



United States  
Department of  
Agriculture



Natural Resources  
Conservation  
Service

# Oregon Basin Outlook Report

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June 1, 2013



**Spring Turns**

*Photo courtesy of Chris Garvey (NRCS Oregon)*

The cold, late May storm delivered over a foot of new snow to a handful of places in Oregon's northern mountain ranges. While this storm cycle brought smiles and fun for spring skiers, it could not repair the damage done by this past winter's snowpack deficit. Most of Oregon will have well below average streamflows this summer, and water users will need to brace for dry conditions and water supply shortages.

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# General Outlook

June 1, 2013

## SUMMARY

Most of Oregon's rivers are expected to have below average streamflows through summer's end. As of June 1, Klamath County is the only location in Oregon where Governor Kitzhaber has issued a drought declaration. However, conditions are dry elsewhere and water shortages are expected throughout most of the state. The latest Drought Monitor update includes southeastern Oregon in the severe drought category and the neighboring basins fall into the moderate category. The most current drought information can be found here:

<http://droughtmonitor.unl.edu/>.

The beginning of May brought warm and dry weather, which flushed out most of Oregon's meager snowpack that remained. Only nine Oregon SNOTEL sites still had snow on June 1. The higher elevation snowpack got a boost from a series of cool and wet Pacific storms arriving during the last half of May. The flurry of spring storms was "a day late and a dollar short", as the lack of normal precipitation from January through March will take its toll on this summer's water supplies.

## SNOWPACK

Nine Oregon SNOTEL sites were measuring snow on June 1. These few areas are located in the northeast mountains of the state, as well as the Mt. Hood area and along the Cascade crest. The Wallowa Mountains have a near normal June 1 snowpack, but the other regions with remaining snowpack are well below normal for this time of year, even with a foot of new snow at some sites.

The areas that still had snow as of June 1 were also the only places that maintained a near normal seasonal snowpack during this winter season. Most of Oregon's mountains started off with a decent snowpack built by the potent December storms, but sparse storms between January and March resulted in low snowpacks and below normal seasonal peaks. To add salt to the wound, April's warm streak and spring sunshine initiated early snowmelt, causing many locations to be snow-free a couple of weeks earlier than usual.

## PRECIPITATION

It seems as though the trend this year has been extended periods of sun followed by short bursts of strong storms. The month of May followed suit by bringing warm and sunny days during the first half of the month, then replacing it with heavy rain and some mountain snow during the last half. The last storm was strong enough for many parts of Oregon to receive average monthly precipitation with some exceptions. Once again, the Hood, Sandy and Lower Deschutes basins in northwestern Oregon had the wettest month at 139% of average. The Owyhee, Malheur, Grande Ronde, Burnt, Powder and Imnaha basins had about 75% of average precipitation in May; the lowest amounts in the state. The Klamath and Lake County basins received near average precipitation for the month, which was much welcomed in such a dry year. The Rogue, Umpqua and Deschutes basins experienced much more variability in precipitation. The valley locations in these basins received just over 50% of average amounts for the month (Bend 53%, Ashland 62% and Medford 53%), while the mountains mostly received average to well above average amounts.

Water year precipitation (Oct 1 to May 1) ranges from 80 to 105% of average for Oregon basins. October and December were exceptionally wet, which continue to keep these averages up. In such a low snowpack year, the wet fall and early winter precipitation do not have much bearing on summer water supplies.

## RESERVOIRS

The June 1 storage at 26 major Oregon reservoirs analyzed in this publication was 74 percent of average. As of June 1, water storage at these reservoirs totaled 1,799 thousand acre feet (kaf), representing 56 percent of useable capacity. Last year at this time, these same reservoirs stored 2,389 kaf of water, or 74 percent of useable capacity.

## STREAMFLOW

Now that most of the snow has melted, most snowmelt driven streams in Oregon have peaked for the season. Some of these streamflow peaks occurred earlier than usual during April, which caused the May streamflow volumes to drop below average. On the same notion, the June through September streamflow is expected to be below average for most rivers in the state. Water users that do not have the benefit of reservoir storage should plan for greatly reduced water supplies given the expected low summer streamflows.

Only the Sandy River in northwest Oregon and a few tributaries to the Willamette River such as the Clackamas, the South Santiam and Scoggins Creek are expected to have average or above average summer streamflow volumes.

A summary of streamflow forecasts for Oregon follows:

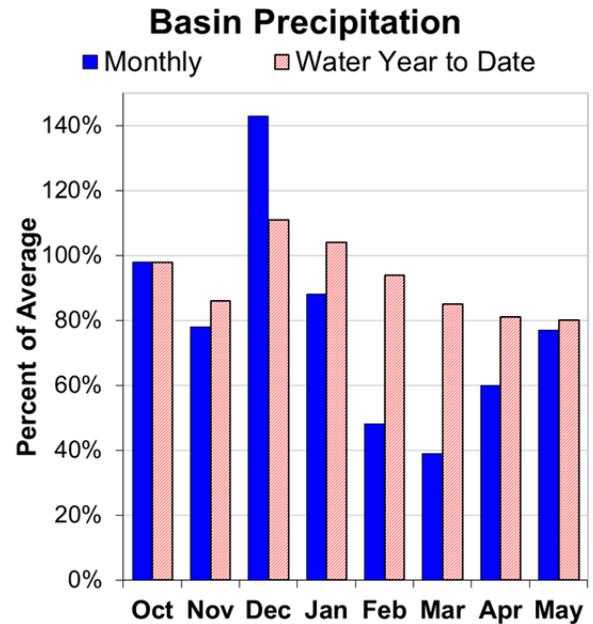
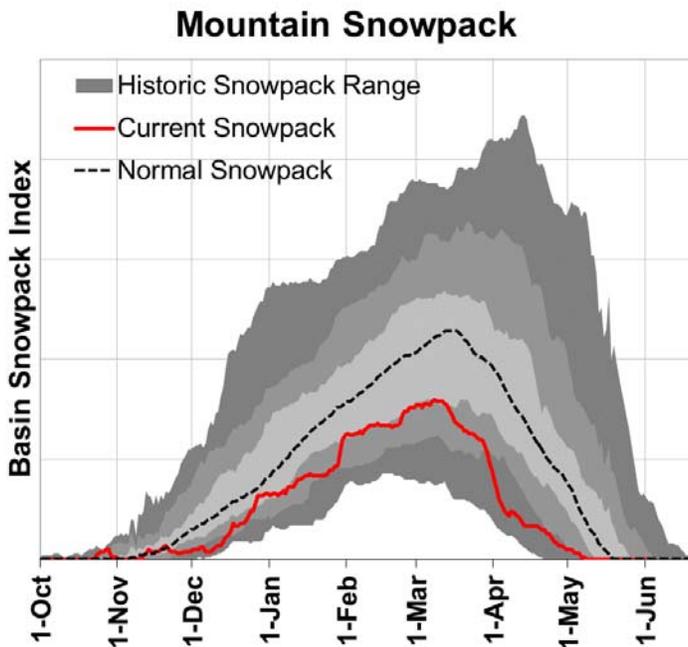
STREAM	Median Forecast (June through September)	
	Volume (Acre-Feet)	Percent of Average
Owyhee Reservoir Inflow	52,000	49
Grande Ronde R at Troy	445,000	86
Umatilla R at Pendleton	22,000	76
Deschutes R at Benham Falls	300,000	91
Willamette R at Salem	1,300,000	79
Rogue R at Raygold	275,000	79
Upper Klamath Lake Inflow	83,000	46
Silvies R nr Burns	4,500	28

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



# Owyhee and Malheur Basins

June 1, 2013



## Summary of Water Supply Conditions

### SNOWPACK

All SNOTEL sites in the basin were snow-free as of June 1, which is typical for a normal year. However, most SNOTEL sites in the basin peaked about 25 to 45% below normal peak snowpack levels this winter, and melted out earlier than normal.

### PRECIPITATION

May precipitation was 77% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 80% of average.

### RESERVOIR

Reservoir storage across the basin is currently well below average. As of June 1, storage at published reservoirs was 54% of average and 40% percent of capacity.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 32% to 49% of average. Water users in the basin can expect greatly reduced streamflows this summer. Most of the basin is currently designated by the US Drought Monitor to be in a severe drought condition.

For more information contact your local Natural Resources Conservation Service office:  
Ontario - (541) 889-7637

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

OWYHEE AND MALHEUR BASINS  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)		
		90%		70%		50%			30%	
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)		(1000AF)	(1000AF)
Malheur R nr Drewsey	JUN-JUL	1.1	2.4	3.5	28	4.8	7.2	12.7		
	JUN-SEP	1.9	3.5	4.9	32	6.5	9.3	15.4		
NF Malheur R at Beulah (2)	JUN-JUL	4.9	6.8	8.2	60	9.7	12.3	13.7		
Owyhee R nr Rome	JUN-JUL	5.0	6.1	17.4	28	29	45	63		
	JUN-SEP	10.0	15.2	28	35	41	60	80		
Owyhee R bl Owyhee Dam (2)	JUN-JUL	14.1	22	29	38	37	49	76		
	JUN-SEP	32	43	52	49	61	77	106		

OWYHEE AND MALHEUR BASINS  
Reservoir Storage (1000 AF) - End of May

OWYHEE AND MALHEUR BASINS  
Watershed Snowpack Analysis - June 1, 2013

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
BEULAH RES	60.0	29.3	53.6	46.7	Owyhee	7	0	0
BULLY CREEK	30.0	12.5	18.7	23.2	Upper Malheur	3	0	0
OWYHEE	715.0	287.5	565.6	536.2	Jordan Creek	2	0	0
WARMSPRINGS	191.0	66.5	146.5	122.4	Bully Creek	0	0	0
					Willow Creek	0	0	0

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

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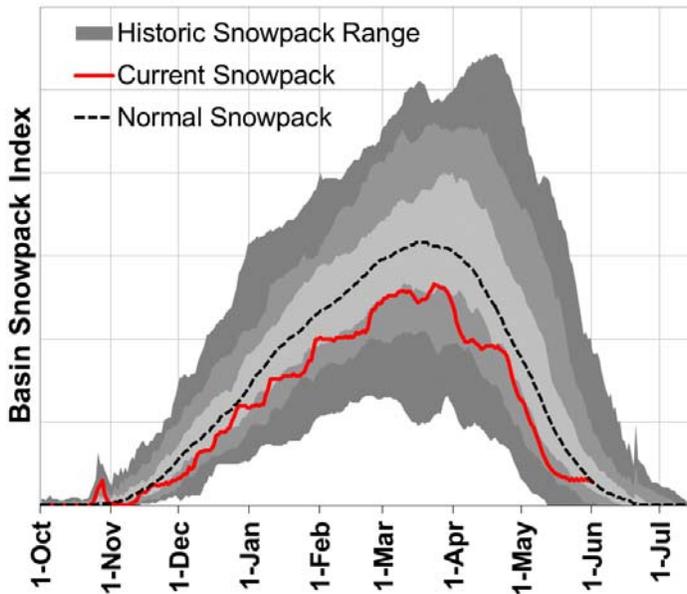
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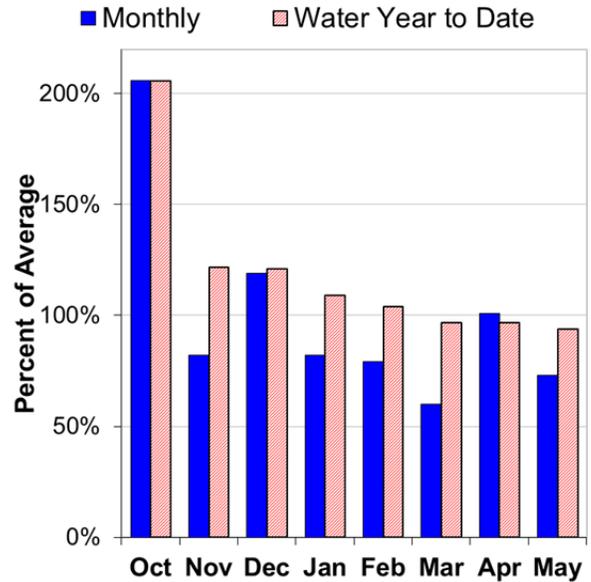
# Grande Ronde, Powder, Burnt and Innaha Basins

June 1, 2013

**Mountain Snowpack**



**Basin Precipitation**



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, the basin snowpack was 104% of normal. Three of the 16 SNOTEL sites still had snow on the ground, which is typical for this time of year. However, most SNOTEL sites in the basin peaked about 10 to 30% below normal peak snowpack levels this winter.

### PRECIPITATION

May precipitation was 73% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 94% of average.

### RESERVOIR

Reservoir storage across the basin is currently well below average. As of June 1, storage at published reservoirs was 69% of average and 57% percent of capacity.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 44% to 90% of average. In general, the northern rivers in the basin will have slightly below normal streamflows, while the southern reaches of the basin can expect greatly reduced streamflows this summer. The southern and eastern parts of the basin are currently designated by the US Drought Monitor to be in a moderate drought condition.

For more information contact your local Natural Resources Conservation Service office:  
Enterprise- (541) 426-4588; Baker City - (541) 523-7121; LaGrande - (541) 963-4178

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

GRANDE RONDE, POWDER, BURNT AND IMNAHA BASINS  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)	
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)			30% (1000AF)
Burnt R nr Hereford (2)	JUN-JUL	0.5	1.2	1.7	39	2.2	2.9	4.3	
	JUN-SEP	1.4	2.2	2.8	47	3.4	4.2	6.0	
Deer Ck nr Sumpter	JUN-JUL	0.2	0.8	1.4	40	1.9	2.8	3.4	
Powder R nr Sumpter	JUN-JUL	0.8	4.4	6.8	46	9.2	12.8	14.7	
	JUN-SEP	0.0	4.1	6.8	44	9.5	13.6	15.6	
Wolf Ck Reservoir Inflow (2)	JUN-JUL	0.2	0.6	1.1	35	1.6	2.6	3.0	
Pine Ck nr Oxbow	JUN-JUL	27	34	39	75	44	51	52	
	JUN-SEP	31	39	44	76	49	57	58	
Imnaha R at Imnaha	JUN-JUL	70	81	89	82	97	108	109	
	JUN-SEP	85	98	107	82	116	129	130	
Lostine R nr Lostine	JUN-JUL	53	58	61	90	64	69	68	
	JUN-SEP	59	64	68	90	72	77	76	
Bear Ck nr Wallowa	JUN-SEP	22	26	29	88	32	36	33	
Catherine Ck nr Union	JUN-JUL	13.0	16.0	18.0	82	20	23	22	
	JUN-SEP	16.8	19.9	22	85	24	27	26	
Grande Ronde R at Troy (1)	JUN-JUL	215	320	365	85	410	515	430	
	JUN-SEP	290	395	445	86	495	600	520	

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GRANDE RONDE, POWDER, BURNT AND IMNAHA BASINS Reservoir Storage (1000 AF) - End of May					GRANDE RONDE, POWDER, BURNT AND IMNAHA BASINS Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of Last Yr      Median	
		This Year	Last Year	Avg				
PHILLIPS LAKE	73.5	38.6	64.9	58.7	Upper Grande Ronde	7	0	0
THIEF VALLEY	17.4	11.3	13.5	15.0	Wallowa	4	109	104
UNITY	25.2	16.4	21.1	22.4	Imnaha	3	109	105
WALLOWA LAKE	37.5	23.4	24.0	27.2	Powder	7	0	0
WOLF CREEK		NO REPORT			Burnt	2	0	0

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

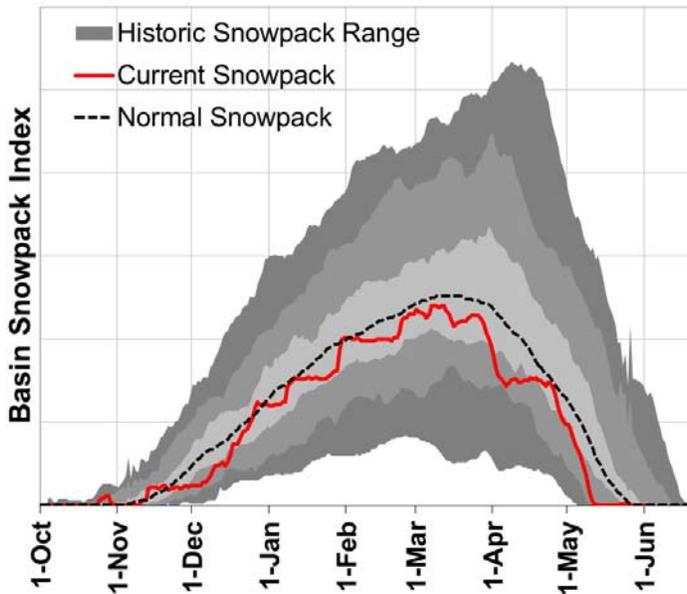
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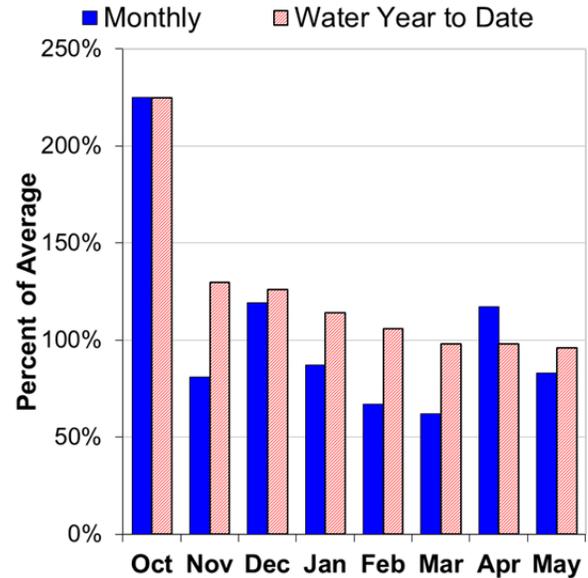
# Umatilla, Walla Walla, and Willow Basins

June 1, 2013

**Mountain Snowpack**



**Basin Precipitation**



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, all but one of the SNOTEL sites in the basin was snow-free, which is typical for a normal year. However, most SNOTEL sites in the basin peaked about 15 to 25% below normal peak snowpack levels this winter, and melted out earlier than normal.

### PRECIPITATION

May precipitation was 83% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 96% of average.

### RESERVOIR

Reservoir storage across the basin is currently below average. As of June 1, storage at published reservoirs was 88% of average and 67% percent of capacity.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 41% to 84% of average. Water users in the basin can expect reduced streamflows this summer.

For more information contact your local Natural Resources Conservation Service office:  
 Pendleton - (541) 278-8049; Heppner - (541) 676-5021; Condon - (541) 384-2671  
 Or visit: <http://www.or.nrcs.usda.gov/snow/watersupply/>

UMATILLA, WALLA WALLA AND WILLOW BASINS  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)	
		90% (1000AF)		70% (1000AF)		50% (1000AF) (% AVG.)			30% (1000AF)
Butter Ck nr Pine City	JUN-JUL	0.4	0.9	1.3	70	1.7	2.2	1.9	
	JUN-SEP	0.6	1.3	1.7	74	2.1	2.8	2.3	
McKay Ck nr Pilot Rock	JUN-SEP	0.2	0.6	1.8	41	3.1	4.9	4.5	
Rhea Ck nr Heppner	JUN-JUL	0.1	0.8	1.2	71	1.6	2.3	1.7	
Umatilla R ab Meacham Ck nr Gibbon	JUN-JUL	5.8	9.1	11.3	80	13.5	16.8	14.2	
	JUN-SEP	10.7	14.2	16.5	84	18.8	22	19.6	
Umatilla R at Pendleton	JUN-JUL	2.1	11.2	17.3	72	23	32	24	
	JUN-SEP	6.4	15.7	22	76	28	38	29	
SF Walla Walla R nr Milton-Freewater	JUN-JUL	9.8	12.8	14.8	81	16.8	19.8	18.2	
	JUN-SEP	19.5	23	26	84	29	32	31	
Willow Ck ab Willow Ck Lake nr Heppn	JUN-JUL	0.2	0.6	1.0	62	1.4	2.0	1.6	

UMATILLA, WALLA WALLA AND WILLOW BASINS  
Reservoir Storage (1000 AF) - End of May

UMATILLA, WALLA WALLA AND WILLOW BASINS  
Watershed Snowpack Analysis - June 1, 2013

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
COLD SPRINGS	44.6	18.1	22.9	32.9	Walla Walla	3	52	0
MCKAY	73.8	61.2	62.8	57.0	Umatilla	5	0	0
WILLOW CREEK	1.8	5.9	6.1	5.9	McKay Creek	3	0	0

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural volume - actual volume may be affected by upstream water management.

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

Pendleton - (541) 278-8049; Heppner - (541) 676-5021; Condon - (541) 384-2671

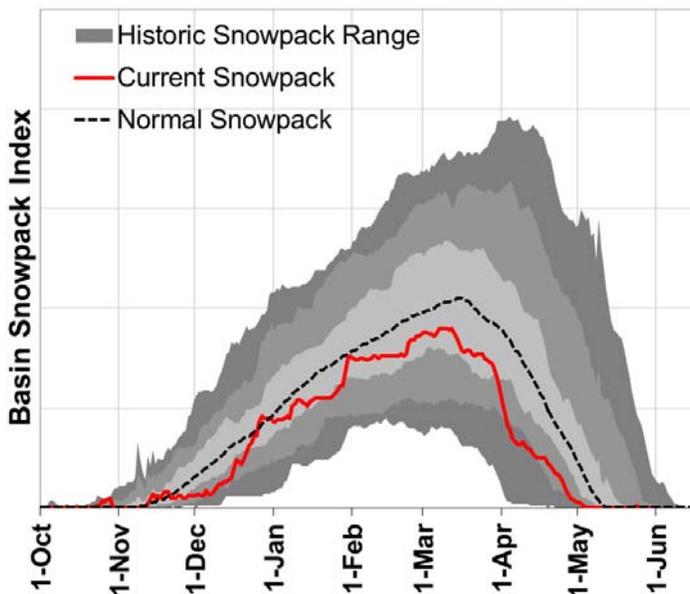
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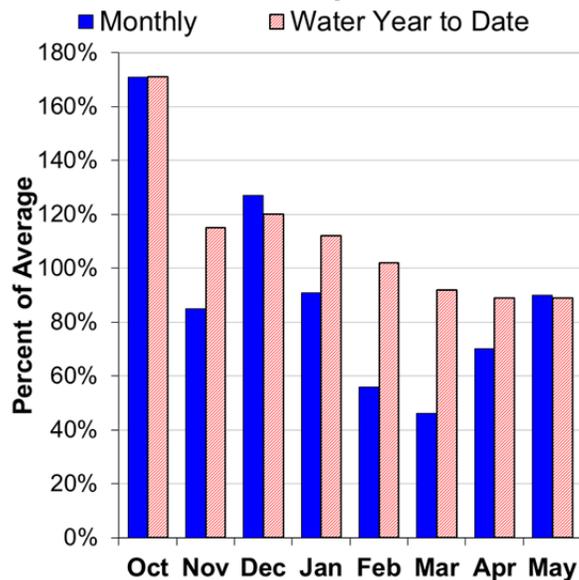
# John Day Basin

June 1, 2013

### Mountain Snowpack



### Basin Precipitation



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, all SNOTEL sites in the basin were snow-free, which is typical for a normal year. However, most SNOTEL sites in the basin peaked about 10 to 30% below normal peak snowpack levels this winter, and melted out earlier than normal.

### PRECIPITATION

May precipitation was 90% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 89% of average.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 34% to 61% of average. Water users in the basin can expect greatly reduced streamflows this summer.

For more information contact your local Natural Resources Conservation Service office:  
John Day - (541) 575-0135

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

JOHN DAY BASIN  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)		
		90%		70%		50%			30%	
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)		(1000AF)	(1000AF)
Strawberry Ck nr Prairie City	JUN-JUL	0.9	1.9	2.6	57	3.3	4.3	4.6		
	JUN-SEP	1.2	2.3	3.0	58	3.7	4.8	5.2		
Mountain Ck nr Mitchell	JUN-JUL	0.0	0.1	0.3	32	0.5	0.8	0.9		
	JUN-SEP	0.0	0.1	0.3	34	0.6	0.9	1.0		
Camas Ck nr Ukiah	JUN-JUL	0.5	1.5	3.0	60	4.5	6.6	5.0		
	JUN-SEP	0.6	2.0	3.5	61	5.0	7.2	5.7		
MF John Day R at Ritter	JUN-JUL	0.7	9.0	14.7	53	20	29	28		
	JUN-SEP	3.1	12.1	18.2	57	24	33	32		
NF John Day R at Monument	JUN-JUL	11.0	46	70	56	94	129	126		
	JUN-SEP	19.0	57	82	57	107	145	143		

JOHN DAY BASIN  
Reservoir Storage (1000 AF) - End of May

JOHN DAY BASIN  
Watershed Snowpack Analysis - June 1, 2013

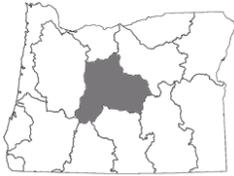
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
					North Fork John Day	7	0	0
					John Day above Kimberly	5	0	0

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

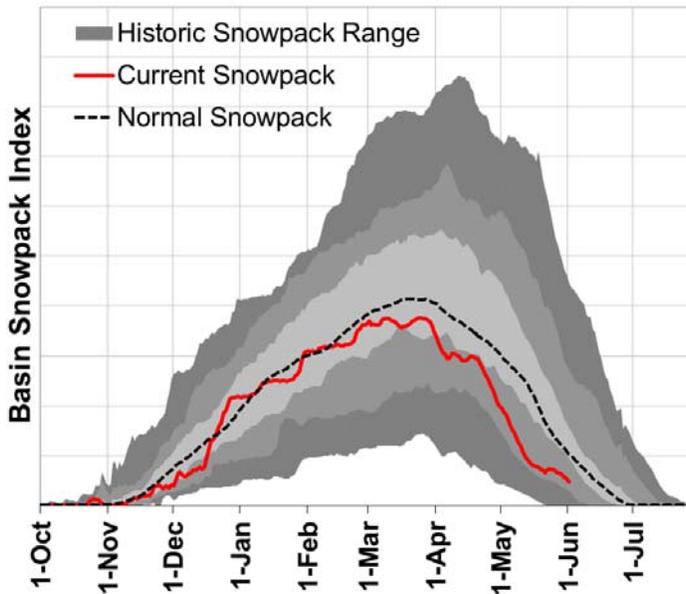
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John Day - (541) 575-0135  
Or visit: <http://www.or.nrcs.usda.gov/snow/watersupply/>



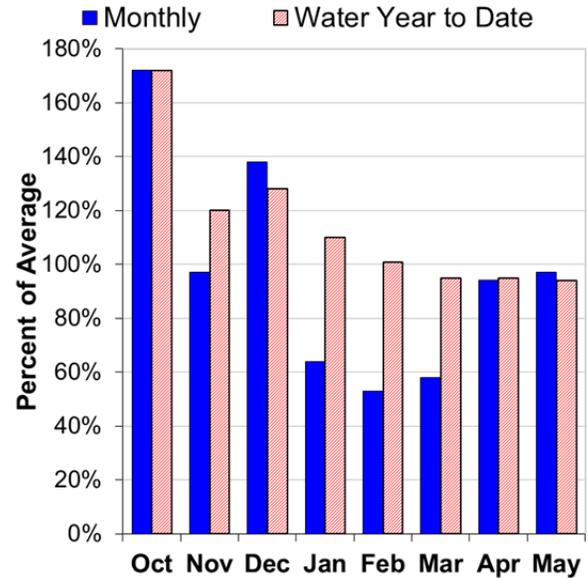
# Upper Deschutes and Crooked Basins

June 1, 2013

**Mountain Snowpack**



**Basin Precipitation**



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, the basin snowpack was 46% of normal. Three of the 14 SNOTEL sites still had snow on the ground, which is typical for this time of year. However, most SNOTEL sites in the basin peaked about 10 to 30% below normal peak snowpack levels this winter, and melted out earlier than normal.

### PRECIPITATION

May precipitation was 97% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 94% of average.

### RESERVOIR

Reservoir storage across the basin is currently slightly above average. As of June 1, storage at published reservoirs was 102% of average and 81% percent of capacity.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 10% of average for Prineville Reservoir Inflow to 91% of average at the Deschutes near Benham Falls. Water users in the basin can expect reduced streamflows this summer. In general, water supply shortages will be greater in the Crooked River basin, than in the western reaches of the basin.

For more information contact your local Natural Resources Conservation Service office:  
Redmond (541) 923-4358

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

UPPER DESCHUTES AND CROOKED BASINS  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)	
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)			30% (1000AF)
Deschutes R bl Snow Ck nr La Pine	JUN-JUL	7.6	11.2	13.6	79	16.0	19.6	17.2	
	JUN-SEP	21	27	31	78	35	41	40	
Crane Prairie Reservoir Inflow (2)	JUN-JUL	17.6	21	24	80	27	30	30	
	JUN-SEP	38	45	49	79	53	60	62	
Crescent Ck nr Crescent (2)	JUN-JUL	1.0	3.2	4.7	77	6.2	8.4	6.1	
	JUN-SEP	2.0	4.7	6.6	79	8.5	11.2	8.4	
Little Deschutes R nr La Pine (2)	JUN-JUL	4.0	10.0	14.0	64	18.0	24	22	
	JUN-SEP	5.2	12.3	17.1	63	22	29	27	
Whychus Ck nr Sisters	JUN-JUL	12.9	14.7	15.9	72	17.1	18.9	22	
	JUN-SEP	21	23	25	74	27	29	34	
Prineville Reservoir Inflow (2)	JUN-JUL	-2.0	1.0	1.9	23	6.3	12.8	8.3	
	JUN-SEP	-6.0	-2.0	0.8	10	5.6	12.7	8.1	
Ochoco Reservoir Inflow (2)	JUN-JUL	-3.7	-0.7	1.4	52	3.4	6.5	2.7	
	JUN-SEP	-4.8	-1.5	0.8	37	3.0	6.4	2.1	
Deschutes R at Benham Falls nr Bend	JUN-JUL	127	140	148	91	156	169	163	
	JUN-SEP	265	285	300	91	315	335	330	

For more information contact your local Natural Resources Conservation Service office:  
Redmond (541) 923-4358  
Or visit: <http://www.or.nrcs.usda.gov/snow/watersupply/>

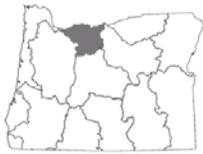
UPPER DESCHUTES AND CROOKED BASINS Reservoir Storage (1000 AF) - End of May					UPPER DESCHUTES AND CROOKED BASINS Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** This Year	Usable Storage Last Year	*** Avg	Watershed	Number of Data Sites	This Year as % of Last Yr	% of Median
CRANE PRAIRIE	55.3	43.9	51.4	42.8	Crooked	3	0	0
CRESCENT LAKE	86.9	77.9	80.8	54.4	Little Deschutes	4	64	64
OCHOCO	47.5	27.8	40.8	34.6	Deschutes above Wickiup R	4	50	42
PRINEVILLE	153.0	136.8	143.0	140.5	Tumalo and Squaw Creeks	2	14	19
WICKIUP	200.0	152.9	191.8	159.7				

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

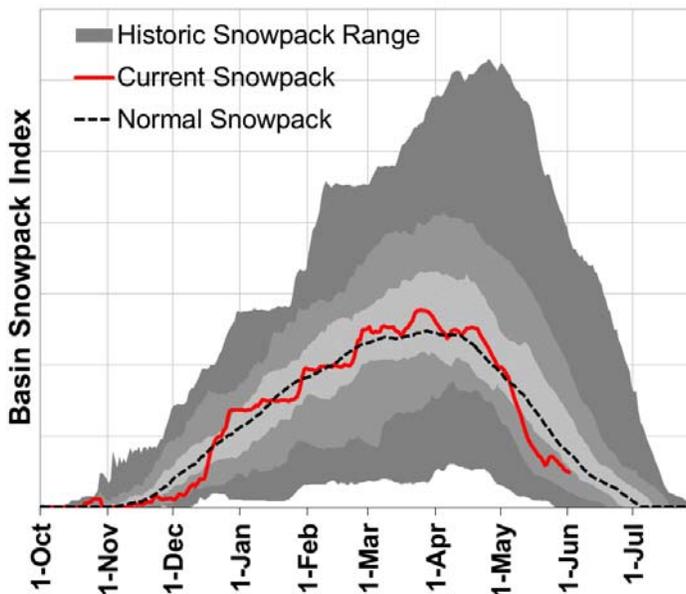
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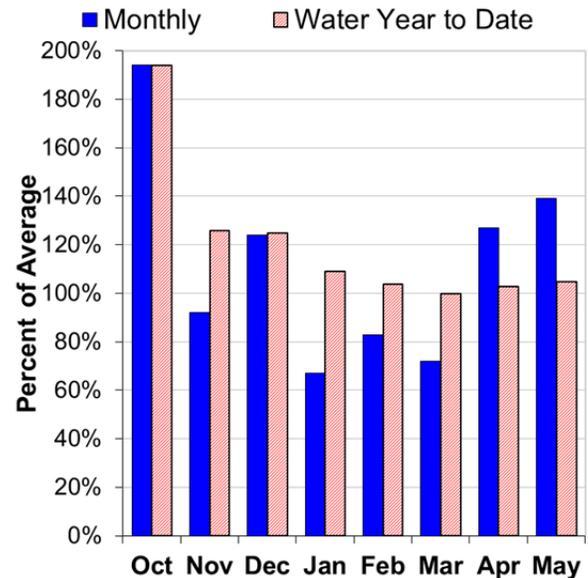
# Hood, Sandy, and Lower Deschutes Basins

June 1, 2013

**Mountain Snowpack**



**Basin Precipitation**



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, the basin snowpack was 64% of normal. Two of the 9 SNOTEL sites still had snow on the ground, which is typical for this time of year. Most SNOTEL sites in the basin peaked slightly below normal peak snowpack levels this winter. However, the three SNOTEL sites in the Bull Run watershed all peaked above their normal peak snowpack levels.

### PRECIPITATION

May precipitation was 139% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 105% of average.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 89% at Hood River at Tucker Bridge to 110% of average at Sandy River near Marmot. Water users in the basin can expect near normal streamflows this summer.

For more information contact your local Natural Resources Conservation Service office:  
The Dalles (541) 296-6178

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

HOOD, SANDY AND LOWER DESCHUTES BASINS  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
WF Hood River nr Dee	JUN-JUL	26	34	39	98	44	52	40
Hood R At Tucker Bridge	JUN-JUL	55	63	69	86	75	83	80
	JUN-SEP	84	98	107	89	116	130	120
Sandy R nr Marmot	JUN-JUL	101	114	122	111	130	143	110
	JUN-SEP	144	161	173	110	185	200	157

HOOD, SANDY AND LOWER DESCHUTES BASINS  
Reservoir Storage (1000 AF) - End of May

HOOD, SANDY AND LOWER DESCHUTES BASINS  
Watershed Snowpack Analysis - June 1, 2013

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
CLEAR LAKE (WASCO)	11.9	8.2	10.2	6.5	Hood River	5	39	66
					Mile Creeks	0	0	0
					White River	4	53	60

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

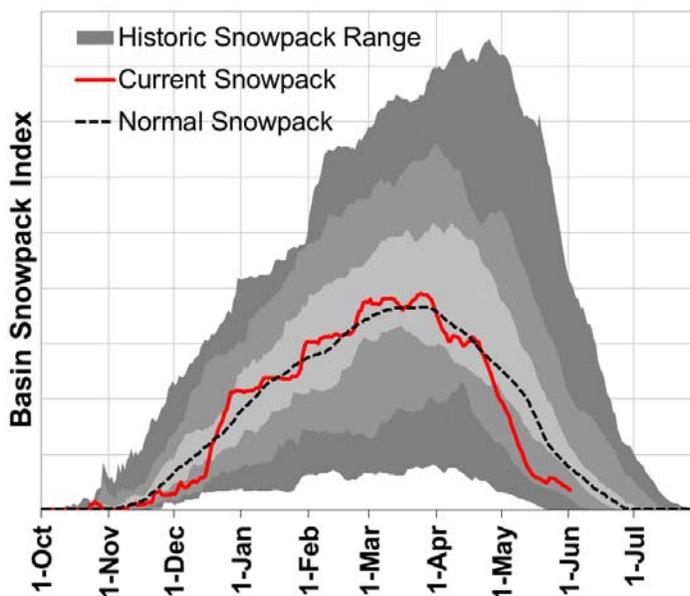
For more information contact your local Natural Resources Conservation Service office:  
The Dalles (541) 296-6178  
Or visit: <http://www.or.nrcs.usda.gov/snow/watersupply/>



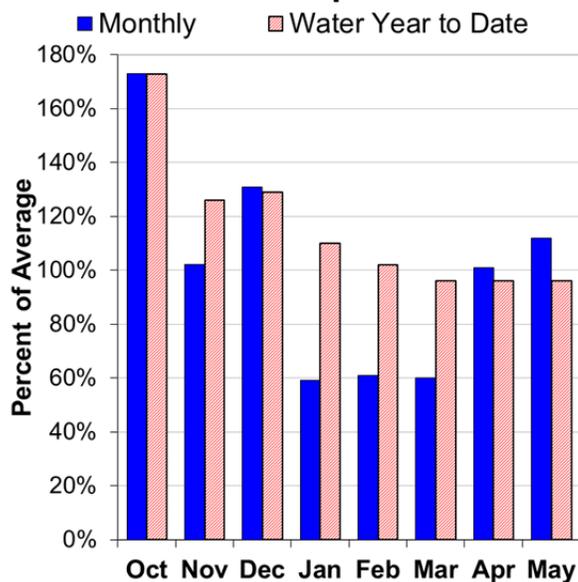
# Willamette Basin

June 1, 2013

### Mountain Snowpack



### Basin Precipitation



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, the basin snowpack was 46% of normal. Four of the 19 SNOTEL sites still had snow on the ground, which is typical for this time of year. Many SNOTEL sites in the basin peaked slightly below normal peak snowpack levels this winter, while several sites actually peaked slightly above their normal peak snowpack.

### PRECIPITATION

May precipitation was 112% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 96% of average.

### RESERVOIR

Reservoir storage across the basin is currently near average. As of June 1, storage at published reservoirs was 100% of average and 100% percent of capacity.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 71% to 100% of average. Water users in the basin can expect slightly below to near normal streamflows this summer.

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

Eugene - (541) 465-6436; Portland - (503) 231-2270; Tangent - (541) 967-5925; Oregon City - (503) 656-3499;

Hillsboro - (503) 648-3174; McMinnville - (503) 472-1474

Salem - (503) 399-5746; Dallas - (503) 623-5534

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

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WILLAMETTE BASIN  
Streamflow Forecasts - June 1, 2013

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Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)	
		90% (1000AF)		70% (1000AF)		Chance Of Exceeding * 50% (1000AF) (% AVG.)			30% (1000AF)
Oak Grove Fork Of Clackamas	JUN-JUL	37	43	47	102	51	57	46	
	JUN-SEP	69	79	85	100	91	101	85	
Clackamas R ab Three Lynx	JUN-JUL	101	129	148	100	167	195	148	
	JUN-SEP	178	210	230	98	250	280	235	
Clackamas R at Estacada	JUN-JUL	116	165	198	97	230	280	205	
	JUN-SEP	210	265	300	95	335	390	315	
Detroit Lake Inflow (1,2)	JUN-SEP	138	198	225	87	250	310	260	
Little North Santiam R nr Mehama (1)	JUN-SEP	4.2	26	36	84	46	68	43	
North Santiam R at Mehama (1,2)	JUN-SEP	140	235	280	84	325	420	335	
Green Peter Lake Inflow (1,2)	JUN-SEP	18.1	62	82	97	102	146	85	
Foster Lake Inflow (1,2)	JUN-SEP	111	141	154	94	167	197	164	
South Santiam R at Waterloo (2)	JUN-JUL	111	123	131	95	139	151	138	
	JUN-SEP	136	151	162	95	173	188	171	
McKenzie R bl Trail Bridge (2)	JUN-JUL	80	90	97	87	104	114	112	
	JUN-SEP	150	165	175	90	185	200	195	
Cougar Lake Inflow (1,2)	JUN-SEP	57	73	80	89	87	103	90	
Blue Lake Inflow (1,2)	JUN-SEP	1.8	11.7	16.2	82	21	31	19.8	
McKenzie R nr Vida (1,2)	JUN-SEP	445	525	560	98	595	675	570	
MF Willamette R bl NF (1,2)	JUN-JUL	121	166	186	85	205	250	220	
Fall Creek Lake Inflow (1,2)	JUN-SEP	9.5	21	26	84	31	43	31	

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For more information contact your local Natural Resources Conservation Service office:  
Eugene - (541) 465-6436; Portland - (503) 231-2270; Tangent - (541) 967-5925; Oregon City - (503) 656-3499; Hillsboro - (503) 648-3174; McMinnville - (503) 472-1474  
Salem - (503) 399-5746; Dallas - (503) 623-5534  
Or visit: <http://www.or.nrcs.usda.gov/snow/watersupply/>

WILLAMETTE BASIN  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)				
		90% (1000AF)		70% (1000AF)		50% (1000AF) (% AVG.)			30% (1000AF)		10% (1000AF)	
		Chance Of Exceeding *										
Cottage Grove Lake Inflow (1,2)	JUN-SEP	1.1	5.4	7.4	71	9.4	13.7	10.4				
Dorena Lake Inflow (1,2)	JUN-SEP	-2.1	17.2	26	81	35	54	32				
Scoggins Ck nr Gaston (2)	JUN-JUL	0.8	1.5	2.0	111	2.5	3.2	1.8				
Willamette R at Salem (1,2)	JUN-SEP	680	1110	1300	79	1490	1920	1640				

WILLAMETTE BASIN  
Reservoir Storage (1000 AF) - End of May

WILLAMETTE BASIN  
Watershed Snowpack Analysis - June 1, 2013

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
BLUE RIVER	85.5	77.3	81.5	78.5	Clackamas	4	0	0
COTTAGE GROVE	29.8	27.3	31.4	30.2	McKenzie	7	32	34
COUGAR	155.2	146.4	173.9	163.7	Row River	1	0	0
DETROIT	300.7	436.7	429.9	423.4	Santiam	6	0	0
DORENA	70.5	69.9	71.1	70.2	Middle Fork Willamette	7	58	54
FALL CREEK	115.5	115.8	116.1	115.1				
FERN RIDGE	109.6	66.2	96.9	91.4				
FOSTER	29.7	43.9	45.7	---				
GREEN PETER	268.2	380.4	398.0	---				
HILLS CREEK	200.2	267.0	278.7	265.5				
LOOKOUT POINT	337.0	344.0	382.6	---				
TIMOTHY LAKE	61.7	62.8	62.2	62.3				
HENRY HAGG LAKE	53.0	51.6	53.4	52.5				

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural volume - actual volume may be affected by upstream water management.

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

Eugene - (541) 465-6436; Portland - (503) 231-2270; Tangent - (541) 967-5925; Oregon City - (503) 656-3499; Hillsboro - (503) 648-3174; McMinnville - (503) 472-1474  
Salem - (503) 399-5746; Dallas - (503) 623-5534

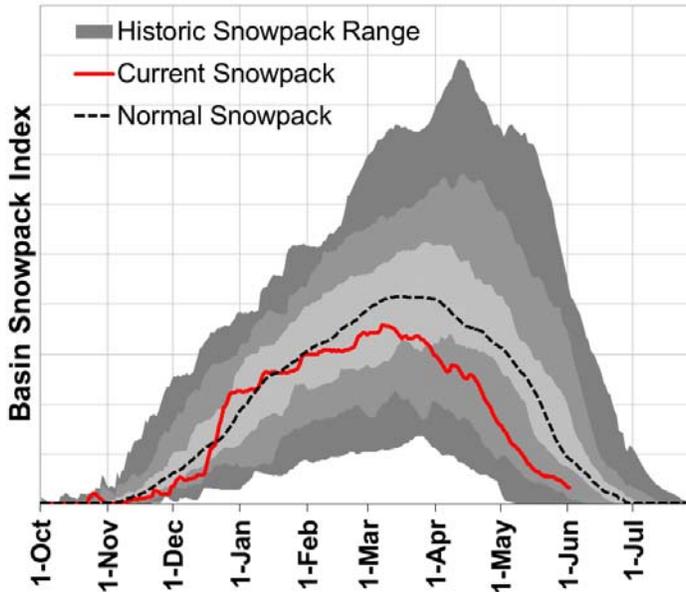
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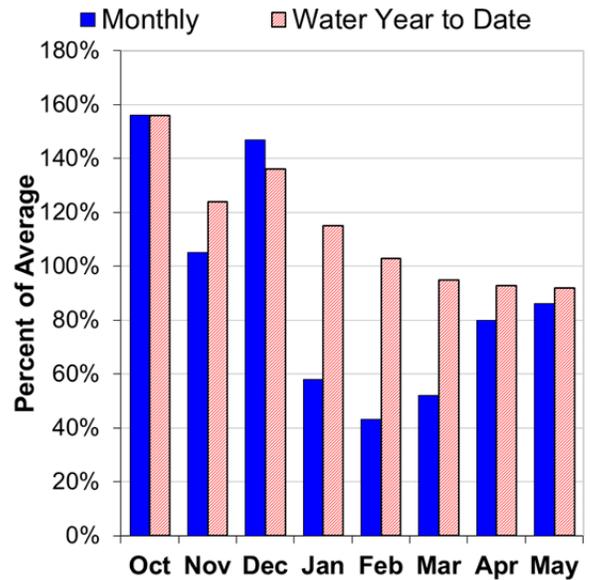
# Rogue and Umpqua Basins

June 1, 2013

### Mountain Snowpack



### Basin Precipitation



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, all but one of the 12 SNOTEL sites in the basin was snow-free. Most SNOTEL sites in the basin peaked about 15 to 40% below normal peak snowpack levels this winter, and melted out earlier than normal.

### PRECIPITATION

May precipitation was 86% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 92% of average.

### RESERVOIR

Reservoir storage across the basin is currently slightly above average. As of June 1, storage at published reservoirs was 103% of average and 84% percent of capacity.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 44% to 79% of average. Water users in the basin can expect greatly reduced streamflows this summer.

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

Roseburg - (541) 673-8316; Medford - (541) 776-4267

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

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ROGUE AND UMPQUA BASINS  
Streamflow Forecasts - June 1, 2013

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Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		=====		Chance Of Exceeding *		=====		
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
Cow Ck nr Azalea (2)	JUN-JUL	0.4	0.6	1.3	41	1.9	2.9	3.1
	JUN-SEP	0.7	0.8	1.9	44	3.0	4.6	4.3
North Umpqua R at Winchester	JUN-JUL	103	143	170	72	197	235	235
	JUN-SEP	200	240	270	77	300	340	350
South Umpqua R at Tiller	JUN-JUL	8.0	15.0	21	53	28	40	40
	JUN-SEP	9.8	19.1	28	57	34	49	49
South Umpqua R nr Brockway	JUN-JUL	0.8	22	36	50	50	71	72
	JUN-SEP	12.5	35	50	56	65	87	90
Hyatt Prairie Reservoir Inflow (2)	JUN-JUL	0.0	0.1	0.1	27	0.3	0.5	0.4
Lost Creek Lake Inflow (2)	JUN-JUL	110	134	150	73	166	190	205
	JUN-SEP	205	240	260	79	280	315	330
Rogue R at Raygold (2)	JUN-JUL	96	137	165	75	193	235	220
	JUN-SEP	198	245	275	79	305	350	350
Rogue R at Grants Pass (2)	JUN-JUL	99	139	167	76	195	235	220
	JUN-SEP	182	230	265	78	300	350	340
Applegate Lake Inflow (2)	JUN-JUL	3.9	11.8	17.1	61	22	30	28
	JUN-SEP	8.2	16.4	22	65	28	36	34
Sucker Ck bl Ltl Grayback Ck nr Holl	JUN-JUL	4.2	7.2	9.3	68	11.4	14.4	13.6
	JUN-SEP	7.0	10.3	12.6	72	14.9	18.2	17.6
Illinois R at Kerby	JUN-JUL	5.0	8.0	14.0	44	23	35	32
	JUN-SEP	5.7	9.5	17.2	45	26	39	38

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For more information contact your local Natural Resources Conservation Service office:  
Roseburg - (541) 673-8316; Medford - (541) 776-4267  
Or visit: <http://www.or.nrcs.usda.gov/snow/watersupply/>

ROGUE AND UMPQUA BASINS Reservoir Storage (1000 AF) - End of May					ROGUE AND UMPQUA BASINS Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage This Year	Last Year	*** Avg	Watershed	Number of Data Sites	This Year as % of Last Yr	% of Median
APPLEGATE	75.2	67.1	68.9	64.9	Applegate	2	0	0
EMIGRANT LAKE	39.0	35.7	37.7	35.5	Bear Creek	1	0	0
FISH LAKE	8.0	6.6	7.5	6.2	Little Butte Creek	3	0	0
FOURMILE LAKE	16.1	10.3	15.5	10.7	Illinois	1	0	0
HOWARD PRAIRIE	60.0	50.1	56.4	48.3	North Umpqua	3	64	64
HYATT PRAIRIE	16.1	14.6	15.7	13.2	Rogue River above Grants	9	0	0
LOST CREEK	315.0	294.6	313.8	---				

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
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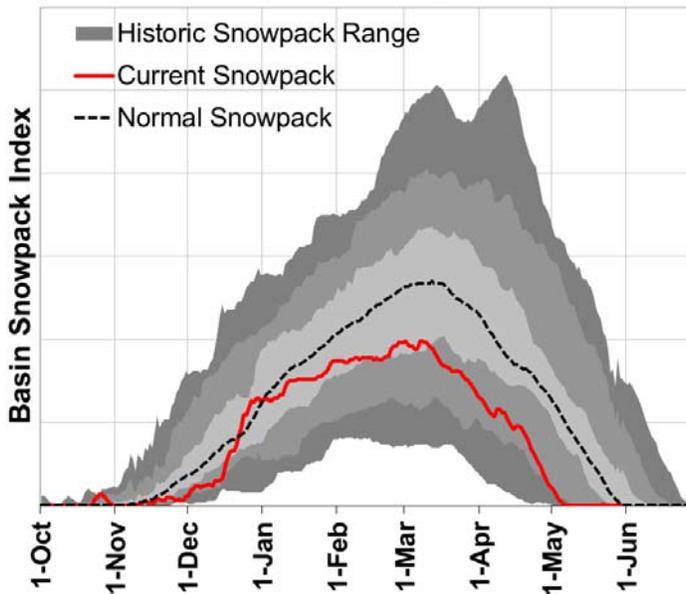
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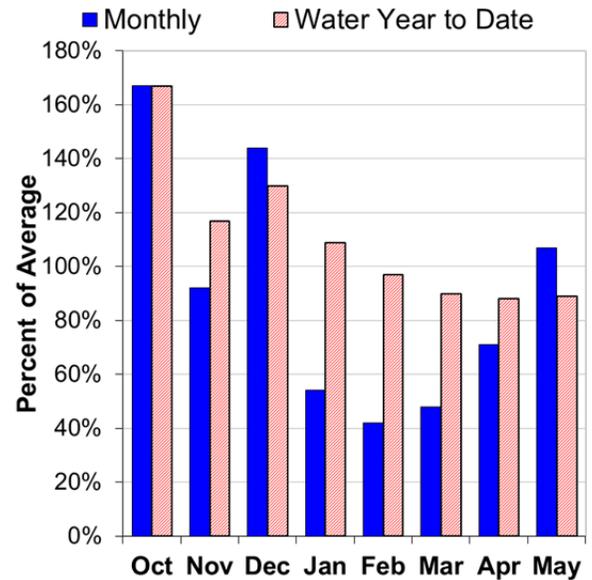
# Klamath Basin

June 1, 2013

### Mountain Snowpack



### Basin Precipitation



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, all 15 SNOTEL sites in the basin were snow-free. For the first time since 2001, the snowpack at Annie Springs SNOTEL (6010 ft) was melted out by June 1. Median snow water equivalent for June 1 at this site is 24 inches. Most SNOTEL sites in the basin peaked about 20 to 40% below normal peak snowpack levels this winter, and melted out much earlier than normal.

### PRECIPITATION

May precipitation was 107% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 89% of average.

### RESERVOIR

Reservoir storage across the basin is currently well below average. As of June 1, storage at published reservoirs was 68% of average and 48% percent of capacity.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 14% to 62% of average. Water users in the basin can expect greatly reduced streamflows this summer. Much of the basin is currently designated by the US Drought Monitor to be in a moderate drought condition.

For more information contact your local Natural Resources Conservation Service office:  
Klamath Falls - (541) 883-6932

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

KLAMATH BASIN  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)		
		90%		70%		50%			30%	
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)		(1000AF)	(1000AF)
Clear Lake Inflow (2)	JUN-JUL	0.1	0.2	1.1	19	4.0	6.9	5.7		
	JUN-SEP	0.1	0.3	1.2	14	4.6	9.6	8.6		
Gerber Res Inflow (2)	JUN-JUL	0.0	0.0	0.2	13	1.0	1.8	1.4		
	JUN-SEP	0.0	0.1	0.3	17	1.0	1.7	1.8		
Sprague R nr Chiloquin	JUN-JUL	7.4	17.9	25	50	32	43	50		
	JUN-SEP	19.7	32	41	56	50	62	73		
Williamson R bl Sprague R nr Chiloqu	JUN-JUL	31	43	52	58	61	73	90		
	JUN-SEP	63	80	92	62	104	121	149		
Upper Klamath Lk Inflow (1)	JUN-JUL	2.0	27	42	41	57	89	103		
	JUN-SEP	13.0	61	83	46	105	153	181		

KLAMATH BASIN Reservoir Storage (1000 AF) - End of May					KLAMATH BASIN Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage This Year	*** Usable Storage Last Year	*** Avg	Watershed	Number of Data Sites	This Year as % of Last Yr	% of Median
CLEAR LAKE (CALIF)	513.3	89.2	117.9	256.5	Lost	2	0	0
GERBER	94.3	39.8	58.6	65.0	Sprague	5	0	0
UPPER KLAMATH LAKE	523.7	408.4	424.1	468.1	Upper Klamath Lake	6	0	0
					Williamson River	4	0	0

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural volume - actual volume may be affected by upstream water management.

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

Klamath Falls - (541) 883-6932

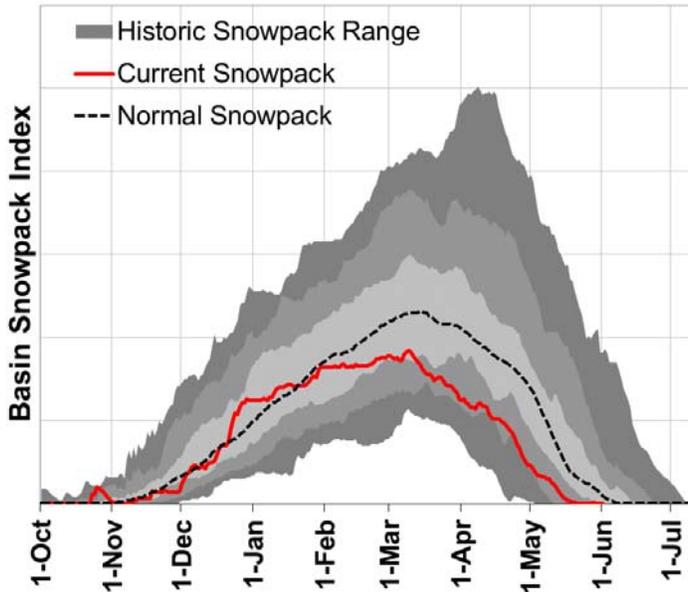
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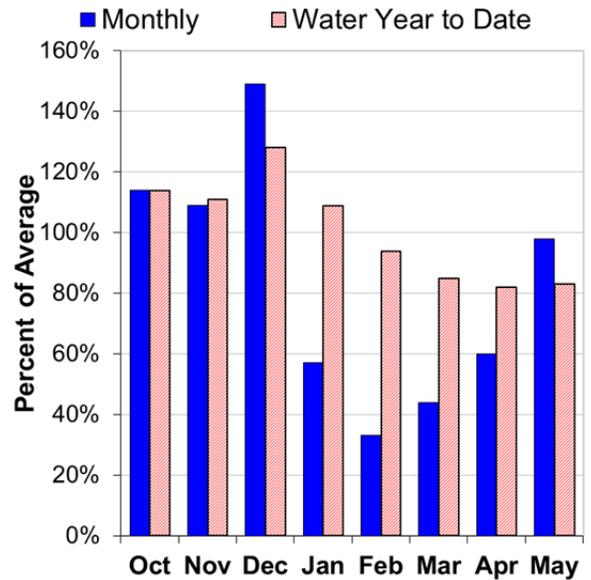
# Lake County and Goose Lake

June 1, 2013

### Mountain Snowpack



### Basin Precipitation



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, all 9 SNOTEL sites in the basin were snow-free. Most SNOTEL sites in the basin peaked about 20 to 40% below normal peak snowpack levels this winter, and melted out earlier than normal.

### PRECIPITATION

May precipitation was 98% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 83% of average.

### RESERVOIR

Reservoir storage across the basin is currently slightly below average. As of June 1, storage at published reservoirs was 94% of average and 69% percent of capacity.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 20% to 46% of average. Water users in the basin can expect greatly reduced streamflows this summer. The entire basin is currently designated by the US Drought Monitor to be in a moderate drought condition.

For more information contact your local Natural Resources Conservation Service office:  
Lakeview - (541) 947-2202

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

LAKE COUNTY AND GOOSE LAKE BASINS  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
Twentymile Ck nr Adel	JUN-JUL	0.3	0.7	0.9	24	1.4	2.2	3.8
	JUN-SEP	0.3	0.8	1.0	23	1.6	2.5	4.3
Deep Ck ab Adel	JUN-JUL	1.2	2.5	3.5	25	5.2	8.0	13.9
	JUN-SEP	1.4	2.8	4.0	25	6.0	9.2	15.8
Honey Ck nr Plush	JUN-JUL	0.1	0.3	0.5	18	0.8	1.2	2.6
	JUN-SEP	0.1	0.3	0.5	20	0.8	1.2	2.7
Chewaucan R nr Paisley	JUN-JUL	2.0	4.2	7.6	40	11.0	16.0	19.0
	JUN-SEP	1.7	7.0	10.6	46	14.2	19.4	23

LAKE COUNTY AND GOOSE LAKE BASINS  
Reservoir Storage (1000 AF) - End of May

LAKE COUNTY AND GOOSE LAKE BASINS  
Watershed Snowpack Analysis - June 1, 2013

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
COTTONWOOD	8.7	6.6	7.8	7.0	Chewaucan River	3	0	0
DREWS	63.0	42.9	54.9	45.5	Deep Creek	0	0	0
					Drew Creek	2	0	0
					Honey Creek	0	0	0
					Silver Creek (Lake Co.)	4	0	0
					Twentymile Creek	0	0	0

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural volume - actual volume may be affected by upstream water management.

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

Lakeview - (541) 947-2202

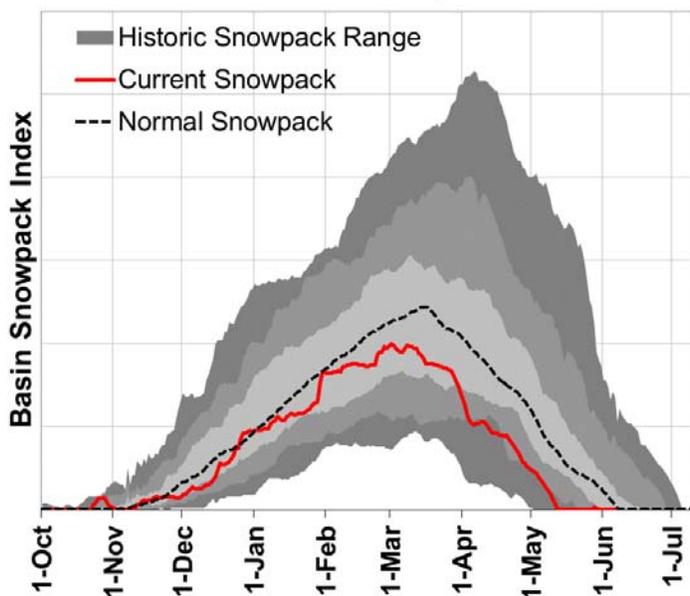
Or visit: <http://www.or.nrcs.usda.gov/snow/watersupply/>



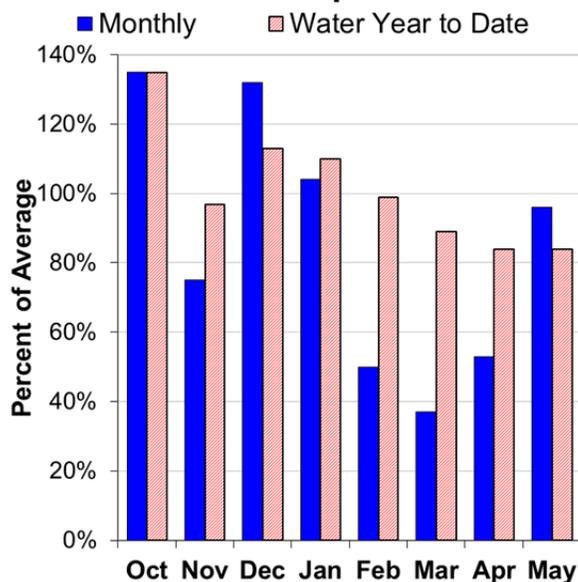
# Harney Basin

June 1, 2013

### Mountain Snowpack



### Basin Precipitation



## Summary of Water Supply Conditions

### SNOWPACK

As of June 1, all 9 SNOTEL sites in the basin were snow-free. Most SNOTEL sites in the basin peaked about 10 to 45% below normal peak snowpack levels this winter, and melted out much earlier than normal.

### PRECIPITATION

May precipitation was 96% of average. Precipitation since the beginning of the water year (October 1 - June 1) has been 84% of average.

### STREAMFLOW FORECAST

June through September streamflow forecasts in the basin range from 28% to 54% of average. Water users in the basin can expect greatly reduced streamflows this summer. The southeastern part of the basin is currently designated by the US Drought Monitor to be in a severe drought condition, while the rest of the basin is designated to be in a moderate drought condition.

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

Hines - (541) 573-6446

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

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HARNEY BASIN  
Streamflow Forecasts - June 1, 2013

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Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)		
		90%		70%		50%			30%	
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)		(1000AF)	(1000AF)
Silvies R nr Burns	JUN-JUL	0.5	2.0	4.0	30	6.0	10.0	13.5		
	JUN-SEP	0.8	2.5	4.5	28	5.5	11.0	16.0		
Donner Und Blitzen R nr Frenchglen	JUN-JUL	4.6	8.9	11.9	50	14.9	19.2	24		
	JUN-SEP	7.8	12.8	16.2	54	19.6	25	30		
Trout Ck nr Denio	JUN-JUL	0.1	0.3	0.5	25	1.0	1.6	2.2		
	JUN-SEP	0.1	0.4	0.8	32	1.2	1.9	2.7		

=====

HARNEY BASIN  
Reservoir Storage (1000 AF) - End of May

=====

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

=====

HARNEY BASIN  
Watershed Snowpack Analysis - June 1, 2013

=====

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Median
Donner und Blitzen River	2	0	0
Silver Creek (Harney Co.)	2	0	0
Silvies River	5	0	0
Trout Creek	2	0	0

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

For more information contact your local Natural Resources Conservation Service office:  
Hines - (541) 573-6446  
Or visit: <http://www.or.nrcs.usda.gov/snow/watersupply/>

# Recession Flow Forecasts

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

<b>OWYHEE AND MALHEUR BASINS</b>					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE</i>			<i>LONG-TERM AVERAGE VALUE</i>
		<i>-----CHANCE OF EXCEEDING -----</i>			
		90%	50%	10%	
Owyhee R nr Rome	2000 cfs	Observed March 19 <sup>th</sup>			<b>May 6</b>
Owyhee R nr Rome	1000 cfs	Observed March 24 <sup>th</sup>			<b>May 18</b>
Owyhee R nr Rome	500 cfs	Observed April 5 <sup>th</sup>			<b>June 2</b>

<b>JOHN DAY BASIN</b>					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE</i>			<i>LONG-TERM AVERAGE VALUE</i>
		<i>----- CHANCE OF EXCEEDING -----</i>			
		90%	50%	10%	
John Day R at Service Creek	Average Daily Flow on Aug 1 <sup>st</sup>	49	143	325	<b>271</b>

<b>UPPER DESCHUTES AND CROOKED BASINS</b>					
<i>FORECAST POINT</i>	<i>FORECAST THRESHOLD</i>	<i>FORECAST VALUE</i>			<i>LONG-TERM AVERAGE VALUE</i>
		<i>----- CHANCE OF EXCEEDING -----</i>			
		90%	50%	10%	
Crane Prairie Inflow	Date of Peak	Observed May 27 <sup>th</sup>			<b>May 25</b>
Crane Prairie Inflow	Peak Flow	277 mean cfs 7-day moving average from Bureau of Reclamation QU data			<b>403</b>
Crane Prairie Inflow	Average Daily Flow on Oct 1 <sup>st</sup>	170	205	240	<b>269</b>
Prineville Reservoir Inflow	113 cfs	Observed April 30 <sup>th</sup>			<b>June 3</b>
Prineville Reservoir Inflow	75 cfs	Observed May 6 <sup>th</sup>			<b>June 11</b>
Prineville Reservoir Inflow	50 cfs	Observed May 10 <sup>th</sup>			<b>June 19</b>
Whychus Creek nr Sisters	100 cfs	July 10	August 1	August 22	<b>August 16</b>

<b>ROGUE AND UMPQUA BASINS</b>					
<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	July 17	July 31	August 12	<b>August 8</b>
South Umpqua R at Tiller	140 cfs	June 16	June 29	July 12	<b>July 11</b>
South Umpqua R at Tiller	90 cfs	July 4	July 20	August 7	<b>August 1</b>
South Umpqua R at Tiller	60 cfs	July 28	August 19	Sept 11	<b>August 28</b>

<b>LAKE COUNTY AND GOOSE LAKE BASINS</b>					
<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	Observed May 31 <sup>st</sup>			<b>June 17</b>
Honey Ck nr Plush	100 cfs	Observed April 4 <sup>th</sup>			<b>May 16</b>
Honey Ck nr Plush	50 cfs	Observed April 13 <sup>th</sup>			<b>June 4</b>
Twentymile Ck nr Adel	50 cfs	Observed March 18 <sup>th</sup>			<b>May 30</b>
Twentymile Ck nr Adel	10 cfs	Observed June 1 <sup>st</sup>			<b>July 20</b>

<b>HARNEY BASIN</b>					
<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	Observed April 12 <sup>th</sup>			<b>May 21</b>
Silvies R nr Burns	200 cfs	Observed April 23 <sup>rd</sup>			<b>June 2</b>
Silvies R nr Burns	100 cfs	Observed May 11 <sup>th</sup>			<b>June 13</b>
Silvies R nr Burns	50 cfs	June 7	June 15	June 27	<b>July 3</b>
Donner Und Blitzen R nr Frenchglen	200 cfs	Observed May 18 <sup>th</sup>			<b>June 20</b>
Donner Und Blitzen R nr Frenchglen	100 cfs	June 7	June 17	June 29	<b>July 9</b>

# Summary of Snowpack Data

## June 2013

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	MEDIAN 81-10
<b>Oregon</b>						
ANEROID LAKE SNOTEL	7400	6/01/13	40	17.8	15.9	16.8
ANNIE SPRING SNOTEL	6010	6/01/13	0	.0	15.7	24.0
ARBUCKLE MTN SNOTEL	5770	6/01/13	0	.0	.0	.0
BEAR GRASS SNOTEL	4720	6/01/13	13	6.7	25.7	--
BEAVER RES. SNOTEL	5150	6/01/13	0	.0	.0	.0
BIG RED MTN SNOTEL	6050	6/01/13	0	.0	3.5	.2
BIGELOW CAMP SNOTEL	5130	6/01/13	0	.0	.0	.0
BILLIE CK DVD SNOTEL	5280	6/01/13	0	.0	.0	.0
BLAZED ALDER SNOTEL	3650	6/01/13	0	.0	8.0	.0
BLUE MTN SPGS SNOTEL	5870	6/01/13	0	.0	.0	.0
BOURNE SNOTEL	5850	6/01/13	0	.0	.0	.0
BOWMAN SPRNGS SNOTEL	4530	6/01/13	0	.0	.0	.0
CASCADE SUM. SNOTEL	5100	6/01/13	0	.0	.0	.2
CHEMULT ALT SNOTEL	4850	6/01/13	0	.0	.0	.0
CLACKAMAS LK. SNOTEL	3400	6/01/13	0	.0	.0	.0
CLEAR LAKE SNOTEL	3810	6/01/13	0	.0	.0	.0
COLD SPRINGS SNOTEL	5940	6/01/13	0	.0	.0	.0
COUNTY LINE SNOTEL	4830	6/01/13	0	.0	.0	.0
CRAZYMAN FLAT SNOTEL	6180	6/01/13	0	.0	.0	.0
DALY LAKE SNOTEL	3690	6/01/13	0	.0	.0	.0
DERR SNOTEL	5850	6/01/13	0	.0	.0	.0
DIAMOND LAKE SNOTEL	5280	6/01/13	0	.0	.0	.0
EILERTSON SNOTEL	5510	6/01/13	0	.0	.0	.0
EMIGRANT SPGS SNOTEL	3800	6/01/13	0	.0	.0	.0
FISH CREEK SNOTEL	7660	6/01/13	0	.0	.0	9.1
FISH LK. SNOTEL	4660	6/01/13	0	.0	.0	.0
FOURMILE LAKE SNOTEL	5970	6/01/13	0	.0	.0	.0
GERBER RES SNOTEL	4890	6/01/13	0	.0	.0	.0
GOLD CENTER SNOTEL	5410	6/01/13	0	.0	.0	.0
GREENPOINT SNOTEL	3310	6/01/13	0	.0	.0	.0
HIGH RIDGE SNOTEL	4920	6/01/13	0	.0	.0	.0
HOGG PASS SNOTEL	4790	6/01/13	0	.0	.0	.0
HOLLAND MDWS SNOTEL	4930	6/01/13	0	.0	.0	.0
IRISH-TAYLOR SNOTEL	5540	6/01/13	26	11.2	22.3	26.7
JUMP OFF JOE SNOTEL	3520	6/01/13	0	.0	.0	.0
KING MTN #2 SNOTEL	4340	6/01/13	0	.0	.0	.0
LAKE CK R.S. SNOTEL	5240	6/01/13	0	.0	.0	.0
LITTLE MEADOW SNOTEL	4020	6/01/13	0	.0	2.5	.0
LUCKY STRIKE SNOTEL	4970	6/01/13	0	.0	.0	.0
MADISON BUTTE SNOTEL	5150	6/01/13	0	.0	.0	.0
MARION FORKS SNOTEL	2590	6/01/13	0	.0	.0	.0
MCKENZIE SNOTEL	4770	6/01/13	5	2.9	21.3	15.2
MILKSHAKES SNOTEL	5580	6/01/13	25	11.8	22.7	--
MILLER WOODS SNOTEL	420	6/01/13	0	.0	.0	--
MOSS SPRINGS SNOTEL	5760	6/01/13	0	.0	.0	.2
MT HOOD TEST SNOTEL	5370	6/01/13	61	29.1	50.4	48.1
MT HOWARD SNOTEL	7910	6/01/13	14	6.1	6.1	6.0
MUD RIDGE SNOTEL	4070	6/01/13	0	.0	4.3	.0
NEW CRESCENT SNOTEL	4910	6/01/13	0	.0	.0	.0
NORTH FK RES SNOTEL	3060	6/01/13	0	.0	4.3	.0
OCHOCO MEADOW SNOTEL	5430	6/01/13	0	.0	.0	.0
PEAVINE RIDGE SNOTEL	3420	6/01/13	0	.0	.0	.0
QUARTZ MTN SNOTEL	5720	6/01/13	0	.0	.0	.0
R.R. OVERPASS SNOTEL	2680	6/01/13	0	.0	.0	.0
RED HILL SNOTEL	4410	6/01/13	14	10.1	33.9	13.5
ROARING RIVER SNOTEL	4950	6/01/13	0	.0	.0	.0
ROCK SPRINGS SNOTEL	5290	6/01/13	0	.0	.0	.0
SADDLE MTN SNOTEL	3110	6/01/13	0	.0	.0	--

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	MEDIAN 81-10
<b>Oregon (continued)</b>						
SALT CK FALLS SNOTEL	4220	6/01/13	0	.0	.0	.0
SANTIAM JCT. SNOTEL	3740	6/01/13	0	.0	.0	.0
SCHNEIDER MDW SNOTEL	5400	6/01/13	0	.0	.0	.0
SEINE CREEK SNOTEL	2060	6/01/13	0	.0	.0	.0
SEVENMILE MARSH SNTL	5700	6/01/13	0	.0	.0	.0
SILVER CREEK SNOTEL	5740	6/01/13	0	.0	.0	.0
SILVIES SNOTEL	6990	6/01/13	0	.0	.0	.0
SMITH RIDGE SNOTEL	3330	6/01/13	0	.0	.0	--
SNOW MTN SNOTEL	6220	6/01/13	0	.0	.0	.0
SF BULL RUN SNOTEL	2690	6/01/13	0	.0	.0	.0
STARR RIDGE SNOTEL	5250	6/01/13	0	.0	.0	.0
STRAWBERRY SNOTEL	5770	6/01/13	0	.0	.0	.0
SUMMER RIM SNOTEL	7080	6/01/13	0	.0	.0	.0
SUMMIT LAKE SNOTEL	5610	6/01/13	39	19.6	30.5	30.5
SUN PASS SNOTEL	5400	6/01/13	0	.0	.0	--
SWAN LAKE MTN SNOTEL	6830	6/01/13	0	.0	.0	--
TAYLOR BUTTE SNOTEL	5030	6/01/13	0	.0	.0	.0
TAYLOR GREEN SNOTEL	5740	6/01/13	0	.0	.0	.0
THREE CK MEAD SNOTEL	5690	6/01/13	0	.0	.0	.0
TIPTON SNOTEL	5150	6/01/13	0	.0	.0	.0
TOKETEE AIRSTRIP SN	3240	6/01/13	0	.0	.0	.0
WOLF CREEK SNOTEL	5630	6/01/13	0	.0	.0	.0
<b>California</b>						
ADIN MTN SNOTEL	6190	6/01/13	0	.0	.0	.0
CEDAR PASS SNOTEL	7030	6/01/13	0	.0	.0	.0
CROWDER FLAT SNOTEL	5170	6/01/13	0	.0	.0	.0
DISMAL SWAMP SNOTEL	7360	6/01/13	0	.0	.0	4.2
<b>Idaho</b>						
MUD FLAT SNOTEL	5730	6/01/13	0	.0	.0	.0
SOUTH MTN SNOTEL	6500	6/01/13	0	.0	.0	.0
<b>Nevada</b>						
BEAR CREEK SNOTEL	7800	6/01/13	0	.0	.0	.1
BIG BEND SNOTEL	6700	6/01/13	1	.1	.0	.0
BUCKSKIN,L SNOTEL	6700	6/01/13	3	2.1	.0	.0
DISASTER PEAK SNOTEL	6500	6/01/13	0	.0	.0	.0
FAWN CREEK SNOTEL	7050	6/01/13	1	1.5	.0	.0
GRANITE PEAK SNOTEL	7800	6/01/13	0	.0	.0	1.5
JACK CREEK, U SNOTEL	7280	6/01/13	1	.2	.0	.0
LAMANCE CREEK SNOTEL	6000	6/01/13	0	.0	.0	.0
LAUREL DRAW SNOTEL	6700	6/01/13	0	.0	.0	.0
SEVENTYSIX CK SNOTEL	7100	6/01/13	0	.0	.0	.0
TAYLOR CANYON SNOTEL	6200	6/01/13	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) 414-3270**

**Web site: <http://www.or.nrcs.usda.gov/snow/index.html>**

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

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

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

# Interpreting Water Supply Forecasts

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

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

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

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

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

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

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

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

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

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

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

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

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

## Using the Forecasts - an Example

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

**Using the 90 and 70 Percent Exceedance Forecasts.** If an unexpected shortage of water could cause problems (such as irrigated agriculture), users might want to plan on receiving 3.3 KAF (from the 70 percent exceedance forecast). There is a 30% chance of receiving *less* than 3.3 KAF.

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

**Using the 30 or 10 Percent Exceedance Forecasts.** If an unexpected excess of water could cause problems (such as operating a flood control reservoir), users might plan on receiving 5.5 KAF (from the 30 percent exceedance forecast). There is a 30% chance of receiving *more* than 5.5 KAF.

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

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**JOHN DAY BASIN**  
**Streamflow Forecasts - February 1, 2013**

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

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

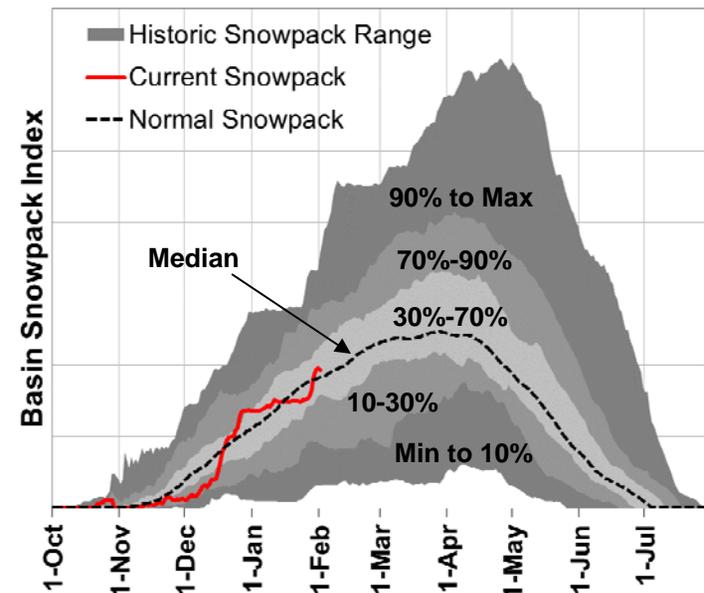
## Interpreting Snowpack Plots

The basin snowpack plots use daily SNOTEL data to show how the current year's snowpack data compares to historic snowpack 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 basin snowpack index is calculated using many sites in each basin. The dark gray shading indicates the historic range of the basin snowpack index, from minimum to maximum for the period of record. The medium gray shading indicates the 10% to 90% range of the basin snowpack index, while the light gray shading indicates the 30% to 70% range of the basin snowpack index. For instance, the 90% line indicates that the snowpack index has been below this line for 90% 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



USDA Natural Resources Conservation Service  
1201 NE Lloyd Suite 900  
Portland, OR 97232-1274

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Official Business



This publication may be found online at:  
<http://www.or.nrcs.usda.gov/snow/watersupply/>

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

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

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**Oregon Snow Survey staff**  
[oregon-snow-office@or.usda.gov](mailto:oregon-snow-office@or.usda.gov) or 503-964-6622