United States
Department of
Agriculture

Natural Resources
Conservation
Service

Oregon
Basin Outlook Report

June 1, 2020

Lake Creek RS SNOTEL in the John Day Basin during annual maintenance on May 27th, 2020
(Photo: Zoe Wellschlager, Snow Survey Staff)

May was exceptionally wet in many parts of the state, but temperatures remained mostly above freezing and snowmelt continued. Some regions in the state melted out up to three weeks earlier than normal. The majority of SNOTEL sites in Oregon are now melted out, and the few sites with snow remaining are at high elevation and melting rapidly as summer approaches. Surface water supplies for the summer are still forecasted to be mostly below average across much of the state.

The NRCS Oregon Snow Survey staff began annual SNOTEL maintenance the week of May 25th in the snow-free John Day Basin where spring and summer-like conditions prevail (note the new vegetative growth in the photo).

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General Outlook

June 1st, 2020

SUMMARY

After a warm and dry April, the month of May brought significant precipitation to Oregon; most parts of the state received above average monthly precipitation. Several of the precipitation events were cold enough to drop snow, but any snow accumulation melted almost immediately, and for the most part the precipitation fell as rain, which further accelerated spring snowmelt runoff. SNOTEL sites in many locations melted out one to three weeks early. Despite above average precipitation, May streamflows were mostly below average, though the northeast corner of the state was the obvious exception to this. Heavy rains in the Blue and Wallowa Mountains and adjacent regions provided above average streamflows and regional flooding during May. This was markedly different from other, drier parts of the state. Summer streamflow forecasts for most of the state remain below average, with limited surface water supplies likely in many areas.

SNOWPACK

The rapid snowmelt of April continued into May, even with the return of precipitation-laden storms. May typically sees the majority of snowmelt at SNOTEL sites and this year was no exception; the only snow still remaining on June 1st was at higher elevations and was melting quickly, which is typical for this time of year.

PRECIPITATION

Overall, the state of Oregon received above average amounts of May precipitation, with a handful of exceptions in central and southern Oregon. Northeast and southwest Oregon received the most precipitation relative to average, with over 200% of average at some individual stations. The Umatilla, Walla Walla, and Willow Basins received the most precipitation relative to average, with 170%. Every basin was above 100% except for Lake County and Goose Lake Basins, which received 95% of average amounts of May precipitation.

Northeast Oregon, in particular the Umatilla, Grande Ronde, and John Day Basins and surrounding areas, received a high intensity rain event May 20-21 with single day precipitation totals as high as 3.5" (Lucky Strike SNOTEL). Regional flooding occurred primarily in the Umatilla and Grand Ronde watersheds and associated tributaries during the storm and in the days that followed.

Above average May precipitation helped boost the water year precipitation totals (since October 1st). The Grande Ronde, Powder, Burnt, and Imnaha Basins reached 100% of its usual water year precipitation, and as of June 1st most Oregon basins were between 75% and 99%. The lowest basins are still in southwestern Oregon in the Klamath Basin and Lake County and Goose Lake Basins, at 67% and 68% of average water year precipitation, respectively. Much of Oregon still remains in drought status, according to the U.S. Drought Monitor: https://droughtmonitor.unl.edu/.

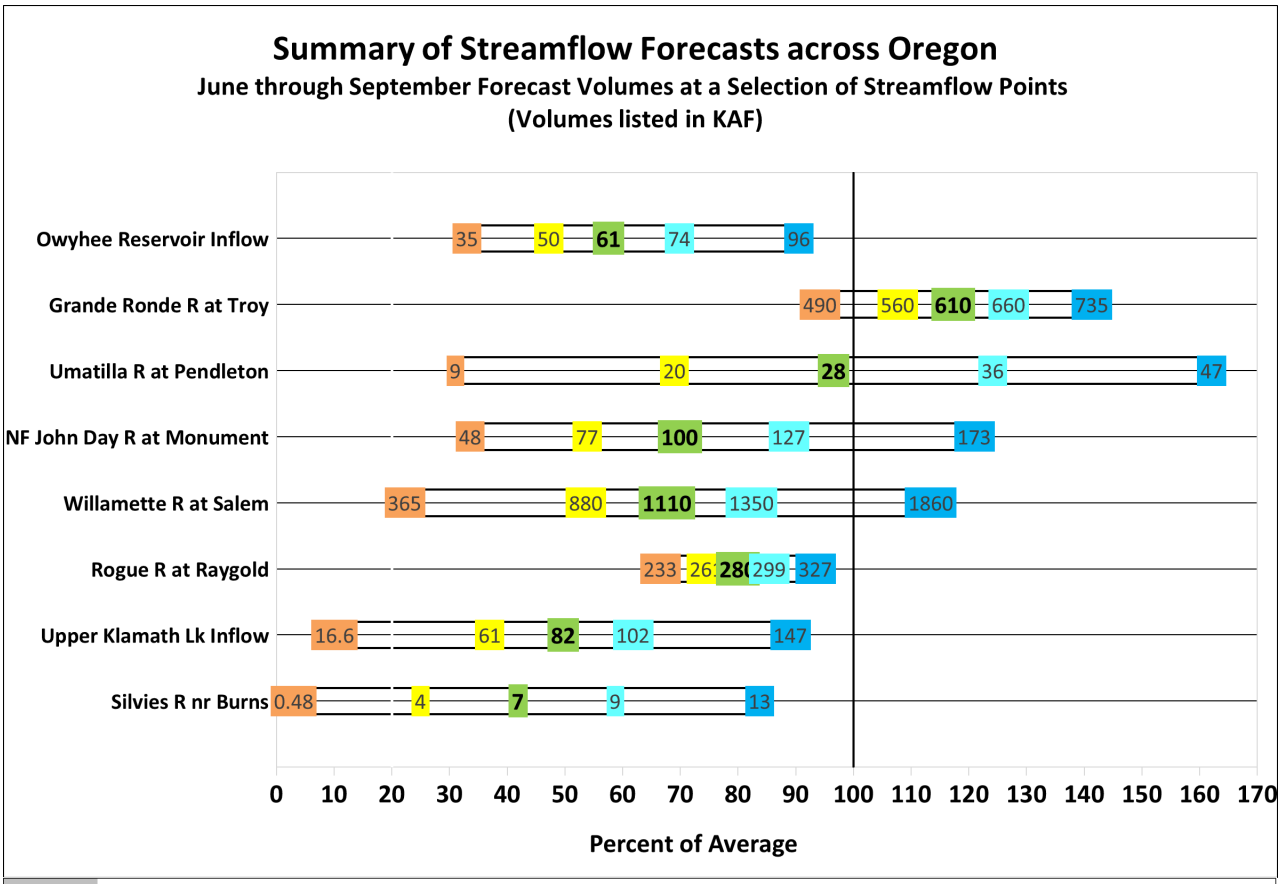
RESERVOIRS

On June 1st, reservoirs were storing varying amounts of water dependent upon the region. Reservoirs in northeast and eastern Oregon (the region that has received the most precipitation relative to average and the highest percent of normal snowpacks this year), stored the most water in reservoirs – roughly 100% to 110% of average; the highest basin wide storage value was in the Owyhee and Malheur Basins at 106% of average. Southern Oregon reservoirs stored the least, with most storing less than 75% of average amounts of water. Reservoirs in the Willamette Valley and foothills were mostly close to average, while the rest of the state had a mixture of below average to near average reservoir storage. As always, reservoir operators take many local and regional factors into account when deciding how much water to store or release.

STREAMFLOW

During the month of May, the majority of streamflows across the state had below average flow, with the exception of streams and rivers in the Grande Ronde and Umatilla Basins, which were above average and caused the flooding of some low-lying areas. The rest of the state had below average May streamflow, with values ranging from 13%-75% of average in central and southern Oregon basins, and 55%-100% of average in northwest Oregon.

Forecasts for summer streamflows are mostly below average, particularly in central and southern Oregon. In particular, the Klamath Basin and Lake County and Goose Lake Basins are forecast to be far below average with 43% of normal flows. Forecasted streamflows are higher in northeast Oregon, with expected values near average to above average.



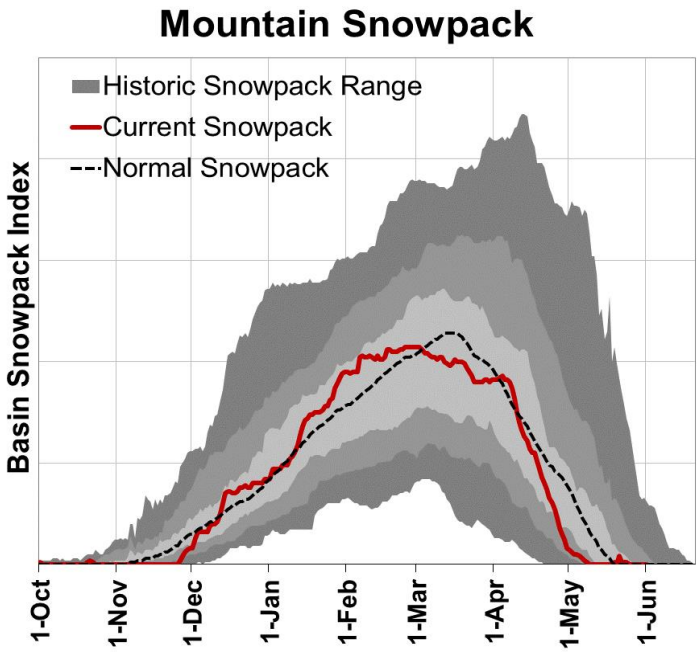
Legend:	←----------Drier----------**Future Conditions**----------Wetter----------→			
90% Exceedance Forecast (KAF) There is a 90% chance that flows will exceed this volume.	**70% Exceedance Forecast (KAF)** There is a 70% chance that flows will exceed this volume.	**50% Exceedance Forecast (KAF)** There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

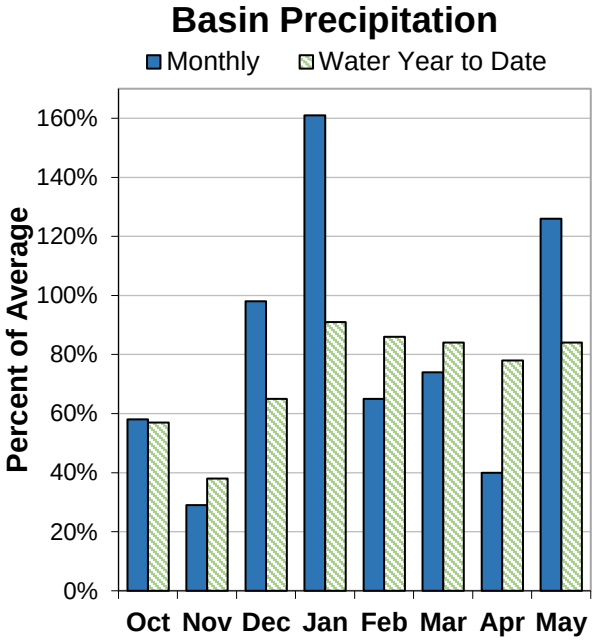
To accompany the forecast summary graphic above, here are some helpful reminders about interpreting streamflow forecasts published in this document. For each forecast point, five possible streamflow volumes are predicted. Where the observed streamflow occurs within this spectrum depends on the range 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. 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 above and explained in more detail at the end of this document.

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.

Owyhee and Malheur Basins

June 1, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, all snow measurement sites in the basin are snow-free, which is typical for this time of year. SNOTEL sites in the basin peaked around 60% to 90% of normal peak snowpack this winter.

PRECIPITATION

May precipitation was 126% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 84% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 90% of average at Bully Creek Reservoir to 108% of average at Lake Owyhee.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 44% to 82% of average. Overall, forecasts increased significantly from last month's report. Surface water supplies are expected to be below normal this summer.

Owyhee And Malheur Basins Summary for June 1, 2020

Streamflow Forecasts June 1, 2020	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment * ←--------Drier----------Future Conditions--------Wetter--------→ 90% (KAF)	70% (KAF)	50% (KAF)	50% % Avg	30% (KAF)	10% (KAF)	30-Year Average (KAF)
Owyhee R nr Rome	JUN-JUL	7.0	15.3	23	37%	32	48	63
	JUN-SEP	14.2	25	35	44%	45	64	80
Owyhee R bl Owyhee Dam[2]	JUN-JUL	15.5	27	36	47%	46	64	76
	JUN-SEP	35	50	61	58%	74	96	106
Malheur R nr Drewsey	JUN-JUL	1.46	3.3	5.1	47%	7.1	10.9	10.8
	JUN-SEP	1.91	4.1	6.0	48%	8.3	12.4	12.5
NF Malheur R at Beulah[2]	JUN-JUL	2.0	7.0	10.5	77%	13.9	18.9	13.7
	JUN-SEP	6.0	11.9	15.9	82%	19.9	26	19.5

* 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	47.2	58.9	46.7	101%	59.2
Bully Creek	20.8	23.5	23.2	90%	23.7
Lake Owyhee	576.5	701.6	536.2	108%	715.0
Warm Springs	128.8	168.4	122.4	105%	169.6

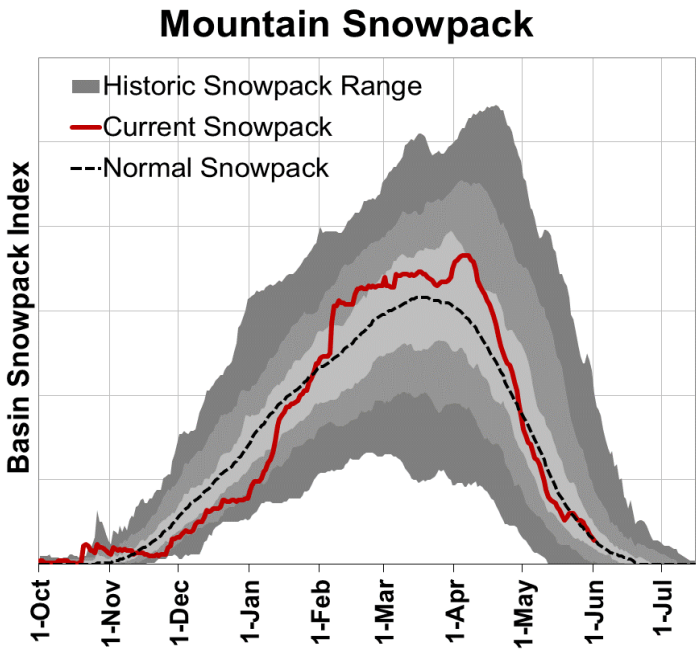
Snowpack Summary by Basin	# of Sites	Basin Snowpack % of Median Current Yr	Last Yr
East Little Owyhee Basin	2	0%	993%
South Fork Owyhee Basin	4		
Upper Malheur Basin	3		
Upper Owyhee Basin	5		

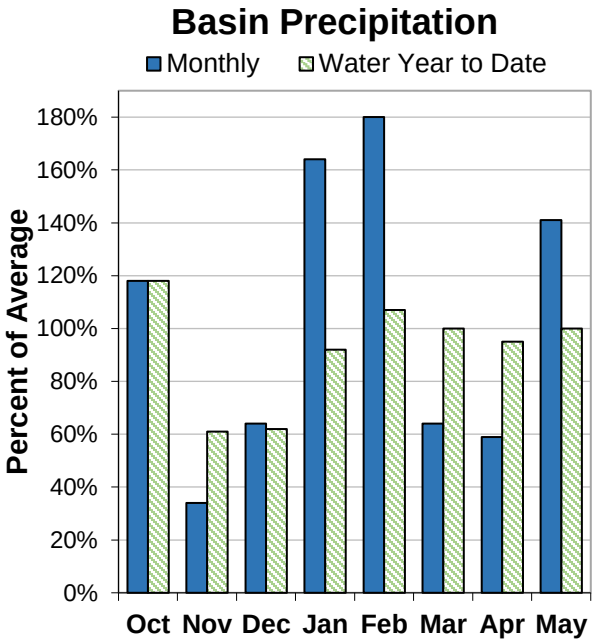
Owyhee And Malheur Basins Summary for June 1, 2020

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	14.9	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		
Jack Creek Upper SNOTEL	7250	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	
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	
Barney Creek (New) Snow Course	5830	1-Jun	0	0.0	0.0		
Mud Flat SNOTEL	5730	1-Jun	0	0.0	0.0	0.0	
Reynolds Creek SNOTEL	5600	1-Jun	0	0.0	0.0	0.0	
Call Meadows AM	5380	1-Jun	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, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, the basin snowpack was 101% of normal. This is higher than last month when the snowpack was 83% of normal. SNOTEL sites in the basin peaked around 80% to 140% of normal peak snowpack this winter.

PRECIPITATION

May precipitation was 141% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 100% of average. Some regional flooding occurred during and after the rain event on May 20-21.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 66% of average at Phillips Lake to 114% of average at Wolf Creek Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 50% to 119% of average. Overall, forecasts increased slightly from last month's report.

Grande Ronde, Powder, Burnt And Imnaha Basins Summary for June 1, 2020

		Forecast Exceedance Probabilities for Risk Assessment *						
		←--------Drier----------Future Conditions--------Wetter--------→						
Streamflow Forecasts June 1, 2020	**Forecast Period**	**90% (KAF)**	**70% (KAF)**	**50% (KAF)**	**50% % Avg**	**30% (KAF)**	**10% (KAF)**	**30-Year Average (KAF)**
Burnt R nr Hereford[2]	JUN-JUL	0.65	1.67	2.6	62%	3.8	5.9	4.2
	JUN-SEP	1.55	2.9	4.1	68%	5.5	8.0	6.0
Powder R nr Sumpter[2]	JUN-JUL	3.0	5.7	8.0	55%	10.7	15.4	14.5
	JUN-SEP	3.4	6.4	9.0	57%	12.0	17.2	15.8
Pine Ck nr Oxbow	JUN-JUL	11.1	20	26	50%	32	41	52
	JUN-SEP	13.4	23	29	50%	35	45	58
Imnaha R at Imnaha	JUN-JUL	57	71	81	74%	90	104	109
	JUN-SEP	72	87	98	75%	108	123	130
Catherine Ck nr Union	JUN-JUL	17.2	23	26	118%	30	36	22
	JUN-SEP	21	27	31	119%	35	40	26
Lostine R nr Lostine	JUN-JUL	52	59	64	94%	69	76	68
	JUN-SEP	58	66	71	93%	77	85	76
Bear Ck nr Wallowa	JUN-JUL	22	27	31	103%	34	40	30
	JUN-SEP	24	29	33	100%	37	42	33
Grande Ronde R at Troy	JUN-JUL	395	465	515	120%	565	635	430
	JUN-SEP	490	560	610	117%	660	735	520

* 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	38.6	48.0	58.7	66%	73.5
Thief Valley	15.0	14.3	13.6	110%	13.3
Unity	24.9	24.8	22.4	111%	25.5
Wallowa Lake		28.1	27.2		37.5
Wolf Creek	11.1	11.1	9.7	114%	11.1

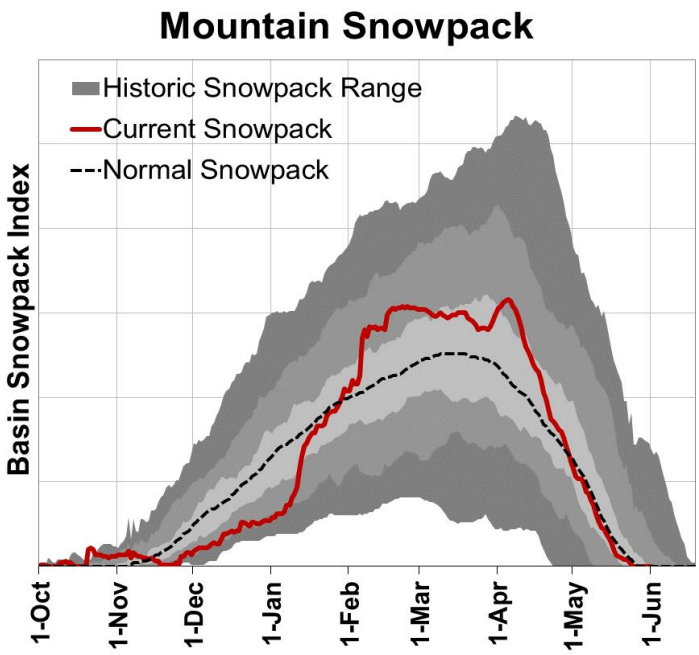
Snowpack Summary by Basin		**Basin Snowpack % of Median**	
	# of Sites	**Current Yr**	**Last Yr**
Burnt Basin	2		
Imnaha Basin	3	77%	131%
Lower Grande Ronde Basin	3		
Powder Basin	7		
Upper Grande Ronde Basin	7	2800%	3100%
Wallowa Basin	4	101%	153%

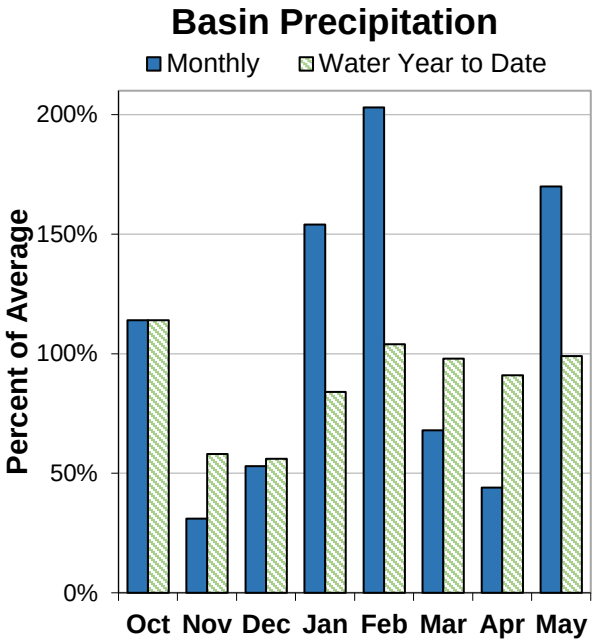
Grande Ronde, Powder, Burnt And Imnaha Basins Summary for June 1, 2020

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	3	2.3	9.4	6.0	38%
Aneroid Lake #2 SNOTEL	7400	1-Jun	38	15.3	19.5	16.8	91%
Anthony Lake (Rev) Snow Course	7160	1-Jun	12	6.0			
TV Ridge AM	7050	1-Jun	0	0.0	0.0		
Bald Mtn AM	6600	1-Jun	7	2.9	4.8		
Big Sheep AM	6230	1-Jun	0	0.0	3.8		
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	
Barney Creek (New) Snow Course	5830	1-Jun	0	0.0	0.0		
Moss Springs SNOTEL	5760	1-Jun	13	5.6	6.2	0.2	2800%
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	21	11.6	13.0		
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	
West Eagle Meadows AM	5500	1-Jun	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	0.9	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, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, all snow measurement sites in the basin are snow-free, with the exception of Milk Shakes SNOTEL. This winter, SNOTEL sites peaked around 90% to 130% of normal peak snowpack.

PRECIPITATION

May precipitation was 170% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 99% of average. Some regional flooding occurred during and after the rain event on May 20-21.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 59% of average at Cold Springs Reservoir to 114% of average at Mckay Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 59% to 103% of average. Overall, forecasts increased slightly from last month's report. Water managers in the basin should expect well below normal to near normal streamflows this spring and summer.

Umatilla, Walla Walla And Willow Basins Summary for June 1, 2020

		Forecast Exceedance Probabilities for Risk Assessment *						
		←--------Drier----------Future Conditions--------Wetter--------→						
Streamflow Forecasts June 1, 2020	**Forecast Period**	**90% (KAF)**	**70% (KAF)**	**50% (KAF)**	**50% % Avg**	**30% (KAF)**	**10% (KAF)**	**30-Year Average (KAF)**
SF Walla Walla R nr Milton-Freewater	JUN-JUL	13.3	15.9	17.7	97%	19.5	22	18.2
	JUN-SEP	25	28	30	97%	32	35	31
Umatilla R ab Meacham nr Gibbon	JUN-JUL	5.6	10.4	13.7	96%	17.0	22	14.2
	JUN-SEP	10.8	15.7	19.0	97%	22	27	19.6
Umatilla R at Pendleton	JUN-JUL	3.9	15.0	23	96%	30	41	24
	JUN-SEP	9.0	20	28	97%	36	47	29
McKay Ck nr Pilot Rock	JUN-JUL	0.62	2.2	3.8	100%	5.9	9.8	3.8
	JUN-SEP	0.77	2.4	4.1	103%	6.2	10.1	4.0
Butter Ck nr Pine City	JUN-JUL	0.40	0.91	1.39	74%	1.96	3.0	1.88
	JUN-SEP	0.60	1.21	1.73	75%	2.4	3.4	2.3
Willow Ck ab Willow Lk nr Heppner	JUN-JUL	0.11	0.50	0.92	59%	1.46	2.5	1.57
	JUN-SEP	0.16	0.58	1.01	59%	1.57	2.6	1.72
Rhea Ck nr Heppner	JUN-JUL	0.25	0.64	1.02	60%	1.48	2.3	1.69
	JUN-SEP	0.43	0.90	1.31	62%	1.80	2.7	2.1

* 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)**
Cold Springs	16.5	27.3	28.2	59%	38.6
Mckay	65.2	65.6	57.0	114%	71.5
Willow Creek	6.1	6.1	5.9	103%	9.8

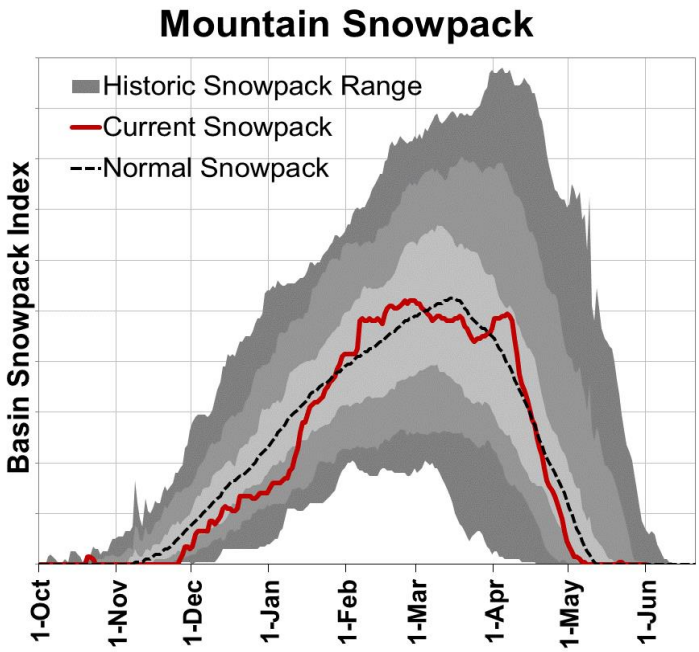
Snowpack Summary by Basin		**Basin Snowpack % of Median**	
	# of Sites	**Current Yr**	**Last Yr**
Umatilla Basin	5		
Walla Walla Basin	7		

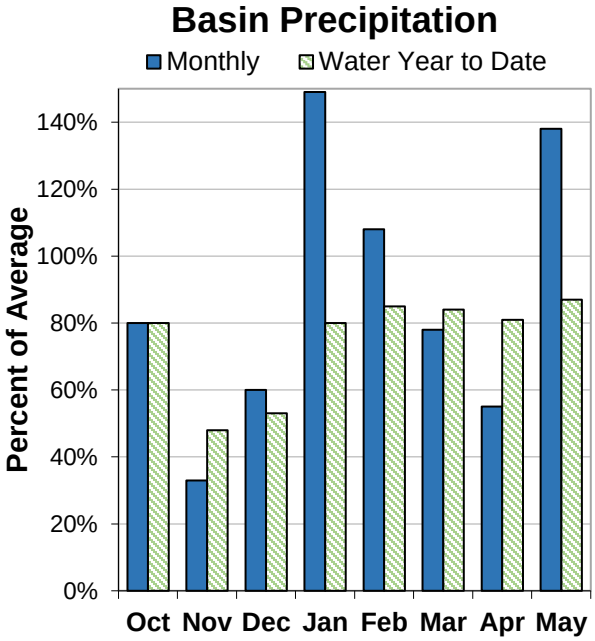
Umatilla, Walla Walla And Willow Basins Summary for June 1, 2020

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	21	11.6	13.0		
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, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, all snow measurement sites in the basin are snow-free, which is typical for this time of year. SNOTEL sites in the basin peaked around 70% to 120% of normal peak snowpack this winter.

PRECIPITATION

May precipitation was 138% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 87% of average.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 19% to 116% of average. Overall, forecasts increased slightly 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, 2020

Streamflow Forecasts June 1, 2020	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment * ←--------Drier----------Future Conditions--------Wetter--------→ 90% (KAF)	70% (KAF)	50% (KAF)	50% % Avg	30% (KAF)	10% (KAF)	30-Year Average (KAF)
Strawberry Ck nr Prairie City	JUN-JUL	1.53	2.6	3.4	74%	4.1	5.2	4.6
	JUN-SEP	1.84	3.0	3.8	73%	4.6	5.7	5.2
Mountain Ck nr Mitchell	JUN-JUL	0.01	0.07	0.16	18%	0.27	0.49	0.90
	JUN-SEP	0.02	0.10	0.19	19%	0.31	0.54	1.01
Camas Ck nr Ukiah	JUN-JUL	2.3	4.2	5.9	116%	7.7	11.0	5.1
	JUN-SEP	3.0	5.0	6.6	116%	8.5	11.7	5.7
MF John Day R at Ritter	JUN-JUL	5.5	10.5	14.8	53%	19.9	29	28
	JUN-SEP	7.9	13.6	18.3	57%	24	33	32
NF John Day R at Monument	JUN-JUL	38	65	87	69%	113	156	126
	JUN-SEP	48	77	100	70%	127	173	143

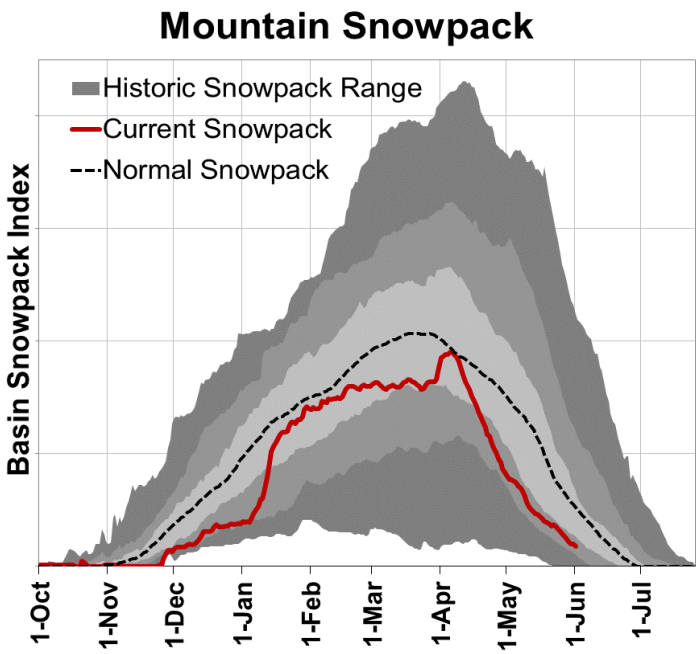
* 90%, 70%, 50%, 30% & 10% exceedance probabilities are the chance that observed streamflow volume will exceed the forecasted volume

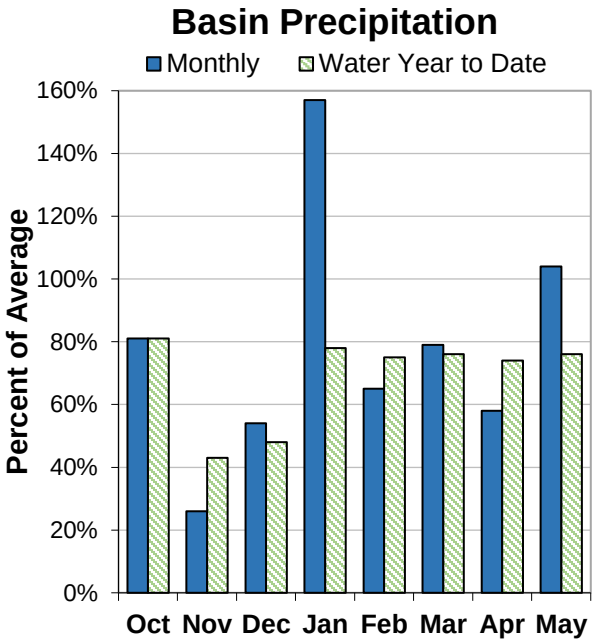
Snowpack Summary by Basin	# of Sites	Basin Snowpack % of Median Current Yr	Last Yr
Lower John Day Basin	3		
North Fork John Day Basin	7		
Upper John Day Basin	5		

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	1-Jun	12	6.0			
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	
Barney Creek (New) Snow Course	5830	1-Jun	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, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, the basin snowpack was 35% of normal. This is lower than last month when the snowpack was 58% of normal. As of June 1, all but two snow measurement sites in the basin are snow-free, which is fairly typical for this time of year. Irish Taylor SNOTEL and Summit Lake SNOTEL were still holding some snow on June 1. This winter, SNOTEL sites peaked around 50% to 90% of normal peak snowpack.

PRECIPITATION

May precipitation was 104% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 76% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 63% of average at Ochoco Reservoir to 110% of average at Crane Prairie Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 1% to 85% of average. Overall, forecasts decreased slightly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

Upper Deschutes And Crooked Basins Summary for June 1, 2020

		Forecast Exceedance Probabilities for Risk Assessment *						
		←--------Drier----------Future Conditions--------Wetter--------→						
Streamflow Forecasts June 1, 2020	**Forecast Period**	**90% (KAF)**	**70% (KAF)**	**50% (KAF)**	**50% % Avg**	**30% (KAF)**	**10% (KAF)**	**30-Year Average (KAF)**
Deschutes R bl Snow Ck	JUN-JUL	6.4	8.9	10.6	62%	12.3	14.8	17.2
	JUN-SEP	15.2	20	23	58%	27	31	40
Crane Prairie Reservoir Inflow[2]	JUN-JUL	12.6	16.5	19.2	64%	22	26	30
	JUN-SEP	27	34	40	65%	45	52	62
Crescent Lake Inflow[2]	JUN-JUL	0.25	0.84	1.43	23%	2.2	3.6	6.1
	JUN-SEP	0.09	0.73	1.51	18%	2.6	4.6	8.4
Little Deschutes R nr La Pine[2]	JUN-JUL	1.46	3.6	5.5	25%	7.9	12.2	22
	JUN-SEP	1.52	3.9	6.2	23%	9.1	14.2	27
Deschutes R at Benham Falls[2]	JUN-JUL	114	127	135	83%	144	156	163
	JUN-SEP	245	265	280	85%	295	315	330
Wychus Ck nr Sisters	JUN-JUL	11.4	14.2	16.1	73%	17.9	21	22
	JUN-SEP	18.8	22	25	74%	27	31	34
Prineville Reservoir Inflow[2]	JUN-JUL	0.00	0.00	0.24	3%	1.24	4.1	8.3
	JUN-SEP	0.00	0.00	0.11	1%	1.02	4.1	8.1
Ochoco Reservoir Inflow[2]	JUN-JUL	0.00	0.01	0.26	10%	0.84	2.3	2.7
	JUN-SEP	0.00	0.00	0.07	3%	0.46	1.63	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	47.0	47.6	42.8	110%	55.3
Crescent Lake	47.2	65.7	54.4	87%	86.9
Ochoco	21.9	38.4	34.6	63%	44.2
Prineville	101.4	148.8	140.5	72%	148.6
Wickiup	103.3	119.6	159.7	65%	200.0

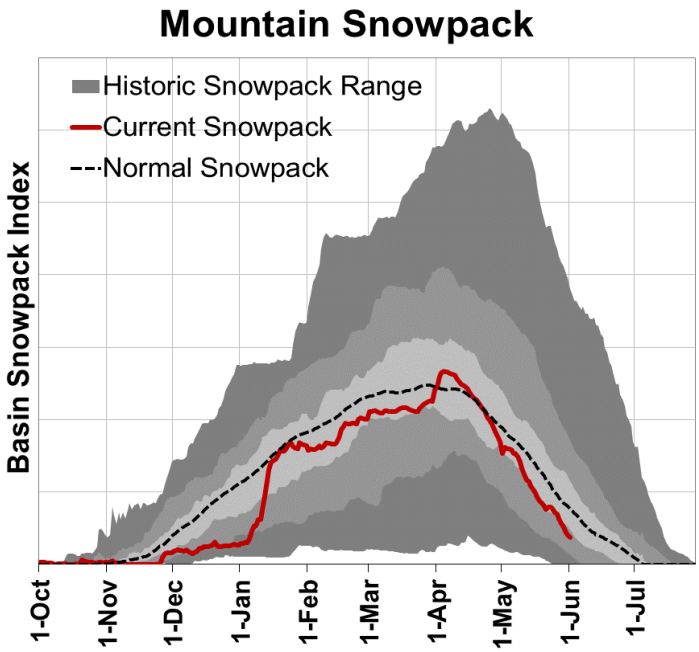
Snowpack Summary by Basin		**Basin Snowpack % of Median**	
	# of Sites	**Current Yr**	**Last Yr**
Little Deschutes Basin	4	55%	79%
Upper Crooked Basin	2		
Upper Deschutes Basin	9	35%	51%

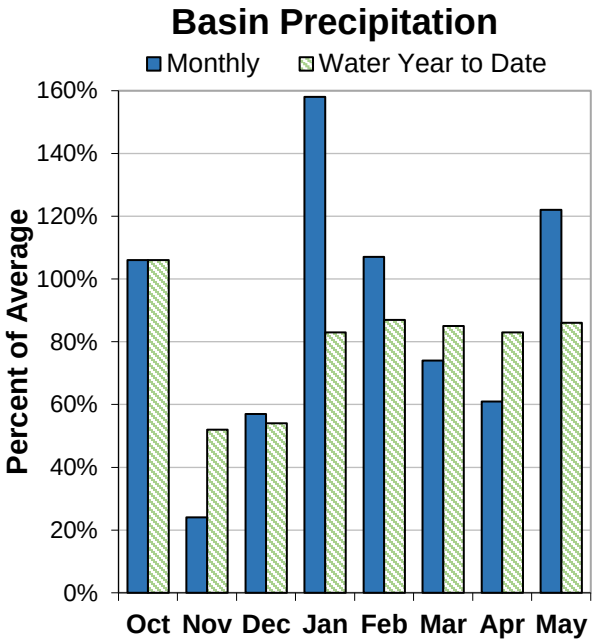
Upper Deschutes And Crooked Basins Summary for June 1, 2020

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	30	16.9	24.1	30.5	55%
Irish Taylor SNOTEL	5540	1-Jun	21	8.6	13.2	26.7	32%
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, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, the basin snowpack was 49% of normal. This is significantly lower than last month when the snowpack was 81% of normal. As of June 1, all but two snow measurement sites in the basin are snow-free, which is fairly typical for this time of year. Mt Hood Test Site SNOTEL and Red Hill SNOTEL were still holding some snow on June 1. This winter, SNOTEL sites peaked around 50% to 150% of normal peak snowpack.

PRECIPITATION

May precipitation was 122% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 86% of average.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 74% to 96% of average. Overall, forecasts remain similar to last month's report. Water managers in the basin should expect well below normal to near normal streamflows this spring and summer.

Hood, Sandy And Lower Deschutes Basins Summary for June 1, 2020

Streamflow Forecasts June 1, 2020	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment * ←--------Drier----------Future Conditions--------Wetter--------→ 90% (KAF)	70% (KAF)	50% (KAF)	50% % Avg	30% (KAF)	10% (KAF)	30-Year Average (KAF)
WF Hood R nr Dee	JUN-JUL	21	26	29	73%	32	37	40
	JUN-SEP	33	39	43	74%	47	53	58
Hood R at Tucker Bridge	JUN-JUL	47	55	60	75%	65	73	80
	JUN-SEP	71	82	90	75%	98	109	120
Sandy R nr Marmot	JUN-JUL	82	95	103	94%	112	124	110
	JUN-SEP	121	139	150	96%	162	179	157

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

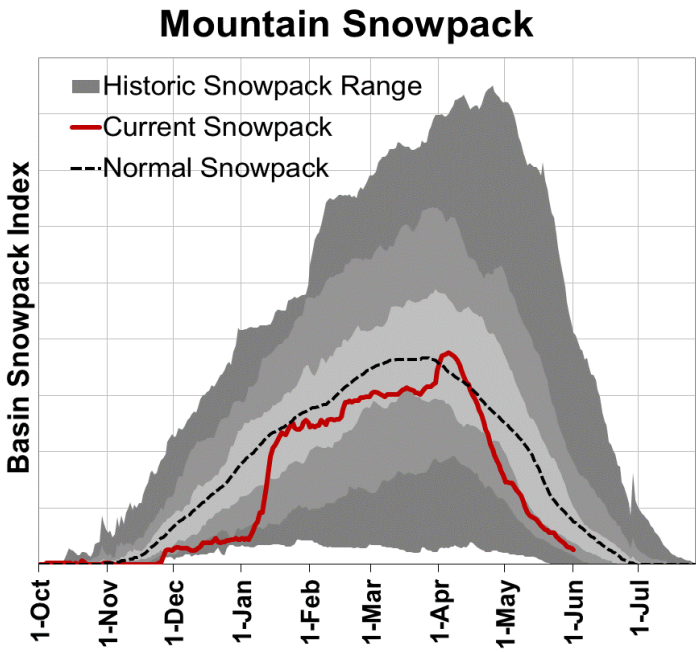
Reservoir Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Useable Capacity (KAF)
Clear Lake	2.4	4.0	6.5	37%	13.1

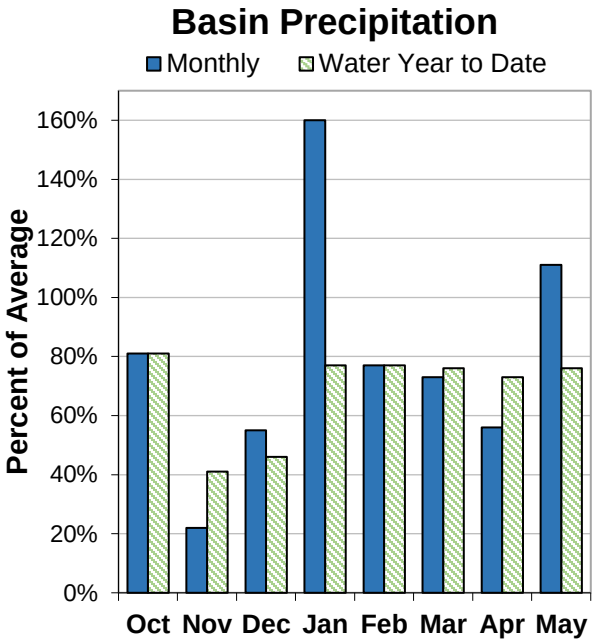
Snowpack Summary by Basin	# of Sites	Basin Snowpack % of Median Current Yr	Last Yr
Lower Columbia - Sandy Basin	7	49%	18%
Lower Deschutes Basin	4	39%	22%
Middle Columbia - Hood Basin	6	48%	19%

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	41	18.7	10.8	48.1	39%
Red Hill SNOTEL	4410	1-Jun	16	11.2	0.0	13.5	83%
Surprise Lakes SNOTEL	4290	1-Jun	14	7.6	3.9	16.9	45%
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, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, the basin snowpack was 35% of normal. This is lower than last month when the snowpack was 63% of normal. As of June 1, all but two snow measurement sites in the basin are snow-free, which is fairly typical for this time of year. Irish Taylor SNOTEL and Summit Lake SNOTEL were still holding some snow on June 1. This winter, SNOTEL sites peaked around 50% to 100% of normal peak snowpack.

PRECIPITATION

May precipitation was 111% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 76% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 73% of average at Fern Ridge Reservoir to 104% of average at Green Peter Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 68% to 94% of average. Overall, forecasts remain similar to last month's report. Water managers in the basin should expect well below normal to near normal streamflows this spring and summer.

Willamette Basin Summary for June 1, 2020

Streamflow Forecasts June 1, 2020	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment * ←--------Drier----------Future Conditions--------Wetter--------→ 90% (KAF)	70% (KAF)	50% (KAF)	50% % Avg	30% (KAF)	10% (KAF)	30-Year Average (KAF)
Hills Creek Reservoir Inflow[1,2]	JUN-SEP	64	86	96	74%	106	129	129
Lookout Point Reservoir Inflow[1,2]	JUN-SEP	151	220	250	76%	280	350	330
McKenzie R bl Trail Bridge	JUN-SEP	138	160	170	87%	180	200	195
Cougar Lake Inflow[1,2]	JUN-SEP	57	73	80	89%	87	103	90
Blue Lake Inflow[1,2]	JUN-SEP	1.59	11.5	16.0	81%	21	30	19.8
McKenzie R nr Vida[1,2]	JUN-SEP	415	465	490	86%	515	565	570
Detroit Lake Inflow[1,2]	JUN-SEP	138	198	225	87%	250	310	260
North Santiam R at Mehama[1,2]	JUN-SEP	135	230	275	82%	320	415	335
Green Peter Lake Inflow[1,2]	JUN-SEP	0.61	41	59	69%	77	117	85
Foster Lake Inflow[1,2]	JUN-SEP	2.6	78	113	69%	147	225	164
South Santiam R at Waterloo[2]	JUN-SEP	5.1	80	116	68%	152	230	171
Willamette R at Salem[1,2]	JUN-SEP	365	880	1110	68%	1350	1860	1640
Oak Grove Fk ab Powerplant	JUN-JUL	28	35	39	85%	43	50	46
	JUN-SEP	56	68	77	91%	85	97	85
Clackamas R ab Three Lynx	JUN-JUL	75	103	122	82%	141	169	148
	JUN-SEP	167	198	220	94%	240	270	235
Clackamas R at Estacada	JUN-JUL	85	133	166	81%	199	250	205
	JUN-SEP	197	250	285	90%	325	380	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, 2020

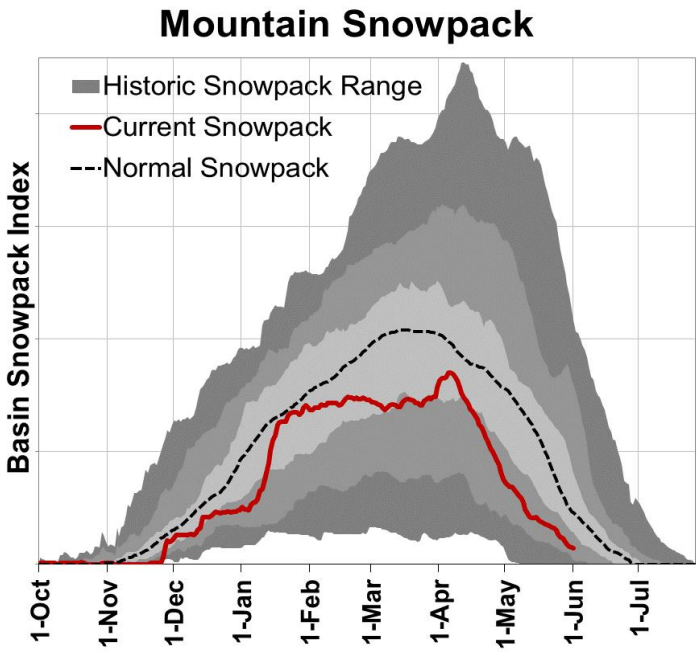
Reservoir Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	% of Average	Useable Capacity (KAF)
Blue River	80.8	70.8	78.6	103%	82.3
Cottage Grove	27.8	26.3	30.3	92%	31.8
Cougar	167.3	107.1	165.0	101%	174.9
Detroit	402.9	423.0	423.4	95%	426.8
Dorena	70.5	60.0	70.4	100%	72.1
Fall Creek	108.8	107.4	115.5	94%	116.0
Fern Ridge	66.5	96.5	91.5	73%	97.3
Foster	45.4	46.0	46.3	98%	46.2
Green Peter	396.6	350.6	381.2	104%	402.8
Hills Creek	239.2	256.2	268.3	89%	279.2
Lookout Point	395.0	384.3	396.8	100%	433.2
Timothy Lake			62.3		63.6
Henry Hagg Lake	51.6	52.9	52.5	98%	53.3

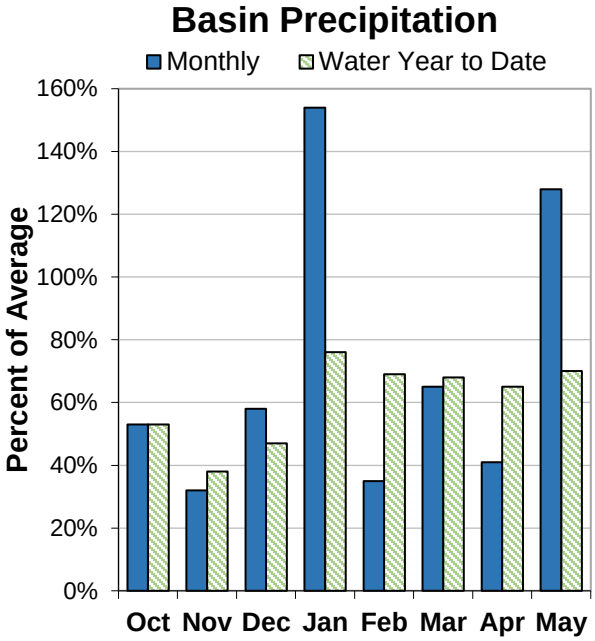
Snowpack Summary by Basin	# of Sites	Basin Snowpack % of Median	
		Current Yr	Last Yr
Clackamas Basin	9	49%	18%
McKenzie Basin	13	35%	51%
Middle Fork Willamette Basin	7	44%	65%
North Santiam Basin	4		
South Santiam Basin	4		

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	30	16.9	24.1	30.5	55%
Irish Taylor SNOTEL	5540	1-Jun	21	8.6	13.2	26.7	32%
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	1	0.3	0.3		
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, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, the basin snowpack was 31% of normal. This is lower than last month when the snowpack was 43% of normal. As of June 1, most snow measurement sites in the basin are snow-free, which is typical for this time of year.

PRECIPITATION

May precipitation was 128% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 70% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 32% of average at Howard Prairie Reservoir to 94% of average at Lost Creek Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 53% to 86% of average. Overall, forecasts increased slightly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

Rogue And Umpqua Basins Summary for June 1, 2020

		Forecast Exceedance Probabilities for Risk Assessment *						
		←--------Drier----------Future Conditions--------Wetter--------→						
Streamflow Forecasts June 1, 2020	**Forecast Period**	**90% (KAF)**	**70% (KAF)**	**50% (KAF)**	**50% % Avg**	**30% (KAF)**	**10% (KAF)**	**30-Year Average (KAF)**
South Umpqua R at Tiller	JUN-JUL	11.5	24	33	83%	42	55	40
	JUN-SEP	19.7	33	42	86%	51	64	49
Cow Ck ab Galesville Reservoir	JUN-JUL	0.40	1.35	2.0	67%	2.6	3.6	3.0
	JUN-SEP	1.07	2.2	2.9	69%	3.7	4.8	4.2
South Umpqua R nr Brockway	JUN-JUL	4.3	26	46	64%	66	95	72
	JUN-SEP	8.4	39	60	67%	81	112	90
North Umpqua R at Winchester	JUN-JUL	97	132	156	66%	179	215	235
	JUN-SEP	188	230	255	73%	280	320	350
Lost Creek Lk Inflow[2]	JUN-JUL	129	147	160	78%	173	191	205
	JUN-SEP	235	260	275	83%	290	315	330
Rogue R at Raygold[2]	JUN-JUL	129	150	165	75%	180	200	220
	JUN-SEP	235	260	280	80%	300	325	350
Rogue R at Grants Pass[2]	JUN-JUL	115	139	155	70%	171	195	220
	JUN-SEP	220	250	270	79%	290	320	340
Applegate Lake Inflow[2]	JUN-JUL	2.9	8.6	12.5	45%	16.4	22	28
	JUN-SEP	6.3	13.3	18.0	53%	23	30	34
Sucker Ck bl Ltl Grayback nr Holland	JUN-JUL	1.34	4.1	6.0	44%	7.9	10.7	13.6
	JUN-SEP	4.4	7.5	9.6	55%	11.7	14.8	17.6
Illinois R nr Kerby	JUN-JUL	1.92	5.9	15.0	47%	24	37	32
	JUN-SEP	1.52	10.6	20	53%	29	43	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	36.7	68.5	64.9	57%	75.2
Emigrant Lake	25.6	36.0	35.5	72%	39.0
Fish Lake	4.9	5.3	6.2	78%	7.9
Fourmile Lake	5.9	9.0	10.7	56%	15.6
Howard Prairie	15.5	33.0	48.3	32%	62.1
Hyatt Prairie	6.7	9.1	13.2	50%	16.2
Lost Creek	283.1	295.5	302.6	94%	315.0

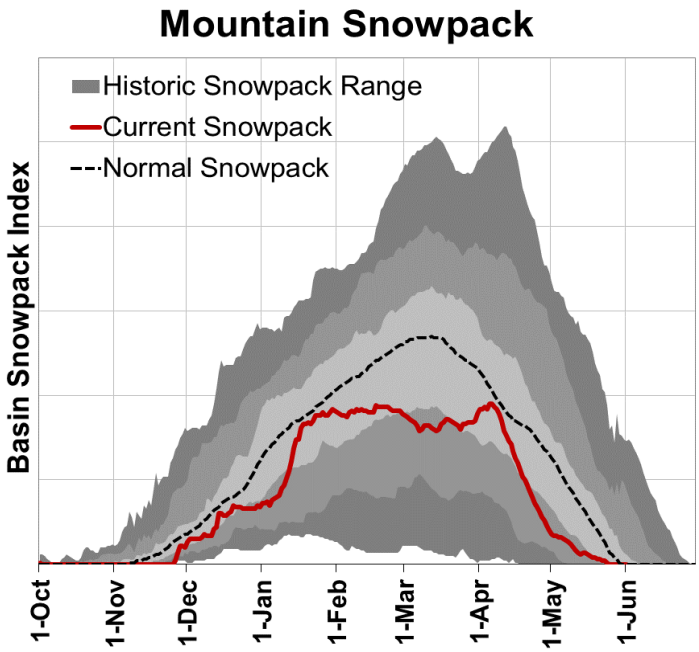
Rogue And Umpqua Basins Summary for June 1, 2020

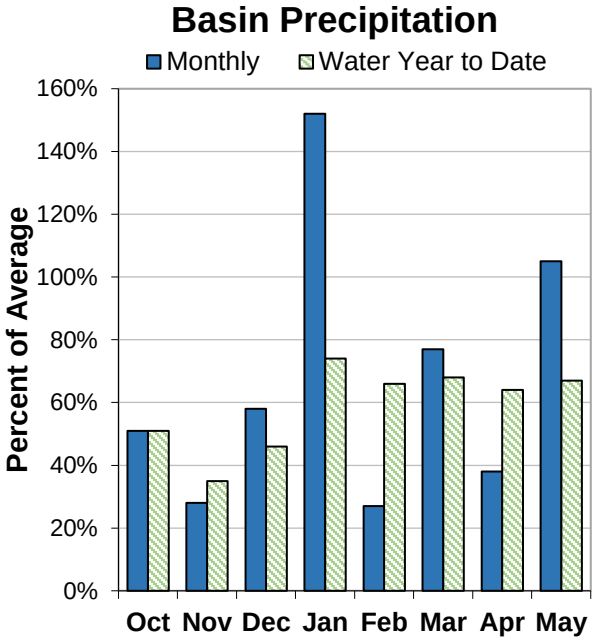
Snowpack Summary by Basin	# of Sites	Basin Snowpack % of Median Current Yr	Last Yr
Applegate Basin	2	0%	1100%
Middle Rogue Basin	1		
North Umpqua Basin	3	55%	79%
South Umpqua Basin	2		
Upper Rogue Basin	6	0%	48%

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	2.2	0.2	0%
Annie Springs SNOTEL	6010	1-Jun	0	0.0	10.9	24.0	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	
Sevenmile Marsh SNOTEL	5700	1-Jun	0	0.0	0.5	0.0	
Summit Lake SNOTEL	5610	1-Jun	30	16.9	24.1	30.5	55%
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	
Toketee Airstrip SNOTEL	3240	1-Jun	0	0.0	0.0	0.0	

Klamath Basin

June 1, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, the basin snowpack was 0% of normal. This is significantly lower than last month when the snowpack was 34% of normal. As of June 1, all snow measurement sites in the basin are snow-free, which is fairly typical for this time of year. SNOTEL sites peaked around 55% to 75% of normal peak snowpack this winter.

PRECIPITATION

May precipitation was 105% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 67% of average.

RESERVOIR

As of June 1, storage at major reservoirs in the basin ranges from 81% of average at Clear Lake to 96% of average at Gerber Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 7% to 68% of average. Overall, forecasts increased significantly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

Klamath Basin Summary for June 1, 2020

Streamflow Forecasts June 1, 2020	Forecast Period	←--------Drier----------Future Conditions--------Wetter--------→ 90% (KAF)	70% (KAF)	50% (KAF)	50% % Avg	30% (KAF)	10% (KAF)	30-Year Average (KAF)
		Forecast Exceedance Probabilities for Risk Assessment *						
Gerber Reservoir Inflow[2]	JUN-JUL	0.00	0.00	0.06	4%	0.35	1.20	1.43
	JUN-SEP	0.00	0.00	0.12	7%	0.54	1.72	1.78
Sprague R nr Chiloquin	JUN-SEP	11.6	26	35	48%	44	58	73
Williamson R bl Sprague nr Chiloquin	JUN-SEP	74	90	101	68%	112	128	149
Upper Klamath Lake Inflow[1,2]	JUN-SEP	16.6	61	82	50%	102	147	165

* 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	199.2	276.4	247.4	81%	513.3
Gerber	62.4	89.9	65.0	96%	94.3
Upper Klamath Lake	396.7	558.2	445.2	89%	523.7

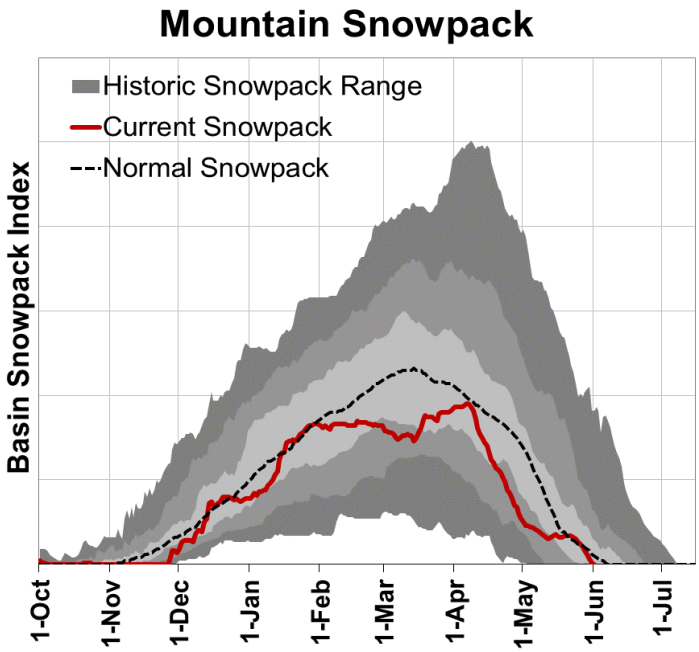
Snowpack Summary by Basin	# of Sites	Basin Snowpack % of Median Current Yr	Last Yr
Lost Basin	3		
Sprague Basin	4		
Upper Klamath Lake Basin	6	0%	48%
Williamson River Basin	4	0%	45%

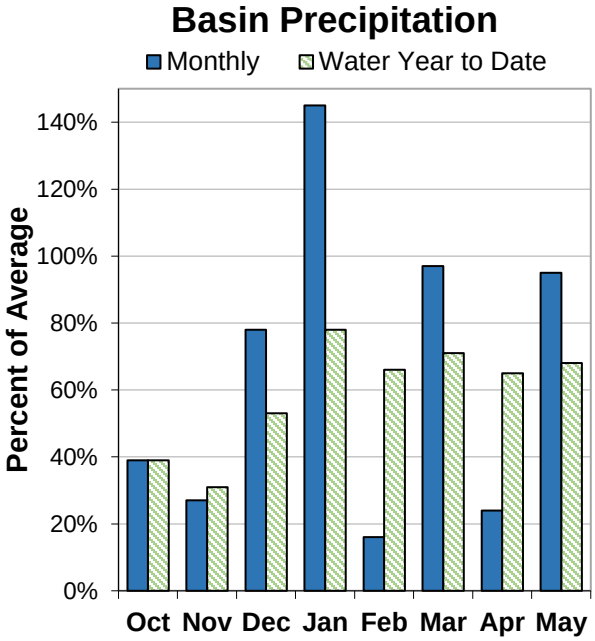
Klamath Basin Summary for June 1, 2020

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		
Crazyman Flat SNOTEL	6180	1-Jun	0	0.0	0.0	0.0	
Annie Springs SNOTEL	6010	1-Jun	0	0.0	10.9	24.0	0%
Finley Corrals AM	6000	1-Jun	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	
Cox Flat AM	5750	1-Jun	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	0.5	0.0	
State Line SNOTEL	5680	1-Jun	0	0.0	0.0		
Sun Pass SNOTEL	5400	1-Jun	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		

Lake County and Goose Lake Basins

June 1, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, the basin snowpack was 5% of normal. This is lower than last month when the snowpack was 30% of normal. As of June 1, all snow measurement sites in the basin are essentially snow-free, which is typical for this time of year. SNOTEL sites peaked around 40% to 100% of normal peak snowpack this winter.

PRECIPITATION

May precipitation was 95% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 68% of average.

RESERVOIR

Reservoir storage across the basin is currently below average. As of June 1, storage at major reservoirs in the basin ranges from 66% of average at Cottonwood Reservoir to 90% of average at Drews Reservoir.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 41% to 47% 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.

Lake County And Goose Lake Basins Summary for June 1, 2020

Streamflow Forecasts June 1, 2020	Forecast Period	←--------Drier----------Future Conditions--------Wetter--------→ 90% (KAF)	70% (KAF)	50% (KAF)	50% % Avg	30% (KAF)	10% (KAF)	30-Year Average (KAF)
		Forecast Exceedance Probabilities for Risk Assessment *						
Twentymile Ck nr Adel	JUN-JUL	0.15	0.68	1.50	39%	2.5	3.5	3.8
	JUN-SEP	0.26	0.87	1.90	44%	2.9	4.4	4.3
Deep Ck ab Adel	JUN-JUL	0.70	2.6	5.0	36%	7.3	10.8	13.9
	JUN-SEP	0.95	4.0	6.5	41%	9.0	12.7	15.8
Honey Ck nr Plush	JUN-JUL	0.08	0.39	0.90	35%	1.52	2.4	2.6
	JUN-SEP	0.08	0.45	1.10	41%	1.75	2.7	2.7
Chewaucan R nr Paisley	JUN-JUL	0.57	4.4	7.8	41%	11.2	16.2	19.0
	JUN-SEP	2.0	7.3	10.9	47%	14.4	19.7	23

* 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	4.7	8.6	7.0	66%	9.3
Drews	41.0	65.1	45.5	90%	63.5

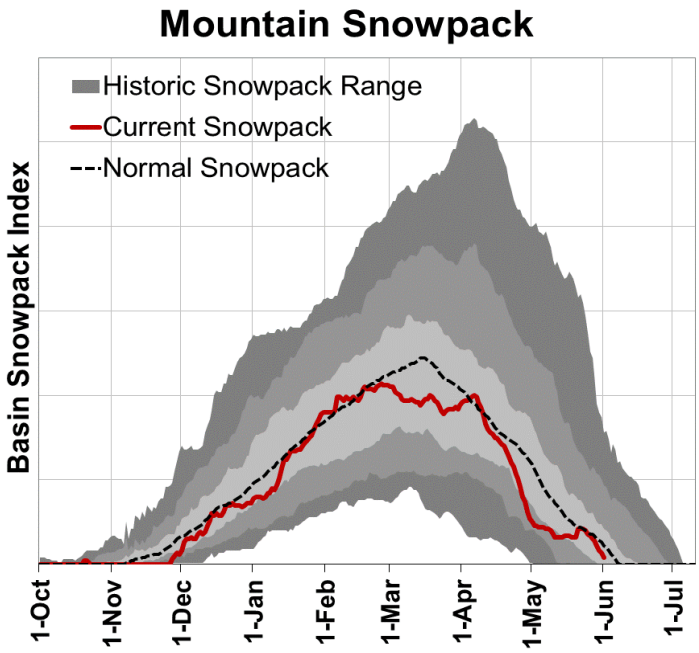
Snowpack Summary by Basin	# of Sites	Basin Snowpack % of Median Current Yr	Last Yr
Goose Lake Basin	2	5%	624%
Lake Abert Basin	1		
Summer Lake Basin	7	5%	624%
Upper Pit Basin	3		

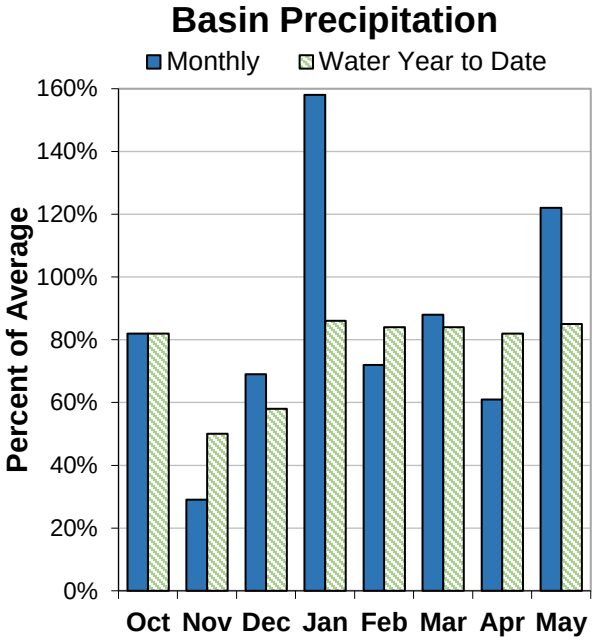
Lake County And Goose Lake Basins Summary for June 1, 2020

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	0	0.2	26.2	4.2	5%
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		
Bear Flat Meadow AM	6580	1-Jun	0	0.0	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	0.0		
Strawberry SNOTEL	5770	1-Jun	0	0.0	0.0	0.0	
Cox Flat AM	5750	1-Jun	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, 2020





Summary of Water Supply Conditions

SNOWPACK

As of June 1, the basin snowpack was 37% of normal. This is slightly lower than last month when the snowpack was 47% of normal. As of June 1, all but one snow measurement site in the basin are snow-free, which is typical for this time of year. This winter, SNOTEL sites peaked around 65% to 100% of normal peak snowpack.

PRECIPITATION

May precipitation was 122% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 85% of average.

STREAMFLOW FORECAST

The June through September streamflow forecasts in the basin range from 42% to 57% of average. Overall, forecasts remain similar to last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

Harney Basin Summary for June 1, 2020

Streamflow Forecasts June 1, 2020	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment * ←--------Drier----------Future Conditions--------Wetter--------→ 90% (KAF)	70% (KAF)	50% (KAF)	50% % Avg	30% (KAF)	10% (KAF)	30-Year Average (KAF)
Silvies R nr Burns	JUN-JUL	0.54	3.0	5.5	41%	8.0	11.7	13.5
	JUN-SEP	0.48	4.0	6.7	42%	9.4	13.4	16.0
Donner Und Blitzen R nr Frenchglen	JUN-JUL	5.6	9.9	12.9	54%	15.8	20	24
	JUN-SEP	8.7	13.7	17.1	57%	20	25	30
Trout Ck nr Denio	JUN-JUL	0.11	0.41	0.90	41%	1.39	2.1	2.2
	JUN-SEP	0.14	0.73	1.30	48%	1.87	2.7	2.7

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

Snowpack Summary by Basin	# of Sites	Basin Snowpack % of Median Current Yr	Last Yr
Alvord Lake Basin	1	37%	221%
Donner und Blitzen River Basin	2	37%	221%
Silvies River Basin	4		
Upper Quinn Basin	3	0%	993%

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	14.9	1.5	0%
Trout Creek AM	7890	1-Jun	0	0.0	0.0		
Fish Creek SNOTEL	7660	1-Jun	6	3.4	20.1	9.1	37%
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	
Call Meadows AM	5380	1-Jun	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	
Buckskin Lake AM	5190	1-Jun	0	0.0	0.0		

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.

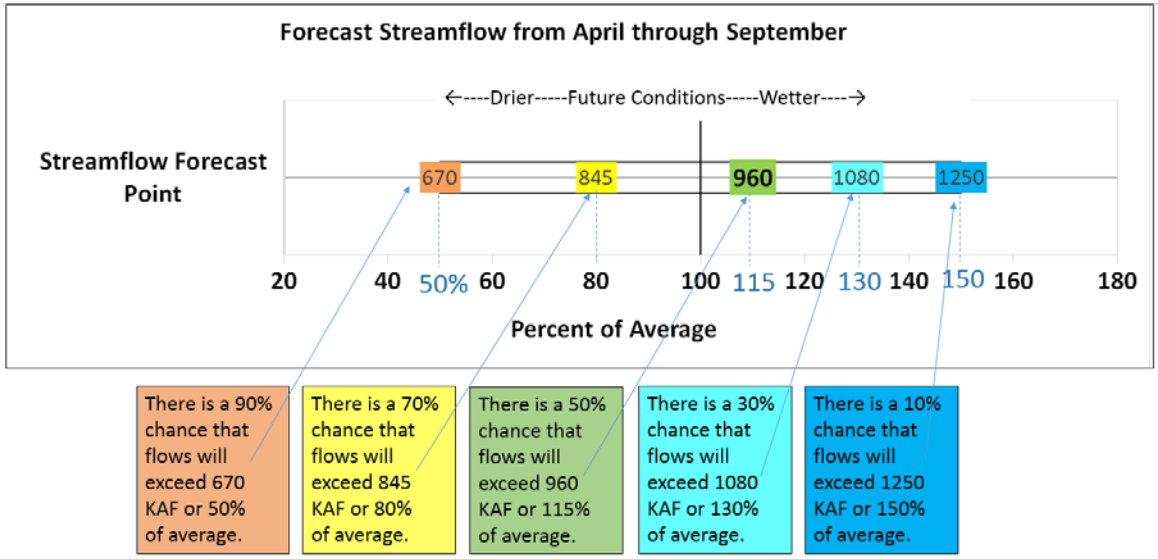
30-Year Average. The 30-year average streamflow for each forecast period is provided for comparison. The average is based on data from 1981-2010. The % AVG. column compares the 50% chance of exceedance forecast to the 30-year average streamflow; values above 100% denote when the 50% chance of exceedance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

<u>Graphical Representation of Streamflow Forecast Range:</u>

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 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.

JOHN DAY BASIN
Streamflow Forecasts - February 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	Future Conditions ======= 50% (1000AF)	(% AVG.)	======= Wetter =====>> 30% (1000AF)	10% (1000AF)	30-Yr Avg. (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

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

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.

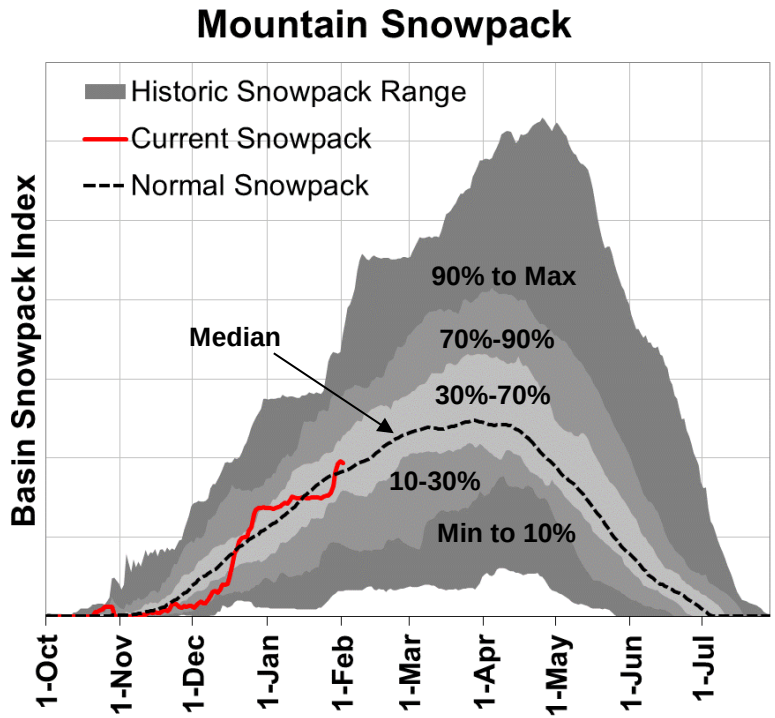
Alternatively, if users determine the risk of using the 30 percent exceedance forecast is too great, then they might plan on receiving 7.1 KAF (from the 10 percent exceedance forecast). There is a 10% chance of receiving more than 7.1 KAF.

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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