



Natural Resources Conservation Service
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Western Snowpack Conditions and Water Supply Forecasts

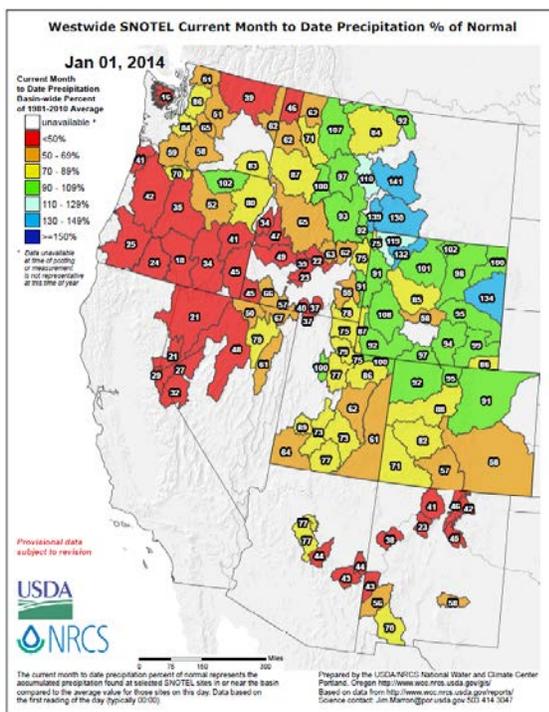
January 1, 2014

The following information is provided to use in describing western climate and water supply conditions as of January 1, 2014. California and Alaska data are updated in this report.

Overview

Neutral El Nino Southern Oscillation (ENSO) conditions have persisted since April 2012. Although the NOAA Climate Prediction Center's [seasonal forecast](#) is calling for a milder and somewhat drier winter for much of the West, analog maps (e.g., weather patterns similar to past years) indicate a cooler winter with nearer normal precipitation, except for somewhat wetter conditions over the Cascades and drier conditions for the Sierra Nevada. What usually results with neutral ENSO is that weather variability is heightened.

December's precipitation pattern across the West (Figure 1) and Alaska (Figure 2) resemble the pattern that has persisted since the start of the 2014 water year in October 2013. Drier conditions are occurring over many of the western states and west of the Continental Divide, whereas somewhat wetter than normal conditions are occurring east of the Divide (Figure 3). Alaska (Figure 4) has also experienced above normal precipitation (snowfall) over the Panhandle and Interior, and below normal conditions over the South-Central Coastal region of the state. Temperatures over the Lower-48 Western states have been within $\pm 5^\circ\text{F}$ of the long-term average from October to December with the warmer departures occurring over California, central Washington, and south-central Idaho. The cooler departures have occurred over eastern Montana, much of Utah, and north-central Wyoming (not shown).



Click any image to enlarge.

Figure 1: For [December 2013](#), precipitation was generally well below normal over the Pacific NW and across much of the Four Corner states. Near average amounts were recorded generally along the Continental Divide. A few river basins in central Montana and in northern Wyoming had substantial surplus totals.

With one-third of the snow accumulation season completed, river basins that have severe deficits in snow water equivalent (SWE) will have difficulty recovering to near normal values by early April when peak SWE is often attained. Those areas with current surpluses should be able to hold on to these gains if colder than average temperatures persist through early spring.

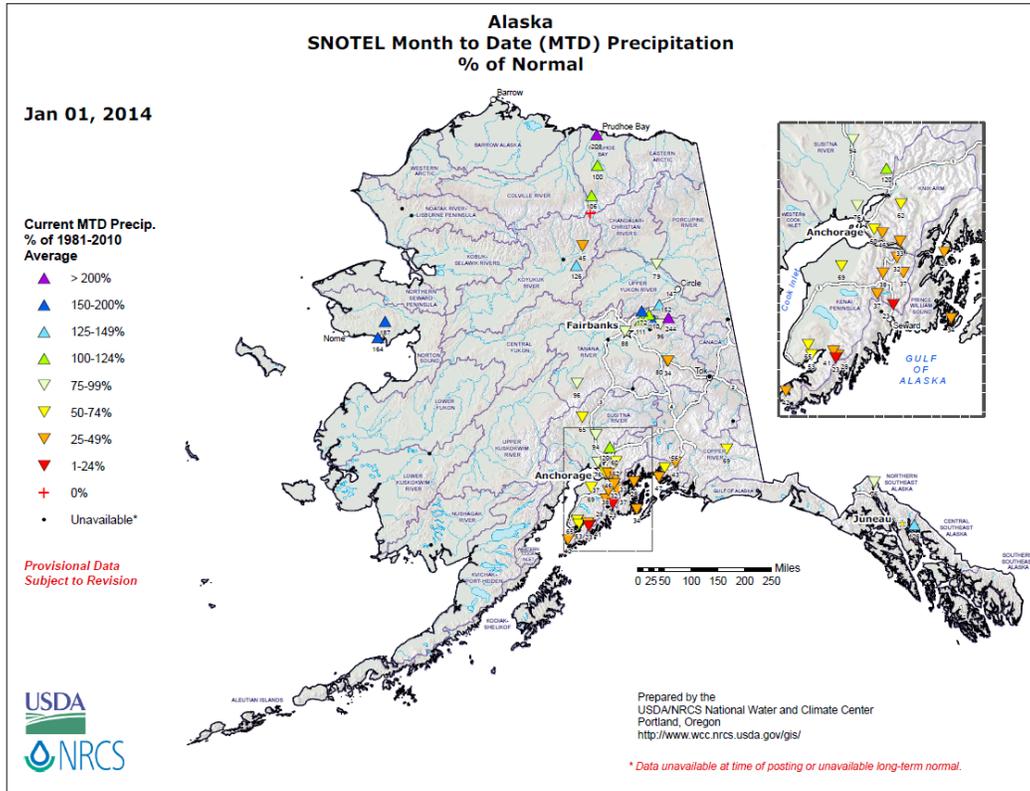


Figure 2: For December 2013, [Alaska](#) first class weather station summaries can be found at:

- [Annette](#)
- [Yakutat](#)
- [Bethel](#)
- [Cold Bay](#)
- [Kodiak](#)
- [Anchorage](#)
- [King Salmon](#)
- [McGrath](#)
- [Saint Paul](#)
- [Valdez](#)
- [Barrow](#)
- [Fairbanks](#)
- [Nome](#)
- [Kotzebue](#)

December was generally drier than average over the south-central coast and somewhat wetter over the remainder of the state.



Seasonal Precipitation

With some notable exceptions, year-to-date precipitation percentages (Figure 3), starting on October 1 and ending on December 31, are similar to the snowpack percentages (Figure 5). All of western Montana has received below normal precipitation over the first three months of the water year, even though the snowpack is near to above normal. This was due to below normal early season temperatures. The same conditions exist in central Arizona.

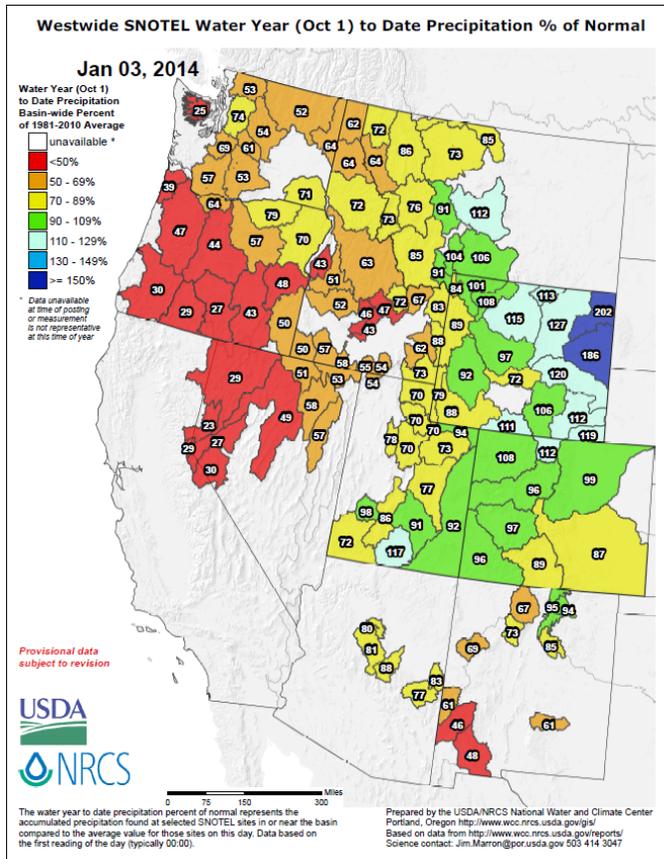


Figure 3: Precipitation percent of normal for the [2014 water year to date](#) reflects a very similar pattern of wet and dry regions that was observed in December. However, southern Utah, southern Colorado, northern New Mexico, and eastern Arizona were drier in December than the preceding two months.

Click on map for latest update.

The Yellowstone headwaters, as well as almost all of Wyoming and the northern half of Colorado, have received above normal precipitation for the first three months of the 2014 water year. The remainder of the western U.S. has received below normal precipitation, with Nevada, southern Idaho, most of Oregon, and northern Washington receiving much below normal precipitation.

For Alaska, the area around Anchorage has received near normal precipitation, whereas the southeast Panhandle has received above normal precipitation. Precipitation over the vast interior of the state has been much above normal, with recorded precipitation in the Susitna Basin at 185% of normal (Figure 4).

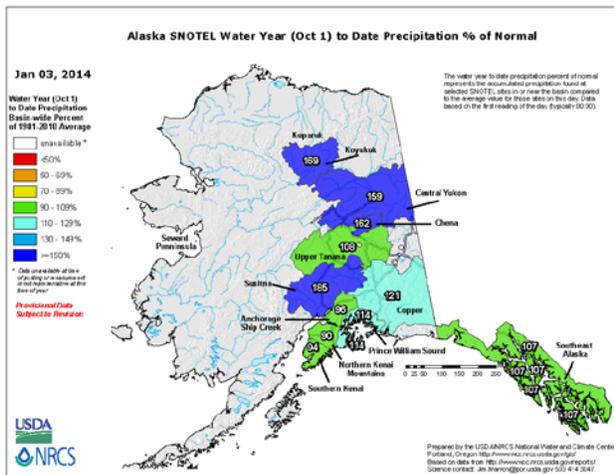


Figure 4: Precipitation percent of normal for Alaska for the 2014 water year to date reflects average to above average conditions across the state.

Click on map for latest update.

Maps containing monthly and daily updates of SNOTEL precipitation are available at the following URL - <http://www.wcc.nrcs.usda.gov/gis/precip.html>.

Snowpack

There is a definite decrease in the January 1 snowpack percentage of median going from the eastern to western portions of the Western U.S. (Figure 5 and Figure 7). The snowpack is slightly to much above normal over Montana, most of Wyoming and Colorado, southern Utah, and central Arizona. The snowpack over the central portion of the West that extends from central Utah, northwestward toward north-central Washington is below normal. The snowpack over the remaining portions of the West that is measured by the NRCS Snow Survey and Water Supply Forecasting Program is much below normal. This includes most of Nevada (including the Lake Tahoe region), most of Oregon, and the western portion of Washington. The Columbia Basin snowpack was very poor on January 1.

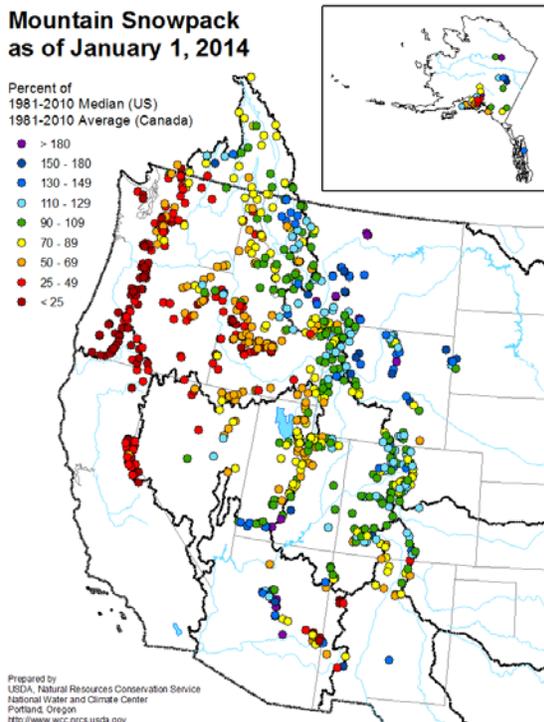


Figure 5: Point map of snow water equivalent that provides higher resolution of actual station data. Snow Telemetry (SNOTEL) and snow course data are used in this depiction.

The Alaska snowpack is below normal in the southern coastal regions, trending to much above normal in the Interior areas (Figure 5 and Figure 6).

Figure 6: Snowpack values on [January 1, 2014](#) show that little snowfall occurred or accumulated across south-central Alaska during the water year. However, percentages of normal values ramp up quickly northward into the interior of the state. The lower values over the south-central region reflect that more precipitation has fallen as rain rather than as snow thus far (compare with Figure 4).

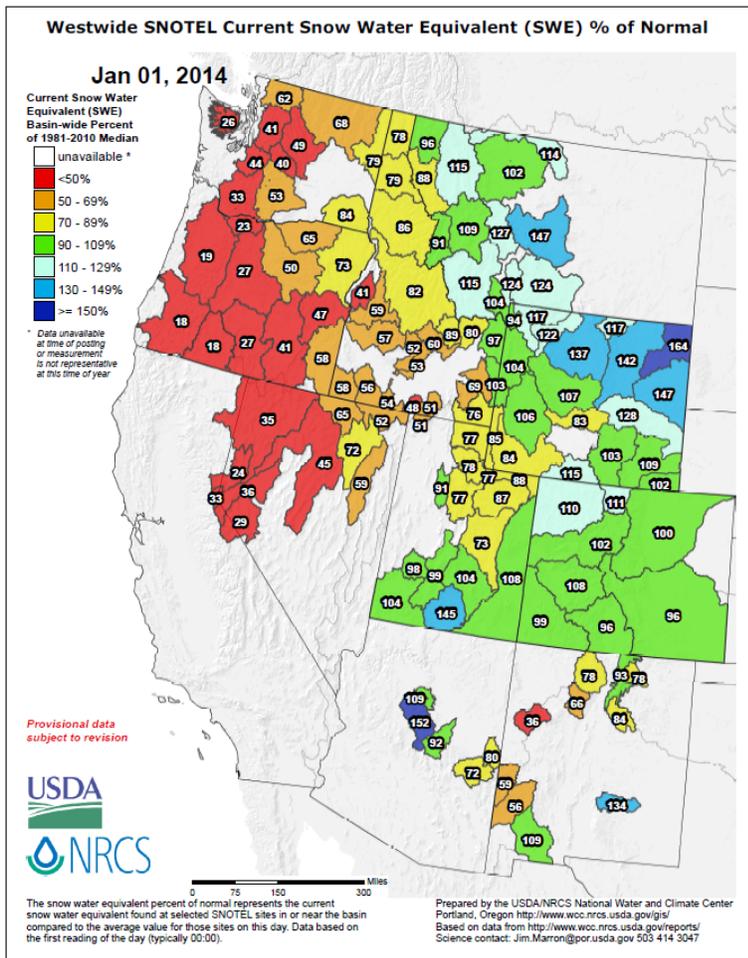
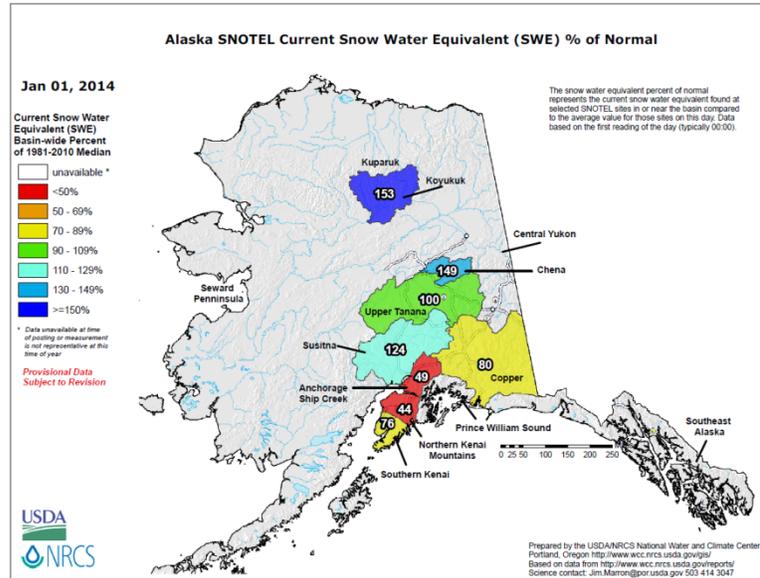


Figure 7: Snowpack values on [January 1, 2014](#) show that precipitation deficits noted in Figure 1 and Figure 3 translate to snowpack deficits over the Pacific Northwest, Sierra, and Great Basin. However, this situation has not occurred over parts of the Southwest where snowpack is substantially greater than total precipitation for the month of December and for the water year that started in October. Only SNOTEL sites are included in this data depiction.

Maps containing daily updates of the westwide snowpack are available at the following links: http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_swepctnormal_update.pdf and http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/ak_swepctnormal_update.pdf

Spring and Summer Streamflow Forecasts

These forecasts are based on daily water supply forecasts (http://www.wcc.nrcs.usda.gov/wsf/daily_forecasts.html) (Figure 8).

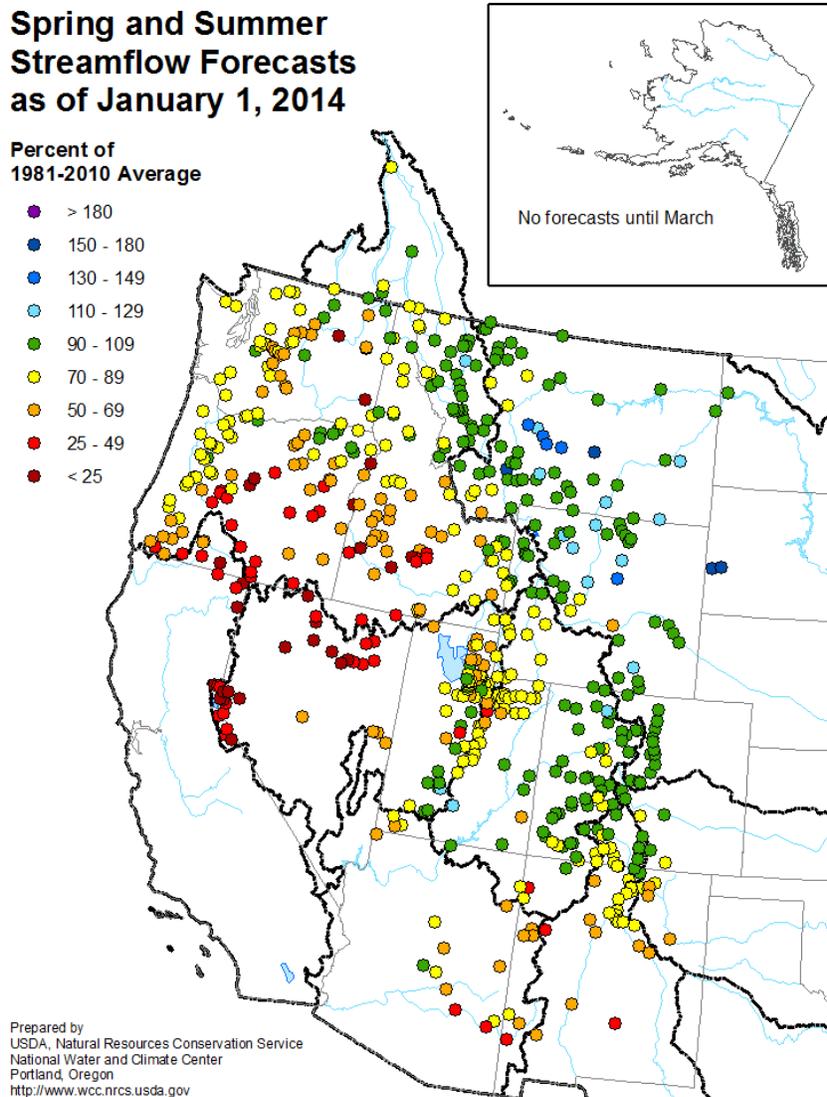


Figure 8: Seasonal Water Supply Forecasts based on January 1, 2014 conditions.

First, it should be noted that spring and summer runoff model predictions for the 2014 water year are based on current climate and hydrologic conditions. This is because climate does not always follow persistence as the year proceeds. Watersheds that have been dry up to this point may accumulate an abundance of snow by April 1, and conversely, watersheds that have had copious amounts of precipitation through the end of December may result in below normal snowpacks on April 1.

The NRCS long-range daily water supply forecasts closely imitate the current snowpack map (Figure 5) and the water year-to-date precipitation maps (Figure 3 and Figure 4). Early season runoff forecasts for the spring and summer show a deficit in California, Nevada, most of Oregon, southern Idaho, central Utah, and southern New Mexico. Early indications are that these areas will receive less than 50% of their normal runoff if climatic conditions don't change drastically. Below normal (60%-80%) runoff can be expected from the snowpacks in Washington, central Idaho, southern Utah, southwestern Wyoming, southern Colorado, and parts of northern New Mexico. Slightly below to near normal runoff is forecast for northeastern Oregon, the Idaho Panhandle region, most of western Montana and Wyoming, northeastern Utah, a large portion of Colorado, and parts of northern New Mexico. Above normal spring and summer runoff can be expected from the Upper Missouri, Upper Yellowstone, Musselshell, Wind, Bighorn, Powder, North Platte, and Belle Fourche watersheds (nearly all rivers tributary to the Upper Missouri River above Fort Peck Reservoir).

State Summaries

Alaska –Alaska's snowpack conditions are quite variable due to the size of the state and are reporting much below normal in the southern part of the state (44% Northern Kenai Mountains to much above normal in the northern Interior (153% Koyukuk). Generally, there is a south to north gradient trending from much below normal to much above normal snowpack.

Despite the variable snow conditions, precipitation over Alaska has been quite good this water year. The Koyukuk, Central Yukon, Chena, and Susitna Basins have all received much above normal precipitation. The Copper and Prince William Sound areas have recorded above normal precipitation. The remainder of the state has received near normal amounts of precipitation. Winter projections indicate near normal precipitation over the Alaska Interior for the remainder of the winter, with wetter than normal conditions for the south and southeast parts of the state.

Alaska runoff forecasts will start on March 1.

Arizona – Arizona snowpack is above normal over the San Francisco Peaks area and the Verde River Basin. The snow thins towards the Arizona-New Mexico border, with slightly below normal snow over the Central Mogollon Rim to much below normal snow over the San Francisco/Upper Gila River Basin.

Water year-to-date precipitation has been between 75% to 80% of normal over most of the high runoff-producing portions of Arizona. Expect near normal conditions for the remainder of the winter.

Arizona water supply forecasts will be variable, but are generally expected to be below median.

California – The snowpack in California is almost non-existent over the entire state. (http://cdec.water.ca.gov/cgi-progs/snowsurvey_sno/PLOT_SWC) . There's still a lot of time left in the snow accumulation season, but at this time, there's not much snow available to provide water to fill the state's reservoirs this spring.

The weighted statewide water year precipitation over the ten hydrologic regions is less than 6%, ranging from 4% over the North Coast, San Francisco Bay, Sacramento River regions, to 20% over the Colorado River Region (http://cdec.water.ca.gov/cgi-progs/snowsurvey_p/PRECIPSUM). Forecasters are predicting below normal precipitation for California for the remainder of the winter season through March.

If something doesn't happen soon to bring precipitation into the state, it will be a difficult to regain adequate reservoir storage for the summer.

Colorado – The Colorado snowpack is in good shape for this time of year, with the Yampa, White, Laramie, and North Platte Basins above normal and the remainder of the state near normal.

Water year precipitation has been the driest in the southern portion of the state, with 88% of normal recorded over the Arkansas Basin and 90% of normal over the upper Rio Grande Basin. The Laramie and North Platte drainages in the far northern portion of the state have recorded 110% of normal precipitation. Statewide precipitation can be categorized as generally normal for the first three months of the 2014

water year. Precipitation predictions indicate near normal conditions in northern Colorado and below normal conditions in southern Colorado.

Prospects for a good runoff season increase from the Rio Grande Basin in the south to the North Platte Basin in the northern part of the state. Runoff in the north is expected to be normal to 110% of normal. The central portion of the state can currently expect normal to slightly below normal streamflow volumes. Further south into the Rio Grande and San Juan Basins, it is expected that streamflow will be in the 60% to 80% range.

Idaho – The Henry's Fork, Teton, and Upper Snake Basin snowpacks are near normal...that's the good news. The snowpack over the remainder of the state doesn't look as good. The snowpack in the Idaho Panhandle, Spokane, Clearwater, and Salmon Basins is generally in the high 70% to low 80% range, whereas the southern snowpack is hovering around 50%.

Precipitation in Idaho, like the remainder of the Columbia Basin, is much below normal starting the new water year. The southeastern portions of the state and the Clearwater Basin have received between 75% to 85% of normal precipitation. The rest of the state has been very dry, with amounts over the southern portion at 50% or below. These conditions are expected to prevail throughout the winter.

Spring and summer runoff predictions in Idaho trend from slightly below normal in the northern Panhandle region, to below normal (60%-70%) in the central mountains, to well below normal (25%-50%) in the southern mountains and the Snake River Plain.

Montana – Along with Wyoming and northern Colorado, Montana has some of the best early season snow conditions in the West. The Flathead, St. Mary/Milk, and upper Yellowstone Basins have above normal snowpack conditions, whereas the Smith/Judith/Musselshell watersheds are reporting much above normal snowpacks. With the exception of the Lower Clark Fork, Bitterroot, and Jefferson watersheds, the remainder of the state is experiencing a near average snowpack.

Water year-to-date precipitation has been variable across Montana, but there is general improvement from west to east across the state. The Lower Clark Fork Basin has received 65% of its normal precipitation, whereas the Smith/Judith/Musselshell area has received 112% of normal. The Flathead, Upper Missouri, and Upper Yellowstone Basins have received near normal precipitation; the rest of the state has received between 75% to 85% of normal amounts. This same precipitation pattern is expected to continue through the winter.

Currently, snowmelt runoff in western Montana is expected to be generally below normal. However, in some pockets (Upper Flathead and Bitterroot) runoff could be slightly above normal. Except for the Upper Jefferson Basin, snowmelt runoff in eastern Montana looks to be near to above normal for the spring and summer period.

Nevada – Nevada doesn't normally receive a lot of precipitation, but this year the lack of moisture should be of great concern. The highest snowpack is along the eastern border with Utah (a low runoff producing area) at 76% of normal. The southern Snake, Owyhee, and Humboldt snowpacks are in the 50% to 60% range. The Northern Great and Lake Tahoe Basins are hovering around 20% to 30%.

Like California, Nevada has received very little precipitation statewide. The highest water producing areas of the state around Lake Tahoe and into the northern Great Basin have received less than 30% or normal precipitation. The remainder of the state is only marginally better, with amounts between 50% to 60% of normal. Also, like California, it will be difficult for Nevada to make up the moisture deficit over the remainder of the winter, according to weather forecasters.

Streamflow is currently forecast to be much below normal.

New Mexico – Snow conditions in New Mexico are better than they have been over the past two years. The snowpack conditions are quite variable statewide. Snow conditions run from 36% of normal over the Zuni/Bluewater River drainage in the western part of the state to 134% of normal over the Rio Hondo drainage near Roswell. The statewide snowpack is categorized as below normal.

Precipitation over New Mexico has not been great so far, but it has been better than the last two years. Still, precipitation over the southern half of the state has only been between 45% to 60% of normal. Precipitation amounts are better approaching the northern portions of the Sangre de Cristo Mountains. However, climate forecasters are predicting below normal winter precipitation for all of New Mexico. Therefore, it looks like the state will not get much relief from the dry conditions that they have been experiencing over the past few years.

There were some early expectations that the 2014 runoff year would be better than the two previous two years, but current and expected climate conditions are whittling away at those expectations. Expect another below normal runoff season for New Mexico, especially in the southern portions of the state.

Oregon – The Pacific Northwest (and Oregon in particular) has been very dry this water year. The best snowpack in Oregon is in the northeastern portion of the state and is only 73% of normal. The snowpack over the central and western portions of the state is poor. The snow trends from 47% in the John Day watershed and 41% in the Harney watershed to 19% in the Willamette and 18% in the Rogue/Umpqua. Snowfall forecasts for the remainder of the season do not look good.

Water year precipitation thus far has been below 50% of normal over almost the entire state, with some areas in the extreme southern portions below 30%. The precipitation has been better (only marginally) over the northeastern mountains. With below normal forecasts being called for, improvement through the winter season is not expected.

The California and Nevada dryness extends into Oregon from the south. Except for the extreme northeast corner of the state, runoff could be much below normal this year.

Utah – The snowpack, like most other parts of the West, is variable. The northeastern snowpack is below normal with values in the 75% to 85% range, while the southern snowpack is essentially normal.

Water year precipitation for Utah is generally slightly below normal (90%-95%) over the southeastern portions of the state, trending to below normal (70%-80%) throughout the central portions, including the highly populated Wasatch Front. Climate forecasters are predicting dry conditions for the remainder of Utah's winter.

Snowmelt runoff will be below normal this year, however in varying degrees as you move within the state. The southern part of the state will be below normal (60%-80%), the Uinta Mountains snow is expected to produce slightly below normal (80%-90%) runoff, whereas the Wasatch Front streams are also expected to produce below normal flows.

Washington – Like Oregon and the rest of the Columbia Basin, this is not starting out as a very good snow year in Washington. The area that normally gets the most snow, the Olympics west of Seattle, has only 26% of normal snowpack. The remainder of the Cascade watersheds aren't much better, with most at or below 50%. As you move east into the Upper Columbia, Spokane, and Lower Snake regions, the snowpack is in the 70% to 80% range.

Washington precipitation for the first three months has been dry (between 55% to 65% of normal over most of the state). The Olympic Mountains would normally receive 80" of precipitation by the end of December. To date, they have only received 20" or 25% of their normal amount. Washington should see near normal precipitation throughout the remainder of the winter, according to the current climate predictions.

Expect below normal (60%-80%) spring and summer streamflow from the Washington state snowpack.

Wyoming – Most of the basins in the state have normal to above normal snow conditions for this time of year. The northeastern snowpacks, which include the Belle Fourche, Bighorn, Powder, and the Cheyenne, are all running much above normal, meaning a very good start to the water year. Except for the Lower Green and Sweetwater Basins, which are below normal, the remainder of Wyoming has near to slightly above normal snow conditions.

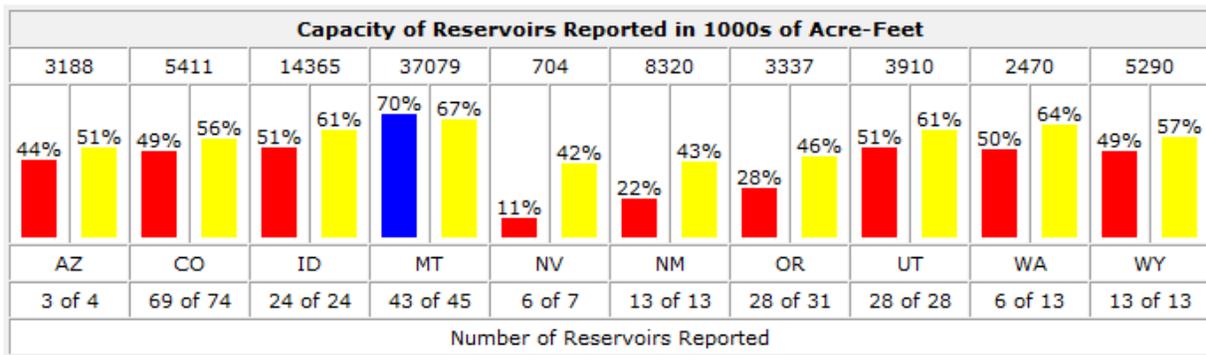
Compared to the rest of the West, precipitation since October 1 has been very good! The Upper Snake River, Lower Green River, and lower Wind River regions of the state have recorded 80% to 90% of normal precipitation, whereas the Upper Missouri, Upper Yellowstone, Upper Green, and Upper Wind Basins have all received near normal amounts of precipitation. Precipitation has been above normal (110%-125%) over the Bighorn, Tongue, Powder, North Platte, and Laramie Basins. And finally, the northeastern corner of the state has received close to 200% for the water year to date. Weather forecasts indicate below normal winter precipitation will prevail over the southwest portion of the state, with near normal amounts elsewhere.

Except for the southwestern portion of the state, Wyoming snowmelt runoff is expected to be near to above normal this spring and summer.

State Basin Outlook Reports can be accessed at: <http://www.wcc.nrcs.usda.gov/wsf/wsf.html>.

Reservoir Storage

Westwide charts, graphs, and tables (<http://www.wcc.nrcs.usda.gov/wsf/wsf-reservoir.html>) show that all statewide reservoir levels are below normal (% of capacity), with the exception of Montana (Figure 9). See the latest detailed [California data](#) report.



[Select here for the Reservoir Dataset for this Period](#)

- Storage is Below Average (% of Capacity)
- Storage is At or Above Average (% of Capacity)
- Average Storage as % of Capacity
- * = Data are not available for this state.

Figure 9: Reservoir Storage – January 1, 2014. See the latest detailed [California data](#) report.

For More Information

The USDA-NRCS National Water and Climate Center Homepage provides the latest available snowpack and water supply information. Please visit us at <http://www.wcc.nrcs.usda.gov>

Follow Current Water Supply Forecast Trends

Daily Water Supply Forecast (DWSF) models are up and running for those interested in following the water supply forecast trends.

As a reminder of where to access these products and west-wide summary maps, here's the [link](#). For a quick overview of current forecasts, the west-wide percent map is quite [handy](#). And if you're curious about the trend over the last two weeks, check [here](#). Not all points are available from the drop down list on the main page – but you can go directly to the ftp server for the [charts / graphs](#).

There are a handful of models missing (spreadsheets need to be updated) – most notably in the Upper Snake and Willamette – and when those are added we'll have over 300 points running across the West.