



Natural Resources Conservation Service
P.O. Box 2890
Washington, D.C. 20013

Weekly Report - Snowpack / Drought Monitor Update Date: 14 January 2010

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: SNOTEL Snow-Water Equivalent percent of normal values for 14 January 2009 shows amounts well below normal over much of the West. The only significant exceptions exist over southeast Utah and over the high country of Arizona and parts of New Mexico (Fig. 1).

Temperature: SNOTEL and ACIS-day station average weekly temperature experienced abnormally warmer conditions over much of the West while cooler than average conditions existed across parts of the Northern and Central Rockies (Fig.2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departure was northeastern California (>+15F) and the greatest negative departure occurred over the Bighorn Mountains of Wyoming (<-15F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 13 January shows the bulk of the heaviest precipitation fell over the Olympic Mountains of Washington (Fig. 3). In terms of percent of normal, above normal amounts fell from northern coastal California to northern coastal Washington and southeastern New Mexico. The remainder of the West was mostly dry (Fig. 3a). Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2010 Water Year that began on October 1, 2009 shows most of the West at or below normal values despite above normal snow water equivalent over much of the Southwest (Fig. 3b).

WESTERN DROUGHT STATUS

The West: A relatively dry week shows no areas improving their status. The only areas really benefitting from recent storms seem to be contained to the coastal regions of the Pacific Northwest, which is not currently in drought.

As for the rest of the story, D0 continues to spread across more of eastern Nevada, southern Idaho, northern Utah, western Wyoming and northwestern Colorado. Temperatures were generally cooler than normal in these states, but many of the basins are only running at 50-75% of normal snowpack, with snow water equivalents (SWE) following suit at 50-75% of normal as well.

Reservoir conditions are a mixed bag across the West according to USDA-NRCS, with below-normal values in Nevada, New Mexico and Oregon but closer-to-normal values for Arizona, Colorado and Wyoming. Streamflows across the West are generally below normal for all but the Pacific Northwest and Rocky Mountain Front Range.

After yet another dry week in the Southwest, and compounded long-term by a very modest monsoon season, changes for the worse are noted this week. An expansion of D0 is noted in central New Mexico as well as a slight incursion of D1 and D2 in those extreme western counties bordering Arizona. In Arizona, D2 now covers most of the state, and a slight expansion is also noted in the D3 across the northeastern Arizona tribal land region. Impacts are starting to flow in with regard to severely impacted range conditions in Arizona, and also in many states in the Southwest and four corners region. The D2 has also spread out of Arizona and connected with previous areas of D2 in southern Nevada and southeastern California in the Mojave Desert region.

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve maintain and improve our natural resources and environment

Weekly Snowpack and Drought Monitor Update Report

Rainfall totals in this area are only coming in at 25-50% of normal or worse in some spots, a little better in others, but generally, not good with each passing dry month. Author: Mark Svoboda, National Drought Mitigation Center

A comprehensive narrative describing drought conditions for the nation can be found at the end of this document.

DROUGHT IMPACTS DEFINITIONS (<http://drought.unl.edu/dm/classify.htm>)

The possible impacts associated with **D4 (H, A)** drought include widespread crop/pasture losses and shortages of water in reservoirs, streams, and wells creating water emergencies. The possible impacts associated with **D3 (H, A)** drought include major crop/pasture losses and widespread water shortages or restrictions. Possible impacts from **D2 (H, A)** drought are focused on water shortages common and water restrictions imposed and crop or pasture losses likely. The possible impacts associated with **D1 (H, A)** drought are focused on water shortages developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 4 and 4a).

SOIL MOISTURE

Soil moisture (Figs. 5a and 5b), is simulated by the [VIC macroscale hydrologic model](#). The detailed, physically-based VIC model is driven by observed daily precipitation and temperature maxima and minima from approximately 2130 stations, selected for reporting reliably in real-time and for having records of longer than 45 years (and various other criteria). Another good resource can be found at:

<http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>.

U.S. HISTORICAL STREAMFLOW

http://water.usgs.gov/cgi-bin/waterwatch?state=us&map_type=dryw&web_type=map.

This map, (Fig. 6) shows the 7-day average streamflow conditions in hydrologic units of the United States and Puerto Rico for the day of year. The colors represent 7-day average streamflow percentiles based on historical streamflow for the day of the year. Thus, the map shows conditions adjusted for this time of the year. Only stations having at least 30 years of record are used. Sub-regions shaded gray indicate that insufficient data were available to compute a reliable 7-day average streamflow value. During winter months, this situation frequently arises due to ice effects. The data used to produce this map are provisional and have not been reviewed or edited. They may be subject to significant change.

STATE ACTIVITIES

State government drought activities can be tracked at the following URL:

<http://drought.unl.edu/mitigate/mitigate.htm>. NRCS SS/WSF State Office personnel are participating in state drought committee meetings and providing the committees and media with appropriate SS/WSF information - <http://www.wcc.nrcs.usda.gov/cgibin/bor.pl>.

Additional information describing the products available from the Drought Monitor can be found at the following URL: <http://drought.unl.edu/dm/> and <http://drought.gov>.

FOR MORE INFORMATION

The National Water and Climate Center Homepage provide the latest available snowpack and water supply information. Please visit us at <http://www.wcc.nrcs.usda.gov>. This document is available from the following location on the NWCC homepage - <http://www.wcc.nrcs.usda.gov/water/drought/wdr.pl>

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This report uses data and products provided by the Interagency Drought Monitor Consortium members and the National Interagency Fire Center.

/s/ NOLLER HERBERT
Director, Conservation Engineering Division

Weekly Snowpack and Drought Monitor Update Report

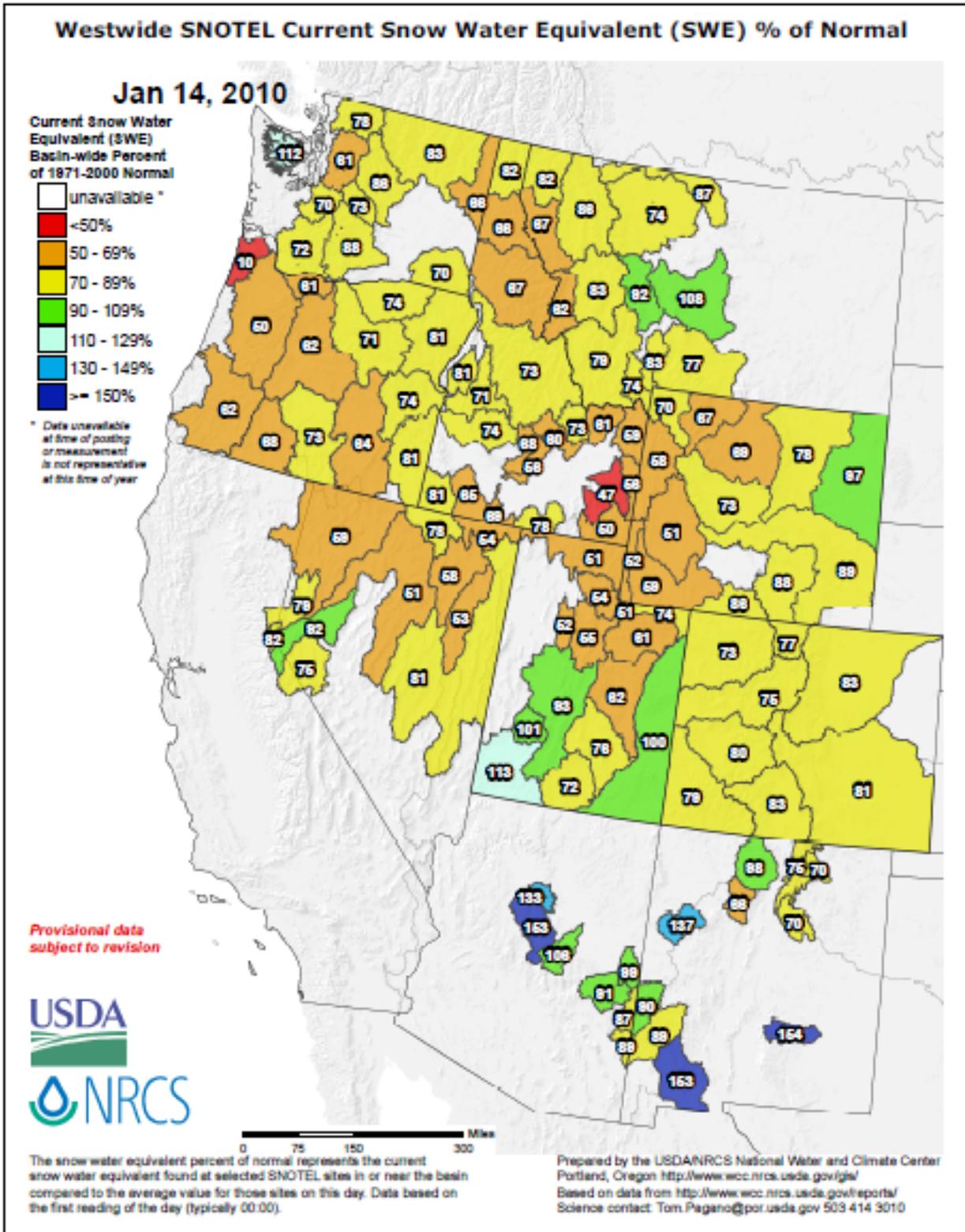


Fig 1. SNOTEL Snow-Water Equivalent percent of normal values for 14 January 2009 shows amounts well below normal over much of the West. The only significant exceptions exist over southeast Utah and over the high country of Arizona and parts of New Mexico.

Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_swepctnormal_update.pdf

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SNOTEL (solid) and ACIS (dot-filled) Networks 7-Day Average Temperature Anomaly (Degrees F)

Jan 14, 2010

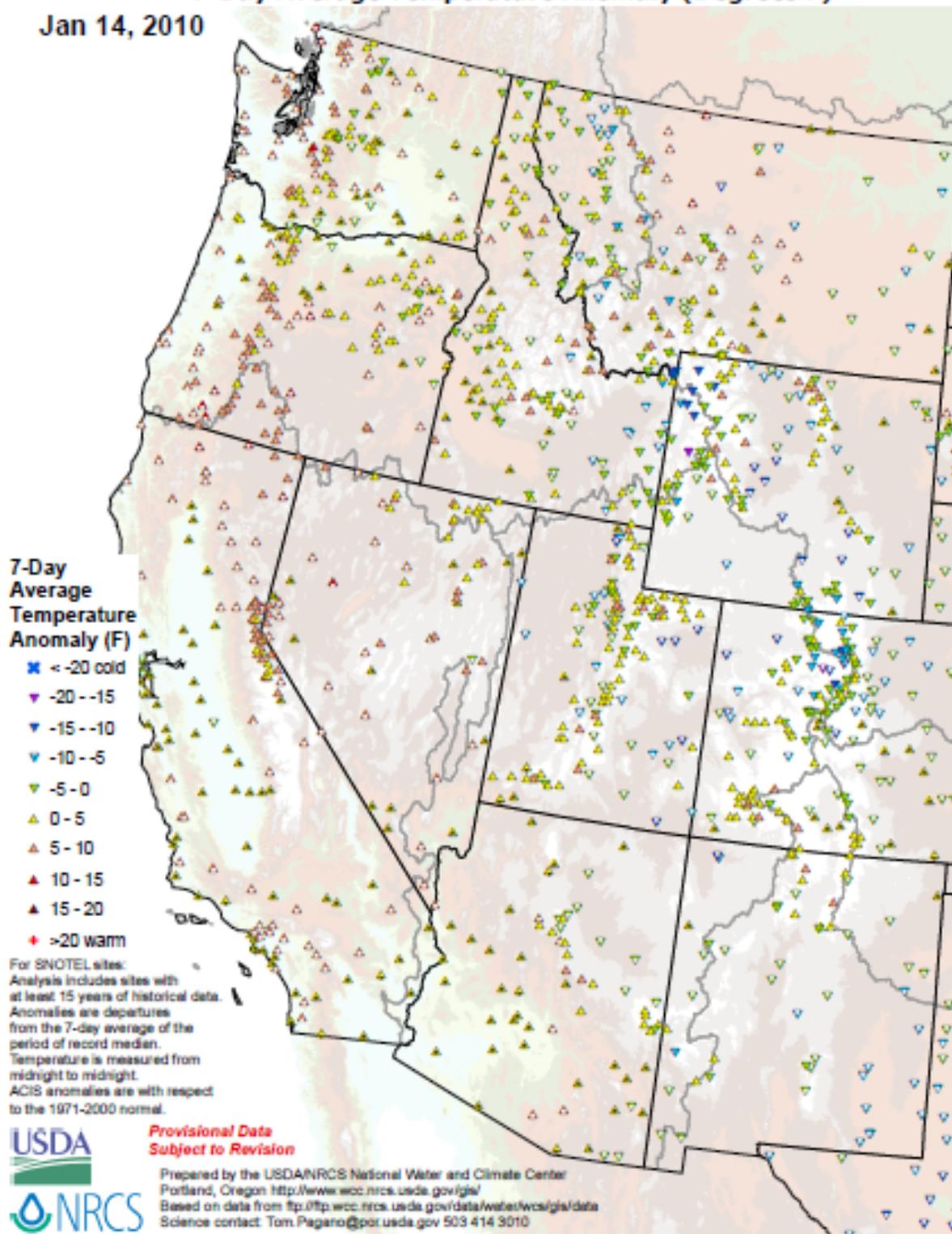
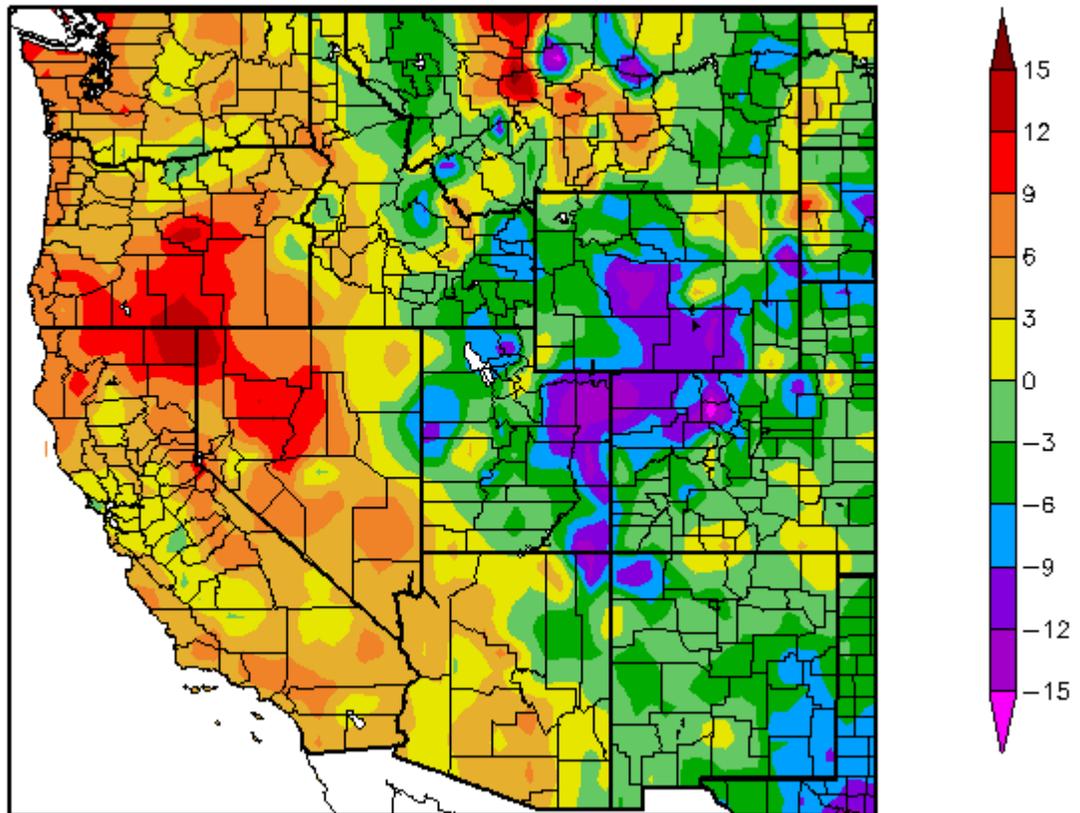


Fig. 2. SNOTEL and ACIS-day station average weekly temperature experienced abnormally warmer conditions over much of the West. Cooler than average conditions existed across parts of the Northern and Central Rockies.

Ref: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavg7dAnomalyAcis.pdf>

Departure from Normal Temperature (F)
1/7/2010 – 1/13/2010



Generated 1/14/2010 at HPRCC using provisional data.

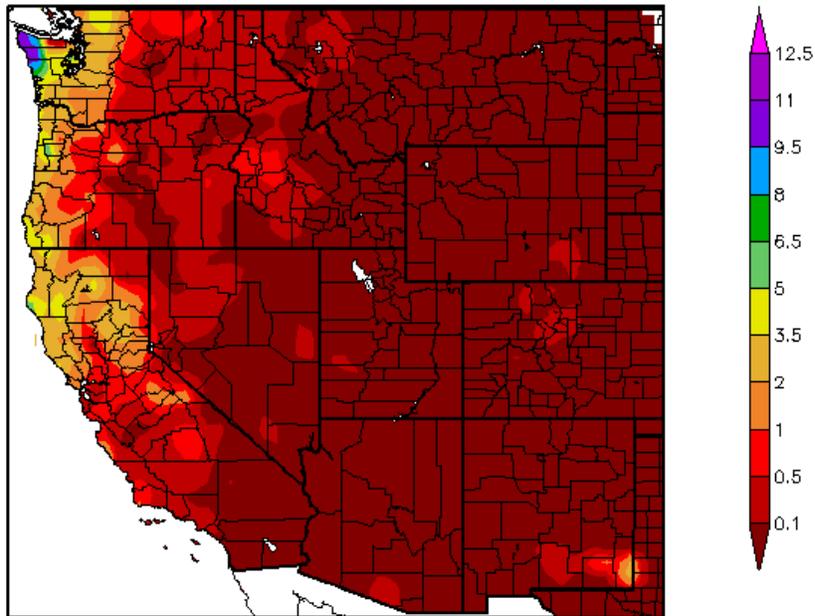
NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies show that the greatest positive temperature departure was northeastern California (>+15F) and the greatest negative departure occurred over the Bighorn Mountains of Wyoming (<-15F).

Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_product&product=TDept

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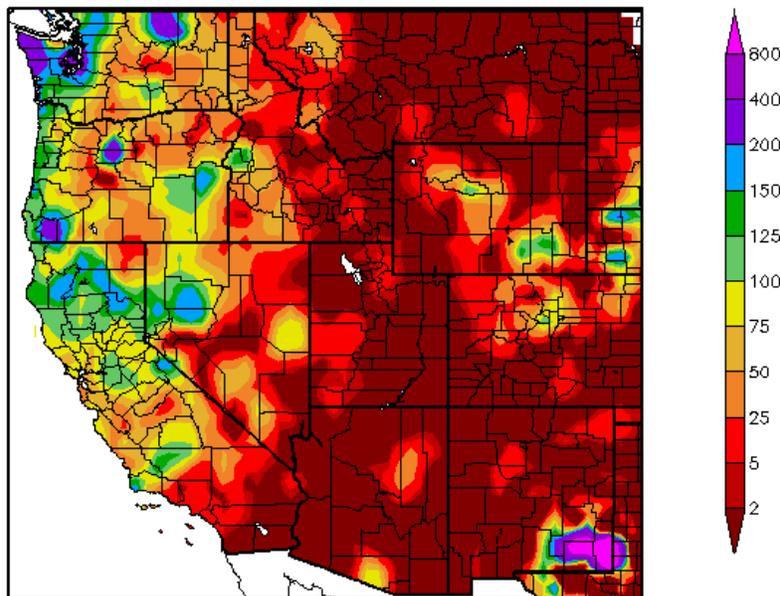
Precipitation (in)
1/7/2010 - 1/13/2010



Generated 1/14/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
1/7/2010 - 1/13/2010



Generated 1/14/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. and 3a. ACIS 7-day average precipitation amounts for the period ending 13 January shows the bulk of the heaviest precipitation fell over the Olympic Mountains of Washington. In terms of percent of normal, above normal amounts fell from northern coastal California to northern coastal Washington and southeastern New Mexico. The remainder of the West was mostly dry.

Ref: <http://www.hprcc.unl.edu/maps/current/>

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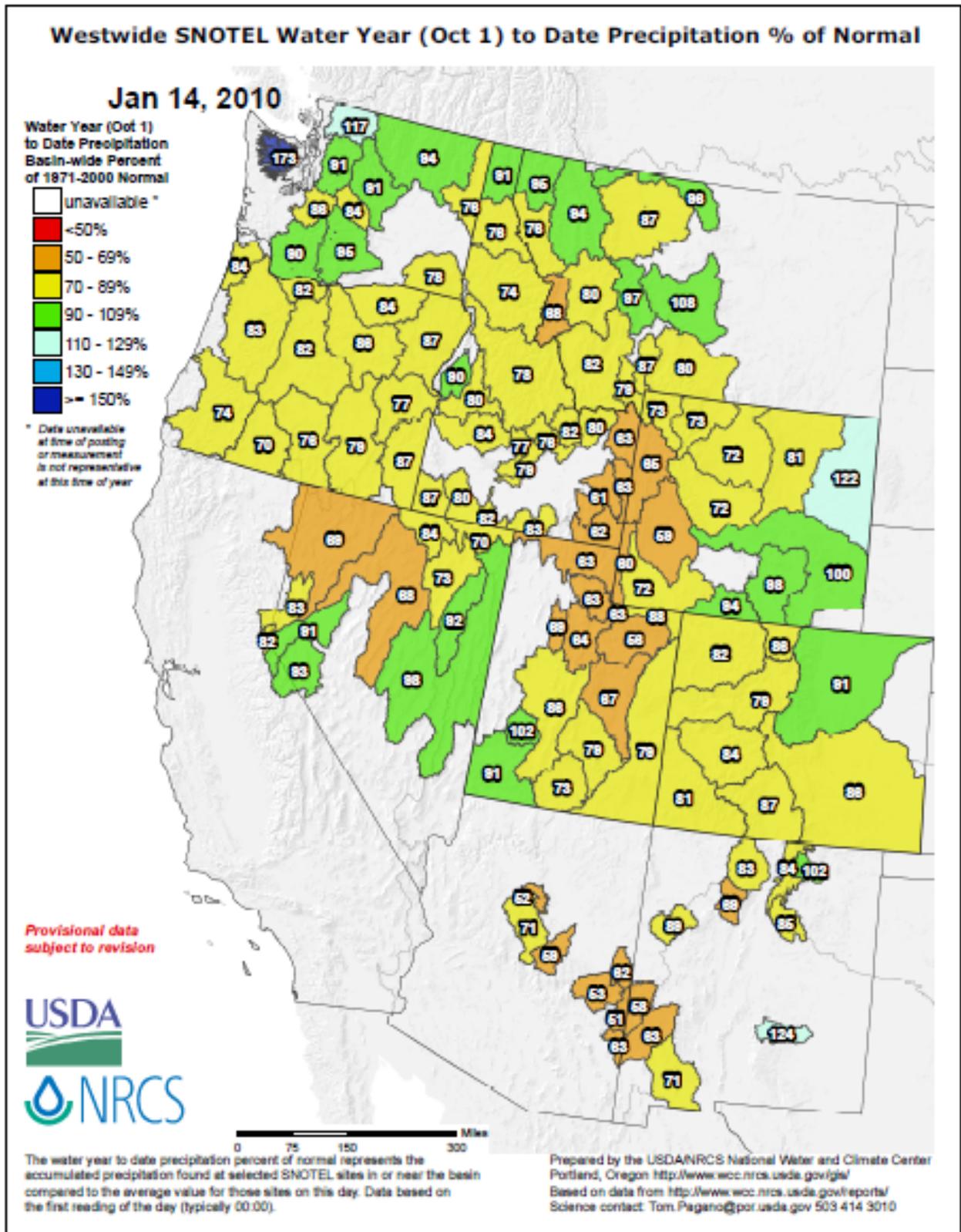
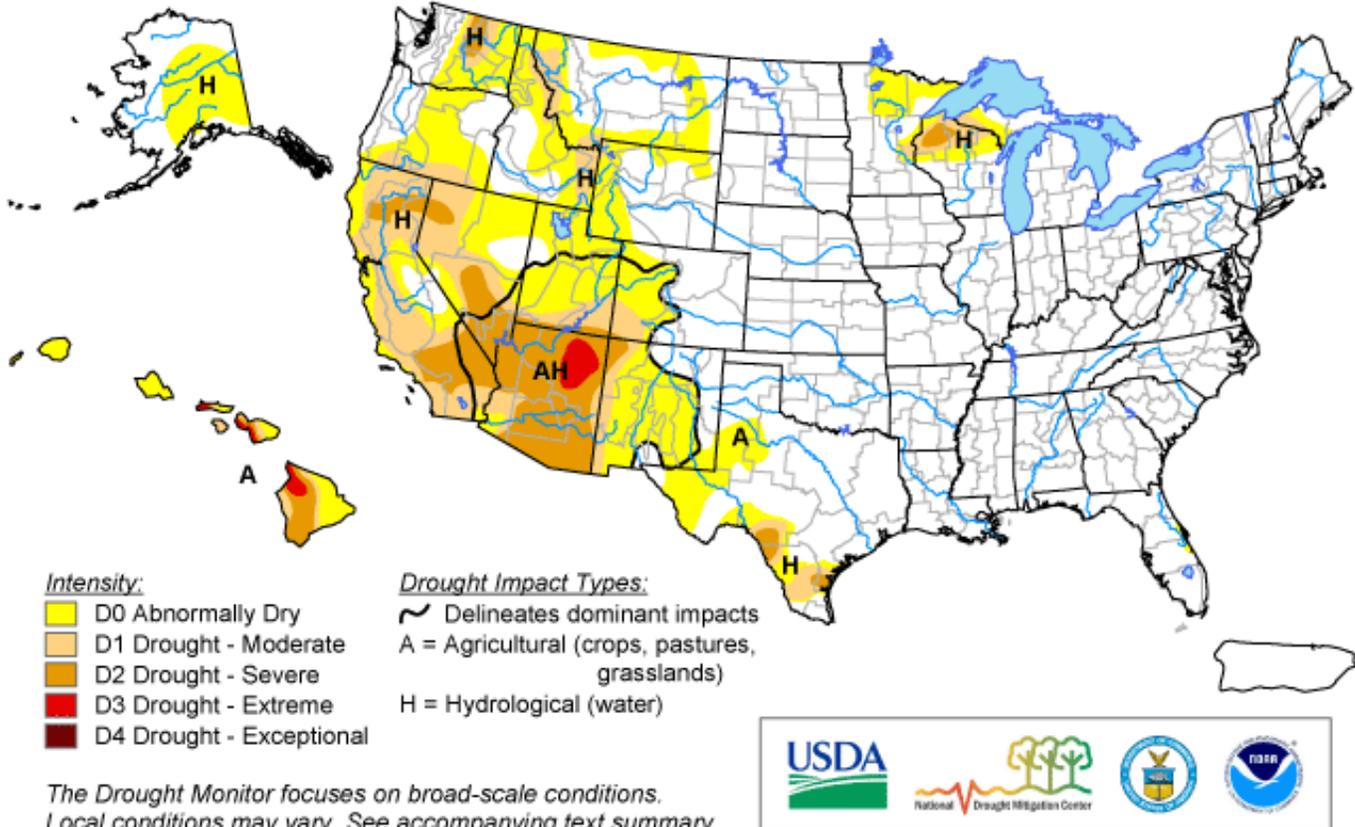


Fig 3b. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2010 Water Year that began on October 1, 2009 shows most of the West at or below normal values despite above normal snow water equivalent over much of the Southwest.

Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_wytdprecptnormal_update.pdf

U.S. Drought Monitor

January 12, 2010
Valid 7 a.m. EST



<http://drought.unl.edu/dm>



Released Thursday, January 14, 2010

Author: Mark Svoboda, National Drought Mitigation Center

Fig. 4. Current Drought Monitor weekly summary.

Ref: National Drought Mitigation Center (NDMC) - <http://www.drought.unl.edu/dm/monitor.html>

U.S. Drought Monitor

West

January 12, 2010

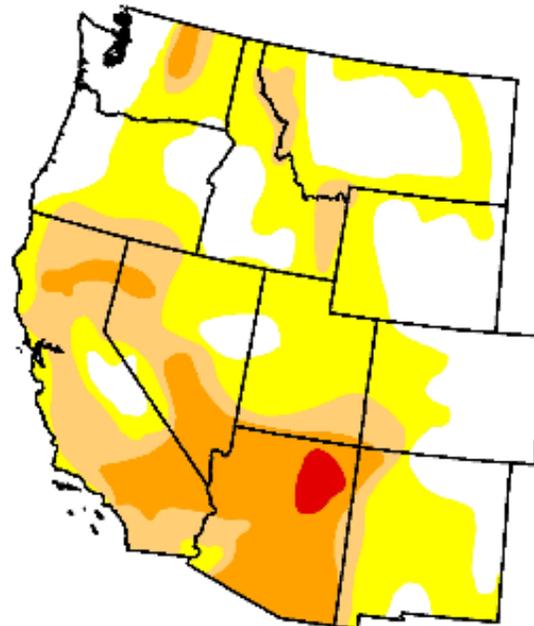
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	31.9	68.1	32.0	14.7	0.9	0.0
Last Week (01/05/2010 map)	40.1	59.9	30.6	9.9	0.5	0.0
3 Months Ago (10/20/2009 map)	47.0	53.0	22.8	9.1	0.0	0.0
Start of Calendar Year (01/05/2010 map)	40.1	59.9	30.6	9.9	0.5	0.0
Start of Water Year (10/06/2009 map)	42.1	57.9	25.4	8.5	0.0	0.0
One Year Ago (01/13/2009 map)	41.9	58.1	28.5	9.1	0.4	0.0

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements



Released Thursday, January 14, 2010

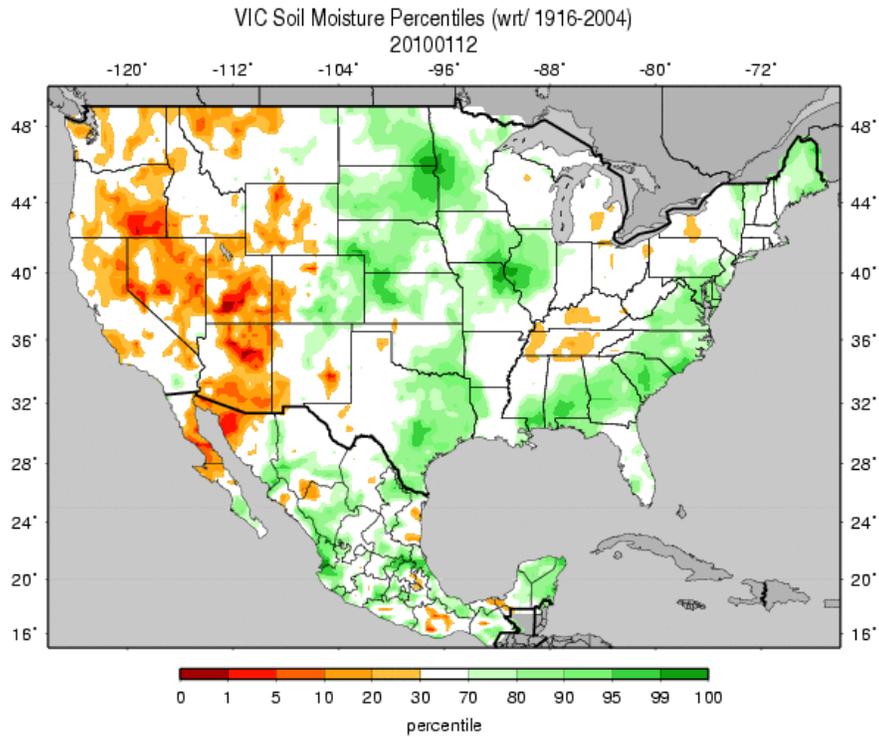
Author: Mark Svoboda, National Drought Mitigation Center

<http://drought.unl.edu/dm>

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Regionally there was some deterioration since last week. Note Extreme drought in Arizona.

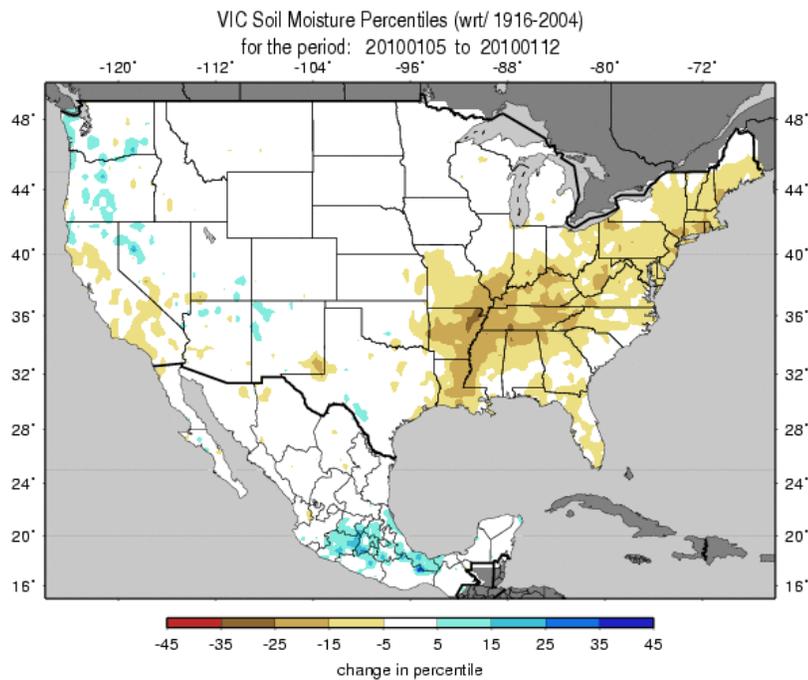
Ref: http://www.drought.unl.edu/dm/DM_west.htm

Weekly Snowpack and Drought Monitor Update Report



Figs. 5a: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 12 January

Ref: http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.gif

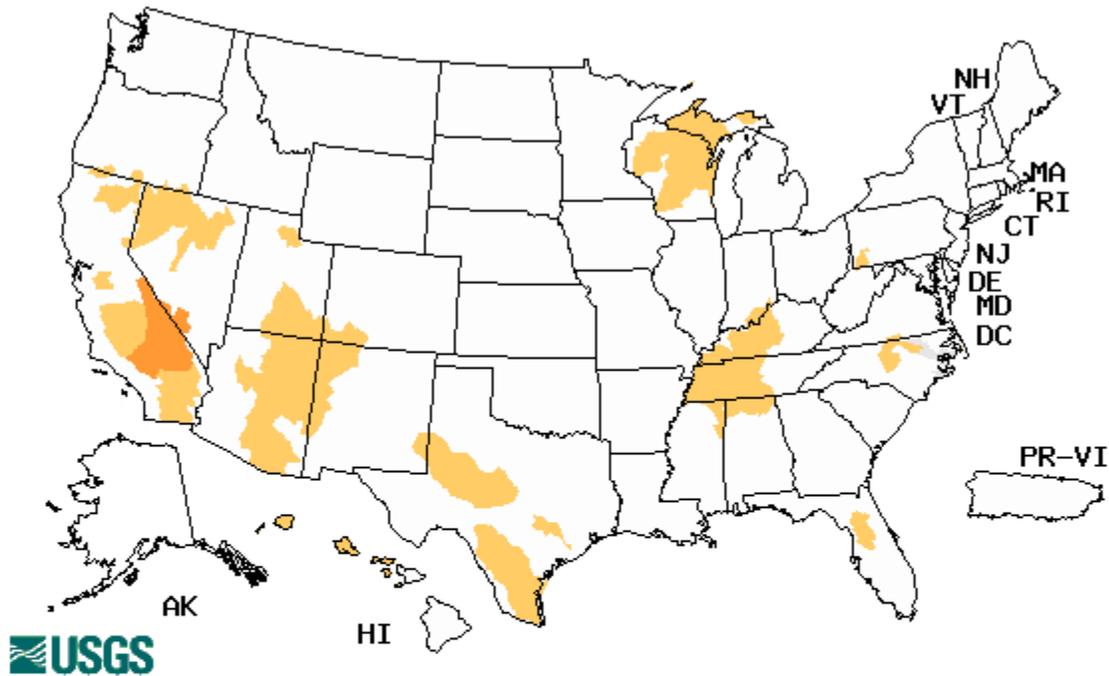


Figs. 5b: Soil Moisture change in percentile based on 1916-2004 climatology for the week. Note extreme dryness over much of the eastern third of the country.

http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.1wk.gif

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Hednesday, January 13, 2010



Choose a data retrieval option and select a state on the map

State DroughtWatch, State map

Explanation - Percentile classes				
Low	<=5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

Fig. 6. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Note, many streams are frozen and thus the flows become more unreliable during the winter. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

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National Drought Summary -- January 12, 2010

The discussion in the Looking Ahead section is simply a description of what the official national guidance from the National Weather Service (NWS) National Centers for Environmental Prediction is depicting for current areas of dryness and drought. The NWS forecast products utilized include the HPC 5-day QPF and 5-day Mean Temperature progs, the 6-10 Day Outlooks of Temperature and Precipitation Probability, and the 8-14 Day Outlooks of Temperature and Precipitation Probability, valid as of late Wednesday afternoon of the USDM release week. The NWS forecast web page used for this section is: <http://www.cpc.ncep.noaa.gov/products/forecasts/>.

The Southeast: The big freeze and significantly below-normal temperatures (10- to 20-degree departures) that spread southward out of the Great Plains and spilled into the Deep South and Southeast were the major story this past week. There are no changes to the map's depiction in this region.

The Great Lakes Region: The significant precipitation that fell in this region managed to miss the drought-affected regions of Minnesota and Wisconsin. The D1 and D2 drought in this area seems to be locked in for the winter.

The Plains: The Great Plains also felt the brunt of the cold arctic outbreak, with temperatures falling 10 to 20 degrees below normal for this time of year. In Texas, which is the only state showing any form of drought in this region, the D0-D2 remain unchanged after a dry week.

The West: A relatively dry week shows no areas improving their status. The only areas really benefitting from recent storms seem to be contained to the coastal regions of the Pacific Northwest, which is not currently in drought.

As for the rest of the story, D0 continues to spread across more of eastern Nevada, southern Idaho, northern Utah, western Wyoming and northwestern Colorado. Temperatures were generally cooler than normal in these states, but many of the basins are only running at 50-75% of normal snowpack, with snow water equivalents (SWE) following suit at 50-75% of normal as well.

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After yet another dry week in the Southwest, and compounded long-term by a very modest monsoon season, changes for the worse are noted this week. An expansion of D0 is noted in central New Mexico as well as a slight incursion of D1 and D2 in those extreme western counties bordering Arizona. In Arizona, D2 now covers most of the state, and a slight expansion is also noted in the D3 across the northeastern Arizona tribal land region. Impacts are starting to flow in with regard to severely impacted range conditions in Arizona, and also in many states in the Southwest and four corners region. The D2 has also spread out of Arizona and connected with previous areas of D2 in southern Nevada and southeastern California in the Mojave Desert region. Rainfall totals in this area are only coming in at 25-50% of normal or worse in some spots, a little better in others, but generally, not good with each passing dry month. There may be some hope on the horizon, though, with a shift in the weather pattern as detailed in the Outlook section summary below.

Hawaii, Alaska and Puerto Rico: The dry pattern persisted again last week across the state of Hawaii, which is seeing below-normal streamflows across many parts of the islands. In addition,

Weekly Snowpack and Drought Monitor Update Report

pasture conditions continue to worsen in the lower elevations. Changes of note this week include a slight expansion of D3 drought in western Molokai and western leeward Maui. D0 now covers all of Kauai, Oahu and the Big Island.

Dry conditions and lagging snow totals led to some expansion of the D0 this week across parts of Alaska. Snow water equivalent values continue to fall, resulting in a push of D0 into parts of the Kenai Peninsula (Anchorage area).

A continual pattern of good rains fell across Puerto Rico last week, leading to the removal of D0 on the island.

Looking Ahead: During the next 5 days (January 14-19, 2010), a nice warm up is in store for almost the entire country, with some readings expected to be 10 to 20 degrees above normal in the northern Plains. More modest warming is expected elsewhere, but it is a nice change of pace from the bitter cold of the past few weeks. The best bet for significant precipitation (one inch or more of liquid equivalent) seems to be concentrated across the Pacific Northwest and northern California, which could really use it. The other area worth noting, for those drought-affected regions, is across southern Texas, where the odds favor some beneficial rains.

The 6-10 day forecast (January 19-23) is also quite favorable precipitation-wise and perhaps reflective of a pattern change as a result of El Niño (favoring above-normal precipitation across the southern tier states). The odds are good for above-normal precipitation across most of the West (all but the northern border regions of Washington, Idaho and northwestern Montana). The best chances are found over most of California, southern Nevada and Arizona. West Texas (the Big Bend area in particular) looks to remain dry during this time frame. The entire eastern half (all but southern Florida) of the country has increased chances of above-normal temperatures, with the best chances found in the Upper Midwest and Great Lakes regions. The Southwest and most of California are looking at better odds of seeing below-normal temperatures to go along with the increased chances of precipitation noted earlier.

Author: [Mark Svoboda, National Drought Mitigation Center](#)

Dryness Categories

D0 ... Abnormally Dry ... used for areas showing dryness but not yet in drought, or for areas recovering from drought.

Drought Intensity Categories

D1 ... Moderate Drought

D2 ... Severe Drought

D3 ... Extreme Drought

D4 ... Exceptional Drought

Drought or Dryness Types

A ... Agricultural

H ... Hydrological

Updated January 13, 2010