



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

Weekly Report - Snowpack / Drought Monitor Update

Date: 24 November 2010

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: SNOTEL Snow-Water Equivalent percent of normal values for 24 November 2010 shows quite a bit of improvement over the Central Cascades and central Interior West this week (Fig 1). The SNOTEL 7-day snow depth change map shows the bulk of the major increases are found over the Cascades, Sierra, Northern Wasatch, and Western Slope of the Northern Rockies (Fig. 1a).

Temperature: SNOTEL 7-day average temperature departure from normal map shows temperatures coolest over the Northern Rockies and warmest over the southern ranges of the West (Fig. 2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over Northern California and the Northern Cascades in Northern Utah and northeastern New Mexico ($>+5^{\circ}\text{F}$) and the greatest negative departures occurred over northwestern Montana ($<-25^{\circ}\text{F}$) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 23 November shows the bulk of the heaviest precipitation confined to Coastal Oregon and the Sierra (Fig. 3). In terms of percent of normal, a very wet week dominated from California northeastward to eastern Montana (Fig. 3a). For the new 2011 Water-Year that began on 1 October 2010, precipitation has been much greater than the long term average over much of the West. Exceptions exist over eastern Arizona and all of New Mexico as would be expected during La Niña. A few river basins over Washington, Montana, Wyoming, and Colorado are also running behind in moisture (Fig. 3b).

The West: The effect of continued beneficial precipitation continued to be experienced in the West. Lingering Severe (D2) Drought in Oregon and California was removed and Abnormal Dryness (D0) and Moderate Drought (D1) were reduced in the area and extending into northern Nevada. Some low reservoir levels are still being experienced in the area. Snow in Colorado and Wyoming has also alleviated Abnormal Dryness (D) and Moderate Drought (D1) in the western parts of both states.

According to local observers, the Steamboat Ski Area in Colorado has opened all ski runs, from base to top, for the first time ever before Thanksgiving. Ski areas around Lake Tahoe are also opening trails, at least for a few days this week, due to the abundance of snow. Author: Michael Brewer, National Climatic Data Center, NOAA.

Ski Santa Fe has delayed opening of their ski area from today until 10 December due to lack of snow.

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

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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>

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

/s/ JEFF GOEBEL
Acting Director, Resource Inventory Division

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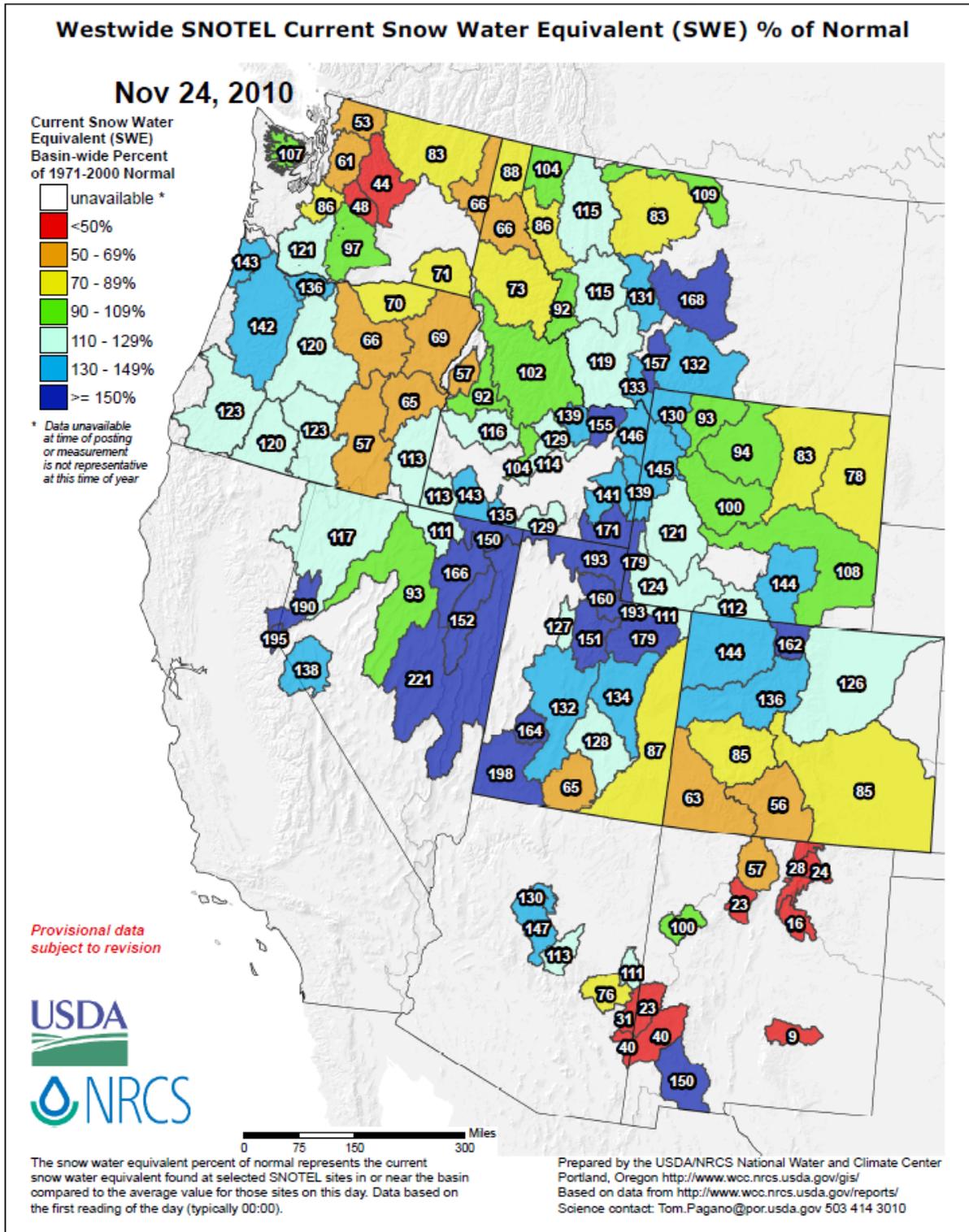


Fig 1. SNOTEL Snow-Water Equivalent percent of normal values for 24 November 2010 shows quite a bit of improvement over the Central Cascades and central Interior West this week.

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

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SNOTEL 7-Day Snow Depth Change (Inches)

Nov 23, 2010

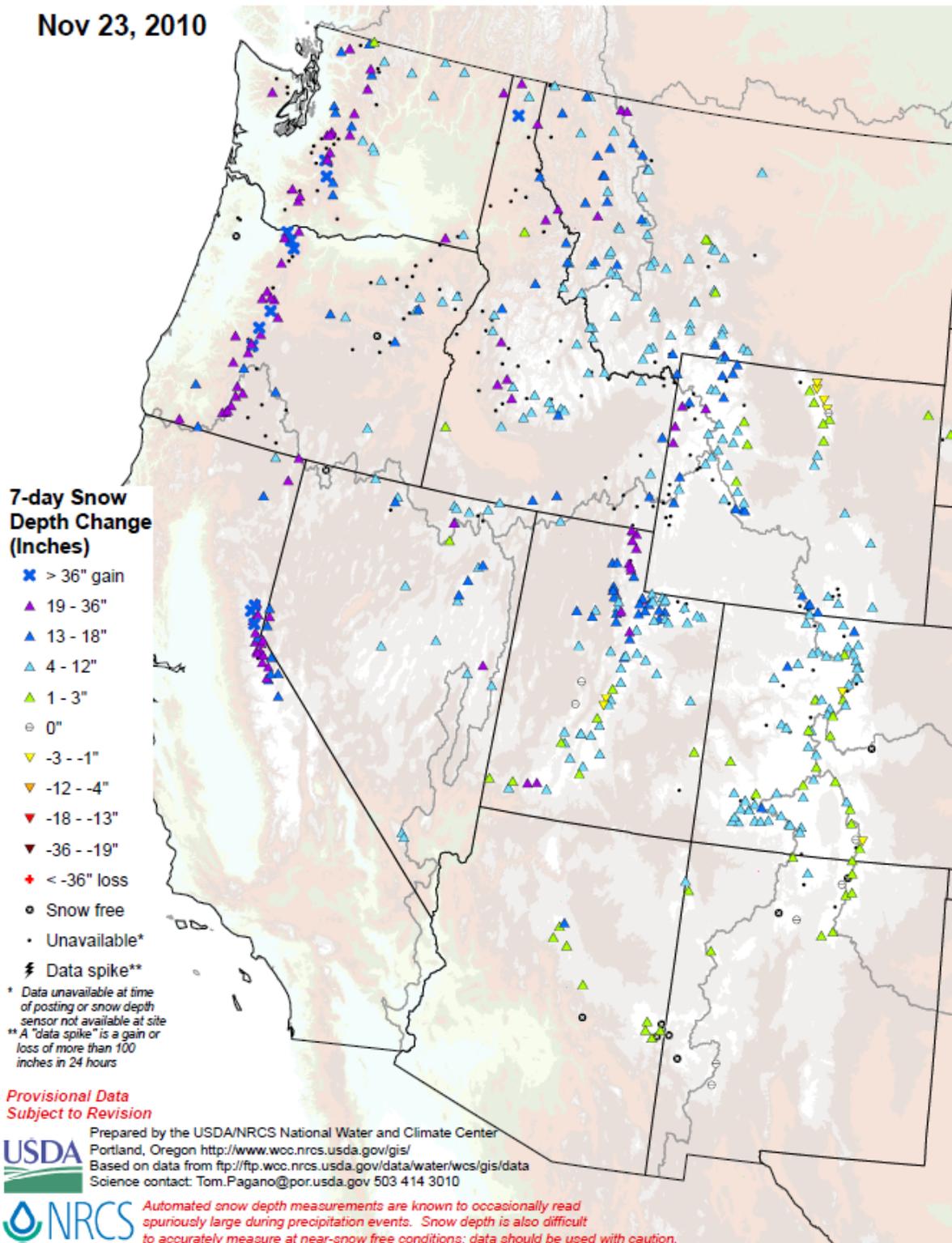


Fig 1a. SNOTEL 7-day snow depth changes show the bulk of the increases are found over the Cascades, Sierra, Northern Wasatch, and Western Slope of the Northern Rockies.

Ref: http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_snowdepth_7ddelta.pdf.

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Fig. 1: SNOTEL 7-day average temperature departure from normal map shows temperatures coolest over the Cascades and warmest over the Central and parts of the Northern Rockies. Ref: <http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/WestwideTavg7dAnomaly.pdf>

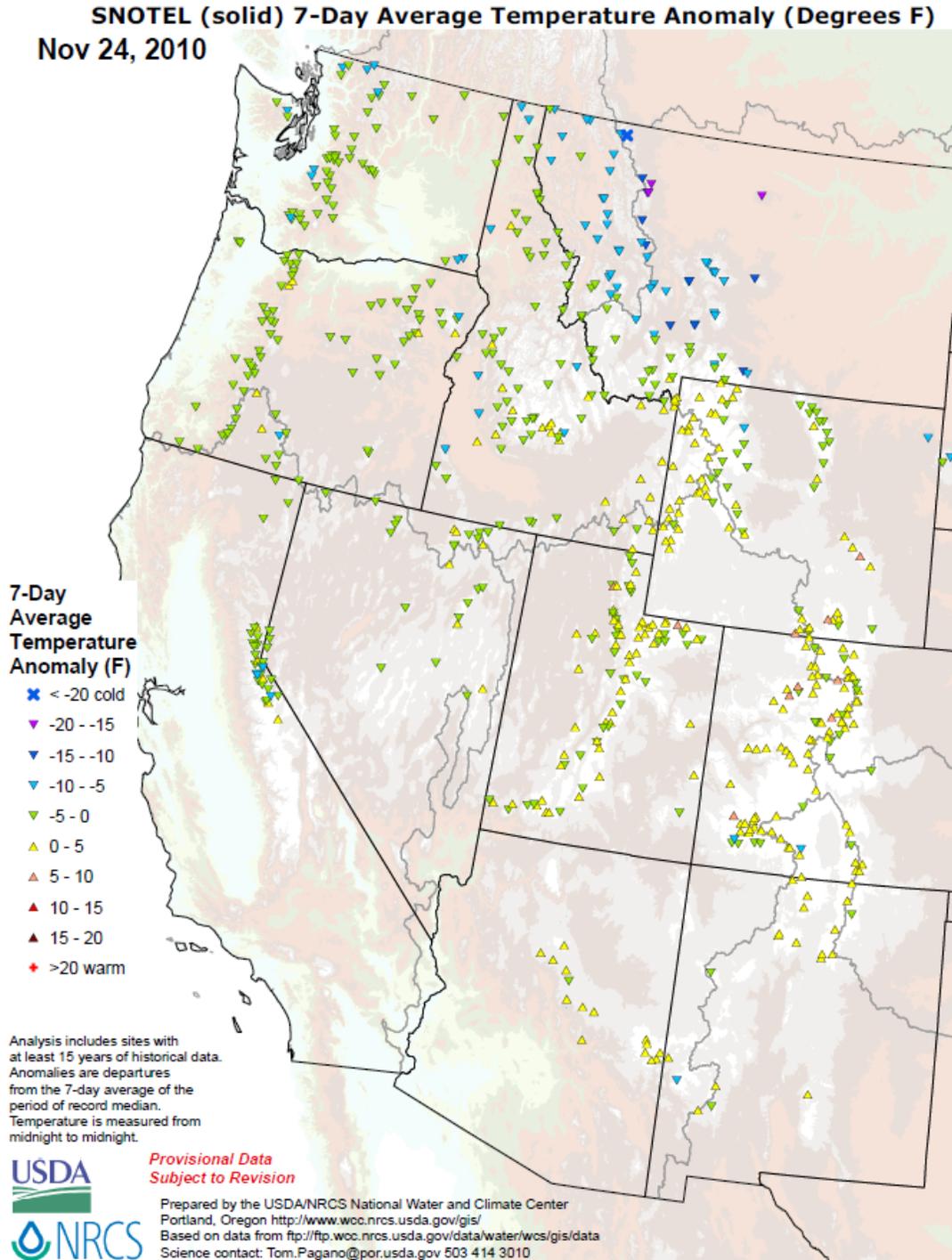
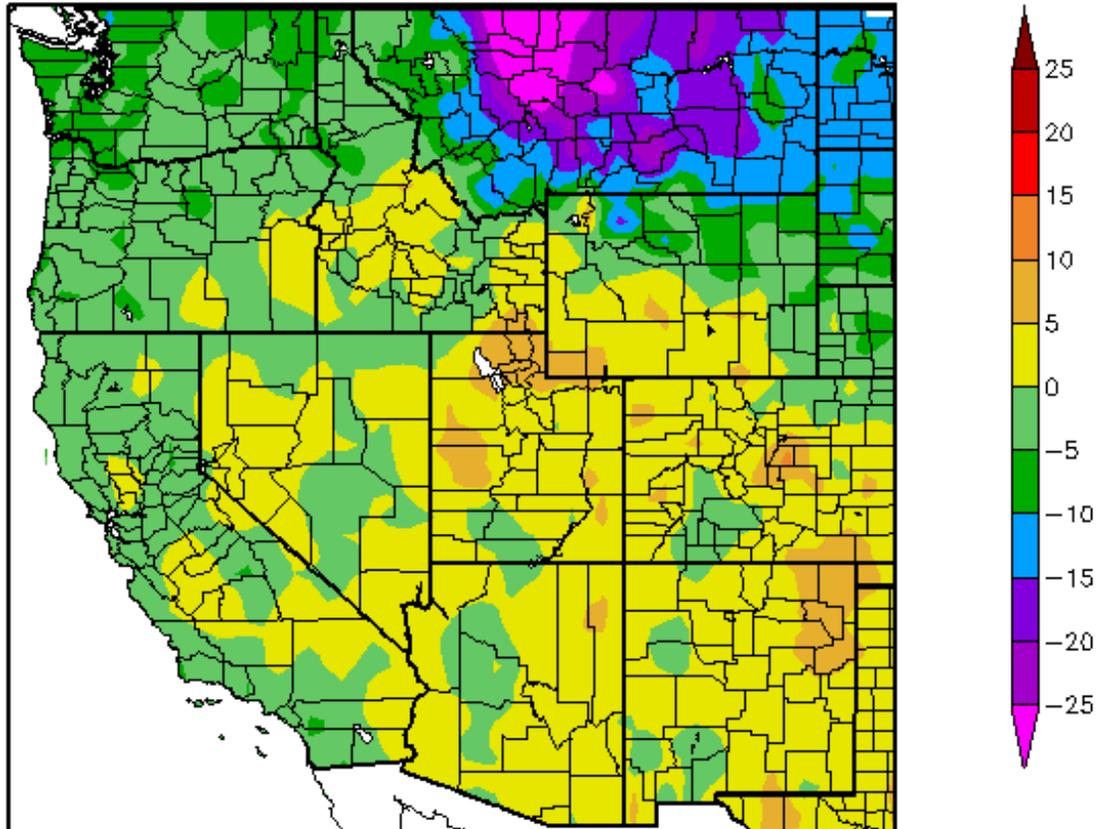


Fig. 2: SNOTEL 7-day average temperature departure from normal map shows temperatures coolest over the Northern Rockies and warmest over the southern ranges of the West. Ref: <http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/WestwideTavg7dAnomaly.pdf>

Departure from Normal Temperature (F)
11/17/2010 – 11/23/2010



Generated 11/24/2010 at HPRCC using provisional data.

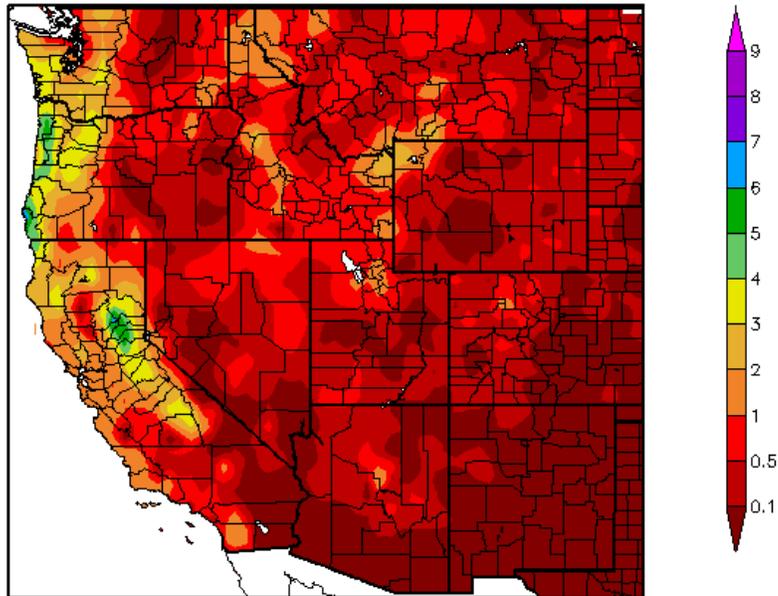
Regional Climate Centers

Fig. 2a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over Northern California and the Northern Cascades in Northern Utah and northeastern New Mexico (>+5°F) and the greatest negative departures occurred over northwestern Montana (<-25°F).

Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=7d

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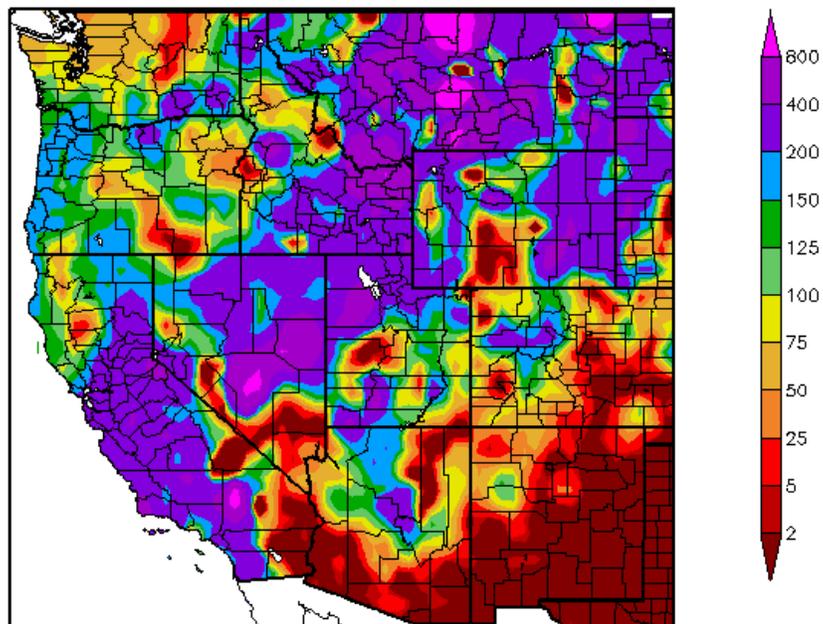
Precipitation (in)
11/17/2010 - 11/23/2010



Generated 11/24/2010 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
11/17/2010 - 11/23/2010



Generated 11/24/2010 at HPRCC using provisional data.

Regional Climate Centers

Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 23 November shows the bulk of the heaviest precipitation confined to Coastal Oregon and the Sierra (Fig. 3). In terms of percent of normal, a very wet week dominated from California northeastward to eastern Montana (Fig. 3a). Ref: <http://www.hprcc.unl.edu/maps/current/>

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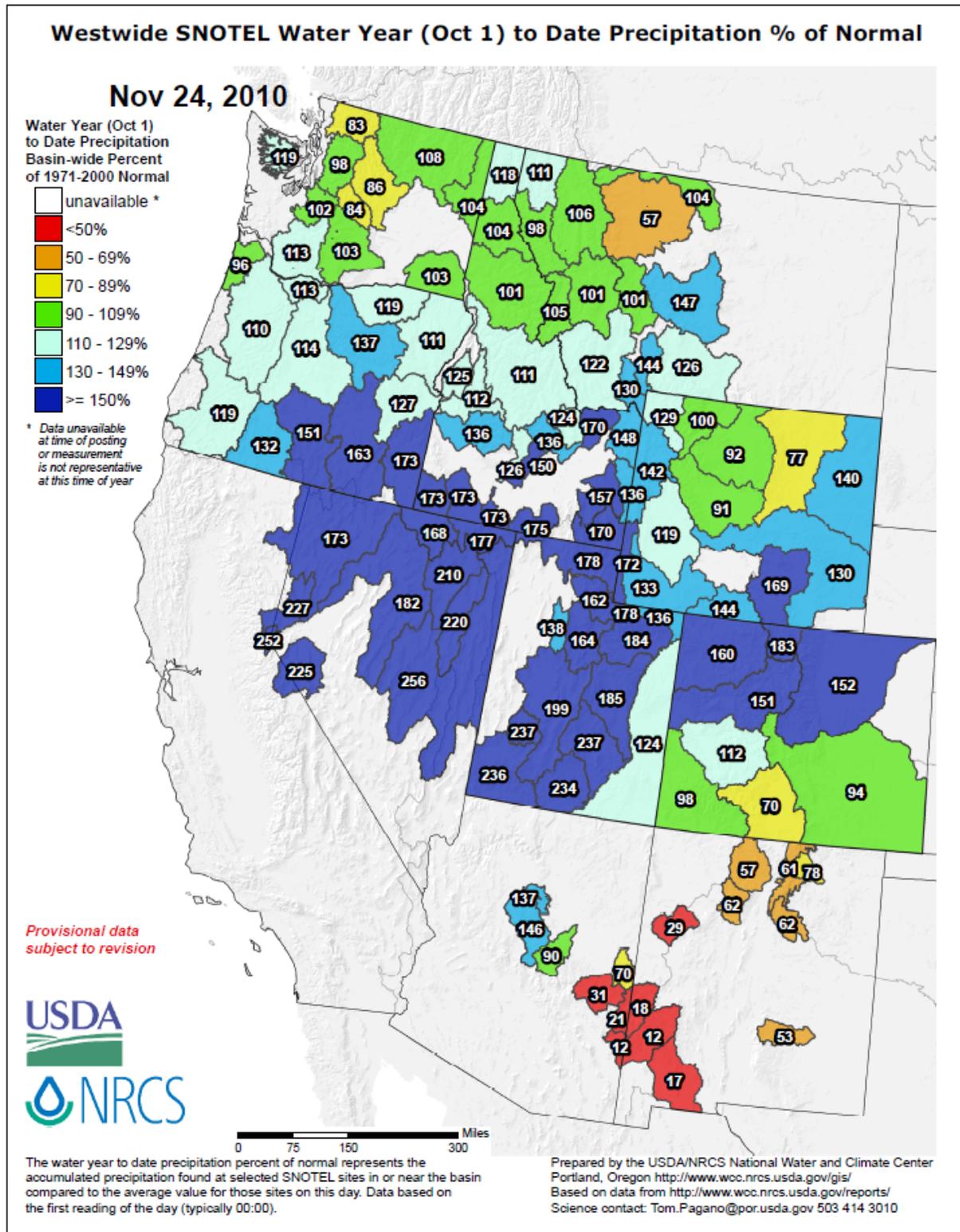
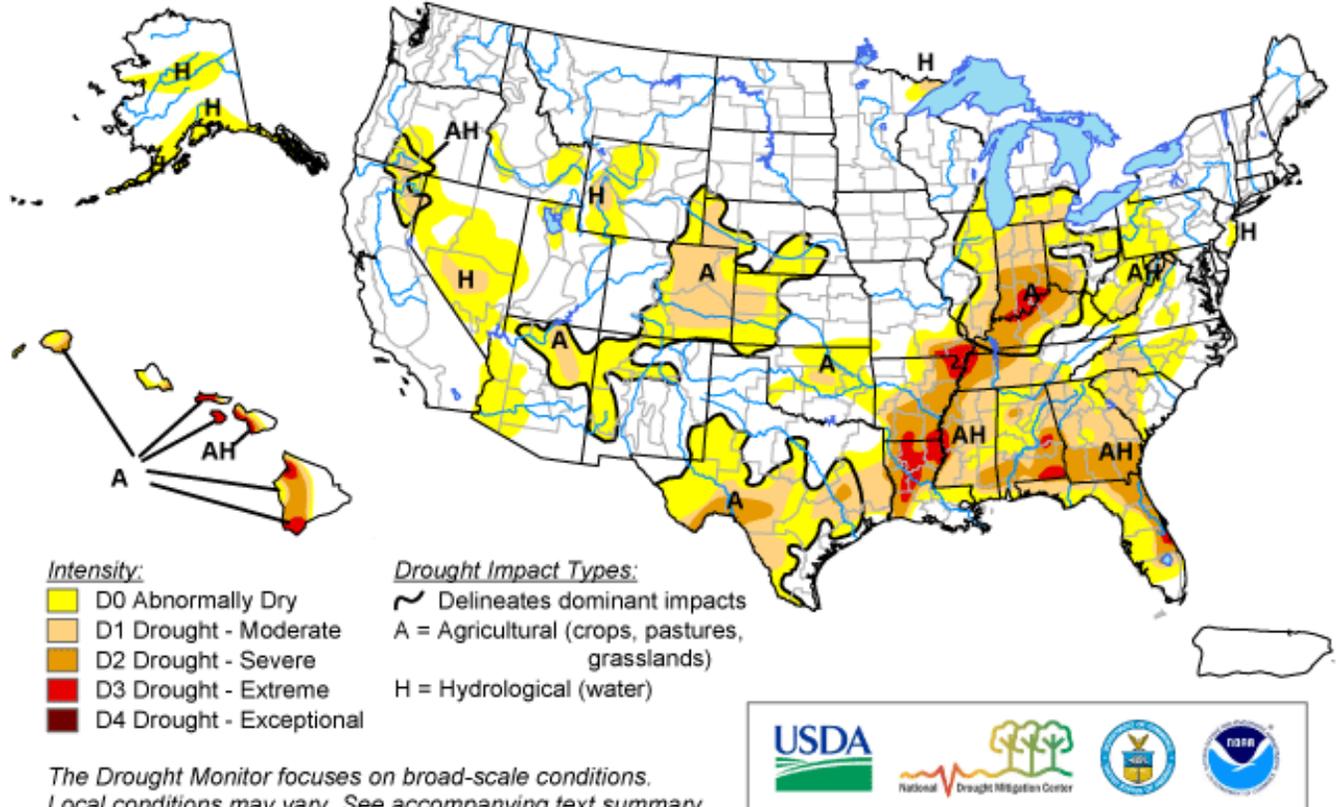


Fig 3b: For the new 2011 Water-Year that began on 1 October 2010, precipitation has been much greater than the long term average over much of the West. Exceptions exist over eastern Arizona and all of New Mexico as would be expected during La Niña. A few river basins over Washington, Montana, Wyoming, and Colorado are also running behind in moisture. Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_wytdprecpcnormal_update.pdf

U.S. Drought Monitor

November 23, 2010
Valid 7 a.m. EST



Released Wednesday, November 24, 2010

Author: Michael Brewer/Liz Love-Brotak, NOAA/NESDIS/NCDC

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

Fig. 4: Current Drought Monitor weekly summary. The severest D3 levels of drought dominate Hawaii, the Lower Mississippi River Valley, and Tennessee River Valley.

Ref: <http://www.drought.unl.edu/dm/monitor.html>

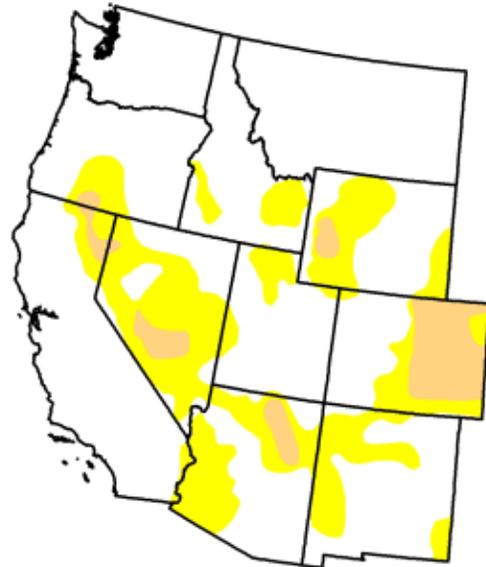
U.S. Drought Monitor

West

November 23, 2010
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	71.9	28.1	5.7	0.0	0.0	0.0
Last Week (11/16/2010 map)	68.5	31.5	6.5	0.2	0.0	0.0
3 Months Ago (08/31/2010 map)	74.7	25.3	6.3	0.6	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 (10/05/2010 map)	62.5	37.5	8.4	0.6	0.0	0.0
One Year Ago (11/24/2009 map)	47.4	52.6	28.6	11.6	0.5	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

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

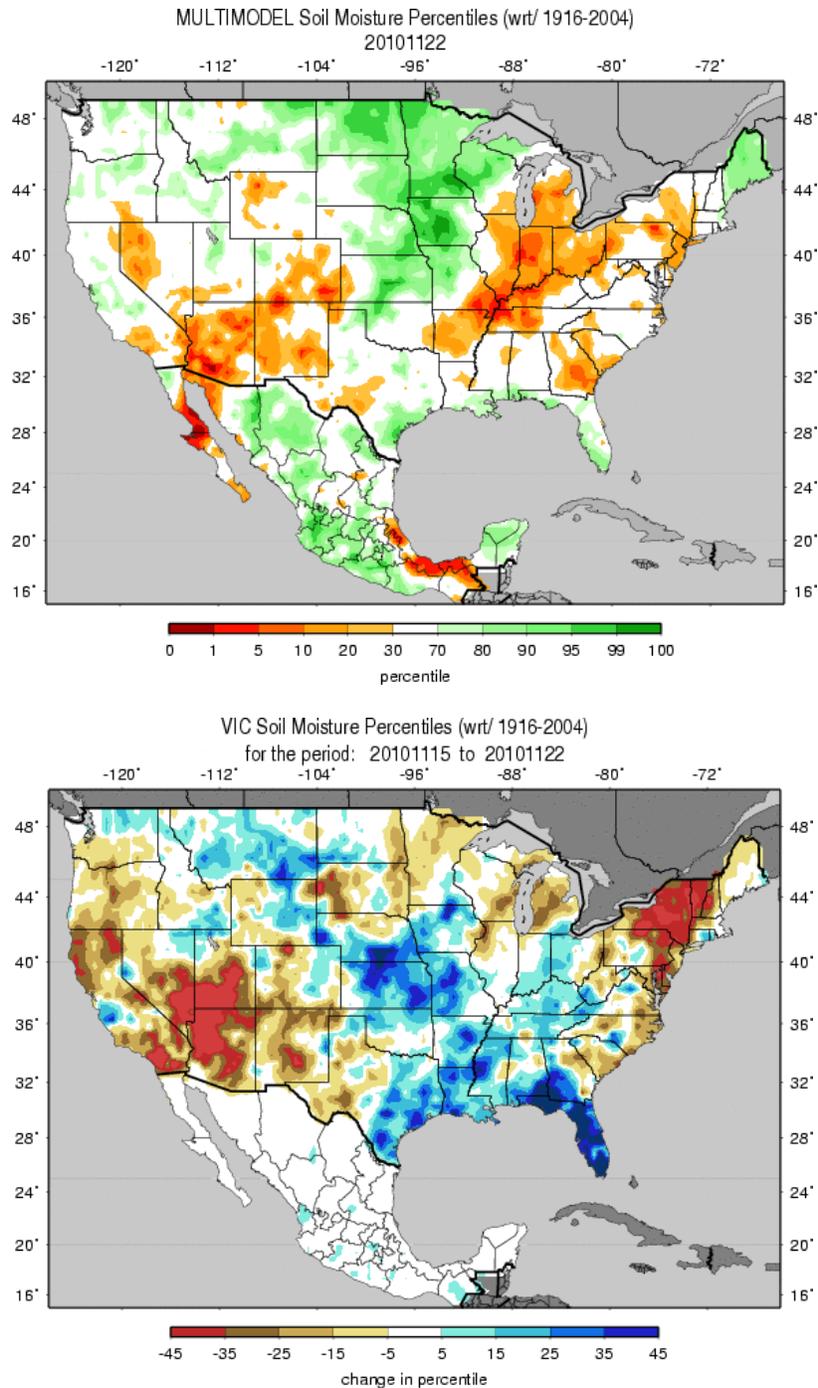


Released Wednesday, November 24, 2010
Author: M. Brewer, NOAA/NCDC

Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. Regionally there was some improvement during the past week.

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

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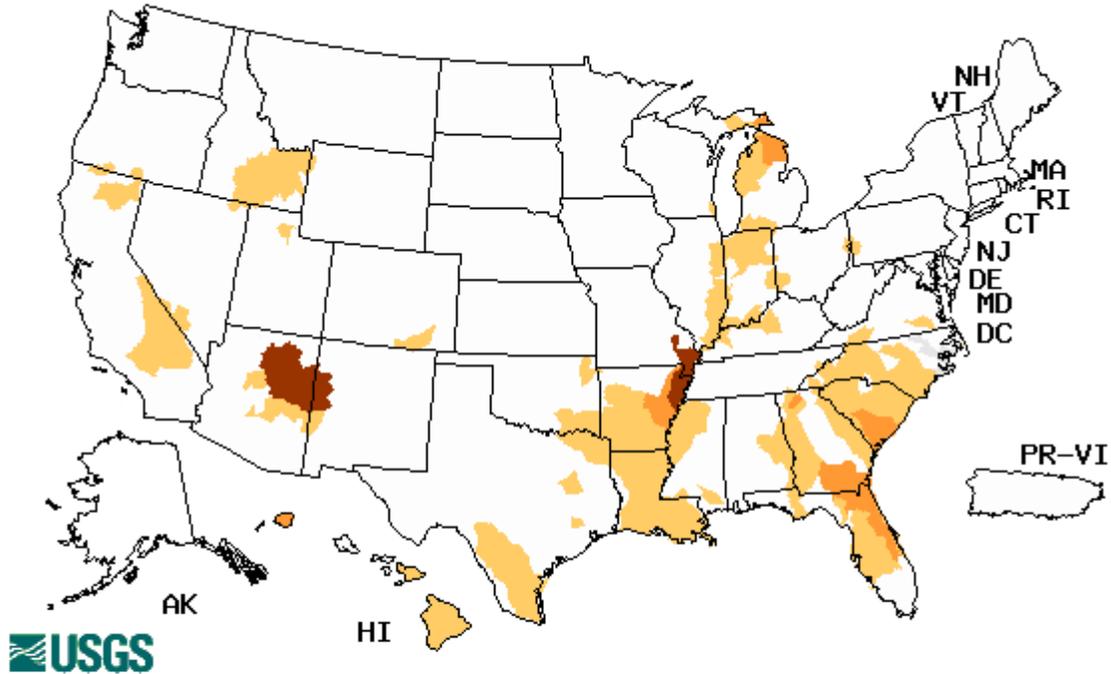


Figs. 5a and 5b: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 22 November. Excessive moisture dominates over the Northern High Plains. Dry soils dominate over the Ohio Valley, Middle Mississippi River Valley, and Arizona (Fig. 5a). During the past week, excessive moisture has increased from Florida northwestward to Montana while dryness has settled into southern New England and much of the western half of the Southwest (Fig. 5b).

Ref: http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/main_sm.multimodel.shtml

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Tuesday, November 23, 2010



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. Clearly, the Middle Mississippi River Valley and Arizona are experiencing the severest flows this week. As winter approaches, northern site gauges will become less accurate as rivers and streams freeze. Ref: <http://waterwatch.usgs.gov/?m=dryw&r>

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National Drought Summary -- November 23, 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/>.

Precipitation this week fell mainly in two swaths. The first went from the Ohio River Valley up into portions of northern New England. The second was from the southern Pacific Coast into the Pacific Northwest and extending into North Dakota, Wyoming, and Colorado. Composite estimates show coastal Oregon and Washington received over two inches of precipitation, with some estimates over eight inches.

The East: In the Southeast, Abnormal Dryness (D0) and Moderate (D1) and Severe (D2) drought expanded throughout much of Georgia and the entire state is now at least abnormally dry (D0). Conversely, Severe (D2) and Extreme (D3) drought was alleviated by the recent rains in southwest Alabama. Abnormal Dryness (D0) and Moderate (D1) drought expanded slightly in the Carolinas. Recent rains alleviate some Abnormal Dryness (D0) near central Pennsylvania but areas in the northwest part of the state and in southwest New York began to experience Abnormal Dryness (D0) this week.

The Plains: Abnormal Dryness (D0) and Moderate Drought (D1) continue to be experienced through the Central Plains, from southwest South Dakota down to southern Texas. Dry conditions have intensified in throughout central Texas. Severe (D2) Drought was introduced this week into the east-central part of the state.

The West: The effect of continued beneficial precipitation continued to be experienced in the West. Lingering Severe (D2) Drought in Oregon and California was removed and Abnormal Dryness (D0) and Moderate Drought (D1) were reduced in the area and extending into northern Nevada. Some low reservoir levels are still being experienced in the area. Snow in Colorado and Wyoming has also alleviated Abnormal Dryness (D) and Moderate Drought (D1) in the western parts of both states.

According to local observers, the Steamboat Ski Area in Colorado has opened all ski runs, from base to top, for the first time ever before Thanksgiving. Ski areas around Lake Tahoe are also opening trails, at least for a few days this week, due to the abundance of snow.

Hawaii, Alaska and Puerto Rico: Drought conditions remained unchanged across Alaska and Puerto Rico this week. In Hawaii, conditions of Extreme Drought (D3) were alleviated on Kauai.

Looking Ahead: There is an enhanced probability of precipitation throughout the eastern U.S. and in the Pacific Northwest early in the November 25-29, 2010 time period. Later in the period, chances of precipitation are highest along the Pacific Coast. Temperatures are generally forecast to be normal to below normal throughout most of the western U.S. as well as from the

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extreme southern Plains up into the mid-Atlantic. Above normal temperatures are generally limited to a swath from the southern Plains into the Midwest.

For the ensuing 5 days (November 30 – December 4, 2010), the odds favor cooler-than-normal conditions from the northern High Plains as well as in the Southeast and mid-Atlantic. Warmer-than-normal conditions are expected in northern New England. The odds of above-normal precipitation extend throughout the Pacific Northwest and into the Rockies. A second area of above normal precipitation is forecast from the South, to the Ohio Valley and through New England. Odds favor below-normal precipitation in the southern Plains, and in Florida south of the Panhandle. Odds favor normal to below normal temperatures and normal to below normal precipitation throughout Alaska.

Author: [Michael Brewer, National Climatic Data Center, NOAA](#)

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 November 23, 2010