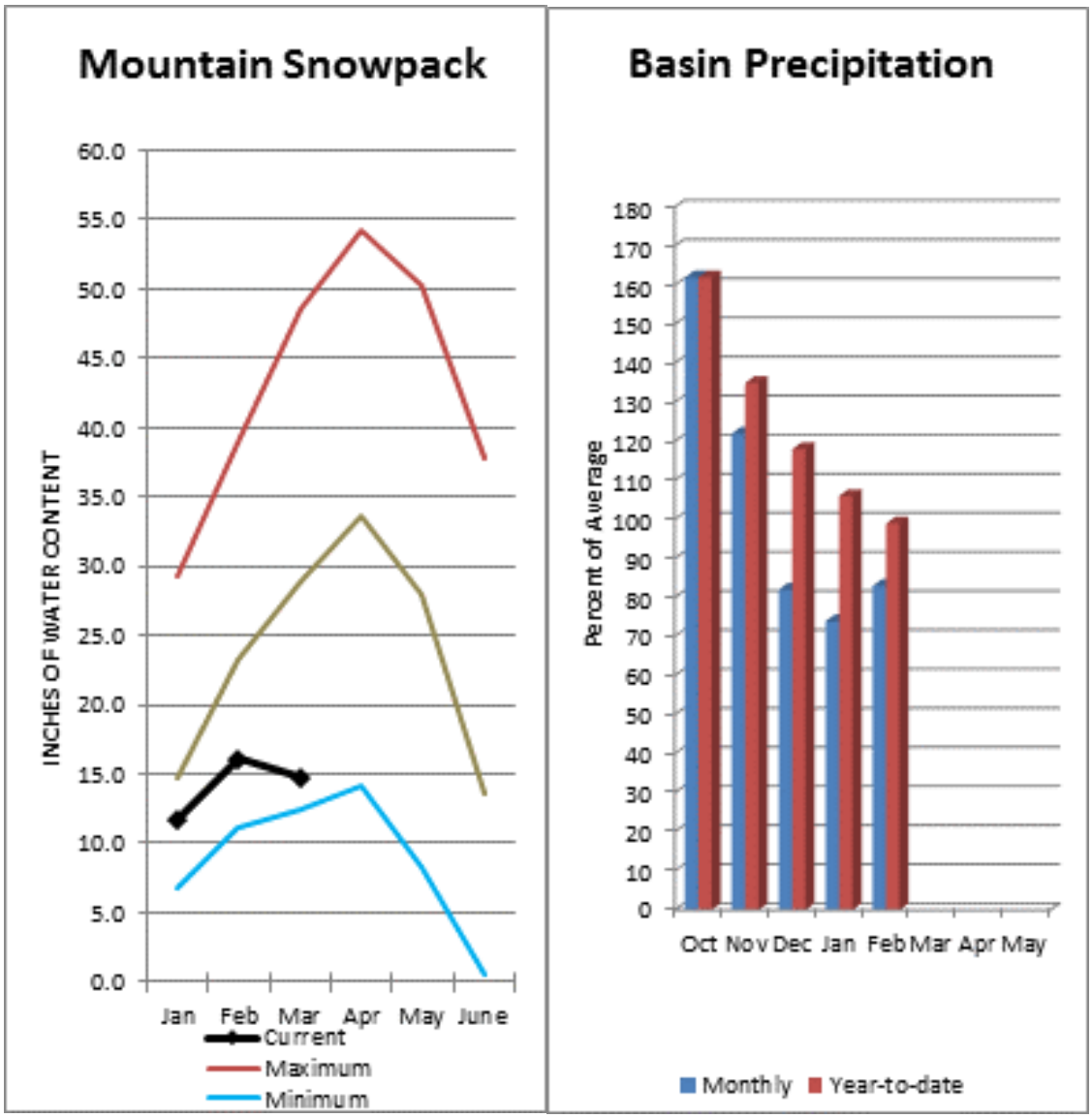
3) Median value used in place of average

Reservoir Storage End of February, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	6.9	9.3	7.3	10.5
Conconully Reservoir	10.7	11.7	7.4	13.0
Basin-wide Total	17.6	21.0	14.7	23.5
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Upper Columbia Basins	26	75%	89%
Okanogan River	15	79%	92%
Omak Creek	3	43%	45%
Sanpoil River	1	0%	42%
Similkameen River	5	82%	114%
Toats Coulee Creek	4	86%	79%
Conconully Lake	3	58%	54%
Methow River	5	90%	94%



Precipitation during February was 83% of average in the basin and 99% for the year-to-date. Runoff for Entiat River is forecast to be 75% of average for the summer. The April-September average forecast for Chelan River is 77%, Wenatchee River at Plain is 69%, Stehekin River is 89% and Icicle Creek is 63%. February average streamflows on the Chelan River were 282% and on the Wenatchee River 251%. March 1 snowpack in the Wenatchee River Basin was 51% of normal; the Chelan, 72%; the Entiat, 63%; Stemilt Creek, 54% and Colockum Creek, 44%. Lyman Lake SNOTEL had the most snow water with 38.1 inches of water. This site would normally have 48.6 inches on March 1. Temperatures were 4-6 degrees above normal for February and 3-4 degrees above normal for the water year.

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

Data Current as of: 3/5/2015 12:04:22 PM

Central Columbia Basins
Streamflow Forecasts - March 1, 2015

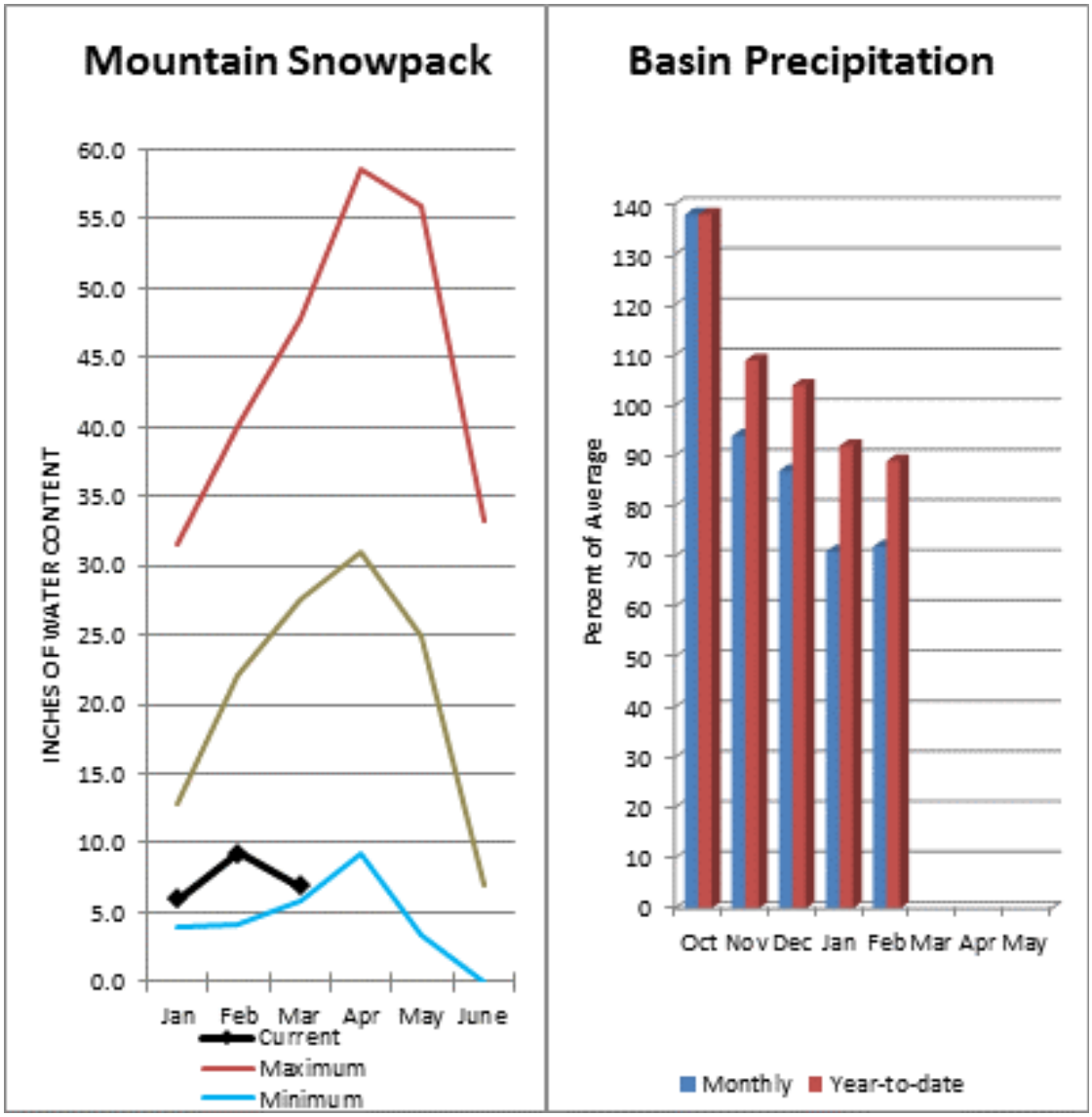
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Stehekin R at Stehekin								
	APR-JUL	485	555	605	89%	655	730	680
	APR-SEP	570	645	700	89%	750	825	790
Chelan R at Chelan								
	APR-JUL	650	735	790	79%	845	930	1000
	APR-SEP	710	805	865	77%	930	1020	1120
Entiat R nr Ardenvoir								
	APR-JUL	121	140	153	77%	167	186	200
	APR-SEP	132	152	166	75%	179	199	220
Wenatchee R at Plain								
	APR-JUL	550	640	705	71%	765	860	990
	APR-SEP	590	685	750	69%	815	915	1080
Icicle Ck nr Leavenworth								
	APR-JUL	135	160	177	64%	194	220	275
	APR-SEP	143	171	189	63%	210	235	300
Wenatchee R at Peshastin								
	APR-JUL	760	885	970	71%	1050	1170	1370
	APR-SEP	805	935	1020	68%	1110	1250	1490
Columbia R bl Rock Island Dam[2]								
	APR-JUL	40700	45400	48500	87%	51600	56300	55770
	APR-SEP	47600	53000	56700	87%	60400	65800	65200

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of February, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Chelan			279.8	676.1
Basin-wide Total			0.0	0.0
# of reservoirs	0	0	0	0

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Central Columbia Basins	3	72%	87%
Chelan Lake Basin	3	72%	87%
Entiat River	1	63%	94%
Wenatchee River	7	51%	92%
Stemilt Creek	1	54%	84%
Colockum Creek	1	44%	98%



March 1 reservoir storage for the Upper Yakima reservoirs was 776,000-acre feet, 172% of average. Forecasts for the Yakima River at Cle Elum are 49% of average and the Teanaway River near Cle Elum is at 37%. Lake inflows are all forecasted to be below average this summer as well. February streamflows within the basin were Cle Elum River near Roslyn at 200%. March 1 snowpack was 25% based upon 8 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 72% of average for February and 89% for the water-year. 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.

Data Current as of: 3/5/2015 12:04:25 PM

Upper Yakima River
Streamflow Forecasts - March 1, 2015

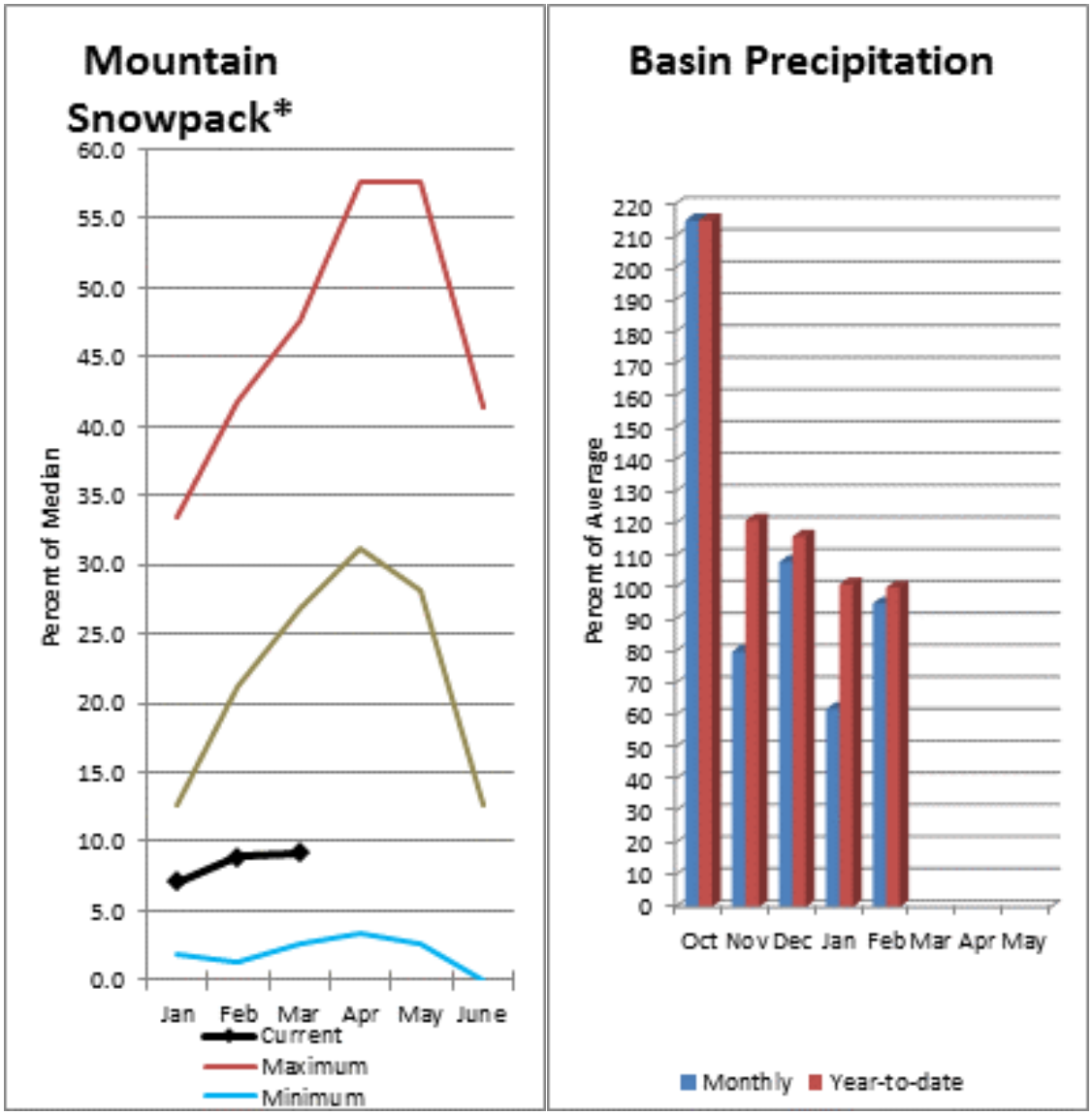
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Keechelus Reservoir Inflow[2]								
	APR-JUL	26	44	56	48%	68	85	116
	APR-SEP	32	50	62	49%	74	92	126
Kachess Reservoir Inflow [2]								
	APR-JUL	22	36	46	44%	55	69	104
	APR-SEP	27	41	51	45%	60	74	113
Cle Elum Lake Inflow [2]								
	APR-JUL	132	169	194	50%	220	255	385
	APR-SEP	139	179	205	49%	235	275	415
Yakima R at Cle Elum [2]								
	APR-JUL	179	290	365	48%	435	545	755
	APR-SEP	200	325	410	49%	490	615	830
Teanaway R bl Forks nr Cle Elum								
	APR-JUL	16	35	47	36%	60	78	130
	APR-SEP	17.6	36	49	37%	62	80	133

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of February, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Keechelus	157.8	106.2	92.3	157.8
Kachess	223.4	187.0	143.6	239.0
Cle Elum	394.8	193.9	214.4	436.9
Basin-wide Total	776.0	487.2	450.3	833.7
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Upper Yakima River	8	25%	97%



February average streamflows within the basin were: Yakima River near Parker, 143% and the Naches River near Naches, 221%. March 1 reservoir storage for Bumping and Rimrock reservoirs was 232,000-acre feet, 170% of average. Forecast averages for Yakima River near Parker are 54%; American River near Nile, 64%; Ahtanum Creek, 66%; and Klickitat River near Glenwood, 58%. March 1 snowpack was 34% based upon 7 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 30% of normal. Precipitation was 95% of average for February and 100% for the water-year. Temperatures were 4-8 degrees above normal for February and for 3-5 degrees above normal for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they March differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

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

Data Current as of: 3/5/2015 12:04:28 PM

Lower Yakima River
Streamflow Forecasts - March 1, 2015

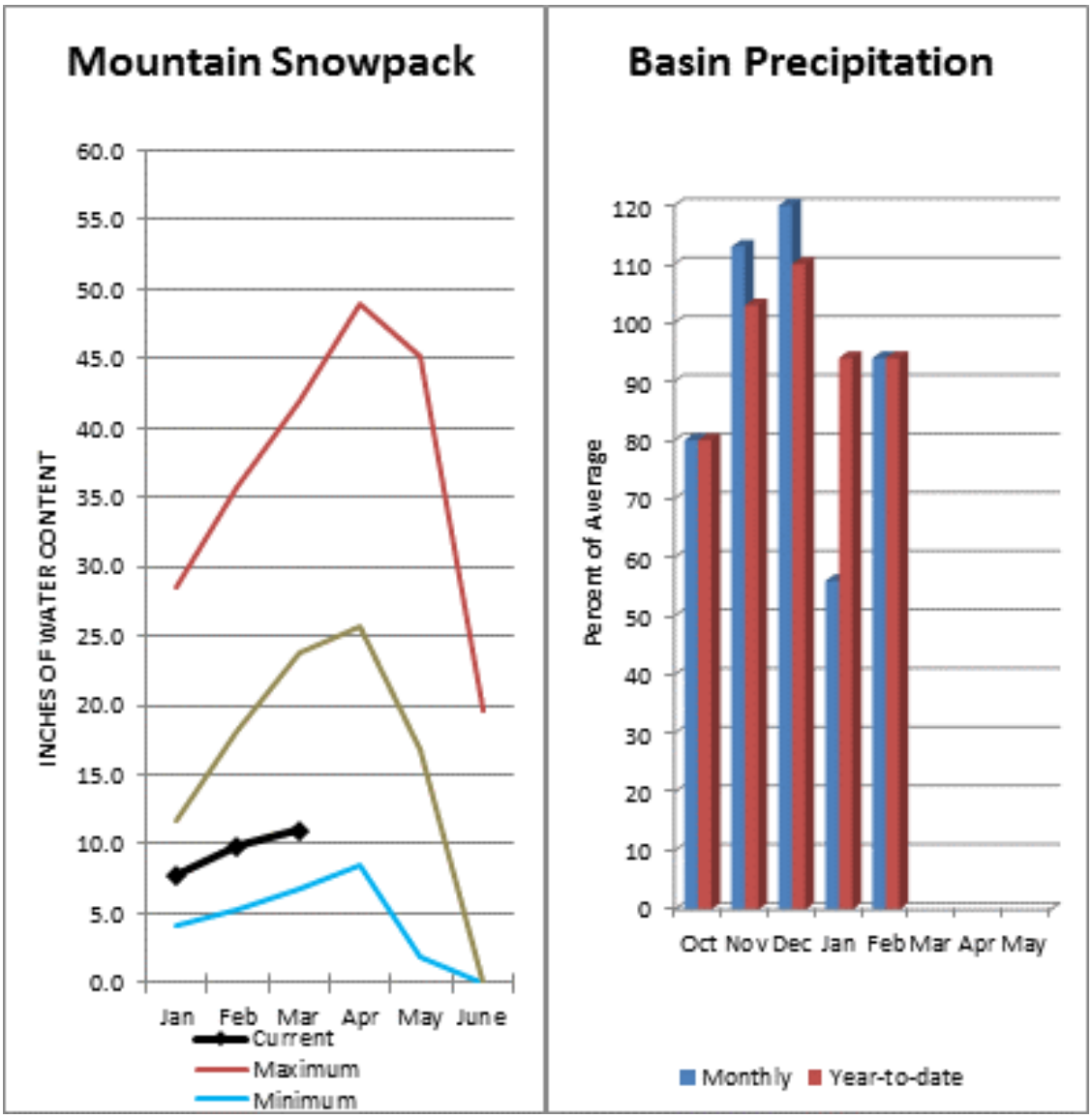
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bumping Lake Inflow [2]								
	APR-JUL	57	71	80	70%	90	104	114
	APR-SEP	61	76	85	69%	95	109	123
American R nr Nile								
	APR-JUL	46	58	66	65%	75	87	102
	APR-SEP	48	61	70	64%	78	91	110
Rimrock Lake Inflow [2]								
	APR-JUL	107	123	135	72%	146	163	187
	APR-SEP	126	145	158	72%	171	190	220
Naches R nr Naches								
	APR-JUL	310	390	445	64%	495	575	700
	APR-SEP	330	415	475	63%	535	620	760
Ahtanum Ck at Union Gap								
	APR-JUL	7.5	13.2	17.1	63%	21	27	27
	APR-SEP	9.3	15	19	66%	23	29	29
Yakima R nr Parker [2]								
	APR-JUL	550	760	900	54%	1040	1250	1660
	APR-SEP	625	840	990	54%	1130	1350	1820
Klickitat R nr Glenwood								
	APR-JUL	49	63	72	57%	82	96	126
	APR-SEP	55	70	81	58%	91	107	139
Klickitat R nr Pitt								
	APR-JUL	210	260	295	68%	325	375	435
	APR-SEP	265	320	360	69%	400	455	520

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of February, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bumping Lake	33.8	16.7	13.3	33.7
Rimrock	197.8	142.1	123.3	198.0
Basin-wide Total	231.6	158.8	136.6	231.7
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Lower Yakima River	7	34%	88%
Ahtanum Creek	2	30%	86%



February precipitation was 94% of average, maintaining the year-to-date precipitation at 94% of average. Snowpack in the basin was 46% of normal. Streamflow forecasts are 74% of average for Mill Creek and 83% for the SF Walla Walla near Milton-Freewater. Average temperatures were 4-6 degrees above normal for February and 3-5 degrees above normal for the water year.

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

Data Current as of: 3/5/2015 12:04:32 PM

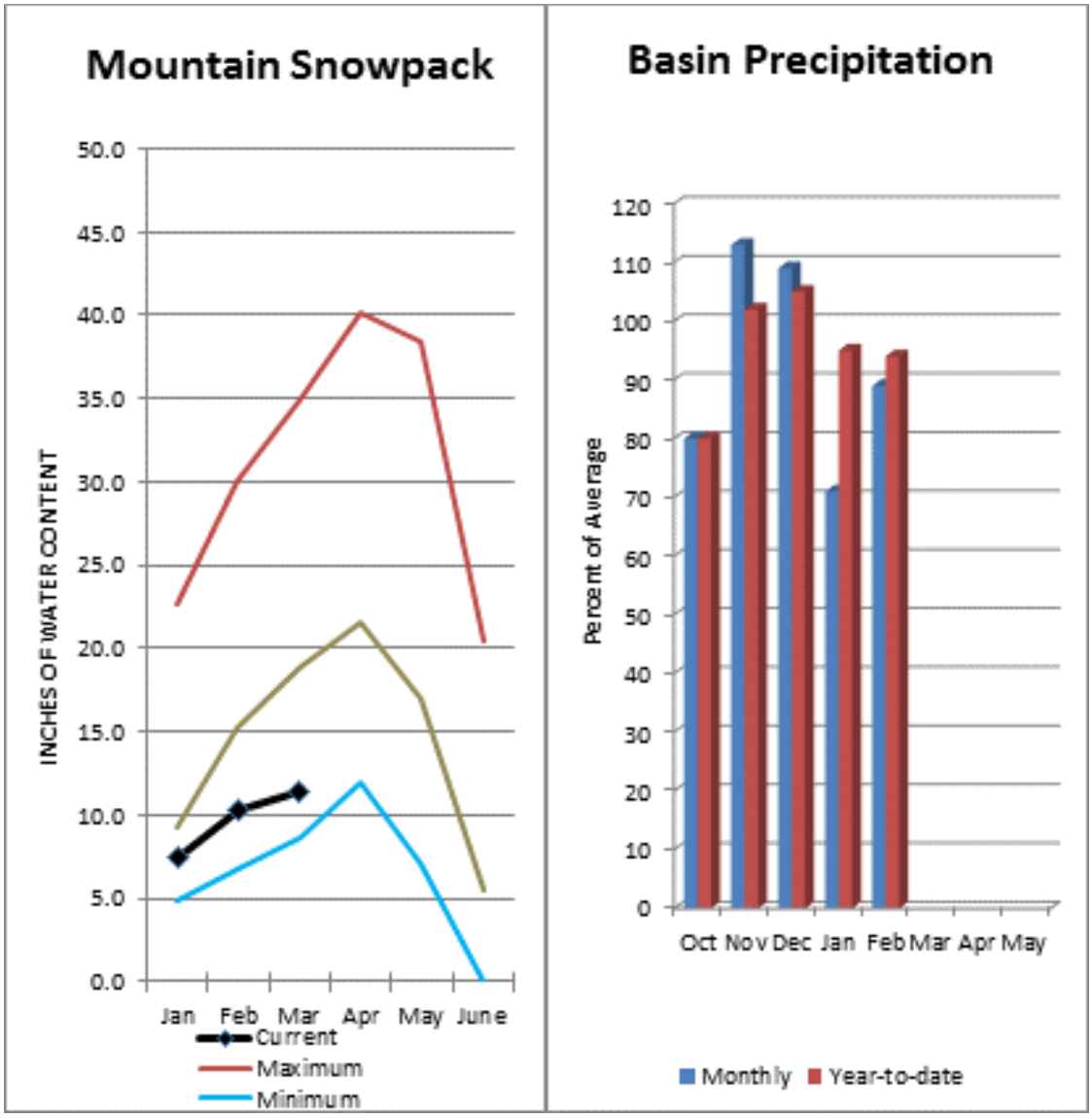
Walla Walla River
Streamflow Forecasts - March 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Walla Walla River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
SF Walla Wall R nr Milton-Freewater								
	MAR-SEP	52	61	66	83%	71	80	80
	APR-JUL	31	38	43	80%	48	55	54
	APR-SEP	42	50	55	83%	60	68	66
Mill Ck nr Walla Walla								
	APR-JUL	10.6	14.7	17.5	73%	20	24	24
	APR-SEP	12.7	17.1	20	74%	23	27	27

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Walla Walla River	2	46%	85%



The Grande Ronde River can expect summer flows to be about 92% of normal. The forecast for Asotin Creek at Asotin predicts 69% of average flows for the April – July runoff period. February precipitation was 89% of average, bringing the year-to-date precipitation to 94% of average. March 1 snowpack readings averaged 60% of normal. February streamflow was 114% of average for Snake River below Lower Granite Dam and 154% for Grande Ronde River near Troy. Dworshak Reservoir storage was 122% of average. Average temperatures were 4-6 degrees above normal for February and 3-5 degrees above for the water year.

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

Data Current as of: 3/5/2015 12:04:35 PM

Lower Snake, Grande Ronde, Clearwater Basins
Streamflow Forecasts - March 1, 2015

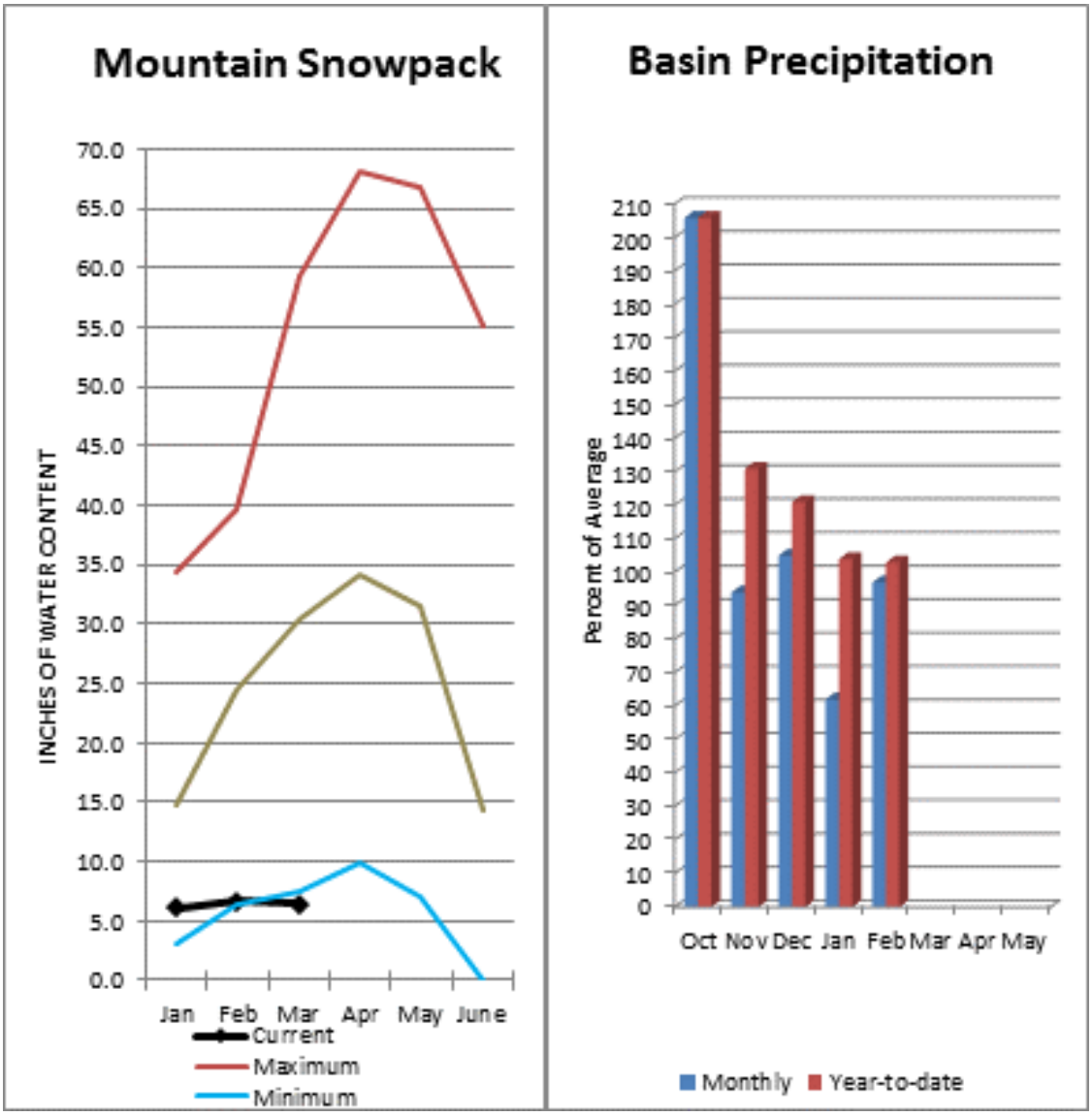
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake, Grande Ronde, Clearwater Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Grande Ronde R at Troy								
	MAR-JUL	1060	1260	1390	92%	1520	1720	1510
	APR-SEP	865	1060	1200	92%	1330	1530	1310
Asotin Ck at Asotin								
	APR-JUL	9.2	18	24	69%	30	39	35
Clearwater R at Spalding[2]								
	APR-JUL	5140	6070	6700	97%	7330	8260	6890
	APR-SEP	5450	6410	7060	97%	7720	8680	7270
Snake R bl Lower Granite Dam[12]								
	APR-JUL	8100	13100	15400	78%	17600	22600	19848
	APR-SEP	9530	15100	17700	79%	20300	25900	22280

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of February, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	2880.4	2365.4	2358.0	3468.0
Basin-wide Total	2880.4	2365.4	2358.0	3468.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Lower Snake, Grande Ronde, Clearwater Basins	14	60%	100%



Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 71% and Cowlitz River at Castle Rock, 84% of average. The Columbia at The Dalles is forecasted to have 84% of average flows this summer according to the River Forecast Center. February average streamflow for Cowlitz River was 108%. The Columbia River at The Dalles was 131% of average. February precipitation was 97% of average and the water-year average was 103%. March 1 snow cover for Cowlitz River was 32%, and Lewis River was 7% of normal. Temperatures were 2-4 degrees above normal during February and for the water year.

Data Current as of: 3/5/2015 12:04:38 PM

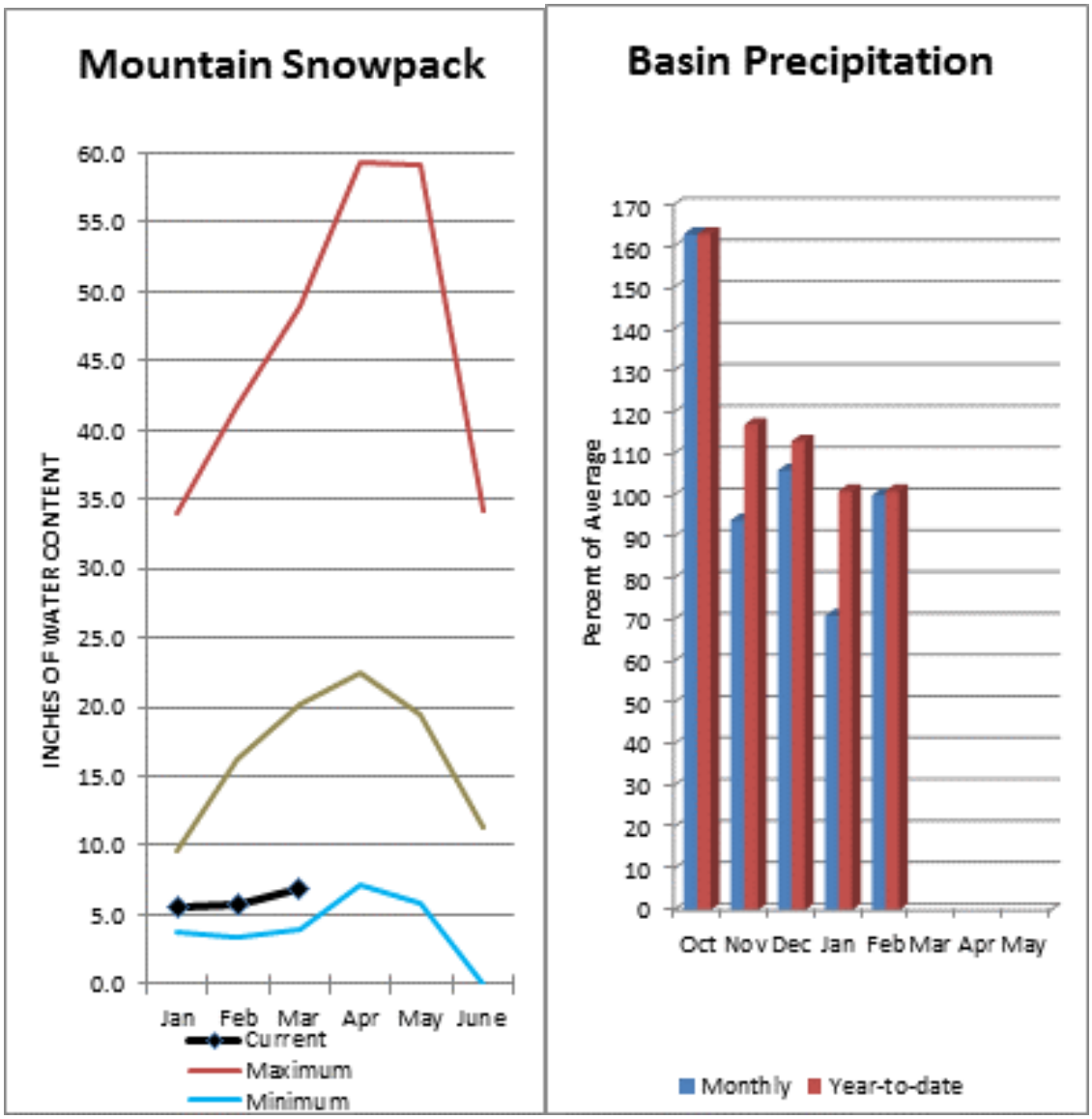
Lower Columbia Basins
Streamflow Forecasts - March 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Columbia R at The Dalles[2]								
	APR-JUL	52700	59700	64500	81%	69300	76300	79855
	APR-SEP	63700	71900	77500	84%	83100	91300	92704
Klickitat R nr Glenwood								
	APR-JUL	49	63	72	57%	82	96	126
	APR-SEP	55	70	81	58%	91	107	139
Klickitat R nr Pitt								
	APR-JUL	210	260	295	68%	325	375	435
	APR-SEP	265	320	360	69%	400	455	520
Lewis R at Ariel[2]								
	APR-JUL	420	585	700	72%	815	980	970
	APR-SEP	500	670	790	71%	910	1080	1120
Cowlitz R bl Mayfiled[2]								
	APR-JUL	810	1050	1210	75%	1370	1610	1620
	APR-SEP	935	1200	1370	74%	1550	1810	1840
Cowlitz R at Castle Rock[2]								
	APR-JUL	1370	1650	1840	83%	2030	2310	2230
	APR-SEP	1610	1910	2120	84%	2330	2630	2520

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Lower Columbia Basins	11	19%	85%
Lewis River	5	7%	69%
Cowlitz River	6	32%	103%



Summer runoff is forecast to be 70% of normal for the Green River below Howard Hanson Dam and 81% for the White River near Buckley. March 1 snowpack was 46% of average for the White River, 38% for Puyallup River and 8% in the Green River Basin. February precipitation was 100% of average, bringing the water year-to-date to 101% of average for the basins. Average temperatures in the area were 2-4 degrees above normal for February and for the water-year.

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

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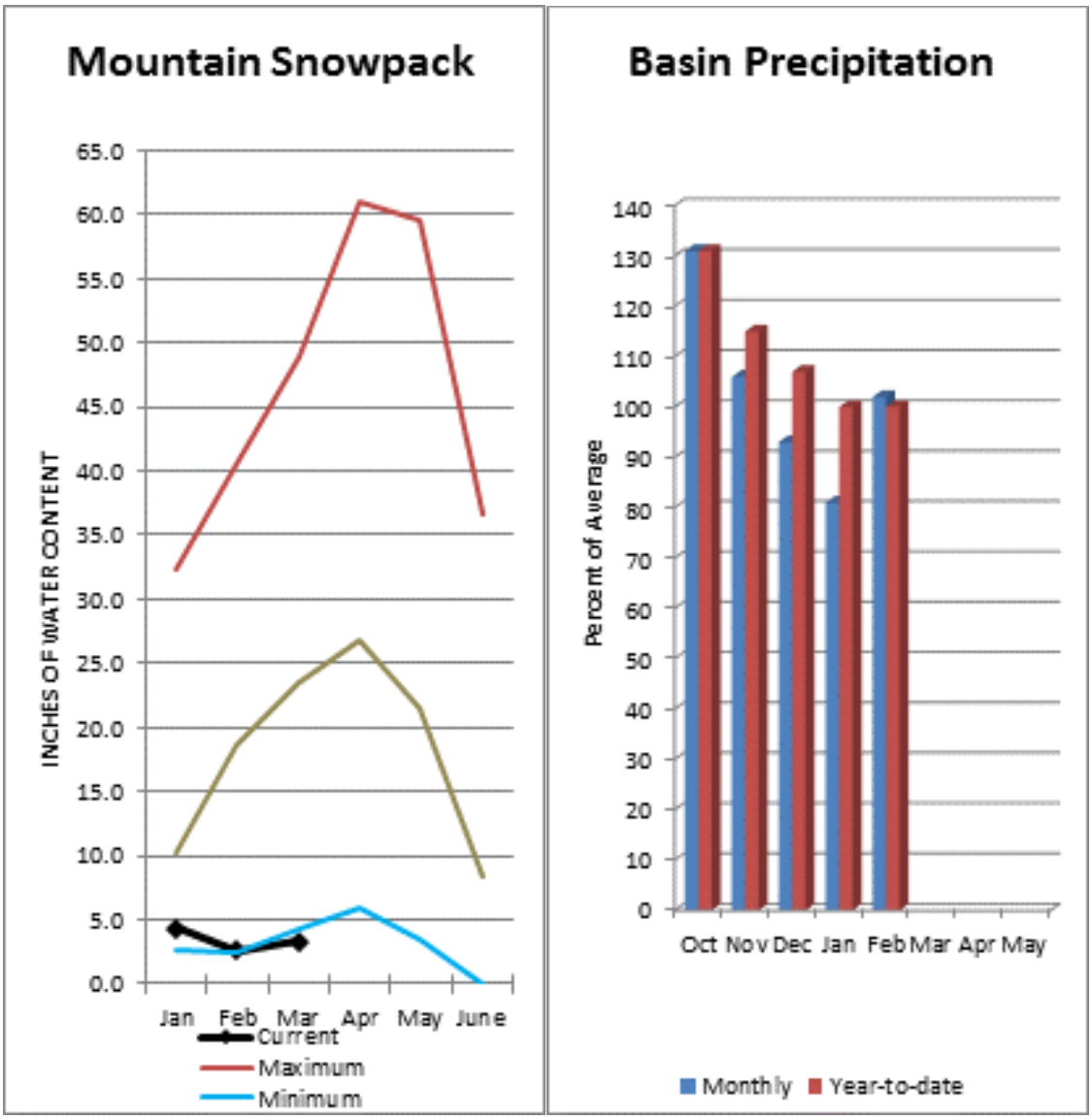
South Puget Sound Basins
Streamflow Forecasts - March 1, 2015

South Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
White R nr Buckley[1,2]								
	APR-JUL	235	315	350	81%	385	465	430
	APR-SEP	285	375	415	81%	455	545	515
Green R bl Howard A Hanson Dam[1,2]								
	APR-JUL	75	129	158	67%	190	270	235
	APR-SEP	95	152	182	70%	215	295	260

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
South Puget Sound Basins	10	34%	85%
White River	3	46%	87%
Green River	2	8%	75%



Forecast for spring and summer flows are: 64% for Cedar River near Cedar Falls; 57% for Rex River; 75% for South Fork of the Tolt River; and 76% for Taylor Creek near Selleck. Basin-wide precipitation for February was 102% of average, bringing water-year-to-date to 100% of average. March 1 median snow cover in Cedar River and Tolt River basins had melted out. Snoqualmie River Basin was 6%, and Skykomish River Basin was 11%. This is a new all-time record low for March 1 snow survey at Alpine Meadows, since records began in 1969. Temperatures were 2-4 degrees above normal for February and for the water-year.

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

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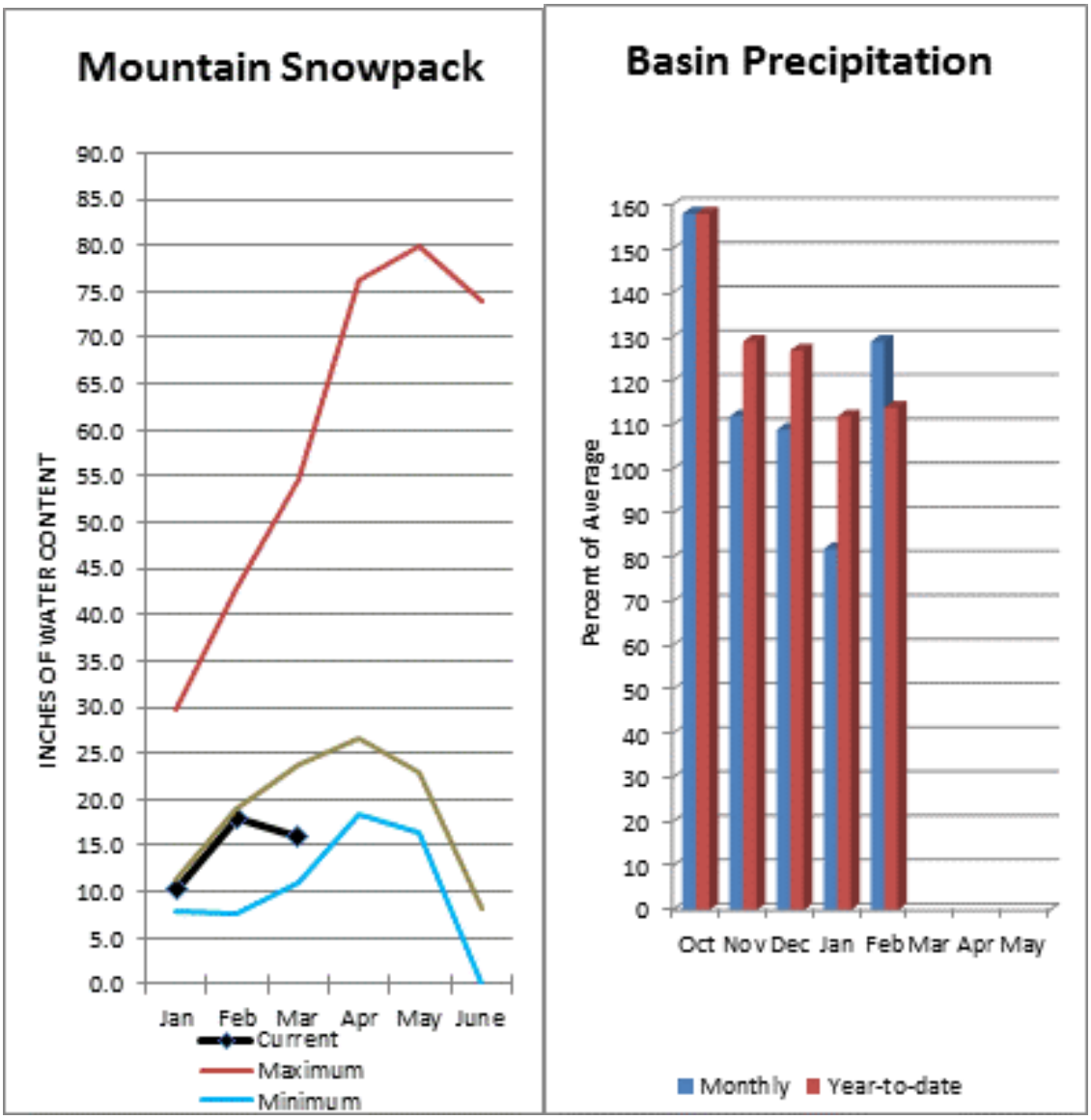
Central Puget Sound Basins
Streamflow Forecasts - March 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Cedar R nr Cedar Falls								
	APR-JUL	25	35	42	60%	49	59	70
	APR-SEP	31	42	49	64%	56	67	76
Rex R nr Cedar Falls								
	APR-JUL	5	9.8	13.1	55%	16.4	21	24
	APR-SEP	7.2	12.1	15.5	57%	18.9	24	27
Taylor Ck nr Selleck								
	APR-JUL	9.6	12.6	14.7	74%	16.7	19.7	20
	APR-SEP	12.9	16.1	18.3	76%	21	24	24
SF Tolt R nr Index								
	APR-JUL	6.4	8.7	10.3	73%	11.9	14.3	14.2
	APR-SEP	7.5	10.2	12	75%	13.8	16.5	16.1

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Central Puget Sound Basins	14	7%	96%
Puyallup River	5	38%	88%
Cedar River	5	0%	97%
Tolt River	3	0%	98%
Snoqualimie River	5	6%	96%
Skykomish River	3	11%	93%



Forecast for Skagit River streamflow at Newhalem is 86% of average for the spring and summer period. February streamflow in Skagit River was 187% of average. Other forecast points included Baker River at 85% and Thunder Creek at 94% of average. Basin-wide precipitation for February was 129% of average, bringing water-year-to-date to 114% of average. March 1 average snow cover in Skagit River Basin was 62%, Nooksack River Basin was 15% and Baker River Basin 26%. March 1 Skagit River reservoir storage was 96% of average and 57% of capacity. Average temperatures were 2-4 degrees above normal for February and 2-3 degrees above for the water year.

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

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North Puget Sound Basins
Streamflow Forecasts - March 1, 2015

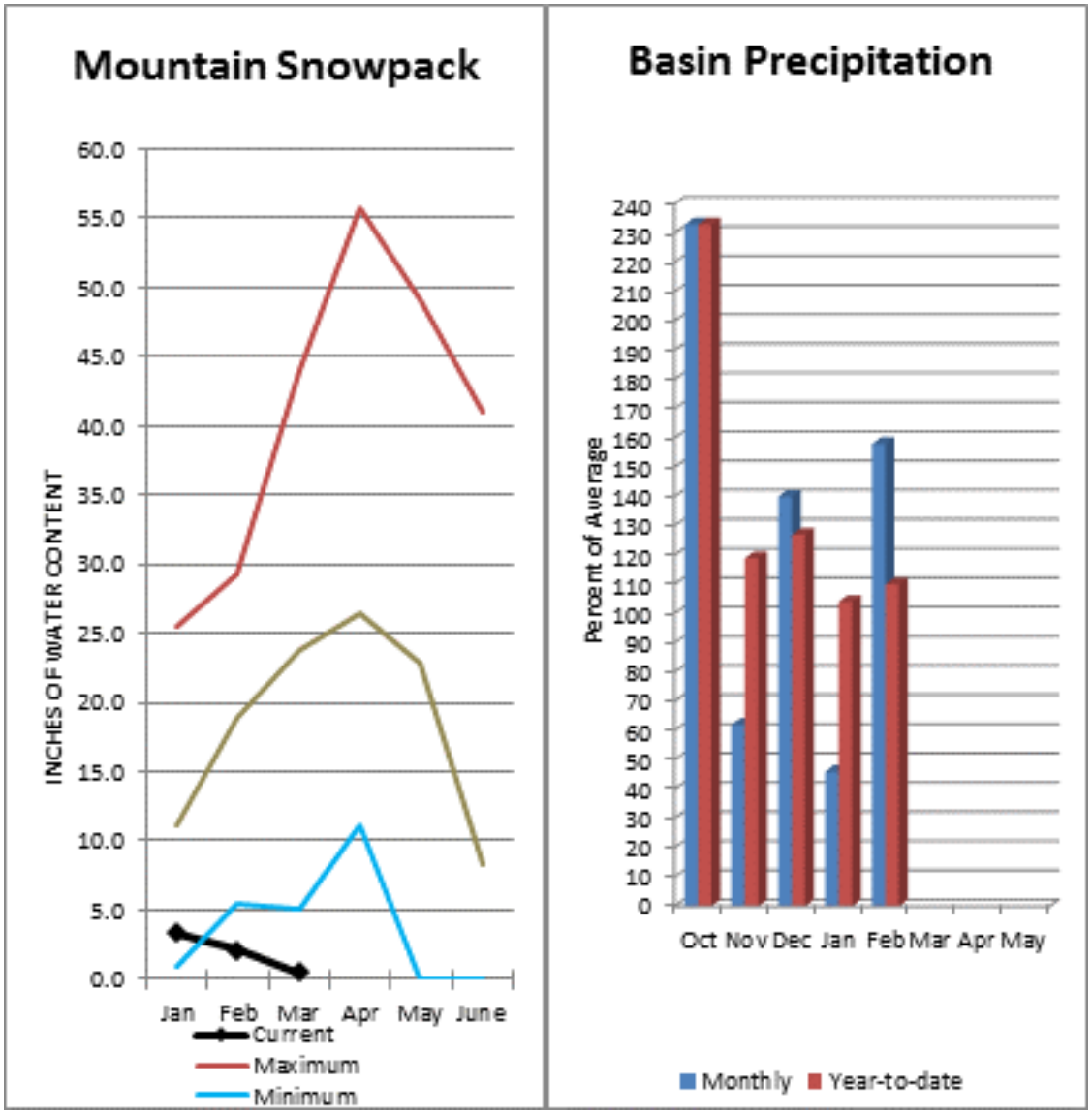
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

North Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Thunder Ck nr Newhalem								
	APR-JUL	185	205	220	94%	230	250	235
	APR-SEP	270	295	310	94%	325	350	330
Skagit R at Newhalem[2]								
	APR-JUL	1230	1380	1480	88%	1580	1730	1680
	APR-SEP	1470	1640	1750	86%	1860	2030	2030
Baker R at Concrete								
	APR-JUL	500	595	660	85%	720	815	780
	APR-SEP	620	750	835	85%	920	1050	980

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of February, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ross	798.1	451.0	832.4	1404.1
Diablo Reservoir			86.2	90.6
Basin-wide Total	798.1	451.0	832.4	1404.1
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
North Puget Sound Basins	25	39%	97%
Skagit River	15	62%	108%
Baker River	7	26%	88%
Nooksack River	3	15%	97%



Forecasted average runoff for streamflow for the Dungeness River is 77% and Elwha River is 73% February runoff in the Dungeness River was 190% of normal. Big Quilcene and Wynoochee rivers may expect below average runoff this summer as well. February precipitation was 46% of average. Precipitation has accumulated at 104% of average for the water year. February precipitation at Quillayute was 79% of normal. Olympic Peninsula snowpack averaged a dismal 9% of normal on March 1, the lowest region in the state and falling within the driest 5% of data records. Temperatures were 4-6 degrees above average for February and 2-3 degrees above normal for the water year.

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

Data Current as of: 3/5/2015 12:04:50 PM

Olympic Penninsula
Streamflow Forecasts - March 1, 2015

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Olympic Penninsula	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Dungeness R nr Sequim								
	APR-JUL	60	71	79	66%	87	101	120
	APR-SEP	71	85	95	66%	105	122	145
Elwha R at McDonald Bridge nr Port Angeles								
	APR-JUL	215	245	270	68%	295	330	400
	APR-SEP	255	295	320	68%	350	395	470

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis March 1, 2015	# of Sites	% Median	Last Year % Median
Olympic Penninsula	6	2%	77%

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

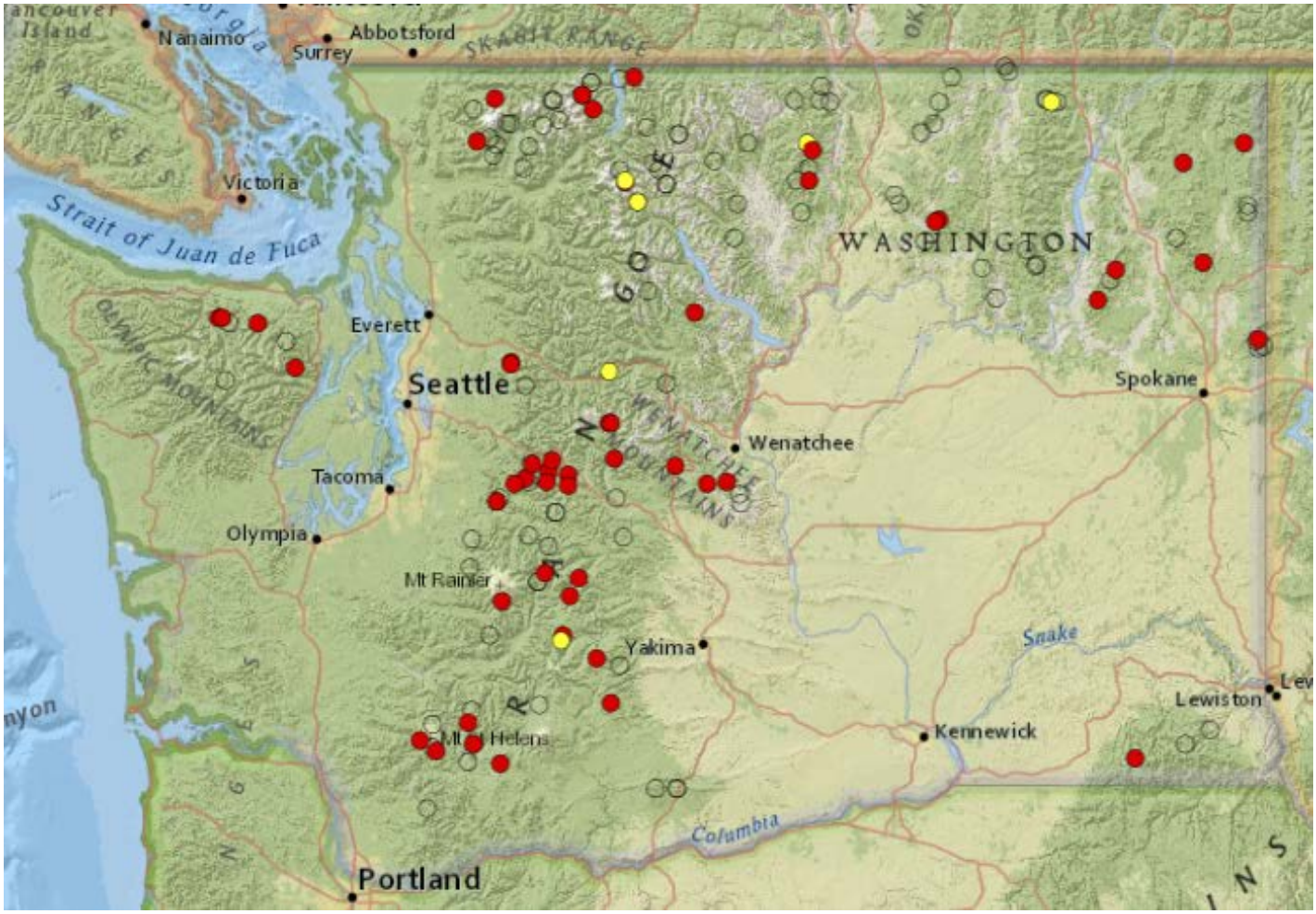
Washington Water Supply Outlook Report

Natural Resources Conservation Service
Spokane, WA

United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
April 1, 2015



A new map product is being introduced soon by the National Water and Climate Center depicting NRCS SNOTEL and Snow Course sites with new record low or near record low snow water equivalent (SWE) for April 2. Stations colored red are in record territory, while yellow shows stations at their second lowest record for the day. Stations with open circles have less than 20 years of record and most all of those have record lows.

Reminder: We are soliciting field work photos from our snow surveyors again this year. Each month we pick one to grace the cover of this report. The photographer will be given proper credit of course. Please include all specific information when submitting photos. Scott.pattee@wa.usda.gov

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

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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.

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Washington
Water Supply Outlook

April 2015

General Outlook

Some snow accumulated in the high country in Washington but added little to the over snowpack. Conditions have practically spun out of control to the point where 74% of our long-term snow monitoring sites have set new record low snow amounts. Many of them reporting in with zero snow for the first time in their history. As expected streamflow forecasts have also tanked in many areas and are also setting new record low flows. Another sort term storm cycle appears to be moving however the mid-month forecast indicates a return to warm and dry. Forecaster models are still holding to the same pattern for the long term. http://www.cpc.ncep.noaa.gov/

Snowpack

The April 1 statewide SNOTEL readings were 22% of normal shattering the previous record low of 33% set in 2005. The Cedar River was snow free followed closely by the Olympics at only 3% of the 30-year median for April 1, the lowest year on record in both basins since measurements began. Readings from the Methow River Basin reported the highest at 79% of normal for April 1. Westside medians from SNOTEL, and April 1 snow surveys, included the North Puget Sound river basins with 44% of normal, the Central and South Puget river basins with 4% and 27% respectively, and the Lower Columbia basins with 16% of normal. Snowpack along the east slopes of the Cascade Mountains included the Lower Yakima with 24% and the Wenatchee area with 34%. Snowpack in the Spokane River Basin was at 31% and the Walla Walla River Basin had 27% of the long term median.

BASIN	PERCENT OF NORMAL	PERCENT OF LAST YEAR
Spokane	31	116
Newman Lake	0	95
Pend Oreille	68	142
Okanogan	67	99
Methow	79	114
Conconully Lake	11	56
Central Columbia	34	102
Upper Yakima	11	101
Lower Yakima	24	98
Ahtanum Creek	19	82
Walla Walla	27	96
Lower Snake	44	112
Cowlitz	29	114
Lewis	3	73
White	41	105
Green	0	86
Puyallup	0	0
Cedar	2	91
Snoqualmie	3	96
Skykomish	6	94
Skagit	56	124
Nooksack	13	117
Baker	N/A	N/A
Olympic Peninsula	3	82

Precipitation

Precipitation fell in the form of rain only last month with near to slightly below average rainfall over most of the state. Even so the water-year to date precipitation remains near to slightly above normal in all basins. The Conconully Lake area was the driest at 48% of normal precipitation for March. Lyman Lake SNOTEL in the upper Chelan Basin measured 232% of normal rainfall for the month. Elbow Lake SNOTEL in the South Fork Nooksack River Basin continues to rein over the entire SNOTEL network with a water-year accumulation of 131.2 inches, 22 inches above normal or 120% of average for the water-year.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	108	92
Pend Oreille	89	101
Upper Columbia	71	101
Central Columbia	78	96
Upper Yakima	80	88
Lower Yakima	86	98
Walla Walla	73	91
Lower Snake	73	91
Lower Columbia	94	102
South Puget Sound	85	98
Central Puget Sound	87	97
North Puget Sound	100	112
Olympic Peninsula	72	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. More rainfall than snow has helped buffer many reservoirs to above normal levels for this time of year. In most cases managers are electing to hold this excess water due to the uncertainty of the snowpack. April 1 Reservoir storage in the Yakima Basin was 833,000-acre feet, 163% of average for the Upper Reaches and 232,000-acre feet or 153% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 227,000 acre feet, 137% of average and 95% of capacity; and the Skagit River reservoirs at 98% of average and 51% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	95	137
Pend Oreille	51	102
Upper Columbia	87	135
Central Columbia		
Upper Yakima	100	163
Lower Yakima	100	153
Lower Snake	93	133
North Puget Sound	51	98

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

Streamflow

April to September runoff forecasts for April 1 continued to drop since the March forecasts were issued due to the obvious lack of snowfall and above normal temperatures. March streamflows were mostly well above normal due to heavy rains and snow melt. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 53%; White River, 74%; and Skagit River, 81%. Some Eastern Washington streams include the Yakima River near Parker 36%, Wenatchee River at Plain 52%; and Spokane River near Post Falls 46%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. **The 50% chance of exceedance of average flows is normally used for planning purposes however with the current uncertainty in weather forecasts and the current lack of snow in most locations it may be advisable to use the 70-90% chance of exceedance to ensure adequate water supply this summer.**

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	46-59
Pend Oreille	51-89
Upper Columbia	39-92
Central Columbia	52-89
Upper Yakima	23-40
Lower Yakima	31-67
Walla Walla	76-63
Lower Snake	52-77
Lower Columbia	54-83
South Puget Sound	45-74
Central Puget Sound	42-68
North Puget Sound	66-86
Olympic Peninsula	57-58

STREAM	PERCENT OF AVERAGE MARCH STREAMFLOWS
Pend Oreille at Albeni Fall Dam	232
Kettle at Laurier	364
Columbia at Birchbank	210
Spokane at Spokane	124
Similkameen at Nighthawk	307
Okanogan at Tonasket	241
Methow at Pateros	317
Chelan at Chelan	196
Wenatchee at Pashastin	158
Cle Elum near Roslyn	136
Yakima at Parker	93
Naches at Naches	111
Grande Ronde at Troy	64
Snake below Lower Granite Dam	90
Columbia River at The Dalles	106
Lewis at Merwin Dam	62
Cowlitz below Mayfield Dam	89
Skagit at Concrete	124
Dungeness near Sequim	117

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

Soil Moisture

Near to above normal fall precipitation provided for wet and nearly saturated soils (60-70% saturation) as the snow finally began to accumulate in mid-December. Great fall soil moisture conditions can help buffer low snowpack runoff come spring. The recent dry spell has resulted in a slight reduction to stored soil moisture however levels are still in good shape. 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.

Natural Resources Conservation Service

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Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/

Oregon:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/

Idaho:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/

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

USDA-NRCS Agency Homepages

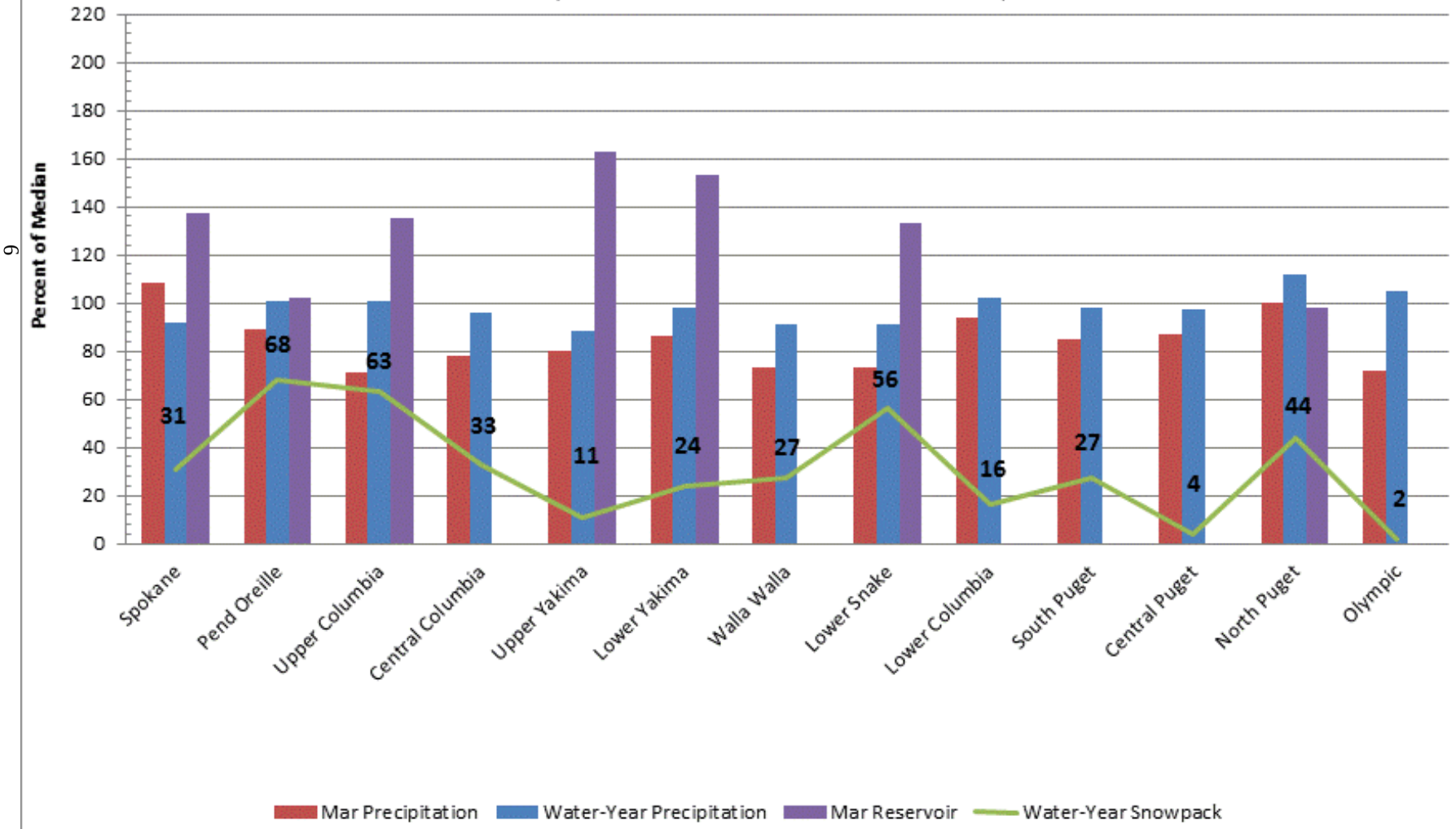
Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/

NRCS National:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

NRCS Natural Resources Conservation Service

April 1, 2015 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2014 - 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 Pacific Area Committee is making plans for the 83rd Annual Western Snow Conference in 2015.

Mark your calendar and start thinking about submitting a paper to attend the 2015 Western Snow Conference:

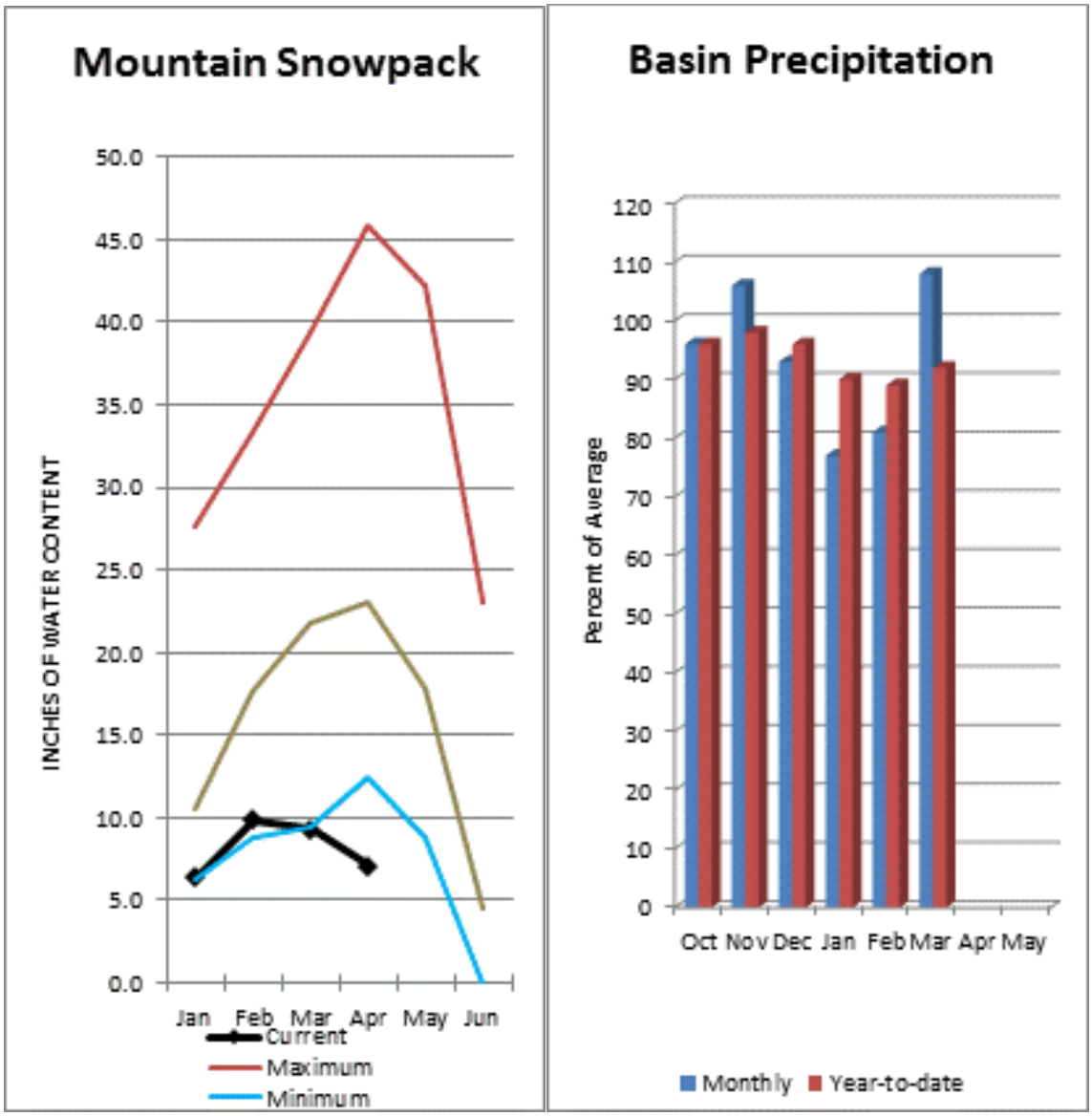
Dates: April 20-24, 2015
Location: Grass Valley, California

The Conference will begin Monday, April 20th with a short course and panel discussion on " LIDAR Basics, Applications, and Use in Snow Hydrology and Field Studies " with several invited experts in the field. Tuesday and Wednesday will include formal paper and poster presentations on a variety of topics, including climate variability, climate change impacts on snow and runoff, water management, water supply forecasting, and modeling and climatology of snow. Thursday will include a technical tour to visit hydrologic and gold mining points of interest around Grass Valley

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



The April 1 forecasts for summer runoff within the Spokane River Basin are 46% of average near Post Falls and 48% at Long Lake. The Chamokane River near Long Lake forecasted to have 59% of average flows for the May-August period. The forecast is based on a basin snowpack that is 31% of normal and precipitation that is 92% of average for the water year. Precipitation for March was near normal at 108% of average. Streamflow on the Spokane River at Spokane was 124% of average for March. April 1 storage in Coeur d'Alene Lake was 227,000 acre feet, 137% of average and 95% of capacity. Snowpack at Quartz Peak SNOTEL site was melted out by the 1st of the month. Normally the site would still have 19 inches of water content Average temperatures in the Spokane basin were 4-6 degrees above normal for March and 3-5 degrees above normal for the water year.

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

Data Current as of: 4/7/2015 8:59:22 AM

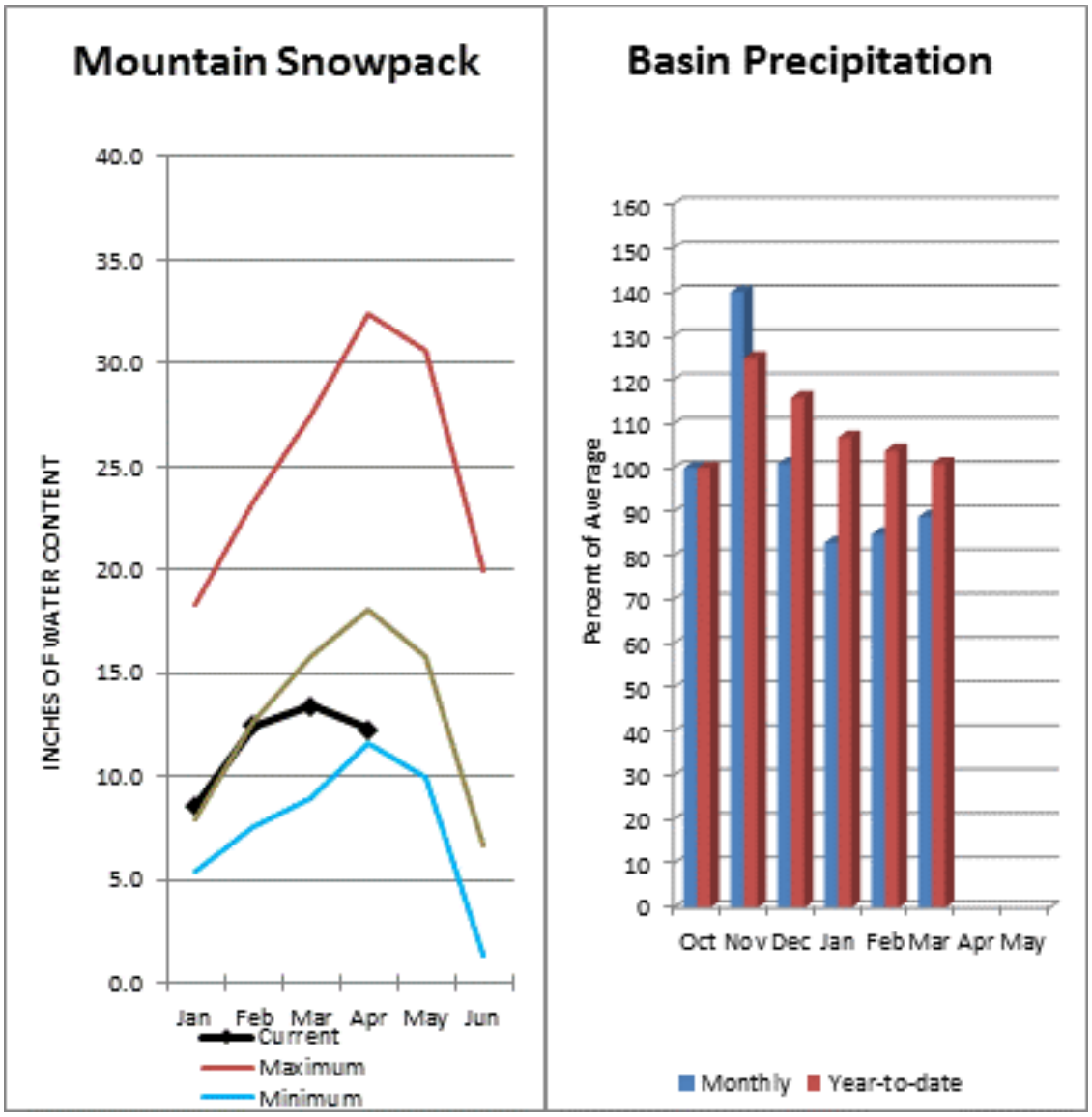
Spokane
Streamflow Forecasts - April 1, 2015

Spokane	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Spokane R nr Post Falls[2]								
	APR-JUL	540	875	1100	46%	1330	1660	2390
	APR-SEP	565	905	1140	46%	1370	1720	2480
Spokane R at Long Lake[2]								
	APR-JUL	585	950	1200	46%	1450	1810	2620
	APR-SEP	740	1120	1380	48%	1640	2020	2850
Chamokane Ck nr Long Lake								
	MAY-AUG	1.82	4	5.5	59%	7	9.2	9.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Coeur d' Alene	227.3	191.6	165.5	238.5
Basin-wide Total	227.3	191.6	165.5	238.5
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Spokane	16	31%	116%
Newman Lake	3	1%	95%



The April – September average forecast for the Priest River near the town of Priest River is 51% and the Pend Orielle below Box Canyon is 88%. March streamflow was 232% of average on the Pend Oreille River and 216% on the Columbia at Birchbank. April 1 snow cover was 68% of normal in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 12.9 inches of snow water on the snow pillow. Normally Bunchgrass would have 26.2 inches on April 1. Precipitation during March was 89% of average, keeping the year-to-date precipitation at 101% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 102% of normal. Average temperatures were 4-6 degrees above normal for March and 3-5 degrees above normal for the water year.

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

Data Current as of: 4/7/2015 8:59:25 AM

Pend Oreille Basins
Streamflow Forecasts - April 1, 2015

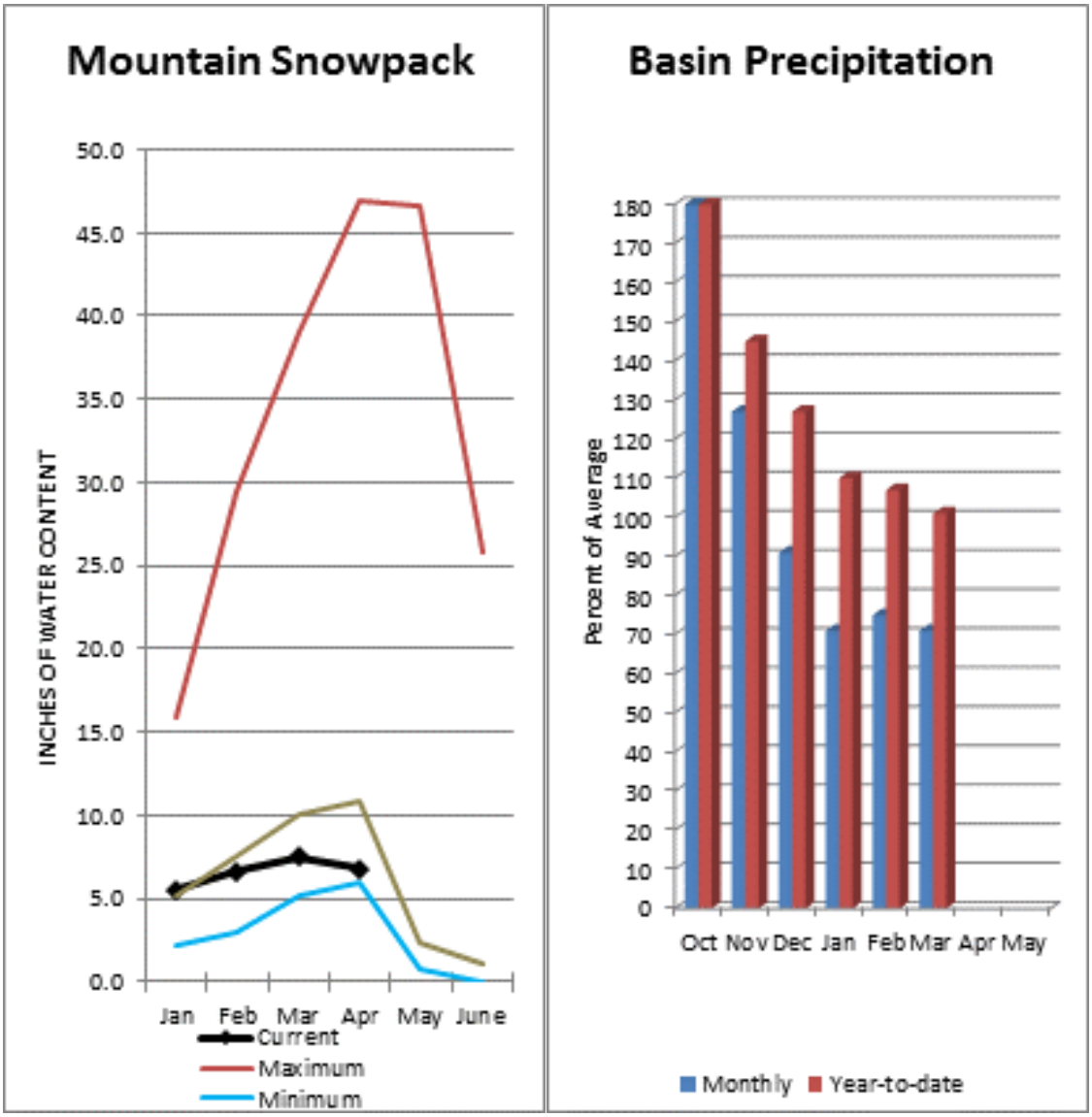
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Pend Oreille Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Pend Oreille Lake Inflow[2]								
	APR-JUL	8670	9700	10400	88%	11100	12100	11800
	APR-SEP	9380	10600	11400	89%	12200	13300	12800
Priest R nr Priest River[2]								
	APR-JUL	220	320	390	50%	460	560	780
	APR-SEP	245	350	420	51%	495	600	830
Pend Oreille R bl Box Canyon[2]								
	APR-JUL	8780	9830	10500	88%	11300	12300	11900
	APR-SEP	9520	10700	11500	88%	12400	13600	13000

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Pend Oreille	754.7	632.2	773.0	1561.3
Priest Lake	100.2	65.6	67.6	119.3
Basin-wide Total	854.9	697.8	840.6	1680.6
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Pend Oreille Basins	75	68%	142%
Colville River	3	4%	74%
Kettle River	8	63%	102%



Summer runoff average forecast for the Okanogan River is 74%, Similkameen River is 90%, Kettle River 49% and Methow River is 73%. April 1 snow cover on the Okanogan was 67% of normal, Omak Creek was 41% and the Methow was 79%. March precipitation in the Upper Columbia was 71% of average, with precipitation for the water year at 101% of average. March streamflow for the Methow River was 317% of average, 241% for the Okanogan River and 307% for the Similkameen. Salmon Meadows SNOTEL, in the Conconully Basin, was snow free on April 1. Combined storage in the Conconully Reservoirs was 20,400 acre-feet or 135% of normal. Temperatures were 4-6 degrees above normal for March and 2-4 degrees above for the water year.

Data Current as of: 4/7/2015 8:59:28 AM

Upper Columbia Basins
Streamflow Forecasts - April 1, 2015

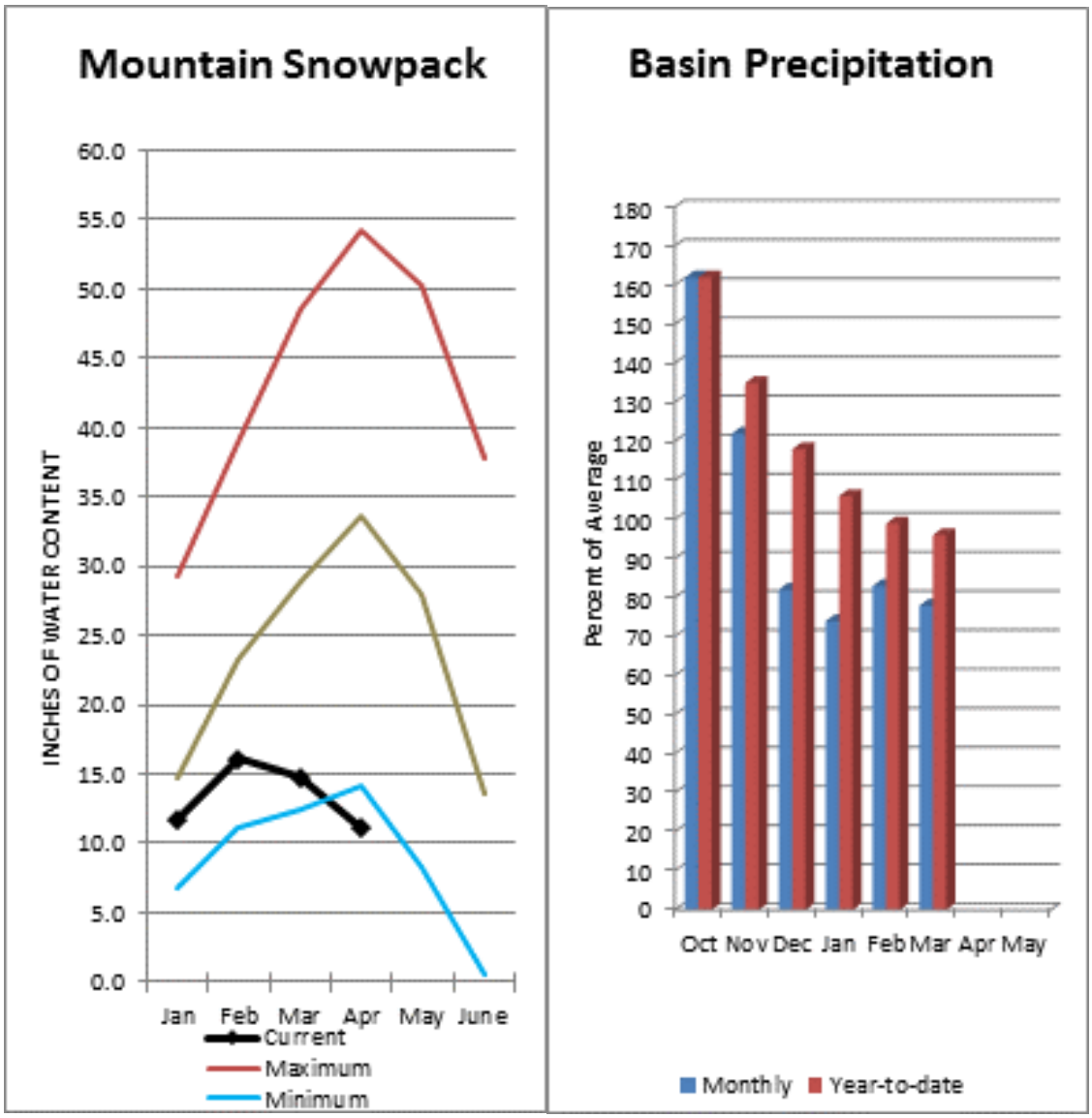
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Kettle R nr Laurier								
	APR-JUL	465	725	905	50%	1080	1340	1800
	APR-SEP	460	740	925	49%	1120	1390	1880
Colville R at Kettle Falls								
	APR-JUL	16.4	32	46	39%	62	90	119
	APR-SEP	18.9	36	51	39%	69	100	131
Columbia R at Grand Coulee[1,2]								
	APR-JUL	40300	43900	45500	89%	47200	50800	51015
	APR-SEP	46200	52100	54800	91%	57500	63300	60110
Similkameen R nr Nighthawk[1]								
	APR-JUL	735	970	1080	90%	1190	1420	1200
	APR-SEP	770	1030	1150	90%	1270	1520	1280
Okanogan R nr Tonasket[1]								
	APR-JUL	620	900	1030	70%	1160	1440	1480
	APR-SEP	690	1010	1160	70%	1310	1630	1650
Okanogan R at Malott[1]								
	APR-JUL	660	940	1070	74%	1200	1480	1450
	APR-SEP	730	1050	1200	74%	1350	1670	1620
Methow R nr Pateros								
	APR-JUL	470	555	610	73%	665	750	835
	APR-SEP	510	595	655	73%	715	805	895
Columbia R at Birchbank[1,2]								
	APR-JUL	27200	30100	31400	93%	32700	35600	33840
	APR-SEP	33900	37500	39200	94%	40800	44400	41750

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	7.7	9.3	7.3	10.5
Conconully Reservoir	12.8	11.6	7.8	13.0
Basin-wide Total	20.4	20.9	15.1	23.5
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Upper Columbia Basins	26	63%	102%
Okanogan River	14	67%	99%
Omak Creek	3	33%	64%
Sanpoil River	1		
Similkameen River	5	70%	122%
Toats Coulee Creek	4	48%	86%
Conconully Lake	3	11%	56%
Methow River	5	79%	114%



Precipitation during March was 78% of average in the basin and 96% for the year-to-date. Runoff for Entiat River is forecast to be 65% of average for the summer. The April-September average forecast for Chelan River is 69%, Wenatchee River at Plain is 52%, Stehekin River is 83% and Icicle Creek is 55%. March average streamflows on the Chelan River were 196% and on the Wenatchee River 158%. April 1 snowpack in the Wenatchee River Basin was 34% of normal; the Chelan, 63%; the Entiat, 0%; Stemilt Creek, 14% and Colockum Creek, 0%. Lyman Lake SNOTEL had the most snow water with 41.8 inches of water. This site would normally have 57.6 inches on April 1. Temperatures were 4-6 degrees above normal for March and 3-4 degrees above normal for the water year.

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

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Central Columbia Basins
Streamflow Forecasts - April 1, 2015

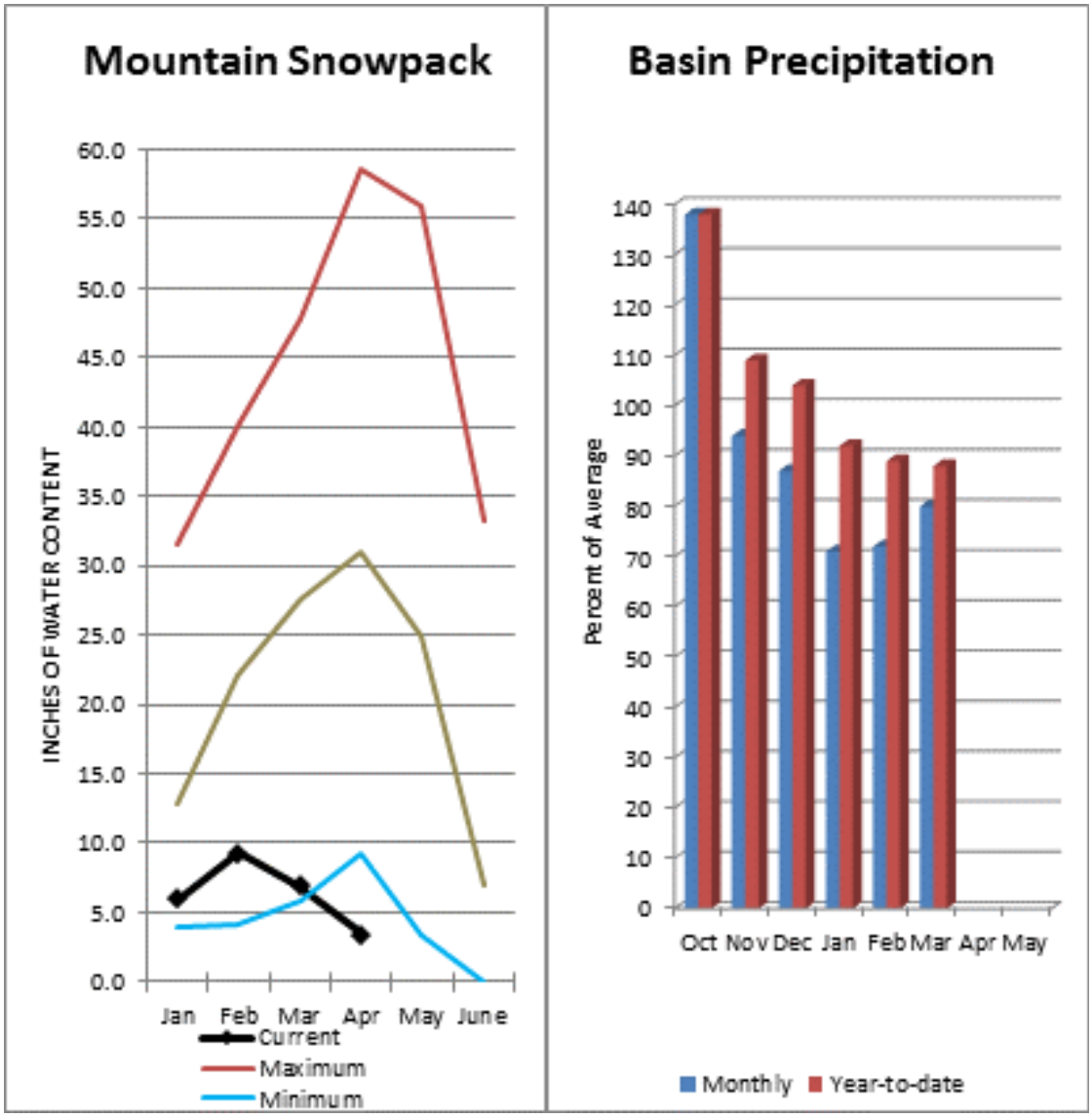
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Stehekin R at Stehekin								
	APR-JUL	470	530	570	84%	615	675	680
	APR-SEP	560	615	655	83%	695	755	790
Chelan R at Chelan								
	APR-JUL	625	680	715	72%	755	810	1000
	APR-SEP	685	740	775	69%	815	870	1120
Entiat R nr Ardenvoir								
	APR-JUL	109	124	134	67%	144	159	200
	APR-SEP	118	134	144	65%	155	170	220
Wenatchee R at Plain								
	APR-JUL	415	480	525	53%	570	640	990
	APR-SEP	440	510	560	52%	610	680	1080
Icicle Ck nr Leavenworth								
	APR-JUL	122	141	155	56%	168	188	275
	APR-SEP	128	150	165	55%	181	205	300
Wenatchee R at Peshastin								
	APR-JUL	595	680	740	54%	800	885	1370
	APR-SEP	620	720	785	53%	850	945	1490
Columbia R bl Rock Island Dam[2]								
	APR-JUL	42700	46400	48900	88%	51300	55000	55770
	APR-SEP	50900	55300	58200	89%	61100	65500	65200

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Chelan		227.6	256.1	676.1
Basin-wide Total		0.0	0.0	0.0
# of reservoirs	0	0	0	0

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Central Columbia Basins	3	63%	109%
Chelan Lake Basin	3	63%	109%
Entiat River	1	3%	100%
Wenatchee River	7	33%	103%
Stemilt Creek	1	14%	84%
Colockum Creek	1	5%	118%



April 1 reservoir storage for the Upper Yakima reservoirs was 833,000-acre feet, 163% of average. Forecasts for the Yakima River at Cle Elum are 40% of average and the Teanaway River near Cle Elum is at 23%. Lake inflows are all forecasted to be below average this summer as well. March streamflows within the basin were Cle Elum River near Roslyn at 200%. April 1 snowpack was 11% based upon 8 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 80% of average for March and 88% for the water-year. 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.

Data Current as of: 4/7/2015 8:59:34 AM

Upper Yakima River
Streamflow Forecasts - April 1, 2015

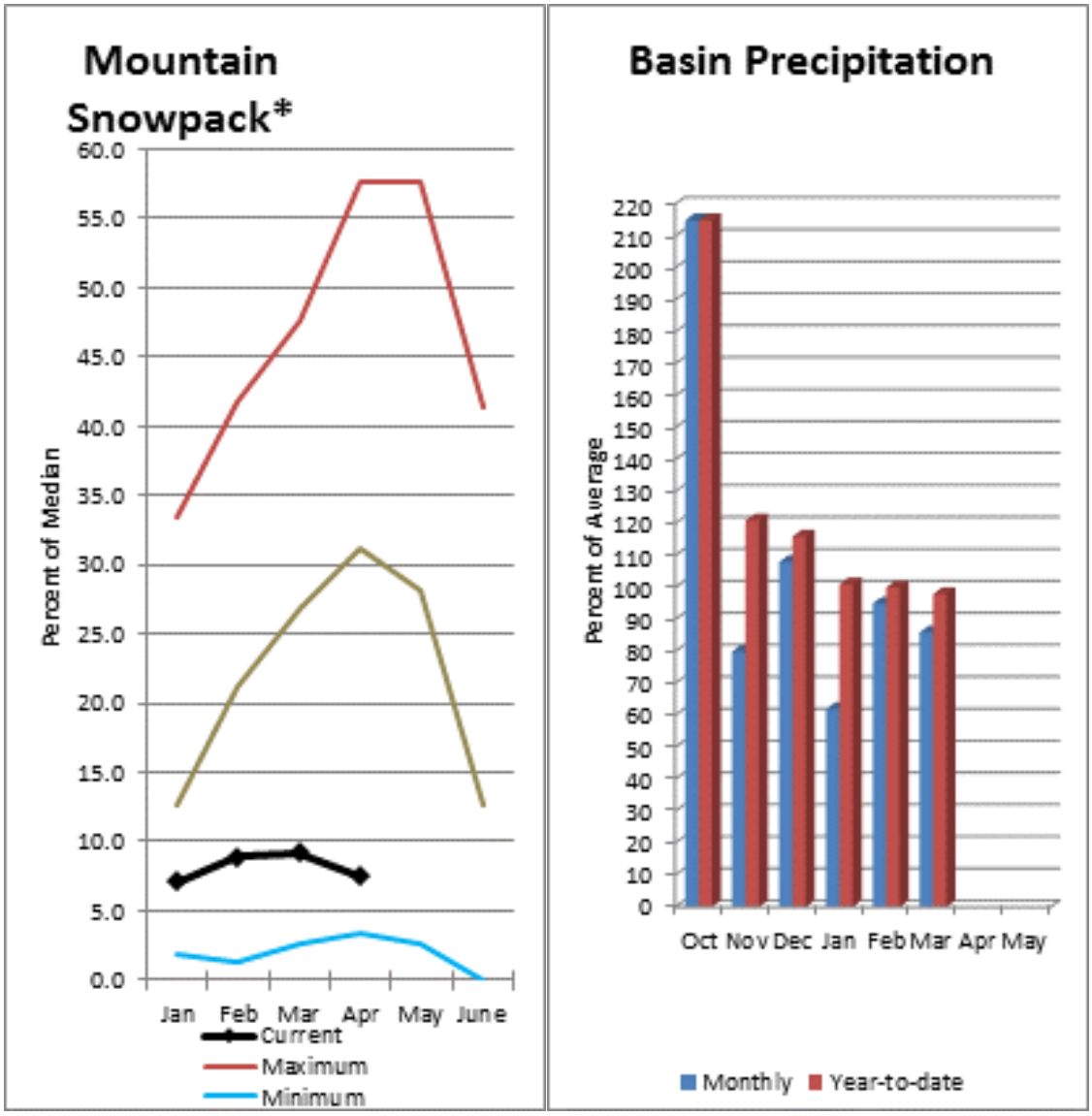
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Keechelus Reservoir Inflow[2]								
	APR-JUL	21	32	40	34%	47	59	116
	APR-SEP	26	38	46	37%	54	66	126
Kachess Reservoir Inflow [2]								
	APR-JUL	17.3	26	32	31%	38	47	104
	APR-SEP	23	32	38	34%	44	53	113
Cle Elum Lake Inflow [2]								
	APR-JUL	120	142	157	41%	171	193	385
	APR-SEP	124	150	167	40%	185	210	415
Yakima R at Cle Elum [2]								
	APR-JUL	143	215	265	35%	315	385	755
	APR-SEP	159	245	305	37%	365	455	830
Teanaway R bl Forks nr Cle Elum								
	APR-JUL	0.17	17.3	29	22%	41	58	130
	APR-SEP	1.03	18.3	30	23%	42	59	133

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Keechelus	158.1	137.3	106.3	157.8
Kachess	238.8	218.6	159.8	239.0
Cle Elum	436.3	254.4	246.3	436.9
Basin-wide Total	833.2	610.2	512.4	833.7
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Upper Yakima River	9	11%	103%



March average streamflows within the basin were: Yakima River near Parker, 93% and the Naches River near Naches, 111%. April 1 reservoir storage for Bumping and Rimrock reservoirs was 232,000-acre feet, 153% of average. Forecast averages for Yakima River near Parker are 36%; American River near Nile, 40%; Ahtanum Creek, 55%; and Klickitat River near Glenwood, 54%. April 1 snowpack was 24% based upon 7 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 30% of normal. Precipitation was 86% of average for March and 98% for the water-year. Temperatures were 4-8 degrees above normal for March and for 3-5 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.

Data Current as of: 4/7/2015 8:59:37 AM

Lower Yakima River
Streamflow Forecasts - April 1, 2015

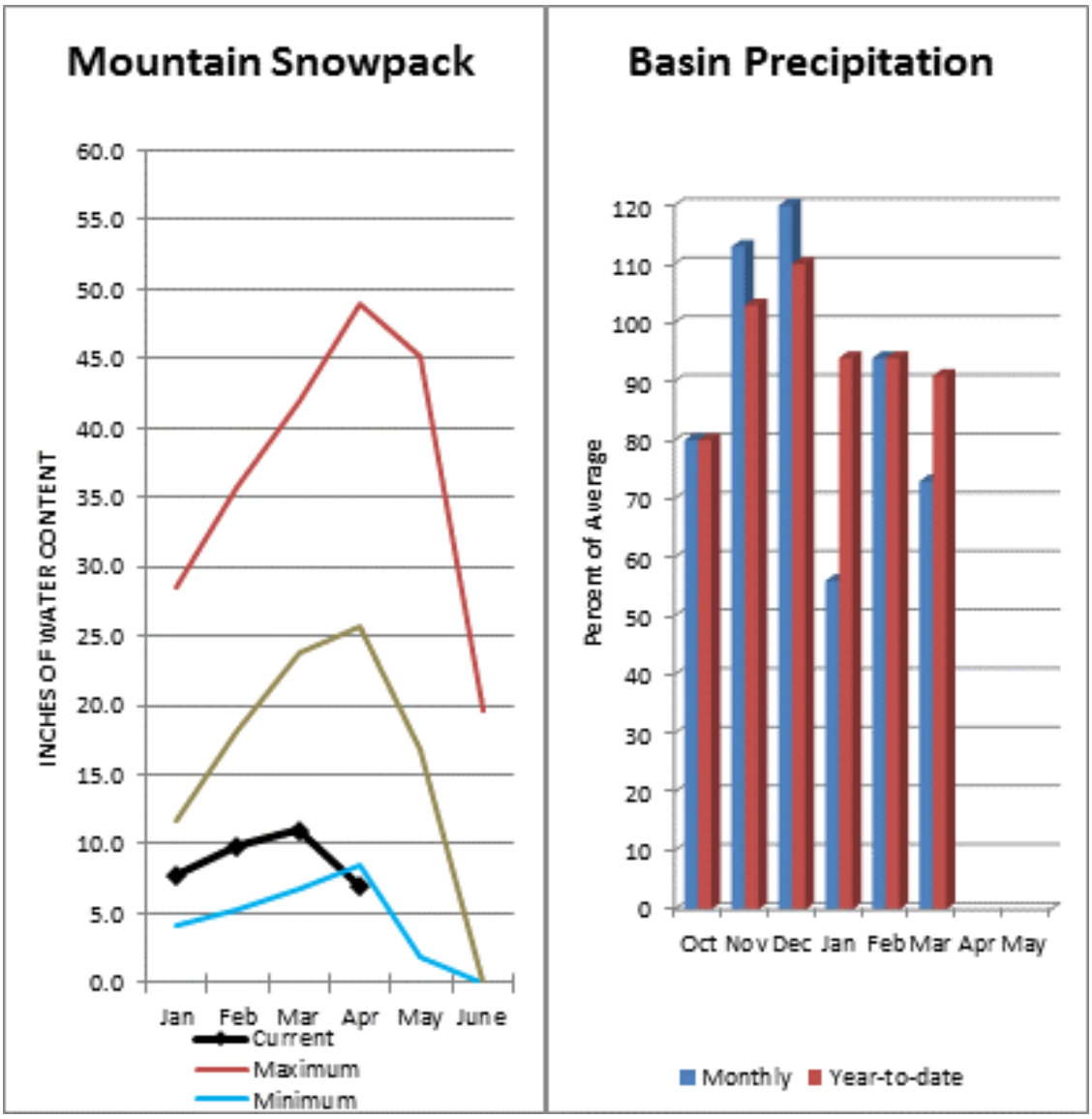
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bumping Lake Inflow [2]								
	APR-JUL	25	34	40	35%	46	54	114
	APR-SEP	25	35	41	33%	48	58	123
American R nr Nile								
	APR-JUL	28	37	42	41%	48	57	102
	APR-SEP	28	37	44	40%	50	60	110
Rimrock Lake Inflow [2]								
	APR-JUL	60	74	84	45%	94	108	187
	APR-SEP	69	87	100	45%	112	130	220
Naches R nr Naches								
	APR-JUL	122	177	215	31%	255	310	700
	APR-SEP	130	193	235	31%	275	340	760
Ahtanum Ck at Union Gap								
	APR-JUL	7.3	11.7	14.6	54%	17.5	22	27
	APR-SEP	8.7	13	16	55%	19	23	29
Yakima R nr Parker [2]								
	APR-JUL	380	505	590	36%	675	800	1660
	APR-SEP	435	565	655	36%	745	875	1820
Klickitat R nr Glenwood								
	APR-JUL	47	59	67	53%	75	87	126
	APR-SEP	52	66	75	54%	84	97	139
Klickitat R nr Pitt								
	APR-JUL	197	245	280	64%	310	360	435
	APR-SEP	255	310	350	67%	390	445	520

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bumping Lake	34.0	20.0	14.6	33.7
Rimrock	197.9	181.4	136.6	198.0
Basin-wide Total	231.9	201.5	151.2	231.7
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Lower Yakima River	7	24%	98%
Ahtanum Creek	2	19%	82%



March precipitation was 73% of average, maintaining the year-to-date precipitation at 91% of average. Snowpack in the basin was 27% of normal. Streamflow forecasts are 63% of average for Mill Creek and 76% for the SF Walla Walla near Milton-Freewater. Average temperatures were 4-6 degrees above normal for March and 3-5 degrees above normal for the water year.

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

Data Current as of: 4/7/2015 8:59:41 AM

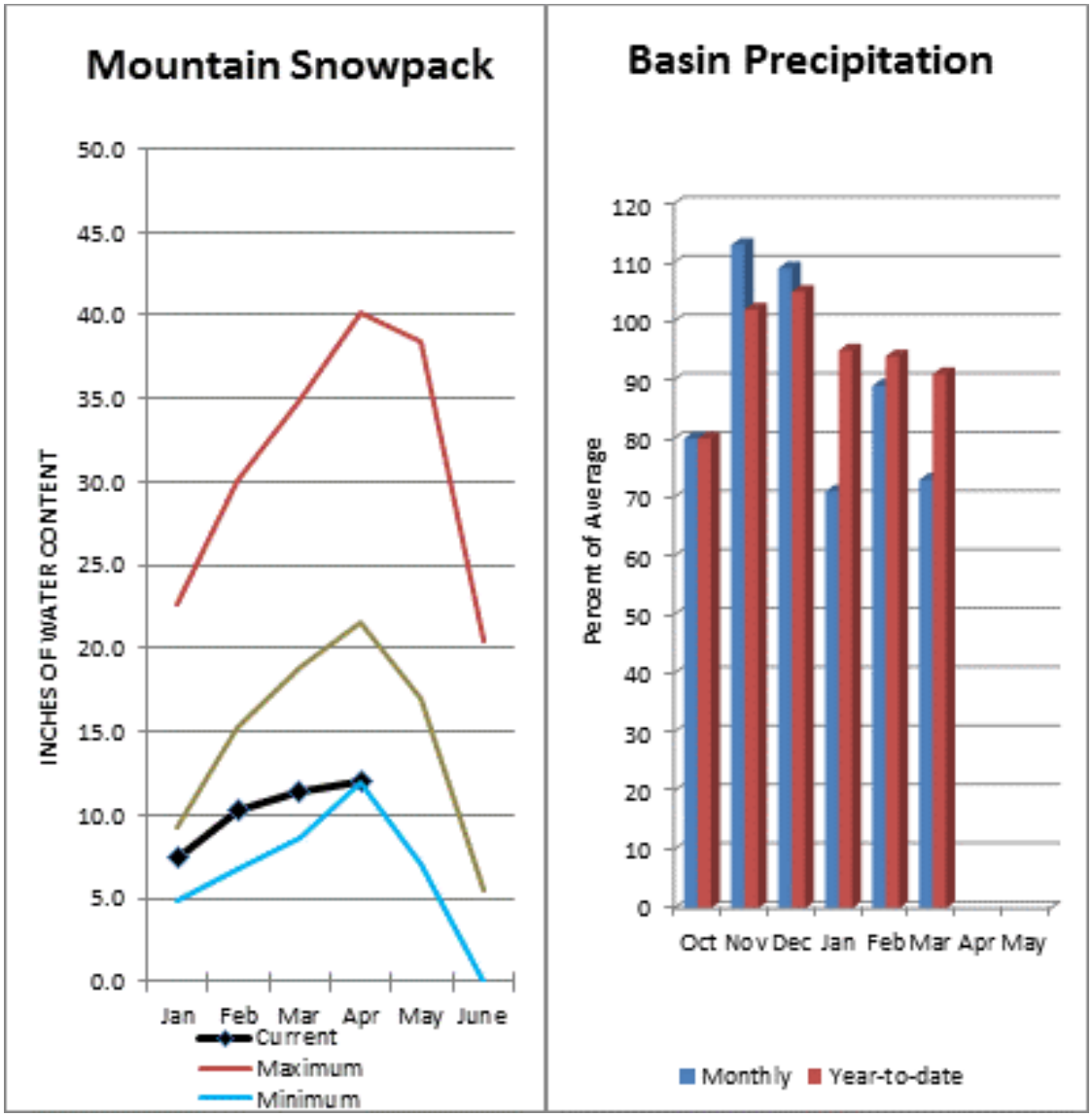
Walla Walla River
Streamflow Forecasts - April 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Walla Walla River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
SF Walla Wall R nr Milton-Freewater								
	APR-JUL	27	35	40	74%	45	53	54
	APR-SEP	36	44	50	76%	56	64	66
Mill Ck nr Walla Walla								
	APR-JUL	7.3	11.6	14.5	60%	17.4	22	24
	APR-SEP	9.4	14	17	63%	20	25	27

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Walla Walla River	2	27%	96%



The Grande Ronde River can expect summer flows to be about 92% of normal. The forecast for Asotin Creek at Asotin predicts 60% of average flows for the April – July runoff period. March precipitation was 73% of average, bringing the year-to-date precipitation to 91% of average. April 1 snowpack readings averaged 44% of normal. March streamflow was 90% of average for Snake River below Lower Granite Dam and 64% for Grande Ronde River near Troy. Dworshak Reservoir storage was 133% of average. Average temperatures were 4-6 degrees above normal for March and 3-5 degrees above for the water year.

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

Data Current as of: 4/7/2015 8:59:44 AM

Lower Snake, Grande Ronde, Clearwater Basins
Streamflow Forecasts - April 1, 2015

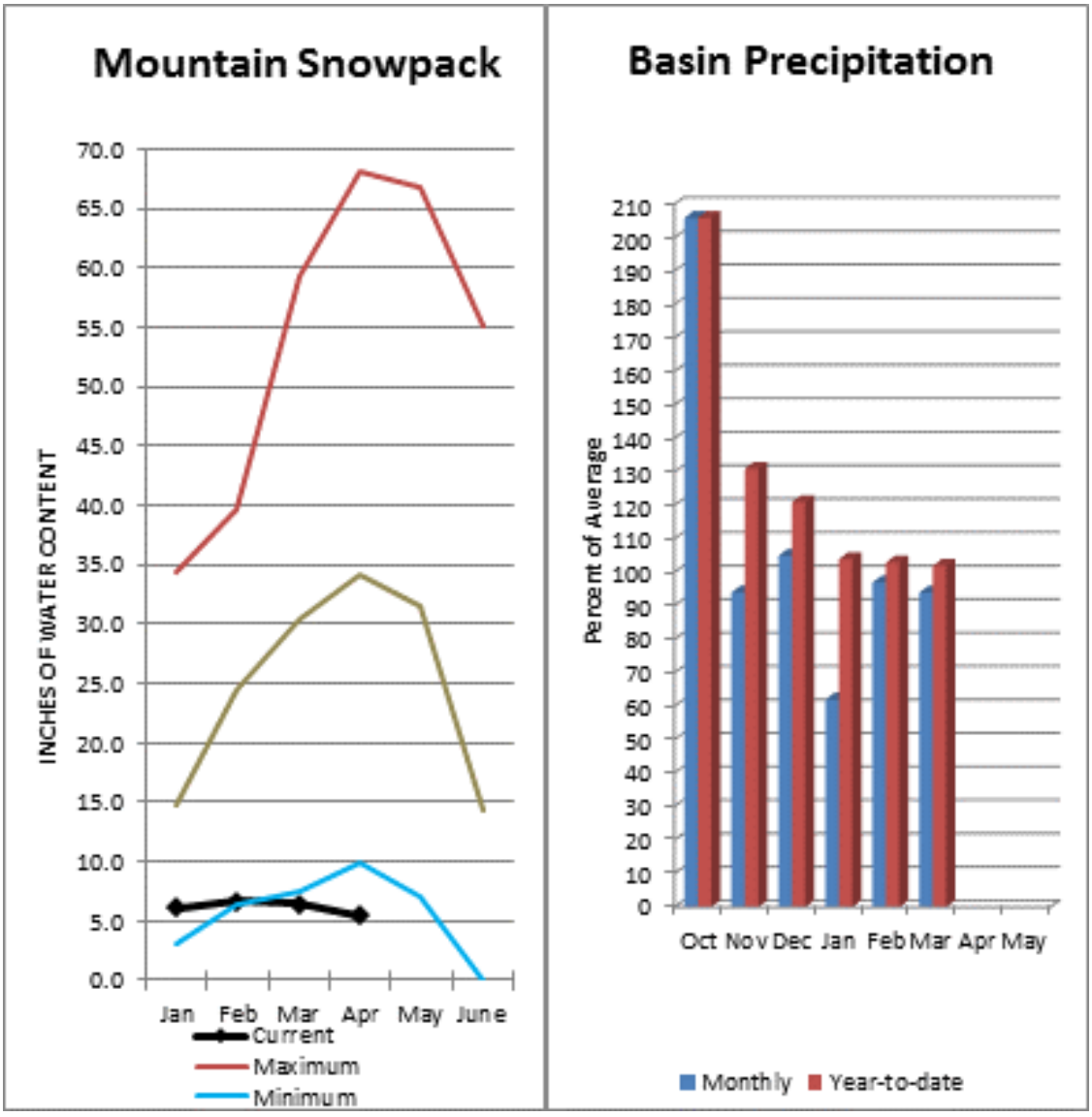
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake, Grande Ronde, Clearwater Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Grande Ronde R at Troy								
	APR-JUL	405	535	630	52%	735	905	1220
	APR-SEP	445	580	680	52%	790	970	1310
Asotin Ck at Asotin								
	APR-JUL	8.3	15.9	21	60%	26	34	35
Clearwater R at Spalding[2]								
	APR-JUL	3990	4760	5280	77%	5800	6570	6890
	APR-SEP	4250	5060	5610	77%	6160	6970	7270
Snake R bl Lower Granite Dam[12]								
	APR-JUL	8480	11900	13400	68%	14900	18300	19848
	APR-SEP	10200	14000	15700	70%	17400	21200	22280

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	3214.1	2124.6	2417.0	3468.0
Basin-wide Total	3214.1	2124.6	2417.0	3468.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Lower Snake, Grande Ronde, Clearwater Basins	16	54%	115%



Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 75% and Cowlitz River at Castle Rock, 67% of average. The Columbia at The Dalles is forecasted to have 83% of average flows this summer according to the River Forecast Center. March average streamflow for Cowlitz River was 89%. The Columbia River at The Dalles was 106% of average. March precipitation was 94% of average and the water-year average was 102%. April 1 snow cover for Cowlitz River was 29%, and Lewis River was 3% of normal. Temperatures were 2-4 degrees above normal during March and for the water year.

Data Current as of: 4/7/2015 8:59:46 AM

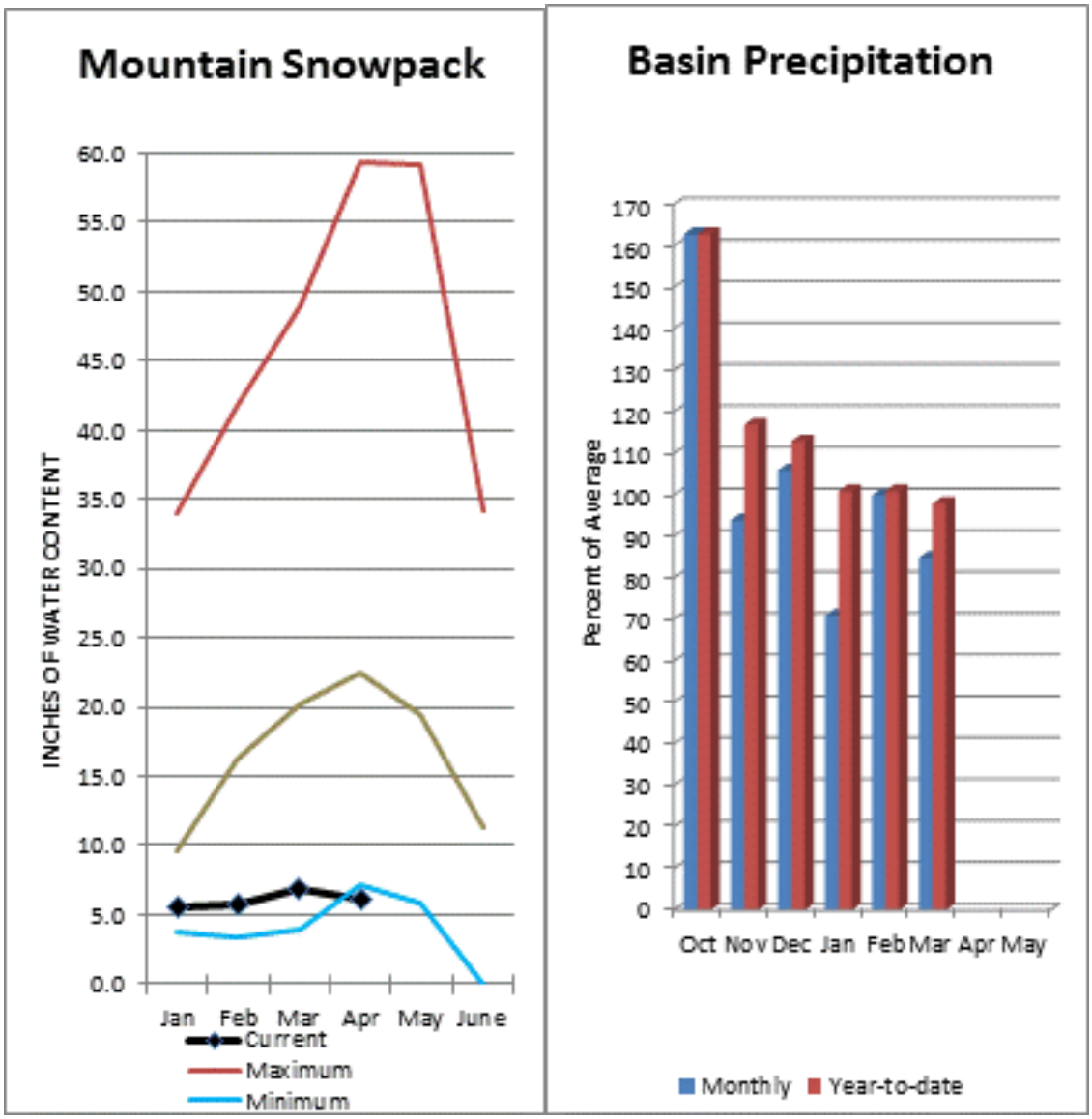
Lower Columbia Basins
Streamflow Forecasts - April 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Columbia R at The Dalles[2]								
	APR-JUL	55700	61100	64800	81%	68500	73900	79855
	APR-SEP	66300	72600	76900	83%	81300	87600	92704
Klickitat R nr Glenwood								
	APR-JUL	47	59	67	53%	75	87	126
	APR-SEP	52	66	75	54%	84	97	139
Klickitat R nr Pitt								
	APR-JUL	197	245	280	64%	310	360	435
	APR-SEP	255	310	350	67%	390	445	520
Lewis R at Ariel[2]								
	APR-JUL	435	605	720	74%	835	1000	970
	APR-SEP	540	715	835	75%	955	1130	1120
Cowlitz R bl Mayfiled[2]								
	APR-JUL	715	920	1060	65%	1200	1410	1620
	APR-SEP	840	1060	1220	66%	1370	1600	1840
Cowlitz R at Castle Rock[2]								
	APR-JUL	970	1270	1470	66%	1670	1970	2230
	APR-SEP	1170	1490	1700	67%	1910	2220	2520

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Lower Columbia Basins	11	16%	93%
Lewis River	5	3%	73%
Cowlitz River	6	29%	114%



Summer runoff is forecast to be 45% of normal for the Green River below Howard Hanson Dam and 74% for the White River near Buckley. April 1 snowpack was 41% of average for the White River. Both the Puyallup and Green River basins had melted out prior to April 1. March precipitation was 85% of average, bringing the water year-to-date to 98% of average for the basins. Average temperatures in the area were 2-4 degrees above normal for March and for the water-year.

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

Data Current as of: 4/7/2015 8:59:49 AM

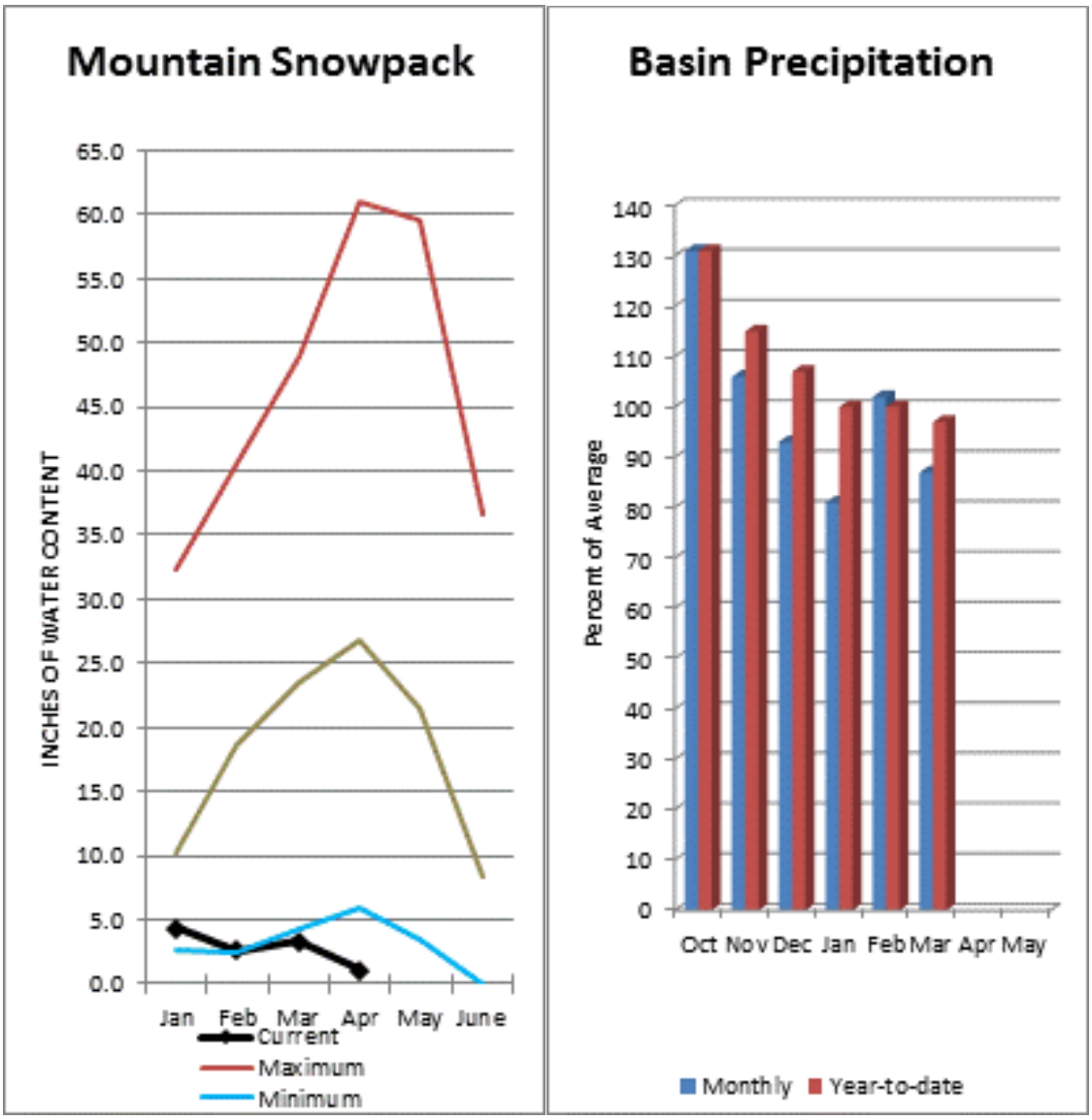
South Puget Sound Basins
Streamflow Forecasts - April 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

South Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
White R nr Buckley[1,2]								
	APR-JUL	186	270	310	72%	345	430	430
	APR-SEP	240	335	380	74%	420	515	515
Green R bl Howard A Hanson Dam[1,2]								
	APR-JUL	17.9	77	104	44%	131	190	235
	APR-SEP	28	89	117	45%	145	205	260

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
South Puget Sound Basins	12	27%	100%
White River	3	41%	105%
Green River	4	0%	86%



Forecast for spring and summer flows are: 51% for Cedar River near Cedar Falls; 42% for Rex River; 66% for South Fork of the Tolt River; and 68% for Taylor Creek near Selleck. Basin-wide precipitation for March was 87% of average, bringing water-year-to-date to 97% of average. Thanks to an end of month snow storm both the Cedar River and Tolt River basins picked up a wee bit of snow, but only enough to last a day or two. Snoqualmie River Basin was 3%, and Skykomish River Basin was 6%. This is a new all-time record low for April 1 snow survey at Alpine Meadows, since records began in 1969. Temperatures were 2-4 degrees above normal for March and for the water-year.

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

Data Current as of: 4/7/2015 8:59:52 AM

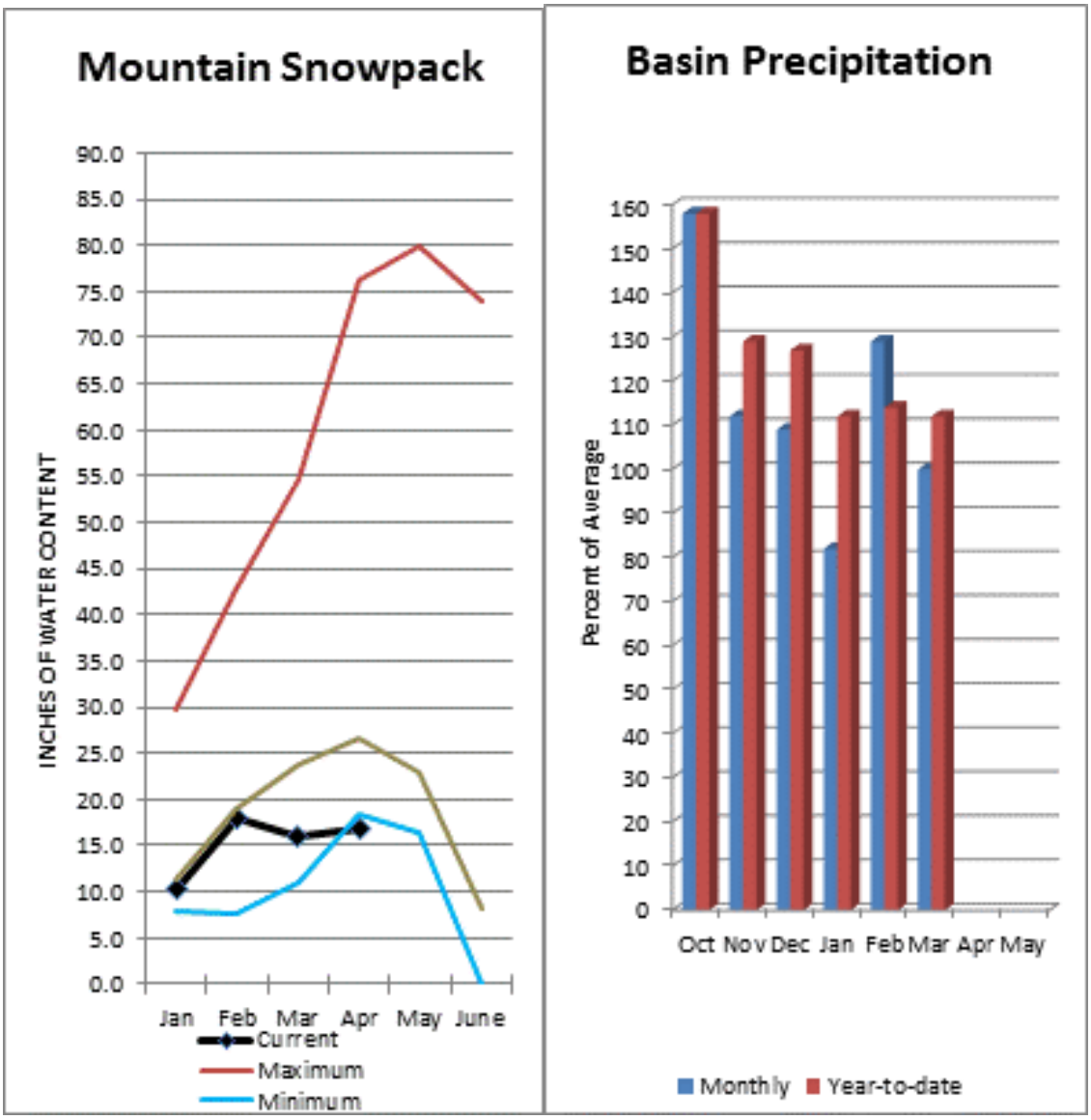
Central Puget Sound Basins
Streamflow Forecasts - April 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Cedar R nr Cedar Falls								
	APR-JUL	21	29	35	50%	41	49	70
	APR-SEP	24	33	39	51%	45	54	76
Rex R nr Cedar Falls								
	APR-JUL	3.5	7.4	10	42%	12.6	16.5	24
	APR-SEP	4.4	8.5	11.3	42%	14.1	18.2	27
Taylor Ck nr Selleck								
	APR-JUL	9.4	11.9	13.6	68%	15.3	17.8	20
	APR-SEP	11.6	14.4	16.3	68%	18.2	21	24
SF Tolt R nr Index								
	APR-JUL	5.7	7.8	9.2	65%	10.7	12.8	14.2
	APR-SEP	6.4	8.9	10.6	66%	12.3	14.8	16.1

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Central Puget Sound Basins	15	4%	97%
Puyallup River	5	35%	105%
Cedar River	6	2%	91%
Tolt River	3	1%	100%
Snoqualimie River	5	3%	99%
Skykomish River	3	6%	94%



Forecast for Skagit River streamflow at Newhalem is 81% of average for the spring and summer period. March streamflow in Skagit River was 124% of average. Other forecast points included Baker River at 66% and Thunder Creek at 86% of average. Basin-wide precipitation for March was 100% of average, bringing water-year-to-date to 112% of average. April 1 average snow cover in Skagit River Basin was 56%, Nooksack River Basin was 13% and Baker River Basin was not available. April 1 Skagit River reservoir storage was 98% of average and 51% of capacity. Average temperatures were 2-4 degrees above normal for March and 2-3 degrees above for the water year.

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

Data Current as of: 4/7/2015 8:59:55 AM

North Puget Sound Basins
Streamflow Forecasts - April 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

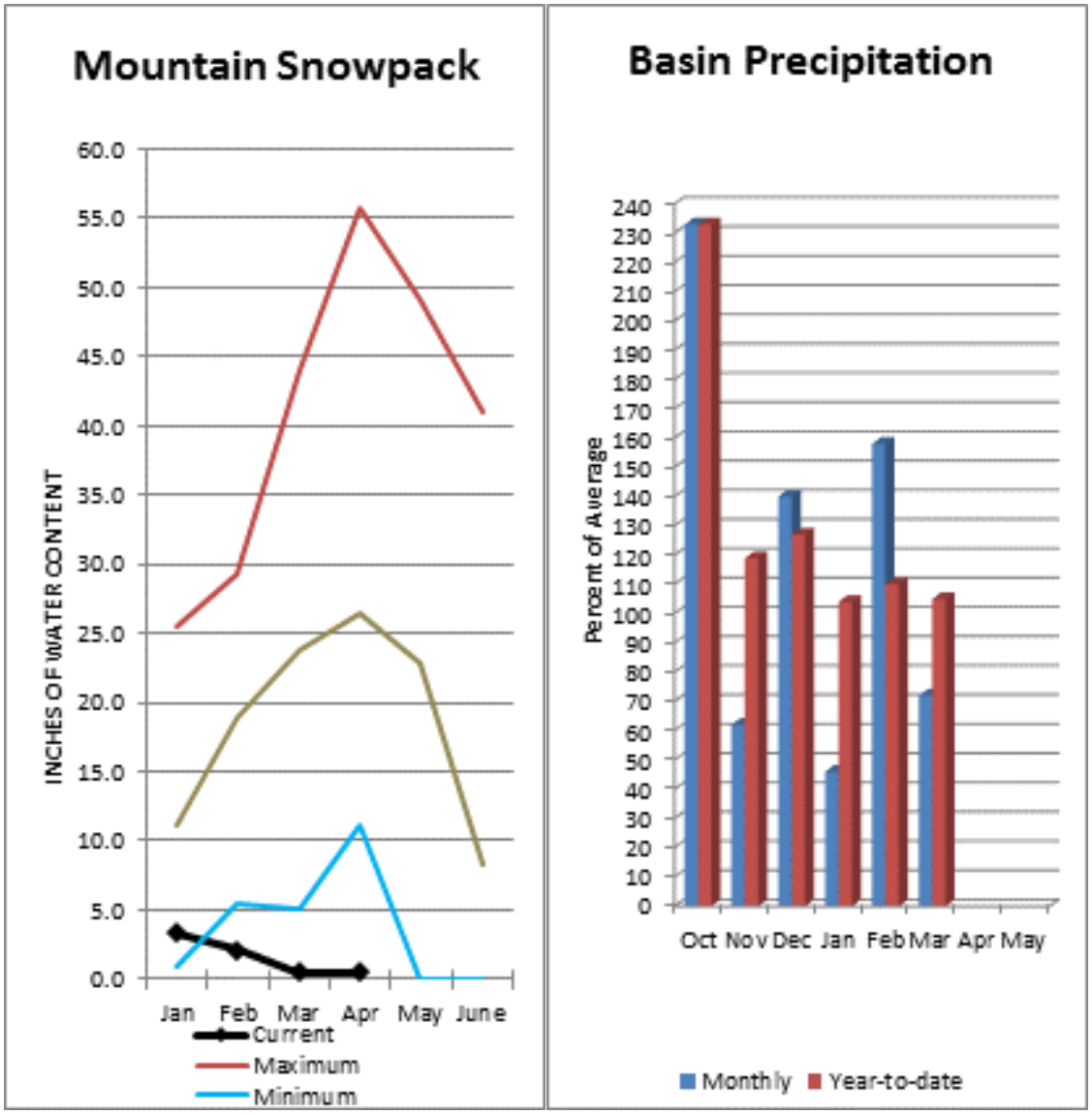
North Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Thunder Ck nr Newhalem								
	APR-JUL	169	187	200	85%	215	230	235
	APR-SEP	250	270	285	86%	300	320	330
Skagit R at Newhalem[2]								
	APR-JUL	1210	1310	1390	83%	1460	1560	1680
	APR-SEP	1440	1560	1650	81%	1730	1860	2030
Baker R at Concrete								
	APR-JUL	390	460	510	65%	555	625	780
	APR-SEP	500	585	645	66%	700	785	980

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of March, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ross	712.5	417.5	730.5	1404.1
Diablo Reservoir			86.0	90.6
Basin-wide Total	712.5	417.5	730.5	1404.1
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
North Puget Sound Basins	23	36%	116%
Skagit River	13	56%	124%
Baker River	7	28%	110%
Nooksack River	3	13%	117%

Olympic Peninsula River Basins



Forecasted average runoff for streamflow for the Dungeness River is 58% and Elwha River is 57% March runoff in the Dungeness River was 190% of normal. Big Quilcene and Wynoochee rivers may expect below average runoff this summer as well. March precipitation was 72% of average. Precipitation has accumulated at 105% of average for the water year. March precipitation at Quillayute was 136% of normal. Olympic Peninsula snowpack averaged a dismal 3% of normal on April 1. With average water content of only 0.8 inches the Olympics shattered to previous record of 11.2 inches in 2005. Temperatures were 4-6 degrees above average for March and 2-3 degrees above normal for the water year.

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

Data Current as of: 4/7/2015 8:59:58 AM

Olympic Penninsula
Streamflow Forecasts - April 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Olympic Penninsula	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Dungeness R nr Sequim								
	APR-JUL	46	60	70	58%	80	94	120
	APR-SEP	53	72	84	58%	96	115	145
Elwha R at McDonald Bridge nr Port Angeles								
	APR-JUL	173	210	235	59%	265	300	400
	APR-SEP	194	240	270	57%	300	345	470

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis April 1, 2015	# of Sites	% Median	Last Year % Median
Olympic Penninsula	6	2%	82%

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

United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
May 1, 2015

Glacier Lilies blooming on the Cox Valley snow course where there would normally be 80” of snow, April 29, 2015. Picture by Bill Baccus, Olympic NPS.

Cox Valley snow course is just one of eleven long-term measurement sites in Washington that were snow free for the very first time. The second lowest year at Cox Valley was in 2005 when it measured 4.4” of water content.

98 snow sites were measured in Washington on May 1 and 66 of those were snow free. 77% of all long-term sites (23+ years) recorded record low SWE for May 1.

With record low snowpack comes a change in peak accumulation and timing of that peak. Looking only at long-term sites 17 of 34 sites recorded the earliest peak on record which was 48 days early on average. Average peak SWE was only 36% of normal.

Paradise SNOTEL recorded the largest deficit with 50” of SWE less than the normal peak. Olallie Meadows followed closely behind with a deficit of 46”.

Reminder: We are soliciting field work photos from our snow surveyors again this year. Each month we pick one to grace the cover of this report. The photographer will be given proper credit of course. Please include all specific information when submitting photos. Scott.pattee@wa.usda.gov

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

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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.

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Washington
Water Supply Outlook

May 2015

General Outlook

It's official winter is over. Statewide we received about 60% of normal precipitation in April with minimal amounts falling in the form of mountain snow. The meager storm activity in April was just not enough to make any difference for summer water supply since the melt cycle was already in the advanced stages and in fact many sites had melted out weeks ahead of schedule. Streamflow forecasts for May-September runoff have also dropped as would be expected under current conditions. Drought conditions continue to worsen with severe drought status creeping in the South Central part of the state. Both short and long term weather forecasts call for persistence of above normal temperatures with slightly below to normal precipitation. However it's worth mentioning that now is the time of year when even "normal" precipitation doesn't amount to very much as it is.
http://www.cpc.ncep.noaa.gov/

Snowpack

The May 1 statewide SNOTEL readings were 17% of normal which continues to be an all-time record low. Seven basins were snow free on the 1st of the month including Newman Lake, Conconully, Walla Walla, Lewis, Cedar and the Olympics. Readings from the Methow River Basin remained steady from last month at 79% of normal on May 1. Westside medians from SNOTEL, and May 1 snow surveys, included the North Puget Sound river basins with 30% of normal, the Central and South Puget river basins with 1% and 28% respectively, and the Lower Columbia basins with 13% of normal. Snowpack along the east slopes of the Cascade Mountains included the Lower Yakima with 19% the Wenatchee area with 29% and the Chelan Lake Basin with 53%. Snowpack in the Spokane River Basin was at 23% of the long term median.

BASIN	PERCENT OF NORMAL	LAST YEAR PERCENT OF NORMAL
Spokane	23	132
Newman Lake	0	74
Pend Oreille	66	161
Okanogan	73	128
Methow	79	119
Conconully Lake	0	0
Central Columbia	29	108
Upper Yakima	2	106
Lower Yakima	19	102
Ahtanum Creek	1	71
Walla Walla	0	116
Lower Snake	32	127
Cowlitz	25	125
Lewis	0	76
White	37	114
Green	0	77
Puyallup	33	116
Cedar	0	112
Snoqualmie	1	112
Skykomish	1	103
Skagit	54	124
Nooksack	14	117
Baker	15	114
Olympic Peninsula	0	88

Precipitation

Seasonally moderate temperatures brought both snow and rain but not in enough quantity to make any real difference. Overall the east side of the state captured about 50% of normal precipitation while the west side did a little better at about 70% of normal. The Upper Columbia area was the driest at 31% of normal precipitation for April. All three SNOTEL sites within the Nooksack drainage received at least 80% of normal rainfall last month. Elbow Lake SNOTEL in the South Fork Nooksack River Basin continues to rein over the entire SNOTEL network with a water-year accumulation of 137.9 inches, 20 inches above normal or 117% of average for the water-year.

RIVER BASIN	APRIL PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	55	88
Pend Oreille	54	95
Upper Columbia	31	95
Central Columbia	52	93
Upper Yakima	46	84
Lower Yakima	58	95
Walla Walla	41	86
Lower Snake	51	86
Lower Columbia	53	98
South Puget Sound	71	96
Central Puget Sound	72	96
North Puget Sound	69	109
Olympic Peninsula	74	103

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. Most reservoirs filled early this year due to winter rain storms. In most cases managers elected to hold this excess winter water due to the uncertainty of the snowpack. May 1 Reservoir storage in the Yakima Basin was 805,000-acre feet, 132% of average for the Upper Reaches and 225,000-acre feet or 126% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 209,000 acre feet, 92% of average and 88% of capacity; and the Skagit River reservoirs at 94% of average and 51% of capacity. Due to the absents of low elevation snow pack many of the irrigation reservoirs have been forced to begin drafting in order to supplement natural flow and provide early season irrigation needs. 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	88	92
Pend Oreille	56	90
Upper Columbia	91	130
Central Columbia		
Upper Yakima	97	132
Lower Yakima	97	126
Lower Snake	93	122
North Puget Sound	51	94

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

Streamflow

May to September runoff forecasts for May 1 continued to drop since the April forecasts were issued due to the obvious lack of new snowfall and below average precipitation. April streamflows were near to below normal due mostly to the lack of rain and near normal temperatures. May-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 45%; White River, 69%; and Skagit River, 76%. Some Eastern Washington streams include the Yakima River near Parker 27%, Wenatchee River at Plain 47%; and Spokane River near Post Falls 34%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. **The 50% chance of exceedance forecast is normally used for planning purposes however with the current uncertainty in weather forecasts and the current lack of snow in most locations it may be advisable to use the 70-90% chance of exceedance volumes to ensure adequate water supply this summer. Please refer to the forecast chart for each basin in the pages below as well as the "Interpreting Water Supply Forecasts" web page: http://www.wcc.nrcs.usda.gov/factpub/intrpret.html**

BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	34-47
Pend Oreille	54-80
Upper Columbia	31-72
Central Columbia	47-65
Upper Yakima	18-33
Lower Yakima	8-46
Walla Walla	58-69
Lower Snake	36-65
Lower Columbia	25-79
South Puget Sound	50-69
Central Puget Sound	45-65
North Puget Sound	69-89
Olympic Peninsula	47-53

STREAM	PERCENT OF AVERAGE APRIL STREAMFLOWS
Pend Oreille at Albeni Fall Dam	104
Kettle at Laurier	113
Columbia at Birchbank	107
Spokane at Spokane	58
Similkameen at Nighthawk	138
Okanogan at Tonasket	165
Methow at Pateros	158
Chelan at Chelan	92
Wenatchee at Pashastin	76
Cle Elum near Roslyn	52
Yakima at Parker	45
Naches at Naches	49
Grande Ronde at Troy	42
Snake below Lower Granite Dam	64
Columbia River at The Dalles	83
Lewis at Merwin Dam	52
Cowlitz below Mayfield Dam	65
Skagit at Concrete	92
Dungeness near Sequim	75

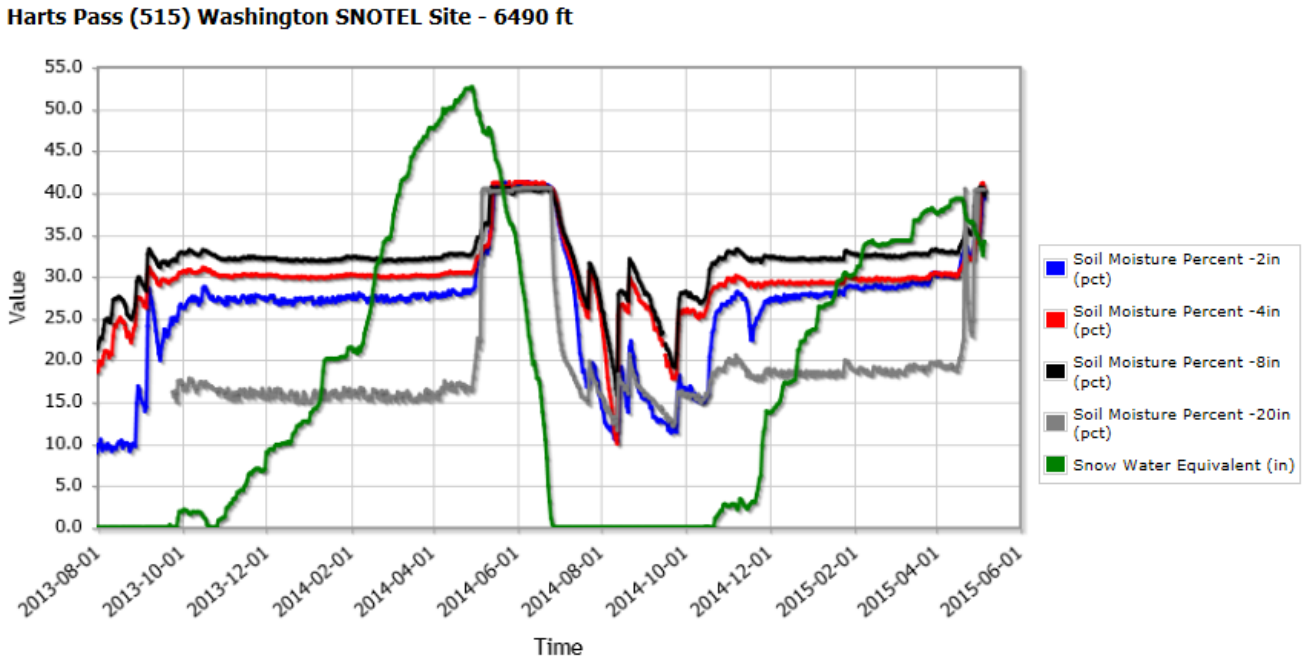
For more information contact your local Natural Resources Conservation Service office.

Soil Moisture

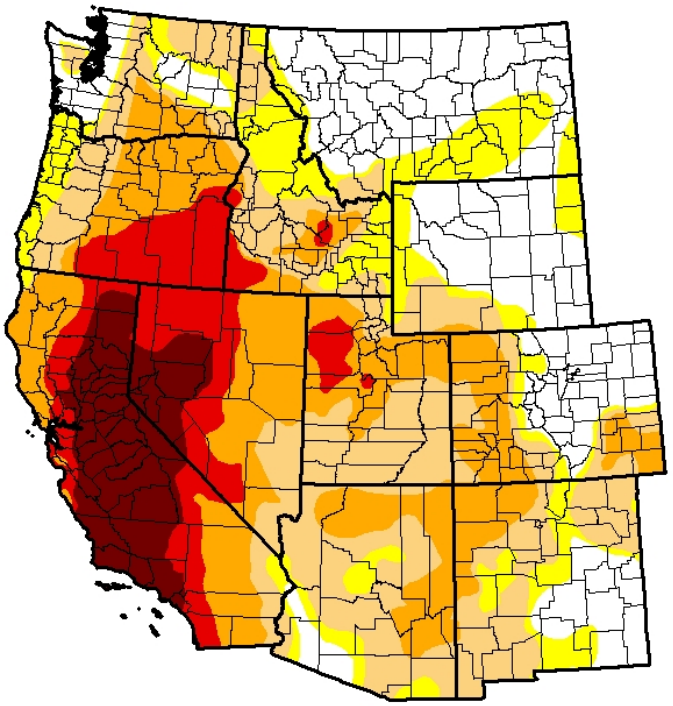
With snow melting early this spring the soil moisture conditions are also in decline, 2-4 weeks earlier than normal.

The following graph from Hart Pass SNOTEL shows a very typical interaction between soil moisture, fall rain, snow accumulation and snow melt. Water-year 2014 was a near normal year with a good snowpack. See where the peak SWE is followed shortly by the increase in soil moisture to the point of saturation. Notice also that the 20" sensor does not seem to be effected by fall rains and only reacts to intense spring melt. All sensors appear to hold saturation until all snow has melted.

2015 appears to have had a rough start with sporadic fall rains often followed by extended dry periods. A lesser snowpack may mean an earlier melt as well as the soils didn't seem to have the same rapid reaction to peak SWE. Very reminiscent of 2005 where the snow melted about a month early and soil saturation only lasted about 1/3rd of normal.



U.S. Drought Monitor
West



May 5, 2015

(Released Thursday, May. 7, 2015)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	23.35	76.65	63.22	39.05	17.54	7.95
Last Week 4/28/2015	26.14	73.86	62.12	39.33	17.64	7.95
3 Months Ago 2/3/2015	30.68	69.32	52.74	31.35	18.51	6.96
Start of Calendar Year 12/30/2014	34.76	65.24	54.48	33.50	18.68	5.40
Start of Water Year 9/30/2014	31.48	68.52	55.57	35.65	19.95	8.90
One Year Ago 5/6/2014	30.20	69.80	61.47	45.60	19.60	4.69

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

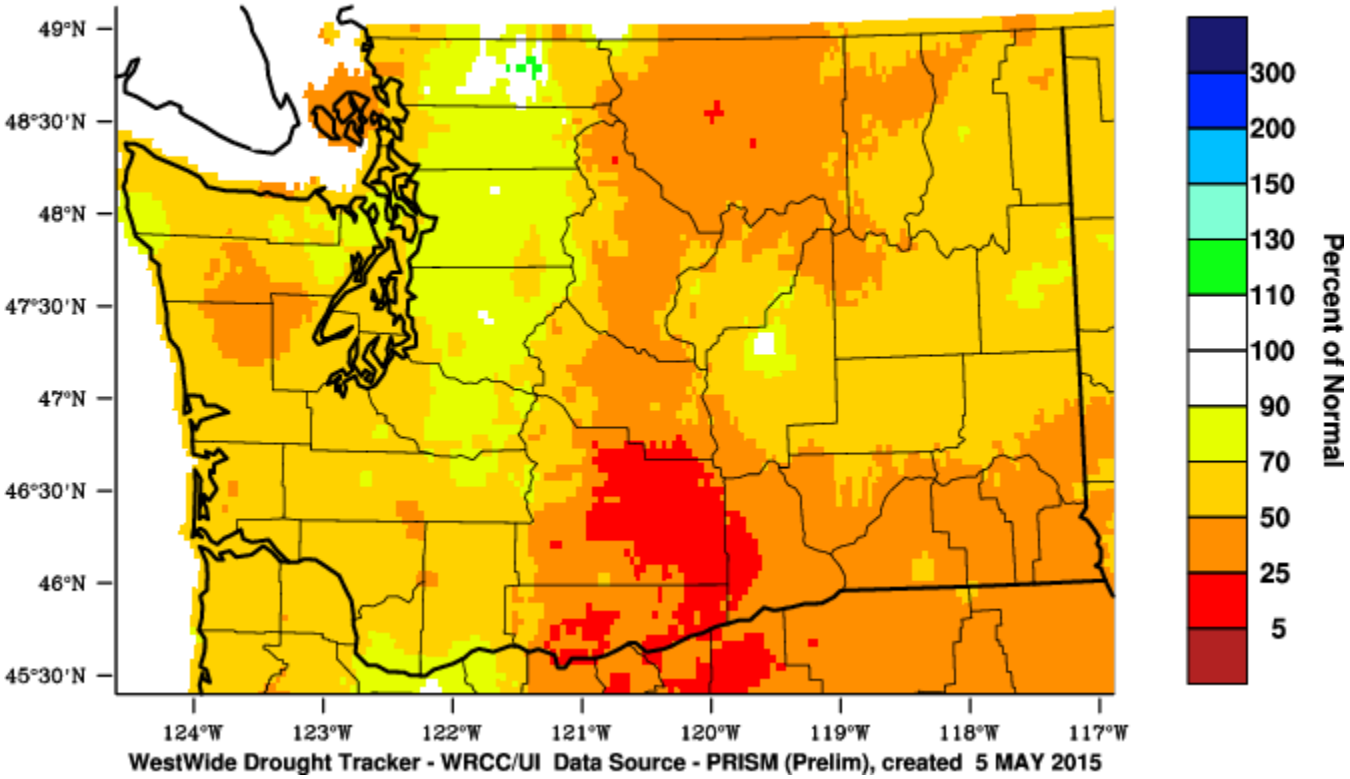
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Mark Svoboda
National Drought Mitigation Center

http://droughtmonitor.unl.edu/

Washington - Precipitation

April 2015 Percent of 1981-2010 Normal



WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Prelim), created 5 MAY 2015

Natural Resources Conservation Service

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Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/

Oregon:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/

Idaho:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/

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

USDA-NRCS Agency Homepages

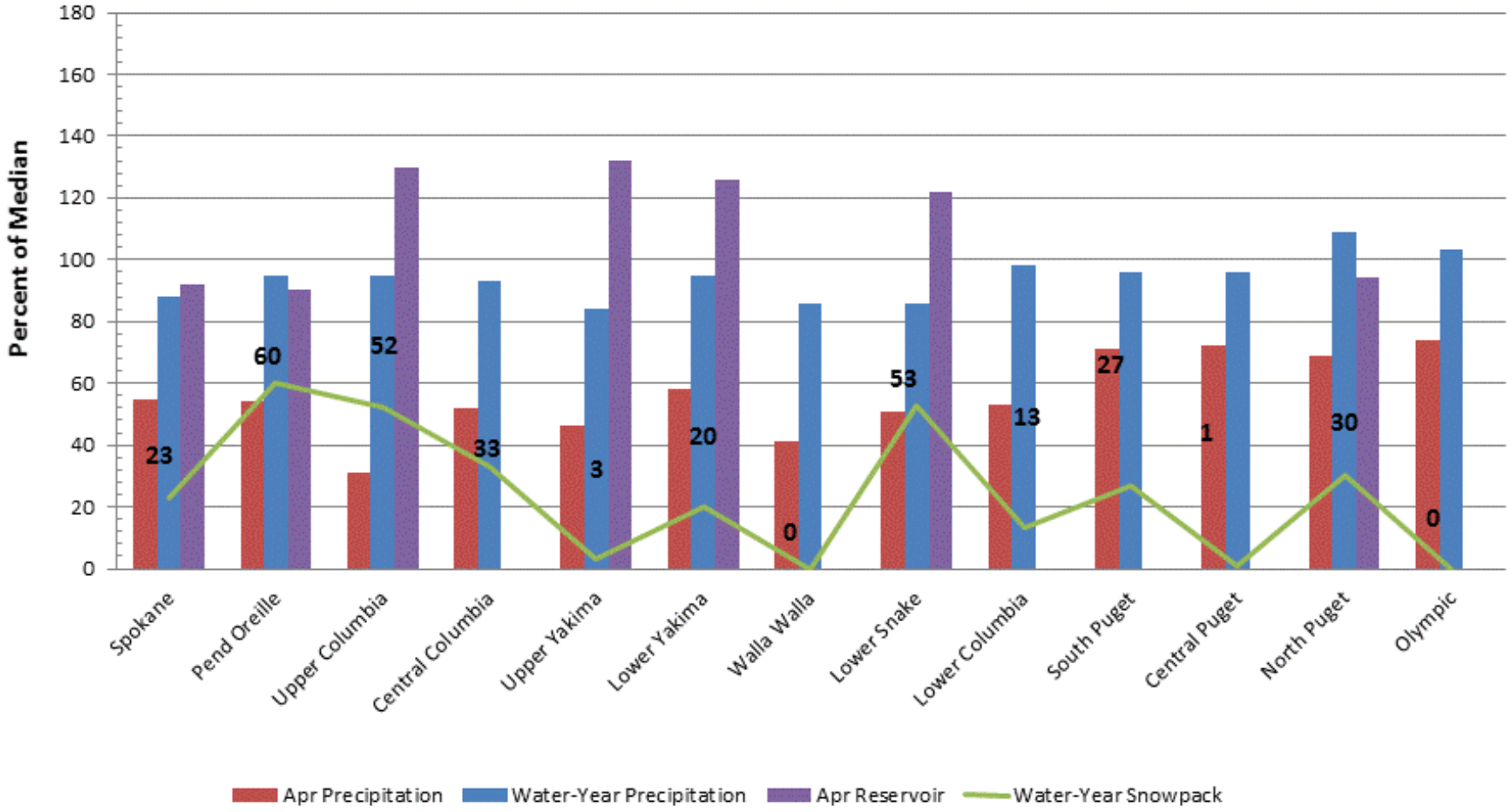
Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/

NRCS National:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

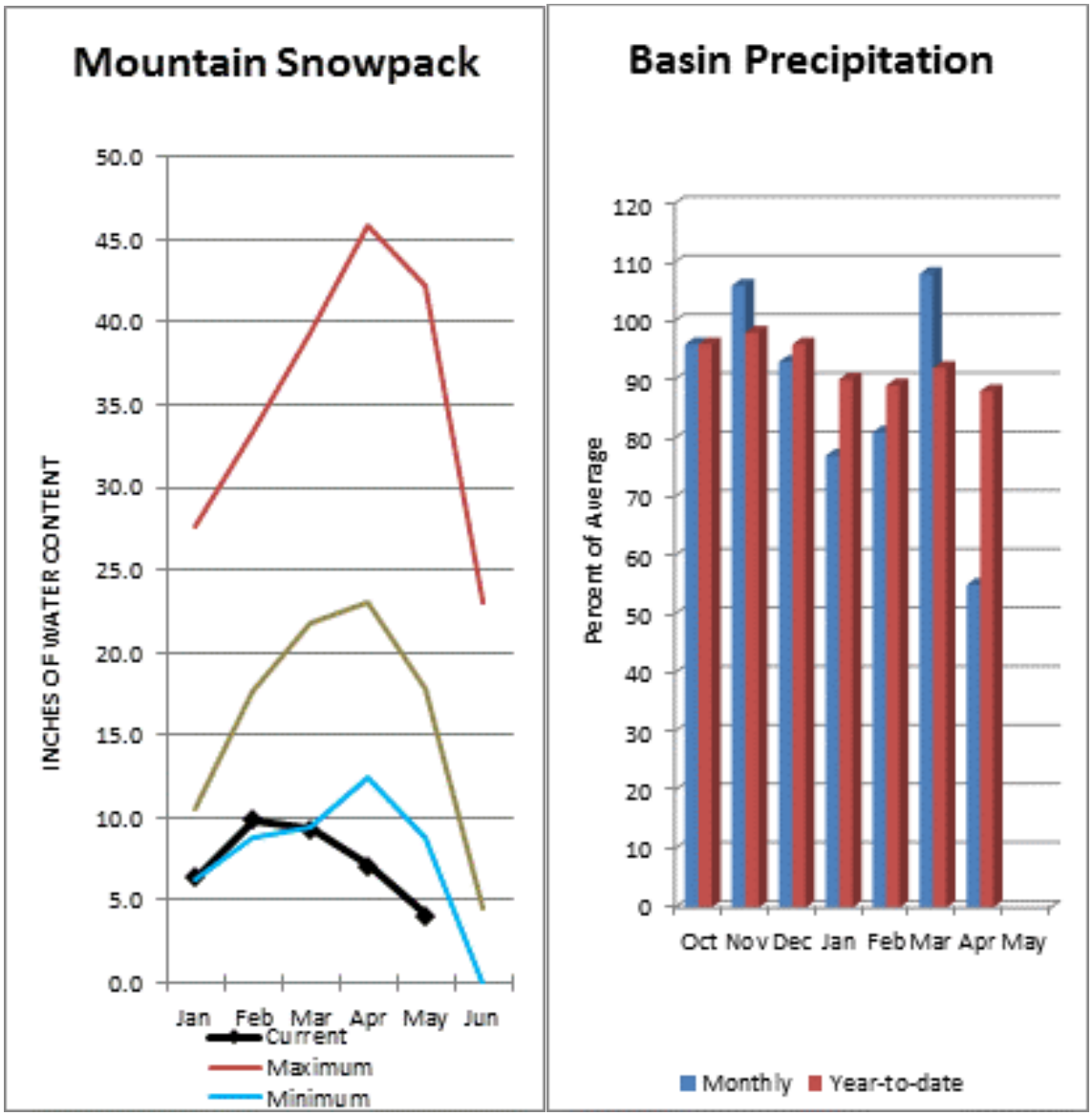
NRCS Natural Resources Conservation Service

May 1, 2015 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2014 - Current Date)



Spokane River Basin



The May 1 forecasts for summer runoff within the Spokane River Basin are 34% of average near Post Falls and 42% at Long Lake. The Chamokane River near Long Lake forecasted to have 47% of average flows for the May-August period. The forecast is based on a basin snowpack that is 23% of normal and precipitation that is 88% of average for the water year. Precipitation for April was near normal at 55% of average. Streamflow on the Spokane River at Spokane was 58% of average for April. May 1 storage in Coeur d'Alene Lake was 209,000 acre feet, 92% of average and 100% of capacity. Snowpack at Quartz Peak SNOTEL site was melted out by the 1st of the month. Normally the site would still have 19 inches of water content Average temperatures in the Spokane basin were 1-3 degrees above normal for April and 2-4 degrees above normal for the water year.

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

Data Current as of: 5/7/2015 11:52:22 AM

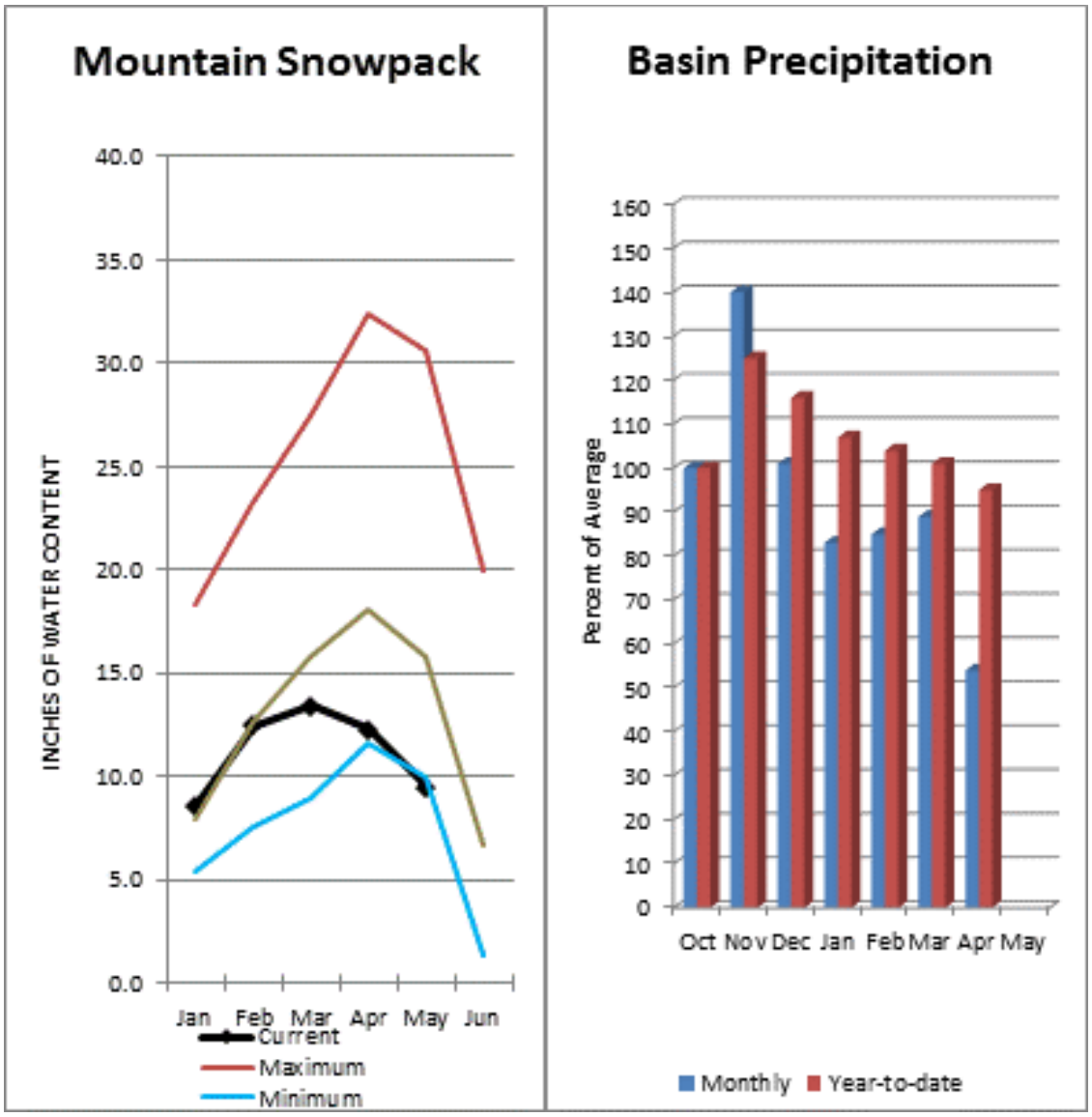
Spokane
Streamflow Forecasts - May 1, 2015

Spokane	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Spokane R nr Post Falls[2]								
	MAY-JUL	69	340	525	34%	710	980	1530
	MAY-SEP	53	350	550	34%	750	1050	1620
Spokane R at Long Lake[2]								
	MAY-JUL	137	465	685	40%	905	1230	1710
	MAY-SEP	235	580	815	42%	1050	1400	1950
Chamokane Ck nr Long Lake								
	MAY-AUG	0.56	2.5	4.4	47%	6.2	8.9	9.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Coeur d' Alene	209.1	238.6	228.0	238.5
Basin-wide Total	209.1	238.6	228.0	238.5
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Spokane	12	23%	132%
Newman Lake	1	0%	74%



The May – September average forecast for the Priest River near the town of Priest River is 54% and the Pend Orielle below Box Canyon is 80%. April streamflow was 104% of average on the Pend Oreille River and 107% on the Columbia at Birchbank. May 1 snow cover was 60% of normal in the Pend Oreille Basin River Basin. Bunchgrass Meadows SNOTEL site had 7.4 inches of snow water on the snow pillow. Normally Bunchgrass would have 23.6 inches on May 1. Precipitation during April was 54% of average, keeping the year-to-date precipitation at 95% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 90% of normal. Average temperatures were 1-3 degrees above normal for April and 2-4 degrees above normal for the water year.

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

Data Current as of: 5/7/2015 11:52:25 AM

Pend Oreille Basins
Streamflow Forecasts - May 1, 2015

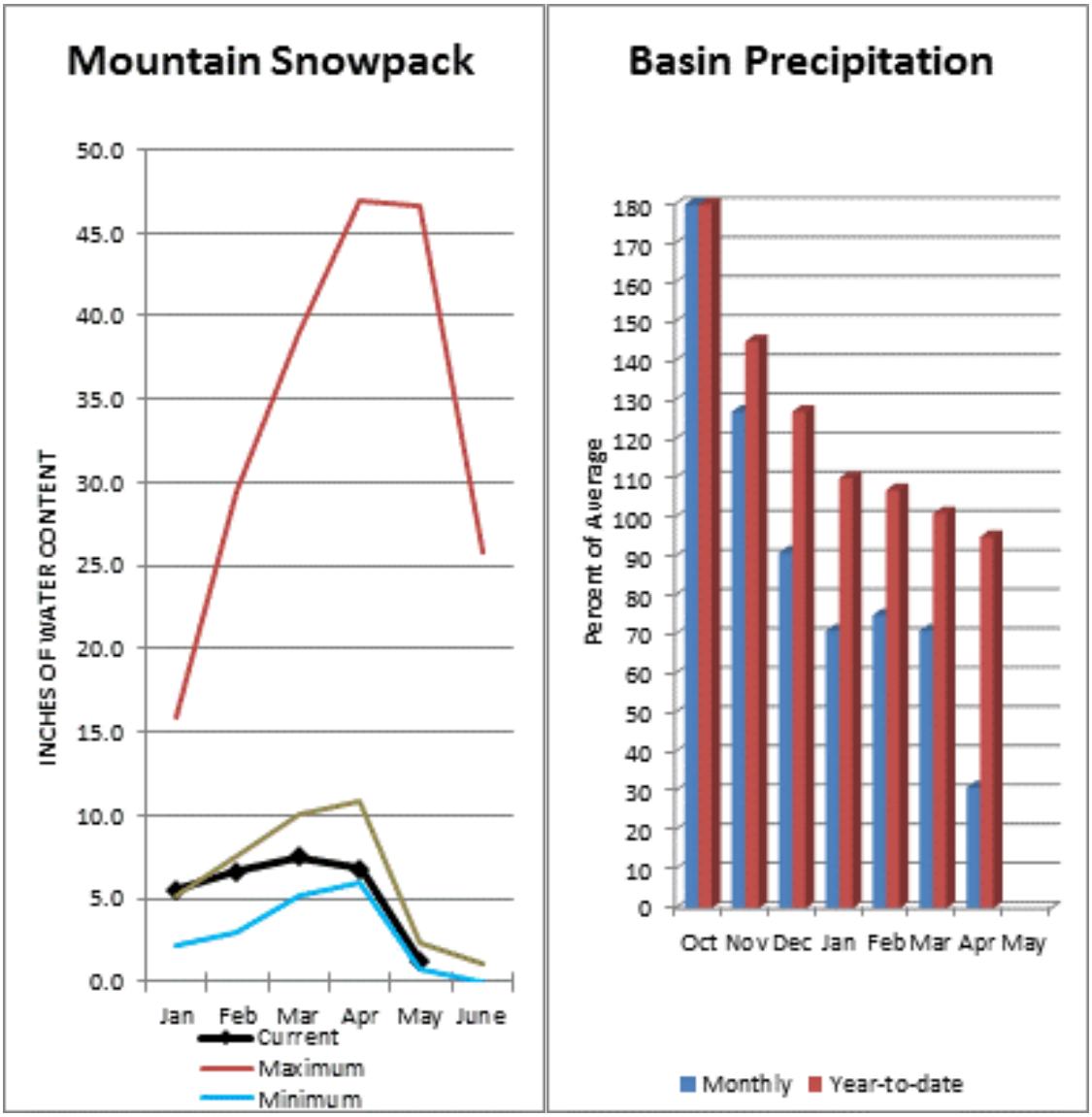
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Pend Oreille Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Pend Oreille Lake Inflow[2]								
	MAY-JUL	6080	7030	7680	79%	8330	9280	9690
	MAY-SEP	6720	7810	8550	80%	9290	10400	10700
Priest R nr Priest River[2]								
	MAY-JUL	220	270	305	53%	345	405	580
	MAY-SEP	245	300	340	54%	380	450	630
Pend Oreille R bl Box Canyon[2]								
	MAY-JUL	6140	7100	7750	79%	8390	9350	9750
	MAY-SEP	6790	7880	8620	80%	9360	10500	10800

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Pend Oreille	851.9	846.5	931.7	1561.3
Priest Lake	81.9	95.9	101.9	119.3
Basin-wide Total	933.8	942.5	1033.6	1680.6
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Pend Oreille Basins	68	60%	161%
Colville River	0		
Kettle River	5	58%	127%



Summer runoff average forecast for the Okanogan River is 72%, Similkameen River is 64%, Kettle River 58% and Methow River is 41%. May 1 snow cover on the Okanogan was 74% of normal, Omak Creek was 0% and the Methow was 79%. April precipitation in the Upper Columbia was 31% of average, with precipitation for the water year at 95% of average. April streamflow for the Methow River was 158% of average, 165% for the Okanogan River and 138% for the Similkameen. Salmon Meadows SNOTEL, in the Conconully Basin, was snow free on May 1. Combined storage in the Conconully Reservoirs was 21,500 acre-feet or 130% of normal. Temperatures were 4-6 degrees above normal for April and 2-4 degrees above for the water year.

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Upper Columbia Basins
Streamflow Forecasts - May 1, 2015

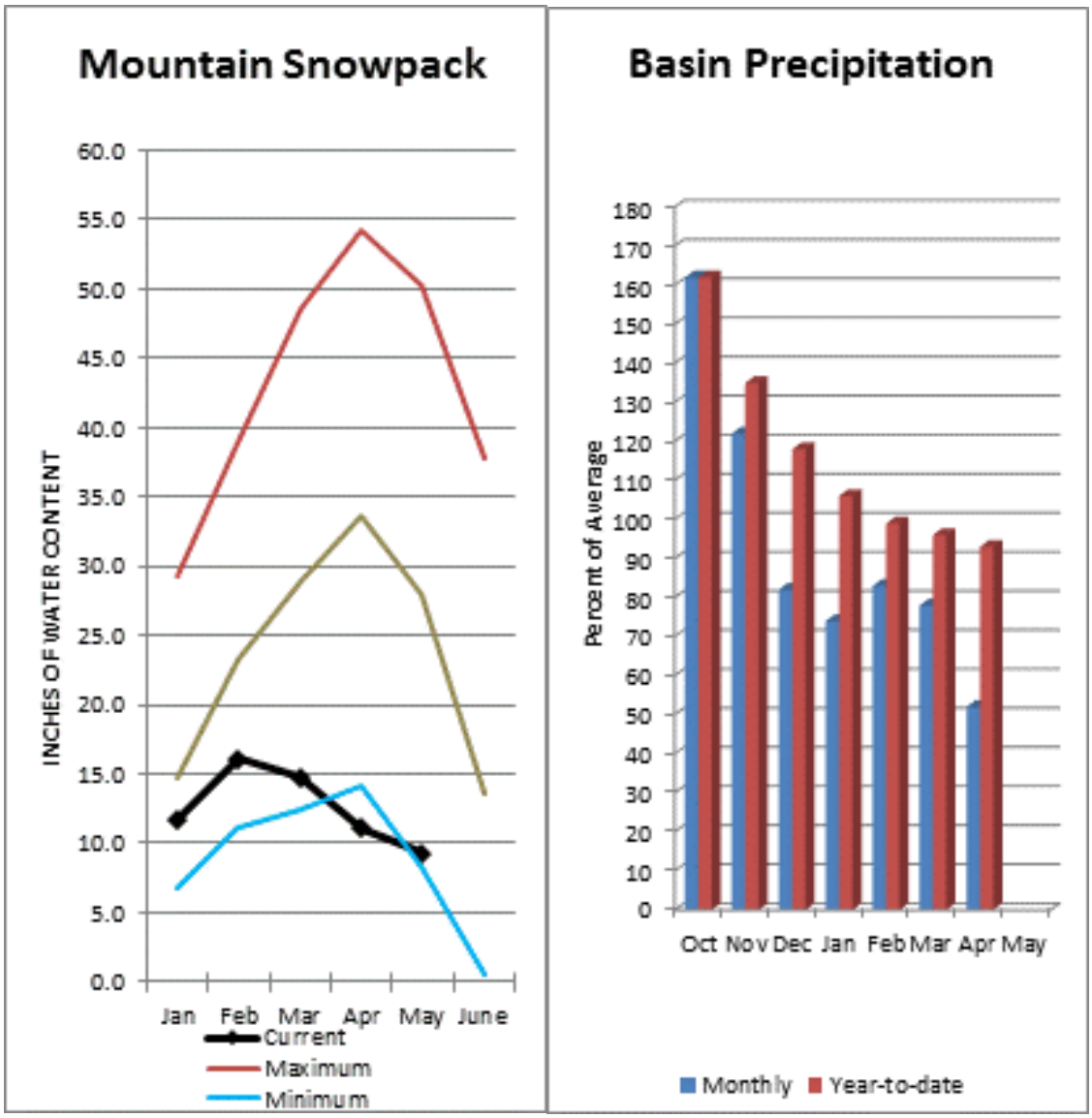
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Kettle R nr Laurier								
	MAY-JUL	535	695	800	55%	905	1060	1450
	MAY-SEP	585	765	885	58%	1010	1190	1530
Colville R at Kettle Falls								
	MAY-JUL	5.7	13.7	21	29%	30	46	72
	MAY-SEP	7.7	17.4	26	31%	37	55	84
Columbia R at Grand Coulee[1,2]								
	MAY-JUL	28600	31300	32500	74%	33700	36400	43870
Similkameen R nr Nighthawk[1]								
	MAY-JUL	440	610	685	65%	760	930	1060
	MAY-SEP	455	645	730	64%	815	1000	1140
Okanogan R nr Tonasket[1]								
	MAY-JUL	440	750	890	68%	1030	1340	1300
	MAY-SEP	490	840	1000	68%	1160	1510	1470
Okanogan R at Malott[1]								
	MAY-JUL	450	775	920	72%	1070	1390	1270
	MAY-SEP	500	865	1030	72%	1200	1560	1440
Methow R nr Pateros								
	MAY-JUL	191	245	290	40%	335	405	730
	MAY-SEP	215	280	325	41%	375	455	790
Columbia R at Birchbank[1,2]								
	MAY-JUL	20200	23400	24900	82%	26400	29600	30480

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	9.0	9.7	7.6	10.5
Conconully Reservoir	12.5	11.5	8.9	13.0
Basin-wide Total	21.5	21.2	16.5	23.5
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Upper Columbia Basins	15	69%	129%
Okanogan River	12	73%	129%
Omak Creek	1	0%	68%
Sanpoil River	0		
Similkameen River	5	63%	139%
Toats Coulee Creek	0		
Conconully Lake	1		
Methow River	4	79%	119%



Precipitation during April was 52% of average in the basin and 93% for the year-to-date. Runoff for Entiat River is forecast to be 60% of average for the summer. The May-September average forecast for Chelan River is 65%, Wenatchee River at Plain is 49%, Stehekin River is 61% and Icicle Creek is 55%. April average streamflows on the Chelan River were 92% and on the Wenatchee River 76%. May 1 snowpack in the Wenatchee River Basin was 29% of normal; the Chelan, 53%; the Entiat, 0%; Stemilt Creek, 0% and Colockum Creek, 0%. Lyman Lake SNOTEL had the most snow water with 40 inches of water. This site would normally have 61.2 inches on May 1. Temperatures were 1-3 degrees above normal for April and 2-4 degrees above normal for the water year.

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

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Central Columbia Basins
Streamflow Forecasts - May 1, 2015

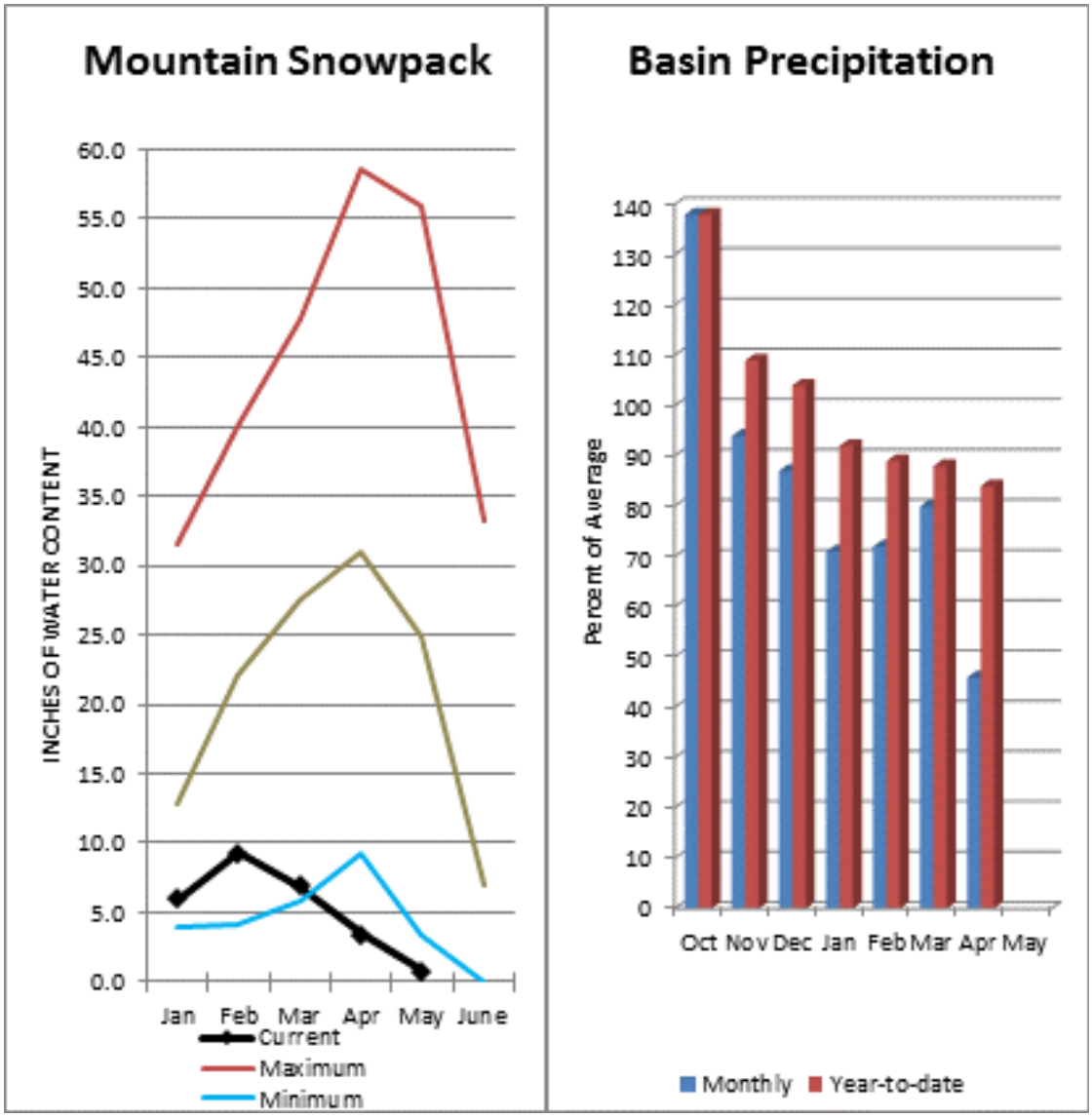
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Stehekin R at Stehekin								
	MAY-JUL	295	330	360	61%	390	430	595
	MAY-SEP	365	400	430	61%	455	500	705
Chelan R at Chelan								
	MAY-JUL	485	535	570	66%	605	655	860
	MAY-SEP	545	595	630	65%	670	725	975
Entiat R nr Ardenvoir								
	MAY-JUL	84	98	108	61%	118	133	178
	MAY-SEP	90	107	118	60%	130	146	196
Wenatchee R at Plain								
	MAY-JUL	295	360	405	49%	445	510	825
	MAY-SEP	310	380	430	47%	480	550	920
Icicle Ck nr Leavenworth								
	MAY-JUL	75	108	131	56%	153	186	235
	MAY-SEP	80	118	143	55%	168	205	260
Wenatchee R at Peshastin								
	MAY-JUL	440	525	580	51%	635	720	1140
	MAY-SEP	465	555	615	49%	675	765	1260
Columbia R bl Rock Island Dam[2]								
	MAY-JUL	29800	32800	34800	73%	36800	39800	47930
	MAY-SEP	36400	40000	42400	74%	44900	48500	57360

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Chelan		291.7	300.7	676.1
Basin-wide Total		0.0	0.0	0.0
# of reservoirs	0	0	0	0

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Central Columbia Basins	3	53%	118%
Chelan Lake Basin	3	53%	118%
Entiat River	1	0%	108%
Wenatchee River	7	29%	108%
Stemilt Creek	1	0%	84%
Colockum Creek	1	0%	178%



May 1 reservoir storage for the Upper Yakima reservoirs was 805,000-acre feet, 132% of average. Forecasts for the Yakima River at Cle Elum are 25% of average and the Teanaway River near Cle Elum is at 18%. Lake inflows are all forecasted to be below average this summer as well. April streamflows within the basin were Cle Elum River near Roslyn at 52%. May 1 snowpack was 2% based upon 8 snow course and SNOTEL readings within the Upper Yakima Basin. Precipitation was 46% of average for April and 84% for the water-year. 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.

Data Current as of: 5/7/2015 11:52:33 AM

Upper Yakima River
Streamflow Forecasts - May 1, 2015

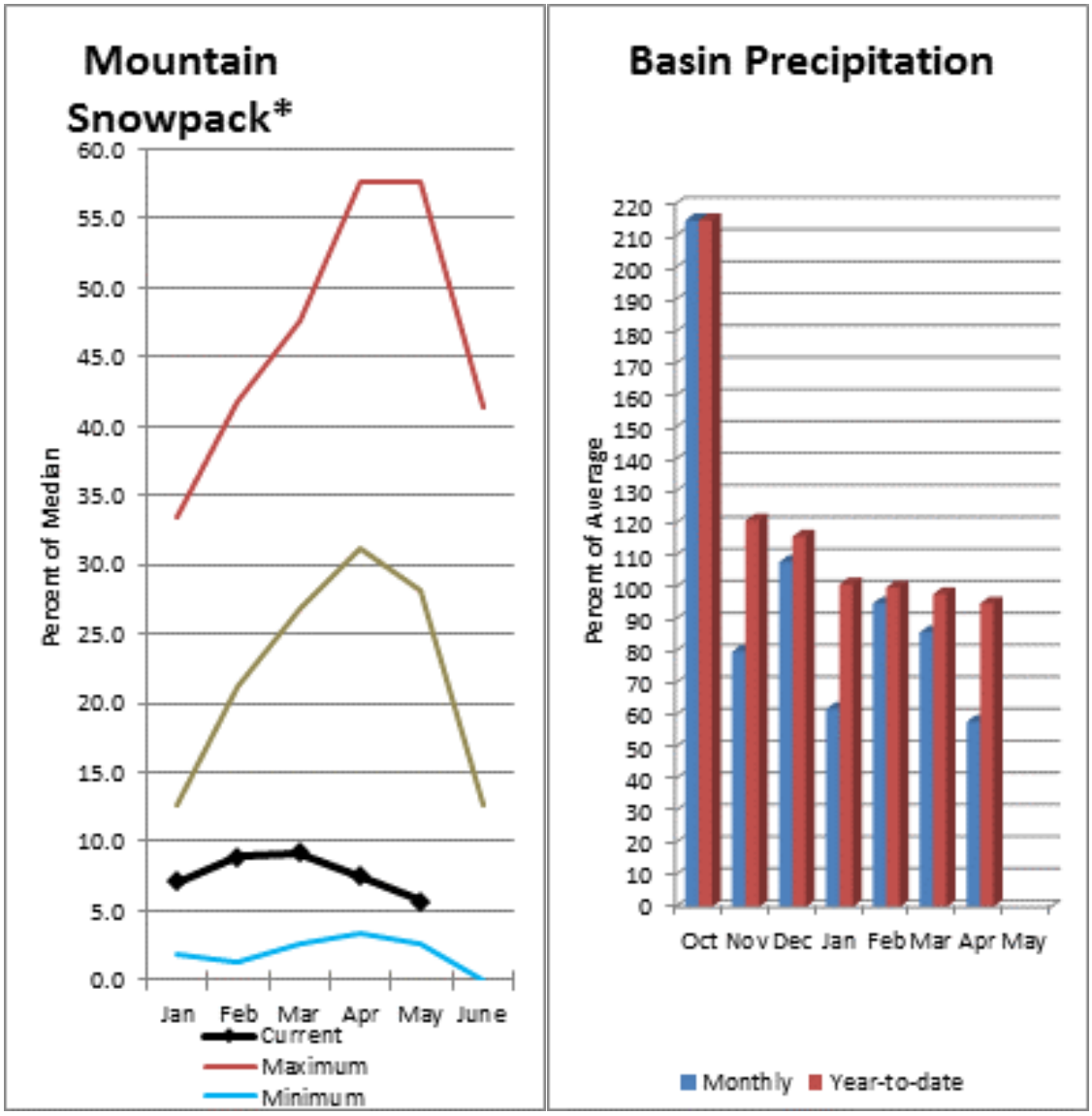
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Keechelus Reservoir Inflow[2]								
	MAY-JUL	8.4	12.1	15	18%	18.2	24	85
	MAY-SEP	13.30257	18.22312	22	23%	26.1323	32.87373	96
Kachess Reservoir Inflow [2]								
	MAY-JUL	7.56285	10.08406	12	16%	14.08247	17.45685	76
	MAY-SEP	10.6	13.7	16	19%	18.5	23	84
Cle Elum Lake Inflow [2]								
	MAY-JUL	58	79	94	31%	109	130	305
	MAY-SEP	66	93	111	33%	129	156	340
Yakima R at Cle Elum [2]								
	MAY-JUL	46	92	123	22%	154	200	570
	MAY-SEP	73	127	164	25%	200	255	645
Teanaway R bl Forks nr Cle Elum								
	MAY-JUL	6.17491	10.3041	13.7	17%	17.57875	24.18442	79
	MAY-SEP	6.99567	11.45562	15.1	18%	19.2469	26.28419	82

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Keechelus	142.1	140.9	122.1	157.8
Kachess	237.3	224.2	183.7	239.0
Cle Elum	425.5	318.7	302.6	436.9
Basin-wide Total	804.8	683.8	608.4	833.7
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Upper Yakima River	8	2%	106%



April average streamflows within the basin were: Yakima River near Parker, 45% and the Naches River near Naches, 49%. May 1 reservoir storage for Bumping and Rimrock reservoirs was 225,000-acre feet, 126% of average. Forecast averages for Yakima River near Parker are 27%; American River near Nile, 23%; Ahtanum Creek, 8%; and Klickitat River near Glenwood, 25%. May 1 snowpack was 19% based upon 7 snow course and SNOTEL readings within the Lower Yakima Basin and Ahtanum Creek reported in at 1% of normal. Precipitation was 58% of average for April and 95% for the water-year. Temperatures were 1-3 degrees above normal for April and for 2-4 degrees above 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.

Data Current as of: 5/7/2015 11:52:35 AM

Lower Yakima River
Streamflow Forecasts - May 1, 2015

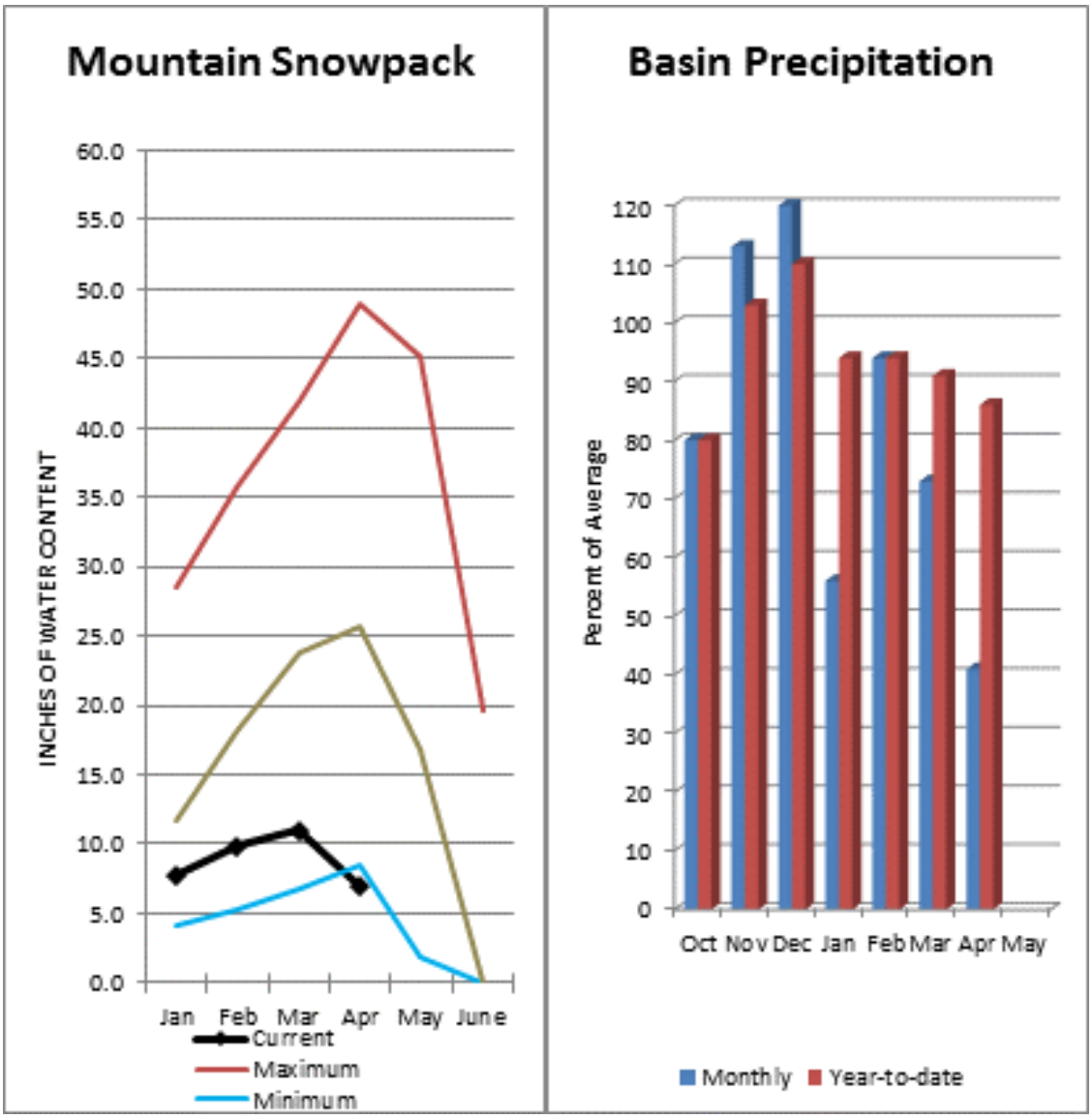
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bumping Lake Inflow [2]								
	MAY-JUL	8.2	14.9	19.4	21%	24	31	93
	MAY-SEP	8.1	15.8	21	20%	26	34	103
American R nr Nile								
	MAY-JUL	8	15.2	20	24%	25	32	84
	MAY-SEP	7.3	15.6	21	23%	27	35	92
Rimrock Lake Inflow [2]								
	MAY-JUL	32	42	49	32%	56	67	151
	MAY-SEP	39	52	61	33%	70	84	185
Naches R nr Naches								
	MAY-JUL	39	61	87	16%	100	134	540
	MAY-SEP	44	70	91	15%	115	156	600
Ahtanum Ck at Union Gap								
	MAY-JUL	0	0.29	0.86	4%	1.72	3.6	19.3
	MAY-SEP	0.13	0.85	1.69	8%	2.8	5	21
Yakima R nr Parker [2]								
	MAY-JUL	135	240	310	25%	380	485	1230
	MAY-SEP	178	290	370	27%	450	560	1390
Klickitat R nr Glenwood								
	MAY-JUL	14.3	19.3	23	24%	27	34	97
	MAY-SEP	18.2	24	28	25%	33	41	110
Klickitat R nr Pitt								
	MAY-JUL	92	111	124	41%	139	161	305
	MAY-SEP	140	165	182	46%	200	230	395

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bumping Lake	33.6	21.0	21.7	33.7
Rimrock	191.2	173.8	156.9	198.0
Basin-wide Total	224.8	194.8	178.6	231.7
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Lower Yakima River	7	19%	102%
Ahtanum Creek	2	1%	71%



April precipitation was 41% of average, maintaining the year-to-date precipitation at 86% of average. Milkshakes SNOTEL still recorded 11.2 of water content on May 1 but the rest of the sites had melted out. Milkshakes is too new to have a normal calculation. Streamflow forecasts are 58% of average for Mill Creek and 69% for the SF Walla Walla near Milton-Freewater. Average temperatures were 1-3 degrees above normal for April and 2-4 degrees above normal for the water year.

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

Data Current as of: 5/7/2015 11:52:38 AM

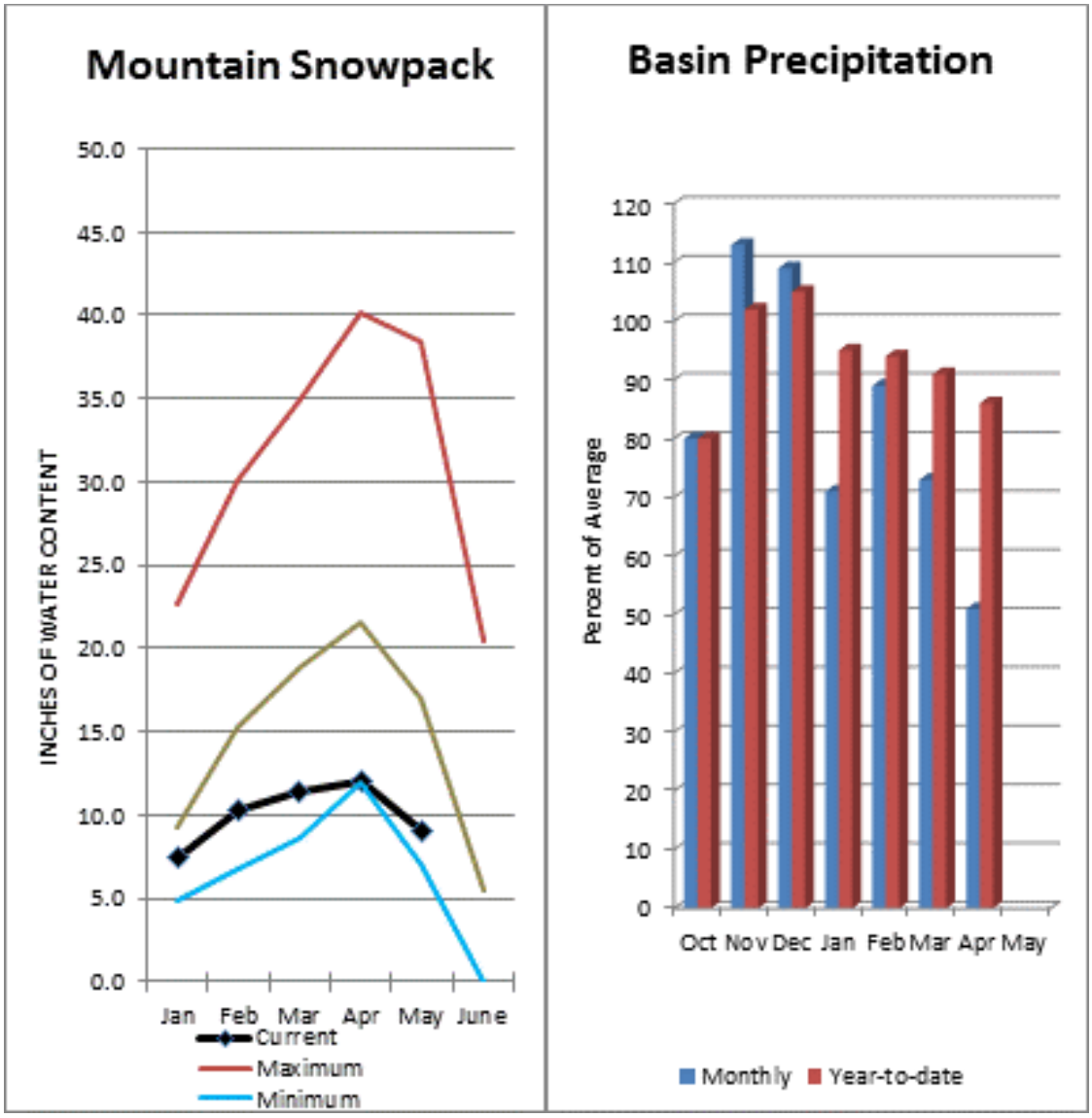
Walla Walla River
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Walla Walla River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
SF Walla Wall R nr Milton-Freewater								
	MAY-JUL	17	21	24	65%	27	32	37
	MAY-SEP	26	31	34	69%	38	43	49
Mill Ck nr Walla Walla								
	MAY-JUL	4.4	6.4	8	58%	9.8	12.8	13.9
	MAY-SEP	6.1	8.3	10	58%	11.8	14.8	17.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Walla Walla River	2	0%	116%



The Grande Ronde River can expect summer flows to be about 48% of normal. The forecast for Asotin Creek at Asotin predicts 36% of average flows for the May – July runoff period. April precipitation was 51% of average, bringing the year-to-date precipitation to 86% of average. May 1 snowpack readings averaged 32% of normal. April streamflow was 64% of average for Snake River below Lower Granite Dam and 42% for Grande Ronde River near Troy. Dworshak Reservoir storage was 122% of average. Average temperatures were 1-3 degrees above normal for April and 2-4 degrees above for the water year.

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

Data Current as of: 5/7/2015 11:52:41 AM

Lower Snake, Grande Ronde, Clearwater Basins
Streamflow Forecasts - May 1, 2015

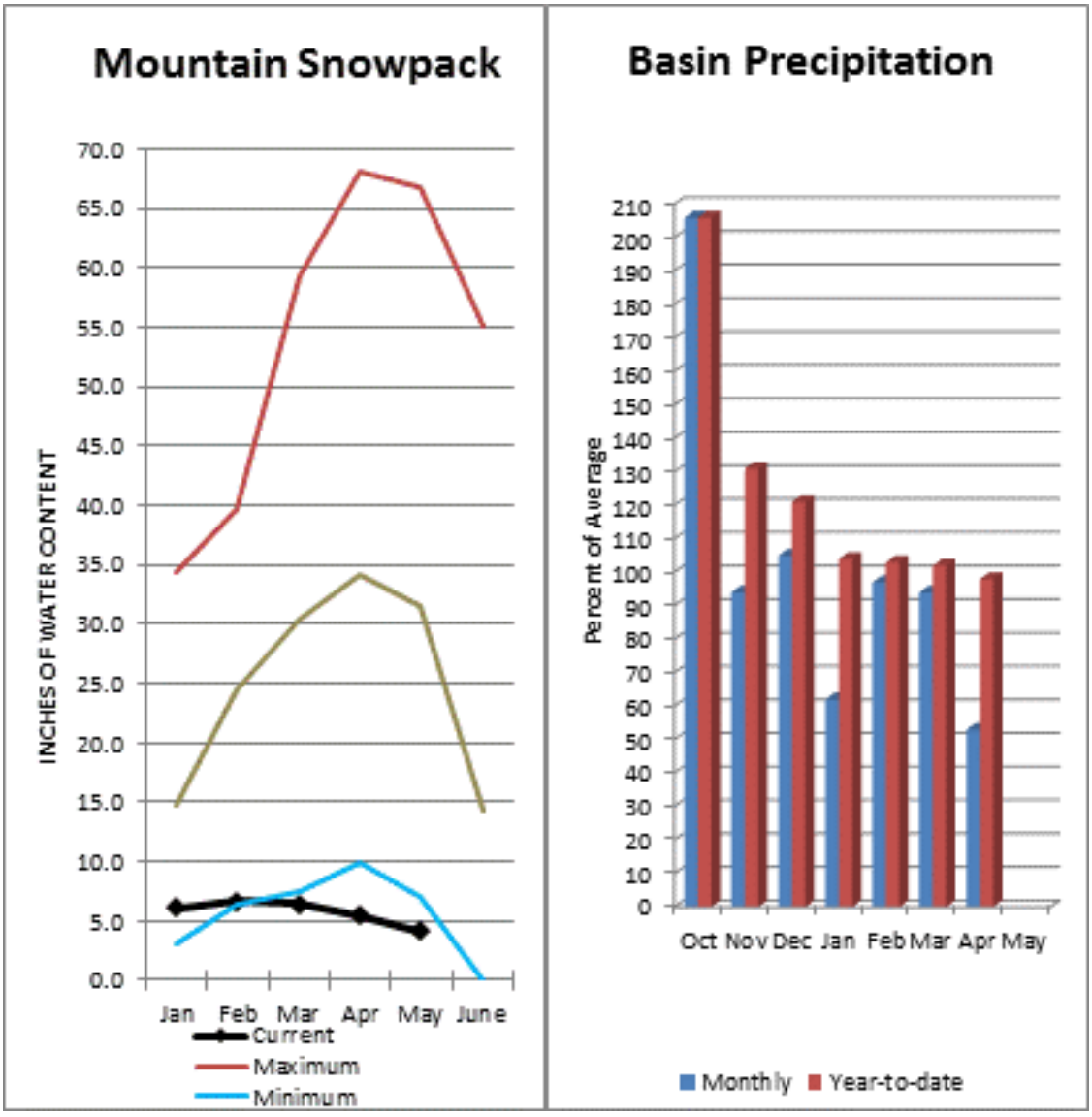
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake, Grande Ronde, Clearwater Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Grande Ronde R at Troy								
	MAY-JUL	250	330	395	46%	465	575	860
	MAY-SEP	295	385	450	48%	520	635	945
Asotin Ck at Asotin								
	MAY-JUL	5.1	7.1	8.6	36%	10.3	13	24
Clearwater R at Spalding[2]								
	MAY-JUL	2450	2990	3350	64%	3710	4250	5260
	MAY-SEP	2710	3280	3670	65%	4060	4630	5640
Snake R bl Lower Granite Dam[12]								
	MAY-JUL	3670	5930	6960	46%	7990	10300	15280
	MAY-SEP	5080	7690	8880	50%	10100	12700	17715

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	3218.2	1888.3	2646.0	3468.0
Basin-wide Total	3218.2	1888.3	2646.0	3468.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Lower Snake, Grande Ronde, Clearwater Basins	14	32%	127%



Forecasts for May – September streamflows within the basin are Lewis River at Ariel, 60% and Cowlitz River at Castle Rock, 79% of average. The Columbia at The Dalles is forecasted to have 65% of average flows this summer according to the River Forecast Center. April average streamflow for Cowlitz River was 65%. The Columbia River at The Dalles was 83% of average. April precipitation was 53% of average and the water-year average was 98%. May 1 snow cover for Cowlitz River was 25%, and Lewis River was 0% of normal. Temperatures were 1-3 degrees above normal during April and for the water year.

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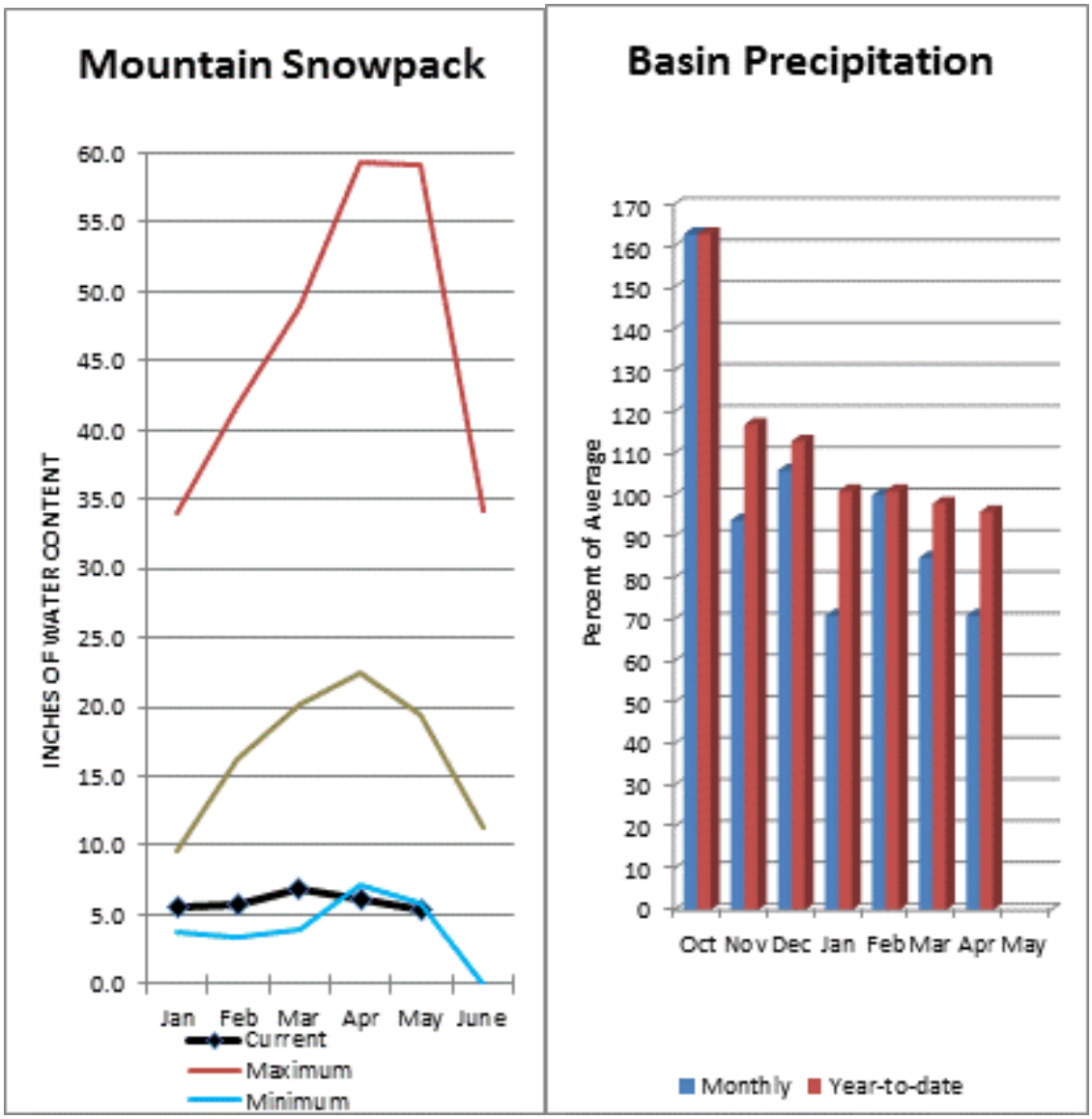
Lower Columbia Basins
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Columbia R at The Dalles[2]								
	MAY-JUL	36100	40300	43100	65%	45900	50100	66050
	MAY-SEP	44600	49700	53100	67%	56500	61500	78900
Klickitat R nr Glenwood								
	MAY-JUL	14.3	19.3	23	24%	27	34	97
	MAY-SEP	18.2	24	28	25%	33	41	110
Klickitat R nr Pitt								
	MAY-JUL	92	111	124	41%	139	161	305
	MAY-SEP	140	165	182	46%	200	230	395
Lewis R at Ariel[2]								
	MAY-JUL	185	280	345	56%	410	505	615
	MAY-SEP	280	390	460	60%	535	640	770
Cowlitz R bl Mayfiled[2]								
	MAY-JUL	465	615	715	61%	815	965	1180
	MAY-SEP	580	765	885	64%	1010	1190	1390
Cowlitz R at Castle Rock[2]								
	MAY-JUL	865	1070	1200	75%	1330	1530	1600
	MAY-SEP	1140	1350	1500	79%	1650	1860	1890

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Lower Columbia Basins	11	13%	101%
Lewis River	5	0%	76%
Cowlitz River	6	25%	125%



Summer runoff is forecast to be 50% of normal for the Green River below Howard Hanson Dam and 69% for the White River near Buckley. May 1 snowpack was 37% of average for the White River and 33% for the Puyallup River. The Green River Basin had melted out prior to May 1. April precipitation was 71% of average, bringing the water year-to-date to 96% of average for the basins. Average temperatures in the area were 1-3 degrees above normal for April and for the water-year.

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

Data Current as of: 5/7/2015 11:52:47 AM

South Puget Sound Basins
Streamflow Forecasts - May 1, 2015

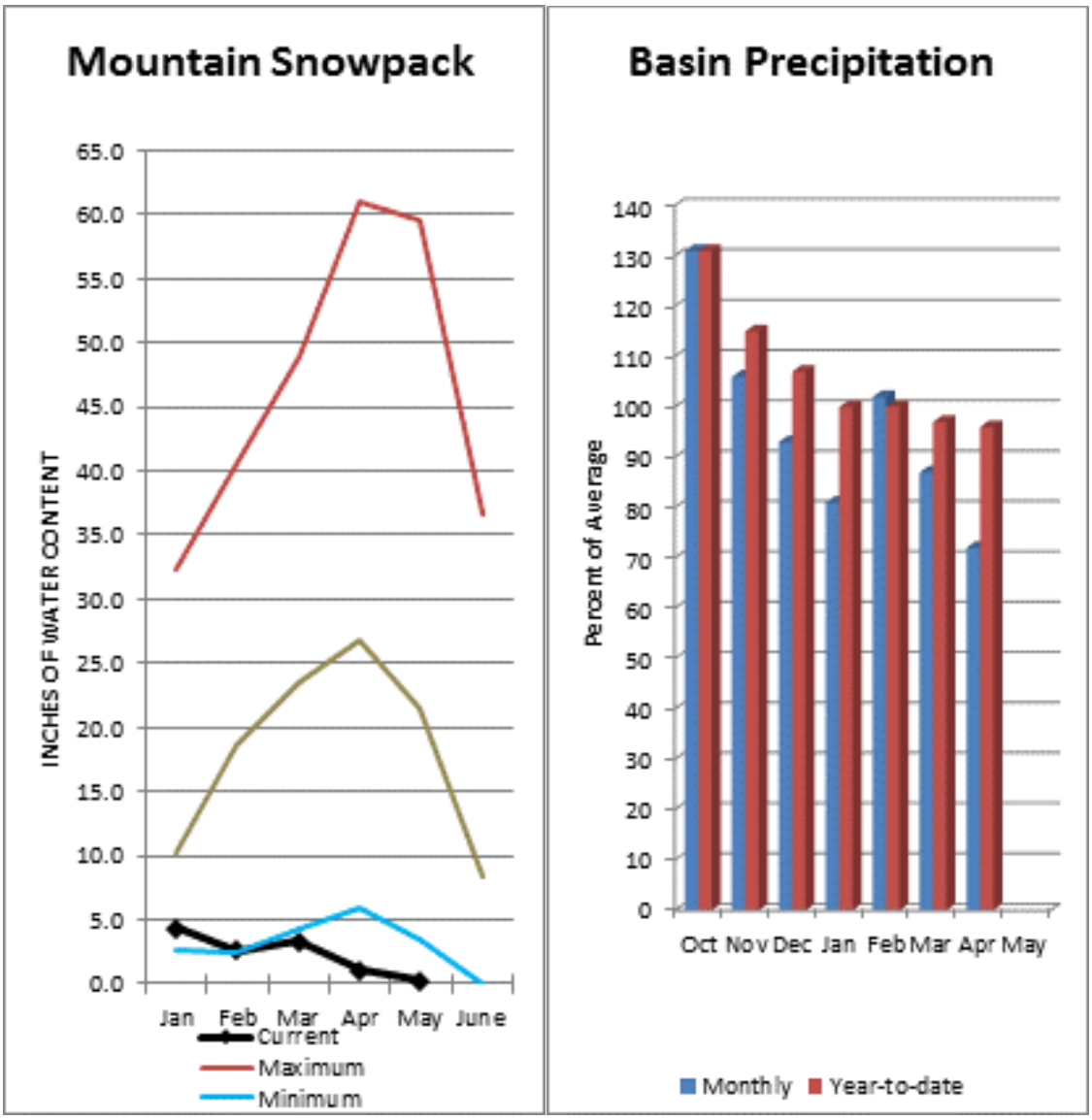
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

South Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
White R nr Buckley[1,2]								
	MAY-JUL	128	195	225	68%	255	320	330
	MAY-SEP	176	255	290	69%	325	405	420
Green R bl Howard A Hanson Dam[1,2]								
	MAY-JUL	28	52	66	43%	81	121	152
	MAY-SEP	41.93168	71.82427	88	50%	105.81709	150.95059	175

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
South Puget Sound Basins	10	28%	108%
White River	3	37%	114%
Green River	2	0%	77%

Central Puget Sound River Basins



Forecast for spring and summer flows are: 45% for Cedar River near Cedar Falls; 46% for Rex River; 51% for South Fork of the Tolt River; and 65% for Taylor Creek near Selleck. Basin-wide precipitation for April was 72% of average, bringing water-year-to-date to 96% of average. Thanks to an end of month snow storm both the Cedar River and Tolt River basins picked up a wee bit of snow, but only enough to last a day or two. Snoqualmie River Basin was 1%, and Skykomish River Basin was 2%. This is a new all-time record low for May 1 snow survey at Alpine Meadows, since records began in 1969. Temperatures were 1-3 degrees above normal for April and for the water-year.

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

Data Current as of: 5/7/2015 11:52:50 AM

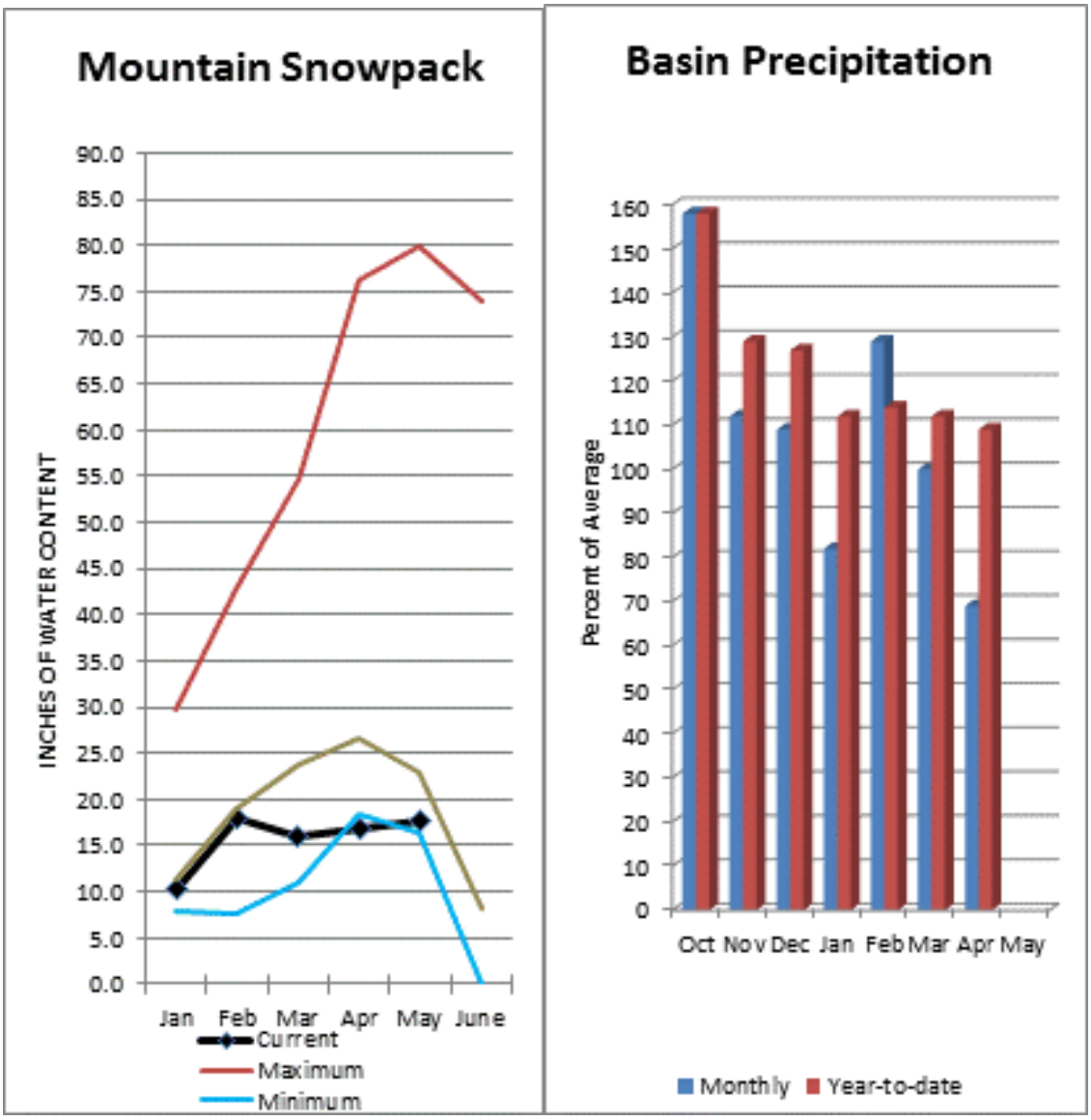
Central Puget Sound Basins
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Cedar R nr Cedar Falls								
	MAY-JUL	12.2	16	19	39%	22	27	49
	MAY-SEP	16.6	21	25	45%	29	35	56
Rex R nr Cedar Falls								
	MAY-JUL	3.3	4.6	5.7	35%	6.9	8.8	16.2
	MAY-SEP	5.2	7.1	8.5	46%	10.1	12.6	18.5
Taylor Ck nr Selleck								
	MAY-JUL	5.6	7	8	60%	9.1	10.9	13.3
	MAY-SEP	7.9	9.7	11	65%	12.4	14.6	16.9
SF Tolt R nr Index								
	MAY-JUL	2.9	3.7	4.3	41%	4.9	6	10.4
	MAY-SEP	4.1	5.3	6.3	51%	7.3	8.9	12.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Central Puget Sound Basins	12	1%	112%
Puyallup River	5	33%	116%
Cedar River	4	0%	112%
Tolt River	2	0%	126%
Snoqualimie River	4	1%	112%
Skykomish River	2	1%	103%



Forecast for Skagit River streamflow at Newhalem is 76% of average for the spring and summer period. April streamflow in Skagit River was 92% of average. Other forecast points included Baker River at 69% and Thunder Creek at 76% of average. Basin-wide precipitation for April was 69% of average, bringing water-year-to-date to 109% of average. May 1 average snow cover in Skagit River Basin was 54%, Nooksack River Basin was 14% and Baker River Basin was 15%. May 1 Skagit River reservoir storage was 94% of average and 51% of capacity. Average temperatures were 1-3 degrees above normal for April and 2-4 degrees above for the water year.

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

Data Current as of: 5/7/2015 11:52:54 AM

North Puget Sound Basins
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

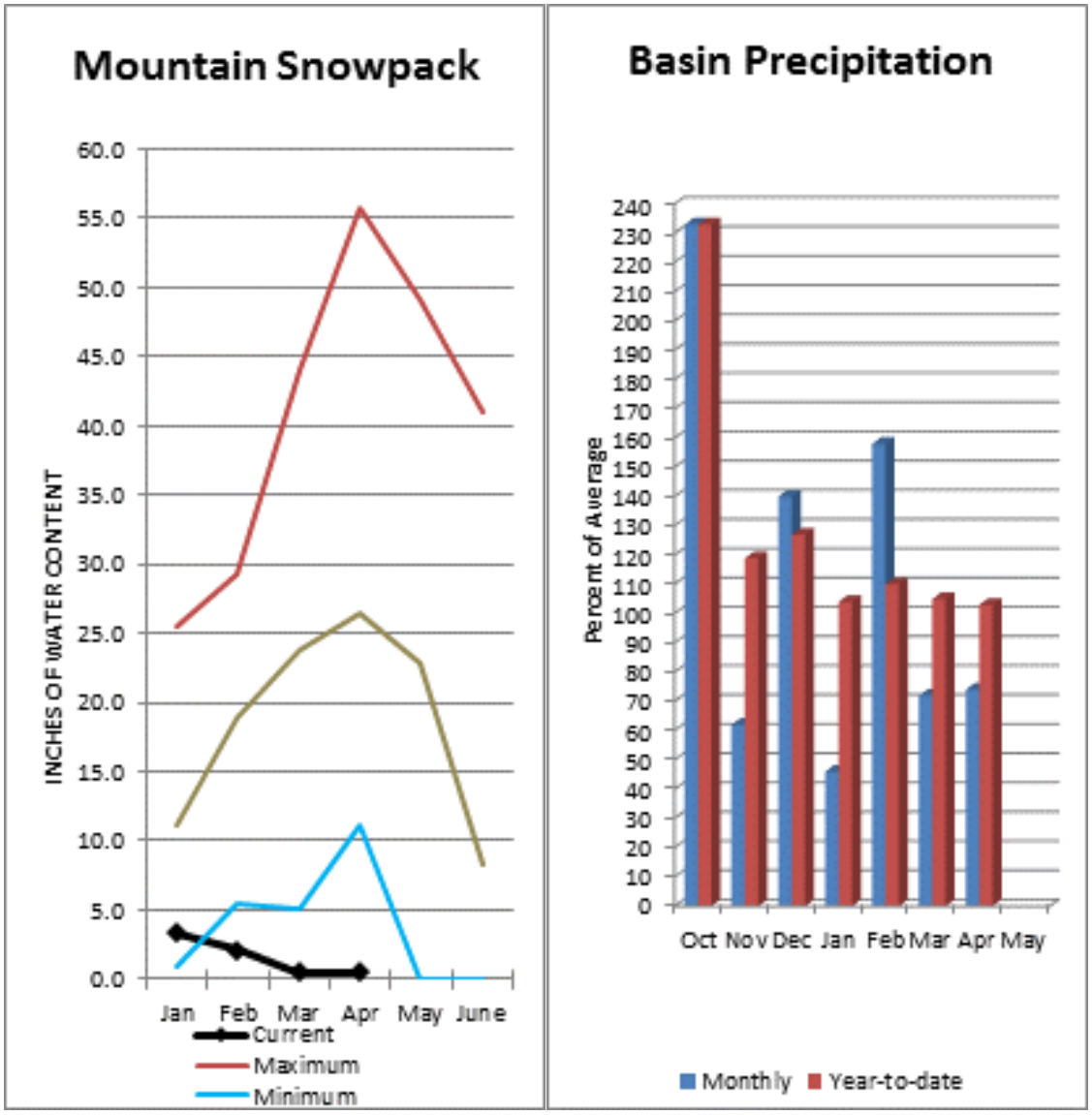
North Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Thunder Ck nr Newhalem								
	MAY-JUL	154	173	186	89%	200	220	210
	MAY-SEP	230	255	270	89%	285	310	305
Skagit R at Newhalem[2]								
	MAY-JUL	925	1020	1090	77%	1160	1260	1420
	MAY-SEP	1140	1260	1340	76%	1420	1540	1770
Baker R at Concrete								
	MAY-JUL	340	395	435	69%	475	545	635
	MAY-SEP	450	525	575	69%	630	715	835

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ross	710.1	376.3	754.4	1404.1
Diablo Reservoir			85.9	90.6
Basin-wide Total	710.1	376.3	754.4	1404.1
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
North Puget Sound Basins	25	30%	118%
Skagit River	16	54%	124%
Baker River	6	15%	114%
Nooksack River	3	14%	117%

Olympic Peninsula River Basins



Forecasted average runoff for streamflow for the Dungeness River is 47% and Elwha River is 53% April runoff in the Dungeness River was 75% of normal. Big Quilcene and Wynoochee rivers may expect below average runoff this summer as well. April precipitation was 74% of average. Precipitation has accumulated at 103% of average for the water year. Olympic Peninsula snowpack had melted out prior to May 1. Only the highest elevations and glaciers still have snow which is visible from afar. Temperatures were 1-2 degrees above average for April and 2-3 degrees above normal for the water year.

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

Data Current as of: 5/7/2015 11:52:57 AM

Olympic Penninsula
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Olympic Penninsula	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Dungeness R nr Sequim								
	MAY-JUL	32	43	50	50%	57	68	101
	MAY-SEP	35	49	59	47%	69	83	125
Elwha R at McDonald Bridge nr Port Angeles								
	MAY-JUL	124	149	166	52%	183	210	320
	MAY-SEP	152	182	205	53%	225	255	390

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Olympic Penninsula	6	0%	88%

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

United States Department of Agriculture

NRCS Natural Resources Conservation Service

Washington
Water Supply Outlook Report
June 1, 2015

Photo by Chris Burns, Jamestown s'Klallam Tribe, 5/27/2015

The above picture is of the mouth of Siebert Creek, Clallam County, WA, which shows the bar-bound characteristic that exists at both Siebert and McDonald creeks. Both salmon/steelhead spawning streams. It gives the viewer a real clear understanding of why surface flows are so critical to these streams. The point is that they are already beginning to feel the effects of low flows in the smaller streams. Low flows are currently impeding the migration of naturally produced salmonids. Typically these small creeks would maintain adequate flows to assist in the smolt migration through the end of June but this year runoff is incredibly low, making migration almost impossible.

Stream gaging is not available at this time however observed flows have dropped precipitously in the last few weeks and are estimated to be as low as 2-3 cubic-feet-per-second (cfs) which is not enough to push over the bar at the mouth of either the creek. Officials have since hand trenched a connecting channel allowing migration of outgoing smolt and incoming Steelhead.

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

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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.

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Washington
Water Supply Outlook

June 2015

General Outlook

With the end of winter comes the end of forecasting season and the final outlook report for this year. Of course we will continue to be available for on-the-fly guidance if requested. From here on out we get what we get with very little chance to make up deficits. Dry conditions (except a few thunder storms) continue to wreak havoc particularly on west side stream conditions and migrating fish. Both short and long term weather forecasts call for persistence of above normal temperatures with below normal precipitation. The lightening season appears to have gotten off to an early and powerful start so watch out for strikes and potential fires. The first lightening caused mountain wildfires of the season are currently burning in the North Cascades National Park. Fire crews are on the scene. Attached to the end of this report is the annual glacier monitoring report produced by the North Cascades National Park.

Snowpack

Only 5 SNOTEL sites managed to hold on to a meager snowpack through the end of May (Harts Pass, Lyman Lake, Brown Top, Easy Pass and Corral Pass) so reporting statewide or basin-wide percent of normal only shows to compare with previous years and becomes a bit ambiguous. As an example; on June 1 2005 there were only 3 sites with remaining snow however 2 of the above listed sites had yet to be installed at higher elevations in the North Cascades. A normal year would see around 30 sites still with snow, which is about 40% of the SNOTEL network in the state.

BASIN	PERCENT OF NORMAL	LAST YEAR PERCENT OF NORMAL
Spokane	0	165
Newman Lake	0	0
Pend Oreille	35	167
Okanogan	24	139
Methow	14	136
Conconully Lake	0	0
Central Columbia	23	112
Upper Yakima	0	83
Lower Yakima	5	92
Ahtanum Creek	0	0
Walla Walla	0	0
Lower Snake	5	179
Cowlitz	0	125
Lewis	0	65
White	6	120
Green	0	62
Puyallup	6	120
Cedar	0	0
Snoqualmie	0	62
Skykomish	0	360
Skagit	9	115
Nooksack	0	148
Baker	0	0
Olympic Peninsula	0	93

Precipitation

May had two tales to tell in that the western side of the state was extremely dry with less than one-half the normal rainfall where the east side received considerable rain, in certain places. The Lower Yakima seemed to be the winner with heavy thunderstorms producing inches of rain at a time when it was most needed (Green Lake SNOTEL collected 4 inches of rain, 2.2 inches more than the long term average of 1.8 inches, Yakima Airport reported over 300% of normal). Local producers reported saving 1-2 watering's for thirsty crops. This was particularly beneficial to junior water right holders who had curtailed irrigation for a few weeks hoping to bank river water for later in the summer.

RIVER BASIN	MAY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	53	85
Pend Oreille	58	91
Upper Columbia	86	94
Central Columbia	17	92
Upper Yakima	56	83
Lower Yakima	114	96
Walla Walla	55	83
Lower Snake	93	87
Lower Columbia	41	94
South Puget Sound	42	91
Central Puget Sound	36	92
North Puget Sound	39	105
Olympic Peninsula	22	98

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. Most reservoirs filled early this year due to winter rain storms. In most cases managers elected to hold this excess winter water due to the uncertainty of the snowpack. June 1 Reservoir storage in the Yakima Basin was 736,000-acre feet, 102% of average for the Upper Reaches and 232,000-acre feet or 108% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 217,000 acre feet, 82% of average and 91% of capacity; and the Skagit River reservoirs at 86% of average and 64% of capacity. Due to the absents of low elevation snow pack many of the irrigation reservoirs have been forced to begin drafting in order to supplement natural flow and provide early season irrigation needs. 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	91	82
Pend Oreille	90	103
Upper Columbia	99	126
Central Columbia		
Upper Yakima	93	106
Lower Yakima	100	108
Lower Snake	99	110
North Puget Sound	64	86

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

Streamflow

Due to current conditions which are highly variable and much different from anything witnessed in the past we have elected to forgo June forecast model runs. The following published forecasts are for the May-Sept. period as were published last month. Below normal rainfall over the past couple of months have brought below normal streamflows in all but a small handful of streams. This added to the lack of snow have pushed many streams to record low runoff and summer forecasts. Be mindful with continued dry conditions these projections will continue to decrease so to err on the conservative side is most warranted. Updated main stem Columbia and Snake River forecasts should be obtained from the Northwest River Forecast Center: http://www.nwrfc.noaa.gov/ws/

MAY thru SEPTEMBER FORECASTS

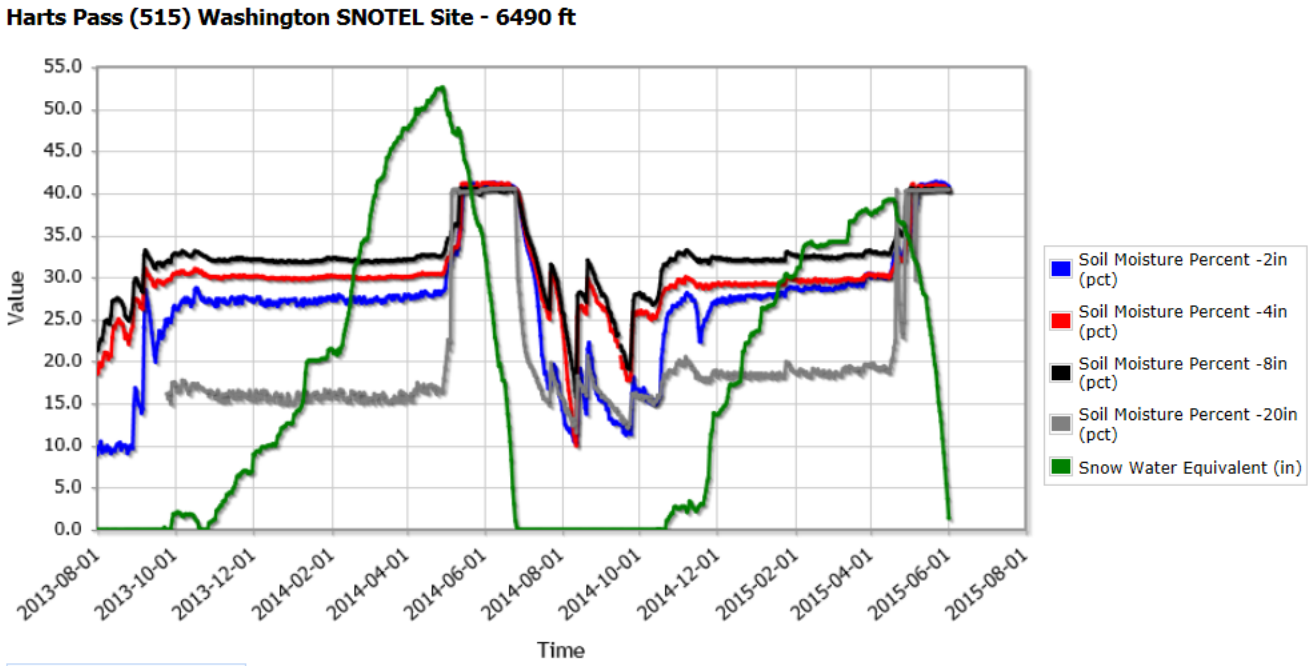
BASIN	PERCENT OF AVERAGE (50 PERCENT CHANCE OF EXCEEDENCE)
Spokane	48-72
Pend Oreille	54-80
Upper Columbia	31-72
Central Columbia	47-65
Upper Yakima	18-33
Lower Yakima	8-46
Walla Walla	58-69
Lower Snake	36-65
Lower Columbia	25-79
South Puget Sound	50-69
Central Puget Sound	45-65
North Puget Sound	69-89
Olympic Peninsula	47-53

STREAM	PERCENT OF AVERAGE MAY STREAMFLOWS
Pend Oreille at Albeni Fall Dam	62
Kettle at Laurier	71
Columbia at Birchbank	96
Spokane at Spokane	29
Similkameen at Nighthawk	82
Okanogan at Tonasket	99
Methow at Pateros	99
Chelan at Chelan	86
Wenatchee at Pashastin	60
Cle Elum near Roslyn	51
Yakima at Parker	32
Naches at Naches	35
Grande Ronde at Troy	49
Snake below Lower Granite Dam	61
Columbia River at The Dalles	69
Lewis at Merwin Dam	42
Cowlitz below Mayfield Dam	41
Skagit at Concrete	68
Dungeness near Sequim	44

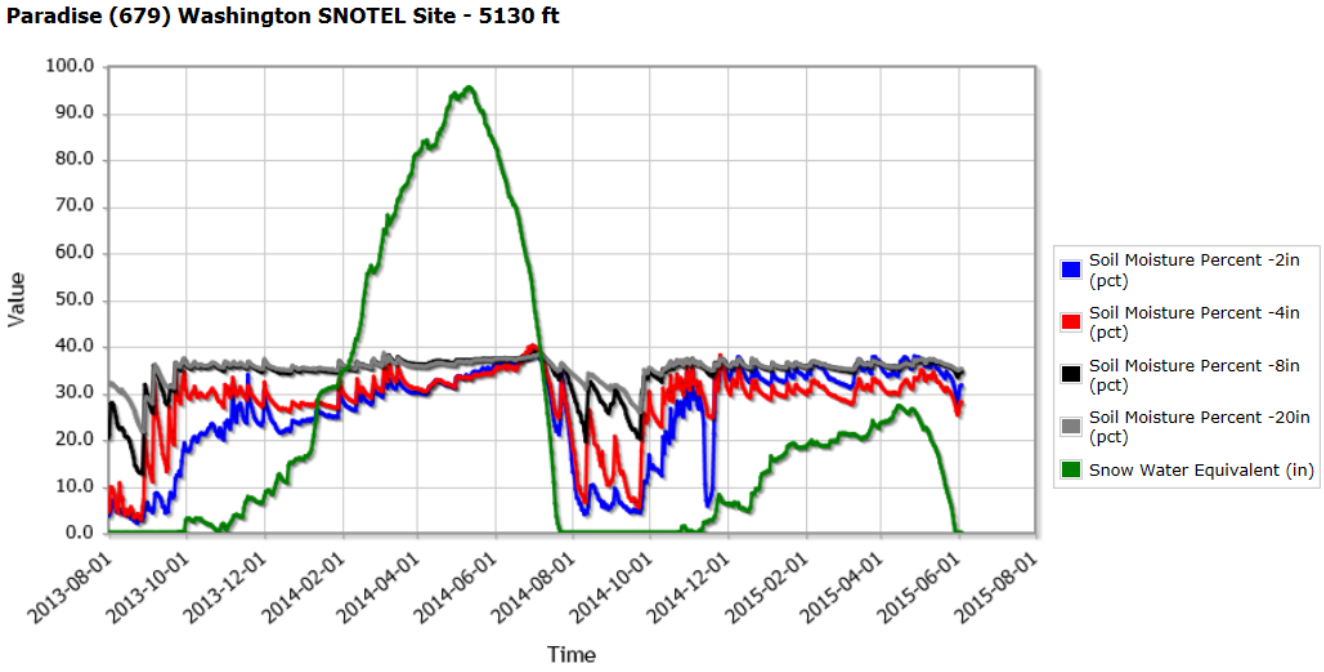
For more information contact your local Natural Resources Conservation Service office.

Soil Moisture

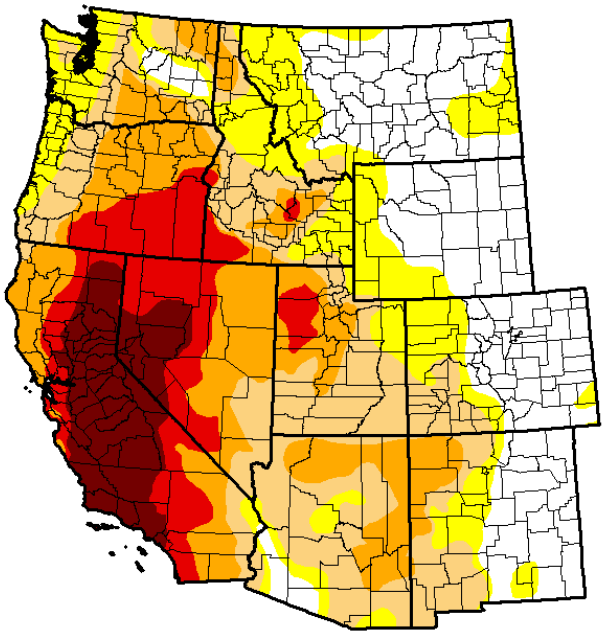
The following graph from Hart Pass SNOTEL shows a very typical interaction between soil moisture, fall rain, snow accumulation and snow melt. Water-year 2014 was a near normal year with a good snowpack. See where the peak SWE is followed shortly by the increase in soil moisture to the point of saturation. This demonstrates the reliance on melting snow to achieve water holding capacity.



This graph from Paradise SNOTEL presents that even without a good snow season soil moisture is recharged to capacity with fall rain. No wonder it's so lush up there.



U.S. Drought Monitor
West



June 2, 2015

(Released Thursday, Jun. 4, 2015)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	25.23	74.77	56.98	35.92	17.99	7.94
Last Week 5/26/2015	25.37	74.63	57.03	35.92	17.59	7.94
3 Months Ago 3/3/2015	29.95	70.05	59.79	29.48	16.62	7.04
Start of Calendar Year 12/30/2014	34.76	65.24	54.48	33.50	18.68	5.40
Start of Water Year 9/30/2014	31.48	68.52	55.57	35.65	19.95	8.90
One Year Ago 6/3/2014	31.84	68.16	60.32	47.21	20.20	4.31

Intensity:

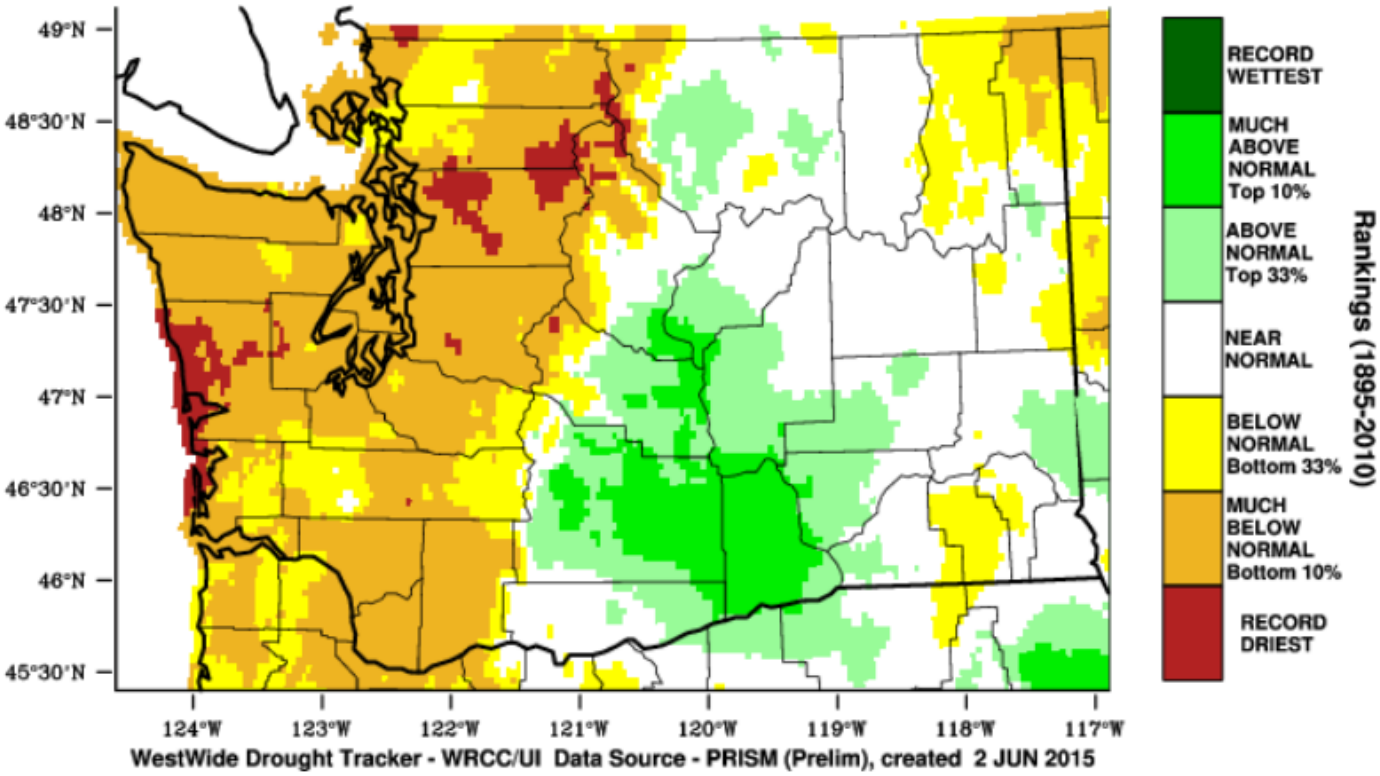
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
David Miskus
NOAA/NWS/NCEP/CPC

http://droughtmonitor.unl.edu/

Washington - Precipitation
May 2015 Percentile



WestWide Drought Tracker - WRCC/UI Data Source - PRISM (Prelim), created 2 JUN 2015

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.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/

Oregon:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/

Idaho:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/

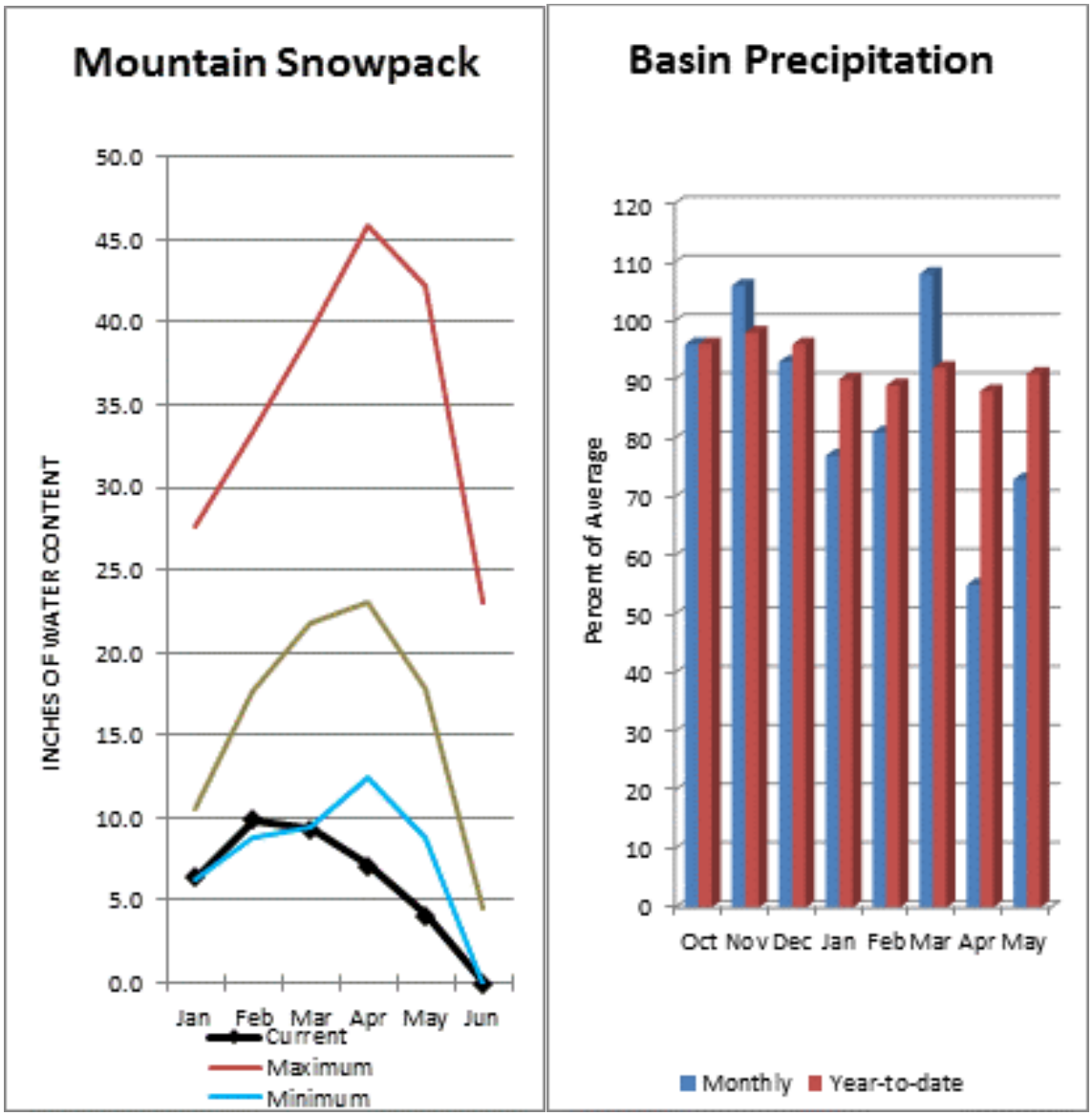
National Water and Climate Center (NWCC):
http://www.wcc.nrcs.usda.gov

USDA-NRCS Agency Homepages

Washington:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/

NRCS National:
http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

Spokane River Basin



The May 1 forecasts for summer runoff within the Spokane River Basin are 34% of average near Post Falls and 42% at Long Lake. The Chamokane River near Long Lake forecasted to have 47% of average flows for the June-August period. Since the snow has melted the forecast is based on basin precipitation that is 85% of average for the water year. Precipitation for May was below normal at 53% of average. Streamflow on the Spokane River at Spokane was 29% of average for May. June 1 storage in Coeur d'Alene Lake was 217,000 acre feet, 82% of average and 91% of capacity. Snowpack at Quartz Peak SNOTEL site was melted out by the 1st of the month which is normal. Average temperatures in the Spokane basin were 2-4 degrees above normal for May and 1-3 degrees above normal for the water year.

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

Data Current as of: 5/7/2015 11:52:22 AM

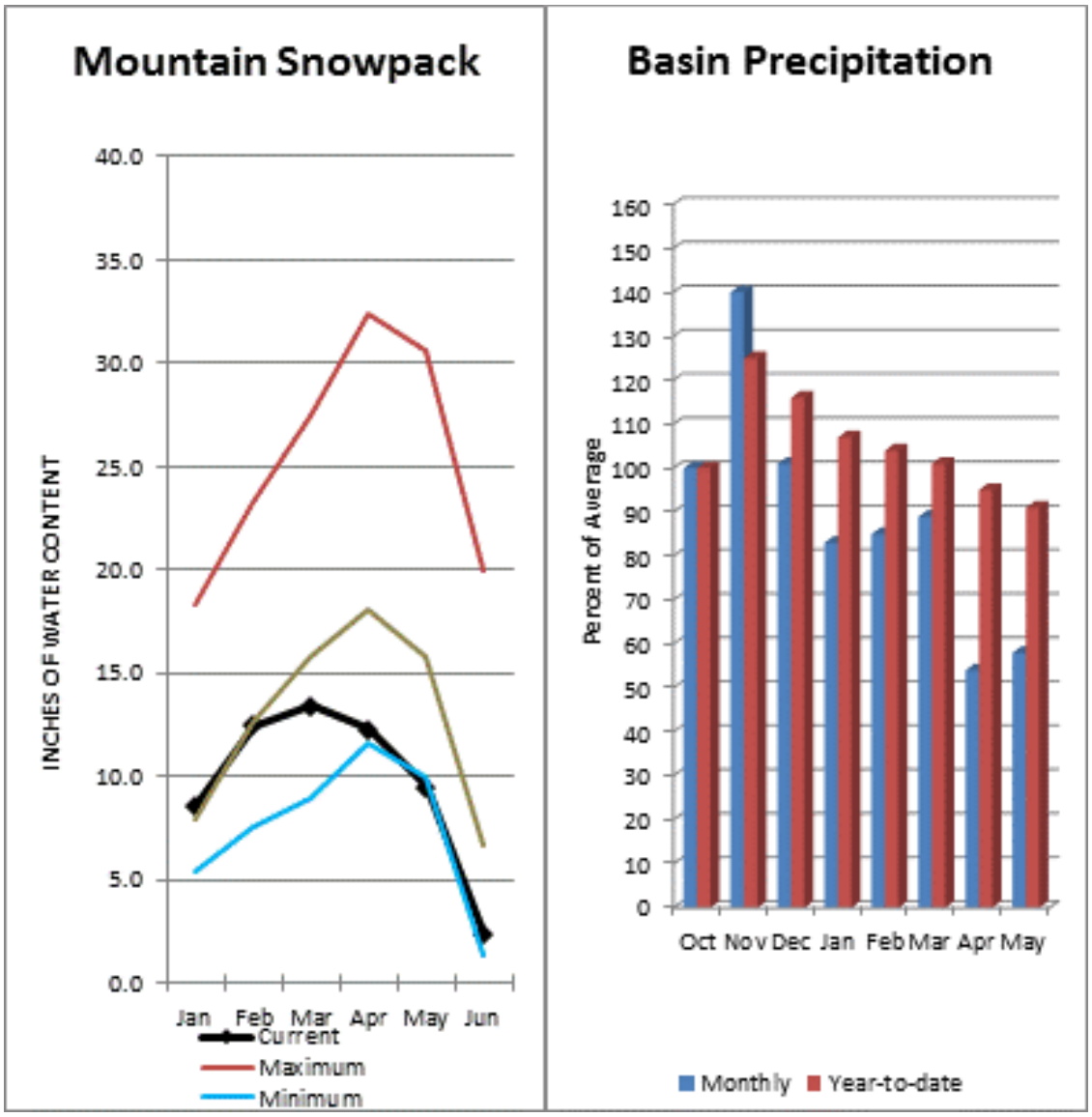
Spokane
Streamflow Forecasts - May 1, 2015

Spokane	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Spokane R nr Post Falls[2]								
	MAY-JUL	69	340	525	34%	710	980	1530
	MAY-SEP	53	350	550	34%	750	1050	1620
Spokane R at Long Lake[2]								
	MAY-JUL	137	465	685	40%	905	1230	1710
	MAY-SEP	235	580	815	42%	1050	1400	1950
Chamokane Ck nr Long Lake								
	MAY-AUG	0.56	2.5	4.4	47%	6.2	8.9	9.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Coeur d' Alene	209.1	238.6	228.0	238.5
Basin-wide Total	209.1	238.6	228.0	238.5
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Spokane	12	23%	132%
Newman Lake	1	0%	74%



The May – September average forecast for the Priest River near the town of Priest River is 54% and the Pend Orielle below Box Canyon is 80%. May streamflow was 62% of average on the Pend Oreille River and 96% on the Columbia at Birchbank. June 1 snow cover was 35% of normal in the Pend Oreille River Basin. Bunchgrass Meadows SNOTEL site had melted out a couple of weeks early. Normally Bunchgrass would still have 6.4 inches on June 1. Precipitation during May was 58% of average, keeping the year-to-date precipitation at 91% of average. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 103% of normal. Average temperatures were 2-4 degrees above normal for May and 1-3 degrees above normal for the water year.

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

Data Current as of: 5/7/2015 11:52:25 AM

Pend Oreille Basins
Streamflow Forecasts - May 1, 2015

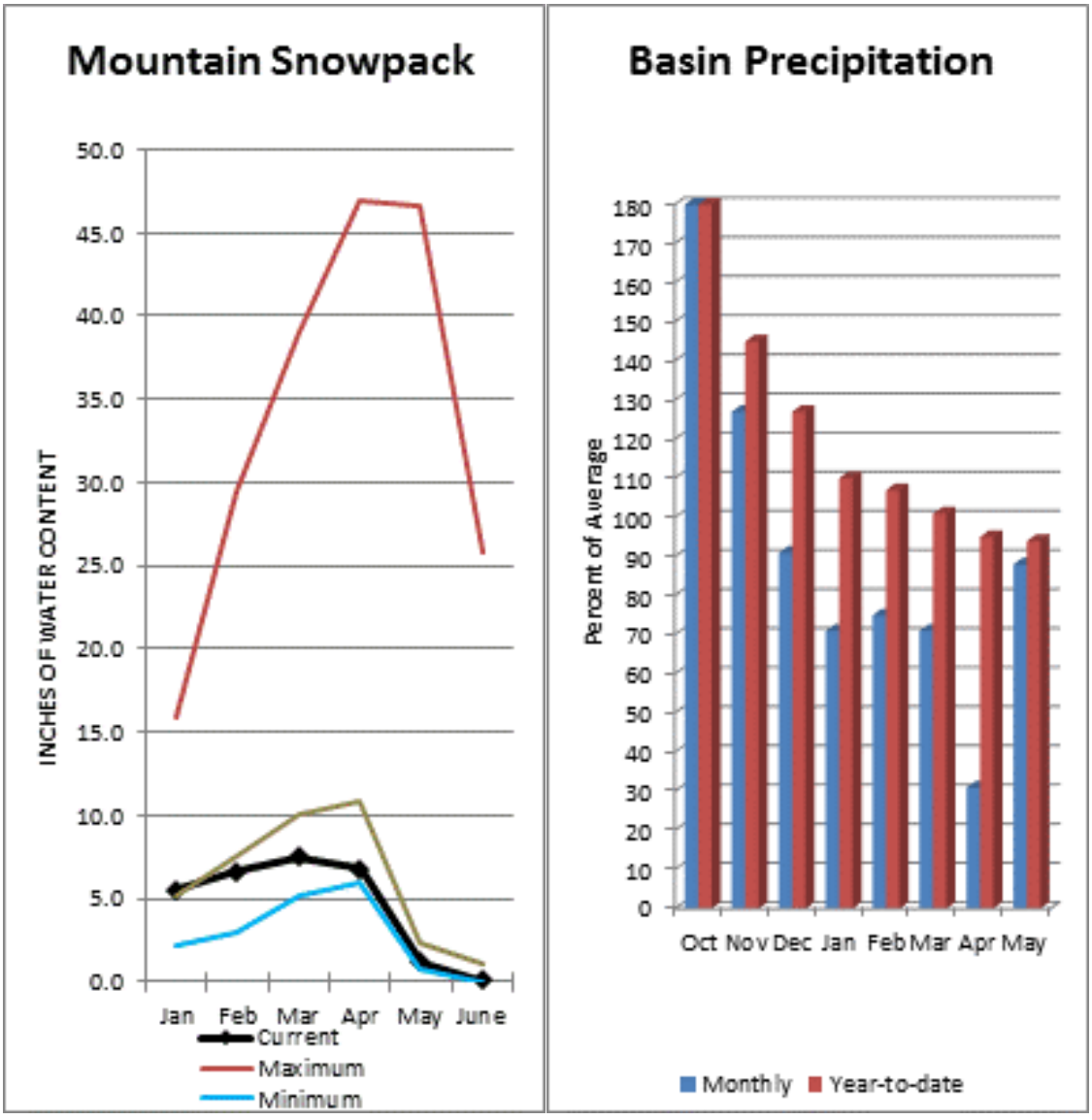
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Pend Oreille Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Pend Oreille Lake Inflow[2]								
	MAY-JUL	6080	7030	7680	79%	8330	9280	9690
	MAY-SEP	6720	7810	8550	80%	9290	10400	10700
Priest R nr Priest River[2]								
	MAY-JUL	220	270	305	53%	345	405	580
	MAY-SEP	245	300	340	54%	380	450	630
Pend Oreille R bl Box Canyon[2]								
	MAY-JUL	6140	7100	7750	79%	8390	9350	9750
	MAY-SEP	6790	7880	8620	80%	9360	10500	10800

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Pend Oreille	851.9	846.5	931.7	1561.3
Priest Lake	81.9	95.9	101.9	119.3
Basin-wide Total	933.8	942.5	1033.6	1680.6
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Pend Oreille Basins	68	60%	161%
Colville River	0		
Kettle River	5	58%	127%



Summer runoff average forecast for the Okanogan River is 15%, Similkameen River is 28%, Kettle River 0% and Methow River is 15%. May precipitation in the Upper Columbia was 86% of average, with precipitation for the water year at 94% of average. May streamflow for the Methow River was 99% of average, 99% for the Okanogan River and 82% for the Similkameen. Salmon Meadows SNOTEL, in the Conconully Basin, was snow free on June 1. Combined storage in the Conconully Reservoirs was 23,300 acre-feet or 126% of normal. Temperatures were 2-4 degrees above normal for May and 1-3 degrees above for the water year.

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Upper Columbia Basins
Streamflow Forecasts - May 1, 2015

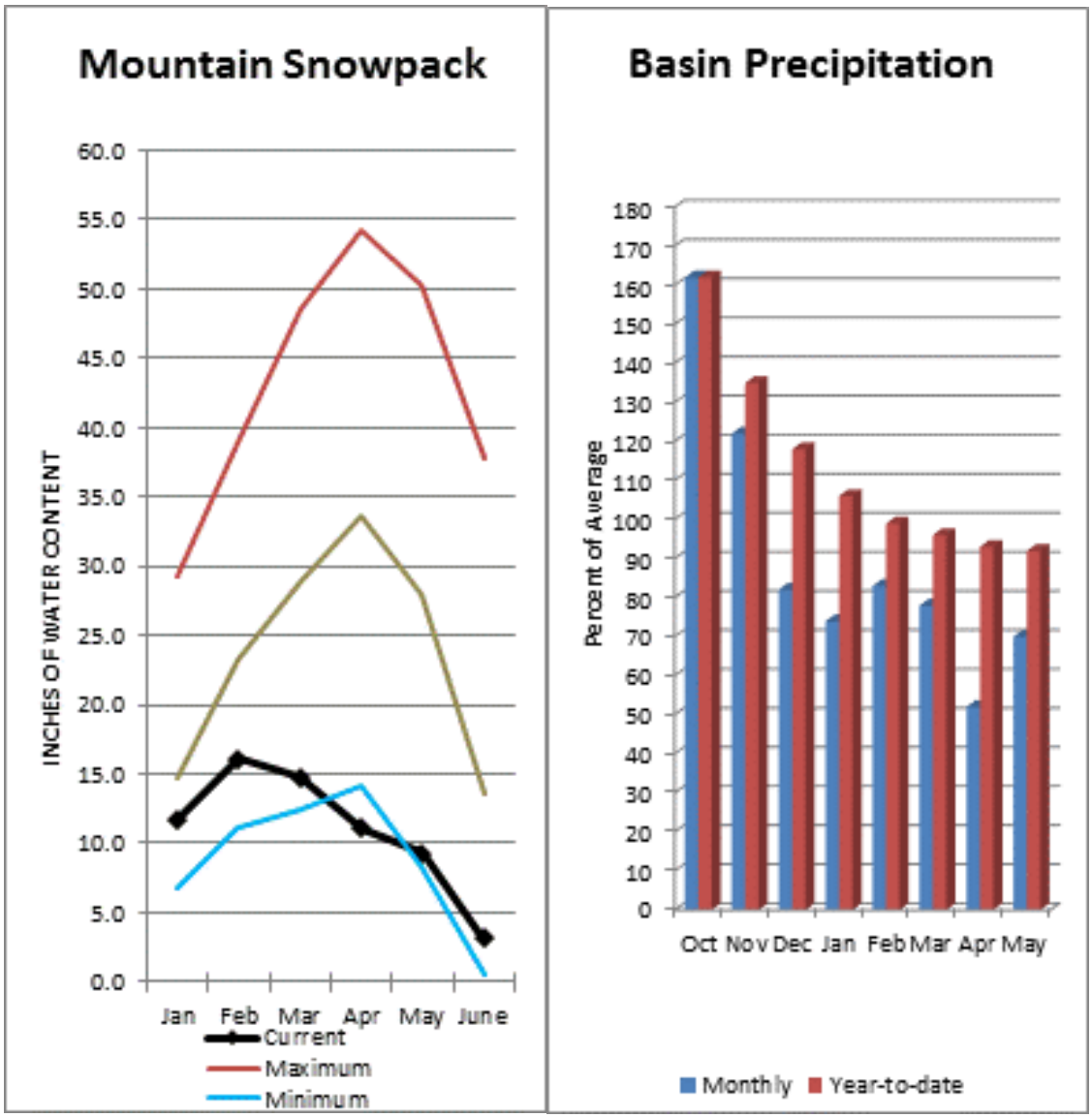
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Kettle R nr Laurier								
	MAY-JUL	535	695	800	55%	905	1060	1450
	MAY-SEP	585	765	885	58%	1010	1190	1530
Colville R at Kettle Falls								
	MAY-JUL	5.7	13.7	21	29%	30	46	72
	MAY-SEP	7.7	17.4	26	31%	37	55	84
Columbia R at Grand Coulee[1,2]								
	MAY-JUL	28600	31300	32500	74%	33700	36400	43870
Similkameen R nr Nighthawk[1]								
	MAY-JUL	440	610	685	65%	760	930	1060
	MAY-SEP	455	645	730	64%	815	1000	1140
Okanogan R nr Tonasket[1]								
	MAY-JUL	440	750	890	68%	1030	1340	1300
	MAY-SEP	490	840	1000	68%	1160	1510	1470
Okanogan R at Malott[1]								
	MAY-JUL	450	775	920	72%	1070	1390	1270
	MAY-SEP	500	865	1030	72%	1200	1560	1440
Methow R nr Pateros								
	MAY-JUL	191	245	290	40%	335	405	730
	MAY-SEP	215	280	325	41%	375	455	790
Columbia R at Birchbank[1,2]								
	MAY-JUL	20200	23400	24900	82%	26400	29600	30480

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	9.0	9.7	7.6	10.5
Conconully Reservoir	12.5	11.5	8.9	13.0
Basin-wide Total	21.5	21.2	16.5	23.5
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Upper Columbia Basins	15	69%	129%
Okanogan River	12	73%	129%
Omak Creek	1	0%	68%
Sanpoil River	0		
Similkameen River	5	63%	139%
Toats Coulee Creek	0		
Conconully Lake	1		
Methow River	4	79%	119%



Precipitation during May was 17% of average in the basin and 92% for the year-to-date. Runoff for Entiat River is forecast to be 60% of average for the summer. The May-September average forecast for Chelan River is 65%, Wenatchee River at Plain is 49%, Stehekin River is 61% and Icicle Creek is 55%. May average streamflows on the Chelan River were 86% and on the Wenatchee River 60%. June 1 snowpack in the Wenatchee River Basin was 23% of normal; the Chelan, 17%; the Entiat, 0%; Stemilt Creek, 0% and Colockum Creek, 0%. Lyman Lake SNOTEL had the most snow water with 11.8 inches of water. This site would normally have 48.9 inches on June 1. Temperatures were 2-4 degrees above normal for May and 1-3 degrees above normal for the water year.

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

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Central Columbia Basins
Streamflow Forecasts - May 1, 2015

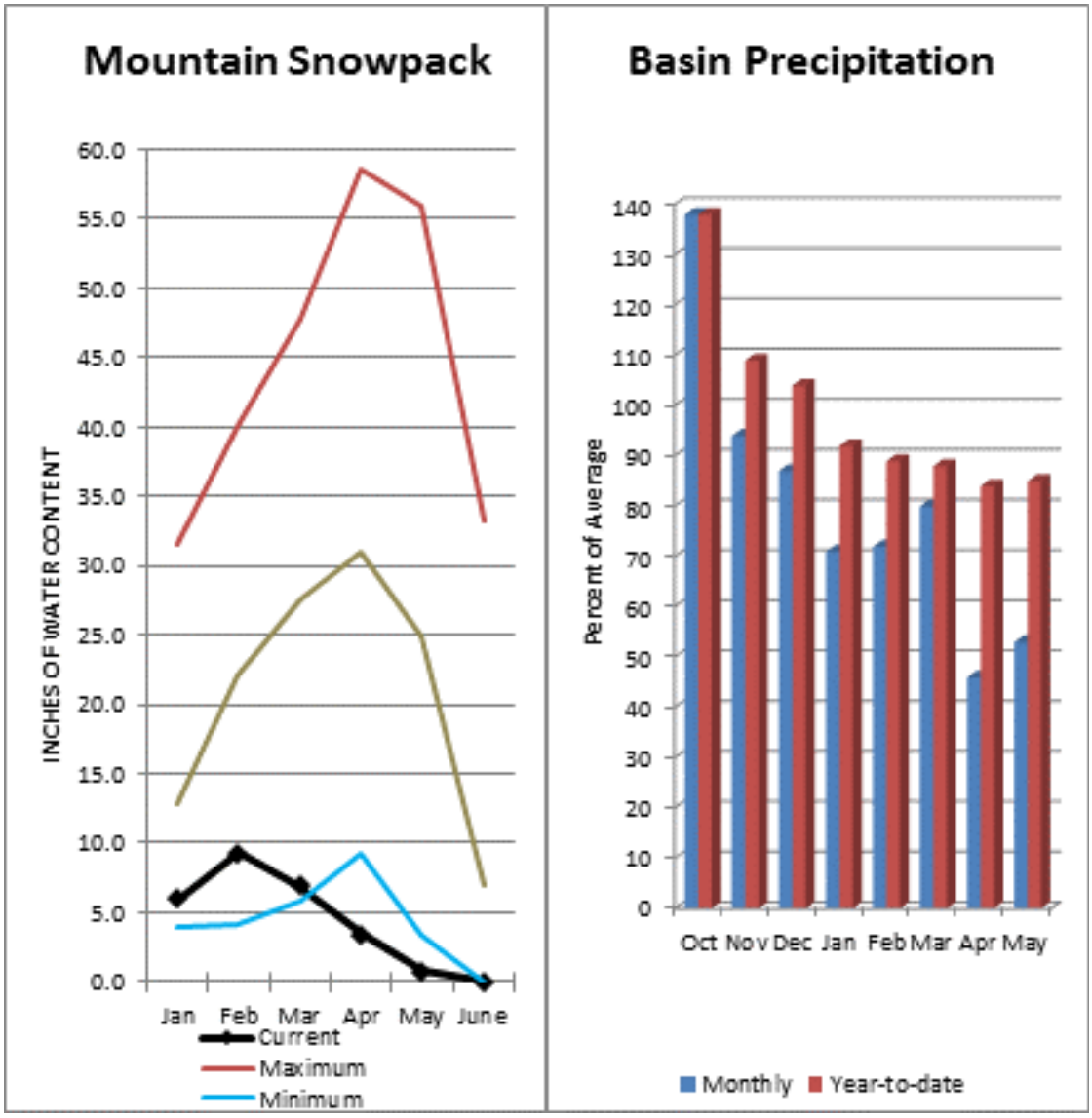
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Stehekin R at Stehekin								
	MAY-JUL	295	330	360	61%	390	430	595
	MAY-SEP	365	400	430	61%	455	500	705
Chelan R at Chelan								
	MAY-JUL	485	535	570	66%	605	655	860
	MAY-SEP	545	595	630	65%	670	725	975
Entiat R nr Ardenvoir								
	MAY-JUL	84	98	108	61%	118	133	178
	MAY-SEP	90	107	118	60%	130	146	196
Wenatchee R at Plain								
	MAY-JUL	295	360	405	49%	445	510	825
	MAY-SEP	310	380	430	47%	480	550	920
Icicle Ck nr Leavenworth								
	MAY-JUL	75	108	131	56%	153	186	235
	MAY-SEP	80	118	143	55%	168	205	260
Wenatchee R at Peshastin								
	MAY-JUL	440	525	580	51%	635	720	1140
	MAY-SEP	465	555	615	49%	675	765	1260
Columbia R bl Rock Island Dam[2]								
	MAY-JUL	29800	32800	34800	73%	36800	39800	47930
	MAY-SEP	36400	40000	42400	74%	44900	48500	57360

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Chelan		291.7	300.7	676.1
Basin-wide Total		0.0	0.0	0.0
# of reservoirs	0	0	0	0

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Central Columbia Basins	3	53%	118%
Chelan Lake Basin	3	53%	118%
Entiat River	1	0%	108%
Wenatchee River	7	29%	108%
Stemilt Creek	1	0%	84%
Colockum Creek	1	0%	178%



June 1 reservoir storage for the Upper Yakima reservoirs was 736,000-acre feet, 102% of average. Forecasts for the Yakima River at Cle Elum are 25% of average and the Teanaway River near Cle Elum is at 18%. Lake inflows are all forecasted to be below average this summer as well. May streamflows within the basin were Cle Elum River near Roslyn at 51%. June 1 snowpack had completely melted in the Upper Yakima Basin. Precipitation was 56% of average for May and 83% for the water-year. Volume forecasts for the Yakima Basin are for natural flow. As such, they June 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.

Data Current as of: 5/7/2015 11:52:33 AM

Upper Yakima River
Streamflow Forecasts - May 1, 2015

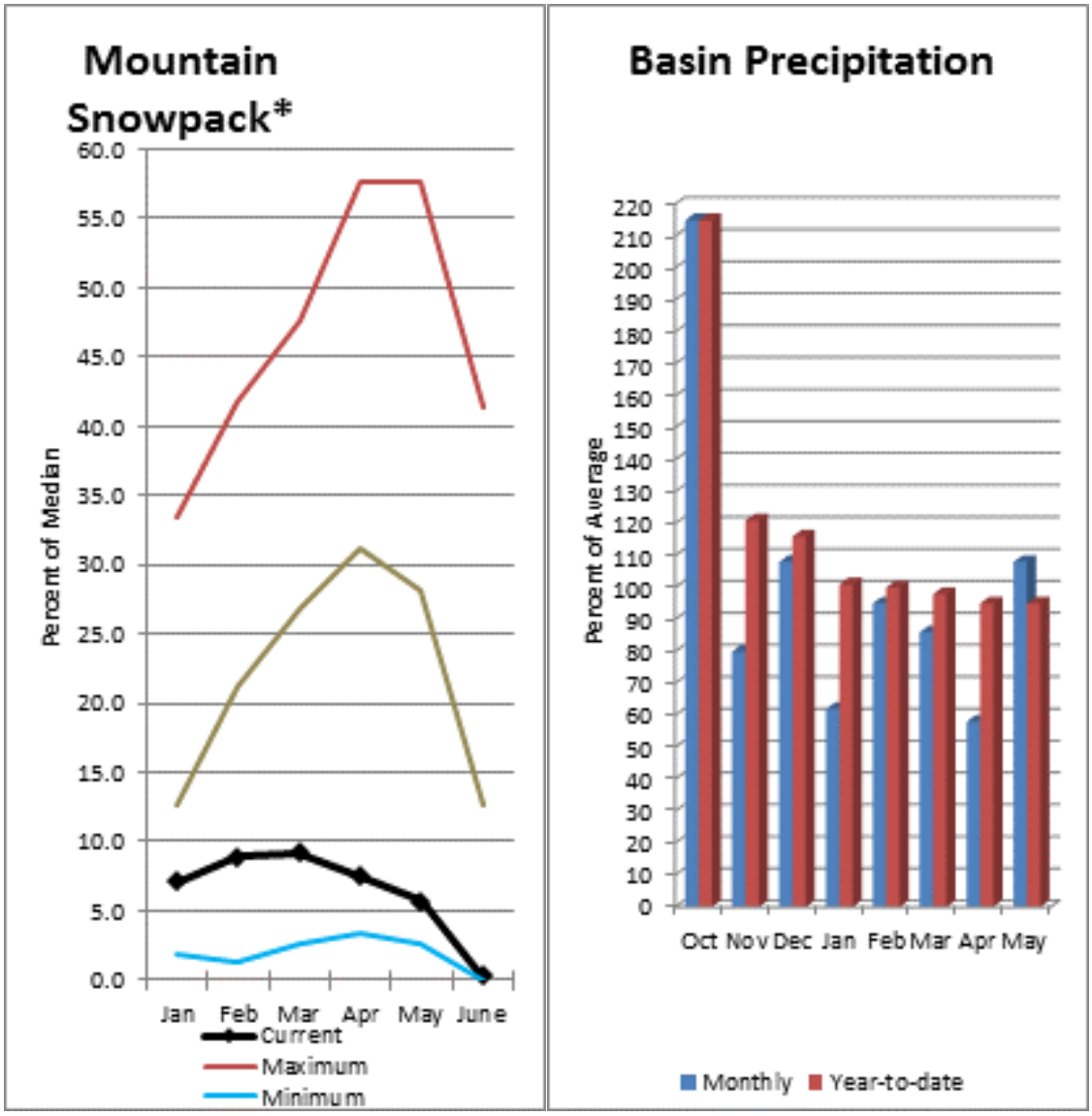
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Upper Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Keechelus Reservoir Inflow[2]								
	MAY-JUL	8.4	12.1	15	18%	18.2	24	85
	MAY-SEP	13.30257	18.22312	22	23%	26.1323	32.87373	96
Kachess Reservoir Inflow [2]								
	MAY-JUL	7.56285	10.08406	12	16%	14.08247	17.45685	76
	MAY-SEP	10.6	13.7	16	19%	18.5	23	84
Cle Elum Lake Inflow [2]								
	MAY-JUL	58	79	94	31%	109	130	305
	MAY-SEP	66	93	111	33%	129	156	340
Yakima R at Cle Elum [2]								
	MAY-JUL	46	92	123	22%	154	200	570
	MAY-SEP	73	127	164	25%	200	255	645
Teanaway R bl Forks nr Cle Elum								
	MAY-JUL	6.17491	10.3041	13.7	17%	17.57875	24.18442	79
	MAY-SEP	6.99567	11.45562	15.1	18%	19.2469	26.28419	82

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Keechelus	142.1	140.9	122.1	157.8
Kachess	237.3	224.2	183.7	239.0
Cle Elum	425.5	318.7	302.6	436.9
Basin-wide Total	804.8	683.8	608.4	833.7
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Upper Yakima River	8	2%	106%



Precipitation was 114% of average for May and 94% for the water-year. Heavy thunder storm activity on May 12-13 and 21 brought heavy rains to the basin. May average streamflows within the basin were: Yakima River near Parker, 32% and the Naches River near Naches, 35%. June 1 reservoir storage for Bumping and Rimrock reservoirs was 232,000-acre feet, 108% of average. Forecast averages for Yakima River near Parker are 27%; American River near Nile, 23%; Ahtanum Creek, 8%; and Klickitat River near Glenwood, 25%. June 1 snowpack was 2% of normal based on measurements from the Corral pass SNOTEL. All other stations had melted out. Temperatures were 2-4 degrees above normal for May and for 1-3degrees above normal for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they June 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.

Data Current as of: 5/7/2015 11:52:35 AM

Lower Yakima River
Streamflow Forecasts - May 1, 2015

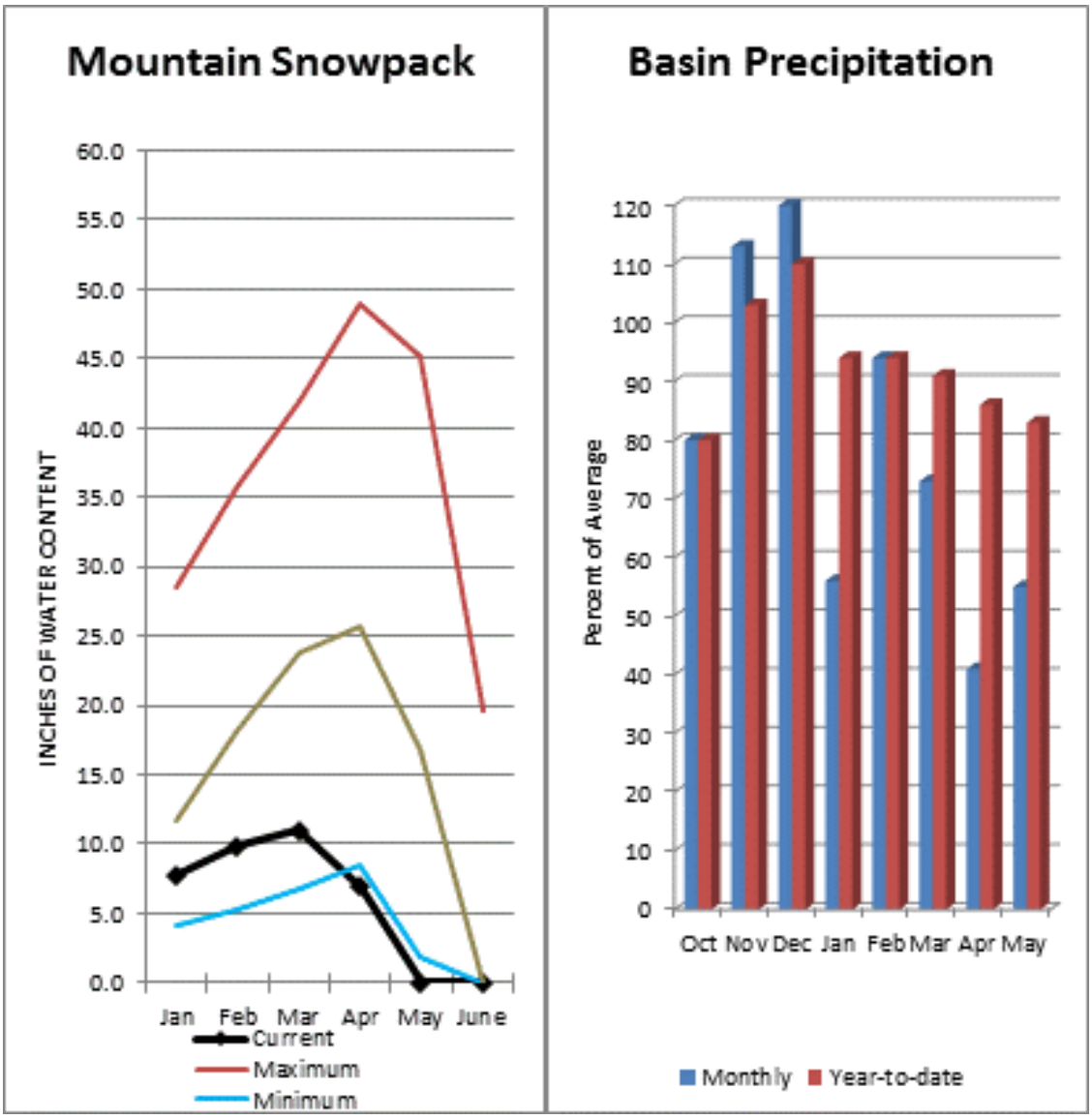
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bumping Lake Inflow [2]								
	MAY-JUL	8.2	14.9	19.4	21%	24	31	93
	MAY-SEP	8.1	15.8	21	20%	26	34	103
American R nr Nile								
	MAY-JUL	8	15.2	20	24%	25	32	84
	MAY-SEP	7.3	15.6	21	23%	27	35	92
Rimrock Lake Inflow [2]								
	MAY-JUL	32	42	49	32%	56	67	151
	MAY-SEP	39	52	61	33%	70	84	185
Naches R nr Naches								
	MAY-JUL	39	61	87	16%	100	134	540
	MAY-SEP	44	70	91	15%	115	156	600
Ahtanum Ck at Union Gap								
	MAY-JUL	0	0.29	0.86	4%	1.72	3.6	19.3
	MAY-SEP	0.13	0.85	1.69	8%	2.8	5	21
Yakima R nr Parker [2]								
	MAY-JUL	135	240	310	25%	380	485	1230
	MAY-SEP	178	290	370	27%	450	560	1390
Klickitat R nr Glenwood								
	MAY-JUL	14.3	19.3	23	24%	27	34	97
	MAY-SEP	18.2	24	28	25%	33	41	110
Klickitat R nr Pitt								
	MAY-JUL	92	111	124	41%	139	161	305
	MAY-SEP	140	165	182	46%	200	230	395

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bumping Lake	33.6	21.0	21.7	33.7
Rimrock	191.2	173.8	156.9	198.0
Basin-wide Total	224.8	194.8	178.6	231.7
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Lower Yakima River	7	19%	102%
Ahtanum Creek	2	1%	71%



May precipitation was 55% of average, maintaining the year-to-date precipitation at 83% of average. As is normal all SNOTEL sites had melted out prior to the 1st of the month. Streamflow forecasts are 58% of average for Mill Creek and 69% for the SF Walla Walla near Milton-Freewater. Average temperatures were 2-4 degrees above normal for May and 2-4 degrees above normal for the water year.

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

Data Current as of: 5/7/2015 11:52:38 AM

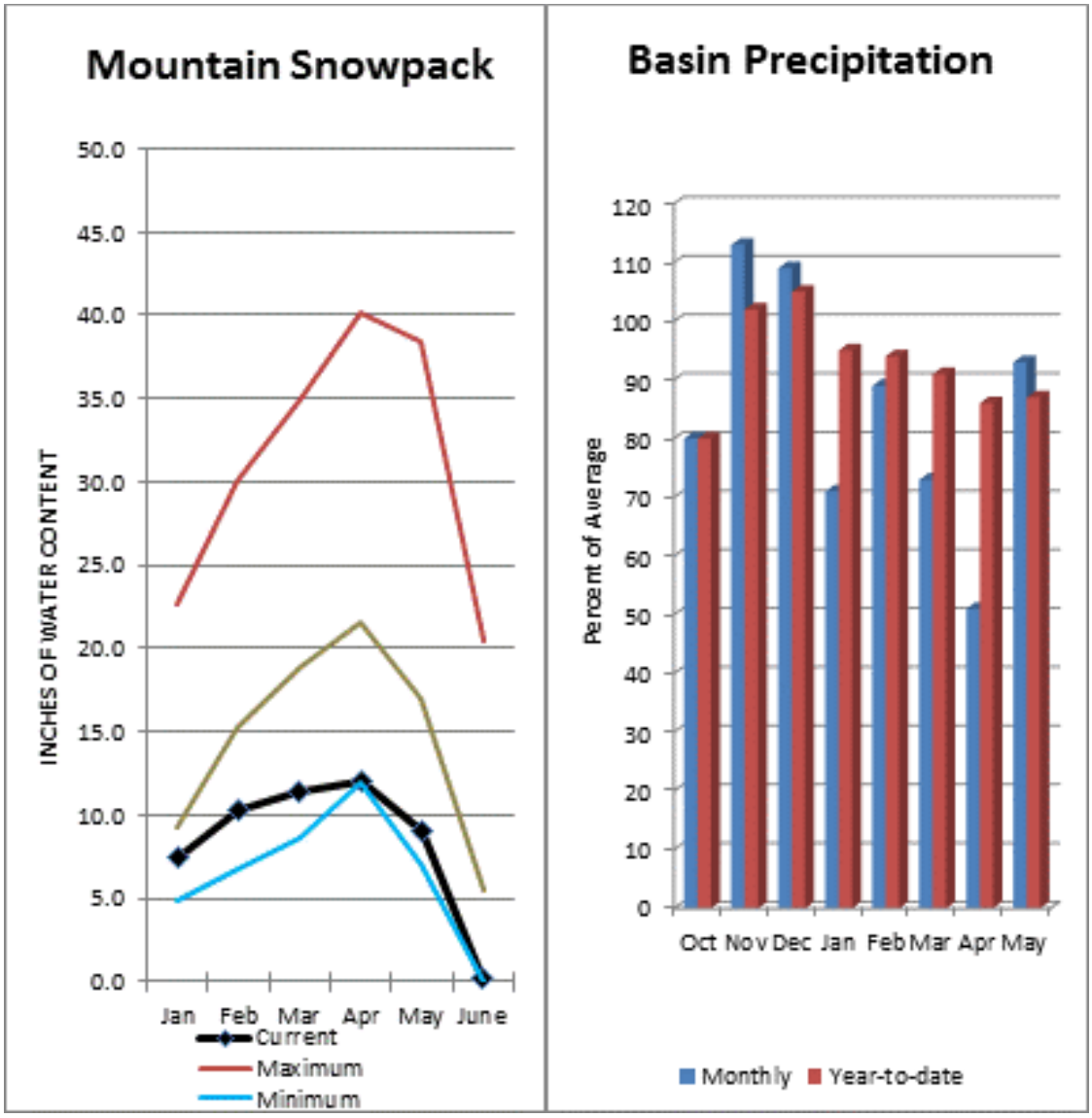
Walla Walla River
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Walla Walla River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
SF Walla Wall R nr Milton-Freewater								
	MAY-JUL	17	21	24	65%	27	32	37
	MAY-SEP	26	31	34	69%	38	43	49
Mill Ck nr Walla Walla								
	MAY-JUL	4.4	6.4	8	58%	9.8	12.8	13.9
	MAY-SEP	6.1	8.3	10	58%	11.8	14.8	17.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Walla Walla River	2	0%	116%



The Grande Ronde River can expect summer flows to be about 48% of normal. The forecast for Asotin Creek at Asotin predicts 36% of average flows for the May – July runoff period. May precipitation was 93% of average, bringing the year-to-date precipitation to 87% of average. June 1 snowpack readings averaged 5% of normal at 1 site located in the very headwaters of the basin at 7400 feet elevation. May streamflow was 61% of average for Snake River below Lower Granite Dam and 49% for Grande Ronde River near Troy. Dworshak Reservoir storage was 110% of average. Average temperatures were 2-4 degrees above normal for May and 2-4 degrees above for the water year.

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

Data Current as of: 5/7/2015 11:52:41 AM

Lower Snake, Grande Ronde, Clearwater Basins
Streamflow Forecasts - May 1, 2015

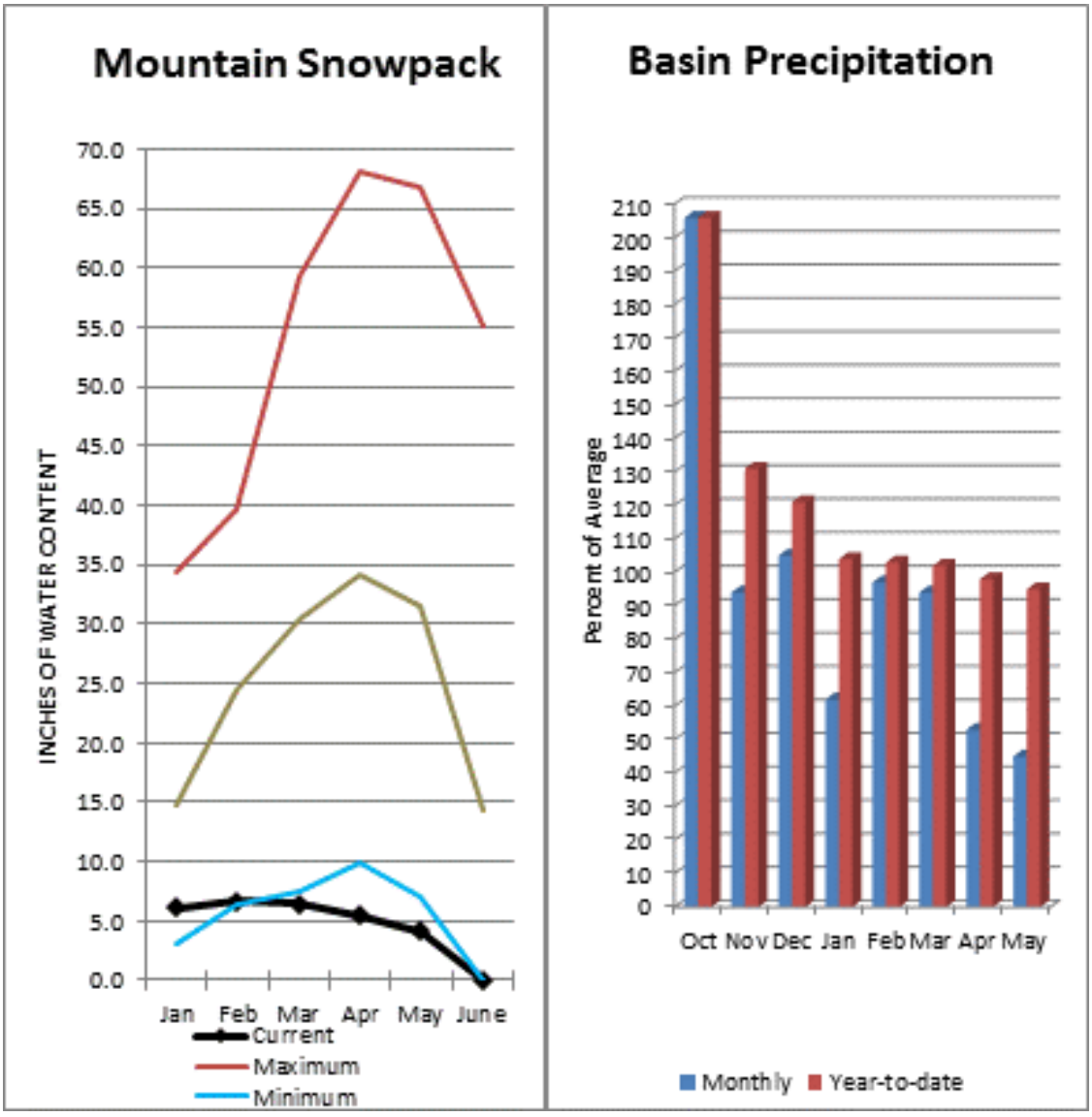
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake, Grande Ronde, Clearwater Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Grande Ronde R at Troy								
	MAY-JUL	250	330	395	46%	465	575	860
	MAY-SEP	295	385	450	48%	520	635	945
Asotin Ck at Asotin								
	MAY-JUL	5.1	7.1	8.6	36%	10.3	13	24
Clearwater R at Spalding[2]								
	MAY-JUL	2450	2990	3350	64%	3710	4250	5260
	MAY-SEP	2710	3280	3670	65%	4060	4630	5640
Snake R bl Lower Granite Dam[12]								
	MAY-JUL	3670	5930	6960	46%	7990	10300	15280
	MAY-SEP	5080	7690	8880	50%	10100	12700	17715

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	3218.2	1888.3	2646.0	3468.0
Basin-wide Total	3218.2	1888.3	2646.0	3468.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Lower Snake, Grande Ronde, Clearwater Basins	14	32%	127%



Forecasts for May – September streamflows within the basin are Lewis River at Ariel, 60% and Cowlitz River at Castle Rock, 79% of average. The Columbia at The Dalles is forecasted to have 65% of average flows this summer according to the River Forecast Center. May average streamflow for Cowlitz River was 41%. The Columbia River at The Dalles was 69% of average. May precipitation was 41% of average and the water-year average was 94%. June 1 snow cover had disappeared for both Cowlitz River and Lewis River basins. Temperatures were 2-4 degrees above normal during May and for the water year.

Data Current as of: 5/7/2015 11:52:44 AM

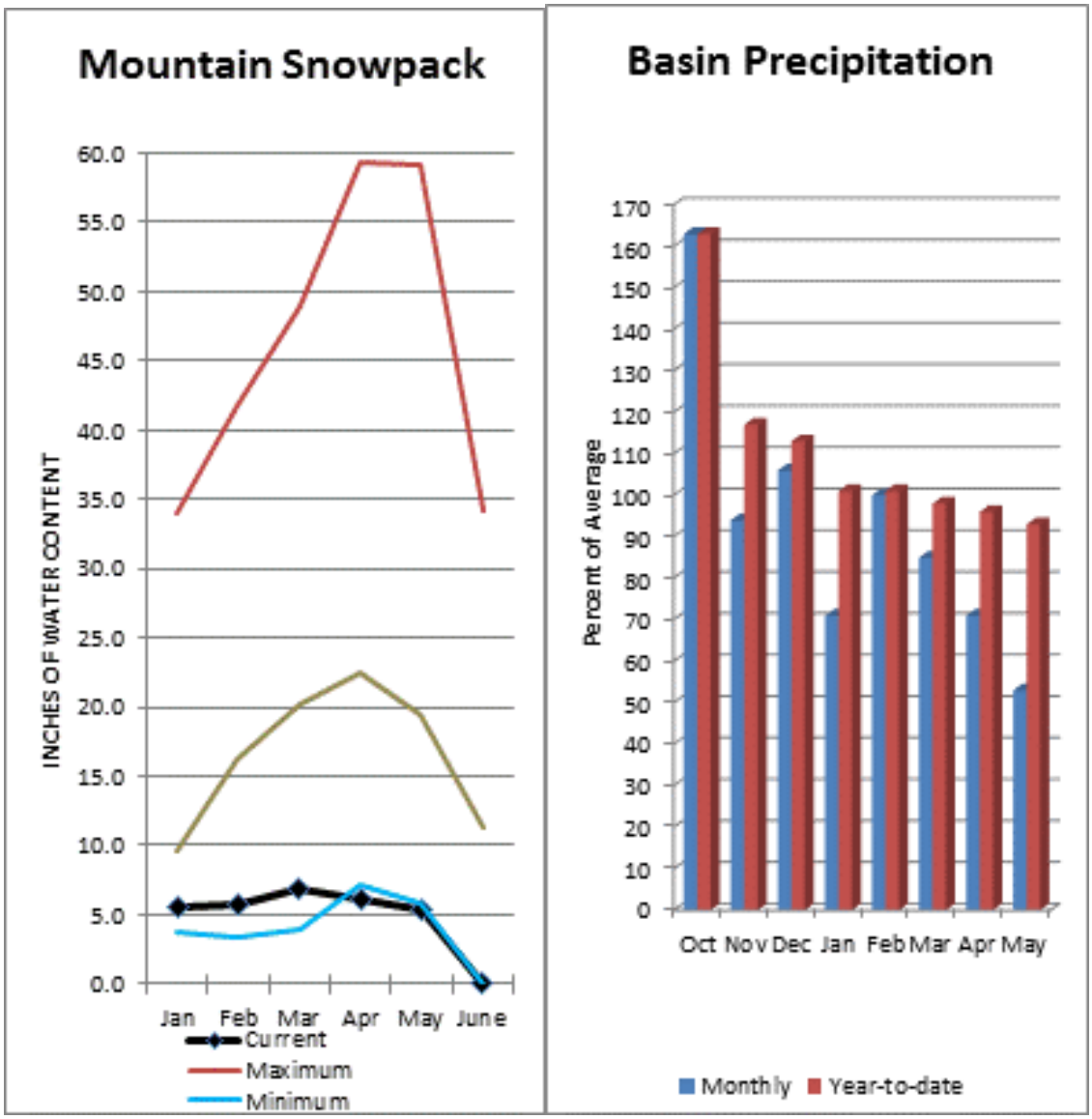
Lower Columbia Basins
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Lower Columbia Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Columbia R at The Dalles[2]								
	MAY-JUL	36100	40300	43100	65%	45900	50100	66050
	MAY-SEP	44600	49700	53100	67%	56500	61500	78900
Klickitat R nr Glenwood								
	MAY-JUL	14.3	19.3	23	24%	27	34	97
	MAY-SEP	18.2	24	28	25%	33	41	110
Klickitat R nr Pitt								
	MAY-JUL	92	111	124	41%	139	161	305
	MAY-SEP	140	165	182	46%	200	230	395
Lewis R at Ariel[2]								
	MAY-JUL	185	280	345	56%	410	505	615
	MAY-SEP	280	390	460	60%	535	640	770
Cowlitz R bl Mayfiled[2]								
	MAY-JUL	465	615	715	61%	815	965	1180
	MAY-SEP	580	765	885	64%	1010	1190	1390
Cowlitz R at Castle Rock[2]								
	MAY-JUL	865	1070	1200	75%	1330	1530	1600
	MAY-SEP	1140	1350	1500	79%	1650	1860	1890

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Lower Columbia Basins	11	13%	101%
Lewis River	5	0%	76%
Cowlitz River	6	25%	125%



Summer runoff is forecast to be 50% of normal for the Green River below Howard Hanson Dam and 69% for the White River near Buckley. Snowpack was gone by the 1st of the month. May precipitation was 42% of average, bringing the water year-to-date to 91% of average for the basins. Average temperatures in the area were 2-4 degrees above normal for May and for the water-year.

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

Data Current as of: 5/7/2015 11:52:47 AM

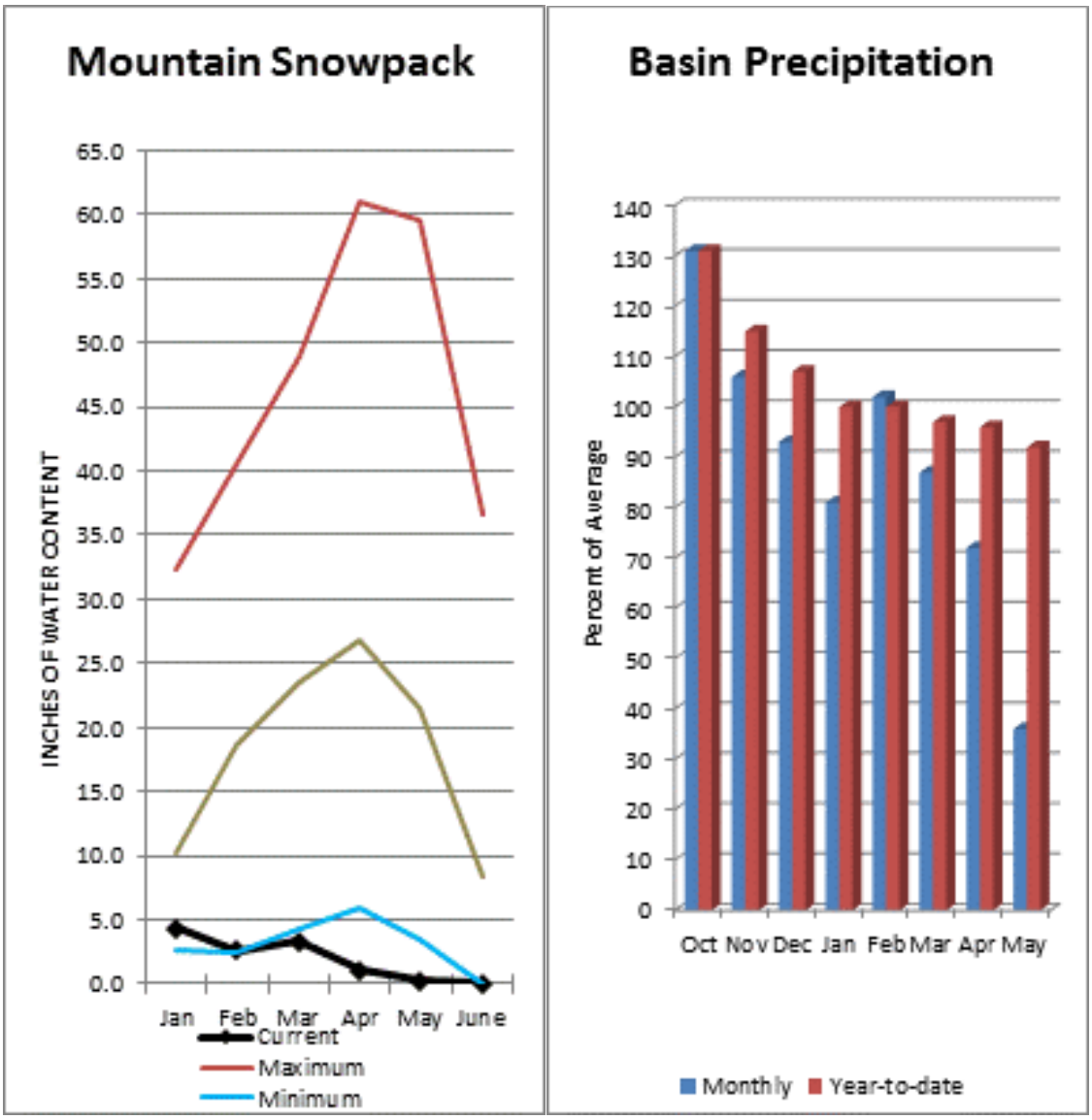
South Puget Sound Basins
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

South Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
White R nr Buckley[1,2]								
	MAY-JUL	128	195	225	68%	255	320	330
	MAY-SEP	176	255	290	69%	325	405	420
Green R bl Howard A Hanson Dam[1,2]								
	MAY-JUL	28	52	66	43%	81	121	152
	MAY-SEP	41.93168	71.82427	88	50%	105.81709	150.95059	175

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
South Puget Sound Basins	10	28%	108%
White River	3	37%	114%
Green River	2	0%	77%



Forecast for spring and summer flows are: 45% for Cedar River near Cedar Falls; 46% for Rex River; 51% for South Fork of the Tolt River; and 65% for Taylor Creek near Selleck. Basin-wide precipitation for May was 36% of average, bringing water-year-to-date to 92% of average. The basin became fully snow free in mid-May. Temperatures were 2-4 degrees above normal for May and for the water-year.

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

Data Current as of: 5/7/2015 11:52:50 AM

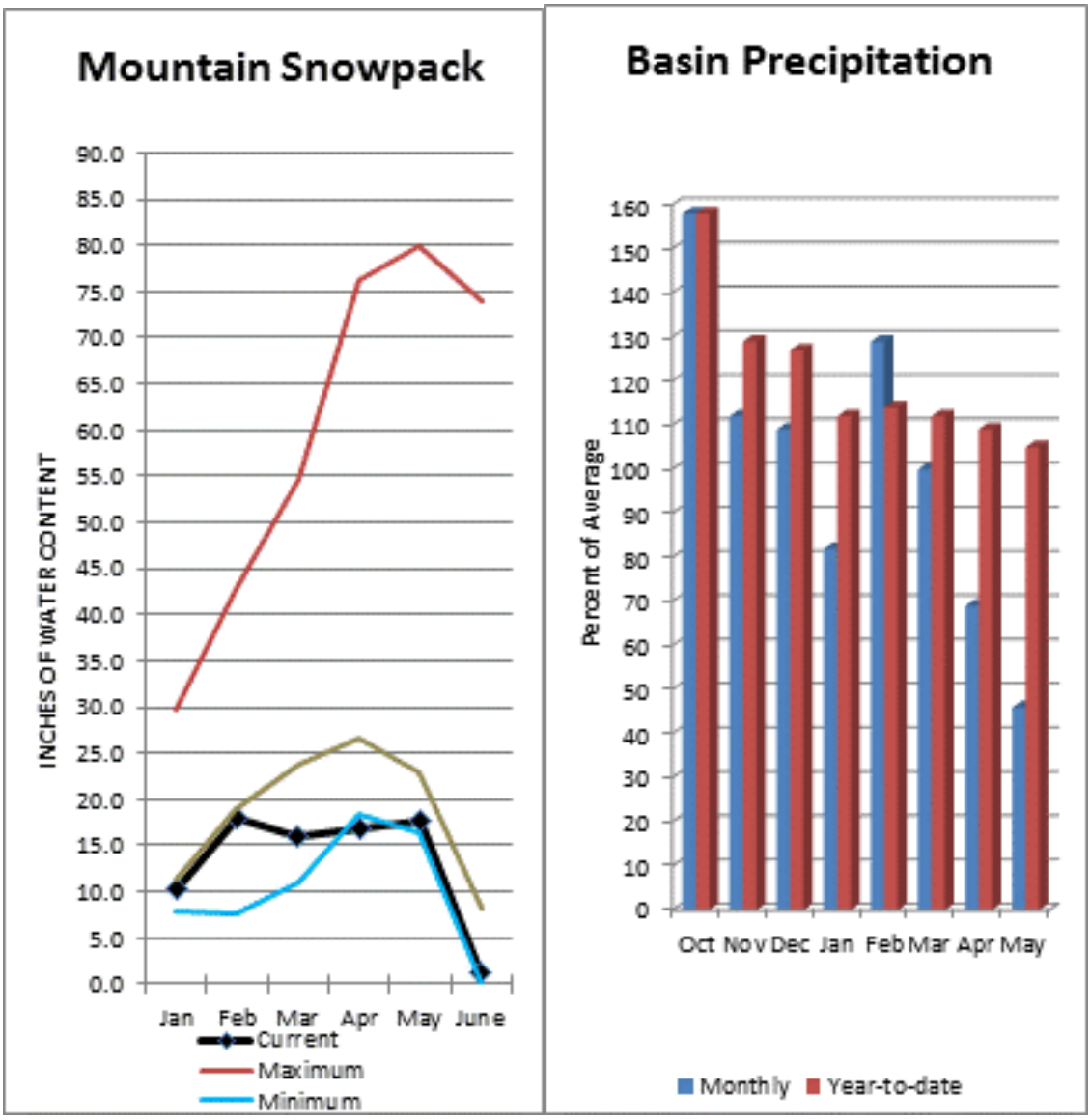
Central Puget Sound Basins
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Central Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Cedar R nr Cedar Falls								
	MAY-JUL	12.2	16	19	39%	22	27	49
	MAY-SEP	16.6	21	25	45%	29	35	56
Rex R nr Cedar Falls								
	MAY-JUL	3.3	4.6	5.7	35%	6.9	8.8	16.2
	MAY-SEP	5.2	7.1	8.5	46%	10.1	12.6	18.5
Taylor Ck nr Selleck								
	MAY-JUL	5.6	7	8	60%	9.1	10.9	13.3
	MAY-SEP	7.9	9.7	11	65%	12.4	14.6	16.9
SF Tolt R nr Index								
	MAY-JUL	2.9	3.7	4.3	41%	4.9	6	10.4
	MAY-SEP	4.1	5.3	6.3	51%	7.3	8.9	12.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Central Puget Sound Basins	12	1%	112%
Puyallup River	5	33%	116%
Cedar River	4	0%	112%
Tolt River	2	0%	126%
Snoqualimie River	4	1%	112%
Skykomish River	2	1%	103%



Forecast for Skagit River streamflow at Newhalem is 76% of average for the spring and summer period. May streamflow in Skagit River was 68% of average. Other forecast points included Baker River at 69% and Thunder Creek at 89% of average. Basin-wide precipitation for May was 39% of average, bringing water-year-to-date to 105% of average. June 1 average snow cover in Skagit River Basin was 6%. Only the highest elevations in the Baker and Nooksack have snow. Easy Pass SNOTEL is reporting 13 inches of water content, in 2013 the site had 95 inches which would be more in line with normal. June 1 Skagit River reservoir storage was 86% of average and 64% of capacity. Average temperatures were 1-3 degrees above normal for May and 1-3 degrees above for the water year.

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

Data Current as of: 5/7/2015 11:52:54 AM

North Puget Sound Basins
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

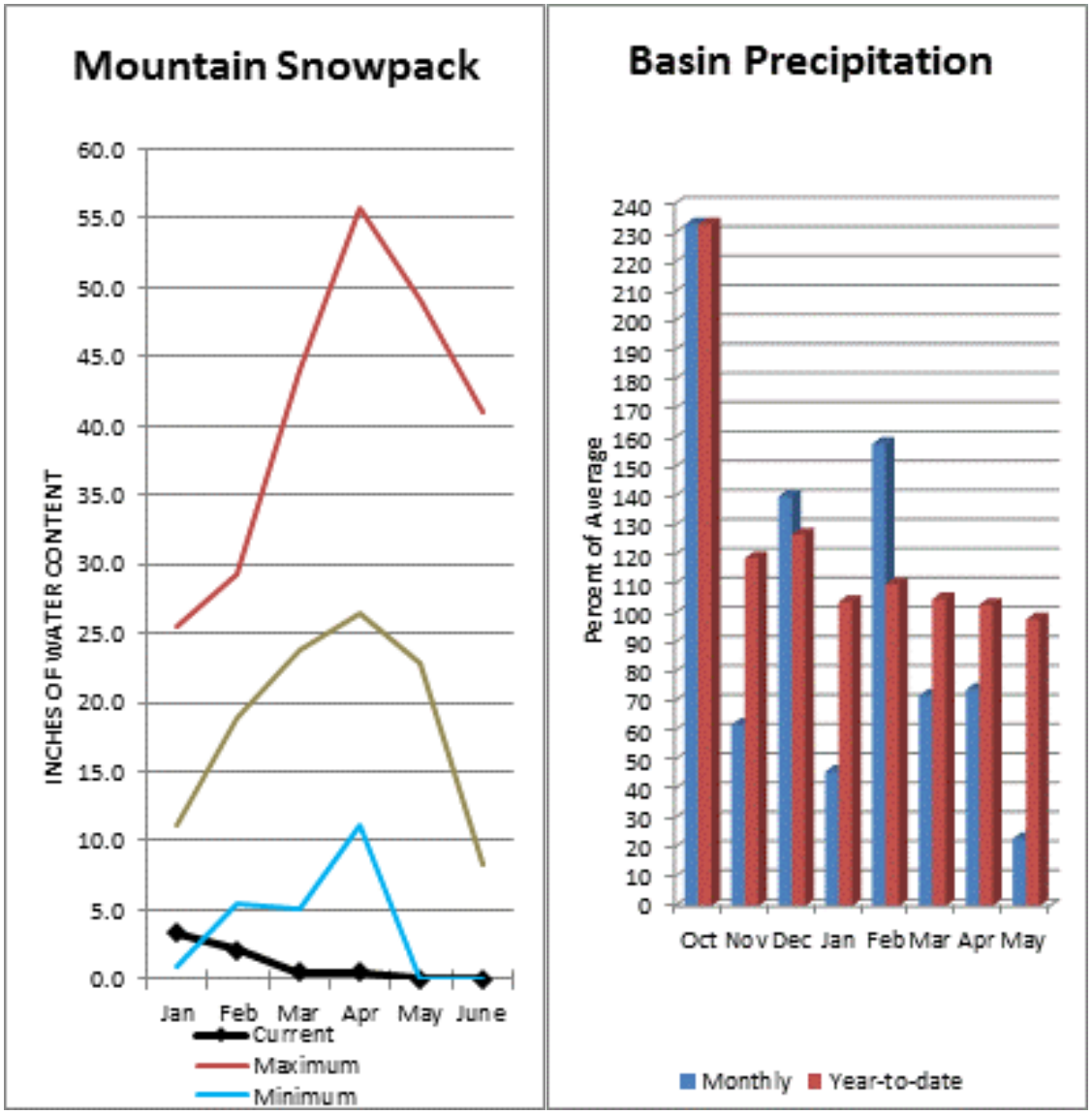
North Puget Sound Basins	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Thunder Ck nr Newhalem								
	MAY-JUL	154	173	186	89%	200	220	210
	MAY-SEP	230	255	270	89%	285	310	305
Skagit R at Newhalem[2]								
	MAY-JUL	925	1020	1090	77%	1160	1260	1420
	MAY-SEP	1140	1260	1340	76%	1420	1540	1770
Baker R at Concrete								
	MAY-JUL	340	395	435	69%	475	545	635
	MAY-SEP	450	525	575	69%	630	715	835

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of April, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ross	710.1	376.3	754.4	1404.1
Diablo Reservoir			85.9	90.6
Basin-wide Total	710.1	376.3	754.4	1404.1
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
North Puget Sound Basins	25	30%	118%
Skagit River	16	54%	124%
Baker River	6	15%	114%
Nooksack River	3	14%	117%

Olympic Peninsula River Basins



Forecasted average runoff for streamflow for the Dungeness River is 47% and Elwha River is 53% May runoff in the Dungeness River was 75% of normal. Big Quilcene and Wynoochee rivers may expect below average runoff this summer as well. May precipitation was 22% of average. Precipitation has accumulated at 98% of average for the water year. Olympic Peninsula snowpack had melted out prior to June 1. Only the highest elevations and glaciers still have snow which is visible from afar. Temperatures were 2-4 degrees above average for May and 1-3 degrees above normal for the water year.

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

Data Current as of: 5/7/2015 11:52:57 AM

Olympic Penninsula
Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Olympic Penninsula	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Dungeness R nr Sequim								
	MAY-JUL	32	43	50	50%	57	68	101
	MAY-SEP	35	49	59	47%	69	83	125
Elwha R at McDonald Bridge nr Port Angeles								
	MAY-JUL	124	149	166	52%	183	210	320
	MAY-SEP	152	182	205	53%	225	255	390

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis May 1, 2015	# of Sites	% Median	Last Year % Median
Olympic Penninsula	6	0%	88%

NORTH CASCADES GLACIER PAGE 2015

North Cascades National Park Glacier Monitoring Program

The National Park Service began monitoring glaciers in North Cascades National Park in 1993 and Mount Rainier glaciers in 2003 (see the Mount Rainier Glacier Page). Goals for this program and additional data can be found at North Cascades National Park home page at http://science.nature.nps.gov/im/units/nccn/monitor/glaciers.cfm or contact Jon_Riedel@nps.gov or Mike_Larrabee@nps.gov.

The four glaciers monitored are located at the headwaters of four watersheds, each with large hydroelectric dams (Figure 1). The glaciers represent a range in elevation from 8300 to 5600 feet, and a range in climatic conditions from maritime to continental. Methods include three visits annually to each glacier to measure winter accumulation and summer melt. Measurements are taken at a series of points down the centerline of the glacier (Table 1), and then integrated across the entire glacier surface to determine mass balance for the entire glacier. In 2014, negative net balances were recorded at all four index glaciers (Figure 2). This is the second year of negative balances following three years of largely positive balances.

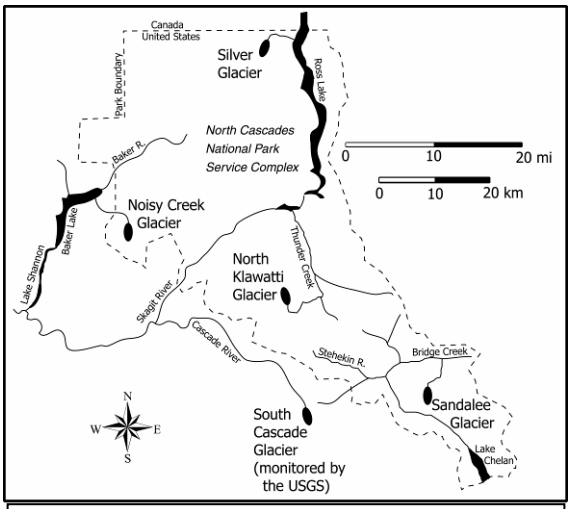


Figure 1. Glaciers monitored in North Cascades N.P.S. Complex.

Table 1		Average	2015	2015
Glacier:	Elev. (feet)	Accumulation (inches W.E.)	Accumulation (inches W.E.)	Percent of Average
Noisy Cr.	**Entire Glacier**	**123**	**78**	**63**
Density = 0.52	5965	141	93	66
	5814	123	70	57
	5709	115	69	60
	5591	117	68	58
Silver	**Entire Glacier**	**89**	**93**	**105**
Density = 0.45	8327	109	135	123
	7881	92	81	89
	7520	113	81	72
	7211	65	74	115
North Klawatti	**Entire Glacier**	**115**	**115**	**99**
Density = 0.52	7585	118	144	122
	7205	123	111	90
	6824	124	119	96
	6286	104	82	78
	5991	94	62	66
Sandalee	**Entire Glacier**	**108**	**95**	**88**
Density = 0.44	7395	109	89	82
	7146	118	94	80
	6778	107	94	88
	6549	**133**	121	91

Table 1. Table 1 presents this spring's provisional winter accumulation data, along with average values and percent of the 22-year average. The 2015 snow depths were measured on April 19th and May 4th on the four glaciers. The provisional data indicate 2015 winter accumulation, as a percentage of average, varies significantly as a function of elevation and location from the Pacific Crest. Snow depth at low elevation sites and east of the crest was below average. At high elevation sites, west of the crest, snow depth was near average. These data are tentative and will be revised after mid-summer visits. Snow densities are based on 2015 field measurements for North Klawatti Glacier and on historical field measurements for Noisy Creek, Silver and Sandaee glaciers. Densities are in fraction of water density. Snow density values will be checked against South Cascade Glacier and nearby SNOTEL values.

The 2014 estimates of glacial contribution to runoff for four watersheds are based on the mass balance measurements and GIS analyses to determine glacier area within 165 ft (50-meter) elevation bands (Table 2). Glaciers reduce the variation of flow in these watersheds by providing melt water from firn and ice during summer drought, in dry/warm years, and by storing water in excess snowpack during wet/cool years. Glacial contribution to stream flow in these watersheds varies by as much as 100% annually. Magnitude of glacial contribution to streamflow is large, but varies by the amount of glacial cover in each watershed. Thunder Creek is 13% glacierized; Baker River, 5%; Stehekin River, 3%; and Ross Lake, 0.9% (Post and others, 1971; Granshaw, 2002).

The glacierized area of a watershed primarily dictates the glacier contribution to runoff. However, the relative importance of glacial contribution to streamflow also generally increases from west to east. For example, glaciers annually contribute a higher percentage of meltwater to streamflow in the Stehekin watershed than in the Baker, despite the fact that the Baker is more highly glacierized. This is due to lower snowfall east of the hydrologic crest of the North Cascades.

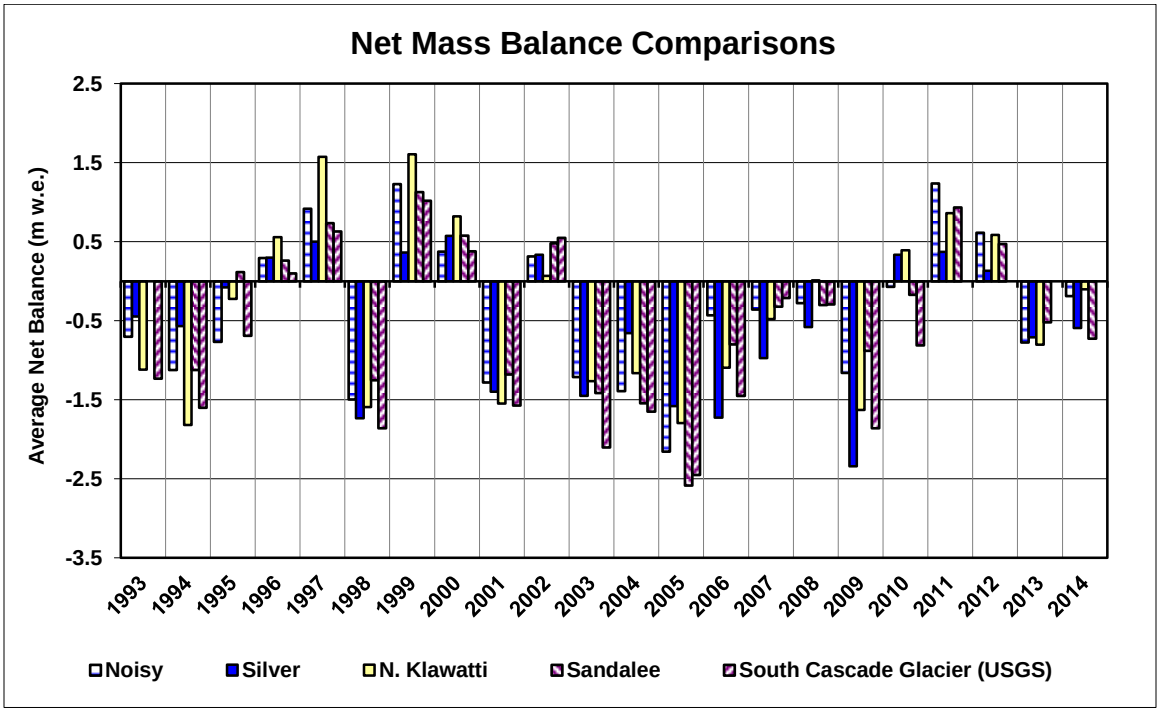


Figure 2. Net annual mass balance for the five glaciers monitored in the North Cascades.

Table 2 *Provisional Data*	May-September Runoff (thousands acre-feet)				Percent Glacial Runoff to Total Summer Runoff		
	2014	mean	min	max	2014	min	max
Noisy Creek Glacier	1.6	1.5	1.0	1.9			
Baker River Watershed	**133.5**	**113.2**	**76.0**	**138.3**	**13.6**	**8.6**	**22.7**
North Klawatti Glacier	4.6	4.0	2.6	5.1			
Thunder Creek Watershed	**109.8**	**96.2**	**65.3**	**117.2**	**32.9**	**20.7**	**46.1**
Sandalee Glacier	0.5	0.5	0.3	0.7			
Stehekin River Watershed	**81.1**	**71.0**	**51.6**	**88.1**	**10.1**	**5.6**	**22.1**
Silver Glacier	0.9	1.0	0.5	1.3			
Ross Lake Watershed	**74.1**	**63.2**	**43.0**	**78.2**	**4.7**	**2.5**	**13.0**

Table 2. Glacial contribution to summer stream flow (May 1 to Sept. 30) for four watersheds. Runoff units are thousands of acre-feet. Data from 1993-2014 except the Sandalee Glacier and Stehekin River Watershed (1995-2014).

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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

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Washington Water Supply Outlook Report

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Spokane, WA