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INTERMOUNTAIN WEST CLIMATE SUMMARY

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April 2012 Mini-Summary

This month's IWCS is a short supplement that covers only precipitation and drought, snowpack conditions, and streamflow forecasts. If you are interested in the most recent updates of other maps and products we feature in the full-length IWCS, please follow the links on the [Notes and Weblinks](#) page. We will release the next full-length IWCS in May.

Announcements & News***WWA Webinar Series***

In early April, WWA kicked off a new series of occasional webinars describing recent and ongoing research by WWA team members. The first webinar, "Simulating Colorado River Streamflow at Interannual and Interdecadal Time Scales and Implications for Water Resources Management", presented on April 2, is available both as a [streaming video file](#), and as [PDFs of the webinar presentations](#).

The next WWA webinar is tentatively scheduled for May 2, with WWA postdoctoral associate Janine Rice presenting "Climate Adaptation in Western National Forests: A Case Study for the Shoshone National Forest", describing her work with the Shoshone NF in northwest Wyoming to develop a climate change vulnerability assessment and associated resources for climate adaptation.

For more information and to register, go to the WWA [webinar home page](#).

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Precipitation and Drought Conditions

March was exceptionally dry and warm across the three-state region, with most of the region receiving less than 50% of average precipitation for the month. **Colorado's** Front Range saw virtually no precipitation, with Denver experiencing the driest and second-warmest March on record. All mountain areas in the region, with the exception of the Yellowstone Plateau, saw below-average precipitation and early snowmelt due to the persistently warm, sunny conditions.

The dry weather in March led to an expansion of drought conditions, with nearly all of **Colorado** and **Utah**, and far eastern and southern **Wyoming**, now classified as abnormally dry (D0) or worse according to the latest U.S. Drought Monitor (Figure RC-1). Moderate drought (D1) conditions extend through northern and central **Utah** into western and southern **Colorado**, with areas of severe drought (D2) in northwestern and far southeastern **Colorado**. A significant storm in the first week of April brought some amelioration of dry conditions in far eastern **Colorado**, but otherwise the region is drier than it was in early March.

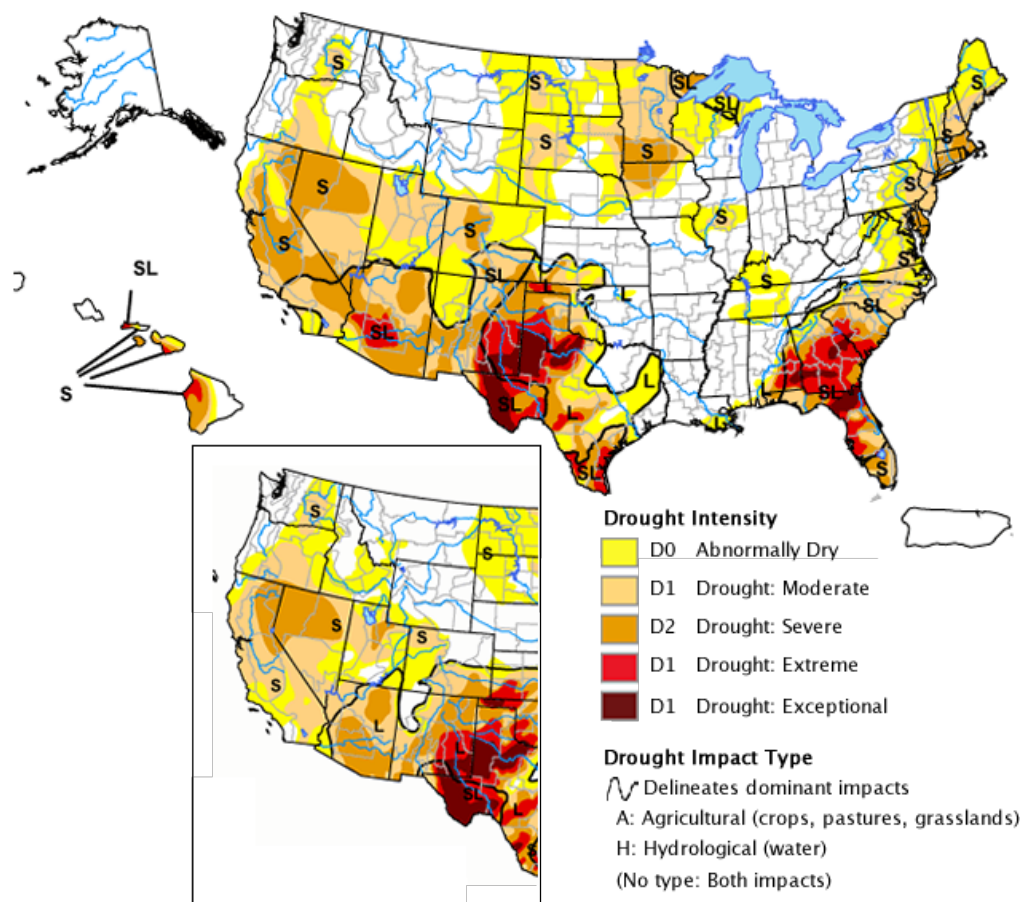


Figure RC-1. Drought Monitor from April 10, 2012 (full size) and March 6, 2012 (inset, lower left) for comparison. (Source: National Drought Mitigation Center)

According to the U.S. Seasonal Drought Outlook, the drought conditions (D1 and D2) across **Utah** and **Colorado** are projected to persist or intensify over the next three months, while drought conditions are expected to emerge in southern **Utah** and far southwestern **Colorado** (Figure DO-1).

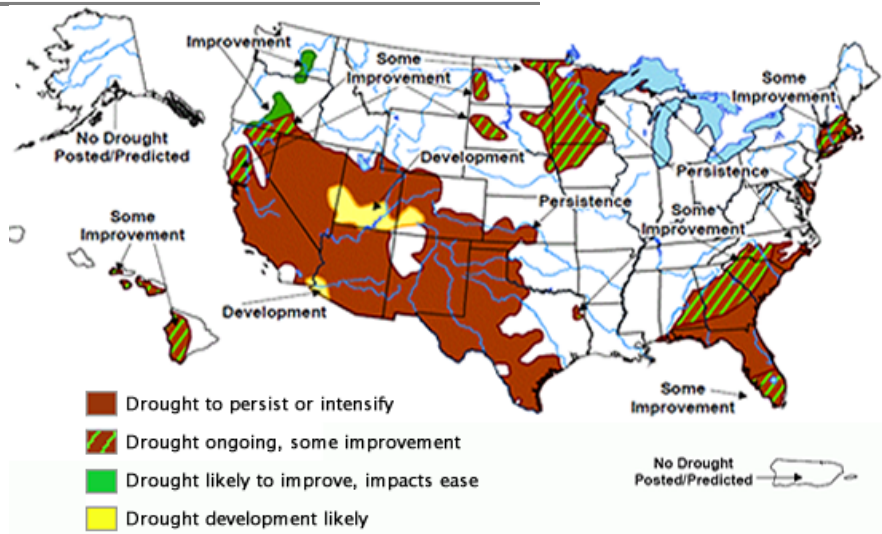


Figure DO-1. Seasonal Drought Outlook for April 5 to June 30, 2012. (Source: NOAA Climate Prediction Center)

[Notes & Weblinks \(Recent Conditions\)](#)

(provides explanations of graphics and additional information sources)

[Notes & Weblinks \(Seasonal Drought Outlook\)](#)

(provides explanations of graphics and additional information sources)

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Intermountain West Snowpack

April 1st percent-of-average snowpack values in the three-state region declined significantly from the already-low March 1st conditions. Nearly all basins in the three-state region reported below- to much-below-average conditions, with only a few **Wyoming** basins reporting near-average conditions (Figure SP-1). While April 1st is generally considered to represent near-peak snow accumulation, many basins in the region likely peaked in early March and have seen significant reductions in measured snow-water equivalent (SWE) on the ground since March 1st. Snowpack conditions averaged across the region on April 1 were the worst since 2002, with a number of individual basins tracking lower than 2002.

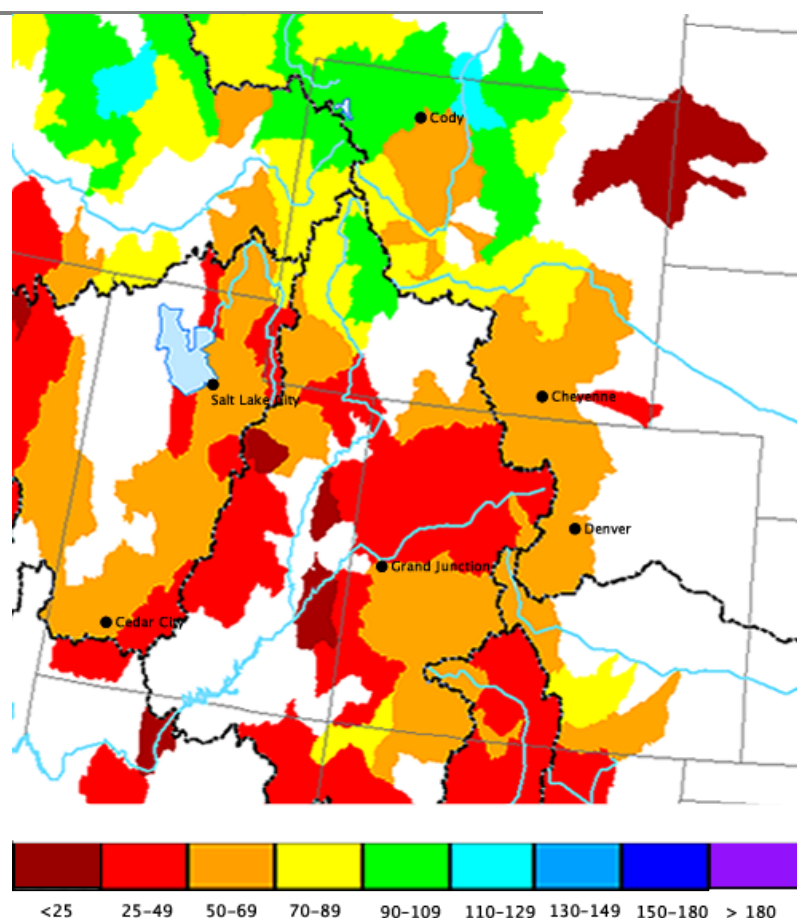


Figure SP-1. Snow water equivalent (SWE) as a percent of average for available SNOTEL and snow course sites in the Intermountain West as of April 1, 2012 (Source: NRCS).

In **Colorado**, April 1 snowpacks were much below average in all basins. A warm, dry and windy March brought large losses in SWE, rather than more typical gains, compared to March 1st. Statewide snowpacks decreased from 81% of average to 52% of average, the lowest value since 2002. Basin April 1st snowpacks ranged from a low of 47% on the White River to a high of 57% on the North Platte. On April 1st, 17 Colorado SNOTEL sites set new record lows, while 16 others were near-record lows. By April 9th, several sites had either melted out with record early melt-out dates or were on a likely trajectory to do so.

Utah statewide snowpacks on April 1 were 52% of average, and 38% of last year's snowpack. Individual basins ranged from a low of 37% in southeast Utah to a high of 59% on the Bear River. A warm, dry, and windy March resulted in SWE decreasing in all basins due to minimal accumulation, high sublimation rates, and early melt onset. March precipitation was 61% of average across Utah, and ranged from 56% in the Uintas and southeastern Utah to 71% in southwestern Utah. Nineteen Utah SNOTEL sites set new record low April 1st SWE readings.

Wyoming snowpacks as of April 1st were below average in most basins, with the statewide snowpack at 67% of average. Conditions were somewhat more favorable in northern basins, but still below average. March precipitation was much below average in most basins. Low precipitation and warm temperatures resulted in a net decrease in SWE in most Wyoming basins. These decreases were generally less severe than those experienced during March in Utah and Colorado.

Snowpack Update, April 13: Continued drier-than-average weather across the region has caused snowpacks to decline further relative to average conditions since April 1. **Colorado's** statewide snowpack is almost exactly matching the trajectory of April 2002, having declined to 39% of average as of April 12. A fast-moving storm is currently affecting the region, with moderate snowfall occurring in parts of **Utah** and forecasted moderate amounts in nearly all **Colorado** mountains. But this will likely just slow meltout for several days rather than generate any substantial snowpack gains.

[The majority of the text in this section comes from the NRCS State Basin Outlook Reports.]

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(provides explanations of graphics and additional information sources)

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Spring and Summer Streamflow Forecasts for the 2012 Runoff Season

The spring and summer streamflow forecasts issued on April 1st call for much-below-average April-July runoff for most of the region. Runoff conditions are more favorable, but still only near-average, in northern **Wyoming**. Forecasted flows are much lower than on those on March 1 for most basins due to unfavorable March weather conditions, and, in many cases, early initiation of snowmelt. The forecasted April-July inflows to Lake Powell, for example, decreased from 67% of average on March 1st to 44% of average as of April 1st (based on 1971-2000; see below).

Important note about "percent of average": The coordinated streamflow forecasts provided in the IWCS are taken from NRCS State Basin Outlook Reports and use the 1971-2000 period for calculating the percent of average, while the NOAA NWS Colorado Basin River Forecast Center (CBRFC) this year has switched to the 1981-2010 period for calculating the percent of average for the same coordinated forecasts. Since the 1970s were wetter than the 2000s, the NRCS baseline is generally higher than CBRFC's for a given gage, and thus the NRCS-reported % of average will generally be lower than the CBRFC-reported % of average for the same volume forecast. For example, the coordinated April 1 forecast for April-July Lake Powell inflow is for 3500 KAF, which NRCS calculates as 44% of average (1971-2000), while CBRFC calculates it as 49% of average (1981-2000).

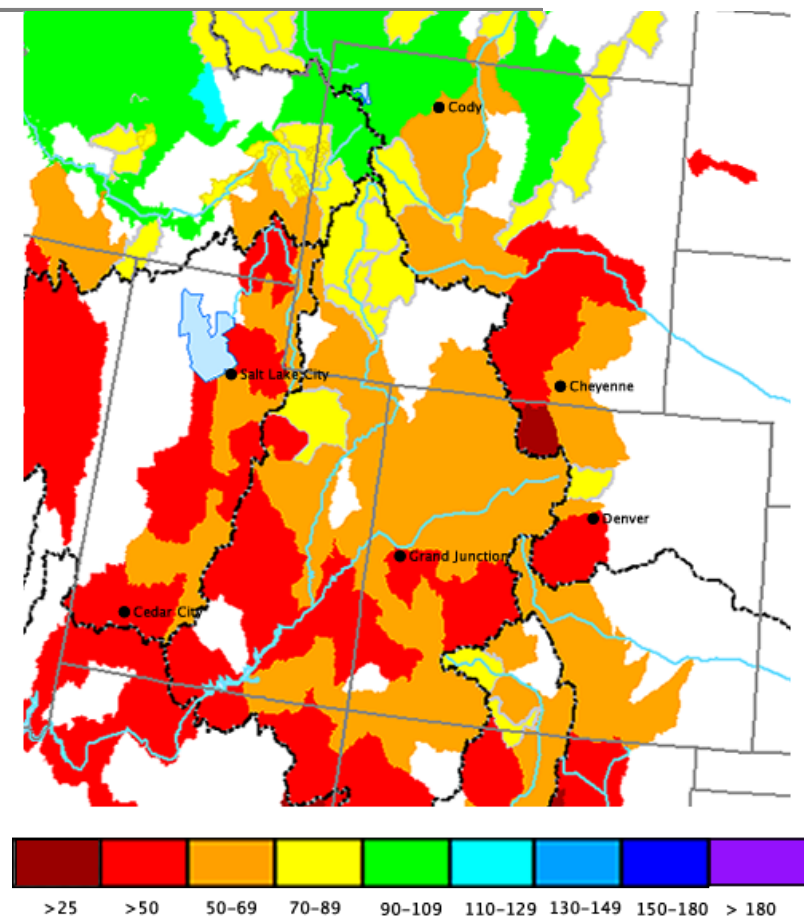


Figure STRM-1. NRCS outlook for natural streamflows for spring and summer 2012 in the Intermountain West

region as a percent of average streamflows (data through April 1, 2012). (Source: NRCS)

In **Colorado**, April 1 streamflow forecasts call for much-below-average runoff conditions throughout the state. Most forecasts fall in the 40% to 60% of average range. The highest forecasts in the state are barely above 70% of average, for areas of the Upper Rio Grande and portions of the Front Range near Boulder. The lowest forecast in the state is for the North Platte near Northgate, at 20% of average. Forecasts decreased very significantly in most areas from the March 1st forecasts due to extremely poor conditions in March. Spring and summer runoff in some areas may approach record-low volumes.

Utah April 1st streamflow forecasts are for much below average runoff conditions statewide. Similar to Colorado, most forecasts are in the range of 40% to 60% of average. The Uinta Basin includes both the lowest forecast point, the Strawberry River at 27% of average, and the highest forecast point, the Yellowstone River at 76% of average.

Wyoming April 1 streamflow forecasts are mostly below average, but considerably higher than Colorado and Utah. The forecasted flows statewide dropped to 75% of average, from the 93% of average forecasted on March 1st. Runoff conditions are generally expected to be near to slightly below average in the north and western regions of the state, and far drier to the south and east.

[The majority of the text in this section comes from the NRCS State Basin Outlook Reports.]

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The Intermountain West Climate Summary is published periodically by Western Water Assessment (WWA), a joint project of the University of Colorado Cooperative Institute for Research in Environmental Sciences (CIRES) and the National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory (ESRL) researching water, climate, and societal interaction.

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