Research Home
Current Publications
All Publications
WWA Reports
WWA Annual Reports
Intermountain West Climate Summary
Stakeholder Climate Needs

INTERMOUNTAIN WEST CLIMATE SUMMARY

A product of the Western Water Assessment

Issued April 20, 2009, Vol. 5, Issue 3

Brad Udall Ð WWA Director

Jessica Lowrey, Kristen Averyt, Andrea Ray Ð Editors/Writers

Julie Malmberg Ð Writer

Lucia Harrop Ð Graphic Designer

Klaus Wolter, Gary Bates Ð Asst. Editors

April 2009 Mini Summary
Announcements & News

This month we introduce a mini IWCS that focuses on drought, snowpack conditions, and streamflow forecasts. If you are interested in updated version 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 next month on May 26, 2009.

We appreciate your input, and please let us know what you think of these changes. Email: **wwasummary@wwa.colorado.edu**

Drought Conditions

In March, precipitation was below average for **Colorado** and **Utah** and above average in **Wyoming**. As a result, drought expanded in western **Colorado** and eastern **Utah** (to D0-abnormally dry) and decreased in southern and northwestern **Wyoming** (from D0 to no drought status) (Figure RC-1). Below average temperatures and a few big snow storms at the end of March/beginning of April in the mountains of central and western **Colorado**, western **Wyoming** and extreme southeastern **Wyoming** kept the drought status away from those areas.

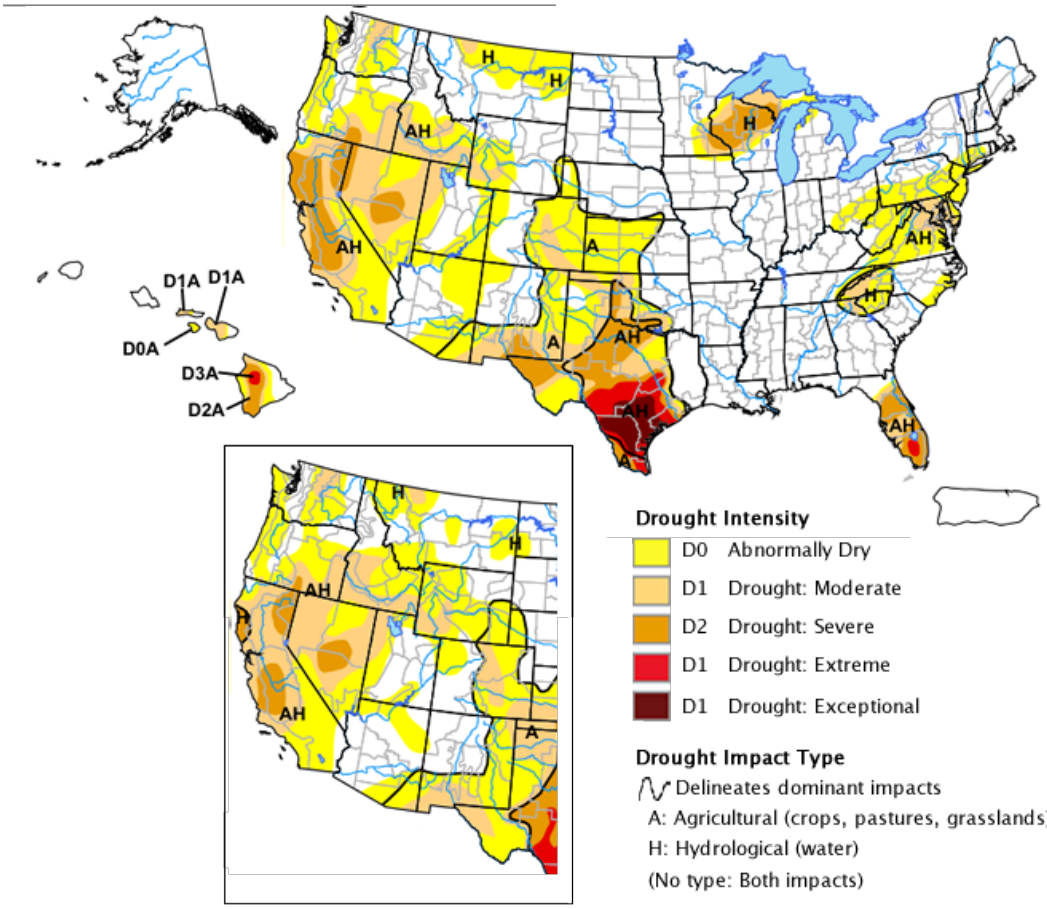

Figure RC-1. Drought Monitor from April 14, 2009 (full size) and March 17, 2009 (inset, lower left) for comparison. (Source: National Drought Mitigation Center)

According to the U.S. Seasonal Drought Outlook, southeastern **Colorado** should see some improvement in drought status in the next two months, but drought will persist in southwestern **Wyoming** and northwestern **Utah** (Figure DO-1). The projected improvements in **Colorado** (and other areas in the central Plains) are largely due to moderate to heavy rain forecasted from April 16-20. On the other hand, climate outlooks show increased changes for below average precipitation in MayÐJuly across the drought areas of the Interior West, including southwestern **Wyoming**. As a result, drought should persist everywhere it exists from the central Rockies westward.

Forecasters report that forecast confidence across the across the southern Plains is moderate to high and confidence across the central Interior West is high.

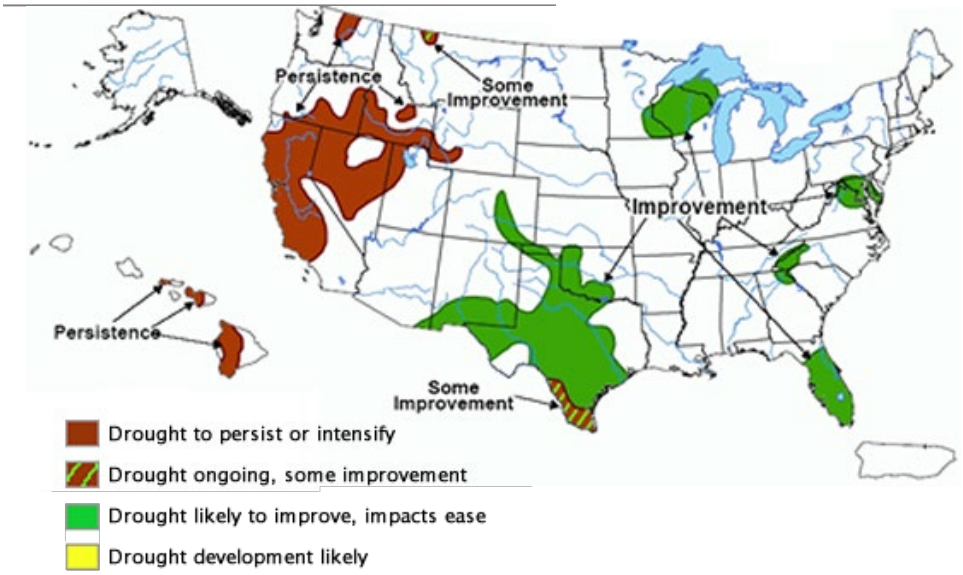

Figure DO-1. Seasonal Drought Outlook for April 14, 2009ÐJuly 2009. (Source: NOAA Climate Prediction Center)

Intermountain West Snowpack

Precipitation in March was above average in **Wyoming**, and below average in **Colorado** and **Utah**. As a result, snowpack as a percent of average increased in parts of **Wyoming,** and decreased throughout most of **Colorado** and **Wyoming** (Figure SP-1).

Between March 1 and April 1, increases of 6Ð15 percentage points occurred in parts of the Yellowstone, Clarks Fork, Snake, and Wind-Big Horn River Basins in the northeast, as well as the North Platte River Basin in central **Wyoming**. As of April 1, snow water equivalent (SWE) across **Wyoming** is slightly below average (98%) for this time of year. SWE in the northwest portion of **Wyoming** is now about 97% of average, northeast **Wyoming** SWE is currently about 111% of average, the southeast **Wyoming** SWE is currently about 100% of average, and the southwest **Wyoming** SWE is about 94% of average.

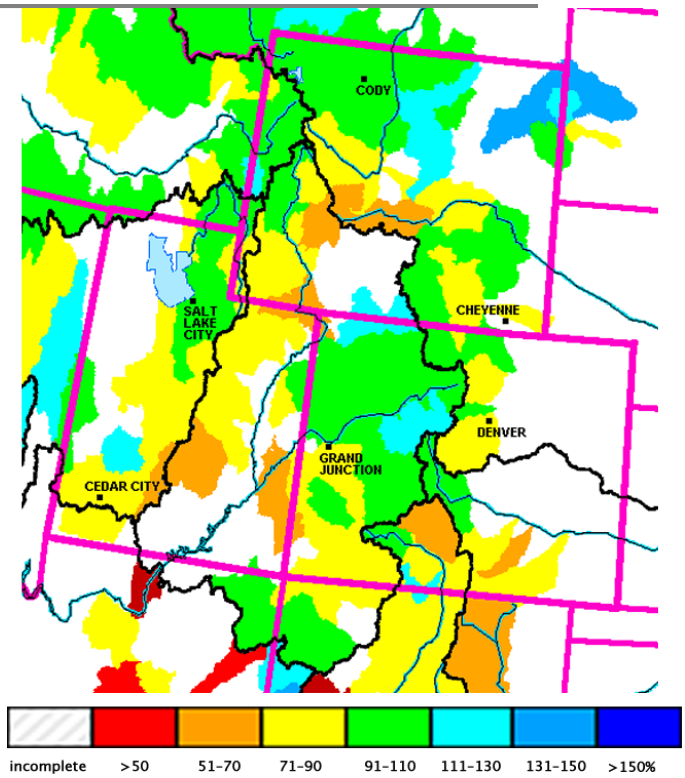

Figure SP-1. Snow water equivalent (SWE) as a percent of average for available SNOTEL and snow course sites in the Intermountain West as of April 1, 2009 (Source: NRCS).

The first three weeks of March were very dry across **Colorado**. As a result, the month ended with lower

snowpack percentages than in the beginning of the month for all the major river basins of the state. March was the third consecutive month where snowpack percentages declined in every basin in **Colorado**. The greatest declines in basinwide percents of average were measured in the San Juan, Animas, Dolores and San Miguel (-20 percentage points), Rio Grande (-17 percentage points), and the Arkansas (-13 percentage points). Only two basins remain with above average snowpack totals: the Colorado and combined Yampa and White River Basins, both at 104% of average. The lowest snowpack percentages were measured in the South Platte and the combined San Juan, Animas, Dolores, and San Miguel River Basins, at only 86% of average.

In **Utah**, March started with a few productive storms, but the middle of the month was very dry. Warm temperatures brought low and mid elevation snowpacks to isothermal conditions and melting began. Snowpacks across the state began a steep decline with many areas showing declines of 5 to 15%. Then in the final week March, a series of storms hit the state and brought snow levels in northern **Utah** back to near average conditions. Southern and eastern **Utah** improved, but not as much as the north. Snowpacks across the state now range from 77% in southeastern **Utah** to 100% in the Weber. March precipitation was below to above average (77Ð118%) in northern **Utah** and much below to below average (35Ð83%) in the south.

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

Notes & Weblinks
(provides explanations of graphics and additional information sources)

RETURN TO TOP

Spring and Summer Streamflow Forecasts for the 2009 Runoff Season

Streamflow projections are below average to much below average for the Intermountain West Region (Figure STRM-1), due to below average precipitation across most of the region in the last few months. However, most reservoirs are near average now, and they should be able to fill this year.

Below average precipitation in March across **Colorado** caused runoff forecasts to decrease since those made on March 1. Southern basins could face a year of below average streamflows, especially the San Juan, Animas, Dolores, San Miguel, and the South Platte River Basins. Volumes in these basins currently range between 75 and 90% of average. Other basins with predominantly below average forecasts include the Rio Grande and the southern tributaries to the Arkansas River. The state's highest outlook for the coming runoff season is confined to the northwestern basins, where the Yampa and Colorado Rivers are forecast to produce slightly above average volumes. For the remainder of the state, near average volumes are expected. It would require a wet spring to raise those lowest forecasts back to near average in the drier basins. Water users can expect a better chance for recovery in the South Platte Basin, which is entering its wettest period of the year; however this is less likely in the southwestern basins given their spring climatologies.

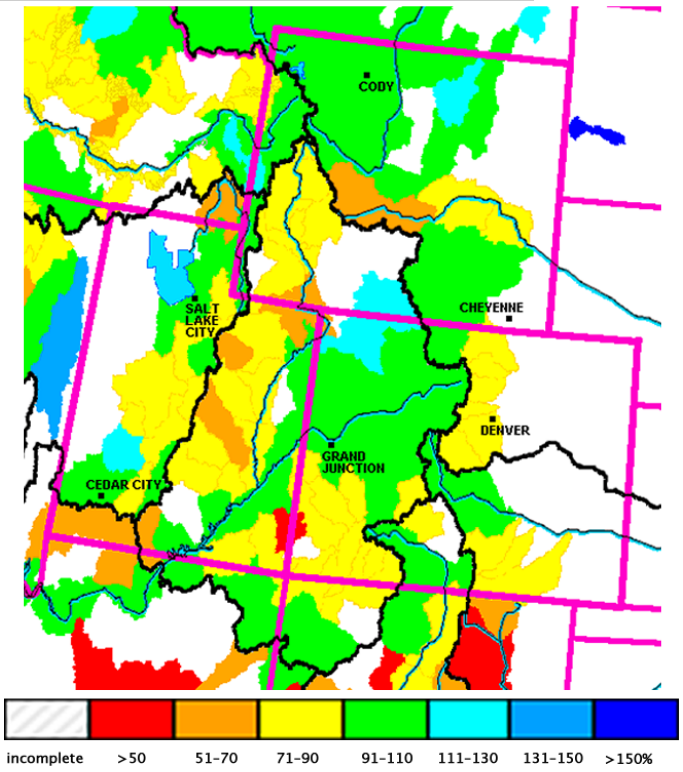

Figure STRM-1. NRCS outlook for natural streamflows for spring and summer in the Intermountain West region as a percent of average streamflows (data through April 1, 2009). (Source: NRCS)

Reservoir storage continues to be the bright spot for water supplies in **Colorado**, especially in basins where runoff forecasts have diminished recently. Storage volumes remain near to slightly above average across most of the state. Most likely, the state's reservoir storage will help supplement water supplies across most of the state this summer. However, with inflows now forecast to be below average in most basins we can now expect to enter water year 2010 with below average volumes.

Streamflows are expected to be below average across **Wyoming**. Most probable yield for the entire state of Wyoming varies from 44 to 131% of average. The highest expected streamflows (about 230% of average) are in the Belle Fourche & Cheyenne River Basins in northeast **Wyoming**. The lowest expected streamflows are in the Little Bear River Basin (68% of average) in southwest **Wyoming** and in the Green River Basin (83% of average) in western **Wyoming**. Other river basins across the state are expected to see near average streamflows.

Reservoirs on the North Platte River are well below average at 78% of average, while the reservoirs in the rest of **Wyoming** are near or slightly above average (range from 101Ð111% of average).

General water supply conditions are near average in northern **Utah** and the Virgin River Basin and near to much below average in central and southeastern **Utah**. Streamflow forecasts range from 53% for the Bear River at Stewart Dam to 115% of average on the Beaver River near Beaver. Surface Water Supply Indices range from 12% on the Bear River to 57% for the Virgin. The extremely low value for the Bear River is a reflection of Bear Lake storage, which continues to be well below average. Snowmelt streamflows are expected to have a wide range from much below average to above average across **Utah** this year. Forecast streamflows range from 32% on South Creek near Monticello to 115% on the Beaver River near Beaver. Most flows are forecast to be in the 80Ð105% range. Most reservoirs in **Utah** should easily fill this runoff season. A notable exception is Bear Lake. All reservoirs with previous fill restrictions are now able to store.

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

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.

Cooperative Institute for Research in Environmental Sciences ■ University of Colorado Boulder ■ 216 UCB ■ Boulder, CO 80309-0216 ■ Phone: 303-735-8173