

## Pacific Northwest Region Water Supply Update

September 12, 2014

A hint of fall is in the air in the PN Region with chillier nights but warm sunny days. The first hard freeze of the season occurred in some areas late this week. The upper Snake basin upstream of American Falls received nearly 300 percent of normal rainfall in August which increased the inflows to the reservoirs and reduced irrigation demand. As a result the carryover storage at the end of October in the upper Snake basin will be about 47 percent of capacity which is the highest carryover since 2011. The rest of the Region was otherwise dry (as typical) in August, and September is continuing the dry trend. Most of the Region escaped drought conditions thanks to a wet couple months in late winter, but southern Oregon remained very dry and faces short water supplies. Reservoirs in the Rogue basin in southwest Oregon did not refill completely and deliveries are being conservatively managed to stretch the tight supply. The Malheur and Owyhee basins in southeast Oregon suffered extreme drought, with runoff volumes of only 20 to 40% of average. Reservoirs there failed to refill by significant margins and have now exhausted their irrigation supplies, which is similar timing to what occurred during past extreme drought years. Irrigators in these basins planned accordingly for a water-short year, but a continuation of drought conditions next winter would lead to a very dire situation in 2015.

	<b>Snowpack % of avg.</b>	<b>Water Year Precipitation % of avg.</b>	<b>Runoff Oct. to Date % of avg.</b>	<b>Reservoir Storage % full</b>	<b>Allocations</b>
Yakima (WA)	n/a	94	105	46	n/a
Flathead/Hungry Horse (MT)	n/a	107	125	95	n/a
Crooked (OR)	n/a	92	49	59	n/a
Rogue (OR)	n/a	76	n/a	20	n/a
Boise (ID)	n/a	92	88	50	n/a
Payette (ID)	n/a	88	96	59	n/a
Upper Snake (ID)	n/a	119	113	46	n/a
Columbia Basin (Columbia R at the Dalles)	n/a	97	104	n/a	n/a

## Pacific Northwest Region Water Supply Update August 8, 2014

A hot summer is in full swing in the PN Region with reservoirs drafting for irrigation deliveries and to provide flows for ESA listed anadromous fish. Most of the Region escaped drought conditions thanks to a wet couple months in late winter, but southern Oregon remained very dry and faces very short water supplies. Reservoirs in the Rogue basin in southwest Oregon did not refill completely and deliveries are being conservatively managed to stretch the tight supply. The Malheur and Owyhee basins in southeast Oregon have been extremely dry, with runoff volumes of only 20 to 40% of average. Reservoirs there failed to refill by significant margins and have now exhausted their irrigation supplies, which is similar timing to what occurred during past extreme drought years. The Little Wood basin in central Idaho also saw 40% of average runoff and will run out of water by late August. Irrigators in these basins planned accordingly for a water-short year, but a continuation of drought conditions next winter would lead to a very dire situation in 2015. Elsewhere in the PN Region, reservoir storage is adequate to meet irrigation demands for the remainder of the season, although carryover storage will likely be below average in many basins. Reclamation will be able to provide the full commitment of 487,000 acre-feet from the Snake River basin to augment flows for ESA listed fish. Forecasts for the next three months call for a continuation of above normal temperatures, with a neutral (ie climatology) forecast for precipitation.

	<b>Snowpack % of avg.</b>	<b>Water Year Precipitation % of avg.</b>	<b>Runoff Oct. to Date % of avg.</b>	<b>Reservoir Storage % full</b>	<b>Allocations</b>
Yakima (WA)	n/a	91	105	70	n/a
Flathead/Hungry Horse (MT)	n/a	106	125	99	n/a
Crooked (OR)	n/a	92	49	69	n/a
Rogue (OR)	n/a	76	n/a	30	n/a
Boise (ID)	n/a	90	88	70	n/a
Payette (ID)	n/a	86	96	74	n/a
Upper Snake (ID)	n/a	116	112	54	n/a
Columbia Basin (Columbia R at the Dalles)	n/a	95	104	n/a	n/a

## Pacific Northwest Region Water Supply Update July 2, 2014

Stream flows and project inflows are in recession throughout the PN Region. The majority of storage projects have reached peak storage levels for the year and are currently drafting for irrigation deliveries. The only exceptions are Hungry Horse Reservoir in Montana and Grand Coulee on the Columbia River in Washington. Hungry Horse and Grand Coulee are both close to full and are expected to fill within the next week. There is adequate storage to meet irrigation deliveries for most basins in the Pacific Northwest, however southern Oregon has remained very dry and faces drought conditions. Reservoirs in the Rogue basin in southwest Oregon did not refill completely and supplies will be tight. The Malheur and Owyhee basins in southeast Oregon have been extremely dry, with expected runoff volumes of only 20 to 40% of average. Reservoirs there have failed to refill by significant margins, and are expected to be emptied by late July or early August, similar to the other drought years. Precipitation during the month of June was variable throughout the region with near to above average precipitation in northern tier basins and below average precipitation in the southern tier basins. For example: June precipitation was 53% of average in the Snake River basin and 152% of average in the Flathead basin of Montana. The June precipitation average for the entire Columbia River basin was 86%. Temperatures were near or slightly below average throughout the PN Region for the month of June. However temperatures are on the rise for the beginning of July with the hottest temperatures of the year expected during the first week of July. The Climate Prediction Center is forecasting a higher probability of above normal temperatures and near normal precipitation for the month of July.

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Yakima (WA)	n/a	94	105	97	n/a
Flathead/Hungry Horse (MT)	n/a	108	121	99	n/a
Crooked (OR)	n/a	90	60	81	n/a
Rogue (OR)	n/a	74	n/a	44	n/a
Boise (ID)	n/a	87	89	91	n/a
Payette (ID)	n/a	86	98	94	n/a
Upper Snake (ID)	n/a	113	113	74	n/a
Columbia Basin (Columbia R at the Dalles)	n/a	94	102	n/a	n/a

## Pacific Northwest Region Water Supply Update

June 6, 2014

The runoff season is winding up in the PN Region. Despite a slow start, a dramatic improvement occurred in February and March resulting in an adequate or better water supply in most of the region. May and June has been warm and dry, making for a very orderly runoff season. Peak inflows have occurred and are now in recession. Reservoir systems in the Yakima, Payette, and Boise are now full or nearly so; the Upper Snake system, Grand Coulee (FDR lake) and Hungry Horse Reservoir will continue to fill over the next month. The exception to the good news is the southern half of Oregon which remained very dry and faces drought conditions. Reservoirs in the Rogue basin in southwest Oregon did no refill completely and supplies will be tight but should stretch through the irrigation season with conservation. The situation in the Malheur and Owyhee basins in southeast Oregon is much worse, with expected runoff volumes of only 20 to 40% of average. Reservoirs there have failed to refill by significant margins, and are expected to be emptied by late July or early August, similar to the other drought years. Summer has arrived in the Region, with the typical warm and dry weather in the forecast.

	<b>Snowpack % of avg.</b>	<b>Water Year Precipitation % of avg.</b>	<b>Runoff Oct. to Date % of avg.</b>	<b>Reservoir Storage % full</b>	<b>Allocations</b>
Yakima (WA)	n/a	89	107	100	n/a
Flathead/Hungry Horse (MT)	n/a	105	112	81	n/a
Crooked (OR)	n/a	76	60	90	n/a
Rogue (OR)	n/a	74	n/a	55	n/a
Boise (ID)	n/a	88	91	94	n/a
Payette (ID)	n/a	86	102	98	n/a
Upper Snake (ID)	n/a	113	114	77	n/a
Columbia Basin (Columbia R at the Dalles)	n/a	94	94	n/a	n/a

## Pacific Northwest Region Water Supply Update

April 23, 2014

A very wet pattern in February and March led to dramatic improvement in the water supply situation in the PN Region, although drought concerns still remain in some Oregon basins. April has seen a continuation of unsettled weather which has preserved the earlier gains. Conditions are well above average in the upper Snake basin above Milner and in the Flathead basin, both of which will be operated for flood control during the refill period (no significant flooding is anticipated).

Unfortunately, the southern half of Oregon missed out on most of this wet pattern and faces drought conditions. Reservoirs in the Rogue basin in southwest Oregon are unlikely to fill and supplies will be tight but should stretch through the irrigation season with conservation. The situation in the Malheur and Owyhee basins in southeast Oregon is much worse, with expected runoff volumes of only 20 to 40% of average. Reservoirs there have failed to refill by significant margins, and are expected to be emptied by late July or early August, similar to the other worst drought years on record. Although hard to forecast, spring precipitation can still play a significant role in determining the final outcome for water supply in 2014.

	<b>Snowpack % of avg.</b>	<b>Water Year Precipitation % of avg.</b>	<b>Forecasted Runoff % of avg.</b>	<b>Reservoir Storage % full</b>	<b>Allocations</b>
Yakima (WA)	99	90	98	82	n/a
Flathead/Hungry Horse (MT)	139	112	130	64	n/a
Crooked (OR)	n/a	76	60	96	n/a
Rogue (OR)	n/a	72	n/a	60	n/a
Boise (ID)	107	94	97	68	n/a
Payette (ID)	101	89	91	77	n/a
Upper Snake (ID)	143	121	135	59	n/a
Columbia Basin (Columbia River at The Dalles)	103	95	108	n/a	n/a

## Pacific Northwest Region Water Supply Update

March 12, 2014

A very wet pattern in February and early March has led to dramatic improvement in the water supply situation in the PN Region, although drought concerns still remain in some Oregon basins. The biggest winner was the upper Snake basin above Milner, which is now reporting snowpack at 150% of median and will likely require flood control operations later this spring. Elsewhere in the region, the Payette, Boise, northeast Oregon, and Yakima basins saw significant improvement during the month and are now projected to have a near normal supply. The Flathead basin continued its trend of above average conditions. Unfortunately, drought concerns remain in southeast, central, and southwest Oregon. Without a wet spring, irrigation shortages will likely occur in the Rogue, Ochoco (Crooked), Malheur, and Owyhee basins. The very wet pattern has run its course for now and the next 10 days are forecast to be drier; weather forecasts beyond that are inconclusive. Spring precipitation can still play a significant role in determining the final outcome for water supply in 2014.

	<b>Snowpack % of avg.</b>	<b>Water Year Precipitation % of avg.</b>	<b>Forecasted Runoff % of avg.</b>	<b>Reservoir Storage % full</b>	<b>Allocations</b>
Yakima (WA)	95	90	92	69	n/a
Flathead/Hungry Horse (MT)	129	109	109	79	n/a
Crooked (OR)	47	74	40	78	n/a
Rogue (OR)	31	71	n/a	53	n/a
Boise (ID)	96	95	79	54	n/a
Payette (ID)	98	89	84	68	n/a
Upper Snake (ID)	150	128	122	51	n/a
Columbia Basin (Columbia R at the Dalles)	96	93	102	n/a	n/a

## Pacific Northwest Region Water Supply Update February 18, 2014

Water Year 2014 has been very dry over most of the PN Region through January. Fortunately, a significant change in the pattern has occurred in February with copious moisture streaming in on a “pineapple express” originating north of Hawaii. Heavy rain and high freezing levels prompted various flood watches and warnings, but no significant flooding has occurred. New snowfall was measured in feet over the higher elevations, leading to dramatic improvement in snowpack percentages (up to +30%) in many basins that were facing critically low conditions at the beginning of the month. However, many of these basins are still well below normal and the region needs to remain in a wet pattern to continue the recent gains. The biggest drought concerns are in Oregon. The Rogue basin in the southwest corner remains in the worst shape with an extremely low snowpack of only 30% of average; a wet spring will be needed to fill the reservoirs and avoid irrigation shortages later this summer. Central and eastern Oregon is faring only slightly better, with current (post-storm) snowpacks in the 50% to 70% range. Without a wet finish to this winter, irrigation shortages will likely occur in the Malheur basin similar to or worse than last year, when reservoirs were essentially emptied by early August. A similar situation could occur at Owyhee Reservoir given its very low carryover storage going into this year. In the Crooked basin, adequate water will exist in Prineville Reservoir to make it through the season, but shortages would likely occur for those lands that can only be served by Ochoco Reservoir due to its low contents (currently 32% of capacity).

Conditions in the Payette and Boise basins are much improved following the recent storm cycle, but snowpacks remain below average at 83% and 89%, respectively. This should be enough to provide adequate supplies unless dry conditions return and these values decline. Drought concerns in the upper Snake basin (above Milner) have mostly gone away, with current snowpack at 129% of average.

The forecasts listed in the following table are from February 1 and will show some improvement when recalculated in March. With roughly 25% of the snow accumulation season left any number of outcomes could occur. Beyond winter, spring precipitation will also play a big part in determining the final water supply.

	<b>Snowpack % of avg.</b>	<b>Water Year Precipitation % of avg.</b>	<b>Forecasted Runoff % of avg.</b>	<b>Reservoir Storage % full</b>	<b>Allocations</b>
Yakima (WA)	81	72	67	60	n/a
Flathead/Hungry Horse (MT)	113	94	107	81	n/a
Crooked (OR)	68	68	18	56	n/a
Rogue (OR)	30	59	n/a	47	n/a
Boise (ID)	89	80	59	45	n/a
Payette (ID)	83	69	70	61	n/a
Upper Snake (ID)	129	111	92	44	n/a
Columbia Basin (Columbia R at the Dalles)	85	78	83	n/a	n/a