



United States
Department of
Agriculture



Natural Resources
Conservation
Service

Oregon Basin Outlook Report

June 1st, 2016



The last of the winter's snow at McKenzie Pass
Photo courtesy of Bill Overman (Oregon NRCS)

Early in the winter, most of Oregon's mountains were on track to have a near normal snow season, but unusually warm springtime temperatures abbreviated the winter and instigated early and rapid snowmelt. While about half of monitoring sites in the state accrued near normal peak amounts of snow, most of these peaks occurred between 1 to 4 weeks earlier than normal. The snow at most of Oregon's snow monitoring sites melted out between 1 and 3 weeks earlier than normal and up to 5 weeks earlier than normal at a few sites. As a result, most streams and rivers throughout the state have reached their snowmelt-driven streamflow peak earlier than usual. As of June 1st, Oregon's streamflow forecasts are below normal to well below normal for the June through September period and water shortages are possible in some locations.

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General Outlook

June 1st, 2016

SUMMARY

Oregon's snow season was shortened by early melt, even after most of the state's mountains achieved a near normal to an above normal seasonal snowpack. Warm temperatures and rapid snowmelt during April resulted in an unusual amount of snowpack loss, even breaking records in some cases. The month of May experienced a return of more seasonable temperatures, slowing snowmelt to typical rates, but the damage had already been done. The rapid flush of early snowmelt caused many rivers to reach their snowmelt-driven streamflow peaks earlier than normal. Current streamflow forecasts are calling for below normal to well below normal streamflow volumes this summer across the state, which may signal water supply shortages for those water users who do not have access to reservoir storage.

Since the water year began on October 1st, total precipitation has been near or above average in the mountains. Precipitation and early snowmelt boosted storage levels in many of Oregon's major irrigation reservoirs since the beginning of the year, but drawdown for irrigation has already begun. Water users with the benefit of access to reservoir water will have more of a buffer than those depending solely on streamflow, but could still experience tight water supplies by summer's end.

NOAA's Climate Prediction Center is calling for above normal temperatures this summer (<http://www.cpc.ncep.noaa.gov/>), which could result in a higher demand on water resources and increased wildfire danger. The US Drought Monitor (<http://droughtmonitor.unl.edu>) currently shows moderate drought delineated in the southeastern part of the state and has all except the southwest corner of the state (where it has been wettest this season) grouped in the abnormally dry category. Water shortages especially threaten southeastern Oregon, where water users have experienced multi-year drought conditions. While June precipitation amounts are usually light, any precipitation received in the coming month will help temporarily offset irrigation demand.

SNOWPACK

With the exception of Northwest Oregon (where snowpacks peaked well below normal), winter temperatures were cold enough to allow the mountains to achieve near normal to above normal amounts of water stored in the snowpack during the accumulation season. However, the season was warm overall, causing many of the snow monitoring sites to reach their peak snowpack amounts much ahead of schedule (mostly ranging from 1 to 4 weeks early).

Record breaking temperatures in April accelerated the snowmelt to greater than normal rates. The snow at most of Oregon's snow measuring sites melted early, ranging from 1 to 3 weeks ahead of normal (a few sites melted up to 5 weeks early). As of June 1st, only 6 monitoring sites in Oregon still have snow. While this is not unusual, the warm spring temperatures that caused rapid snowpack depletion certainly were. The implications of early snowmelt include below normal summer streamflow volumes, subsequent impacts on water users and wildlife, as well as the increased threat of early forest fire danger.

PRECIPITATION

May was the second month in a row to be drier than usual for most of the state. The middle of the month brought a significant round of precipitation, including some snowfall in the higher elevations, but not enough to bring May precipitation totals up to normal. The eastern Klamath basin, Lake County and Goose Lake basins were the exceptions this month, receiving near average to well above average amounts of precipitation. Still, the amount of precipitation received was certainly not enough to make up for the early loss of snowpack.

Zooming out to the yearly scale, ample precipitation has fallen throughout the state since the water year began on October 1st. All basins have received near average to above average amounts for the year's total so far. The yearly total amounts that fell have significantly improved reservoir storage since the end of last summer. June precipitation will play a critical role in water supply demand, and the timing of streamflows falling to their base flows.

RESERVOIRS

The above average water year precipitation in addition to the early and rapid snowmelt has boosted reservoirs throughout the state. Many of Oregon's major irrigation reservoirs are kicking off the summer season with near average volumes of stored water. This brings a much better water supply story than compared to this time last year when reservoir storage was well below average for most of these reservoirs. Even so, if summer is hot and demand for the reservoir water is high, water users drawing from reservoir sources could still experience tight water supplies near summer's end.

STREAMFLOW

Last month, most of Oregon's rivers experienced well below normal streamflows owing to early loss of snowpack and below normal May precipitation. Overall this year, snowmelt-driven streams have exhibited a similar pattern to this season's snowpack: both reaching their peaks and receding earlier than usual in the season. Therefore, streamflow forecasts for the summer are calling for below normal to well below normal residual streamflow volumes. Some of the lowest streamflows are expected in southeastern Oregon, where the total June through September volumes are forecast to be less than 60% of average for this time frame.

A summary of streamflow forecasts for Oregon follows:

STREAM	Median Forecast (June through September)	
	Volume (Acre-Feet)	Percent of Average
Owyhee Reservoir Inflow	65,000	61%
Grande Ronde R at Troy	285,000	55%
Umatilla R at Pendleton	20,000	69%
Deschutes R at Benham Falls	315,000	95%
Willamette R at Salem	1,390,000	85%
Rogue R at Raygold	280,000	80%
Upper Klamath Lake Inflow	143,000	78%
Silvies R nr Burns	5,800	36%

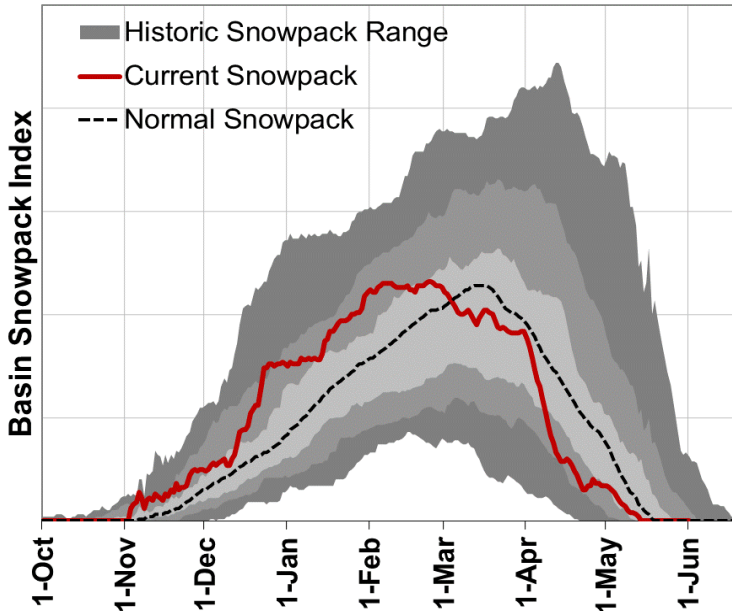
Some of these forecasts assume that normal weather conditions will occur from now to the end of the forecast period. This report contains data furnished by the Oregon Department of Water Resources, U.S. Geological Survey, NOAA National Weather Service and other cooperators. This report will be updated monthly, January through June.



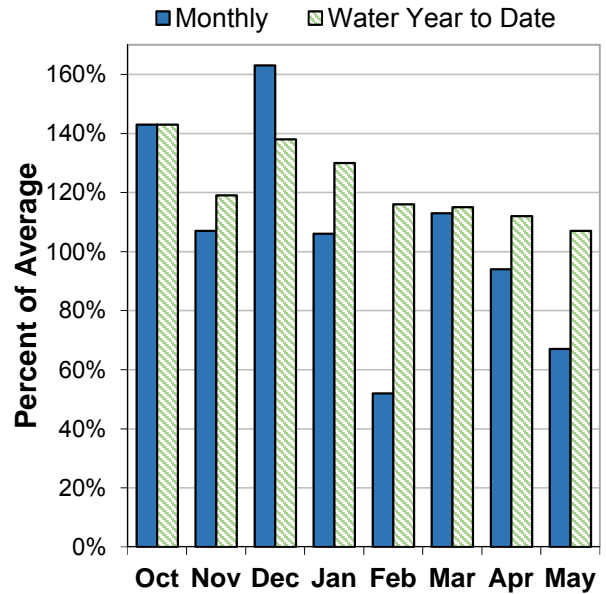
Owyhee and Malheur Basins

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, all SNOTEL sites in the basin are snow-free, which is normal for this time of year. Due to warm spring temperatures, most sites melted out 1 to 4 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 80% to 120% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 67% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 107% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 78% of average at Warm Springs Reservoir to 108% of average at Beulah Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 42% to 61% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

Owyhee And Malheur Basins Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *

Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Owyhee R nr Rome	JUN-JUL	2.2	18.7	30	48%	41	58	63
	JUN-SEP	9.5	28	41	51%	54	73	80
Owyhee R bl Owyhee Dam ²	JUN-JUL	23	33	42	55%	50	65	76
	JUN-SEP	42	55	65	61%	75	92	106
Malheur R nr Drewsey	JUN-JUL	1.32	2.7	3.9	36%	5.3	7.7	10.8
	JUN-SEP	2.2	3.9	5.3	42%	7.0	9.9	12.5
NF Malheur R at Beulah	JUN-JUL	4.4	6.1	7.5	55%	9.0	11.4	13.7

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume
 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Useable Capacity (KAF)
Beulah	50.2	29.0	46.7	108%	59.2
Bully Creek	20.6	13.1	23.2	89%	23.7
Lake Owyhee	454.3	153.4	536.2	85%	715.0
Warm Springs	94.9	34.4	122.4	78%	169.6

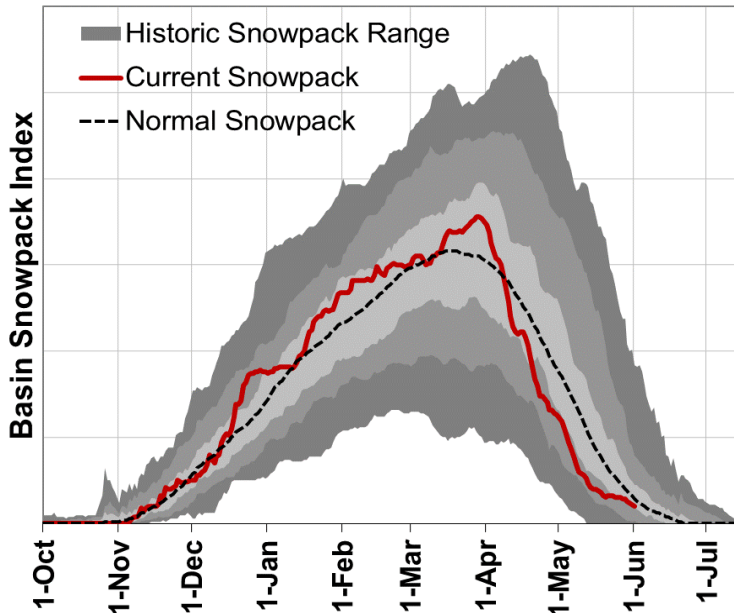
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Granite Peak SNOTEL	8543	1-Jun	0	0.0	0.0	1.5	0%
Trout Creek AM	7890	1-Jun	0	0.0	0.0		
Toe Jam SNOTEL	7700	1-Jun	0	0.0	0.0		
Govt Corrals AM	7400	1-Jun	0	0.0	0.0		
Jack Creek Upper SNOTEL	7250	1-Jun	0	0.0	0.0	0.0	
Reynolds-Dobson Divide Snow Course	7064	1-Jun	0	0.0	0.0	0.0	
Fawn Creek SNOTEL	7000	1-Jun	0	0.0	0.0	0.0	
Buckskin Lower SNOTEL	6915	1-Jun	0	0.0	0.0	0.0	
Reynolds West Fork #2 Snow Course	6798	1-Jun	0	0.0	0.0	0.0	
Big Bend SNOTEL	6700	1-Jun	0	0.0	0.0	0.0	
Fry Canyon SNOTEL	6700	1-Jun	0	0.0	0.0		
Laurel Draw SNOTEL	6697	1-Jun	0	0.0	0.0	0.0	
South Mtn. SNOTEL	6500	1-Jun	0	0.0	0.0	0.0	
Taylor Canyon SNOTEL	6200	1-Jun	0	0.0	0.0	0.0	
Blue Mountain Spring SNOTEL	5870	1-Jun	0	0.0	0.0	0.0	
Mud Flat SNOTEL	5730	1-Jun	0	0.0	0.0	0.0	
Democrat Creek Snow Course	5686	1-Jun	0	0.0	0.0	0.0	
Reynolds Creek SNOTEL	5600	1-Jun	0	0.0	0.0	0.0	
Rock Springs SNOTEL	5290	1-Jun	0	0.0	0.0	0.0	
Lake Creek R.S. SNOTEL	5240	1-Jun	0	0.0	0.0	0.0	



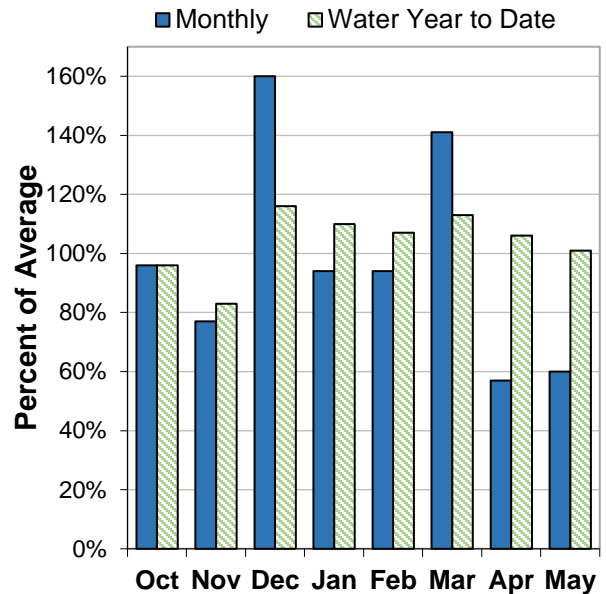
Grande Ronde, Powder, Burnt and Imnaha Basins

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, the only two measurement sites in the basin that still have snow are Aneroid Lake and Milk Shakes SNOTEL sites, which is not unusual for this time of year. Of the snow-free sites, most melted out 1 to 2 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 80% to 110% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 60% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 101% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 93% of average at Wolf Creek Reservoir to 111% of average at Wallowa Lake.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 50% to 73% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

Grande Ronde, Powder, Burnt And Imnaha Basins Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Burnt R nr Hereford	JUN-JUL	1.01	1.70	2.2	51%	2.6	3.3	4.3
	JUN-SEP	2.0	2.8	3.4	57%	4.0	4.8	6.0
Deer Ck nr Sumpter	JUN-JUL	0.47	1.33	1.92	56%	2.5	3.4	3.4
Powder R nr Sumpter	JUN-JUL	2.2	5.8	8.2	56%	10.6	14.2	14.7
	JUN-SEP	1.08	5.1	7.8	50%	10.6	14.6	15.6
Wolf Ck Reservoir Inflow ²	JUN-JUL	0.28	0.77	1.23	41%	1.80	2.8	3.0
Pine Ck nr Oxbow	JUN-JUL	16.7	24	29	56%	34	41	52
	JUN-SEP	19.7	28	33	57%	38	46	58
Imnaha R at Imnaha	JUN-JUL	52	63	71	65%	79	90	109
	JUN-SEP	62	75	84	65%	93	106	130
Catherine Ck nr Union	JUN-JUL	10.6	13.6	15.6	71%	17.6	21	22
	JUN-SEP	13.8	16.9	19.0	73%	21	24	26
Lostine R nr Lostine	JUN-JUL	39	44	47	69%	50	55	68
	JUN-SEP	43	48	52	68%	56	61	76
Bear Ck nr Wallowa	JUN-SEP	16.5	21	24	73%	27	31	33
Grande Ronde R at Troy ¹	JUN-JUL	105	173	220	51%	265	335	430
	JUN-SEP	167	235	285	55%	335	405	520

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

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	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Useable Capacity (KAF)
Phillips Lake	33.9	29.2	58.7	58%	73.5
Thief Valley	13.4	12.8	13.6	98%	13.3
Unity	21.2	21.4	22.4	95%	25.5
Wallowa Lake	30.3	36.8	27.2	111%	37.5
Wolf Creek	9.0	4.6	9.7	93%	11.1

Grande Ronde, Powder, Burnt And Imnaha Basins Summary for June 1, 2016

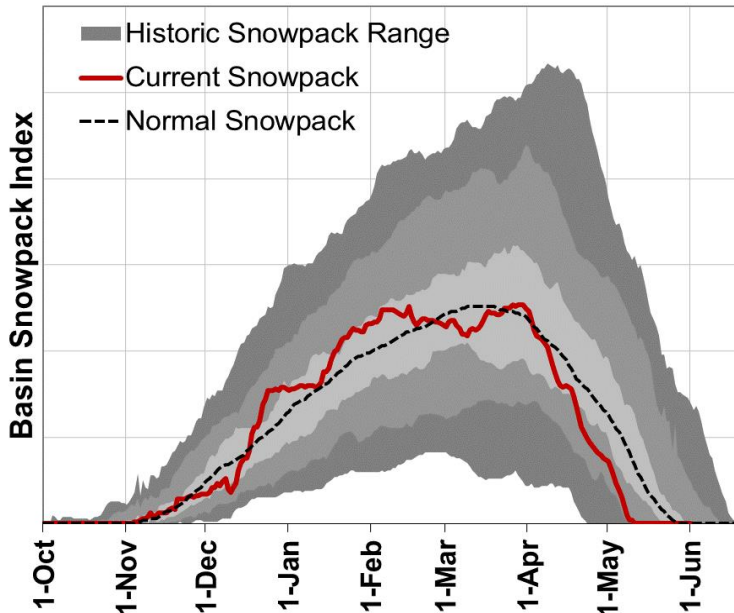
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Mt. Howard SNOTEL	7910	1-Jun	0	0.0	0.0	6.0	0%
Aneroid Lake #2 SNOTEL	7400	1-Jun	42	17.2	1.4	16.8	102%
TV Ridge AM	7050	1-Jun	0	0.0	0.0		
Big Sheep AM	6230	1-Jun	0	0.0	0.0		
Bear Saddle SNOTEL	6180	1-Jun	0	0.0	0.0	0.0	
Bourne SNOTEL	5850	1-Jun	0	0.0	0.0	0.0	
Moss Springs SNOTEL	5760	1-Jun	0	0.0	0.0	0.2	0%
Taylor Green SNOTEL	5740	1-Jun	0	0.0	0.0	0.0	
Spruce Springs SNOTEL	5700	1-Jun	0	0.0	0.0	0.0	
Wolf Creek SNOTEL	5630	1-Jun	0	0.0	0.0	0.0	
Milk Shakes SNOTEL	5580	1-Jun	6	2.8	0.0		
West Branch SNOTEL	5560	1-Jun	0	0.0	0.0	0.0	
Touchet SNOTEL	5530	1-Jun	0	0.0	0.0	0.0	
Eilertson Meadows SNOTEL	5510	1-Jun	0	0.0	0.0	0.0	
Gold Center SNOTEL	5410	1-Jun	0	0.0	0.0	0.0	
Schneider Meadows SNOTEL	5400	1-Jun	0	0.0	0.0	0.0	
Beaver Reservoir SNOTEL	5150	1-Jun	0	0.0	0.0	0.0	
Tipton SNOTEL	5150	1-Jun	0	0.0	0.0	0.0	
High Ridge SNOTEL	4920	1-Jun	0	0.0	0.0	0.0	
County Line SNOTEL	4830	1-Jun	0	0.0	0.0	0.0	
Bowman Springs SNOTEL	4530	1-Jun	0	0.0	0.0	0.0	
Sourdough Gulch SNOTEL	4000	1-Jun	0	0.0	0.0	0.0	



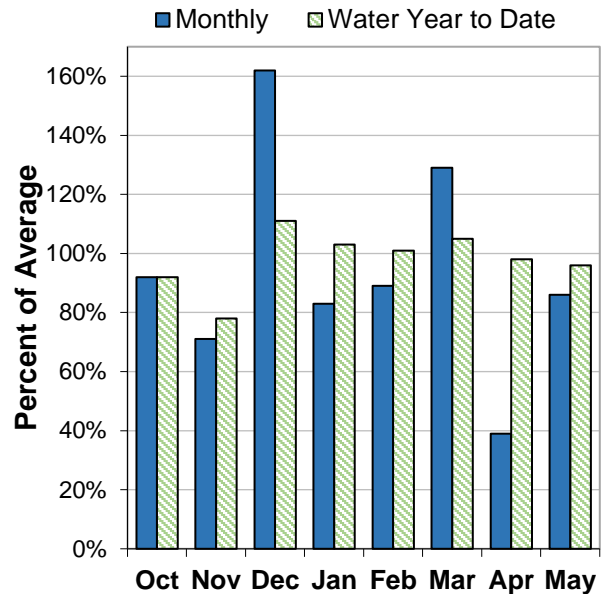
Umatilla, Walla Walla and Willow Basins

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, Milk Shakes SNOTEL is the only site in the basin that still has snow, which is normal for this time of year. Due to warm spring temperatures, most sites melted out 2 to 3 weeks earlier than normal. However, Emigrant Springs and Madison Butte SNOTEL sites melted out 5 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 80% to 110% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 86% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 96% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 65% of average at Cold Springs Reservoir to 95% of average at Willow Creek Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 51% to 78% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

Umatilla, Walla Walla And Willow Basins Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
SF Walla Walla R nr Milton-Freewater	JUN-JUL	7.6	10.6	12.6	69%	14.6	17.6	18.2
	JUN-SEP	15.5	19.4	22	71%	25	28	31
Umatilla R ab Meacham Ck Gibbon	JUN-JUL	5.7	9.0	11.2	79%	13.4	16.7	14.2
	JUN-SEP	9.5	13.0	15.3	78%	17.6	21	19.6
Umatilla R at Pendleton	JUN-JUL	1.92	11.0	17.1	71%	23	32	24
	JUN-SEP	4.4	13.7	20	69%	26	36	29
McKay Ck nr Pilot Rock	JUN-SEP	0.86	1.22	2.3	51%	3.5	5.3	4.5
Butter Ck nr Pine City	JUN-JUL	0.22	0.76	1.13	60%	1.49	2.0	1.88
	JUN-SEP	0.41	1.04	1.47	64%	1.89	2.5	2.3
Willow Ck ab Willow Lk nr Heppner	JUN-JUL	0.17	0.39	0.80	51%	1.21	1.82	1.57
Rhea Ck nr Heppner	JUN-JUL	0.15	0.53	0.98	58%	1.43	2.1	1.69

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

Reservoir Storage	Current	Last Year	Average	% of	Useable
	(KAF)	(KAF)	(KAF)	Average	Capacity
Cold Springs	18.4	17.2	28.2	65%	38.6
Mckay	51.9	44.0	57.0	91%	71.5
Willow Creek	5.6	5.4	5.9	95%	9.8

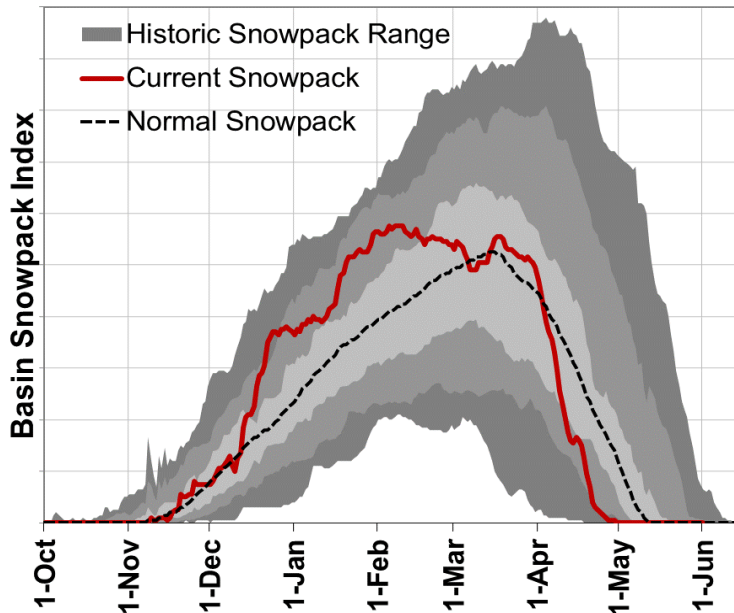
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Arbuckle Mtn SNOTEL	5770	1-Jun	0	0.0	0.0	0.0	
Spruce Springs SNOTEL	5700	1-Jun	0	0.0	0.0	0.0	
Milk Shakes SNOTEL	5580	1-Jun	6	2.8	0.0		
Touchet SNOTEL	5530	1-Jun	0	0.0	0.0	0.0	
Madison Butte SNOTEL	5150	1-Jun	0	0.0	0.0	0.0	
Lucky Strike SNOTEL	4970	1-Jun	0	0.0	0.0	0.0	
High Ridge SNOTEL	4920	1-Jun	0	0.0	0.0	0.0	
Bowman Springs SNOTEL	4530	1-Jun	0	0.0	0.0	0.0	
Emigrant Springs SNOTEL	3800	1-Jun	0	0.0	0.0	0.0	



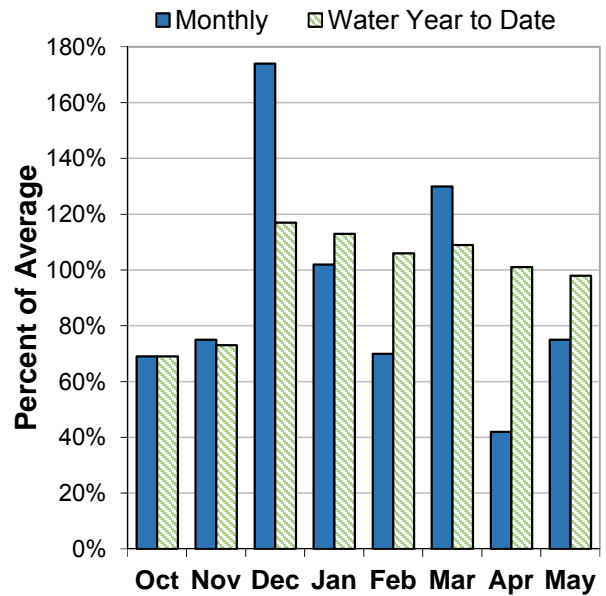
John Day Basin

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, all SNOTEL sites in the basin are snow-free, which is normal for this time of year. Due to warm spring temperatures, most sites melted out 1 to 3 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 90% to 130% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 75% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 98% of average.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 62% to 72% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

John Day Basin Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *

Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Strawberry Ck nr Prairie City	JUN-JUL	1.49	2.5	3.2	70%	3.9	4.9	4.6
	JUN-SEP	1.80	2.9	3.6	69%	4.3	5.4	5.2
Mountain Ck nr Mitchell	JUN-JUL	0.10	0.40	0.61	68%	0.81	1.12	0.90
	JUN-SEP	0.13	0.47	0.69	68%	0.92	1.25	1.01
Camas Ck nr Ukiah	JUN-JUL	0.10	2.0	3.5	70%	4.9	7.1	5.0
	JUN-SEP	0.37	2.6	4.1	72%	5.6	7.8	5.7
MF John Day R at Ritter	JUN-JUL	2.6	11.0	16.6	59%	22	31	28
	JUN-SEP	5.3	14.3	20	63%	26	35	32
NF John Day R at Monument	JUN-JUL	17.9	53	77	61%	101	136	126
	JUN-SEP	26	64	89	62%	115	152	143

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

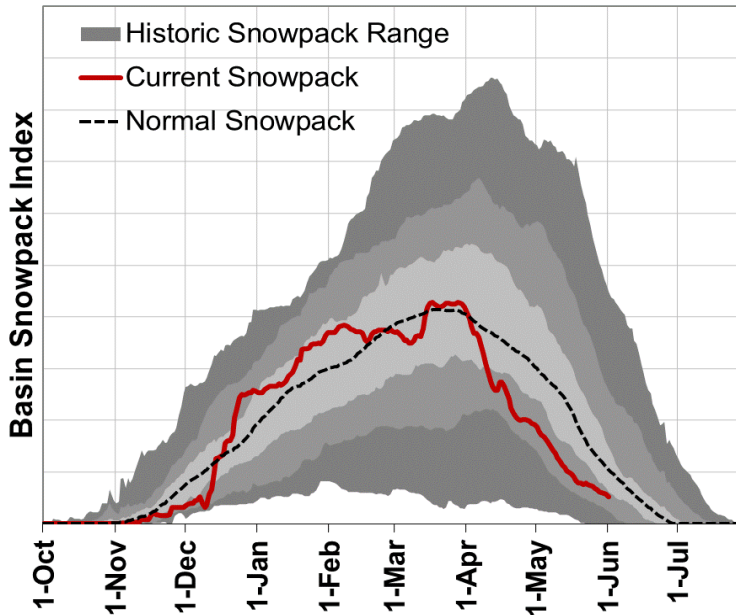
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Snow Mountain SNOTEL	6230	1-Jun	0	0.0	0.0	0.0	
Blue Mountain Spring SNOTEL	5870	1-Jun	0	0.0	0.0	0.0	
Bourne SNOTEL	5850	1-Jun	0	0.0	0.0	0.0	
Derr. SNOTEL	5850	1-Jun	0	0.0	0.0	0.0	
Arbuckle Mtn SNOTEL	5770	1-Jun	0	0.0	0.0	0.0	
Ochoco Meadows SNOTEL	5430	1-Jun	0	0.0	0.0	0.0	
Gold Center SNOTEL	5410	1-Jun	0	0.0	0.0	0.0	
Starr Ridge SNOTEL	5250	1-Jun	0	0.0	0.0	0.0	
Lake Creek R.S. SNOTEL	5240	1-Jun	0	0.0	0.0	0.0	
Madison Butte SNOTEL	5150	1-Jun	0	0.0	0.0	0.0	
Tipton SNOTEL	5150	1-Jun	0	0.0	0.0	0.0	
Lucky Strike SNOTEL	4970	1-Jun	0	0.0	0.0	0.0	
County Line SNOTEL	4830	1-Jun	0	0.0	0.0	0.0	



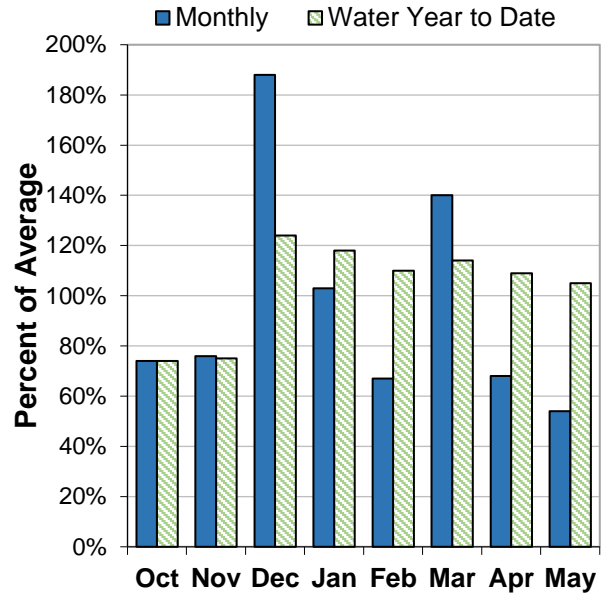
Upper Deschutes and Crooked Basins

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, the only 2 measurement sites in the basin that still have snow are Irish Taylor and Summit Lake SNOTEL sites, which is not unusual for June 1. Of the snow-free sites, some melted out up to 3 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 80% to 120% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 54% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 105% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 89% of average at Wickiup Reservoir to 117% of average at Ochoco Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 49% to 95% of average. Streamflow forecasts in the Crooked River basin are significantly below normal, while forecasts for the western drainages of the Deschutes Basin are slightly higher, but still below normal. Overall, forecasts decreased slightly from last month's report. Depending on their location within the basin, water managers should expect well below normal to near normal streamflows this summer.

Upper Deschutes And Crooked Basins Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Deschutes R bl Snow Ck	JUN-JUL	8.3	11.9	14.3	83%	16.7	20	17.2
	JUN-SEP	23	29	33	83%	37	43	40
Crane Prairie Reservoir Inflow ²	JUN-JUL	19.6	23	26	87%	29	32	30
	JUN-SEP	42	49	53	85%	57	64	62
Crescent Lake Inflow ²	JUN-JUL	1.13	3.3	4.8	79%	6.3	8.5	6.1
	JUN-SEP	1.99	4.7	6.6	79%	8.5	11.2	8.4
Little Deschutes R nr La Pine	JUN-JUL	7.6	13.6	17.6	80%	22	28	22
	JUN-SEP	10.1	17.2	22	81%	27	34	27
Deschutes R at Benham Falls ²	JUN-JUL	135	148	156	96%	164	177	163
	JUN-SEP	280	300	315	95%	330	350	330
Wychus Ck nr Sisters	JUN-JUL	13.9	15.7	16.9	77%	18.2	20	22
	JUN-SEP	22	25	26	76%	28	30	34
Prineville Reservoir Inflow ²	JUN-JUL	-6.50	0.00	4.4	53%	8.8	15.3	8.3
	JUN-SEP	-7.90	0.00	4.0	49%	8.8	15.9	8.1
Ochoco Reservoir Inflow ²	JUN-JUL	-3.50	-0.47	1.59	59%	3.6	6.7	2.7
	JUN-SEP	-4.30	-1.01	1.25	57%	3.5	6.8	2.2

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Useable Capacity (KAF)
Crane Prairie	44.7	44.0	42.8	104%	55.3
Crescent Lake	59.8	75.0	54.4	110%	86.9
Ochoco	40.3	30.0	34.6	117%	44.2
Prineville	137.7	102.4	140.5	98%	148.6
Wickiup	142.9	152.7	159.7	89%	200.0

Upper Deschutes And Crooked Basins Summary for June 1, 2016

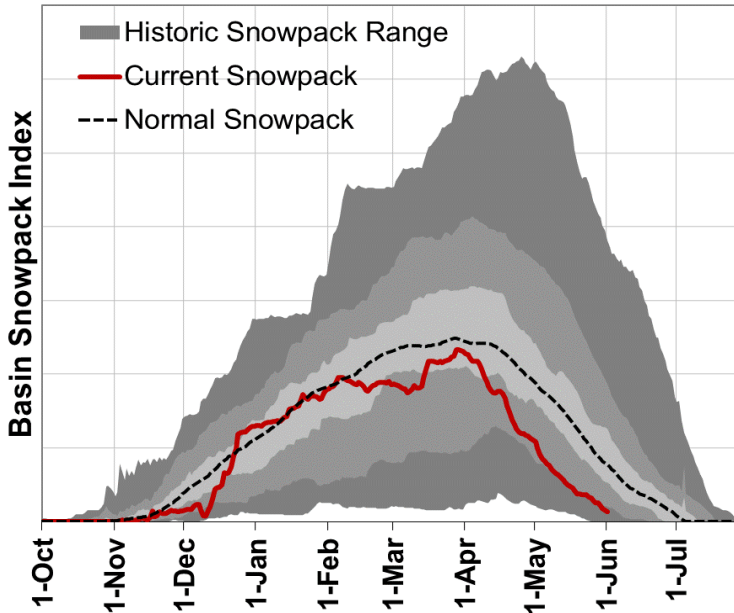
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Snow Mountain SNOTEL	6230	1-Jun	0	0.0	0.0	0.0	
Derr. SNOTEL	5850	1-Jun	0	0.0	0.0	0.0	
Three Creeks Meadow SNOTEL	5690	1-Jun	0	0.0	0.0	0.0	
Summit Lake SNOTEL	5610	1-Jun	46	23.4	0.0	30.5	77%
Irish Taylor SNOTEL	5540	1-Jun	26	12.7	0.0	26.7	48%
Ochoco Meadows SNOTEL	5430	1-Jun	0	0.0	0.0	0.0	
Cascade Summit SNOTEL	5100	1-Jun	0	0.0	0.0	0.2	0%
Roaring River SNOTEL	4950	1-Jun	0	0.0	0.0	0.0	
New Crescent Lake SNOTEL	4910	1-Jun	0	0.0	0.0	0.0	
Chemult Alternate SNOTEL	4850	1-Jun	0	0.0	0.0	0.0	
Hogg Pass SNOTEL	4790	1-Jun	0	0.0	0.0	0.0	
McKenzie SNOTEL	4770	1-Jun	0	0.0	0.0	15.2	0%
Salt Creek Falls SNOTEL	4220	1-Jun	0	0.0	0.0	0.0	
Santiam Jct. SNOTEL	3740	1-Jun	0	0.0	0.0	0.0	



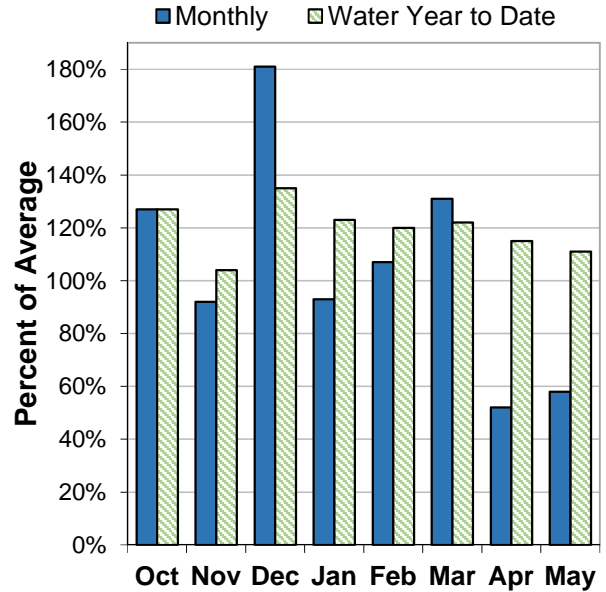
Hood, Sandy and Lower Deschutes Basins

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, only two sites in the basin still have snow, which is not unusual for this time of year. Due to warm spring temperatures, most sites melted out 1 to 3 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 60% to 90% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 58% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 111% of average.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 69% to 71% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should expect well below normal streamflows this summer.

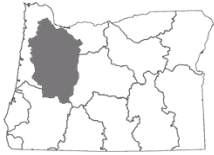
Hood, Sandy And Lower Deschutes Basins Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
WF Hood River nr Dee	JUN-JUL	14.8	23	28	70%	33	41	40
	JUN-SEP	26	35	41	71%	47	56	58
Hood R at Tucker Bridge	JUN-JUL	41	49	55	69%	61	69	80
	JUN-SEP	62	76	85	71%	94	108	120
Sandy R nr Marmot	JUN-JUL	47	59	68	62%	76	88	110
	JUN-SEP	79	96	108	69%	120	137	157

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

Reservoir Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Useable Capacity (KAF)
Clear Lake	4.6	3.8	6.5	70%	13.1

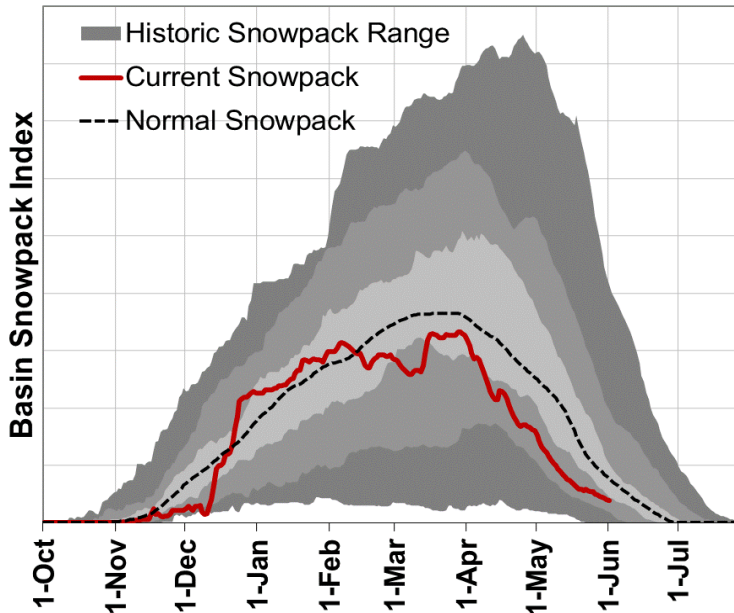
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Mt Hood Test Site SNOTEL	5370	1-Jun	21	10.7	0.0	48.1	22%
Red Hill SNOTEL	4410	1-Jun	0	0.0	0.0	13.5	0%
Surprise Lakes SNOTEL	4290	1-Jun	18	9.5	0.0	16.9	56%
Mud Ridge SNOTEL	4070	1-Jun	0	0.0	0.0	0.0	
Clear Lake SNOTEL	3810	1-Jun	0	0.0	0.0	0.0	
Blazed Alder SNOTEL	3650	1-Jun	0	0.0	0.0	0.0	
Clackamas Lake SNOTEL	3400	1-Jun	0	0.0	0.0	0.0	
Greenpoint SNOTEL	3310	1-Jun	0	0.0	0.0	0.0	
North Fork SNOTEL	3060	1-Jun	0	0.0	0.0	0.0	
South Fork Bull Run SNOTEL	2690	1-Jun	0	0.0	0.0	0.0	



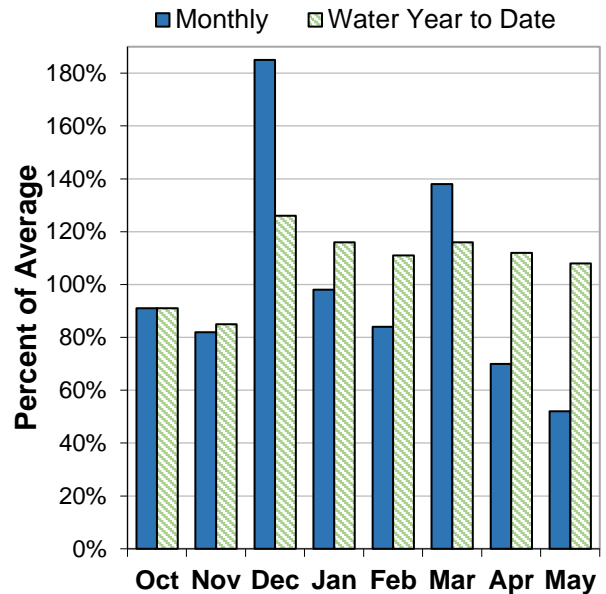
Willamette Basin

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, only two measurement sites in the basin still have snow, which is not unusual for this time of year. Of the snow-free sites, most melted out 2 to 3 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 50% to 90% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 52% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 108% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 88% of average at Blue River Reservoir to 105% of average at Fern Ridge Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 75% to 91% of average. Overall, forecasts decreased slightly from last month's report. Water managers in the basin should expect well below normal to below normal streamflows this summer.

Willamette Basin Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Hills Creek Reservoir Inflow ^{1,2}	JUN-SEP	76	99	109	84%	119	142	129
MF Willamette R bl NF nr Oakridge ^{1,2}	JUN-JUL	118	163	183	83%	205	250	220
	JUN-SEP	189	245	270	86%	295	350	315
Lookout Point Reservoir Inflow ^{1,2}	JUN-SEP	184	250	280	85%	315	380	330
Fall Creek Reservoir Inflow ^{1,2}	JUN-SEP	8.5	19.8	25	81%	30	42	31
Cottage Grove Lake Inflow ^{1,2}	JUN-SEP	1.99	6.3	8.3	80%	10.2	14.6	10.4
Dorena Lake Inflow ^{1,2}	JUN-SEP	2.6	17.2	26	81%	35	54	32
McKenzie R bl Trail Bridge	JUN-JUL	80	90	97	87%	104	114	112
	JUN-SEP	147	162	172	88%	182	197	195
Cougar Lake Inflow ^{1,2}	JUN-SEP	50	66	73	81%	80	96	90
Blue Lake Inflow ^{1,2}	JUN-SEP	0.39	10.3	14.8	75%	19.3	29	19.8
McKenzie R nr Vida ¹	JUN-SEP	390	470	505	89%	540	620	570
Detroit Lake Inflow ^{1,2}	JUN-JUL	85	135	157	89%	179	230	176
	JUN-SEP	148	210	235	90%	260	320	260
Little North Santiam R nr Mehama ¹	JUN-SEP	7.2	29	39	91%	49	71	43
North Santiam R at Mehama ¹	JUN-SEP	160	255	300	90%	345	440	335
Green Peter Lake Inflow ^{1,2}	JUN-SEP	11.1	55	75	88%	95	139	85
Foster Lake Inflow ^{1,2}	JUN-SEP	101	131	144	88%	157	187	164
South Santiam R at Waterloo ²	JUN-JUL	99	111	119	86%	127	139	138
	JUN-SEP	124	139	150	88%	161	176	171
Willamette R at Salem ^{1,2}	JUN-SEP	775	1200	1390	85%	1580	2010	1640
Scoggins Reservoir Inflow ²	JUN-JUL	0.19	0.88	1.35	75%	1.82	2.5	1.80
Oak Grove Fk ab Powerplant	JUN-JUL	32	38	42	91%	46	52	46
	JUN-SEP	61	71	77	91%	83	93	85
Clackamas R above Three Lynx	JUN-JUL	74	102	121	82%	140	168	148
	JUN-SEP	141	172	193	82%	215	245	235
Clackamas R at Estacada	JUN-JUL	86	135	168	82%	200	250	205
	JUN-SEP	169	225	260	83%	295	350	315

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

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

Willamette Basin Summary for June 1, 2016

Reservoir Storage					Useable
	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Capacity (KAF)
Blue River	69.3	47.6	78.6	88%	82.3
Cottage Grove	30.3	23.9	30.3	100%	31.8
Cougar	64.9	86.4	165.0	39%	174.9
Detroit	393.6	261.2	423.4	93%	426.8
Dorena	62.6	70.6	70.4	89%	72.1
Fall Creek	104.1	75.8	115.5	90%	116.0
Fern Ridge	96.0	82.2	91.5	105%	97.3
Foster	44.0	43.8	46.3	95%	46.2
Green Peter	331.7	283.4	381.2	87%	402.8
Hills Creek	199.8	232.3	268.3	74%	279.2
Lookout Point	274.5	199.2	396.8	69%	433.2
Timothy Lake	63.4	60.0	62.3	102%	63.6
Henry Hagg Lake	52.7	51.6	52.5	100%	53.3

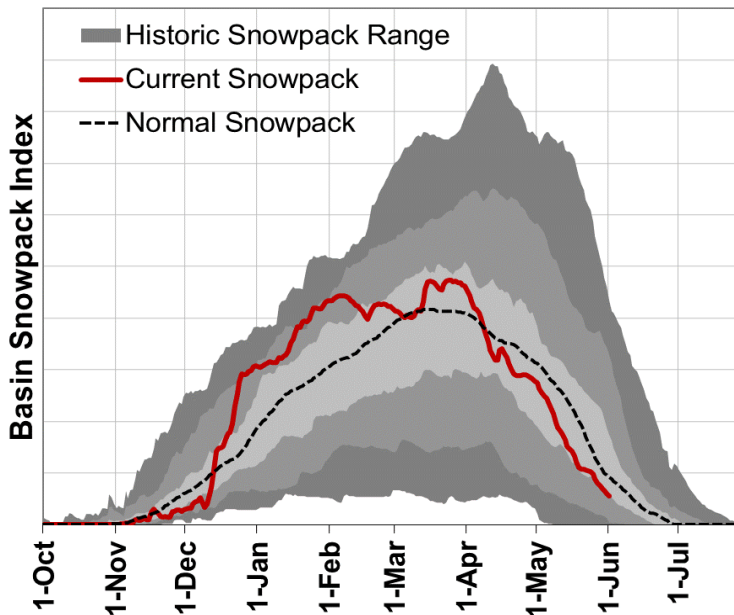
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Summit Lake SNOTEL	5610	1-Jun	46	23.4	0.0	30.5	77%
Irish Taylor SNOTEL	5540	1-Jun	26	12.7	0.0	26.7	48%
Cascade Summit SNOTEL	5100	1-Jun	0	0.0	0.0	0.2	0%
Roaring River SNOTEL	4950	1-Jun	0	0.0	0.0	0.0	
Holland Meadows SNOTEL	4930	1-Jun	0	0.0	0.0	0.0	
McKenzie SNOTEL	4770	1-Jun	0	0.0	0.0	15.2	0%
Bear Grass SNOTEL	4720	1-Jun	0	0.0	0.0		
Salt Creek Falls SNOTEL	4220	1-Jun	0	0.0	0.0	0.0	
Mud Ridge SNOTEL	4070	1-Jun	0	0.0	0.0	0.0	
Little Meadows SNOTEL	4020	1-Jun	0	0.0	0.0	0.0	
Clear Lake SNOTEL	3810	1-Jun	0	0.0	0.0	0.0	
Santiam Jct. SNOTEL	3740	1-Jun	0	0.0	0.0	0.0	
Daly Lake SNOTEL	3690	1-Jun	0	0.0	0.0	0.0	
Jump Off Joe SNOTEL	3520	1-Jun	0	0.0	0.0	0.0	
Peavine Ridge SNOTEL	3420	1-Jun	0	0.0	0.0	0.0	
Clackamas Lake SNOTEL	3400	1-Jun	0	0.0	0.0	0.0	
Smith Ridge SNOTEL	3270	1-Jun	0	0.0	0.0		
Saddle Mountain SNOTEL	3110	1-Jun	0	0.0	0.0		
Railroad Overpass SNOTEL	2680	1-Jun	0	0.0	0.0	0.0	
Marion Forks SNOTEL	2590	1-Jun	0	0.0	0.0	0.0	
Seine Creek SNOTEL	2060	1-Jun	0	0.0	0.0	0.0	
Miller Woods SNOTEL	420	1-Jun	0	0.0	0.0		



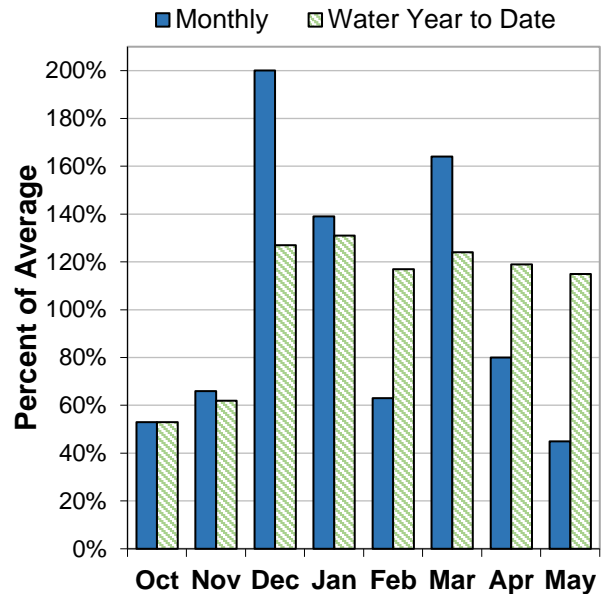
Rogue and Umpqua Basins

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, only two measurement sites in the basin still have snow, which is normal for this time of year. Of the snow-free sites, some melted out up to 2 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 90% to 120% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 45% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 115% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 86% of average at Howard Prairie Reservoir to 104% of average at Applegate Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 65% to 86% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should expect well below normal to below normal streamflows this summer.

Rogue And Umpqua Basins Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Hyatt Reservoir Inflow ²	JUN-JUL	0.09	0.15	0.26	70%	0.57	1.04	0.37
South Umpqua R at Tiller	JUN-JUL	5.3	18.2	27	68%	36	49	40
	JUN-SEP	12.1	25	34	69%	43	56	49
Cow Ck nr Azalea ²	JUN-JUL	0.50	1.45	2.1	68%	2.7	3.7	3.1
	JUN-SEP	0.13	1.72	2.8	65%	3.9	5.5	4.3
South Umpqua R nr Brockway	JUN-JUL	13.6	35	49	68%	63	84	72
	JUN-SEP	25	47	62	69%	78	100	90
North Umpqua R at Winchester	JUN-JUL	121	161	188	80%	215	255	235
	JUN-SEP	215	255	285	81%	315	355	350
Lost Creek Lk Inflow ²	JUN-JUL	130	154	170	83%	186	210	205
	JUN-SEP	230	265	285	86%	305	340	330
Rogue R at Raygold ²	JUN-JUL	105	146	174	79%	200	245	220
	JUN-SEP	205	250	280	80%	310	355	350
Rogue R at Grants Pass ²	JUN-JUL	109	149	177	80%	205	245	220
	JUN-SEP	192	240	275	81%	310	360	340
Applegate Lake Inflow ²	JUN-JUL	6.1	14.0	19.3	69%	25	32	28
	JUN-SEP	9.2	17.4	23	68%	29	37	34
Sucker Ck bl Ltl Grayback Ck nr Holland	JUN-JUL	4.8	7.9	9.9	73%	11.9	15.0	13.6
	JUN-SEP	7.1	10.4	12.7	72%	15.0	18.3	17.6
Illinois R nr Kerby	JUN-JUL	0.85	13.4	22	69%	31	43	32
	JUN-SEP	4.1	17.1	26	68%	35	48	38

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Useable Capacity (KAF)
Applegate	67.7	40.9	64.9	104%	75.2
Emigrant Lake	36.3	31.1	35.5	102%	39.0
Fish Lake	5.9	5.0	6.2	95%	7.9
Fourmile Lake	9.5	7.1	10.7	89%	15.6
Howard Prairie	41.6	22.0	48.3	86%	62.1
Hyatt Prairie	11.9	6.5	13.2	90%	16.2
Lost Creek	291.0	269.0	302.6	96%	315.0

Rogue And Umpqua Basins Summary for June 1, 2016

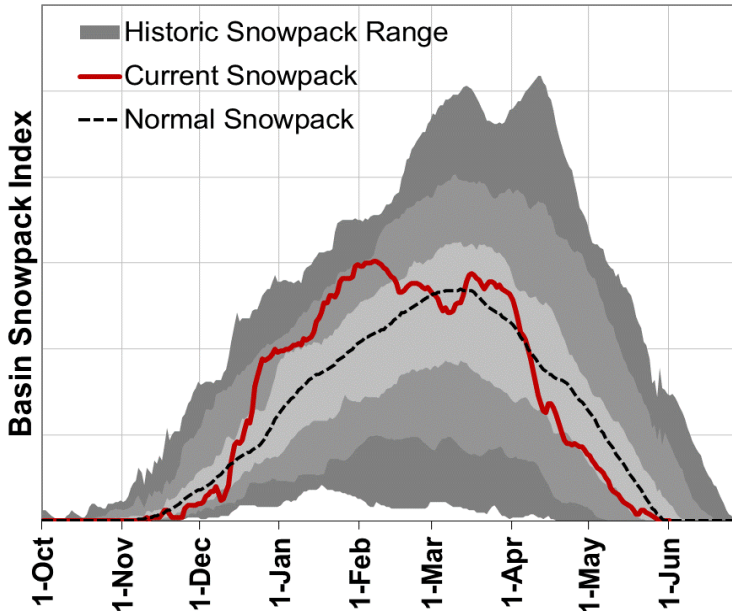
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Big Red Mountain SNOTEL	6050	1-Jun	0	0.0	0.0	0.2	0%
Annie Springs SNOTEL	6010	1-Jun	19	9.5	0.0	24.0	40%
Fourmile Lake SNOTEL	5970	1-Jun	0	0.0	0.0	0.0	
Cold Springs Camp SNOTEL	5940	1-Jun	0	0.0	0.0	0.0	
Sevenmile Marsh SNOTEL	5700	1-Jun	0	0.0	0.0	0.0	
Summit Lake SNOTEL	5610	1-Jun	46	23.4	0.0	30.5	77%
Billie Creek Divide SNOTEL	5280	1-Jun	0	0.0	0.0	0.0	
Diamond Lake SNOTEL	5280	1-Jun	0	0.0	0.0	0.0	
Bigelow Camp SNOTEL	5130	1-Jun	0	0.0	0.0	0.0	
Fish Lk. SNOTEL	4660	1-Jun	0	0.0	0.0	0.0	
Howard Prairie SNOTEL	4580	1-Jun	0	0.0	0.0		
King Mountain SNOTEL	4340	1-Jun	0	0.0	0.0	0.0	
Tokenetee Airstrip SNOTEL	3240	1-Jun	0	0.0	0.0	0.0	



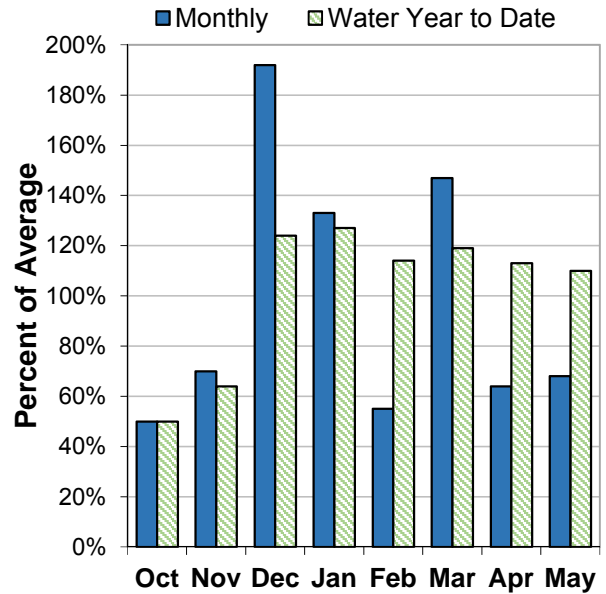
Klamath Basin

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, Annie Springs SNOTEL is the only site in the basin that still has snow, which is normal for this time of year. Due to warm spring temperatures, most sites melted out up to 2 weeks earlier than normal. However, Crowder Flat, Taylor Butte and Strawberry SNOTEL sites melted out 3-5 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 90% to 130% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 68% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 110% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 47% of average at Clear Lake to 103% of average at Upper Klamath Lake.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 78% to 90% of average. Water managers in the basin should expect well below normal to below normal streamflows this summer.

Klamath Basin Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *

Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Gerber Reservoir Inflow ²	JUN-JUL	0.01	0.15	1.20	84%	2.3	3.8	1.43
	JUN-SEP	0.05	0.54	1.60	90%	2.7	4.2	1.78
Sprague R nr Chiloquin	JUN-JUL	26	36	42	84%	48	58	50
	JUN-SEP	40	52	61	84%	70	82	73
Williamson bl Sprague nr Chiloquin	JUN-JUL	55	67	76	84%	85	97	90
	JUN-SEP	100	117	129	87%	141	158	149
Upper Klamath Lake Inflow ^{1,2}	JUN-JUL	30	62	77	74%	92	124	104
	JUN-SEP	73	121	143	78%	165	215	183

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

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	Current	Last Year	Average	% of	Useable
	(KAF)	(KAF)	(KAF)	Average	Capacity (KAF)
Clear Lake	117.2	41.7	247.4	47%	513.3
Gerber	42.9	10.4	65.0	66%	94.3
Upper Klamath Lake	458.1	424.9	445.2	103%	523.7

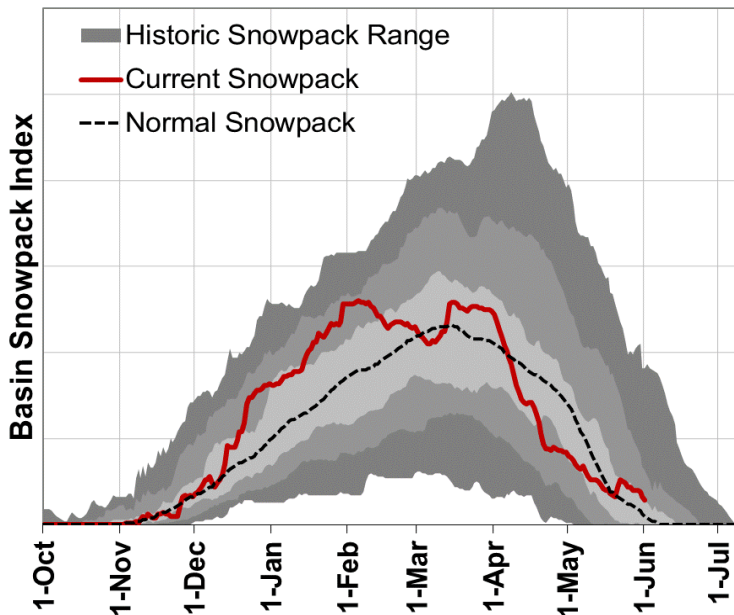
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Summer Rim SNOTEL	7080	1-Jun	0	0.0	0.0	0.0	
Swan Lake Mtn SNOTEL	6830	1-Jun	0	0.0	0.0	0.0	
Colvin Creek AM	6520	1-Jun	0	0.0	0.0	0.0	
Crazyman Flat SNOTEL	6180	1-Jun	0	0.0	0.0	0.0	
Annie Springs SNOTEL	6010	1-Jun	19	9.5	0.0	24.0	40%
Finley Corrals AM	6000	1-Jun	0	0.0	0.0	0.0	
Fourmile Lake SNOTEL	5970	1-Jun	0	0.0	0.0	0.0	
Cold Springs Camp SNOTEL	5940	1-Jun	0	0.0	0.0	0.0	
Strawberry SNOTEL	5770	1-Jun	0	0.0	0.0	0.0	
Silver Creek SNOTEL	5740	1-Jun	0	0.0	0.0	0.0	
Quartz Mountain SNOTEL	5720	1-Jun	0	0.0	0.0	0.0	
Sevenmile Marsh SNOTEL	5700	1-Jun	0	0.0	0.0	0.0	
State Line SNOTEL	5680	1-Jun	0	0.0	0.0	0.0	
Sun Pass SNOTEL	5400	1-Jun	0	0.0	0.0	0.0	
Billie Creek Divide SNOTEL	5280	1-Jun	0	0.0	0.0	0.0	
Diamond Lake SNOTEL	5280	1-Jun	0	0.0	0.0	0.0	
Crowder Flat SNOTEL	5170	1-Jun	0	0.0	0.0	0.0	
Taylor Butte SNOTEL	5030	1-Jun	0	0.0	0.0	0.0	
Gerber Reservoir SNOTEL	4890	1-Jun	0	0.0	0.0	0.0	
Chemult Alternate SNOTEL	4850	1-Jun	0	0.0	0.0	0.0	
Fish Lk. SNOTEL	4660	1-Jun	0	0.0	0.0	0.0	
Howard Prairie SNOTEL	4580	1-Jun	0	0.0	0.0	0.0	



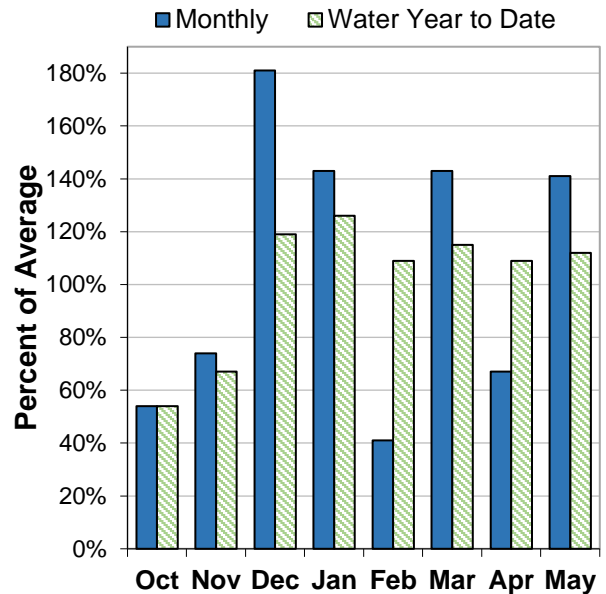
Lake County and Goose Lake Basins

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, Dismal Swamp SNOTEL is the only site in the basin that still has snow, which is normal for this time of year. Due to warm spring temperatures, most sites melted out about 2 weeks earlier than normal. However, Crowder Flat and Strawberry SNOTEL sites melted out 5 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 90% to 120% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 141% of average, which was by far the highest in the state. Precipitation since the beginning of the water year (October 1 - June 1) has been 112% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 98% of average at Drews Reservoir to 124% of average at Cottonwood Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 67% to 76% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should expect well below normal streamflows this summer.

Lake County And Goose Lake Basins Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *

Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Twentymile Ck nr Adel	JUN-JUL	0.41	1.83	2.8	74%	3.8	5.2	3.8
	JUN-SEP	0.66	2.2	3.2	74%	4.2	5.7	4.3
Deep Ck ab Adel	JUN-JUL	4.2	7.7	10.1	73%	12.5	16.0	13.9
	JUN-SEP	5.2	8.9	11.4	72%	13.9	17.6	15.8
Honey Ck nr Plush	JUN-JUL	0.21	1.13	1.75	67%	2.4	3.3	2.6
	JUN-SEP	0.20	1.15	1.80	67%	2.4	3.4	2.7
Chewaucan R nr Paisley	JUN-JUL	6.1	11.1	14.5	76%	17.9	23	19.0
	JUN-SEP	8.7	13.9	17.5	76%	21	26	23

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

Reservoir Storage					Useable Capacity
	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	(KAF)
Cottonwood	8.7	3.0	7.0	124%	9.3
Drews	44.6	8.5	45.5	98%	63.5

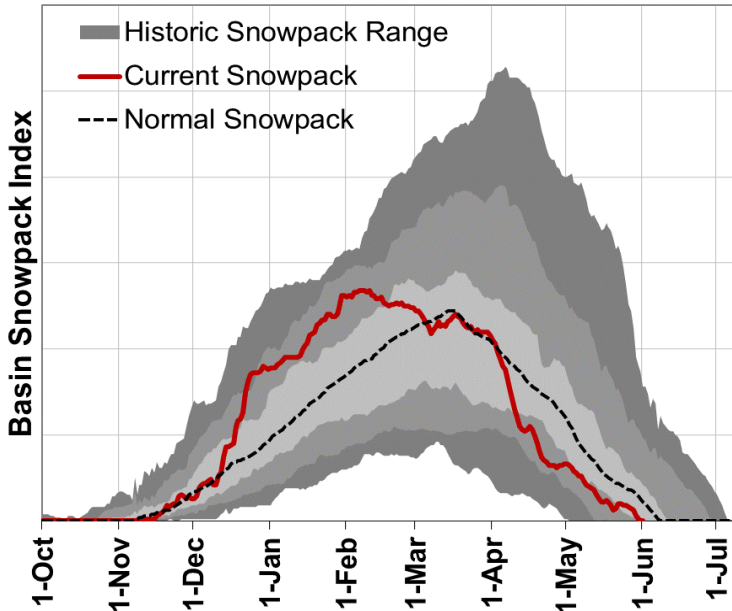
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Dismal Swamp SNOTEL	7360	1-Jun	33	12.1	0.0	4.2	288%
Summer Rim SNOTEL	7080	1-Jun	0	0.0	0.0	0.0	
Cedar Pass SNOTEL	7030	1-Jun	0	0.0	0.0	0.0	
Patton Meadows AM	6800	1-Jun	0	0.0	0.0		
Sherman Valley AM	6640	1-Jun	0	0.0	0.0		
Colvin Creek AM	6520	1-Jun	0	0.0			
Hart Mountain AM	6430	1-Jun	0	0.0	0.0		
Rogger Meadow AM	6360	1-Jun	0	0.0	0.0		
Adin Mtn SNOTEL	6190	1-Jun	0	0.0	0.0	0.0	
Crazyman Flat SNOTEL	6180	1-Jun	0	0.0	0.0	0.0	
Finley Corrals AM	6000	1-Jun	0	0.0			
Sheldon SCAN	5860	1-Jun	0	0.0	0.0	0.0	
Strawberry SNOTEL	5770	1-Jun	0	0.0	0.0	0.0	
Silver Creek SNOTEL	5740	1-Jun	0	0.0	0.0	0.0	
State Line SNOTEL	5680	1-Jun	0	0.0	0.0		
Crowder Flat SNOTEL	5170	1-Jun	0	0.0	0.0	0.0	



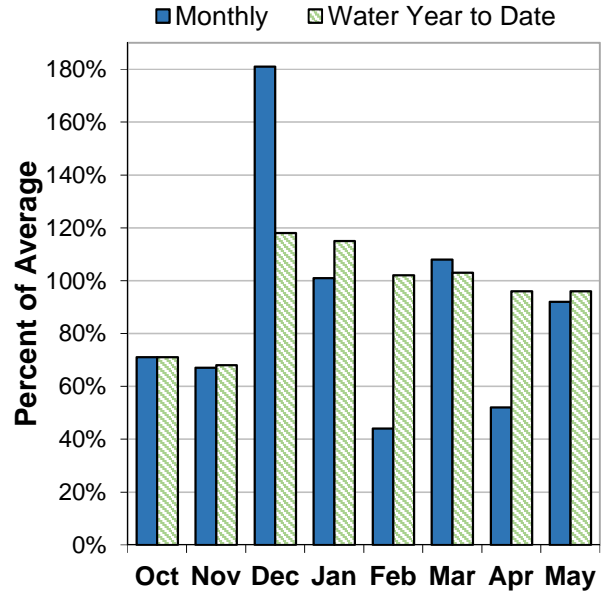
Harney Basin

June 1, 2016

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

As of June 1, all SNOTEL sites in the basin are snow-free, when normally Fish Creek SNOTEL still has over a foot of snowpack remaining at this date. Due to warm spring temperatures, most sites melted out 2 to 3 weeks earlier than normal. In general, SNOTEL sites in the basin peaked around 90% to 120% of normal peak snowpack levels.

PRECIPITATION

May precipitation was 92% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 96% of average.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 36% to 59% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should expect well below normal streamflows this summer.

Harney Basin Summary for June 1, 2016

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts June 1, 2016	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Silvies R nr Burns	JUN-JUL	0.20	1.11	5.3	39%	9.5	15.6	13.5
	JUN-SEP	0.20	0.98	5.8	36%	10.6	17.7	16.0
Donner Und Blitzen R nr Frenchglen	JUN-JUL	5.3	9.6	12.6	53%	15.6	19.9	24
	JUN-SEP	7.6	12.6	16.0	53%	19.4	24	30
Trout Ck nr Denio	JUN-JUL	0.04	0.76	1.25	57%	1.74	2.5	2.2
	JUN-SEP	0.19	1.02	1.59	59%	2.2	3.0	2.7

* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Granite Peak SNOTEL	8543	1-Jun	0	0.0	0.0	1.5	0%
Trout Creek AM	7890	1-Jun	0	0.0	0.0		
Fish Creek SNOTEL	7660	1-Jun	0	0.0	0.0	9.1	0%
Govt Corrals AM	7400	1-Jun	0	0.0	0.0		
Silvies SNOTEL	6990	1-Jun	0	0.0	0.0	0.0	
Buckskin Lower SNOTEL	6915	1-Jun	0	0.0	0.0	0.0	
V Lake AM	6600	1-Jun	0	0.0	0.0		
Disaster Peak SNOTEL	6500	1-Jun	0	0.0	0.0	0.0	
Hart Mountain AM	6430	1-Jun	0	0.0	0.0		
Snow Mountain SNOTEL	6230	1-Jun	0	0.0	0.0	0.0	
Lamance Creek SNOTEL	6000	1-Jun	0	0.0	0.0	0.0	
Blue Mountain Spring SNOTEL	5870	1-Jun	0	0.0	0.0	0.0	
Sheldon SCAN	5860	1-Jun	0	0.0	0.0	0.0	
Rock Springs SNOTEL	5290	1-Jun	0	0.0	0.0	0.0	
Starr Ridge SNOTEL	5250	1-Jun	0	0.0	0.0	0.0	
Lake Creek R.S. SNOTEL	5240	1-Jun	0	0.0	0.0	0.0	

Recession Forecasts for Oregon

Recession flow forecasts are presented below for key streamflow sites where reliable daily streamflow data are available. The recession flow forecasts use exceedance probabilities in a format similar to the standard water supply forecasts presented in this document. Each forecast provides a range of possible outcomes representing the uncertainty of forecasting models.

The types of forecasts in the table below are:

- 1) Threshold flow -- Date that the daily streamflow rate falls below the given threshold flow
- 2) Peak flow -- Maximum daily flow
- 3) Date of peak flow -- Date of occurrence of maximum daily flow
- 4) Average daily flow on a given date

OWYHEE AND MALHEUR BASINS					
FORECAST POINT	FORECAST THRESHOLD	FORECAST VALUE ----- CHANCE OF EXCEEDING ----- -----			LONG-TERM AVERAGE VALUE
		90%	50%	10%	
Owyhee R nr Rome	2000 cfs	** Observed	Mar 21	**	May 6
Owyhee R nr Rome	1000 cfs	** Observed	May 17	**	May 18
Owyhee R nr Rome	500 cfs	** Imminent	Jun 3	**	Jun 2

UPPER JOHN DAY BASIN					
FORECAST POINT	FORECAST THRESHOLD	FORECAST VALUE ----- CHANCE OF EXCEEDING ----- -----			LONG-TERM AVERAGE VALUE
		90%	50%	10%	
John Day R at Service Creek	Average Daily Flow on Aug. 1st	25	175	360	271

UPPER DESCHUTES AND CROOKED BASINS					
FORECAST POINT	FORECAST THRESHOLD	FORECAST VALUE ----- CHANCE OF EXCEEDING ----- -----			LONG-TERM AVERAGE VALUE
		90%	50%	10%	
Crane Prairie Inflow *	Date of Peak	** Observed	April 24	**	May 25
Crane Prairie Inflow	Peak Flow	** Observed	250 *	**	403
Crane Prairie Inflow	Average Daily Flow on Oct. 1st	165	200	235	269
Prineville Reservoir Inflow	113 cfs	** Observed	May 11	**	May 30
Prineville Reservoir Inflow	75 cfs	** Observed	May 19	**	June 7
Whychus Creek nr Sisters	100 cfs	Jul 13	Aug 2	Aug 27	August 16

**Observed dates and flow values are based on provisional data and subject to change.

* Crane Prairie Peak Inflow based on provisional data from USBR: 7-day moving average of adjusted QU data

ROGUE AND UMPQUA BASINS					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE ----- CHANCE OF EXCEEDING ----- -----</i>			<i>LONG-TERM AVERAGE VALUE</i>
		<i>90%</i>	<i>50%</i>	<i>10%</i>	
South Umpqua R nr Brockway *	90 cfs	Jul 23	Aug 2	Aug 17	August 8
South Umpqua R at Tiller	140 cfs	Jun 18	Jul 1	Jul 14	July 11
South Umpqua R at Tiller	90 cfs	Jul 6	Jul 23	Aug 7	August 1
South Umpqua R at Tiller	60 cfs	Aug 2	Aug 22	Sep 11	August 28

*Dates are based on streamflow data adjusted for releases from Galesville Reservoir to reflect natural flow conditions and do not match observed gage data. There is an approximately 20% chance in any given year that the flow will not recede below 90 cfs; the dates given here are for the event that the flow does recede below 90 cfs.

LAKE COUNTY AND GOOSE LAKE BASINS					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE ----- CHANCE OF EXCEEDING ----- -----</i>			<i>LONG-TERM AVERAGE VALUE</i>
		<i>90%</i>	<i>50%</i>	<i>10%</i>	
Deep Ck ab Adel	100 cfs	Jun 8	Jun 21	Jul 4	June 17
Honey Ck nr Plush	100 cfs	** Observed	Mar 23	**	May 16
Honey Ck nr Plush	50 cfs	** Observed	May 1	**	June 4
Twentymile Ck nr Adel	50 cfs	** Observed	May 28	**	May 30
Twentymile Ck nr Adel	10 cfs	Jun 12	Jun 29	Jul 16	July 7

HARNEY BASIN					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE ----- CHANCE OF EXCEEDING ----- -----</i>			<i>LONG-TERM AVERAGE VALUE</i>
		<i>90%</i>	<i>50%</i>	<i>10%</i>	
Silvies R nr Burns	400 cfs	** Observed	Apr 19	**	May 21
Silvies R nr Burns	200 cfs	** Observed	May 1	**	June 2
Silvies R nr Burns	100 cfs	** Observed	May 28	**	June 13
Silvies R nr Burns	50 cfs	** Imminent	Jun 7	**	July 3
Donner Und Blitzen R nr Frenchglen	200 cfs	Jun 6	Jun 14	Jun 23	June 20
Donner Und Blitzen R nr Frenchglen	100 cfs	Jun 20	Jul 1	Jul 12	July 9

Basin Outlook Reports: How Forecasts Are Made

Federal – State – Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

USDA, Natural Resources Conservation Service
Snow Survey Office
1201 NE Lloyd Suite 900
Portland, OR 97232
Phone: (503) 414-3271
Web site <http://www.or.nrcs.usda.gov/snow>

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. 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 uncertainty is in 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.

Interpreting Water Supply Forecasts

Each month, five forecasts are issued for each forecast point and each forecast period. Unless otherwise specified, all streamflow forecasts are for streamflow volumes that would occur naturally without any upstream influences. Water users need to know what the different forecasts represent if they are to use the information correctly when making operational decisions. The following is an explanation of each of the forecasts.

90 Percent Chance of Exceedance Forecast. There is a 90 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 10 percent chance that the actual streamflow volume will be less than this forecast value.

70 Percent Chance of Exceedance Forecast. There is a 70 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 30 percent chance that the actual streamflow volume will be less than this forecast value.

50 Percent Chance of Exceedance Forecast. There is a 50 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 50 percent chance that the actual streamflow volume will be less than this forecast value. Generally, this forecast is the middle of the range of possible streamflow volumes that can be produced given current conditions.

30 Percent Chance of Exceedance Forecast. There is a 30 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 70 percent chance that the actual streamflow volume will be less than this forecast value.

10 Percent Chance of Exceedance Forecast. There is a 10 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 90 percent chance that the actual streamflow volume will be less than this forecast value.

*Note: There is still a 20 percent chance that actual streamflow volumes will fall either below the 90 percent exceedance forecast or above the 10 percent exceedance forecast.

These forecasts represent the uncertainty inherent in making streamflow predictions. This uncertainty may include sources such as: unknown future weather conditions, uncertainties associated with the various prediction methodologies, and the spatial coverage of the data network in a given basin.

30-Year Average. The 30-year average streamflow for each forecast period is provided for comparison. The average is based on data from 1981-2010. The % AVG. column compares the 50% chance of exceedance forecast to the 30-year average streamflow; values above 100% denote when the 50% chance of exceedance forecast would be greater than the 30-year average streamflow.

AF - Acre-feet, forecasted volume of water are typically in thousands of acre-feet.

These forecasts are given to users to help make risk-based decisions. Users can select the forecast corresponding to the level of risk they are willing to accept in order to minimize the negative impacts of having more or less water than planned for.

To Decrease the Chance of Having Less Water than Planned for: A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive less than this amount). To reduce the risk of having less water than planned for, users can base their operational decisions on one of the forecasts with a greater chance of being exceeded such as the 90 or 70 percent exceedance forecasts.

To Decrease the Chance of Having More Water than Planned for: A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive more than this amount). To reduce the risk of having more water than planned for, users can base their operational decisions on one of the forecasts with a lesser chance of being exceeded such as the 30 or 10 percent exceedance forecasts.

Using the Forecasts - an Example

Using the 50 Percent Exceedance Forecast. Using the example forecasts shown on the next page, there is a 50% chance that actual streamflow volume at the Mountain Creek near Mitchell will be less than 4.4 KAF between April 1 and Sept 30. There is also a 50% chance that actual streamflow volume will be greater than 4.4 KAF.

Using the 90 and 70 Percent Exceedance Forecasts. If an unexpected shortage of water could cause problems (such as irrigated agriculture), users

might want to plan on receiving 3.3 KAF (from the 70 percent exceedance forecast). There is a 30% chance of receiving *less* than 3.3 KAF.

Alternatively, if users determine the risk of using the 70 percent exceedance forecast is too great, then they might plan on receiving 1.7 KAF (from the **90** percent exceedance forecast). There is 10% chance of receiving less than 1.7 KAF.

Using the 30 or 10 Percent Exceedance Forecasts. If an unexpected excess of water could cause problems (such as operating a flood control

reservoir), users might plan on receiving 5.5 KAF (from the 30 percent exceedance forecast). There is a 30% chance of receiving *more* than 5.5 KAF.

Alternatively, if users determine the risk of using the 30 percent exceedance forecast is too great, then they might plan on receiving 7.1 KAF (from the 10 percent exceedance forecast). There is a 10% chance of receiving more than 7.1 KAF.

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JOHN DAY BASIN

Streamflow Forecasts - February 1, 2013

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Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>				30-Yr Avg. (1000AF)		
		===== Chance Of Exceeding * =====						
		90% (1000AF)	70% (1000AF)	50% (1000AF) (% AVG.)	30% (1000AF)		10% (1000AF)	
Strawberry Ck nr Prairie City	MAR-JUL	5.0	6.6	7.6	89	8.6	10.2	8.5
	APR-SEP	5.2	6.8	7.9	90	9.0	10.6	8.8
Mountain Ck nr Mitchell	FEB-JUL	3.2	5.4	6.9	99	8.4	10.6	7.0
	APR-SEP	1.7	3.3	4.4	90	5.5	7.1	4.9

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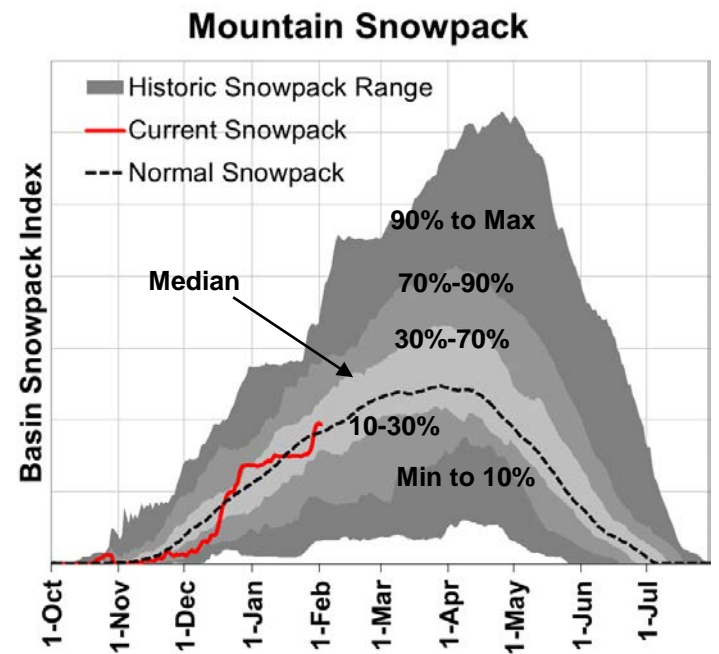
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

Interpreting Snowpack Plots

The basin snowpack plots display an index calculated using daily SNOTEL data for many sites in each basin. They show how the current year's snowpack data compares to historical data in the basin. The "Current Snowpack" line can be compared with the "Normal Snowpack" (median) line, as well as the historic range for the basin. This gives users important context about the current year and historic variability of snowpack in the basin.

The grey shaded areas represent different percentiles of the historical range of the snowpack index for each day. The dark grey shading indicates the extreme lows and highs in the SNOTEL record (minimum to the 10th percentile and the 90th percentile to maximum). The medium grey shading indicates the range from the 10th to 30th percentiles and the 70th to 90th percentiles. The light grey shading indicates the range between the 30th to 70th percentiles, while the median is the 50th percentile. A percentile is the value of the snowpack index below which the given percent of historical years fall. For instance, the 90th percentile line indicates that the snowpack index has been below this line for 90 percent of the years of record.

** Please note: These plots only use daily data from SNOTEL sites in the basin. Because snow course data is collected monthly, it cannot be included in these plots. The official snowpack percent of normal for the basin incorporates both SNOTEL and snow course data, so occasionally there might be slight discrepancies between the plot and official basin percent of normal (stated in basin summary below each plot).



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

Released by
Ron Alvarado, State Conservationist
Natural Resources Conservation Service
Portland, Oregon

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