



United States
Department of
Agriculture



Natural Resources
Conservation
Service

Oregon Basin Outlook Report

April 1, 2017



Landslide blocking road & preventing field staff from reaching and conducting snow surveys at Bigelow Camp SNOTEL site in the Siskiyou Mountains

Photo courtesy of Bill Overman (OR NRCS Snow Surveys)

Warm, moist March storms originating in the tropics (known as atmospheric rivers) brought large amounts of precipitation to Oregon's mountains this month, initiating the season's first major snowmelt episode as well as widespread flooding and landslides. The above photo illustrates just one instance of travel disruption due to landslides, as snow surveyors were stymied by a recent landslide when trying to reach a measurement site. Fortunately for water managers, numerous cold winter storms had accumulated enough snowpack so that, despite significant March melt, the April 1st snowpack remains near normal to well above normal across Oregon. Streamflow forecasts are predicting above normal summer flows for the entire state as of April 1st.

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General Outlook

April 1st, 2017

SUMMARY

Oregon's wintry weather pivoted abruptly to spring conditions during March. The middle of March brought warm mountain temperatures and heavy rainfall that instigated significant snowmelt throughout all but the highest elevations of Oregon. Precipitation for the month was above average throughout the state, and for the first time this winter, significant amounts fell as rain instead of snow in the mountains. However, the abundant snowpack provided by previous winter storms proved its resilience, and as of April 1st, snowpack conditions remain near normal in southeastern Oregon and well above normal throughout the rest of the state.

Given current snowpack conditions, streamflow forecasts across the state are calling for above average to well above average streamflows for the summer water supply season. Most of Oregon's major irrigation reservoirs are storing average to above average amounts of water as of the end of March. As long as abnormally warm temperatures and rapid snowmelt are kept at bay, Oregon will be in store for a good water year. Additionally, the drought monitor is showing Oregon in a drought-free status for the first time since 2011: <http://droughtmonitor.unl.edu/>.

SNOWPACK

Significant snowmelt was the dominant story for most snowpack measurement sites this month. While snowmelt is normal during March, especially in the lower elevations, the warm mountain rainfall accelerated snowmelt rates. The most notable amounts of snowmelt occurred in eastern Oregon, where some sites lost over twice the normal amount during the month. The heavy rain in the mountains and warm temperatures were in stark contrast to the previous three months of cold temperatures and above normal snow accumulation. Prior to recent snowmelt, most Oregon SNOTEL sites had surpassed (or well surpassed) their normal annual peak snow amounts and were recording a well above normal snowpack. Winter's surplus of snow compensated for the snowmelt and has left behind an above normal statewide snowpack as of April 1st.

While winter brought a consistent snow accumulation trend to Oregon, springtime has unveiled the variable snowpack conditions within each basin. In eastern Oregon, the snow at many of the lower elevation sites has melted quickly and levels have dipped slightly below normal as of April 1st, while snowpacks in a few places like the Wallowa, Ochoco, and Elkhorn Mountains are holding onto significantly higher than normal amounts of snow. By contrast, in western Oregon, many sites in the lower elevations of the Cascade Mountains are hanging on to a higher percent of normal snowpack than the higher elevation sites. Even with the variable snow conditions, the snowpack in the state ranges from 99% of normal in the Owyhee and Malheur basins to 137% of normal in the Willamette basin on April 1st. Grouping together all 81 SNOTEL sites in the state, the April 1st snowpack for Oregon is 126% of normal, which is significantly higher than last year at this time when it was only 101% of normal. The statewide snowpack conditions haven't been well above normal since 2012 when the April 1st snowpack for Oregon was 120% of normal.

PRECIPITATION

While the last few winter months brought mostly cold, wintry storms to the mountains, mid-March brought several warm and moisture-laden atmospheric river storm events which originated in the tropics. While not the first of their kind this winter, these particular storms caused the first significant statewide snowmelt of the season. Precipitation for the entire month was well above average and brought double the usual amount at some sites. Eleven SNOTEL sites broke records for the highest or second highest March precipitation. The lowest amounts of March precipitation fell in southeastern Oregon at 136% of average in the Owyhee and Malheur basins and in the Lake County region. The wettest region in March was in the Hood, Sandy and Lower Deschutes, where 186% of average amounts fell.

It has no doubt been a wet winter and all basins have experienced well above average precipitation since the water year began on October 1st. Sixteen SNOTEL sites broke records for the highest or second highest water year-to-date precipitation. Basin precipitation totals for the water year range from 121% of average in the Hood, Sandy and Lower Deschutes basins up to 151% of average for the Rogue and Umpqua basins. The Rogue, Umpqua, Klamath and Goose Lake basins have already surpassed the usual amount of precipitation that falls in an entire water year and the rest of the state is not too far behind.

RESERVOIRS

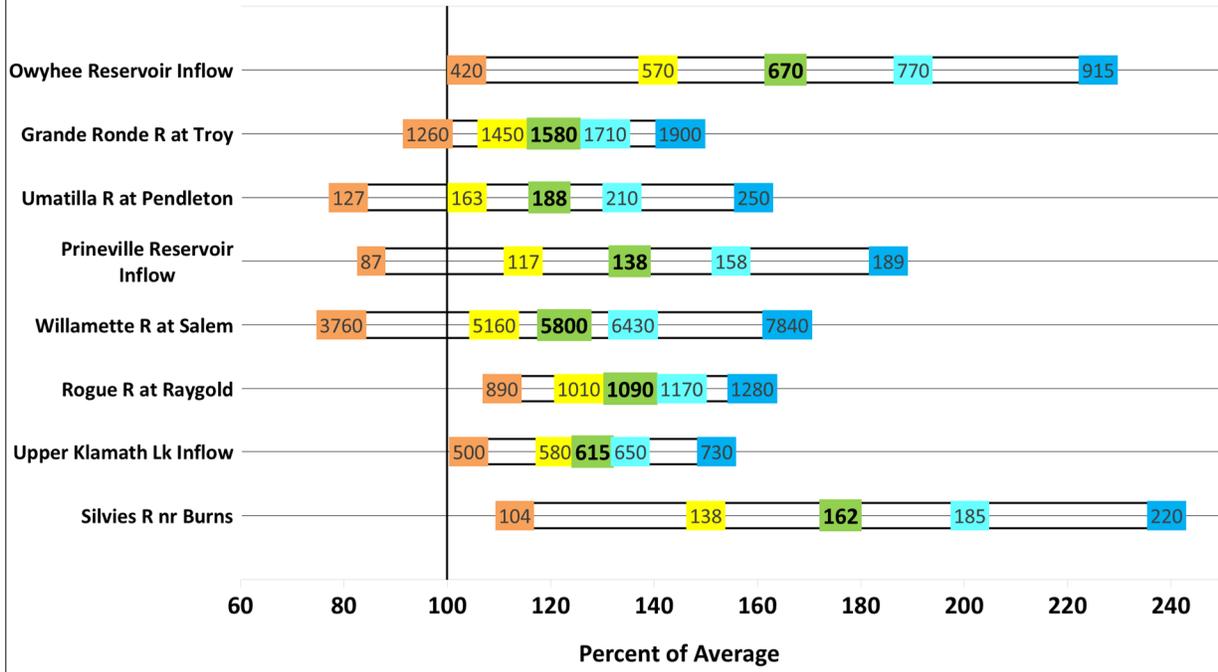
A wetter than normal March in all basins compounded by low elevation snowmelt across much of the state provided reservoir operators with ample amounts of water to manage. As of the end of March, reservoir storage in almost all basins in Oregon is at or above normal levels for this time of year. The largest reservoir in the state, Lake Owyhee, is storing 136% of average amounts of water as of the end of March, which is the first time since 2012 the lake has been above normal on April 1st.

STREAMFLOW

The flush of snowmelt and heavy rainfall caused Oregon's streams and rivers to flow well above average for the month. Many rivers crested above the flood stage as a result of too much water all at once. With no shortage of recent precipitation and the mountains hanging on to near normal to above normal snowpack as of April 1st, all streamflow forecasts in Oregon are calling for above average to well above average streamflows for the water supply season. The final determining factors will be springtime temperatures and snowmelt rates. Ideally, temperatures will remain cool in the mountains to preserve and slowly melt the snowpack, naturally sustaining streamflows throughout the season.

To accompany the new forecast summary graphic, here are some helpful reminders about interpreting streamflow forecasts published in this document. For each forecast point, 5 possible streamflow volumes are predicted. Where the observed streamflow occurs within this spectrum depends on the range of future weather conditions. If water users wish to plan conservatively, they may lean toward using the 70% chance of exceedance forecast, or the drier forecast (which may be below average depending on the region). Conversely, if a water user believes future conditions will provide more water to the system, they could choose to use the 30% chance of exceedance forecast (the wetter forecast). These arrays of forecasts are shown in the chart on the following page and explained in more detail on page 35.

Summary of Streamflow Forecasts across Oregon
April through September Forecast Volumes at a Selection of Streamflow Points
(Volumes listed in KAF)



Legend:	←-----Drier-----	Future Conditions	-----Wetter-----→	
90% Exceedance Forecast (KAF) There is a 90% chance that flows will exceed this volume.	70% Exceedance Forecast (KAF) There is a 70% chance that flows will exceed this volume.	50% Exceedance Forecast (KAF) There is a 50% chance that flows will exceed this volume.	30% Exceedance Forecast (KAF) There is a 30% chance that flows will exceed this volume.	10% Exceedance Forecast (KAF) There is a 10% chance that flows will exceed this volume.

All forecasts are listed with units of 1000 acre-feet (KAF). 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.

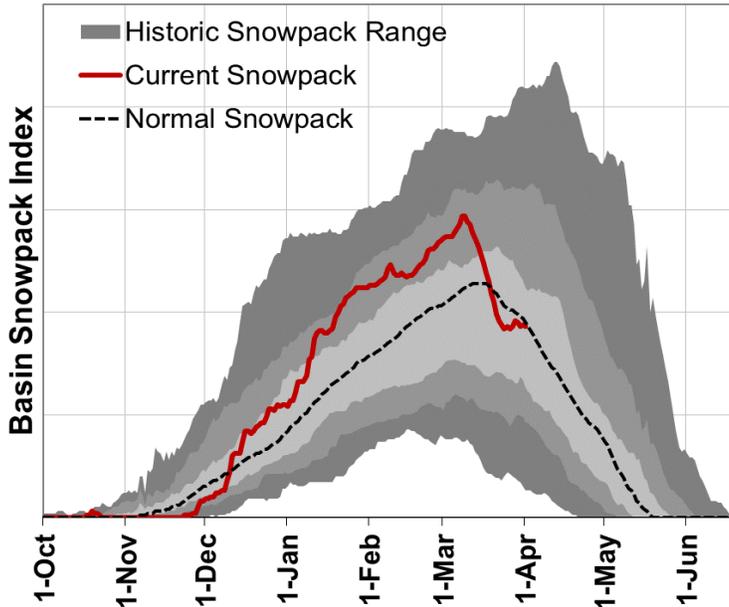
Note: A select set of streamflow forecasts have been discontinued in the Rogue, Grande Ronde and Willamette basins. Please contact us for more information.



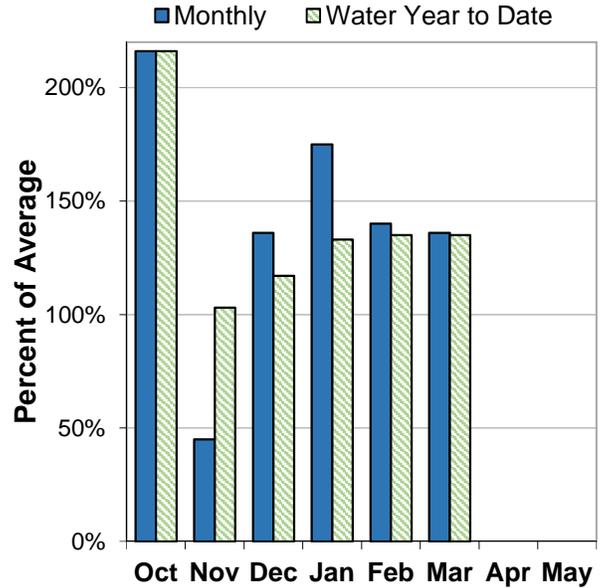
Owyhee and Malheur Basins

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, all but the highest elevation measurement sites (above ~7000 ft) have likely reached their seasonal snowpack peak as of April 1. In general, SNOTEL sites in the basin peaked around 110% to 150% of normal peak snowpack levels. As of April 1, the basin snowpack was 99% of normal. This is significantly lower than last month when the snowpack was 139% of normal.

PRECIPITATION

March precipitation was 136% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 135% of average. Out of 39 years of measurement, Blue Mountain SNOTEL site has broken a record for the highest March precipitation (7.5"; 204% of average).

RESERVOIR

As of April 1, storage at major reservoirs in the basin ranges from 83% of average at Bully Creek Reservoir to 136% of average at Lake Owyhee. After several years of well below normal volumes, Lake Owyhee is now storing 675.4 KAF (136% of average), which is the highest level that Lake Owyhee has experienced in any month since the summer of 2011.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 165% to 176% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should expect well above normal streamflows this summer.

Owyhee And Malheur Basins Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Owyhee R nr Rome	APR-JUL	360	505	600	174%	695	840	345
	APR-SEP	380	525	625	171%	720	865	365
Owyhee R bl Owyhee Dam ²	APR-JUL	385	530	630	168%	730	875	375
	APR-SEP	420	570	670	165%	770	915	405
Malheur R nr Drewsey	APR-JUL	91	108	120	176%	132	150	68
	APR-SEP	94	111	123	176%	136	153	70
NF Malheur R at Beulah ²	APR-JUL	69	80	88	157%	95	107	56

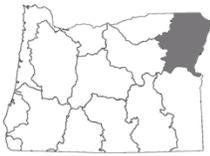
* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume
 2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage	Useable Capacity				
	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	(KAF)
Beulah	51.3	52.7	43.5	118%	59.2
Bully Creek	19.8	23.4	23.8	83%	23.7
Lake Owyhee	675.4	404.8	495.8	136%	715.0
Warm Springs	146.8	82.7	113.8	129%	169.6

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
East Little Owyhee Basin	7	163%	95%
South Fork Owyhee Basin	7	105%	93%
Upper Malheur Basin	8	103%	84%
Upper Owyhee Basin	5	104%	107%

Owyhee And Malheur Basins Summary for April 1, 2017

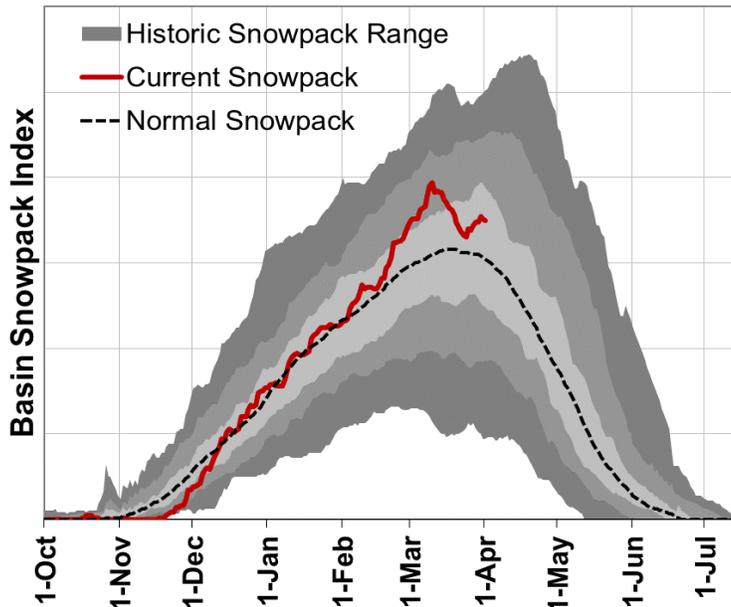
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Granite Peak SNOTEL	8543	1-Apr	86	35.0	25.0	21.2	165%
Trout Creek AM	7890	1-Apr	29	12.2	15.0	12.7	96%
Toe Jam SNOTEL	7700	1-Apr	74	30.8	18.7		
Govt Corrals AM	7400	1-Apr	54	22.7	15.0	15.0	151%
Jack Creek Upper SNOTEL	7250	1-Apr	46	17.3	18.3	16.7	104%
Dobson Creek Snow Course	7084	3-Apr	48	20.4	28.5	27.2	75%
Reynolds-Dobson Divide Snow Course	7064	3-Apr	64	27.2	25.8	24.2	112%
Fawn Creek SNOTEL	7000	1-Apr	50	18.6	20.0	15.8	118%
Merritt Mountain AM	7000	27-Mar	8	2.4	0.7	5.5	44%
Buckskin Lower SNOTEL	6915	1-Apr	26	10.4	10.0	8.5	122%
Jack Creek Lower Snow Course	6800	28-Mar	0	0.0	0.6	0.8	0%
Reynolds West Fork #2 Snow Course	6798	3-Apr	61	25.2	25.1	23.9	105%
Gold Creek Snow Course	6707	27-Mar	12	3.8	0.0	2.0	190%
Big Bend SNOTEL	6700	1-Apr	21	10.1	9.5	7.7	131%
Fry Canyon SNOTEL	6700	1-Apr	0	0.0	0.0		
Fry Canyon Snow Course	6700	27-Mar	11	2.9	2.0	4.8	60%
Laurel Draw SNOTEL	6697	1-Apr	19	7.5	7.2	8.6	87%
Columbia Basin AM	6650	27-Mar	19	5.7	1.3	7.6	75%
Red Canyon AM	6600	31-Mar	21	8.4	0.0	4.1	205%
Louse Canyon AM	6530	31-Mar	4	1.6	0.0	3.2	50%
South Mtn. SNOTEL	6500	1-Apr	32	12.8	11.3	17.3	74%
Succor Creek AM	6310	1-Apr	1	0.4	1.4	8.0	5%
Quinn Ridge AM	6270	31-Mar	5	2.0	0.0	0.0	
Taylor Canyon SNOTEL	6200	1-Apr	8	2.9	0.0	1.3	223%
Blue Mountain Spring SNOTEL	5870	1-Apr	43	16.0	16.4	15.9	101%
Vaught Ranch AM	5850	31-Mar	2	0.8	0.0	0.0	
Buck Pasture AM	5740	1-Apr	1	0.4	0.0	0.0	
Lookout Butte AM	5740	31-Mar	3	1.2	0.0	0.0	
Mud Flat SNOTEL	5730	1-Apr	0	0.0	0.0	2.5	0%
Battle Creek AM	5710	31-Mar	1	0.4	0.0	0.0	
Boulder Creek AM	5710	1-Apr	1	0.4	0.0	0.5	80%
Democrat Creek Snow Course	5686	3-Apr	0	0.0	0.9	6.2	0%
Reynolds Creek SNOTEL	5600	1-Apr	2	0.8	0.0	0.1	800%
Bull Basin AM	5460	31-Mar	4	1.6	0.0	0.0	
Dooley Mountain Snow Course	5440	3-Apr	0	0.0	0.0	8.0	0%
Call Meadows AM	5380	1-Apr	2	0.9	0.0	1.2	75%
Bully Creek AM	5300	1-Apr	0	0.0	0.0	0.0	
Rock Springs SNOTEL	5290	1-Apr	0	0.0	0.0	0.9	0%
Lake Creek R.S. SNOTEL	5240	1-Apr	20	8.5	6.0	8.6	99%
Flag Prairie AM	4720	1-Apr	4	1.7	0.0	0.0	
Eldorado Pass Snow Course	4630	3-Apr	0	0.0	0.0	0.0	



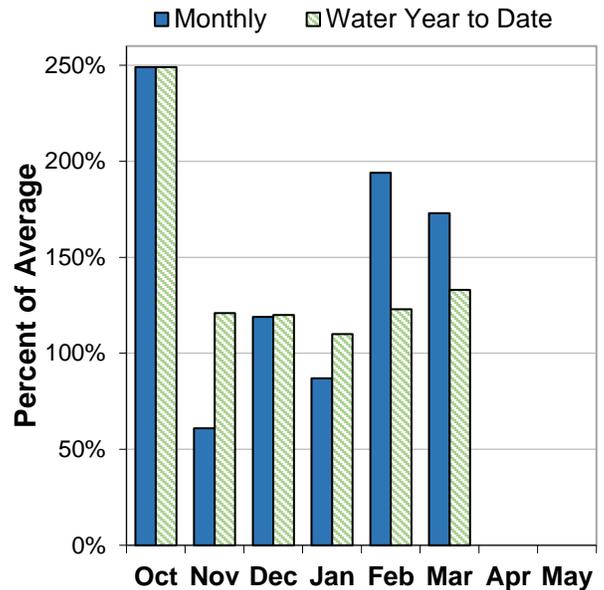
Grande Ronde, Powder, Burnt and Imnaha Basins

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, all but the highest elevation measurement sites in the Wallowa Mountains (above ~5600 ft) have likely reached their seasonal snowpack peak as of April 1. In general, SNOTEL sites in the basin peaked around 100% to 150% of normal peak snowpack levels. As of April 1, the basin snowpack was 110% of normal. This is slightly lower than last month when the snowpack was 120% of normal.

PRECIPITATION

March precipitation was 173% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 133% of average. Out of 37 years of measurement, Beaver Reservoir SNOTEL site has broken a record for the highest March precipitation (5.6"; 182% of average).

RESERVOIR

As of April 1, storage at major reservoirs in the basin ranges from 69% of average at Wolf Creek Reservoir to 139% of average at Wallowa Lake.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 112% to 177% of average. Overall, forecasts increased slightly from last month's report. Water managers in the basin should expect above normal to well above normal streamflows this summer.

Grande Ronde, Powder, Burnt And Imnaha Basins Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Burnt R nr Hereford ²	APR-JUL	45	54	59	179%	65	73	33
	APR-SEP	47	56	62	177%	68	76	35
Powder R nr Sumpter ²	APR-JUL	71	79	85	160%	90	98	53
	APR-SEP	72	81	86	159%	92	101	54
Pine Ck nr Oxbow	APR-JUL	138	168	189	120%	210	240	157
	APR-SEP	145	175	195	120%	215	245	163
Imnaha R at Imnaha	APR-JUL	275	315	345	135%	370	410	255
	APR-SEP	300	340	370	132%	400	440	280
Catherine Ck nr Union	APR-JUL	53	62	68	113%	74	83	60
	APR-SEP	56	66	72	113%	79	88	64
Lostine R nr Lostine	APR-JUL	113	121	127	120%	132	141	106
	APR-SEP	122	131	137	119%	144	153	115
Bear Ck nr Wallowa	APR-JUL	59	66	71	113%	76	83	63
	APR-SEP	61	69	73	112%	78	86	65
Grande Ronde R at Troy	APR-JUL	1160	1350	1480	121%	1610	1790	1220
	APR-SEP	1260	1450	1580	121%	1710	1900	1310

* 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)
Phillips Lake	30.2	20.8	42.0	72%	73.5
Thief Valley	14.4	14.0	13.9	103%	13.3
Unity	22.7	22.4	20.6	110%	25.5
Wallowa Lake	23.6	20.6	17.0	139%	37.5
Wolf Creek	3.7	3.7	5.3	69%	11.1

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Burnt Basin	5	117%	107%
Imnaha Basin	4	122%	109%
Lower Grande Ronde Basin	5	108%	108%
Powder Basin	10	108%	108%
Upper Grande Ronde Basin	9	107%	115%
Wallowa Basin	7	108%	111%

Grande Ronde, Powder, Burnt And Imnaha Basins Summary for April 1, 2017

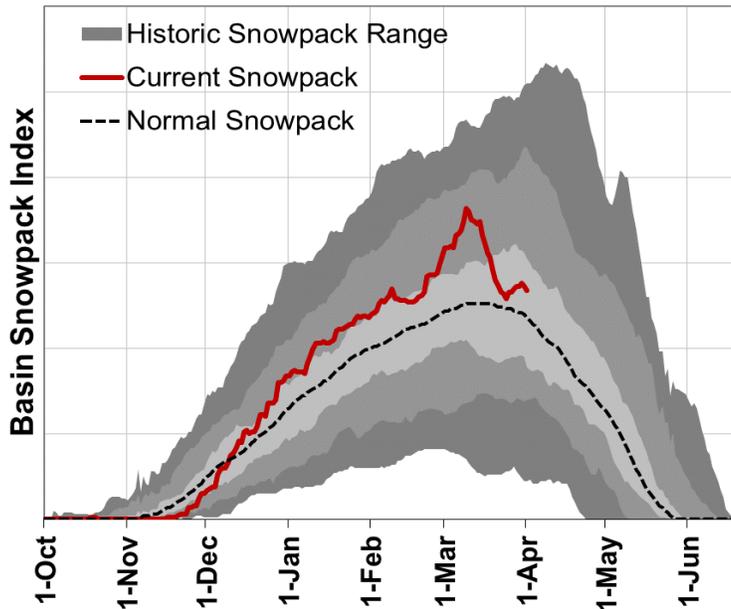
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Mt. Howard SNOTEL	7910	1-Apr	53	19.9	16.8	15.5	128%
Aneroid Lake #2 SNOTEL	7400	1-Apr	63	27.1	25.1	24.1	112%
Standley AM	7360	1-Apr	91	37.3	37.8	32.4	115%
Anthony Lake (Rev) Snow Course	7160	3-Apr	63	30.1	29.8	26.0	116%
TV Ridge AM	7050	1-Apr	39	14.8	15.5	17.8	83%
Bald Mtn AM	6600	1-Apr	79	32.4	33.3	25.8	126%
Little Alps Snow Course	6360	3-Apr	38	13.9	13.4	13.6	102%
Big Sheep AM	6230	1-Apr	72	30.2	25.4	24.2	125%
Bear Saddle SNOTEL	6180	1-Apr	65	23.9	25.9	22.3	107%
Placer Creek Snow Course	5860	29-Mar	58	21.8	20.8	16.4	133%
Bourne SNOTEL	5850	1-Apr	39	16.4	15.1	14.7	112%
Moss Springs SNOTEL	5760	1-Apr	58	23.6	28.7	25.1	94%
Taylor Green SNOTEL	5740	1-Apr	42	17.6	21.5	19.6	90%
Boulder Creek AM	5710	1-Apr	1	0.4	0.0	0.5	80%
Spruce Springs SNOTEL	5700	1-Apr	32	13.1	12.0	13.8	95%
Wolf Creek SNOTEL	5630	1-Apr	41	15.4	16.8	16.8	92%
Milk Shakes SNOTEL	5580	1-Apr	99	41.7	45.1		
West Branch SNOTEL	5560	1-Apr	58	22.3	20.8	21.0	106%
Touchet SNOTEL	5530	1-Apr	77	36.1	36.4	30.1	120%
Eilertson Meadows SNOTEL	5510	1-Apr	24	10.2	7.6	6.7	152%
Dooley Mountain Snow Course	5440	3-Apr	0	0.0	0.0	8.0	0%
Gold Center SNOTEL	5410	1-Apr	29	12.6	10.0	3.9	323%
Schneider Meadows SNOTEL	5400	1-Apr	79	33.2	31.1	26.5	125%
Beaver Reservoir SNOTEL	5150	1-Apr	18	7.2	10.7	8.6	84%
Tipton SNOTEL	5150	1-Apr	34	15.1	15.7	11.6	130%
Thorson Cabin #2 Snow Course	5100	29-Mar	27	12.6			
High Ridge SNOTEL	4920	1-Apr	60	29.5	28.1	20.7	143%
County Line SNOTEL	4830	1-Apr	0	0.0	0.0	0.5	0%
Eldorado Pass Snow Course	4630	3-Apr	0	0.0	0.0	0.0	
Little Antone (Alt.) Snow Course	4560	3-Apr	10	4.7	6.1	6.8	69%
Bowman Springs SNOTEL	4530	1-Apr	8	3.4	1.4	5.5	62%
Sourdough Gulch SNOTEL	4000	1-Apr	0	0.0	0.0	0.0	



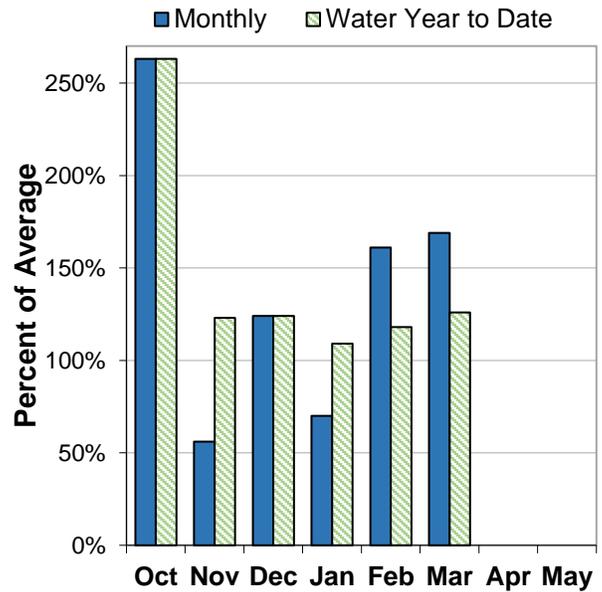
Umatilla, Walla Walla and Willow Basins

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, all but the highest elevation measurement sites (above ~5600 ft) have likely reached their seasonal snowpack peak as of April 1. In general, SNOTEL sites in the basin peaked around 120% to 160% of normal peak snowpack levels. As of April 1, the basin snowpack was 114% of normal. While still well above normal, this is significantly lower than last month when the snowpack was 131% of normal.

PRECIPITATION

March precipitation was 169% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 126% of average. Out of 36 years of measurement, Emigrant Springs SNOTEL site has broken a record for the highest March precipitation (7.3"; 175% of average).

RESERVOIR

As of April 1, storage at major reservoirs in the basin ranges from 73% of average at Cold Springs Reservoir to 121% of average at McKay Reservoir.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 114% to 138% of average. Overall, forecasts decreased slightly from last month's report. Water managers in the basin should expect above normal to well above normal streamflows this summer.

Umatilla, Walla Walla And Willow Basins Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	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	APR-JUL	58	65	70	130%	75	82	54
	APR-SEP	71	78	84	127%	89	96	66
Umatilla R ab Meacham nr Gibbon	APR-JUL	61	77	88	119%	99	116	74
	APR-SEP	66	83	94	118%	105	121	80
Umatilla R at Pendleton	APR-JUL	120	156	181	120%	205	240	151
	APR-SEP	127	163	188	120%	210	250	157
McKay Ck nr Pilot Rock	APR-SEP	10.1	24	33	114%	42	56	29
Butter Ck nr Pine City	APR-JUL	7.8	10.8	12.9	137%	14.9	17.9	9.4
	APR-SEP	8.4	11.4	13.5	138%	15.5	18.5	9.8
Willow Ck ab Willow Lk nr Heppner	APR-JUL	4.7	7.7	9.8	140%	11.9	14.9	7.0
Rhea Ck nr Heppner	APR-JUL	4.4	7.3	9.4	132%	11.4	14.4	7.1

* 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 (KAF)
Cold Springs	21.5	25.5	29.4	73%	38.6
Mckay	61.6	54.6	50.8	121%	71.5
Willow Creek	5.7	5.6	5.4	106%	9.8

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
	Umatilla Basin	5	113%
Walla Walla Basin	7	114%	104%

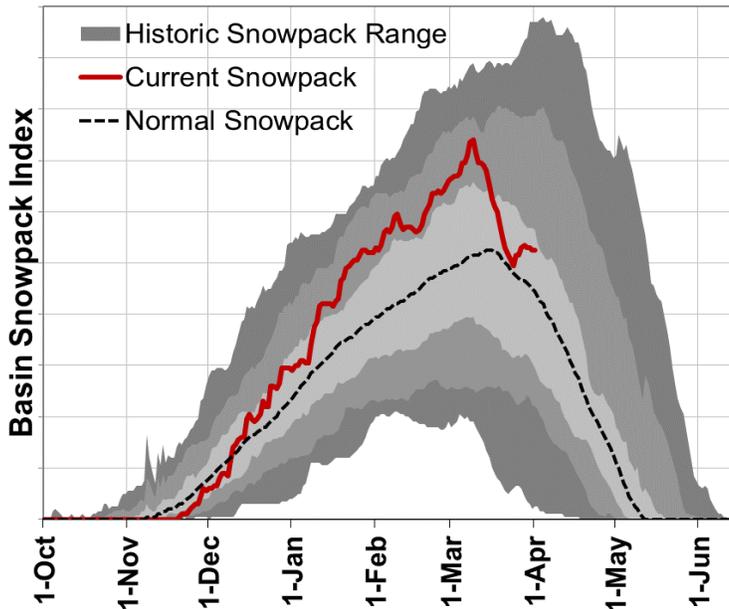
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Arbuckle Mtn SNOTEL	5770	1-Apr	51	19.9	18.2	18.8	106%
Spruce Springs SNOTEL	5700	1-Apr	32	13.1	12.0	13.8	95%
Milk Shakes SNOTEL	5580	1-Apr	99	41.7	45.1		
Touchet SNOTEL	5530	1-Apr	77	36.1	36.4	30.1	120%
Madison Butte SNOTEL	5150	1-Apr	0	0.0	0.0	1.2	0%
Lucky Strike SNOTEL	4970	1-Apr	11	5.1	1.8	6.2	82%
High Ridge SNOTEL	4920	1-Apr	60	29.5	28.1	20.7	143%
Bowman Springs SNOTEL	4530	1-Apr	8	3.4	1.4	5.5	62%
Emigrant Springs SNOTEL	3800	1-Apr	0	0.0	0.0	0.0	



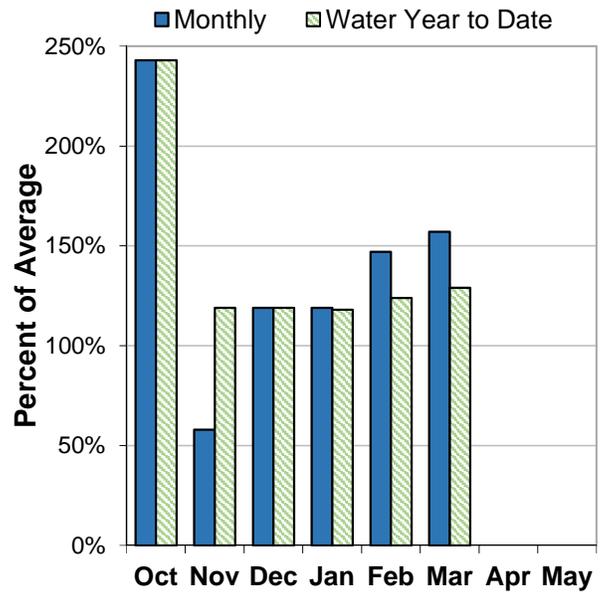
John Day Basin

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, all but the highest elevation measurement sites (above ~5800 ft) have likely reached their seasonal snowpack peak as of April 1. In general, SNOTEL sites in the basin peaked around 110% to 150% of normal peak snowpack levels. As of April 1, the basin snowpack was 116% of normal. While still well above normal, this is significantly lower than last month when the snowpack was 139% of normal.

PRECIPITATION

March precipitation was 157% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 129% of average. Out of 39 years of measurement, Blue Mountain SNOTEL site has broken a record for the highest March precipitation (7.5"; 204% of average). In addition, Gold Center SNOTEL site received a record high amount of October through March precipitation (27.2"; 157% of average).

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 108% to 149% of average. Overall, forecasts decreased slightly from last month's report. Water managers in the basin should expect above normal to well above normal streamflows this summer.

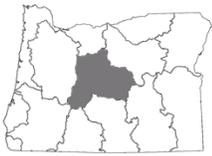
John Day Basin Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Strawberry Ck nr Prairie City	APR-JUL	7.2	8.8	9.9	122%	11.0	12.6	8.1
	APR-SEP	8.0	9.7	10.8	123%	11.9	13.5	8.8
Mountain Ck nr Mitchell	APR-JUL	5.3	6.4	7.2	150%	7.9	9.0	4.8
	APR-SEP	5.5	6.6	7.3	149%	8.1	9.2	4.9
Camas Ck nr Ukiah	APR-JUL	22	31	37	109%	43	52	34
	APR-SEP	22	31	38	109%	44	53	35
MF John Day R at Ritter	APR-JUL	115	141	158	131%	176	200	121
	APR-SEP	120	146	164	130%	182	210	126
NF John Day R at Monument	APR-JUL	460	560	630	109%	700	800	580
	APR-SEP	475	575	645	108%	715	820	600

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

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Lower John Day Basin	6	118%	103%
North Fork John Day Basin	8	120%	109%
Upper John Day Basin	6	115%	110%

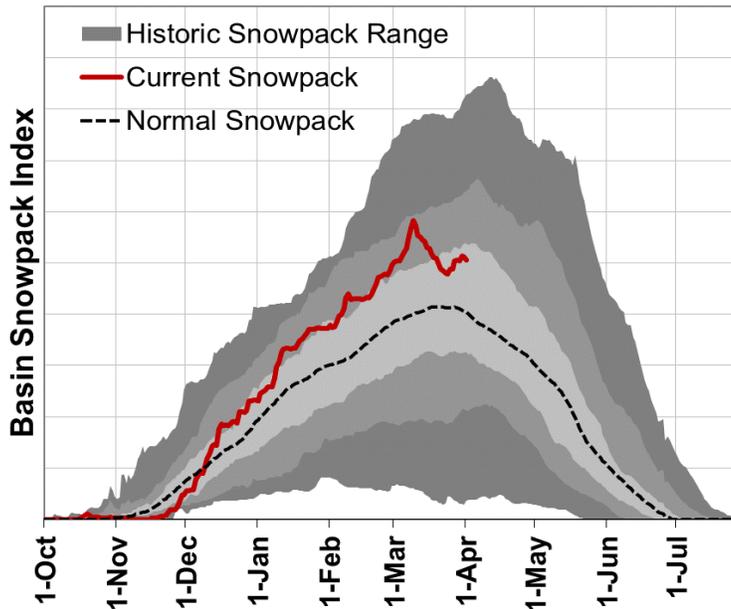
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Anthony Lake (Rev) Snow Course	7160	3-Apr	63	30.1	29.8	26.0	116%
Little Alps Snow Course	6360	3-Apr	38	13.9	13.4	13.6	102%
Snow Mountain SNOTEL	6230	1-Apr	26	12.9	13.3	12.2	106%
Blue Mountain Spring SNOTEL	5870	1-Apr	43	16.0	16.4	15.9	101%
Derr Snow Course	5860	3-Apr	20	7.6	7.3	7.6	100%
Bourne SNOTEL	5850	1-Apr	39	16.4	15.1	14.7	112%
Derr. SNOTEL	5850	1-Apr	46	19.9	18.9	12.0	166%
Arbuckle Mtn SNOTEL	5770	1-Apr	51	19.9	18.2	18.8	106%
Ochoco Meadows SNOTEL	5430	1-Apr	21	9.5	6.9	9.5	100%
Gold Center SNOTEL	5410	1-Apr	29	12.6	10.0	3.9	323%
Starr Ridge SNOTEL	5250	1-Apr	0	0.0	0.0	0.0	
Lake Creek R.S. SNOTEL	5240	1-Apr	20	8.5	6.0	8.6	99%
Ochoco Meadows Snow Course	5190	31-Mar	24	9.3	7.0	8.8	106%
Madison Butte SNOTEL	5150	1-Apr	0	0.0	0.0	1.2	0%
Tipton SNOTEL	5150	1-Apr	34	15.1	15.7	11.6	130%
Lucky Strike SNOTEL	4970	1-Apr	11	5.1	1.8	6.2	82%
County Line SNOTEL	4830	1-Apr	0	0.0	0.0	0.5	0%
Marks Creek Snow Course	4580	31-Mar	0	0.0	0.0	0.0	
Little Antone (Alt.) Snow Course	4560	3-Apr	10	4.7	6.1	6.8	69%



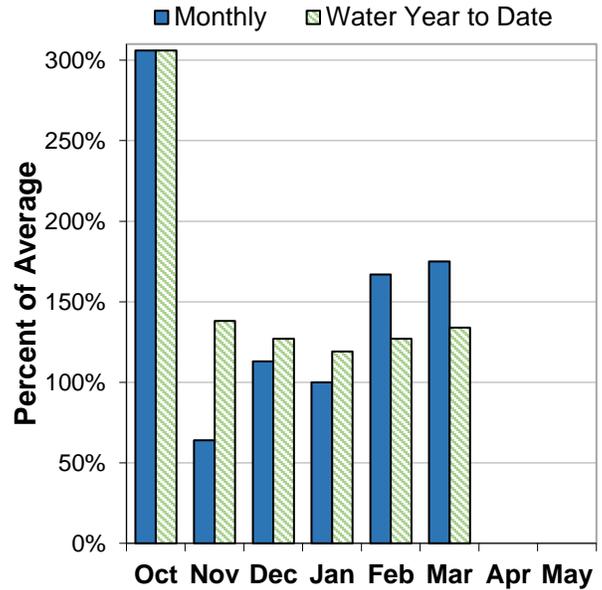
Upper Deschutes and Crooked Basins

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, measurement sites located in the Ochoco Mountains and those that are below 5000 feet have likely reached their seasonal snowpack peak as of April 1. Several of the high elevation sites located in the Cascade Mountains may still yet reach their seasonal peak. In general, SNOTEL sites in the basin peaked around 110% to 160% of normal peak snowpack levels. As of April 1, the basin snowpack was 125% of normal. Conditions remain similar to last month when the snowpack was 127% of normal.

PRECIPITATION

March precipitation was 175% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 134% of average.

RESERVOIR

As of April 1, storage at major reservoirs in the basin ranges from 92% of average at Wickiup Reservoir to 133% of average at Ochoco Reservoir.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 114% to 172% of average. Overall, forecasts remain similar to last month's report. Water managers in the basin should expect above normal to well above normal streamflows this summer.

Upper Deschutes And Crooked Basins Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Deschutes R bl Snow Ck	APR-JUL	33	38	41	137%	43	48	30
	APR-SEP	62	69	73	140%	78	84	52
Crane Prairie Reservoir Inflow ²	APR-JUL	67	74	78	139%	83	90	56
	APR-SEP	106	116	124	141%	131	141	88
Crescent Lake Inflow ²	APR-JUL	19.8	22	24	160%	26	28	15.0
	APR-SEP	24	27	29	167%	31	34	17.4
Little Deschutes R nr La Pine ²	APR-JUL	93	101	107	170%	113	121	63
	APR-SEP	104	113	119	172%	126	135	69
Deschutes R at Benham Falls ²	APR-JUL	345	360	370	116%	380	395	320
	APR-SEP	520	540	555	114%	570	585	485
Wychus Ck nr Sisters	APR-JUL	36	38	40	114%	42	44	35
	APR-SEP	49	52	54	115%	56	58	47
Prineville Reservoir Inflow ²	APR-JUL	88	117	138	135%	158	187	102
	APR-SEP	87	117	138	135%	158	189	102
Ochoco Reservoir Inflow ²	APR-JUL	16.9	23	28	133%	32	38	21
	APR-SEP	16.7	23	27	135%	31	38	20

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

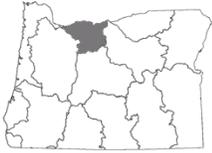
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage	Useable Capacity				
	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	(KAF)
Crane Prairie	46.3	41.6	42.1	110%	55.3
Crescent Lake	61.1	53.9	48.4	126%	86.9
Ochoco	40.3	39.5	30.2	133%	44.2
Prineville	135.5	141.6	130.4	104%	148.6
Wickiup	173.9	176.1	189.2	92%	200.0

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Little Deschutes Basin	4	145%	125%
Upper Crooked Basin	5	122%	106%
Upper Deschutes Basin	11	123%	102%

Upper Deschutes And Crooked Basins Summary for April 1, 2017

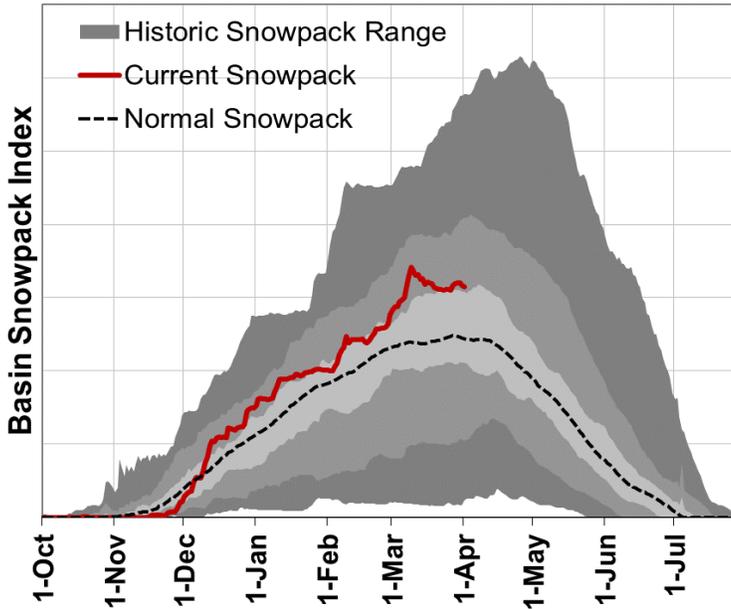
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
New Dutchman #3 Snow Course	6320	30-Mar	129	53.0	50.6	44.8	118%
Snow Mountain SNOTEL	6230	1-Apr	26	12.9	13.3	12.2	106%
Derr Snow Course	5860	3-Apr	20	7.6	7.3	7.6	100%
Derr. SNOTEL	5850	1-Apr	46	19.9	18.9	12.0	166%
Three Creeks Meadow SNOTEL	5690	1-Apr	40	17.8	16.1	18.4	97%
Summit Lake SNOTEL	5610	1-Apr	111	50.0	43.9	37.1	135%
Bald Peter Snow Course	5600	31-Mar	69	32.0		31.4	102%
Irish Taylor SNOTEL	5540	1-Apr	97	38.7	36.1	37.2	104%
Tangent Snow Course	5470	30-Mar	45	20.4	17.2	18.1	113%
Ochoco Meadows SNOTEL	5430	1-Apr	21	9.5	6.9	9.5	100%
Ochoco Meadows Snow Course	5190	31-Mar	24	9.3	7.0	8.8	106%
Racing Creek Snow Course	5160	31-Mar	44	20.4		13.6	150%
Cascade Summit SNOTEL	5100	1-Apr	92	35.9	32.4	31.0	116%
Roaring River SNOTEL	4950	1-Apr	71	33.8	26.6	26.0	130%
New Crescent Lake SNOTEL	4910	1-Apr	48	14.9	9.4	5.4	276%
Chemult Alternate SNOTEL	4850	1-Apr	22	9.3	9.0	2.5	372%
Hogg Pass SNOTEL	4790	1-Apr	58	25.4	16.1	26.0	98%
McKenzie SNOTEL	4770	1-Apr	94	40.8	34.2	37.4	109%
Marks Creek Snow Course	4580	31-Mar	0	0.0	0.0	0.0	
Salt Creek Falls SNOTEL	4220	1-Apr	56	25.9	18.0	17.5	148%
Santiam Jct. SNOTEL	3740	1-Apr	34	15.8	4.5	9.8	161%



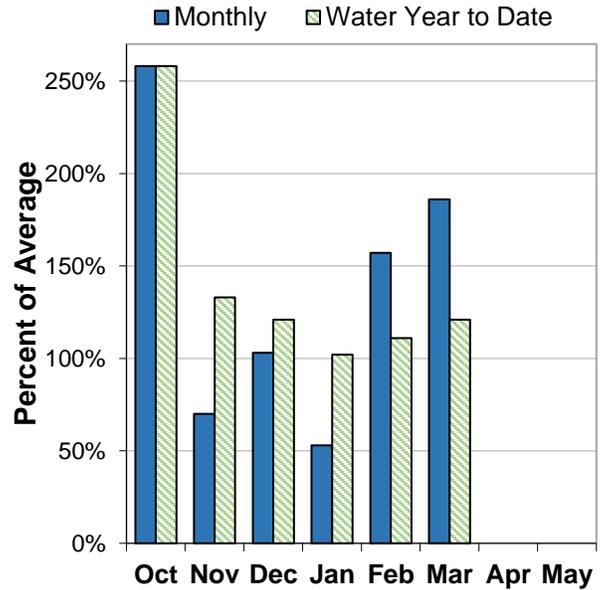
Hood, Sandy and Lower Deschutes Basins

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, measurement sites located below 3600 feet elevation have likely reached their seasonal snowpack peak as of April 1. Several of the high elevation sites located on Mt Hood may still yet reach their seasonal peak. In general, SNOTEL sites in the basin peaked around 120% to 150% of normal peak snowpack levels. As of April 1, the basin snowpack was 125% of normal. Conditions remain similar to last month when the snowpack was 123% of normal.

PRECIPITATION

March precipitation was 186% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 121% of average. South Fork Bull Run SNOTEL site received the most March precipitation since measurements began 20 years ago. During the month, 24.9 inches of precipitation fell at this site, bringing the water year total to 106.9 inches (also a record for this site).

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 112% to 115% of average. Overall, forecasts increased slightly from last month's report. Water managers in the basin should expect above normal streamflows this summer.

Hood, Sandy And Lower Deschutes Basins Summary for April 1, 2017

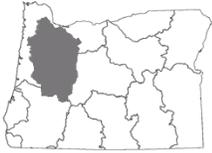
Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
WF Hood R nr Dee	APR-JUL	104	123	137	114%	150	170	120
	APR-SEP	121	142	156	112%	171	192	139
Hood R at Tucker Bridge	APR-JUL	205	235	260	116%	280	310	225
	APR-SEP	240	275	300	113%	325	360	265
Sandy R nr Marmot	APR-JUL	280	330	360	116%	395	445	310
	APR-SEP	325	380	415	115%	450	505	360

* 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	1.3	3.9	4.4	29%	13.1

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Lower Columbia - Sandy Basin	7	129%	93%
Lower Deschutes Basin	5	109%	89%
Middle Columbia - Hood Basin	8	123%	99%

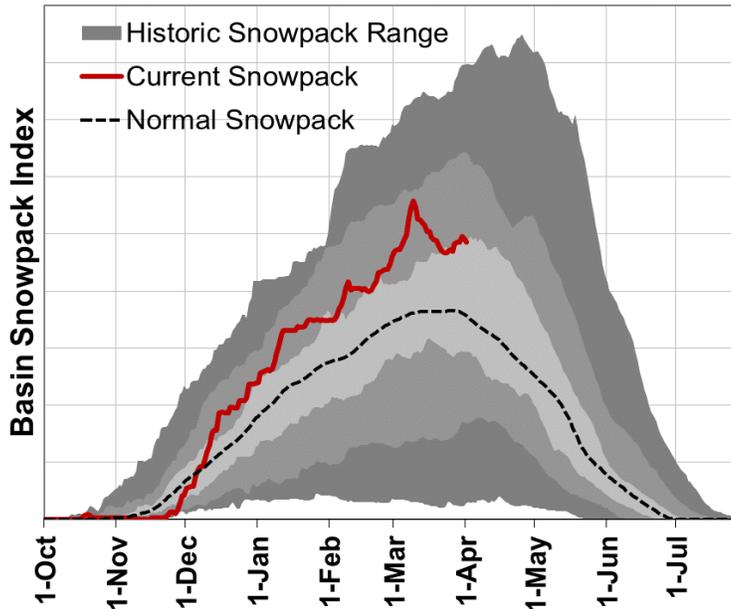
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
High Prairie Snow Course	6080	3-Apr	106	45.6	43.4	42.2	108%
Bald Peter Snow Course	5600	31-Mar	69	32.0		31.4	102%
Mt Hood Test Site SNOTEL	5370	1-Apr	131	53.9	49.8	60.2	90%
Racing Creek Snow Course	5160	31-Mar	44	20.4		13.6	150%
Red Hill SNOTEL	4410	1-Apr	108	59.6	46.8	45.7	130%
Mill Creek Meadow Snow Course	4400	3-Apr	28	11.4	4.9	10.8	106%
Surprise Lakes SNOTEL	4290	1-Apr	126	61.9	56.4	45.5	136%
Beaver Creek #2 Snow Course	4220	30-Mar	26	10.2		6.8	150%
Beaver Creek #1 Snow Course	4210	30-Mar	43	16.8		13.6	124%
Mud Ridge SNOTEL	4070	1-Apr	71	31.3	21.8	23.4	134%
Clear Lake SNOTEL	3810	1-Apr	37	14.7	7.8	10.4	141%
Blazed Alder SNOTEL	3650	1-Apr	93	41.6	25.5	25.6	163%
Clackamas Lake SNOTEL	3400	1-Apr	30	12.8	6.7	8.6	149%
Greenpoint SNOTEL	3310	1-Apr	46	19.9	16.6	15.6	128%
North Fork SNOTEL	3060	1-Apr	63	26.3	14.6	14.4	183%
South Fork Bull Run SNOTEL	2690	1-Apr	11	4.5	0.0	0.0	



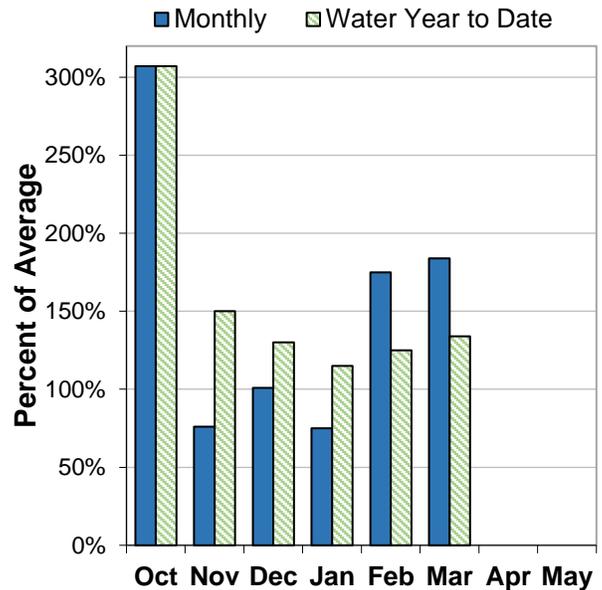
Willamette Basin

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, the majority of measurement sites have likely reached their seasonal snowpack peak as of April 1. Several of the high elevation sites located in the Cascade Mountains may still yet reach their seasonal peak. In general, SNOTEL sites in the basin peaked around 110% to 150% of normal peak snowpack levels. As of April 1, the basin snowpack was 137% of normal. Conditions remain similar to last month when the snowpack was 134% of normal.

PRECIPITATION

March precipitation was 184% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 134% of average. Out of 38 years of measurement, Saddle Mountain SNOTEL site has broken a record for the highest March precipitation (21.6"; 213% of average).

RESERVOIR

Reservoir storage across the basin is currently above average. As of April 1, storage at major reservoirs in the basin ranges from 101% of average at Timothy Lake to 124% of average at Cougar Reservoir.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 113% to 132% of average. Overall, forecasts increased slightly from last month's report. Water managers in the basin should expect above normal to well above normal streamflows this summer.

Willamette Basin Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	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}	APR-JUN	230	295	325	133%	355	420	245
	APR-SEP	310	385	415	132%	450	520	315
Lookout Point Reservoir Inflow ^{1,2}	APR-JUN	595	765	845	130%	920	1090	650
	APR-SEP	790	975	1060	128%	1140	1330	825
McKenzie R bl Trail Bridge	APR-JUN	205	225	240	114%	255	270	210
	APR-SEP	345	370	390	113%	405	435	345
Cougar Lake Inflow ^{1,2}	APR-JUN	151	200	225	122%	245	295	185
	APR-SEP	198	255	280	119%	305	360	235
Blue Lake Inflow ^{1,2}	APR-JUN	54	83	96	120%	110	139	80
	APR-SEP	59	89	103	120%	117	147	86
McKenzie R nr Vida ^{1,2}	APR-JUN	710	885	960	116%	1040	1210	830
	APR-SEP	1070	1270	1360	114%	1450	1650	1190
Detroit Lake Inflow ^{1,2}	APR-JUN	410	525	580	123%	630	745	470
	APR-SEP	565	695	750	123%	805	935	610
North Santiam R at Mehama ^{1,2}	APR-JUN	560	745	830	125%	915	1100	665
	APR-SEP	740	945	1040	124%	1130	1330	840
Green Peter Lake Inflow ^{1,2}	APR-JUN	175	270	315	119%	360	455	265
	APR-SEP	205	305	350	119%	395	495	295
Foster Lake Inflow ^{1,2}	APR-JUN	330	510	590	118%	675	855	500
	APR-SEP	385	575	660	117%	745	935	565
South Santiam R at Waterloo ²	APR-JUN	410	540	625	119%	710	840	525
	APR-SEP	475	605	695	118%	785	915	590
Willamette R at Salem ^{1,2}	APR-JUN	2950	4250	4840	123%	5430	6730	3950
	APR-SEP	3760	5160	5800	123%	6430	7840	4730
Oak Grove Fk ab Powerplant	APR-JUL	113	127	137	119%	146	161	115
	APR-SEP	150	168	181	117%	193	210	155
Clackamas R ab Three Lynx	APR-JUL	420	485	525	117%	570	630	450
	APR-SEP	510	575	620	116%	665	730	535
Clackamas R at Estacada	APR-JUL	555	660	730	117%	800	905	625
	APR-SEP	660	770	845	116%	920	1030	730

* 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 April 1, 2017

Reservoir Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Useable Capacity (KAF)
Blue River	59.5	56.3	56.4	106%	82.3
Cottage Grove	21.3	19.2	19.3	110%	31.8
Cougar	147.1	5.5	118.6	124%	174.9
Detroit	363.1	351.8	335.5	108%	426.8
Dorena	53.5	45.1	44.4	121%	72.1
Fall Creek	97.5	82.1	81.6	119%	116.0
Fern Ridge	83.4	79.5	73.1	114%	97.3
Foster	24.4	21.6	30.9	79%	46.2
Green Peter	347.2	336.7	332.6	104%	402.8
Hills Creek	241.9	225.0	205.6	118%	279.2
Lookout Point	340.5	335.3	296.7	115%	433.2
Timothy Lake	53.3	57.6	52.7	101%	63.6
Henry Hagg Lake	51.2	51.4	50.0	102%	53.3

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Clackamas Basin	11	125%	93%
McKenzie Basin	16	125%	106%
Middle Fork Willamette Basin	7	124%	103%
North Santiam Basin	4	197%	71%
South Santiam Basin	4	196%	70%

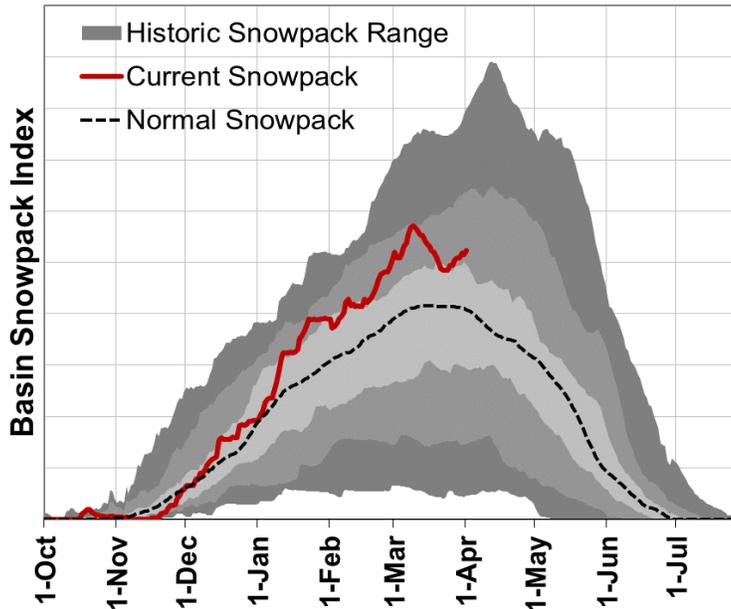
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Summit Lake SNOTEL	5610	1-Apr	111	50.0	43.9	37.1	135%
Irish Taylor SNOTEL	5540	1-Apr	97	38.7	36.1	37.2	104%
Cascade Summit SNOTEL	5100	1-Apr	92	35.9	32.4	31.0	116%
Roaring River SNOTEL	4950	1-Apr	71	33.8	26.6	26.0	130%
Holland Meadows SNOTEL	4930	1-Apr	55	26.5	18.5	21.1	126%
McKenzie SNOTEL	4770	1-Apr	94	40.8	34.2	37.4	109%
Bear Grass SNOTEL	4720	1-Apr	122	64.2	47.3		
Beaver Creek #2 Snow Course	4220	30-Mar	26	10.2		6.8	150%
Salt Creek Falls SNOTEL	4220	1-Apr	56	25.9	18.0	17.5	148%
Beaver Creek #1 Snow Course	4210	30-Mar	43	16.8		13.6	124%
Mud Ridge SNOTEL	4070	1-Apr	71	31.3	21.8	23.4	134%
Little Meadows SNOTEL	4020	1-Apr	85	43.2	25.4	23.3	185%
Clear Lake SNOTEL	3810	1-Apr	37	14.7	7.8	10.4	141%
Santiam Jct. SNOTEL	3740	1-Apr	34	15.8	4.5	9.8	161%
Daly Lake SNOTEL	3690	1-Apr	36	16.7	3.0	7.7	217%
Marys Peak (Rev.) Snow Course	3580	31-Mar	0	0.0	0.0		
Jump Off Joe SNOTEL	3520	1-Apr	30	11.8	2.5	7.8	151%
Peavine Ridge SNOTEL	3420	1-Apr	34	16.6	5.1	8.9	187%
Clackamas Lake SNOTEL	3400	1-Apr	30	12.8	6.7	8.6	149%
Smith Ridge SNOTEL	3270	1-Apr	2	1.1	0.0		
Saddle Mountain SNOTEL	3110	1-Apr	0	0.0	0.0		
Railroad Overpass SNOTEL	2680	1-Apr	0	0.0	0.0	0.0	
Marion Forks SNOTEL	2590	1-Apr	31	15.1	0.0	5.4	280%
Seine Creek SNOTEL	2060	1-Apr	0	0.0	0.0	0.0	
Miller Woods SNOTEL	420	1-Apr	0	0.0	0.0		



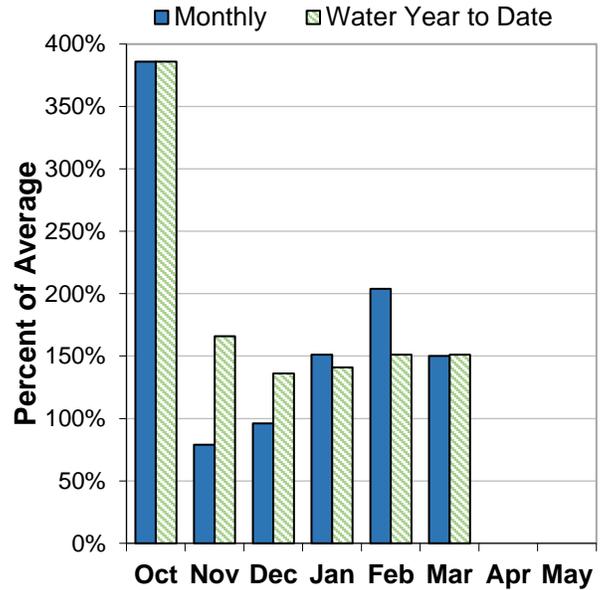
Rogue and Umpqua Basins

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, all but the highest elevation measurement sites (above ~6000 ft) have likely reached their seasonal snowpack peak as of April 1. In general, SNOTEL sites in the basin peaked around 90% to 150% of normal peak snowpack levels. As of April 1, the basin snowpack was 134% of normal. Conditions remain similar to last month when the snowpack was 134% of normal.

PRECIPITATION

March precipitation was 150% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 151% of average. Three SNOTEL sites set new records for the most October through March precipitation recorded since measurements began in 1980: Bigelow Camp (99.1"; 186% of average), Big Red (74.6"; 175% of average), and King Mountain (76.6"; 156% of average).

RESERVOIR

As of April 1, storage at major reservoirs in the basin ranges from 76% of average at Fourmile Lake to 130% of average at Howard Prairie Reservoir.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 127% to 200% of average. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect well above normal streamflows this summer.

Rogue And Umpqua Basins Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
South Umpqua R at Tiller	APR-JUL	205	260	295	153%	335	390	193
	APR-SEP	215	270	310	155%	345	400	200
Cow Ck ab Galesville Reservoir	APR-JUL	20	25	28	201%	31	36	13.9
	APR-SEP	22	26	30	200%	33	38	15.0
South Umpqua R nr Brockway	APR-JUL	455	585	675	173%	765	895	390
	APR-SEP	490	620	710	173%	800	935	410
North Umpqua R at Winchester	APR-JUL	845	995	1100	142%	1200	1350	775
	APR-SEP	995	1150	1250	140%	1360	1510	890
Lost Creek Lk Inflow ²	APR-JUL	570	630	670	129%	710	770	520
	APR-SEP	710	780	820	127%	865	930	645
Rogue R at Raygold ²	APR-JUL	735	845	920	136%	995	1110	675
	APR-SEP	890	1010	1090	135%	1170	1280	805
Rogue R at Grants Pass ²	APR-JUL	775	910	1000	138%	1100	1240	725
	APR-SEP	925	1070	1170	138%	1270	1410	845
Applegate Lake Inflow ²	APR-JUL	163	184	198	182%	210	235	109
	APR-SEP	173	194	210	183%	225	245	115
Sucker Ck bl Ltl Grayback nr Holland	APR-JUL	74	90	101	184%	111	127	55
	APR-SEP	80	96	107	181%	117	133	59
Illinois R nr Kerby	APR-JUL	215	280	325	173%	370	435	188
	APR-SEP	225	290	335	174%	380	445	193

* 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	46.2	49.2	44.0	105%	75.2
Emigrant Lake	37.0	35.9	33.6	110%	39.0
Fish Lake	4.7	4.2	5.2	91%	7.9
Fourmile Lake	5.7	5.0	7.5	76%	15.6
Howard Prairie	54.4	36.6	41.9	130%	62.1
Hyatt Prairie	10.0	9.5	12.1	83%	16.2
Lost Creek	277.2	266.8	266.7	104%	315.0

Rogue And Umpqua Basins Summary for April 1, 2017

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Applegate Basin	5	137%	101%
Middle Rogue Basin	8	147%	103%
North Umpqua Basin	9	175%	129%
South Umpqua Basin	10	261%	131%
Upper Rogue Basin	11	122%	111%

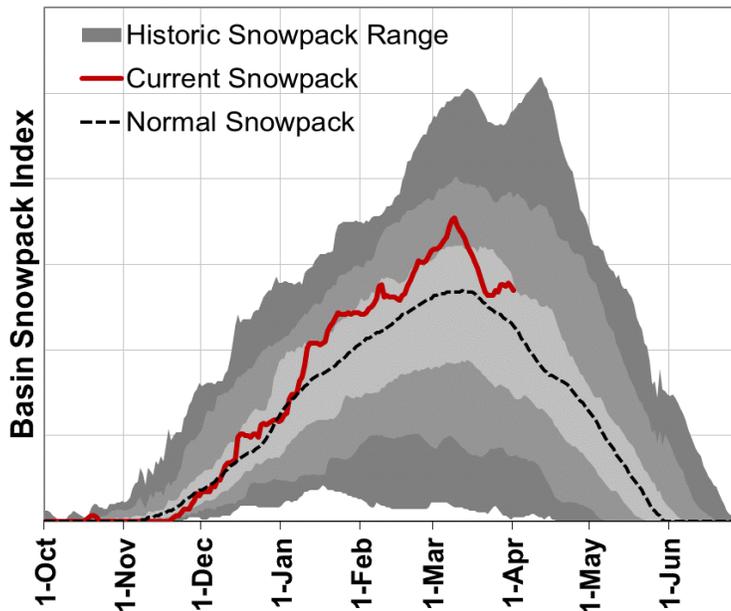
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Park H.Q. Rev Snow Course	6570	3-Apr	158	79.6	70.6	59.6	134%
Caliban (Alt.) Snow Course	6500	31-Mar	105	43.6	32.6	30.6	142%
Mt. Ashland Switchback Snow Course	6430	31-Mar	100	42.2	31.0	32.4	130%
Ski Bowl Road Snow Course	6070	31-Mar	70	27.8	25.2	23.6	118%
Big Red Mountain SNOTEL	6050	1-Apr	90	37.4	29.1	27.8	135%
Annie Springs SNOTEL	6010	1-Apr	120	57.0	47.5	41.0	139%
Fourmile Lake SNOTEL	5970	1-Apr	69	26.4	33.0	28.9	91%
Cold Springs Camp SNOTEL	5940	1-Apr	65	30.2	25.6	28.8	105%
Sevenmile Marsh SNOTEL	5700	1-Apr	86	38.3	32.7	31.8	120%
Summit Lake SNOTEL	5610	1-Apr	111	50.0	43.9	37.1	135%
Billie Creek Divide SNOTEL	5280	1-Apr	51	23.1	26.1	21.2	109%
Diamond Lake SNOTEL	5280	1-Apr	39	20.1	14.6	10.2	197%
Bigelow Camp SNOTEL	5130	1-Apr	49	20.3	8.8	10.8	188%
Beaver Dam Creek Snow Course	5120	31-Mar	27	11.1	6.9	8.0	139%
King Mountain 1 Snow Course	4760	31-Mar	31	13.3	4.5	3.2	416%
Deadwood Junction Snow Course	4660	31-Mar	7	2.7	1.2	3.0	90%
Fish Lk. SNOTEL	4660	1-Apr	22	8.4	10.4	6.8	124%
Howard Prairie SNOTEL	4580	1-Apr	6	2.6	0.0		
Howard Prairie Snow Course	4580	31-Mar	7	2.7	1.1	4.2	64%
Siskiyou Summit Rev. 2 Snow Course	4560	31-Mar	20	8.0	3.0	3.4	235%
Red Butte 1 Snow Course	4460	30-Mar	46	20.3	9.2	7.2	282%
King Mountain SNOTEL	4340	1-Apr	7	3.2	0.0	0.5	640%
North Umpqua Snow Course	4200	4-Apr	28	10.3	8.1	5.4	191%
Red Butte 2 Snow Course	4050	30-Mar	0	0.0	0.0	1.0	0%
Trap Creek Snow Course	3830	31-Mar	36	13.8	8.5	4.5	307%
Silver Burn Snow Course	3680	3-Apr	32	13.8	11.8	7.5	184%
King Mountain 3 Snow Course	3680	31-Mar	0	0.0	0.0	0.0	
Red Butte 3 Snow Course	3500	30-Mar	0	0.0	0.0	0.0	
Toketee Airstrip SNOTEL	3240	1-Apr	0	0.0	0.0	0.0	
King Mountain 4 Snow Course	3050	31-Mar	0	0.0	0.0	0.0	
Red Butte 4 Snow Course	3000	30-Mar	0	0.0	0.0	0.0	



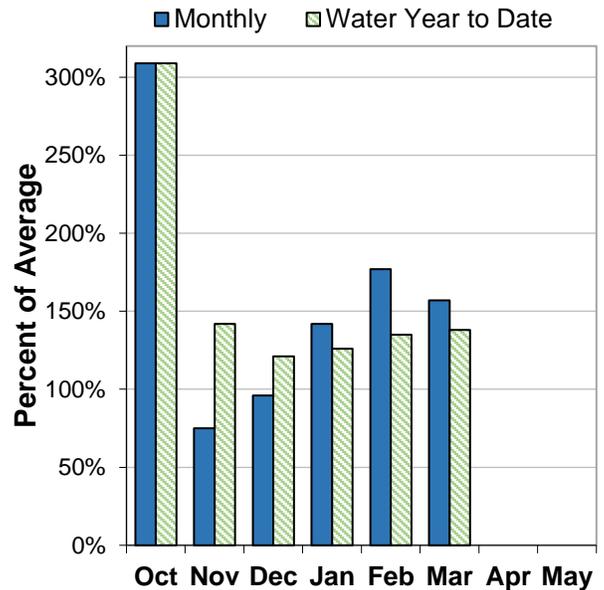
Klamath Basin

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, almost all measurement sites have likely reached their seasonal snowpack peak as of April 1. In general, SNOTEL sites in the basin peaked around 90% to 140% of normal peak snowpack levels. As of April 1, the basin snowpack was 124% of normal. This is slightly higher than last month when the snowpack was 119% of normal.

PRECIPITATION

March precipitation was 157% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 138% of average.

RESERVOIR

Reservoir storage across the basin is currently above average. As of April 1, storage at major reservoirs in the basin ranges from 102% of average at Clear Lake to 132% of average at Gerber Reservoir.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 127% to 146% of average. Overall, forecasts decreased significantly from last month's report. Water managers in the basin should expect well above normal streamflows this summer.

Klamath Basin Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Gerber Reservoir Inflow ²	APR-JUL	6.5	14.7	20	143%	26	34	14.0
	APR-SEP	6.9	15.1	21	146%	26	34	14.4
Sprague R nr Chiloquin	APR-JUL	215	245	260	138%	280	310	188
	APR-SEP	240	270	290	138%	310	335	210
Williamson R bl Sprague nr Chiloquin	APR-JUL	325	360	380	129%	405	440	295
	APR-SEP	390	425	450	127%	475	510	355
Upper Klamath Lake Inflow ^{1,2}	APR-JUL	410	480	515	129%	550	620	400
	APR-SEP	500	580	615	128%	650	730	480

* 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)
Clear Lake	250.3	122.6	245.0	102%	513.3
Gerber	82.5	48.4	62.5	132%	94.3
Upper Klamath Lake	464.8	479.7	424.5	109%	523.7

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Lost Basin	5	0%	0%
Sprague Basin	8	113%	96%
Upper Klamath Lake Basin	8	121%	112%
Williamson River Basin	5	145%	122%

Klamath Basin Summary for April 1, 2017

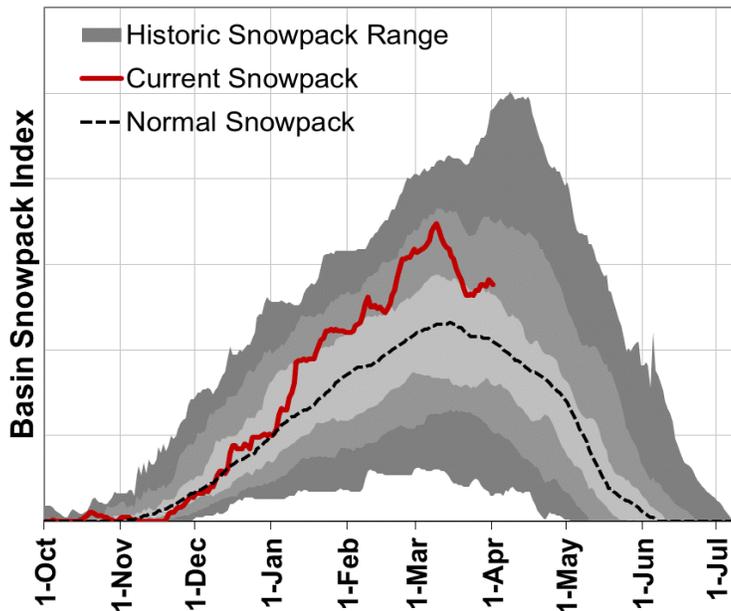
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Summer Rim SNOTEL	7080	1-Apr	39	15.5	19.1	16.4	95%
Swan Lake Mtn SNOTEL	6830	1-Apr	70	31.8	31.2		
Park H.Q. Rev Snow Course	6570	3-Apr	158	79.6	70.6	59.6	134%
Colvin Creek AM	6520	31-Mar	2	0.8	0.0	0.0	
Crazyman Flat SNOTEL	6180	1-Apr	42	17.7	16.6	13.1	135%
Ski Bowl Road Snow Course	6070	31-Mar	70	27.8	25.2	23.6	118%
Annie Springs SNOTEL	6010	1-Apr	120	57.0	47.5	41.0	139%
Finley Corral AM	6000	1-Apr	31	12.7	10.4	13.0	98%
Fourmile Lake SNOTEL	5970	1-Apr	69	26.4	33.0	28.9	91%
Cold Springs Camp SNOTEL	5940	1-Apr	65	30.2	25.6	28.8	105%
Strawberry SNOTEL	5770	1-Apr	0	0.0	0.0	1.2	0%
Cox Flat AM	5750	1-Apr	0	0.0	0.0	0.2	0%
Silver Creek SNOTEL	5740	1-Apr	24	10.4	5.0	7.2	144%
Quartz Mountain SNOTEL	5720	1-Apr	0	0.0	0.0	0.0	
Sevenmile Marsh SNOTEL	5700	1-Apr	86	38.3	32.7	31.8	120%
Sycan Flat AM	5580	31-Mar	0	0.0	0.0	0.4	0%
Sun Pass SNOTEL	5400	1-Apr	60	23.9	20.9		
Billie Creek Divide SNOTEL	5280	1-Apr	51	23.1	26.1	21.2	109%
Diamond Lake SNOTEL	5280	1-Apr	39	20.1	14.6	10.2	197%
Beaver Dam Creek Snow Course	5120	31-Mar	27	11.1	6.9	8.0	139%
Taylor Butte SNOTEL	5030	1-Apr	6	3.1	0.0	3.0	103%
Dog Hollow AM	4920	31-Mar	0	0.0	0.0	0.0	
Gerber Reservoir SNOTEL	4890	1-Apr	0	0.0	0.0	0.0	
Chemult Alternate SNOTEL	4850	1-Apr	22	9.3	9.0	2.5	372%
Deadwood Junction Snow Course	4660	31-Mar	7	2.7	1.2	3.0	90%
Fish Lk. SNOTEL	4660	1-Apr	22	8.4	10.4	6.8	124%
Howard Prairie SNOTEL	4580	1-Apr	6	2.6	0.0		
Howard Prairie Snow Course	4580	31-Mar	7	2.7	1.1	4.2	64%
Siskiyou Summit Rev. 2 Snow Course	4560	31-Mar	20	8.0	3.0	3.4	235%



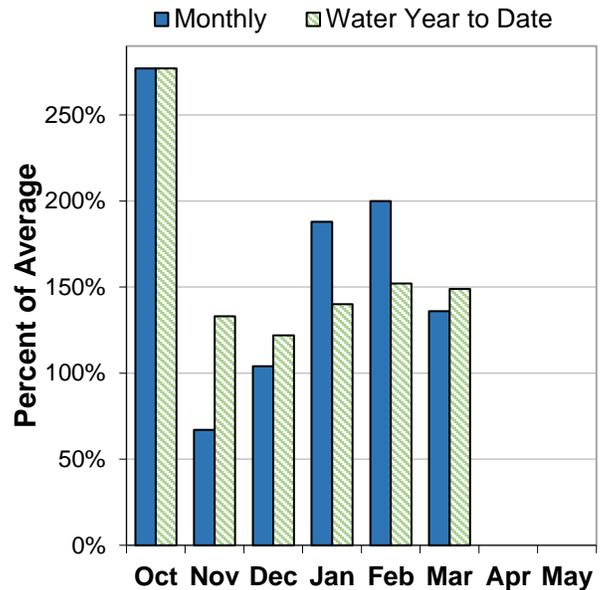
Lake County and Goose Lake Basins

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, all but the highest elevation measurement sites (above ~7300 ft) have likely reached their seasonal snowpack peak as of April 1. In general, SNOTEL sites in the basin peaked around 100% to 140% of normal peak snowpack levels. As of April 1, the basin snowpack was 130% of normal. While still well above normal, this is significantly lower than last month when the snowpack was 145% of normal.

PRECIPITATION

March precipitation was 136% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 149% of average.

RESERVOIR

Reservoir storage across the basin is currently well above average. As of April 1, storage at major reservoirs in the basin ranges from 150% of average at Drews Reservoir to 154% of average at Cottonwood Reservoir.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 151% to 184% of average. Overall, forecasts decreased slightly from last month's report. Water managers in the basin should expect well above normal streamflows this summer.

Lake County And Goose Lake Basins Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *

Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Twentymile Ck nr Adel	APR-JUL	17.2	24	28	165%	33	39	17.0
	APR-SEP	17.8	24	29	167%	33	40	17.4
Deep Ck ab Adel	APR-JUL	90	102	110	175%	119	131	63
	APR-SEP	92	105	113	174%	122	134	65
Honey Ck nr Plush	APR-JUL	19.4	23	26	186%	28	32	14.0
	APR-SEP	19.6	23	26	184%	28	32	14.1
Chewaucan R nr Paisley	APR-JUL	88	100	108	152%	116	128	71
	APR-SEP	93	105	113	151%	121	134	75

* 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)
Cottonwood	9.7	7.9	6.3	154%	9.3
Drews	62.9	42.9	42.0	150%	63.5

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Goose Lake Basin	8	131%	96%
Lake Abert Basin	7	108%	81%
Summer Lake Basin	13	130%	103%
Upper Pit Basin	3	138%	126%

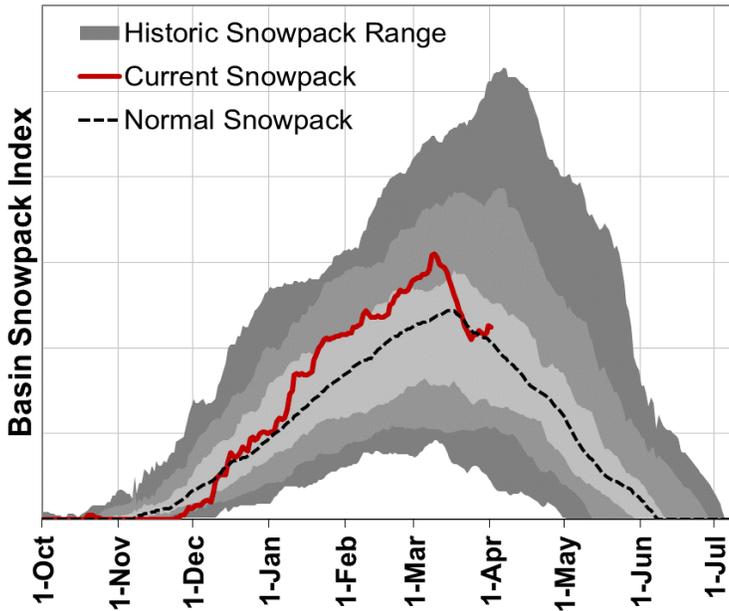
Basin Snowpack Measurement Sites	Elevation (ft)	Date Measured	Depth (in)	Snow Water Equivalent (in)			
				Current SWE	Last Yr SWE	Median	% of Median
Summer Rim SNOTEL	7080	1-Apr	39	15.5	19.1	16.4	95%
Patton Meadows AM	6800	1-Apr	40	16.4	14.7	16.0	103%
Sherman Valley AM	6640	1-Apr	36	14.8	6.3	13.0	114%
Bear Flat Meadow AM	6580	31-Mar	24	9.6	5.0	11.8	81%
Colvin Creek AM	6520	31-Mar	2	0.8	0.0	0.0	
Hart Mountain AM	6430	1-Apr	0	0.0	0.0	0.0	
Roger Meadow AM	6360	31-Mar	33	13.5	6.7	8.8	153%
Crazyman Flat SNOTEL	6180	1-Apr	42	17.7	16.6	13.1	135%
Finley Corrals AM	6000	1-Apr	31	12.7	10.4	13.0	98%
Camas Creek #3 Snow Course	5860	30-Mar	44	17.1	12.1	11.0	155%
Sheldon SCAN	5860	1-Apr	0	0.0	0.0	0.0	
Strawberry SNOTEL	5770	1-Apr	0	0.0	0.0	1.2	0%
Cox Flat AM	5750	1-Apr	0	0.0	0.0	0.2	0%
Silver Creek SNOTEL	5740	1-Apr	24	10.4	5.0	7.2	144%
Sycan Flat AM	5580	31-Mar	0	0.0	0.0	0.4	0%



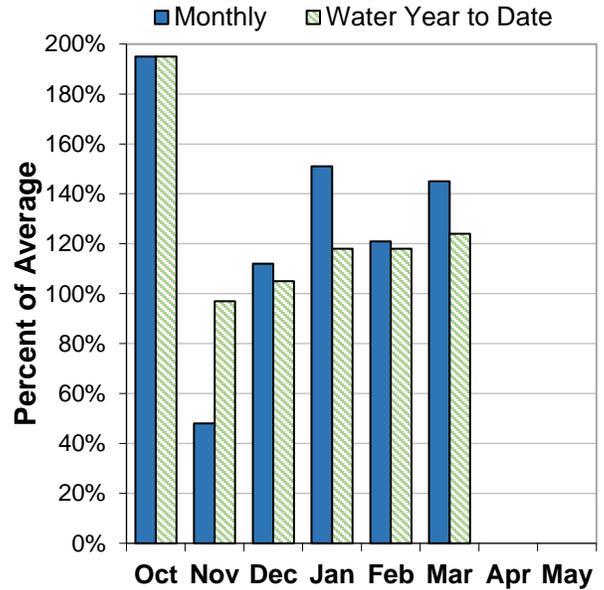
Harney Basin

April 1, 2017

Mountain Snowpack



Basin Precipitation



Summary of Water Supply Conditions

SNOWPACK

In this region, all but the highest elevation measurement sites (above ~7000 ft) have likely reached their seasonal snowpack peak as of April 1. In general, SNOTEL sites in the basin peaked around 110% to 150% of normal peak snowpack levels. As of April 1, the basin snowpack was 110% of normal. While still well above normal, this is significantly lower than last month when the snowpack was 126% of normal.

PRECIPITATION

March precipitation was 145% of average. Precipitation since the beginning of the water year (October 1 - April 1) has been 124% of average.

STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin range from 110% to 176% of average. Overall, forecasts remain similar to last month's report. Water managers in the basin should expect above normal to well above normal streamflows this summer.

Harney Basin Summary for April 1, 2017

Forecast Exceedance Probabilities for Risk Assessment *								
Streamflow Forecasts April 1, 2017	Forecast Period	←-----Drier-----Future Conditions-----Wetter-----→						Average (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Silvies R nr Burns	APR-JUL	100	134	157	176%	181	215	89
	APR-SEP	104	138	162	176%	185	220	92
Donner Und Blitzen R nr Frenchglen	APR-JUL	44	58	68	110%	78	93	62
	APR-SEP	49	64	75	110%	85	100	68
Trout Ck nr Denio	APR-JUL	5.4	8.4	10.4	137%	12.5	15.5	7.6
	APR-SEP	5.9	8.9	11.0	138%	13.1	16.1	8.0

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

Snowpack Summary by Basin	Basin Snowpack % of Median		
	# of Sites	Current Yr	Last Yr
Alvord Lake Basin	7	118%	107%
Donner und Blitzen River Basin	5	110%	105%
Silvies River Basin	4	99%	89%
Upper Quinn Basin	6	122%	98%

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-Apr	86	35.0	25.0	21.2	165%
Trout Creek AM	7890	1-Apr	29	12.2	15.0	12.7	96%
Fish Creek SNOTEL	7660	1-Apr	81	37.5	36.0	27.4	137%
Govt Corrals AM	7400	1-Apr	54	22.7	15.0	15.0	151%
Oregon Canyon AM	7050	31-Mar	3	1.2	0.0	3.0	40%
Silvies SNOTEL	6990	1-Apr	38	14.8	12.6	15.6	95%
Pueblo Summit AM	6970	31-Mar	2	0.4	0.0	0.0	
Buckskin Lower SNOTEL	6915	1-Apr	26	10.4	10.0	8.5	122%
V Lake AM	6600	1-Apr	0	0.0	1.5	4.9	0%
Louse Canyon AM	6530	31-Mar	4	1.6	0.0	3.2	50%
Disaster Peak SNOTEL	6500	1-Apr	0	0.0	0.0	1.9	0%
Hart Mountain AM	6430	1-Apr	0	0.0	0.0	0.0	
Quinn Ridge AM	6270	31-Mar	5	2.0	0.0	0.0	
Snow Mountain SNOTEL	6230	1-Apr	26	12.9	13.3	12.2	106%
Lamance Creek SNOTEL	6000	1-Apr	2	0.3	0.8	6.6	5%
Blue Mountain Spring SNOTEL	5870	1-Apr	43	16.0	16.4	15.9	101%
Sheldon SCAN	5860	1-Apr	0	0.0	0.0	0.0	
Buck Pasture AM	5740	1-Apr	1	0.4	0.0	0.0	
Call Meadows AM	5380	1-Apr	2	0.9	0.0	1.2	75%
Rock Springs SNOTEL	5290	1-Apr	0	0.0	0.0	0.9	0%
Starr Ridge SNOTEL	5250	1-Apr	0	0.0	0.0	0.0	
Lake Creek R.S. SNOTEL	5240	1-Apr	20	8.5	6.0	8.6	99%
Buckskin Lake AM	5190	1-Apr	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					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE</i> ----- <i>CHANCE OF EXCEEDING</i> ----- -----			<i>LONG-TERM AVERAGE VALUE</i>
		90%	50%	10%	
Owyhee R nr Rome	2000 cfs	Apr 13	May 4	Jun 1	May 6
Owyhee R nr Rome	1000 cfs	Apr 20	May 15	Jun 12	May 18
Owyhee R nr Rome	500 cfs	May 1	Jun 4	Jul 8	Jun 2

UPPER JOHN DAY BASIN					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE</i> ----- <i>CHANCE OF EXCEEDING</i> ----- -----			<i>LONG-TERM AVERAGE VALUE</i>
		90%	50%	10%	
John Day R at Service Creek	Average Daily Flow on Aug. 1st	158	370	575	271

UPPER DESCHUTES AND CROOKED BASINS					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE</i> ----- <i>CHANCE OF EXCEEDING</i> ----- -----			<i>LONG-TERM AVERAGE VALUE</i>
		90%	50%	10%	
Crane Prairie Inflow *	Date of Peak	May 7	May 23	Jun 8	May 25
Crane Prairie Inflow	Peak Flow	390	520	645	403
Crane Prairie Inflow	Average Daily Flow on Oct. 1st	310	345	380	269
Prineville Reservoir Inflow	150 cfs	May 22	Jun 12	Jul 3	May 30
Prineville Reservoir Inflow	80 cfs	May 28	Jun 18	Jul 9	June 7
Whychus Creek nr Sisters	100 cfs	Aug 12	Sep 6	Sep 26	August 16

ROGUE AND UMPQUA BASINS					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE</i> ----- <i>CHANCE OF EXCEEDING</i> ----- -----			<i>LONG-TERM AVERAGE VALUE</i>
		90%	50%	10%	
South Umpqua R nr Brockway *	90 cfs	Aug 12	Sep 1	Sep 16	August 8
South Umpqua R at Tiller	140 cfs	Jul 12	Aug 2	Aug 22	July 11
South Umpqua R at Tiller	90 cfs	Aug 2	Aug 22	Sep 11	August 1
South Umpqua R at Tiller	60 cfs	Aug 27	Sep 21	Oct 16	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</i> ----- <i>CHANCE OF EXCEEDING</i> ----- -----			<i>LONG-TERM AVERAGE VALUE</i>
		90%	50%	10%	
Deep Ck ab Adel	100 cfs	Jun 22	Jul 9	Jul 28	June 17
Honey Ck nr Plush	100 cfs	Apr 30	May 31	Jul 1	May 16
Honey Ck nr Plush	50 cfs	May 24	Jun 20	Jul 17	June 4
Twentymile Ck nr Adel	50 cfs	Jun 6	Jul 4	Aug 2	May 30
Twentymile Ck nr Adel	10 cfs	Jul 12	Aug 2	Aug 22	July 7

HARNEY BASIN					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE</i> ----- <i>CHANCE OF EXCEEDING</i> ----- -----			<i>LONG-TERM AVERAGE VALUE</i>
		90%	50%	10%	
Silvies R nr Burns	400 cfs	Apr 26	May 17	Jun 7	May 21
Silvies R nr Burns	200 cfs	May 10	Jun 2	Jun 25	June 2
Silvies R nr Burns	100 cfs	May 25	Jun 18	Jul 12	June 13
Silvies R nr Burns	50 cfs	Jun 16	Jul 12	Aug 7	July 3
Donner Und Blitzen R nr Frenchglen	200 cfs	Jun 3	Jun 22	Jul 11	June 20
Donner Und Blitzen R nr Frenchglen	100 cfs	Jun 26	Jul 12	Jul 28	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. Streamflow forecasts help users make risk-based decisions. Water 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. 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. AF stands for acre-feet. Forecasted volumes of water are typically in thousands of acre-feet.

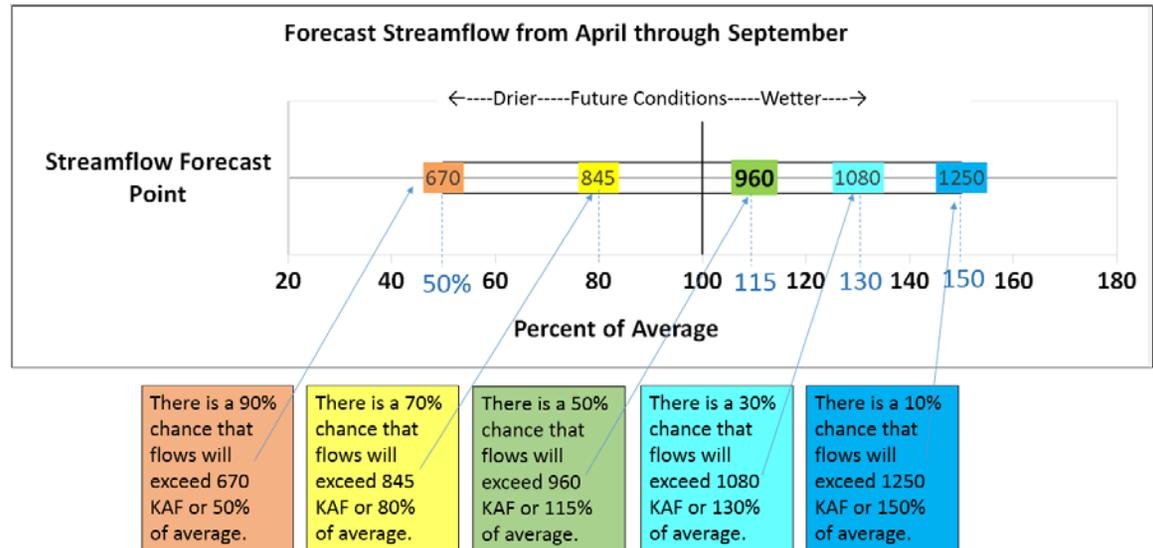
30-Year Average. The 30-year average streamflow for each forecast period is provided for comparison. The average is based on data from 1981-2010. The % AVG. column compares the 50% chance of exceedance forecast to the 30-year average streamflow; values above 100% denote when the 50% chance of exceedance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

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.

Graphical Representation of Streamflow Forecast Range:

This type of graphic is used in the state-wide streamflow forecast summary



Using the Forecasts - an Example

Using the 50 Percent Exceedance Forecast. Using the example forecasts shown here, there is a 50% chance that actual streamflow volume at Burnt River Hereford will be less than 41 KAF between April 1 and Sept 30. There is also a 50% chance that actual streamflow volume will be greater than 41 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 31 KAF (from the 70 percent exceedance forecast). There is a 30% chance of receiving less than 31 KAF.

Alternatively, if users determine the risk of using the 70 percent exceedance forecast is too great, then they might plan on receiving 17.4 KAF (from the 90 percent exceedance forecast). There is 10% chance of receiving less than 17.4 KAF.

Grande Ronde, Powder, Burnt And Innaha Basins Summary for January 1, 2017

		Forecast Exceedance Probabilities for Risk Assessment *						
Streamflow Forecasts January 1, 2017		←-----Drier-----Future Conditions-----Wetter-----→						
Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	Average (KAF)	
Burnt River Hereford	FEB-JUL	32	48	59	116%	70	86	51
	APR-SEP	17.4	31	41	117%	50	64	35

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 50 KAF (from the 30 percent exceedance forecast). There is a 30% chance of receiving more than 50 KAF.

Alternatively, if users determine the risk of using the 30 percent exceedance forecast is too great, then they might plan on receiving 64 KAF (from the 10 percent exceedance forecast). There is a 10% chance of receiving more than 64 KAF.

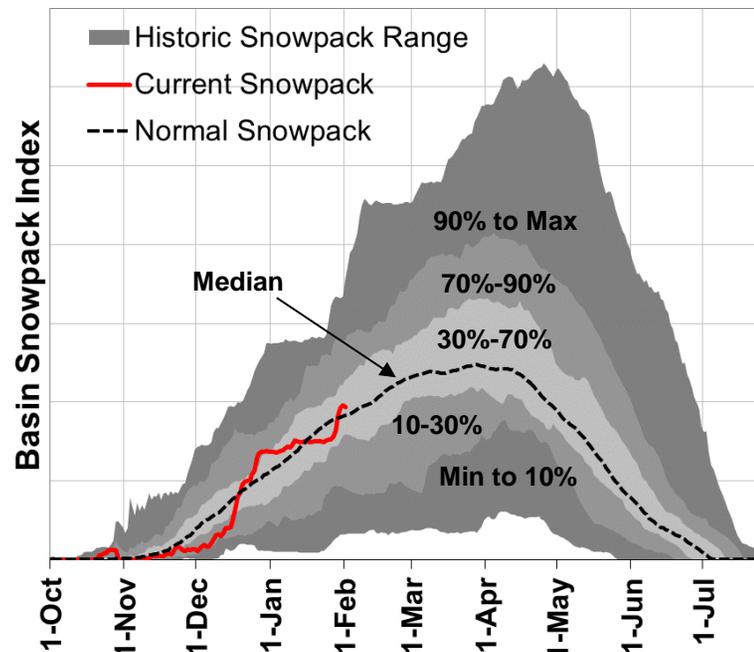
Interpreting Snowpack Plots

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).

Mountain Snowpack



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Official Business



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<http://www.or.nrcs.usda.gov/snow>

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