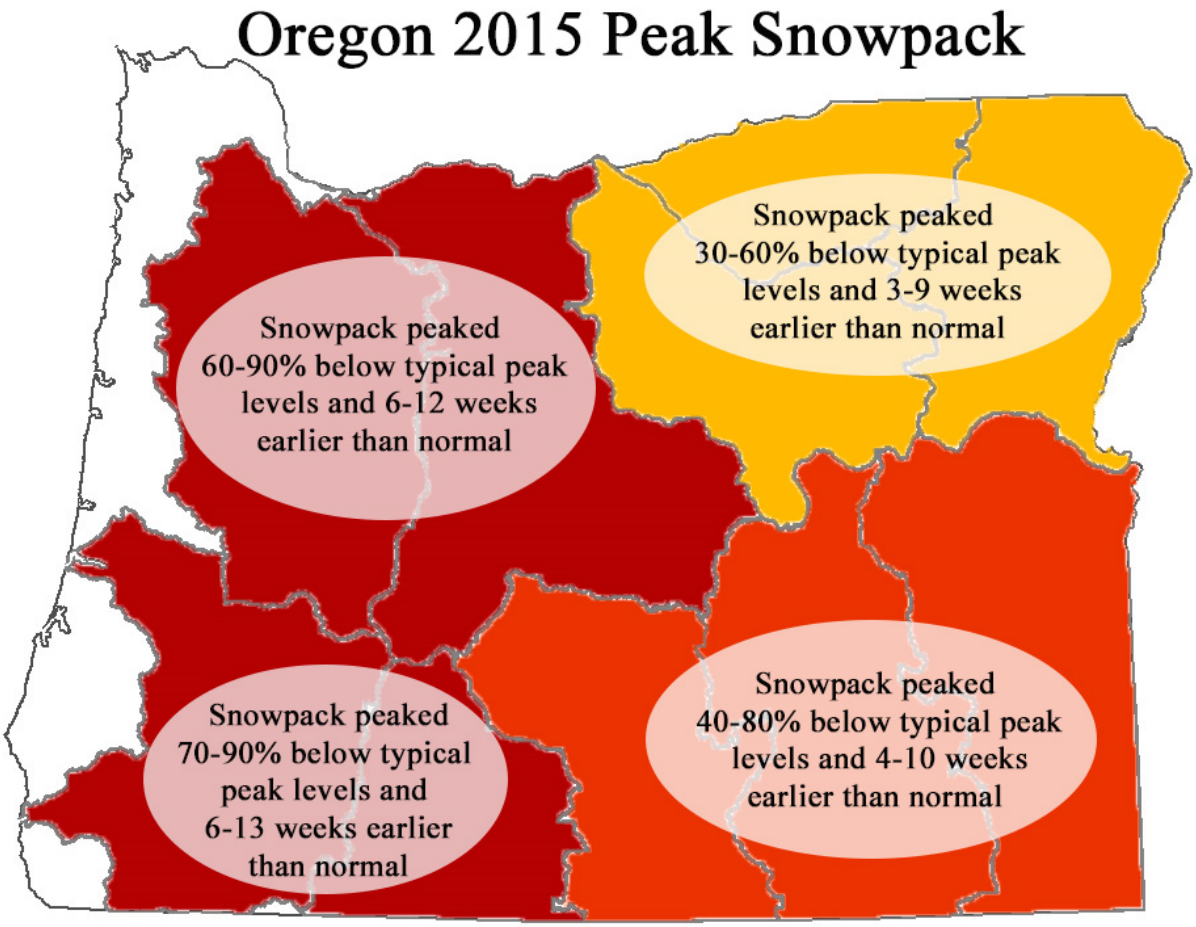
United States
Department of
Agriculture

Natural Resources
Conservation
Service

# Oregon
# Basin Outlook Report

## May 1, 2015




**Across Oregon, much of the winter's precipitation fell as rain rather than as snow, causing sixty percent of the long-term snowpack monitoring sites to set new records for the lowest and earliest peak snowpack in over 30 years. Due to the warm mountain temperatures, one third of snow monitoring sites in the state didn't receive enough snow to build a lasting snowpack at all this year. The current snowpack deficit means that the mountains are missing several feet of water, normally frozen in the high elevation snowpack, that usually serves as a natural reservoir to feed streams and rivers throughout the summer. Because of the record low snowpack, water users depending on streamflow without access to reservoir storage should expect water shortages this summer.**

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# General Outlook

## May 1, 2015

### SUMMARY

The winter of 2015 will go down in Oregon's history books as the year that was dominated by bare ground in the mountains. As of May 1, the statewide snowpack was 11% of normal and only 15 out of 112 snow monitoring stations had any snow left at all. Throughout the winter, Oregon's snowpack was confined to the highest of elevations and was well below normal across the entire state. Sixty percent of the long-term snowpack monitoring sites set records for the lowest peak snowpack levels as well as the earliest peak dates since measurements began over 30 years ago. One third of the snow measurement sites in the state didn't receive enough snow to build a seasonal snowpack this year at all. Because the snowpack levels peaked well below normal across the state, there is a mountain snowpack deficit that amounts to several feet of frozen water that would typically be stored in the snowpack, but is not present this year. Oregon's streams and rivers that depend on this snowpack for summer flows will be significantly lower than normal this year.

Warm winter temperatures across Oregon are to blame for the record low snowpack experienced this winter. If mountain temperatures had been colder, Oregon's snowpack would likely have been much closer to normal. Instead, winter precipitation often fell as rain in the mountains, leading to near average precipitation totals (Oct 1 - May 1) and one of the lowest state-wide snowpacks on record. Many of Oregon's irrigation reservoirs captured the winter rain, which will help provide a buffer to water users with access to reservoir water. However, rain is not an acceptable substitute for a snowpack. Rainfall timing and amounts are only predictable a few days ahead of time and it moves through the system quickly; whereas snowpack is a measurable frozen reservoir of water that can be counted on for water supply and streamflow during spring and summer.

Most of Oregon is included in the moderate to severe drought category for this summer; and SE Oregon is in the extreme drought category, according to the National Drought Monitor: http://droughtmonitor.unl.edu/. This means that there will likely be water shortages this summer; especially for water users that depend on streamflow that is not tied to a reservoir. As of May 1, Governor Brown has declared a drought state of emergency for the following counties, with more likely to follow: Klamath, Lake, Malheur, Harney, Crook, Baker, and Wheeler. Water users should brace for a dry and hot summer with limited water supplies.

### SNOWPACK

A rare and unusual winter occurred in Oregon this year. Winter was only felt at Oregon's highest elevations and elsewhere received more rainfall instead of snow accumulation. The following facts explain the unusual snowpack conditions experienced during the winter of 2015:

- More than half of all the long-term snowpack monitoring stations in Oregon peaked at their lowest level on record and also peaked earlier in the winter than in any time in the last 30 years.
- The state-wide snowpack set new record lows replacing the previous lows of 1977, 1981, 1992 and 2005.
- Only 15 out of 112 sites have any snow at all as of May 1 and this remaining snow is melting rapidly.
- The sites that were snow-free on May 1 melted many weeks earlier than usual.

- One third of long-term snowpack monitoring sites did not receive enough snow to accumulate a seasonal snowpack this winter. These sites were primarily snow-free throughout the winter.
- Most of Oregon had snow on the ground at only the higher elevations this winter and the snowpack peaked 40-90% below typical peak levels.
- Northeastern Oregon had the most snow coverage this season but the snowpack still peaked 30-60% below typical peak levels.

Late April brought some snow in the higher elevations and the coldest sustained temperatures felt since December. However, the snow that fell in late April was too little and too late to fill the snowpack void left behind from Oregon's lack of winter. Warm temperatures during winter storms this season resulted in more rain falling than snow in the Cascades. Only the highest of elevations held onto a veneer of a snowpack this year; albeit record or near record low.

Standing on bare ground in the mountains of Oregon during late winter and early spring left nature and humans confused about the season. Mosquitos and budding trees were observed in February following heavy rains and snowmelt. The lack of a normal winter snowpack not only disrupts our senses but also causes earlier drying of mountain soils, strain on plants, increased threat of wildfire, low summer streamflows and the potential for significant water shortages during the irrigation season.

## PRECIPITATION

April was another drier than normal month across the state, with monthly precipitation ranging from 41% of normal in northeastern Oregon to 80% of normal in the Owyhee and Malheur basins. Since the water year began on October 1, the mountains have received just slightly below average amounts of precipitation. October through December brought well above average precipitation to the state but the January through April period was below normal. Had the temperatures been cold enough, the state-wide snowpack would likely be near normal even with below normal precipitation amounts that fell over the last few months. In a normal year, that season's worth of precipitation would be stored in the snowpack and slowly released during the dry season. Unfortunately, this year that precipitation fell as rain and has already moved through the system.

## RESERVOIRS

Because the mountains are mostly snow-free as of May 1, reservoir storage is extremely critical for water users this summer. Despite the record low snowpack, winter rainfall brought enough moisture that some of Oregon's major reservoirs are storing nearly the same amount as last year or better. Reservoirs that have benefitted the most are located in the Upper Deschutes and Crooked River basins. Most of the reservoirs in this basin are storing near their capacity and near average amounts of water for this time of year. Owyhee, Malheur and Harney basins are storing the lowest amounts in the state with respect to capacity ranging from 19% of capacity in Drews reservoir up to 62% in Beulah Reservoir. Elsewhere, there is quite a bit of variability in reservoir storage within each basin. For example in the Rogue and Umpqua basins, current storage ranges from 42% of capacity at Howard Prairie up to 99% in the Lost Creek Reservoir. If Oregon's reservoirs were solely dependent on this year's historic low snowpack, they would be storing much less water. As it is, further reservoir filling will be dependent on spring and summer rainfall as the majority of the high country has already shed its snow.

## STREAMFLOW

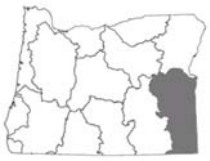
Many of Oregon's rivers have already experienced peak flows this season. In western and southwestern Oregon, streamflow peaks occurred during a rain-on-snow event in February while other regions saw peak flows occur as early as December. Normally, most of Oregon's rivers experience peak flows during snowmelt in May through July. With the vast majority of Oregon being snow free as of May 1, rivers are well into recession and will not see increased flow until precipitation returns to the region in the fall.

According to the USGS, much of the state is currently experiencing streamflows that are at or below the 10th percentile. These conditions are not expected to improve. If the warm and dry conditions persist, some rivers and streams are likely to hit new record low flows by the end of summer. In extreme years such as this, forecast models may not capture the full range of uncertainty in their predictions. However, the snowpack and temperature trends this season make it very clear that streamflows will be well below normal throughout the state this summer.

A summary of streamflow forecasts for Oregon follows:

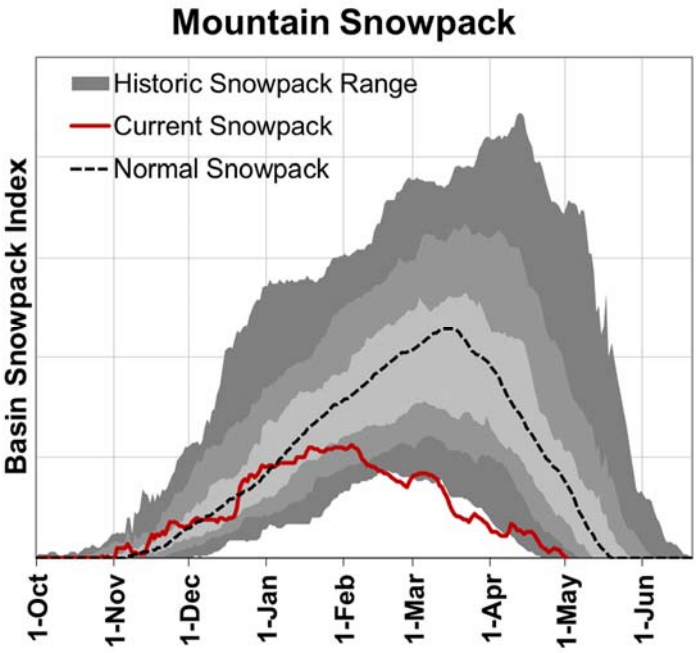
| STREAM | Median Forecast (May through September) | |
|---|---|---|
| | Volume (Acre-Feet) | Percent of Average |
| Owyhee Reservoir Inflow | 61,000 | 25 |
| Grande Ronde R at Troy | 450,000 | 48 |
| Umatilla R at Pendleton | 43,000 | 54 |
| Deschutes R at Benham Falls | 295,000 | 71 |
| Willamette R at Salem | 1,920,000 | 64 |
| Rogue R at Raygold | 315,000 | 55 |
| Upper Klamath Lake Inflow | 130,000 | 41 |
| Silvies R nr Burns | 3,900 | 8 |

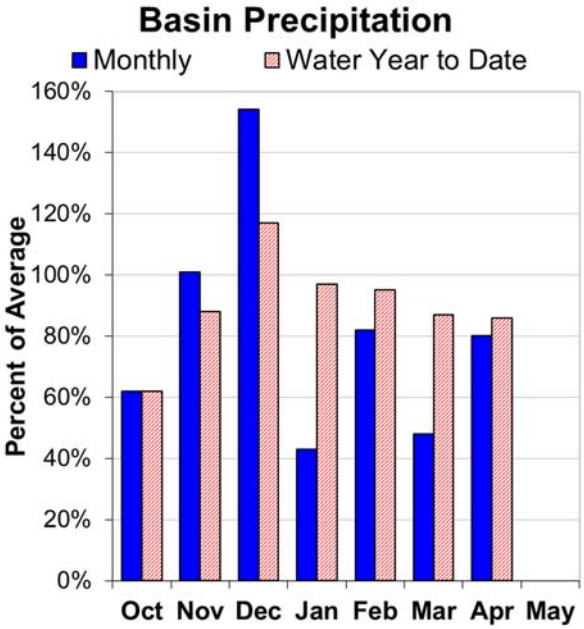
Some of these forecasts assume that normal weather conditions will occur from now to the end of the forecast period. This report contains data furnished by the Oregon Department of Water Resources, U.S. Geological Survey, NOAA National Weather Service and other cooperators. This report will be updated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



# Owyhee and Malheur Basins

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, all 18 snow monitoring sites in the basin were snow-free. The snowpack in this region peaked significantly below normal this winter. In general, SNOTEL sites in the basin peaked 40 to 70% below typical peak snowpack levels and many weeks earlier than normal.

### PRECIPITATION

April precipitation was 80% of average, the highest in the state. Precipitation since the beginning of the water year (October 1 - May 1) has been 86% of average.

### RESERVOIR

Reservoir storage across the basin is currently well below average. As of May 1, storage at major reservoirs in the basin ranges from 36% of average at Lake Owyhee and Warm Springs Reservoir to 76% of average at Beulah Reservoir.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 15% to 40% of average for the May through September period. Forecasted streamflow volumes fall in the lowest quarter of observed streamflows since 1981. Water managers in the basin should expect significant water shortages this summer.

# Owyhee And Malheur Basins Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| Owyhee R nr Rome | MAY-JUL | 0.16 | 8.0 | 20 | 11% | 37 | 73 | 188 |
| | MAY-SEP | 2.1 | 14.8 | 30 | 15% | 50 | 90 | 205 |
| Owyhee R bl Owyhee Dam[2] | MAY-JUL | 9.0 | 24 | 38 | 18% | 55 | 87 | 210 |
| | MAY-SEP | 22 | 43 | 61 | 25% | 83 | 121 | 240 |
| Malheur R nr Drewsey | MAY-JUL | 0.42 | 2.9 | 5.8 | 16% | 9.8 | 17.5 | 37 |
| | MAY-SEP | 0.54 | 3.2 | 6.3 | 17% | 10.5 | 18.5 | 38 |
| NF Malheur R at Beulah | MAY-JUL | 6.3 | 10.1 | 13.2 | 39% | 16.6 | 22 | 34 |
| | MAY-SEP | 8.4 | 12.6 | 16.0 | 40% | 19.8 | 26 | 40 |

Forecast Exceedance Probabilities for Risk Assessment *

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

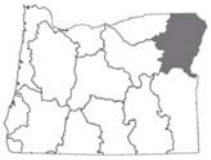
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

| Reservoir Storage | Current (KAF) | Last Year (KAF) | Average (KAF) | Useable Capacity (KAF) |
|---|---|---|---|---|
| Beulah | 37.1 | 38.9 | 49.0 | 60.0 |
| Bully Creek | 15.5 | 16.4 | 25.3 | 30.0 |
| Lake Owyhee | 193.2 | 184.1 | 533.1 | 715.0 |
| Warm Springs | 45.4 | 55.9 | 126.8 | 191.0 |

| Snowpack Summary by Basin | # of Sites | Basin Snowpack % of 30-Year Median Current Yr | Last Yr |
|---|---|---|---|
| East Little Owyhee Basin | 2 | 0% | 41% |
| South Fork Owyhee Basin | 4 | 0% | 57% |
| Upper Malheur Basin | 3 | 0% | 61% |
| Upper Owyhee Basin | 5 | 0% | 57% |

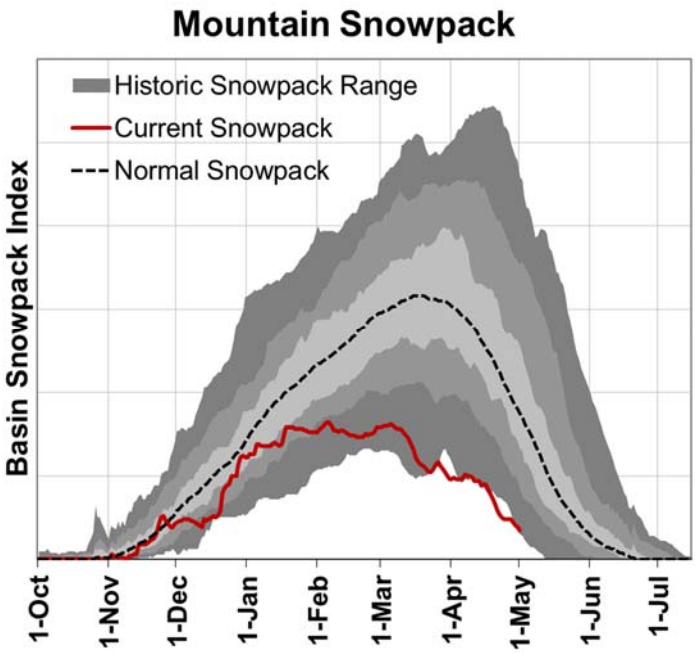
# Owyhee And Malheur Basins Summary for May 1, 2015

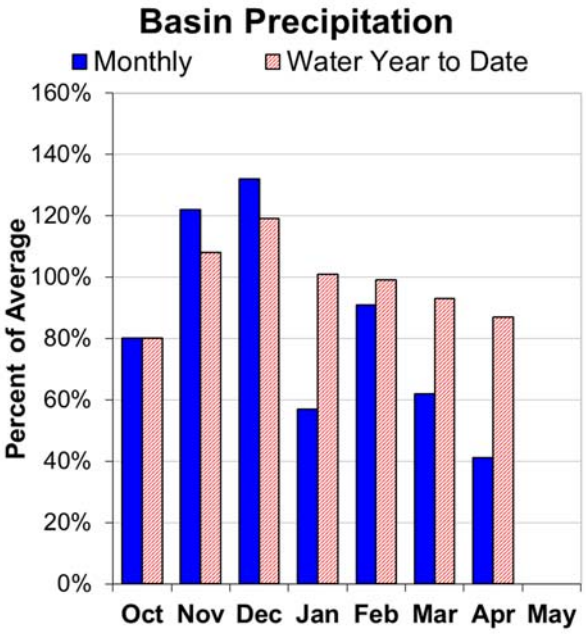
| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Granite Peak SNOTEL | 8543 | 1-May | 0 | 0.0 | 8.1 | 19.5 | 0% |
| Trout Creek AM | 7890 | 1-May | 0 | 0.0 | 4.0 | | |
| Toe Jam SNOTEL | 7700 | 1-May | 0 | 0.0 | 0.7 | | |
| Govt Corrals AM | 7400 | 1-May | 0 | 0.0 | 4.0 | | |
| Jack Creek Upper SNOTEL | 7250 | 1-May | 0 | 0.0 | 8.8 | 14.4 | 0% |
| Fawn Creek SNOTEL | 7000 | 1-May | 0 | 0.0 | 5.9 | 11.4 | 0% |
| Buckskin Lower SNOTEL | 6915 | 1-May | 0 | 0.0 | 0.0 | 0.2 | 0% |
| Big Bend SNOTEL | 6700 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Fry Canyon SNOTEL | 6700 | 1-May | 0 | 0.0 | | | |
| Laurel Draw SNOTEL | 6697 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| South Mtn. SNOTEL | 6500 | 1-May | 0 | 0.0 | 0.0 | 5.6 | 0% |
| Taylor Canyon SNOTEL | 6200 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Blue Mountain Spring SNOTEL | 5870 | 1-May | 0 | 0.0 | 3.5 | 5.7 | 0% |
| Mud Flat SNOTEL | 5730 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Reynolds Creek SNOTEL | 5600 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Rock Springs SNOTEL | 5290 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Lake Creek R.S. SNOTEL | 5240 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Taylor Butte SNOTEL | 5030 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |



# Grande Ronde, Powder, Burnt and Imnaha Basins

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 19% of normal and 16 out of the 23 snow monitoring sites in the basin were snow-free. The snowpack in this region peaked significantly below normal this winter. In general, SNOTEL sites in the basin peaked 30 to 60% below typical peak snowpack levels and 3 to 7 weeks earlier than normal. Two long-term monitoring sites in the basin set new record lows for May 1 snowpack (Schneider Meadows SNOTEL and TV Ridge AM). TV Ridge was snow free for the first time since records began in 1965. In addition, Aneroid Lake, Bowman Springs, and Wolf Creek SNOTEL experienced their lowest snowpack peak levels on record.

### PRECIPITATION

April precipitation was 41% of average, the lowest in the state. Precipitation since the beginning of the water year (October 1 - May 1) has been 87% of average.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 59% of average at Phillips Lake Reservoir to 157% of average at Wallowa Lake Reservoir.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 12% to 67% of average for the May through September period. Water managers in the basin should expect significant water shortages this summer.

# Grande Ronde, Powder, Burnt And Imnaha Basins Summary for May 1, 2015

| | | Forecast Exceedance Probabilities for Risk Assessment * | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| **Streamflow Forecasts May 1, 2015** | **Forecast Period** | **90% (KAF)** | **70% (KAF)** | **50% (KAF)** | **50% % Avg** | **30% (KAF)** | **10% (KAF)** | **30-Yr Avg (KAF)** |
| Burnt R nr Hereford | MAY-JUL | 0.00 | 0.48 | 1.33 | 9% | 2.6 | 5.3 | 14.7 |
| | MAY-SEP | 0.08 | 0.87 | 1.91 | 12% | 3.4 | 6.2 | 16.4 |
| Deer Ck nr Sumpter | MAY-JUL | 0.45 | 1.42 | 2.4 | 24% | 3.5 | 5.7 | 9.8 |
| Powder R nr Sumpter | MAY-JUL | 5.4 | 9.3 | 12.5 | 35% | 16.2 | 22 | 36 |
| | MAY-SEP | 5.8 | 9.8 | 13.1 | 35% | 16.8 | 23 | 37 |
| Wolf Ck Reservoir Inflow[2] | MAY-JUN | 0.48 | 1.19 | 1.86 | 20% | 2.7 | 4.2 | 9.1 |
| Pine Ck nr Oxbow | MAY-JUL | 20 | 31 | 40 | 36% | 50 | 67 | 112 |
| | MAY-SEP | 22 | 34 | 43 | 36% | 53 | 70 | 118 |
| Imnaha R at Imnaha | MAY-JUL | 52 | 75 | 93 | 47% | 113 | 147 | 200 |
| | MAY-SEP | 62 | 86 | 105 | 48% | 126 | 161 | 220 |
| Catherine Ck nr Union | MAY-JUL | 14.8 | 18.9 | 22 | 48% | 25 | 31 | 46 |
| | MAY-SEP | 16.5 | 21 | 24 | 48% | 27 | 33 | 50 |
| Lostine R nr Lostine | MAY-JUL | 50 | 60 | 66 | 67% | 72 | 82 | 98 |
| | MAY-SEP | 53 | 64 | 71 | 67% | 78 | 89 | 106 |
| Bear Ck nr Wallowa | MAY-SEP | 20 | 25 | 28 | 50% | 31 | 37 | 56 |
| Grande Ronde R at Troy[1] | MAY-JUL | 250 | 330 | 395 | 46% | 465 | 575 | 860 |
| | MAY-SEP | 295 | 385 | 450 | 48% | 520 | 635 | 945 |

* 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)** | **Useable Capacity (KAF)** |
|---|---|---|---|---|
| Phillips Lake | 31.1 | 36.4 | 52.6 | 73.5 |
| Thief Valley | 12.3 | 13.6 | 15.3 | 17.4 |
| Unity | 24.7 | 25.0 | 24.1 | 25.2 |
| Wallowa Lake | 31.7 | 26.2 | 20.2 | 37.5 |
| Wolf Creek | 6.6 | 9.4 | 8.7 | 10.4 |

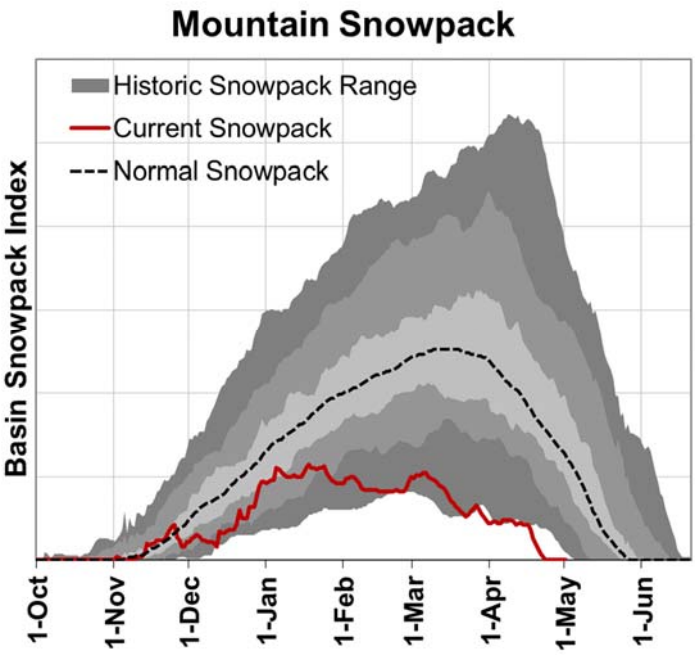
| **Snowpack Summary by Basin** | | **Basin Snowpack % of 30-Year Median** | |
|---|---|---|---|
| | **# of Sites** | **Current Yr** | **Last Yr** |
| Burnt Basin | 2 | 0% | 55% |
| Imnaha Basin | 4 | 37% | 108% |
| Lower Grande Ronde Basin | 4 | 0% | 102% |
| Powder Basin | 8 | 18% | 114% |
| Upper Grande Ronde Basin | 8 | 21% | 131% |
| Wallowa Basin | 5 | 30% | 115% |

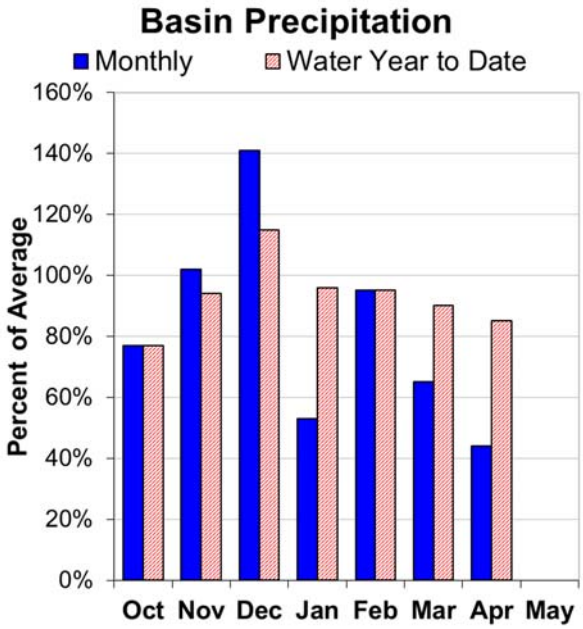
# Grande Ronde, Powder, Burnt And Imnaha Basins Summary for May 1, 2015

| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Mt. Howard SNOTEL | 7910 | 1-May | 16 | 8.0 | 23.0 | 16.8 | 48% |
| Aneroid Lake #2 SNOTEL | 7400 | 1-May | 39 | 14.9 | 26.1 | 25.2 | 59% |
| Anthony Lake (Rev) Snow Course | 7160 | 1-May | 28 | 11.0 | 34.0 | 25.9 | 42% |
| Tv Ridge AM | 7050 | 1-May | 0 | 0.0 | 15.1 | 19.5 | 0% |
| Big Sheep AM | 6230 | 1-May | 16 | 6.0 | 19.2 | 19.2 | 31% |
| Bear Saddle SNOTEL | 6180 | 1-May | 0 | 0.0 | 8.4 | 10.3 | 0% |
| Bourne SNOTEL | 5850 | 1-May | 0 | 0.0 | 4.4 | 4.7 | 0% |
| Moss Springs SNOTEL | 5760 | 1-May | 9 | 4.3 | 27.7 | 18.5 | 23% |
| Taylor Green SNOTEL | 5740 | 1-May | 0 | 0.0 | 11.9 | 10.0 | 0% |
| Spruce Springs SNOTEL | 5700 | 1-May | 0 | 0.0 | 8.5 | 5.1 | 0% |
| Wolf Creek SNOTEL | 5630 | 1-May | 0 | 0.0 | 7.4 | 6.9 | 0% |
| Milk Shakes SNOTEL | 5580 | 1-May | 26 | 11.2 | 39.3 | | |
| West Branch SNOTEL | 5560 | 1-May | 0 | 0.0 | 12.1 | 8.9 | 0% |
| Touchet SNOTEL | 5530 | 1-May | 0 | 0.0 | 23.9 | 21.8 | 0% |
| Eilertson Meadows SNOTEL | 5510 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Gold Center SNOTEL | 5410 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Schneider Meadows SNOTEL | 5400 | 1-May | 2 | 0.5 | 16.3 | 17.3 | 3% |
| Beaver Reservoir SNOTEL | 5150 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Tipton SNOTEL | 5150 | 1-May | 0 | 0.0 | 1.1 | 2.0 | 0% |
| High Ridge SNOTEL | 4920 | 1-May | 0 | 0.0 | 14.0 | 11.0 | 0% |
| County Line SNOTEL | 4830 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Bowman Springs SNOTEL | 4530 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Sourdough Gulch SNOTEL | 4000 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |

# Umatilla, Walla Walla, and Willow Basins

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, 8 out of the 9 snow monitoring sites in the basin were snow-free. The snowpack in this region peaked significantly below normal this winter. In general, SNOTEL sites in the basin peaked 50 to 60% below typical peak snowpack levels and 4 to 9 weeks earlier than normal. In addition, Arbuckle Mtn and Bowman Springs SNOTEL sites experienced their lowest snowpack peak levels on record.

### PRECIPITATION

April precipitation was 44% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 85% of average.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 57% of average at Cold Springs Reservoir to 101% of average at Willow Creek Reservoir.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 29% to 69% of average for the May through September period. Forecasted streamflow volumes fall in the lowest quarter of observed streamflows since 1981. Water managers in the basin should expect water shortages this summer.

# Umatilla, Walla Walla And Willow Basins Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| SF Walla Walla R nr Milton-Freewater | MAY-JUL | 17.0 | 21 | 24 | 65% | 27 | 32 | 37 |
| | MAY-SEP | 26 | 31 | 34 | 69% | 38 | 43 | 49 |
| Umatilla R ab Meacham nr Gibbon | MAY-JUL | 12.1 | 19.0 | 25 | 60% | 31 | 42 | 42 |
| | MAY-SEP | 15.9 | 23 | 29 | 60% | 35 | 46 | 48 |
| Umatilla R at Pendleton | MAY-JUL | -2.30 | 23 | 41 | 55% | 59 | 84 | 74 |
| | MAY-SEP | -1.17 | 25 | 43 | 54% | 61 | 87 | 80 |
| McKay Ck nr Pilot Rock | MAY-SEP | 0.23 | 2.1 | 4.4 | 29% | 7.6 | 13.8 | 15.2 |
| Butter Ck nr Pine City | MAY-JUL | 0.50 | 1.44 | 2.4 | 47% | 3.5 | 5.6 | 5.1 |
| | MAY-SEP | 0.63 | 1.62 | 2.6 | 46% | 3.7 | 5.8 | 5.6 |
| Willow Ck ab Willow Lake nr Heppner | MAY-JUL | 0.29 | 0.90 | 1.50 | 37% | 2.2 | 3.6 | 4.1 |
| Rhea Ck nr Heppner | MAY-JUL | 0.18 | 0.78 | 1.44 | 35% | 2.3 | 3.9 | 4.1 |

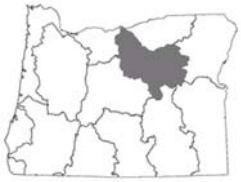
Forecast Exceedance Probabilities for Risk Assessment *

* 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) | Useable Capacity (KAF) |
|---|---|---|---|---|
| Cold Springs | 20.9 | 22.2 | 36.8 | 50.0 |
| Mckay | 50.0 | 65.5 | 53.3 | 73.8 |
| Willow Creek | 5.8 | 6.0 | 5.8 | 13.9 |

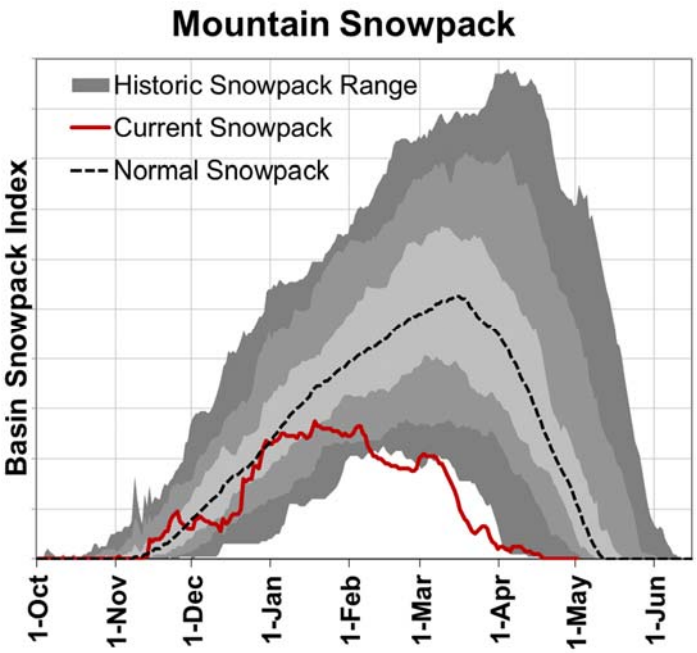
| Snowpack Summary by Basin | # of Sites | Basin Snowpack % of 30-Year Median Current Yr | Last Yr |
|---|---|---|---|
| Umatilla Basin | 5 | 0% | 84% |
| Walla Walla Basin | 7 | 0% | 97% |

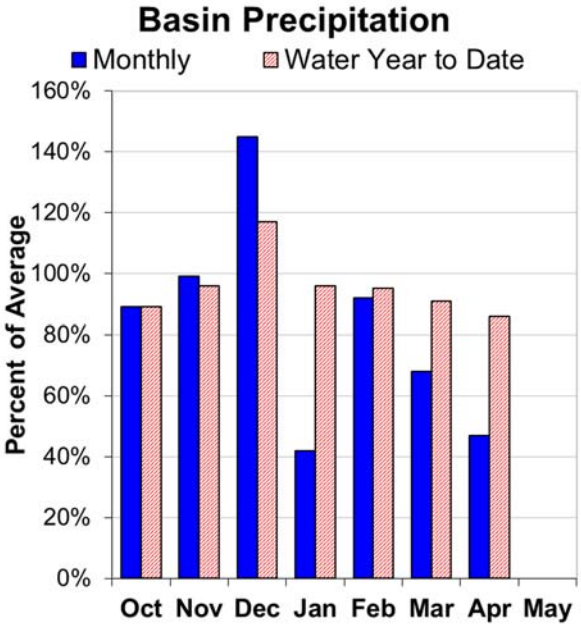
| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Arbuckle Mtn SNOTEL | 5770 | 1-May | 0 | 0.0 | 4.5 | 11.0 | 0% |
| Spruce Springs SNOTEL | 5700 | 1-May | 0 | 0.0 | 8.5 | 5.1 | 0% |
| Milk Shakes SNOTEL | 5580 | 1-May | 26 | 11.2 | 39.3 | | |
| Touchet SNOTEL | 5530 | 1-May | 0 | 0.0 | 23.9 | 21.8 | 0% |
| Madison Butte SNOTEL | 5150 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Lucky Strike SNOTEL | 4970 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| High Ridge SNOTEL | 4920 | 1-May | 0 | 0.0 | 14.0 | 11.0 | 0% |
| Bowman Springs SNOTEL | 4530 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Emigrant Springs SNOTEL | 3800 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |



# John Day Basin

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, only 1 out of 15 snow monitoring sites in the basin still had snow. The snowpack in this region peaked significantly below normal this winter. In general, SNOTEL sites in the basin peaked 40 to 60% below typical peak snowpack levels and 5 to 8 weeks earlier than normal. In addition, 5 SNOTEL sites in the basin experienced their earliest snowpack peaks on record.

### PRECIPITATION

April precipitation was 47% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 86% of average.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 10% to 52% of average for the May through September period. Forecasted streamflow volumes fall in the lowest third of observed streamflows since 1981. Water managers in the basin should expect significant water shortages this summer.

# John Day Basin Summary for May 1, 2015

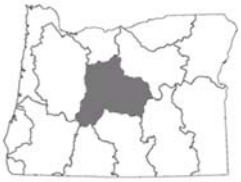
## Forecast Exceedance Probabilities for Risk Assessment *

| Streamflow Forecasts May 1, 2015 | Forecast Period | ←--------Drier---------- 90% (KAF) | 70% (KAF) | Future Conditions---------- 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) ----------Wetter--------→ | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| Strawberry Ck nr Prairie City | MAY-JUL | 2.5 | 3.3 | 3.8 | 52% | 4.5 | 5.4 | 7.3 |
| | MAY-SEP | 2.8 | 3.5 | 4.1 | 52% | 4.7 | 5.7 | 7.9 |
| Mountain Ck nr Mitchell | MAY-JUL | 0.02 | 0.14 | 0.30 | 11% | 0.51 | 0.93 | 2.8 |
| | MAY-SEP | 0.02 | 0.15 | 0.30 | 10% | 0.51 | 0.92 | 2.9 |
| Camas Ck nr Ukiah | MAY-JUL | 2.5 | 4.9 | 6.9 | 41% | 9.3 | 13.5 | 17.0 |
| | MAY-SEP | 2.8 | 5.3 | 7.3 | 41% | 9.7 | 13.9 | 17.7 |
| MF John Day R at Ritter | MAY-JUL | 10.6 | 19.9 | 28 | 37% | 37 | 53 | 75 |
| | MAY-SEP | 12.2 | 22 | 30 | 38% | 40 | 56 | 80 |
| NF John Day R at Monument | MAY-JUL | 51 | 97 | 136 | 38% | 182 | 260 | 355 |
| | MAY-SEP | 56 | 103 | 143 | 38% | 190 | 270 | 375 |

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

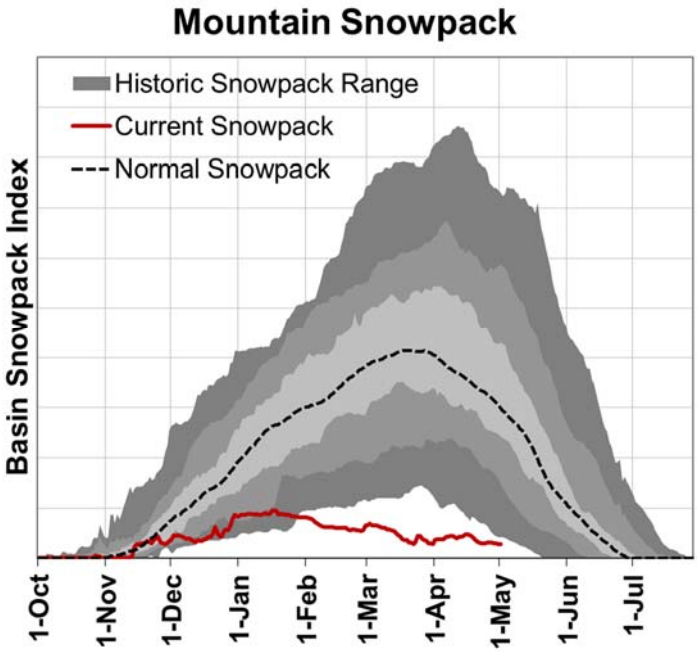
| Snowpack Summary by Basin | # of Sites | Basin Snowpack % of 30-Year Median Current Yr | Last Yr |
|---|---|---|---|
| Lower John Day Basin | 3 | 0% | 0% |
| North Fork John Day Basin | 8 | 25% | 101% |
| Upper John Day Basin | 5 | 0% | 57% |

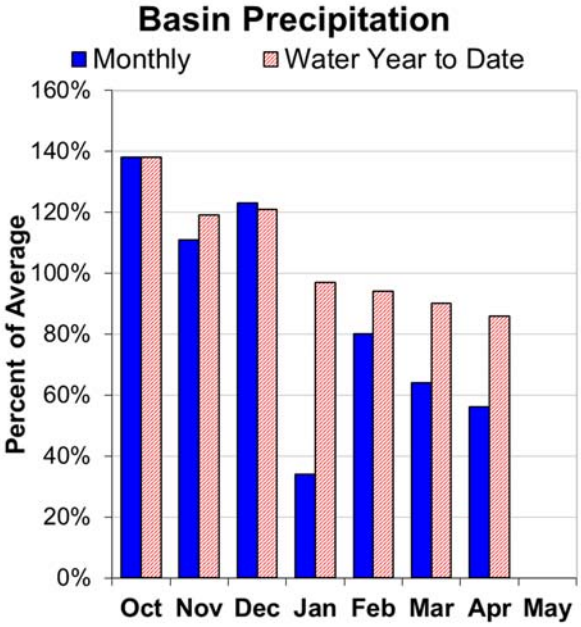
| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Anthony Lake (Rev) Snow Course | 7160 | 1-May | 28 | 11.0 | 34.0 | 25.9 | 42% |
| Snow Mountain SNOTEL | 6230 | 1-May | 0 | 0.0 | 3.0 | 4.2 | 0% |
| Blue Mountain Spring SNOTEL | 5870 | 1-May | 0 | 0.0 | 3.5 | 5.7 | 0% |
| Bourne SNOTEL | 5850 | 1-May | 0 | 0.0 | 4.4 | 4.7 | 0% |
| Derr. SNOTEL | 5850 | 1-May | 0 | 0.0 | 0.0 | 1.5 | 0% |
| Arbuckle Mtn SNOTEL | 5770 | 1-May | 0 | 0.0 | 4.5 | 11.0 | 0% |
| Ochoco Meadows SNOTEL | 5430 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Gold Center SNOTEL | 5410 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Starr Ridge SNOTEL | 5250 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Lake Creek R.S. SNOTEL | 5240 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Madison Butte SNOTEL | 5150 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Tipton SNOTEL | 5150 | 1-May | 0 | 0.0 | 1.1 | 2.0 | 0% |
| Lucky Strike SNOTEL | 4970 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| County Line SNOTEL | 4830 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Marks Creek Snow Course | 4580 | 1-May | 0 | 0.0 | | 0.0 | |



# Upper Deschutes and Crooked Basins

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, only 2 out of 17 snow monitoring sites in the basin still had snow. Almost all of the SNOTEL sites in the basin peaked at the lowest level and earliest date since records began over 30 years ago. In general, SNOTEL sites in the basin peaked 60 to 90% below typical peak snowpack levels and 6 to 12 weeks earlier than normal. Three long-term monitoring sites set new record lows for May 1 snowpack (Irish Taylor, McKenzie, and Summit Lake SNOTEL sites). McKenzie SNOTEL was snow-free for the first time since records began in 1982.

### PRECIPITATION

April precipitation was 56% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 86% of average.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 82% of average at Prineville Reservoir to 149% of average at Crescent Lake Reservoir.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 6% to 71% of average for the May through September period. Forecasted streamflow volumes fall in the lowest quarter of observed streamflows since 1981. Water managers in most of the basin should expect significant water shortages this summer.

# Upper Deschutes And Crooked Basins Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| Deschutes R bl Snow Ck | MAY-JUL | 5.1 | 8.1 | 10.6 | 44% | 13.3 | 18.0 | 24 |
| | MAY-SEP | 8.3 | 12.9 | 16.7 | 36% | 21 | 28 | 47 |
| Crane Prairie Reservoir Inflow[2] | MAY-JUL | 12.1 | 16.0 | 19.0 | 41% | 22 | 27 | 46 |
| | MAY-SEP | 19.8 | 26 | 30 | 39% | 35 | 42 | 77 |
| Crescent Lake Inflow[2] | MAY-JUL | 0.49 | 1.12 | 1.70 | 14% | 2.4 | 3.6 | 12.0 |
| | MAY-SEP | 0.01 | 0.34 | 0.82 | 6% | 1.49 | 2.8 | 14.4 |
| Little Deschutes R nr La Pine | MAY-JUL | 1.45 | 4.1 | 6.6 | 15% | 9.8 | 15.6 | 45 |
| | MAY-SEP | 0.73 | 3.3 | 6.1 | 12% | 9.8 | 16.7 | 51 |
| Deschutes R at Benham Falls[2] | MAY-JUL | 140 | 156 | 167 | 67% | 178 | 194 | 250 |
| | MAY-SEP | 260 | 280 | 295 | 71% | 310 | 330 | 415 |
| Wychus Ck nr Sisters | MAY-JUL | 13.9 | 16.7 | 18.7 | 62% | 21 | 23 | 30 |
| | MAY-SEP | 19.7 | 23 | 26 | 62% | 28 | 32 | 42 |
| Prineville Reservoir Inflow[2] | MAY-JUL | 0.01 | 1.42 | 3.8 | 10% | 7.3 | 14.6 | 39 |
| | MAY-SEP | 0.01 | 1.14 | 3.5 | 9% | 7.1 | 14.8 | 39 |
| Ochoco Reservoir Inflow[2] | MAY-JUL | 0.90 | 2.0 | 3.1 | 32% | 4.3 | 6.5 | 9.6 |
| | MAY-SEP | 0.47 | 1.40 | 2.3 | 25% | 3.4 | 5.6 | 9.1 |

Forecast Exceedance Probabilities for Risk Assessment *

* 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) | Useable Capacity (KAF) |
|---|---|---|---|---|
| Crane Prairie | 51.1 | 54.6 | 44.1 | 55.3 |
| Crescent Lake | 75.1 | 75.1 | 50.5 | 86.9 |
| Ochoco | 33.2 | 34.5 | 34.5 | 47.5 |
| Prineville | 116.5 | 150.7 | 142.9 | 153.0 |
| Wickiup | 180.9 | 192.1 | 184.5 | 200.0 |

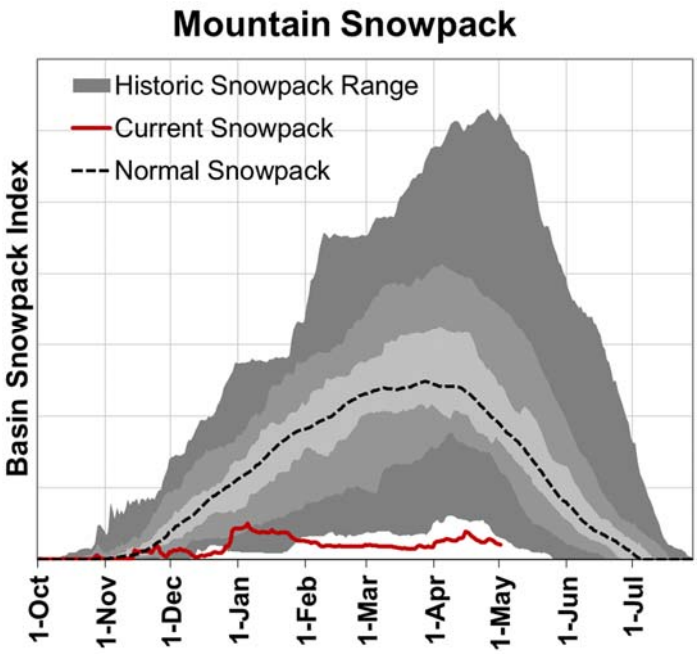
| Snowpack Summary by Basin | # of Sites | Basin Snowpack % of 30-Year Median Current Yr | Last Yr |
|---|---|---|---|
| Little Deschutes Basin | 4 | 17% | 63% |
| Upper Crooked Basin | 2 | 0% | 0% |
| Upper Deschutes Basin | 9 | 11% | 60% |

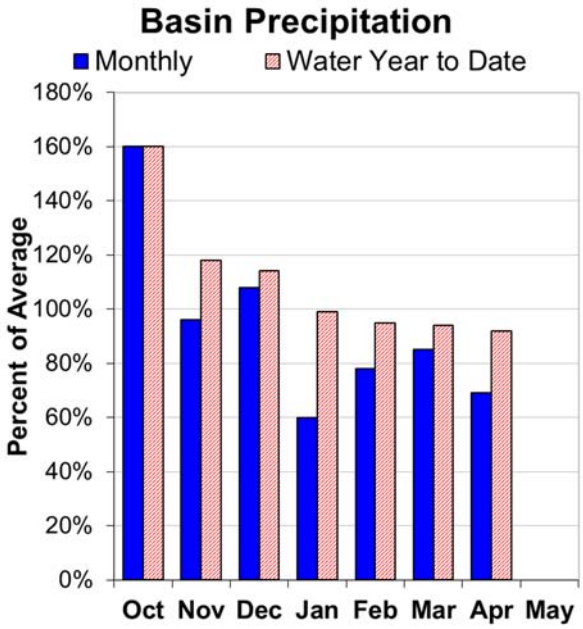
# Upper Deschutes And Crooked Basins Summary for May 1, 2015

| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Snow Mountain SNOTEL | 6230 | 1-May | 0 | 0.0 | 3.0 | 4.2 | 0% |
| Derr. SNOTEL | 5850 | 1-May | 0 | 0.0 | 0.0 | 1.5 | 0% |
| Three Creeks Meadow SNOTEL | 5690 | 1-May | 0 | 0.0 | 1.7 | 13.4 | 0% |
| Summit Lake SNOTEL | 5610 | 1-May | 29 | 11.4 | 27.7 | 40.8 | 28% |
| Bald Peter Snow Course | 5600 | 1-May | 0 | 0.0 | | 28.6 | 0% |
| Irish Taylor SNOTEL | 5540 | 1-May | 21 | 8.1 | 28.2 | 39.8 | 20% |
| Ochoco Meadows SNOTEL | 5430 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Racing Creek Snow Course | 5160 | 1-May | 0 | 0.0 | | 5.0 | 0% |
| Cascade Summit SNOTEL | 5100 | 1-May | 0 | 0.0 | 14.0 | 24.9 | 0% |
| Roaring River SNOTEL | 4950 | 1-May | 0 | 0.0 | 12.6 | 20.9 | 0% |
| New Crescent Lake SNOTEL | 4910 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Chemult Alternate SNOTEL | 4850 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Hogg Pass SNOTEL | 4790 | 1-May | 0 | 0.0 | 2.5 | 19.3 | 0% |
| Mckenzie SNOTEL | 4770 | 1-May | 0 | 0.0 | 26.1 | 35.1 | 0% |
| Marks Creek Snow Course | 4580 | 1-May | 0 | 0.0 | | 0.0 | |
| Salt Creek Falls SNOTEL | 4220 | 1-May | 0 | 0.0 | 0.7 | 10.1 | 0% |
| Santiam Jct. SNOTEL | 3740 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |

# Hood, Sandy, and Lower Deschutes Basins

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, only 2 out of 14 snow monitoring sites in the basin still had snow. Almost all of the SNOTEL sites in the basin peaked at the lowest level since records began over 30 years ago. In general, SNOTEL sites in the basin peaked 70 to 90% below typical peak snowpack levels and 6 to 12 weeks earlier than normal. Three long-term monitoring sites in the basin set new record lows for May 1 snowpack (Mt. Hood SNOTEL, Red Hill SNOTEL and Bald Peter snow course). Both Red Hill and Bald Peter were snow-free for the first time since records began in the 1970's. Normal snow water content for Red Hill is 39.8 inches and for Bald Peter is 28.6 inches. Mt. Hood SNOTEL had 16.4 inches of snow water content on May 1, while the 30-year normal is 62.0 inches.

### PRECIPITATION

April precipitation was 69% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 92% of average.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 52% to 56% of average for the May through September period. Forecasted streamflow volumes fall in the lowest quarter of observed streamflows since 1981. Water managers in the basin should expect water shortages this summer.

# Hood, Sandy And Lower Deschutes Basins Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| WF Hood River nr Dee | MAY-JUL | 29 | 36 | 41 | 53% | 46 | 55 | 78 |
| | MAY-SEP | 40 | 48 | 54 | 56% | 61 | 71 | 96 |
| Hood R at Tucker Bridge | MAY-JUL | 36 | 55 | 69 | 46% | 82 | 101 | 151 |
| | MAY-SEP | 58 | 82 | 98 | 52% | 113 | 137 | 190 |
| Sandy R nr Marmot | MAY-JUL | 74 | 93 | 108 | 51% | 123 | 148 | 210 |
| | MAY-SEP | 104 | 127 | 144 | 56% | 162 | 191 | 255 |

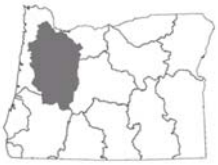
**Forecast Exceedance Probabilities for Risk Assessment ***

* 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) | Useable Capacity (KAF) |
|---|---|---|---|---|
| Clear Lake | 5.2 | 7.7 | 5.4 | 11.9 |

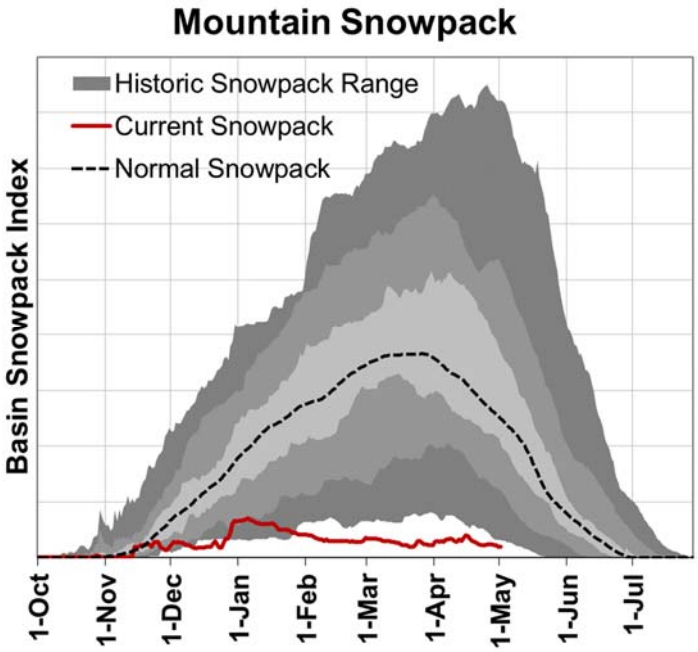
| Snowpack Summary by Basin | # of Sites | Basin Snowpack % of 30-Year Median Current Yr | Last Yr |
|---|---|---|---|
| Lower Columbia - Sandy Basin | 7 | 11% | 83% |
| Lower Deschutes Basin | 4 | 20% | 92% |
| Middle Columbia - Hood Basin | 6 | 10% | 83% |

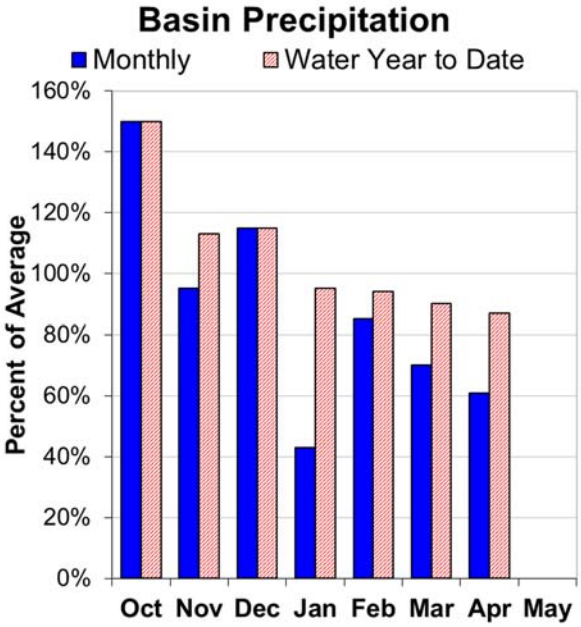
| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Bald Peter Snow Course | 5600 | 1-May | 0 | 0.0 | | 28.6 | 0% |
| Mt Hood Test Site SNOTEL | 5370 | 1-May | 36 | 16.4 | 58.5 | 62.0 | 26% |
| Racing Creek Snow Course | 5160 | 1-May | 0 | 0.0 | | 5.0 | 0% |
| Red Hill SNOTEL | 4410 | 1-May | 0 | 0.0 | 37.4 | 39.8 | 0% |
| Surprise Lakes SNOTEL | 4290 | 1-May | 1 | 0.3 | 36.5 | 42.6 | 1% |
| Beaver Creek #2 Snow Course | 4220 | 1-May | 0 | 0.0 | | 0.3 | 0% |
| Beaver Creek #1 Snow Course | 4210 | 1-May | 0 | 0.0 | | 7.6 | 0% |
| Mud Ridge SNOTEL | 4070 | 1-May | 0 | 0.0 | 16.4 | 17.8 | 0% |
| Clear Lake SNOTEL | 3810 | 1-May | 0 | 0.0 | 0.0 | 1.6 | 0% |
| Blazed Alder SNOTEL | 3650 | 1-May | 0 | 0.0 | 11.9 | 20.4 | 0% |
| Clackamas Lake SNOTEL | 3400 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Greenpoint SNOTEL | 3310 | 1-May | 0 | 0.0 | 0.0 | 1.2 | 0% |
| North Fork SNOTEL | 3060 | 1-May | 0 | 0.0 | 0.0 | 7.3 | 0% |
| South Fork Bull Run SNOTEL | 2690 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |



# Willamette Basin

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, only 2 out of 25 snow monitoring sites in the basin still had snow. Many of the SNOTEL sites in the basin peaked at their lowest level and earliest date since records began over 30 years ago. In general, SNOTEL sites in the basin peaked 70 to 90% below typical peak snowpack levels and 8 to 12 weeks earlier than normal.

### PRECIPITATION

April precipitation was 61% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 87% of average.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 51% of average at Lookout Point Reservoir to 101% of average at Henry Hagg Lake Reservoir.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 43% to 73% of average for the May through September period. Water managers in the basin should expect greatly limited water supplies this summer.

# Willamette Basin Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| Hills Creek Reservoir Inflow[1,2] | MAY-JUN | 32 | 55 | 67 | 44% | 81 | 115 | 152 |
| | MAY-SEP | 68 | 97 | 113 | 51% | 129 | 169 | 220 |
| MF Willamette R bl NF nr Oakridge[1,2] | MAY-JUN | 85 | 147 | 181 | 47% | 220 | 310 | 385 |
| | MAY-SEP | 172 | 250 | 290 | 53% | 335 | 445 | 550 |
| Lookout Point Reservoir Inflow[1,2] | MAY-JUN | 79 | 144 | 180 | 45% | 220 | 320 | 400 |
| | MAY-SEP | 178 | 260 | 300 | 53% | 345 | 460 | 570 |
| Fall Creek Reservoir Inflow[1,2] | MAY-JUN | 4.6 | 16.5 | 24 | 44% | 34 | 59 | 55 |
| | MAY-SEP | 8.6 | 23 | 32 | 50% | 43 | 72 | 64 |
| Cottage Grove Lake Inflow[1,2] | MAY-JUN | 1.55 | 6.2 | 9.2 | 47% | 13.0 | 23 | 19.6 |
| | MAY-SEP | 3.1 | 8.8 | 12.2 | 53% | 16.3 | 27 | 23 |
| Dorena Lake Inflow[1,2] | MAY-JUN | 2.3 | 15.2 | 25 | 37% | 37 | 71 | 67 |
| | MAY-SEP | 6.4 | 23 | 33 | 43% | 46 | 81 | 77 |
| McKenzie R bl Trail Bridge | MAY-JUN | 74 | 84 | 91 | 66% | 99 | 110 | 137 |
| | MAY-SEP | 166 | 184 | 196 | 73% | 210 | 230 | 270 |
| Cougar Lake Inflow[1,2] | MAY-JUN | 26 | 44 | 54 | 48% | 65 | 93 | 112 |
| | MAY-SEP | 53 | 77 | 90 | 56% | 103 | 135 | 160 |
| Blue Lake Inflow[1,2] | MAY-JUN | 3.2 | 10.9 | 15.9 | 39% | 22 | 38 | 41 |
| | MAY-SEP | 5.6 | 15.2 | 21 | 45% | 28 | 46 | 47 |
| McKenzie R nr Vida[1] | MAY-JUN | 192 | 275 | 320 | 63% | 365 | 475 | 510 |
| | MAY-SEP | 430 | 550 | 610 | 70% | 670 | 815 | 870 |
| Detroit Lake Inlfow[1,2] | MAY-JUN | 87 | 137 | 163 | 57% | 192 | 265 | 285 |
| | MAY-SEP | 172 | 240 | 275 | 64% | 315 | 405 | 430 |
| Little North Santiam R nr Mehama[1] | MAY-JUN | 18.0 | 33 | 41 | 58% | 50 | 73 | 71 |
| | MAY-SEP | 26 | 45 | 56 | 64% | 67 | 96 | 87 |
| North Santiam R at Mehama[1] | MAY-JUN | 131 | 195 | 230 | 58% | 265 | 355 | 395 |
| | MAY-SEP | 141 | 285 | 355 | 62% | 420 | 565 | 570 |
| Green Peter Lake Inflow[1,2] | MAY-JUN | 30 | 61 | 79 | 54% | 99 | 150 | 145 |
| | MAY-SEP | 49 | 87 | 108 | 61% | 131 | 189 | 177 |
| Foster Lake Inflow[1,2] | MAY-JUN | 65 | 123 | 156 | 57% | 192 | 285 | 275 |
| | MAY-SEP | 104 | 175 | 215 | 64% | 255 | 360 | 335 |
| South Santiam R at Waterloo[2] | MAY-JUN | 87 | 131 | 167 | 59% | 205 | 270 | 285 |
| | MAY-SEP | 133 | 186 | 225 | 64% | 270 | 345 | 350 |
| Willamette R at Salem[1,2] | MAY-JUN | 515 | 960 | 1210 | 55% | 1480 | 2190 | 2200 |
| | MAY-SEP | 1030 | 1610 | 1920 | 64% | 2250 | 3080 | 2980 |
| Scoggins Reservoir Inflow[2] | MAY-JUL | 1.26 | 2.6 | 3.7 | 69% | 5.0 | 7.4 | 5.4 |
| Oak Grove Fk ab Powerplant | MAY-JUL | 33 | 41 | 47 | 59% | 53 | 63 | 80 |
| | MAY-SEP | 59 | 70 | 78 | 65% | 86 | 99 | 120 |
| Clackamas R above Three Lynx | MAY-JUL | 102 | 135 | 160 | 55% | 187 | 230 | 290 |
| | MAY-SEP | 171 | 210 | 240 | 63% | 270 | 315 | 380 |
| Clackamas R at Estacada | MAY-JUL | 154 | 194 | 225 | 56% | 255 | 305 | 405 |
| | MAY-SEP | 235 | 285 | 320 | 63% | 360 | 415 | 510 |

Forecast Exceedance Probabilities for Risk Assessment *

* 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%

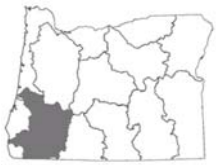
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

# Willamette Basin Summary for May 1, 2015

| Reservoir Storage | Current (KAF) | Last Year (KAF) | Average (KAF) | Useable Capacity (KAF) |
|---|---|---|---|---|
| Blue River | 48.0 | 79.2 | 73.5 | 85.5 |
| Cottage Grove | 24.6 | 26.3 | 26.7 | 29.8 |
| Cougar | 79.6 | 162.6 | 151.9 | 155.2 |
| Detroit | 266.6 | 432.2 | 408.5 | 300.7 |
| Dorena | 57.4 | 60.8 | 61.5 | 70.5 |
| Fall Creek | 66.3 | 110.2 | 108.0 | 115.5 |
| Fern Ridge | 80.7 | 97.6 | 89.1 | 109.6 |
| Foster | 24.3 | 44.2 | 24.6 | 29.7 |
| Green Peter | 312.7 | 400.8 | 378.4 | 268.2 |
| Hills Creek | 205.9 | 262.0 | 247.3 | 200.2 |
| Lookout Point | 190.2 | 368.2 | 373.8 | 337.0 |
| Timothy Lake | 59.2 | 59.7 | 59.0 | 61.7 |
| Henry Hagg Lake | 53.0 | 53.3 | 52.6 | 53.0 |

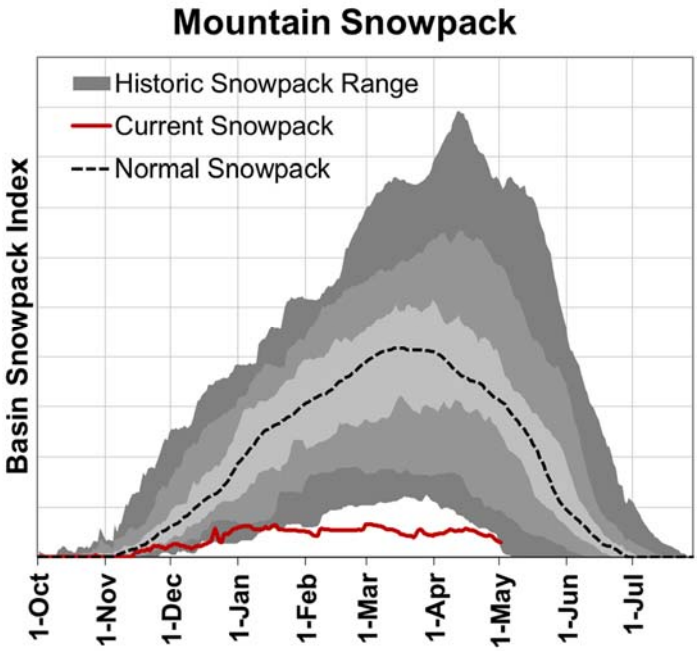
| Snowpack Summary by Basin | | Basin Snowpack % of 30-Year Median | |
|---|---|---|---|
| | # of Sites | Current Yr | Last Yr |
| Clackamas Basin | 9 | 11% | 83% |
| McKenzie Basin | 6 | 8% | 70% |
| Middle Fork Willamette Basin | 7 | 13% | 57% |
| North Santiam Basin | 4 | 0% | 39% |
| South Santiam Basin | 4 | 0% | 39% |

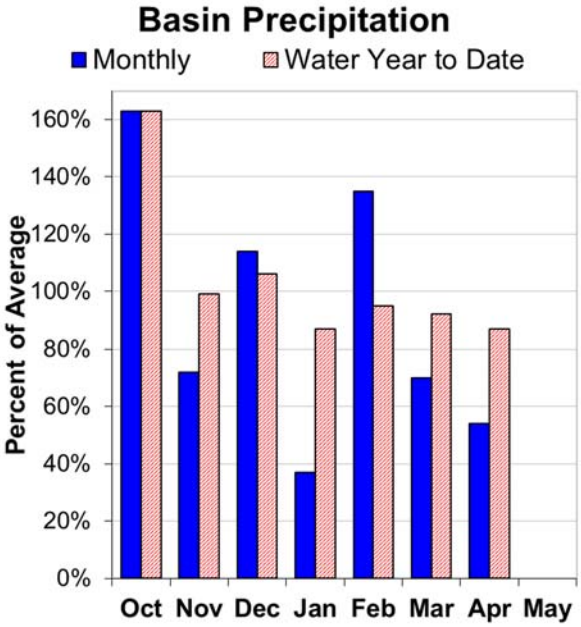
| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Summit Lake SNOTEL | 5610 | 1-May | 29 | 11.4 | 27.7 | 40.8 | 28% |
| Irish Taylor SNOTEL | 5540 | 1-May | 21 | 8.1 | 28.2 | 39.8 | 20% |
| Cascade Summit SNOTEL | 5100 | 1-May | 0 | 0.0 | 14.0 | 24.9 | 0% |
| Roaring River SNOTEL | 4950 | 1-May | 0 | 0.0 | 12.6 | 20.9 | 0% |
| Holland Meadows SNOTEL | 4930 | 1-May | 0 | 0.0 | 0.0 | 10.7 | 0% |
| Hogg Pass SNOTEL | 4790 | 1-May | 0 | 0.0 | 2.5 | 19.3 | 0% |
| Mckenzie SNOTEL | 4770 | 1-May | 0 | 0.0 | 26.1 | 35.1 | 0% |
| Bear Grass SNOTEL | 4720 | 1-May | 0 | 0.0 | 23.9 | | |
| Beaver Creek #2 Snow Course | 4220 | 1-May | 0 | 0.0 | | 0.3 | 0% |
| Salt Creek Falls SNOTEL | 4220 | 1-May | 0 | 0.0 | 0.7 | 10.1 | 0% |
| Beaver Creek #1 Snow Course | 4210 | 1-May | 0 | 0.0 | | 7.6 | 0% |
| Mud Ridge SNOTEL | 4070 | 1-May | 0 | 0.0 | 16.4 | 17.8 | 0% |
| Little Meadows SNOTEL | 4020 | 1-May | 0 | 0.0 | 6.3 | 16.0 | 0% |
| Clear Lake SNOTEL | 3810 | 1-May | 0 | 0.0 | 0.0 | 1.6 | 0% |
| Santiam Jct. SNOTEL | 3740 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Daly Lake SNOTEL | 3690 | 1-May | 0 | 0.0 | 0.0 | 0.3 | 0% |
| Jump Off Joe SNOTEL | 3520 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Peavine Ridge SNOTEL | 3420 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Clackamas Lake SNOTEL | 3400 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Smith Ridge SNOTEL | 3270 | 1-May | 0 | 0.0 | 0.0 | | |
| Saddle Mountain SNOTEL | 3110 | 1-May | 0 | 0.0 | 0.0 | | |
| Railroad Overpass SNOTEL | 2680 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Marion Forks SNOTEL | 2590 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Seine Creek SNOTEL | 2060 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Miller Woods SNOTEL | 420 | 1-May | 0 | 0.0 | 0.0 | | |



# Rogue and Umpqua Basins

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, only 5 out of 29 snow monitoring sites in the basin still had snow. In general, SNOTEL sites in the basin peaked 70 to 90% below typical peak snowpack levels and 6 to 13 weeks earlier than normal. Many of the SNOTEL sites in the basin peaked at their lowest level and earliest date since records began over 30 years ago.

### PRECIPITATION

April precipitation was 54% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 87% of average.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 53% of average at Hyatt Prairie Reservoir to 104% of average at Lost Creek Reservoir.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 19% to 64% of average for the May through September period. Forecasted streamflow volumes fall in the lowest quarter of observed streamflows since 1981. Water managers in the basin should expect significant water shortages this summer.

# Rogue And Umpqua Basins Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| | | Forecast Exceedance Probabilities for Risk Assessment * | | | | | | |
| Hyatt Reservoir Inflow[2] | MAY-JUL | 0.01 | 0.07 | 0.28 | 19% | 0.61 | 1.36 | 1.46 |
| South Umpqua R at Tiller | MAY-JUL | 17.4 | 28 | 37 | 35% | 47 | 63 | 106 |
| | MAY-SEP | 23 | 35 | 44 | 38% | 55 | 73 | 115 |
| Cow Ck nr Azalea[2] | MAY-JUL | 0.98 | 1.75 | 2.4 | 32% | 3.2 | 4.4 | 7.6 |
| | MAY-SEP | 1.09 | 1.91 | 2.6 | 30% | 3.4 | 4.8 | 8.8 |
| South Umpqua R nr Brockway | MAY-JUL | 7.2 | 27 | 47 | 24% | 73 | 122 | 194 |
| | MAY-SEP | 8.9 | 30 | 51 | 24% | 78 | 129 | 215 |
| North Umpqua R at Winchester | MAY-JUL | 145 | 196 | 235 | 49% | 280 | 350 | 475 |
| | MAY-SEP | 220 | 280 | 325 | 55% | 375 | 450 | 590 |
| Lost Creek Lk Inflow[2] | MAY-JUL | 160 | 194 | 215 | 58% | 240 | 275 | 370 |
| | MAY-SEP | 245 | 285 | 315 | 64% | 340 | 380 | 495 |
| Rogue R at Raygold[2] | MAY-JUL | 92 | 168 | 220 | 50% | 270 | 345 | 440 |
| | MAY-SEP | 173 | 260 | 315 | 55% | 375 | 460 | 570 |
| Rogue R at Grants Pass[2] | MAY-JUL | 131 | 181 | 220 | 48% | 260 | 330 | 455 |
| | MAY-SEP | 205 | 265 | 305 | 53% | 355 | 425 | 580 |
| Applegate Lake Inflow[2] | MAY-JUL | 4.5 | 8.4 | 11.8 | 17% | 15.7 | 23 | 69 |
| | MAY-SEP | 6.5 | 10.9 | 14.6 | 19% | 18.8 | 26 | 75 |
| Sucker Ck bl Little Grayback Ck | MAY-JUL | 3.7 | 7.2 | 10.2 | 31% | 13.8 | 20 | 33 |
| | MAY-SEP | 5.3 | 9.2 | 12.6 | 35% | 16.4 | 23 | 36 |
| Illinois R nr Kerby | MAY-JUL | 11.4 | 22 | 30 | 33% | 40 | 58 | 90 |
| | MAY-SEP | 13.7 | 24 | 34 | 35% | 44 | 62 | 96 |

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

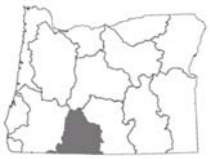
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

| Reservoir Storage | Current (KAF) | Last Year (KAF) | Average (KAF) | Useable Capacity (KAF) |
|---|---|---|---|---|
| Applegate | 42.7 | 59.9 | 62.1 | 75.2 |
| Emigrant Lake | 33.9 | 31.1 | 36.0 | 39.0 |
| Fish Lake | 4.8 | 4.9 | 5.8 | 8.0 |
| Fourmile Lake | 8.0 | 8.0 | 8.7 | 16.1 |
| Howard Prairie | 25.3 | 34.7 | 46.7 | 60.0 |
| Hyatt Prairie | 7.0 | 7.5 | 13.2 | 16.1 |
| Lost Creek | 312.4 | 312.7 | 301.1 | 315.0 |

# Rogue And Umpqua Basins Summary for May 1, 2015

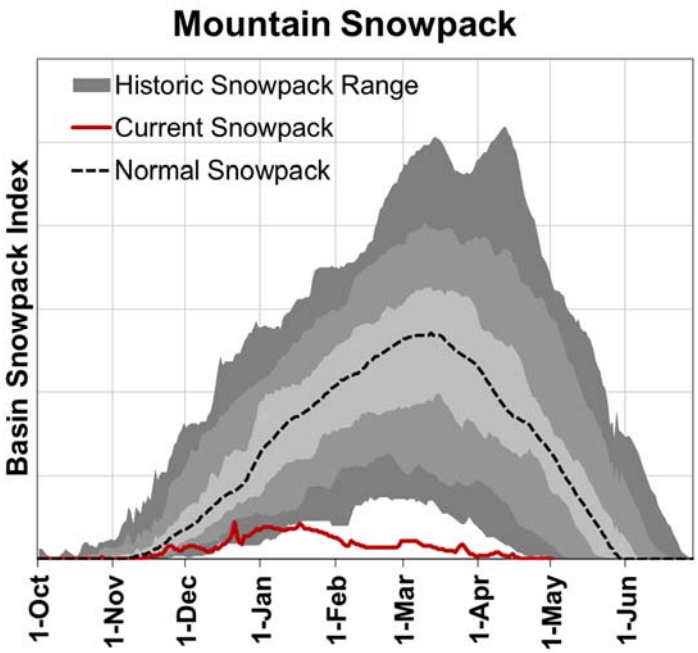
| Snowpack Summary by Basin | # of Sites | Basin Snowpack % of 30-Year Median Current Yr | Last Yr |
|---|---|---|---|
| Applegate Basin | 5 | 3% | 3% |
| Middle Rogue Basin | 7 | 4% | 0% |
| North Umpqua Basin | 7 | 26% | 64% |
| South Umpqua Basin | 10 | 0% | 0% |
| Upper Rogue Basin | 11 | 14% | 35% |

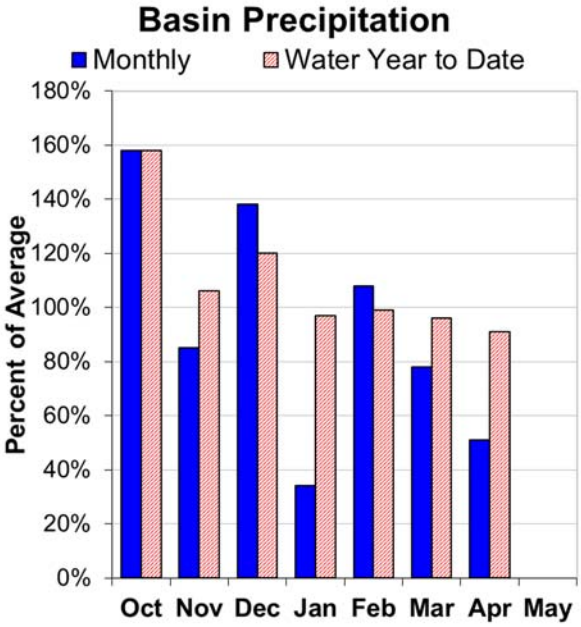
| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Annie Springs SNOTEL | 6010 | 1-May | 12 | 6.2 | 18.5 | 43.6 | 14% |
| Beaver Dam Creek Snow Course | 5120 | 30-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Big Red Mountain SNOTEL | 6050 | 1-May | 0 | 0.0 | 3.6 | 23.5 | 0% |
| Bigelow Camp SNOTEL | 5130 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Billie Creek Divide SNOTEL | 5280 | 1-May | 0 | 0.0 | 0.0 | 10.8 | 0 |
| Caliban (Alt.) Snow Course | 6500 | 30-Apr | 6 | 2.8 | 0.0 | 29.2 | 0.1 |
| Cold Springs Camp SNOTEL | 5940 | 1-May | 0 | 0.0 | 0.0 | 21.1 | 0 |
| Deadwood Junction Snow Course | 4660 | 30-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Diamond Lake SNOTEL | 5280 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Fish Lk. SNOTEL | 4660 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Fourmile Lake SNOTEL | 5970 | 1-May | 0 | 0.0 | 3.0 | 22.5 | 0% |
| Howard Prairie Snow Course | 4580 | 30-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Howard Prairie SNOTEL | 4580 | 1-May | 0 | 0.0 | 0.0 | | |
| King Mountain SNOTEL | 4340 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| King Mountain 1 Snow Course | 4760 | 29-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| King Mountain 3 Snow Course | 3680 | 29-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| King Mountain 4 Snow Course | 3050 | 29-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Mount Ashland Switchback SC | 6430 | 30-Apr | 1 | 0.8 | 0.0 | 30.6 | 0.03 |
| Park H.Q. Rev Snow Course | 6570 | 1-May | 43 | 19.4 | 38.9 | 61.0 | 0.32 |
| Red Butte 1 Snow Course | 4460 | 29-Apr | 0 | 0.0 | 0.0 | 2.8 | 0% |
| Red Butte 2 Snow Course | 4050 | 29-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Red Butte 3 Snow Course | 3500 | 29-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Red Butte 4 Snow Course | 3000 | 29-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Sevenmile Marsh SNOTEL | 5700 | 1-May | 0 | 0.0 | 4.4 | 24.3 | 0 |
| Silver Burn Snow Course | 3680 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Siskiyou Summit (Rev.) SC | 4560 | 30-Apr | 0 | 0.0 | | | |
| Ski Bowl Road Snow Course | 6070 | 30-Apr | 0 | 0.0 | 0.0 | 21.5 | 0% |
| Summit Lake SNOTEL | 5610 | 1-May | 29 | 11.4 | 27.7 | 40.8 | 28% |
| Toketee Airstrip SNOTEL | 3240 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |



# Klamath Basin

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, only 2 out of 26 snow monitoring sites in the basin still had snow. Almost all of the SNOTEL sites in the basin peaked at their lowest level and earliest date since records began over 30 years ago. In general, SNOTEL sites in the basin peaked 70 to 90% below typical peak snowpack levels and 7 to 12 weeks earlier than normal.

### PRECIPITATION

April precipitation was 51% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 91% of average.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 17% of average at Clear Lake, CA Reservoir to 102% of average at Upper Klamath Lake Reservoir.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 26% to 49% of average for the May through September period. Water managers in the basin should expect significant water shortages this summer.

# Klamath Basin Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | 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-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| Clear Lake Inflow[2] | MAY-JUL | 0.13 | 0.93 | 3.1 | 23% | 8.5 | 14.4 | 13.3 |
| | MAY-SEP | 0.16 | 0.48 | 4.8 | 30% | 9.3 | 15.0 | 16.1 |
| Gerber Resvervoir Inflow[2] | MAY-JUL | 0.05 | 0.22 | 1.20 | 22% | 4.2 | 8.6 | 5.4 |
| | MAY-SEP | 0.06 | 0.17 | 1.50 | 26% | 4.4 | 7.4 | 5.8 |
| Sprague R nr Chiloquin | APR-JUL | 15.9 | 44 | 63 | 34% | 82 | 110 | 188 |
| | APR-SEP | 29 | 59 | 79 | 38% | 99 | 129 | 210 |
| | MAY-JUL | 1.18 | 22 | 38 | 32% | 54 | 79 | 118 |
| | MAY-SEP | 11.4 | 37 | 54 | 38% | 71 | 97 | 141 |
| Williamson R bl Sprague nr Chiloquin | MAY-JUL | 29 | 59 | 79 | 42% | 99 | 129 | 187 |
| | MAY-SEP | 68 | 99 | 120 | 49% | 141 | 172 | 245 |
| Upper Klamath Lake Inflow[1,2] | APR-SEP | 72 | 150 | 185 | 39% | 220 | 298 | 480 |
| | MAY-JUL | 2.4 | 60 | 87 | 36% | 114 | 174 | 240 |
| | MAY-SEP | 37 | 101 | 130 | 41% | 159 | 223 | 320 |

* 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%

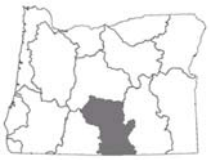
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

| Reservoir Storage | Current (KAF) | Last Year (KAF) | Average (KAF) | Useable Capacity (KAF) |
|---|---|---|---|---|
| Clear Lake, CA | 43.2 | 52.9 | 254.1 | 513.3 |
| Gerber | 15.3 | 19.3 | 68.2 | 94.3 |
| Upper Klamath Lake | 454.8 | 423.3 | 448.0 | 523.7 |

| Snowpack Summary by Basin | # of Sites | Basin Snowpack Current Yr | Basin Snowpack Last Yr |
|---|---|---|---|
| Lost Basin | 3 | | |
| Sprague Basin | 4 | 0% | 10% |
| Upper Klamath Lake Basin | 8 | 14% | 35% |
| Williamson River Basin | 5 | 24% | 55% |

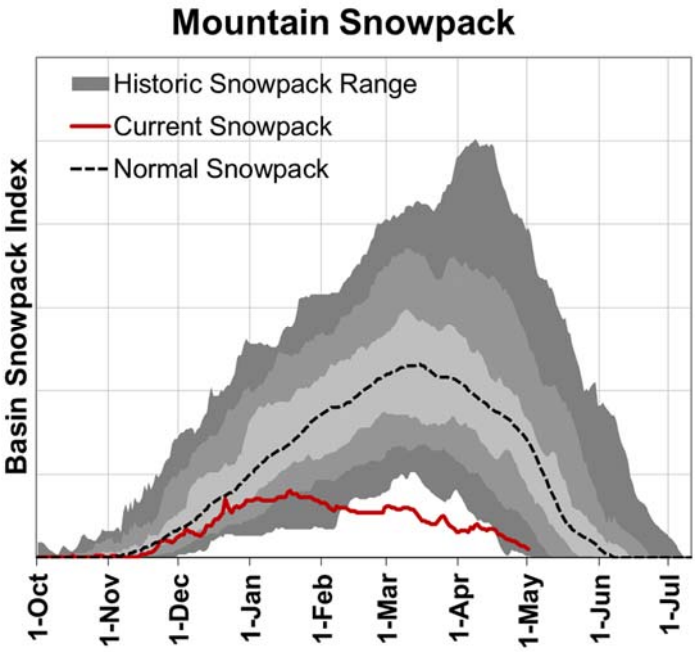
# Klamath Basin Summary for May 1, 2015

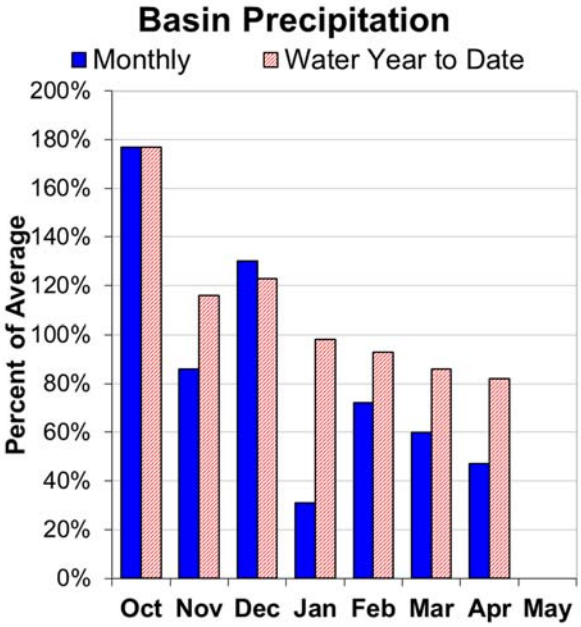
| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Annie Springs SNOTEL | 6010 | 1-May | 12 | 6.2 | 18.5 | 43.6 | 14% |
| Beaver Dam Creek Snow Course | 5120 | 30-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Billie Creek Divide SNOTEL | 5280 | 1-May | 0 | 0.0 | 0.0 | 10.8 | 0% |
| Chemult Alternate SNOTEL | 4850 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Cold Springs Camp SNOTEL | 5940 | 1-May | 0 | 0.0 | 0.0 | 21.1 | 0 |
| Crazyman Flat SNOTEL | 6180 | 1-May | 0 | 0.0 | 0.0 | 4.6 | 0 |
| Crowder Flat SNOTEL | 5170 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Deadwood Junction Snow Course | 4660 | 30-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Diamond Lake SNOTEL | 5280 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Fish Lk. SNOTEL | 4660 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Fourmile Lake SNOTEL | 5970 | 1-May | 0 | 0.0 | 3.0 | 22.5 | 0% |
| Gerber Reservoir SNOTEL | 4890 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Howard Prairie SNOTEL | 4580 | 1-May | 0 | 0.0 | 0.0 | | |
| Howard Prairie Snow Course | 4580 | 30-Apr | 0 | 0.0 | 0.0 | 0.0 | |
| Park H.Q. Rev Snow Course | 6570 | 1-May | 43 | 19.4 | 38.9 | 61.0 | 32% |
| Quartz Mountain SNOTEL | 5720 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Sevenmile Marsh SNOTEL | 5700 | 1-May | 0 | 0.0 | 4.4 | 24.3 | 0% |
| Silver Creek SNOTEL | 5740 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Siskiyou Summit (Rev.) SC | 4560 | 30-Apr | 0 | 0.0 | | | |
| Ski Bowl Road Snow Course | 6070 | 30-Apr | 0 | 0.0 | 0.0 | 21.5 | 0 |
| State Line SNOTEL | 5680 | 1-May | 0 | 0.0 | | | |
| Strawberry SNOTEL | 5770 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Summer Rim SNOTEL | 7080 | 1-May | 0 | 0.0 | 1.6 | 11.7 | 0% |
| Sun Pass SNOTEL | 5400 | 1-May | 0 | 0.0 | 0.0 | | |
| Swan Lake Mtn SNOTEL | 6830 | 1-May | 0 | 0.0 | 0.0 | | |
| Taylor Butte SNOTEL | 5030 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |



# Lake County and Goose Lake

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, only 1 out of 15 snow monitoring sites in the basin still had snow. Almost all of the SNOTEL sites in the basin peaked at their lowest level and earliest date since records began over 30 years ago. In general, SNOTEL sites in the basin peaked 50 to 80% below typical peak snowpack levels and 4 to 10 weeks earlier than normal.

### PRECIPITATION

April precipitation was 47% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 82% of average.

### RESERVOIR

Reservoir storage across the basin is currently well below average. As of May 1, storage at major reservoirs in the basin ranges from 26% of average at Drews Reservoir to 56% of average at Cottonwood Reservoir.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 10% to 18% of average for the May through September period. Water managers in the basin should expect significant water shortages this summer.

# Lake County And Goose Lake Basins Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| Twentymile Ck nr Adel | MAY-JUL | 0.02 | 0.64 | 1.55 | 14% | 2.9 | 5.5 | 10.8 |
| | MAY-SEP | 0.05 | 0.79 | 1.77 | 16% | 3.1 | 5.9 | 11.2 |
| Deep Ck ab Adel | APR-JUL | 9.3 | 15.4 | 20 | 32% | 26 | 36 | 63 |
| | APR-SEP | 9.9 | 16.1 | 21 | 32% | 27 | 37 | 65 |
| | MAY-JUL | 0.82 | 2.6 | 4.5 | 11% | 6.8 | 11.1 | 41 |
| | MAY-SEP | 1.27 | 3.4 | 5.5 | 13% | 8.0 | 12.7 | 43 |
| Honey Ck nr Plush | MAY-JUL | 0.01 | 0.35 | 0.84 | 9% | 1.55 | 3.0 | 9.2 |
| | MAY-SEP | 0.02 | 0.38 | 0.89 | 10% | 1.62 | 3.1 | 9.3 |
| Chewaucan R nr Paisley | MAY-JUL | 2.9 | 5.7 | 8.1 | 16% | 10.9 | 15.8 | 50 |
| | MAY-SEP | 4.1 | 7.3 | 9.9 | 18% | 13.0 | 18.2 | 54 |

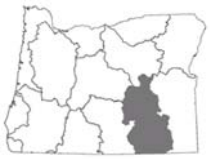
Forecast Exceedance Probabilities for Risk Assessment *

* 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) | Useable Capacity (KAF) |
|---|---|---|---|---|
| Cottonwood | 4.0 | 3.0 | 7.1 | 8.7 |
| Drews | 12.1 | 24.8 | 45.7 | 63.0 |

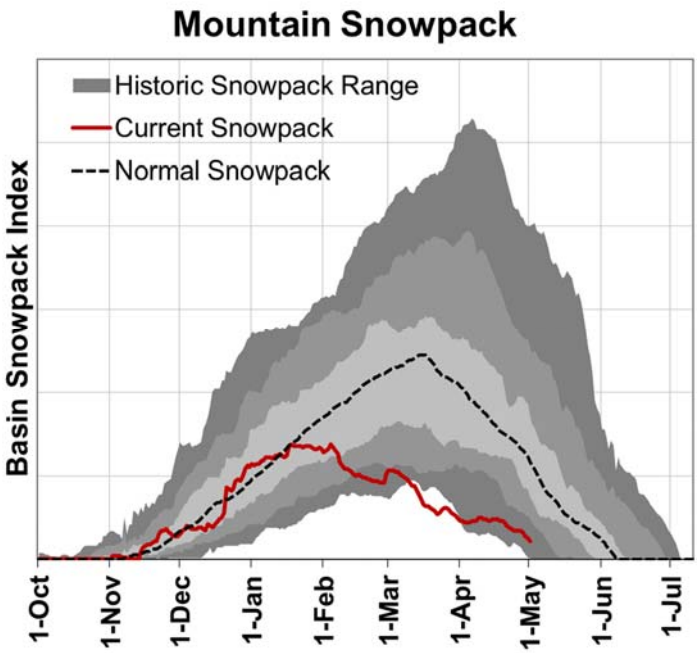
| Snowpack Summary by Basin | # of Sites | Basin Snowpack % of 30-Year Median Current Yr | Last Yr |
|---|---|---|---|
| Goose Lake Basin | 3 | 12% | 40% |
| Lake Abert Basin | 1 | 0% | 14% |
| Summer Lake Basin | 9 | 7% | 25% |
| Upper Pit Basin | 3 | 0% | 1% |

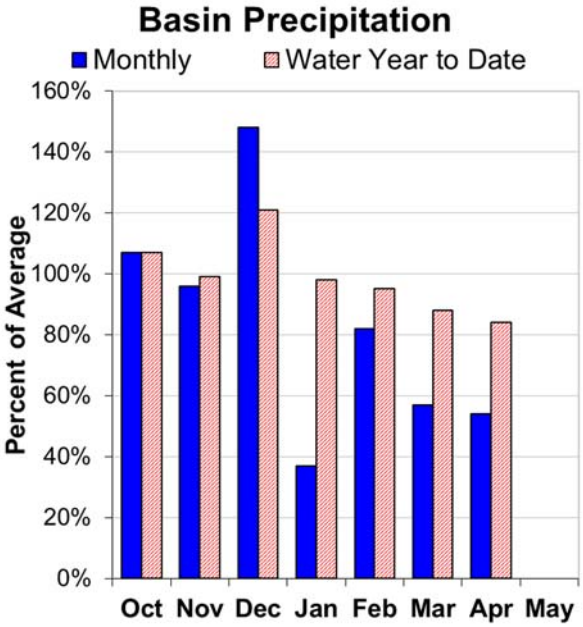
| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Dismal Swamp SNOTEL | 7360 | 1-May | 12 | 4.6 | 14.9 | 26.0 | 18% |
| Summer Rim SNOTEL | 7080 | 1-May | 0 | 0.0 | 1.6 | 11.7 | 0% |
| Cedar Pass SNOTEL | 7030 | 1-May | 0 | 0.0 | 0.1 | 12.9 | 0% |
| Patton Meadows AM | 6800 | 1-May | 0 | 0.0 | 0.0 | 11.5 | 0% |
| Sherman Valley AM | 6640 | 1-May | 0 | 0.0 | 0.0 | | |
| Hart Mountain AM | 6430 | 1-May | 0 | 0.0 | 0.0 | | |
| Rogger Meadow AM | 6360 | 1-May | 0 | 0.0 | 0.0 | | |
| Adin Mountains Snow Course | 6190 | 29-Apr | 0 | 0.0 | 0.0 | 2.2 | 0% |
| Adin Mtn SNOTEL | 6190 | 1-May | 0 | 0.0 | 0.0 | 1.4 | 0% |
| Crazyman Flat SNOTEL | 6180 | 1-May | 0 | 0.0 | 0.0 | 4.6 | 0% |
| Camas Creek #3 Snow Course | 5860 | 1-May | 0 | 0.0 | | 3.6 | 0% |
| Sheldon SCAN | 5860 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Strawberry SNOTEL | 5770 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Silver Creek SNOTEL | 5740 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Crowder Flat SNOTEL | 5170 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |



# Harney Basin

**May 1, 2015**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, only 1 out of 16 snow monitoring sites in the basin still had snow. The snowpack in this region peaked significantly below normal this winter. In general, SNOTEL sites in the basin peaked 40 to 70% below typical peak snowpack levels and 5 to 10 weeks earlier than normal. In addition, 4 SNOTEL sites in the basin experienced their earliest snowpack peaks on record.

### PRECIPITATION

April precipitation was 54% of average. Precipitation since the beginning of the water year (October 1 - May 1) has been 84% of average.

### STREAMFLOW FORECAST

Summer streamflow forecasts in the basin range from 8% to 39% of average for the May through September period. Forecasted streamflow volumes fall in the lowest third of observed streamflows since 1981. Water managers in the basin should expect significant water shortages this summer.

# Harney Basin Summary for May 1, 2015

| Streamflow Forecasts May 1, 2015 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | 50% % Avg | 30% (KAF) | 10% (KAF) | 30-Yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| | | ←--------Drier----------Future Conditions----------Wetter--------→ | | | | | | |
| Silvies R nr Burns | MAY-JUL | 0.17 | 0.88 | 3.4 | 8% | 7.6 | 16.9 | 45 |
| | MAY-SEP | 0.09 | 1.10 | 3.9 | 8% | 8.3 | 17.9 | 47 |
| Donner Und Blitzen R nr Frenchglen | MAY-JUL | 8.8 | 13.8 | 17.9 | 37% | 23 | 30 | 49 |
| | MAY-SEP | 11.0 | 16.6 | 21 | 39% | 26 | 34 | 54 |
| Trout Ck nr Denio | MAY-JUL | 0.01 | 0.30 | 0.70 | 13% | 1.26 | 2.4 | 5.6 |
| | MAY-SEP | 0.04 | 0.38 | 0.81 | 14% | 1.41 | 2.6 | 6.0 |

**Forecast Exceedance Probabilities for Risk Assessment ***

* 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 30-Year Median Current Yr | Last Yr |
|---|---|---|---|
| Alvord Lake Basin | 1 | 34% | 88% |
| Donner und Blitzen River Basin | 2 | 24% | 63% |
| Silvies River Basin | 4 | 0% | 71% |
| Upper Quinn Basin | 3 | 0% | 41% |

| Basin Snowpack Measurement Sites | Elevation (ft) | Date Measured | Snow Depth (in) | Snow Water Equivalent (in) Current SWE | Last Yr SWE | 30-Yr Median | % of 30-Yr Median |
|---|---|---|---|---|---|---|---|
| Granite Peak SNOTEL | 8543 | 1-May | 0 | 0.0 | 8.1 | 19.5 | 0% |
| Trout Creek AM | 7890 | 1-May | 0 | 0.0 | 4.0 | | |
| Fish Creek SNOTEL | 7660 | 1-May | 18 | 9.0 | 23.4 | 26.6 | 34% |
| Govt Corrals AM | 7400 | 1-May | 0 | 0.0 | 4.0 | | |
| Silvies SNOTEL | 6990 | 1-May | 0 | 0.0 | 0.0 | 10.3 | 0% |
| Buckskin Lower SNOTEL | 6915 | 1-May | 0 | 0.0 | 0.0 | 0.2 | 0% |
| V Lake AM | 6600 | 1-May | 0 | 0.0 | 0.0 | | |
| Disaster Peak SNOTEL | 6500 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Hart Mountain AM | 6430 | 1-May | 0 | 0.0 | 0.0 | | |
| Snow Mountain SNOTEL | 6230 | 1-May | 0 | 0.0 | 3.0 | 4.2 | 0% |
| Lamance Creek SNOTEL | 6000 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Blue Mountain Spring SNOTEL | 5870 | 1-May | 0 | 0.0 | 3.5 | 5.7 | 0% |
| Sheldon SCAN | 5860 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Rock Springs SNOTEL | 5290 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Starr Ridge SNOTEL | 5250 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |
| Lake Creek R.S. SNOTEL | 5240 | 1-May | 0 | 0.0 | 0.0 | 0.0 | |

# Recession Forecasts for Oregon

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

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

| OWYHEE AND MALHEUR BASINS | | | | | |
|---|---|---|---|---|---|
| *FORECAST POINT* | *FORECAST THRESHOLD* | *FORECAST VALUE ---------- CHANCE OF EXCEEDING ---------- ------* | | | *LONG-TERM AVERAGE VALUE* |
| | | *90%* | *50%* | *10%* | |
| Owyhee R nr Rome | 2000 cfs | **Observed | Jan 21 | ** | **May 6** |
| Owyhee R nr Rome | 1000 cfs | **Observed | Feb 13 | ** | **May 18** |
| Owyhee R nr Rome | 500 cfs | **Observed | Feb 19 | ** | **Jun 2** |

| UPPER JOHN DAY BASIN | | | | | |
|---|---|---|---|---|---|
| *FORECAST POINT* | *FORECAST THRESHOLD* | *FORECAST VALUE ---------- CHANCE OF EXCEEDING ---------- ------* | | | *LONG-TERM AVERAGE VALUE* |
| | | *90%* | *50%* | *10%* | |
| John Day R at Service Creek | Average Daily Flow on Aug. 1st | 15 | 65 | 260 | **271** |

| UPPER DESCHUTES AND CROOKED BASINS | | | | | |
|---|---|---|---|---|---|
| *FORECAST POINT* | *FORECAST THRESHOLD* | *FORECAST VALUE ---------- CHANCE OF EXCEEDING ---------- ------* | | | *LONG-TERM AVERAGE VALUE* |
| | | *90%* | *50%* | *10%* | |
| Crane Prairie Inflow | Date of Peak | ** Observed | Dec 20 | ** | **May 25** |
| Crane Prairie Inflow | Peak Flow | ** Observed | 775 | ** | **403** |
| Crane Prairie Inflow | Average Daily Flow on Oct. 1st | 101 | 134 | 167 | **269** |
| | | | | | |
| Prineville Reservoir Inflow | 113 cfs | ** Observed | Apr 16 | ** | **June 3** |
| Prineville Reservoir Inflow | 75 cfs | ** Observed | Apr 20 | ** | **June 11** |
| Prineville Reservoir Inflow | 50 cfs | ** Observed | Apr 23 | ** | **June 19** |
| | | | | | |
| Whychus Creek nr Sisters | 100 cfs | ** Observed | Apr 2 | ** | **August 16** |

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

| ROGUE AND UMPQUA BASINS | | | | | |
|---|---|---|---|---|---|
| *FORECAST POINT* | *FORECAST THRESHOLD* | *FORECAST VALUE ---------- CHANCE OF EXCEEDING ---------- ------* | | | *LONG-TERM AVERAGE VALUE* |
| | | *90%* | *50%* | *10%* | |
| South Umpqua R nr Brockway * | 90 cfs | Jun 10 | Jun 28 | Jul 16 | **August 8** |
| | | | | | |
| South Umpqua R at Tiller | 140 cfs | May 14 | May 28 | Jun 11 | **July 11** |
| South Umpqua R at Tiller | 90 cfs | Jun 9 | Jun 22 | Jul 6 | **August 1** |
| South Umpqua R at Tiller | 60 cfs | Jun 22 | Jul 3 | Jul 14 | **August 28** |

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

| LAKE COUNTY AND GOOSE LAKE BASINS | | | | | |
|---|---|---|---|---|---|
| *FORECAST POINT* | *FORECAST THRESHOLD* | *FORECAST VALUE ---------- CHANCE OF EXCEEDING ---------- ------* | | | *LONG-TERM AVERAGE VALUE* |
| | | *90%* | *50%* | *10%* | |
| Deep Ck ab Adel | 100 cfs | **Observed | Mar 28 | ** | **June 17** |
| | | | | | |
| Honey Ck nr Plush | 100 cfs | ** Flow did not exceed this level ** | | | **May 16** |
| Honey Ck nr Plush | 50 cfs | ** Flow did not exceed this level ** | | | **June 4** |
| | | | | | |
| Twentymile Ck nr Adel | 50 cfs | ** Observed | Feb 11 | ** | **May 30** |
| Twentymile Ck nr Adel | 10 cfs | ** Observed | Apr 5 | ** | **July 7** |

| HARNEY BASIN | | | | | |
|---|---|---|---|---|---|
| *FORECAST POINT* | *FORECAST THRESHOLD* | *FORECAST VALUE ---------- CHANCE OF EXCEEDING ---------- ------* | | | *LONG-TERM AVERAGE VALUE* |
| | | *90%* | *50%* | *10%* | |
| Silvies R nr Burns | 400 cfs | ** Observed | Feb 13 | ** | **May 21** |
| Silvies R nr Burns | 200 cfs | ** Observed | Feb 21 | ** | **June 2** |
| Silvies R nr Burns | 100 cfs | ** Observed | Apr 14 | ** | **June 13** |
| Silvies R nr Burns | 50 cfs | ** Observed | Apr 29 | ** | **July 3** |
| | | | | | |
| Donner Und Blitzen R nr Frenchglen | 200 cfs | ** Daily flow did not exceed this level ** | | | **June 20** |
| Donner Und Blitzen R nr Frenchglen | 100 cfs | May 10 | May 25 | Jun 9 | **July 9** |

# Basin Outlook Reports: How Forecasts Are Made

## Federal – State – Private
## Cooperative Snow Surveys

*For more water supply and resource management information, contact:*

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

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

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

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

# Interpreting Water Supply Forecasts

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

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

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

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

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

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

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

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

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

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

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

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

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

## Using the Forecasts - an Example

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

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

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

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

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

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

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

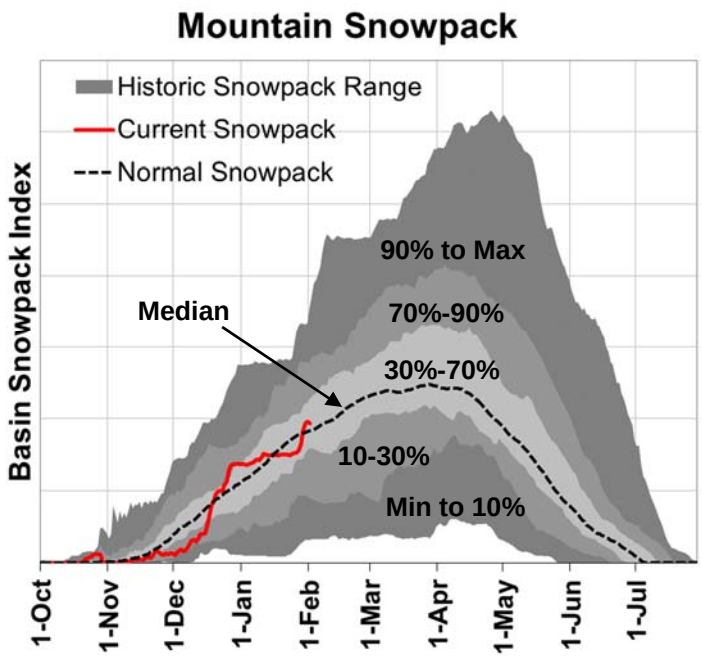
** 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.*

# 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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