



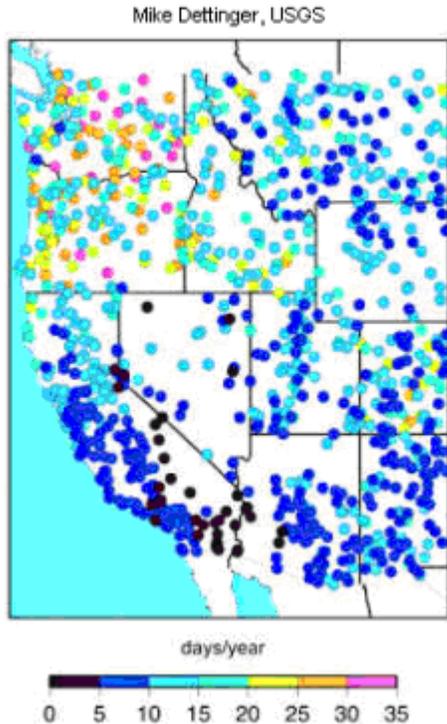
Natural Resources Conservation Service
 P.O. Box 2890
 Washington, D.C. 20013

Weekly Report - Snowpack / Drought Monitor Update **Date: 26 November, 2008**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date continues to show a decline across the West since last week. Few water basins are near or above expected values for this time of year (Fig 1). The latest seasonal forecast from NOAA indicates an equal chance for above or below normal (http://www.noaanews.noaa.gov/stories2008/20081120_winteroutlook.html) temperatures and precipitation over the West. As noted by the figure below, despite a very slow start to the Water Year, it only takes a few storms to obtain half a year's worth of precipitation over California and much of the Interior West. The snow accumulation season is still young but this dry trend needs to reverse itself by the end of the calendar year to better ensure nearer normal totals by 1 April.

AVERAGE NUMBER OF DAYS/YR TO OBTAIN HALF OF
 TOTAL PRECIPITATION, WY 1951-2006



Temperature: SNOTEL and ACIS-day station average temperature anomalies were well above normal during the past week in most locales across the West (Fig. 2). Specifically, the greatest positive temperature departures occurred over the Great Basin, southern California, and Arizona (>+9F) and the greatest negative departures occurred over western Washington-Oregon and southeastern New Mexico (<=-3F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 25 November shows significant amounts falling (mostly as rain) over parts of Montana and Idaho. Mostly dry conditions prevailed over the remainder of the West (Fig. 3). Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008

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Weekly Snowpack and Drought Monitor Update Report

shows values falling 10 to more than 20 percent across most of the West since last week. Above normal amounts are noted over portions of the Great Basin, Snake River Drainage, and Northern Cascades (Fig. 3a). For precipitation totals, departures, and percent of normal for several time periods see: <http://www.water.gov/> and <http://ciq.mesonet.org/~derek/public/droughtmonitoring/>.

WESTERN DROUGHT STATUS

The West: With the entire region remaining under warm, mostly dry conditions, no changes to the drought depiction were introduced. However, such a pattern of dry weather and unusual warmth, if it were to persist, would eventually lead to further increases in the severity and areal extent of Western drought. Agriculturally, a lack of moisture remained a concern with respect to proper establishment of Northwestern winter wheat. According to the U.S. Department of Agriculture, 33% of Washington's wheat crop was rated in very poor to poor condition on November 23, along with 24% of Oregon's crop. Author: Brad Rippey, U.S. Department of Agriculture

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, 4a, and 4b).

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).

OBSERVED FIRE DANGER CLASS

The National Interagency Coordination Center provides a variety of products that describe the current wildfire status for the U.S. - http://activefiremaps.fs.fed.us/lq_fire2.php. The latest Observed Fire Danger Class is shown in Figs. 6 shows the current active wildfires across the West - <http://geomac.usgs.gov/>.

U.S. HISTORICAL STREAMFLOW

This map, (Fig. 7) 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.

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

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

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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/>

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/ NOLLER HERBERT
Director, Conservation Engineering Division

Weekly Snowpack and Drought Monitor Update Report

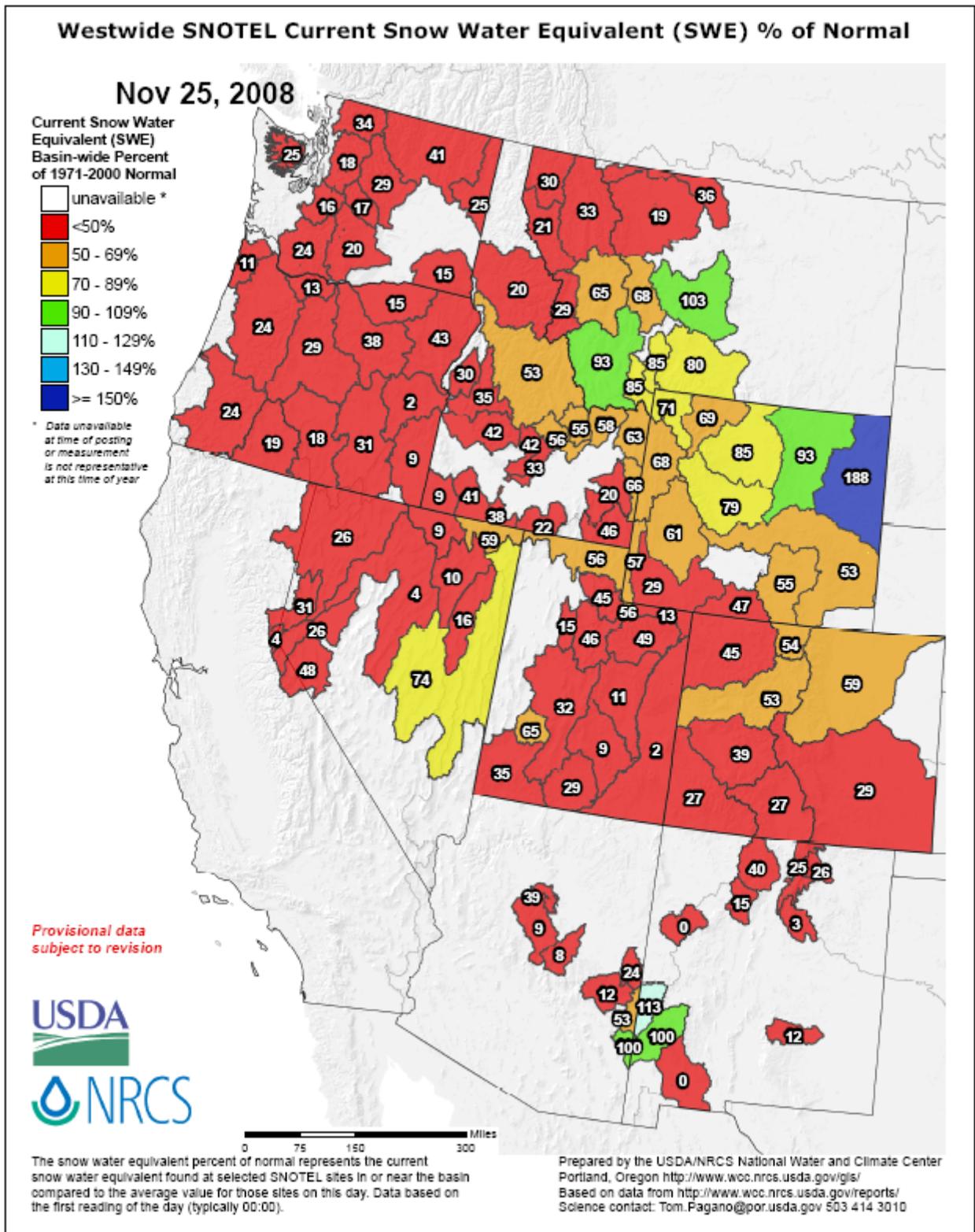


Fig. 1. Snow-water equivalent percent to date continues to show a decline across the West since last week. Few water basins are near or above expected values for this time of year.

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)

Nov 25, 2008

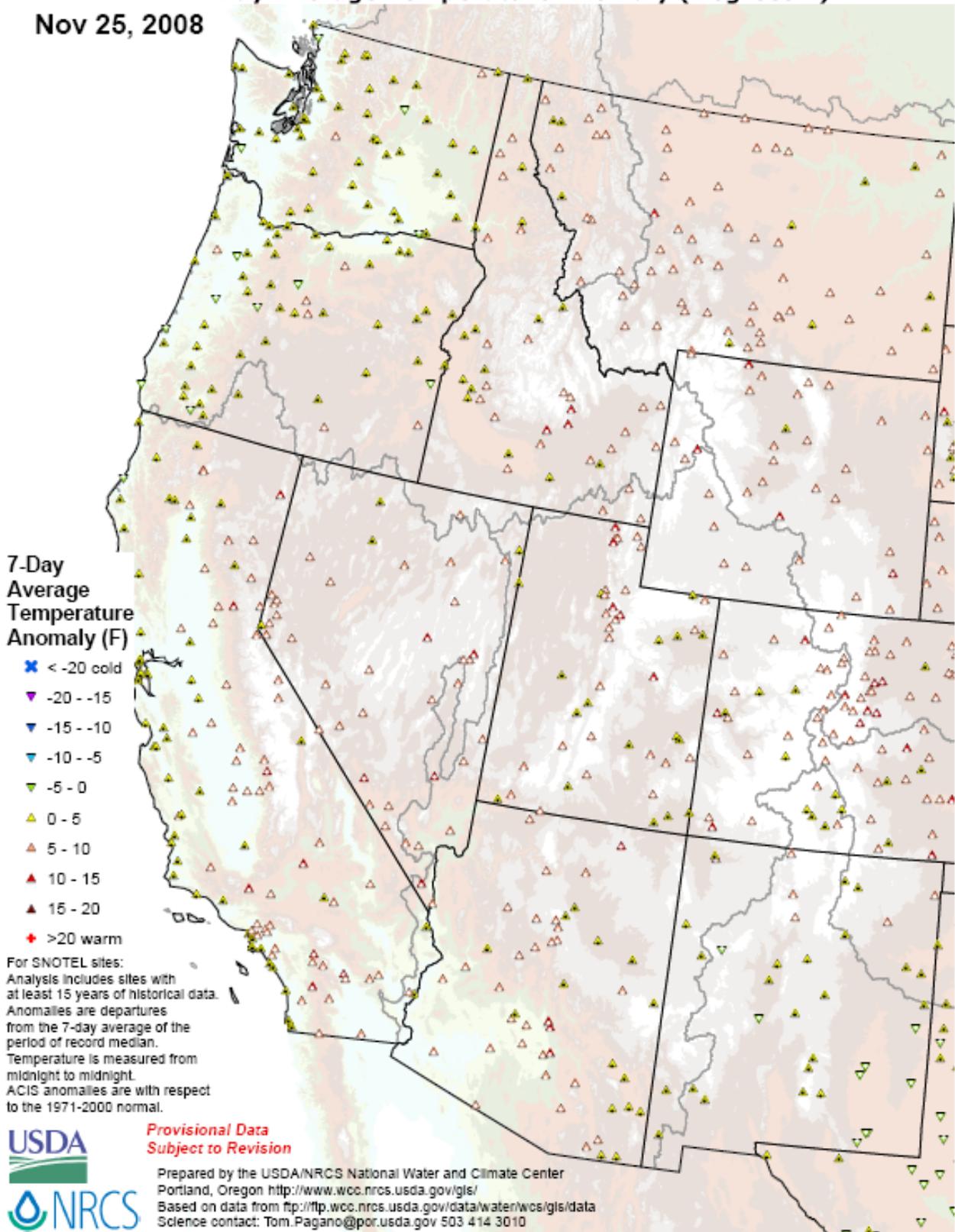
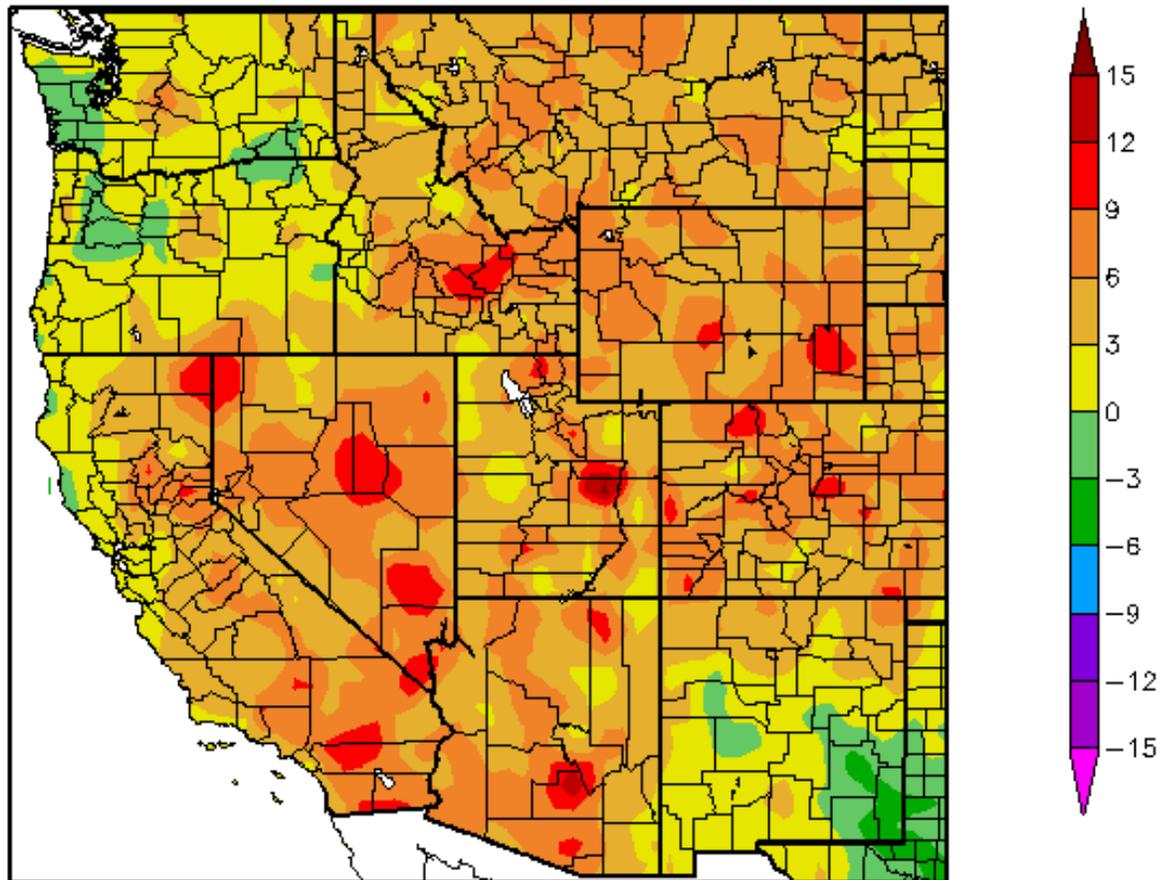


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were well above normal during the past week in most locales across the West.

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

Departure from Normal Temperature (F)
11/19/2008 – 11/25/2008



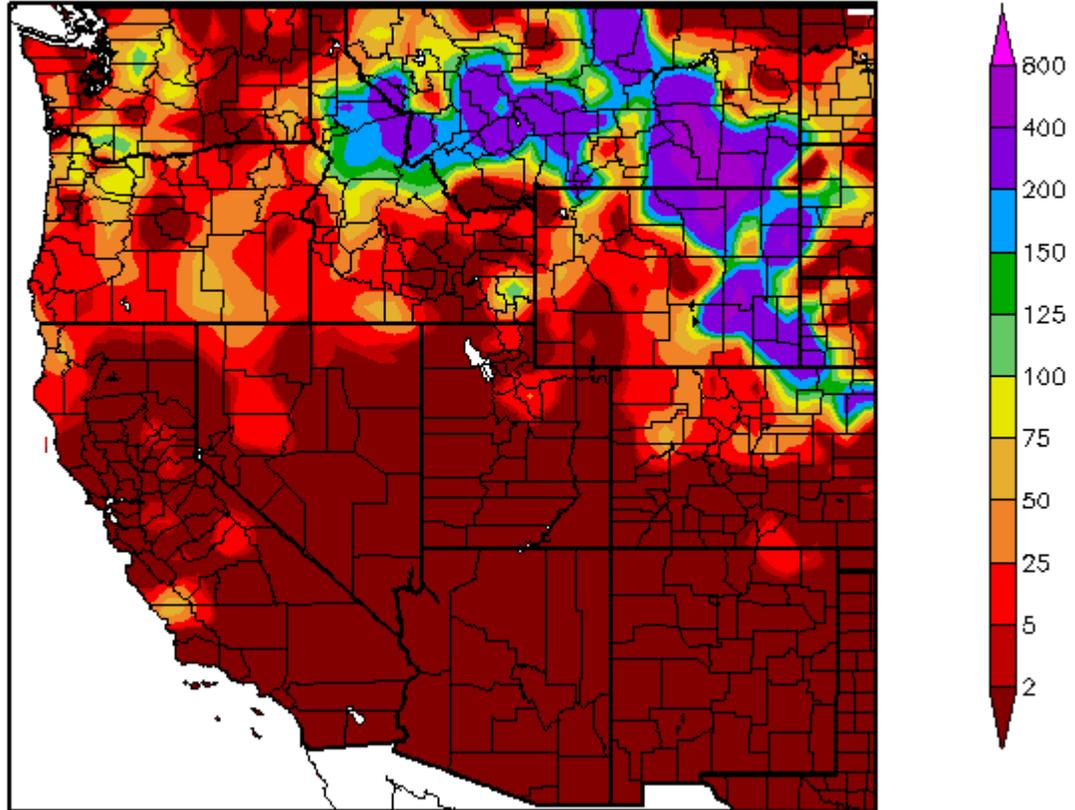
Generated 11/26/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over the Great Basin, southern California, and Arizona (>+9F) and greatest negative departures occurred over western Washington-Oregon and southeastern New Mexico (<=-3F).

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

Percent of Normal Precipitation (%)
11/13/2008 – 11/19/2008



Generated 11/20/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 25 November shows significant amounts falling (mostly as rain) occurring over parts of Montana and Idaho. Mostly dry conditions prevailed over the remainder of the West.

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

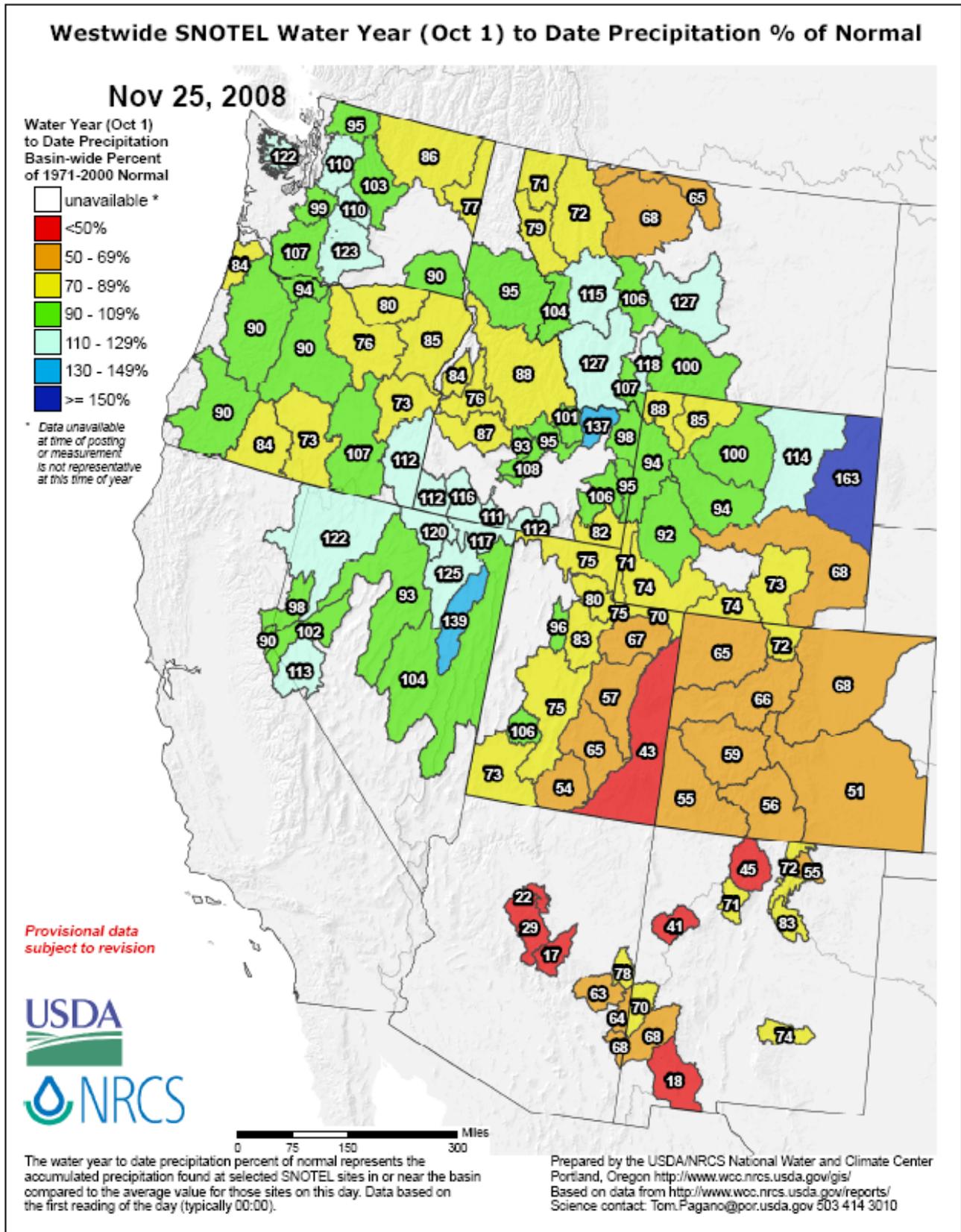
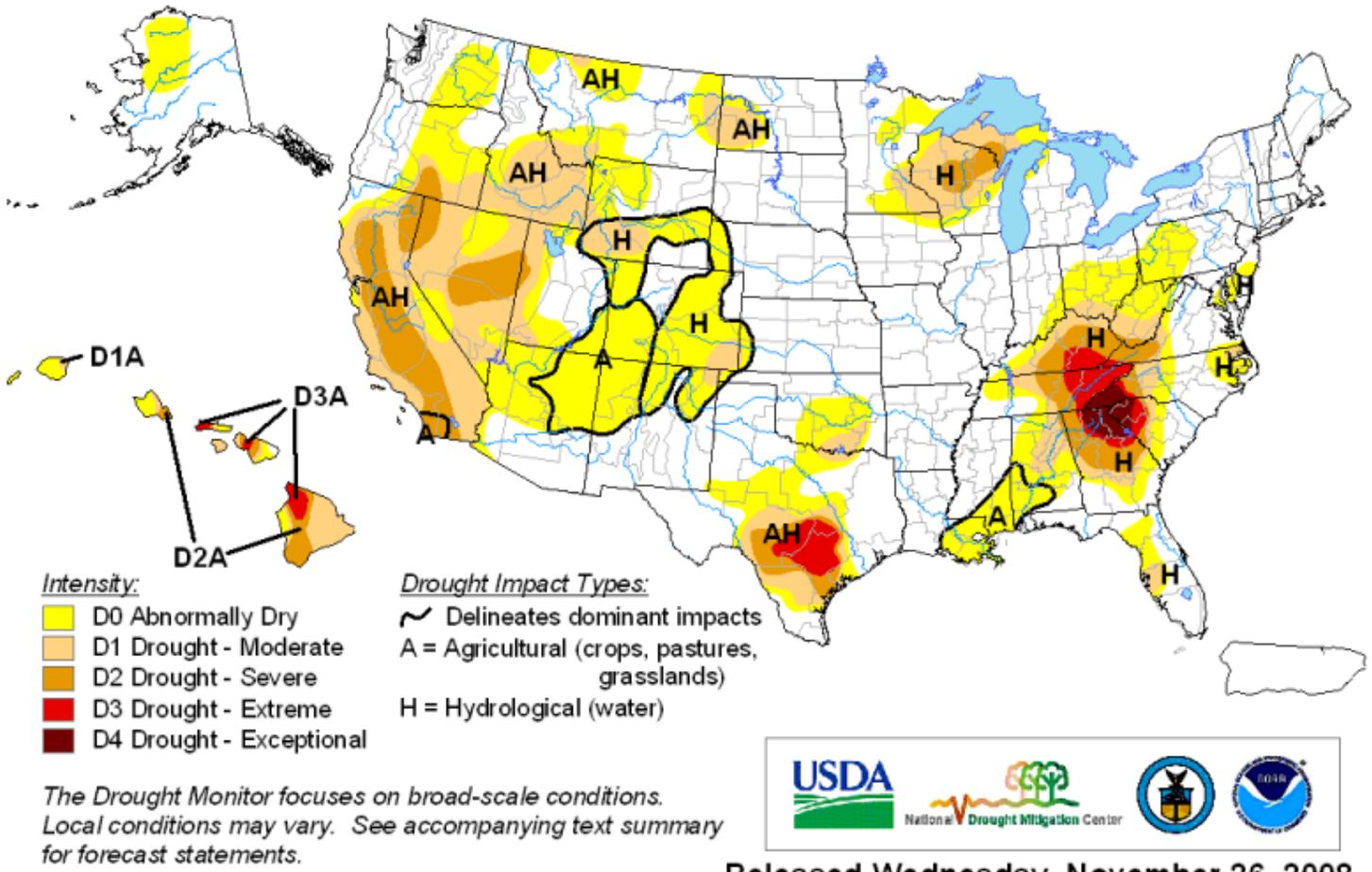


Fig 3a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values falling 10 to more than 20 percent across most of the West since last week. Above normal amounts are noted over portions of the Great Basin, Snake River Drainage, and Northern Cascades.

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

U.S. Drought Monitor

November 25, 2008
Valid 8 a.m. EST



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

Released Wednesday, November 26, 2008
Author: Brad Rippey, U.S. Department of Agriculture

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

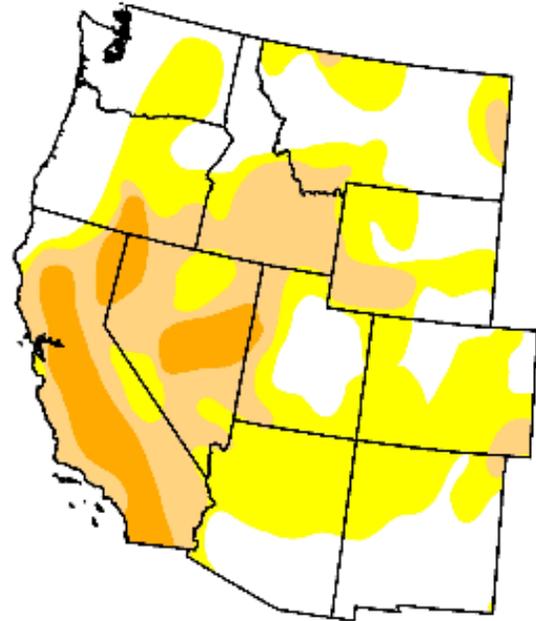
West

November 25, 2008

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	36.0	64.0	29.3	8.6	0.0	0.0
Last Week (11/18/2008 map)	36.0	64.0	29.3	8.6	0.0	0.0
3 Months Ago (09/02/2008 map)	34.2	65.8	31.1	10.1	0.2	0.0
Start of Calendar Year (01/01/2008 map)	26.3	73.7	54.7	33.1	2.7	0.0
Start of Water Year (10/07/2008 map)	41.3	58.7	28.6	10.4	0.1	0.0
One Year Ago (11/27/2007 map)	25.4	74.6	58.4	38.1	7.9	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 26, 2008

Author: Brad Rippey, U.S. Department of Agriculture

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note no change since last week. Ref: http://www.drought.unl.edu/dm/DM_west.htm

U.S. Drought Monitor

Southeast

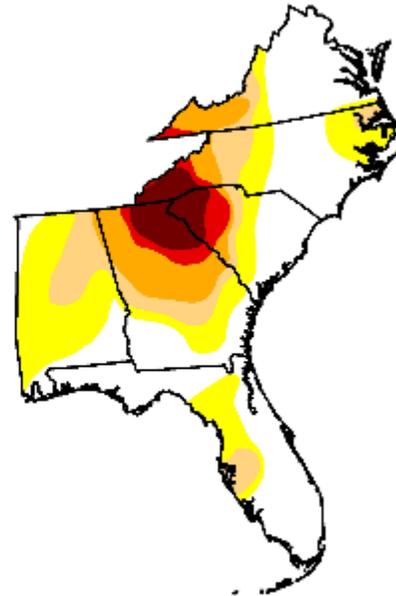
November 25, 2008
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	45.7	54.3	30.2	18.4	8.6	5.3
Last Week (11/18/2008 map)	49.5	50.5	28.9	18.4	8.5	4.6
3 Months Ago (09/02/2008 map)	34.5	65.5	42.6	20.0	7.6	1.5
Start of Calendar Year (01/01/2008 map)	9.6	90.4	74.3	58.5	41.0	22.0
Start of Water Year (10/07/2008 map)	35.2	64.8	41.8	20.8	9.4	1.9
One Year Ago (11/27/2007 map)	13.0	87.0	76.2	58.0	43.5	27.8

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

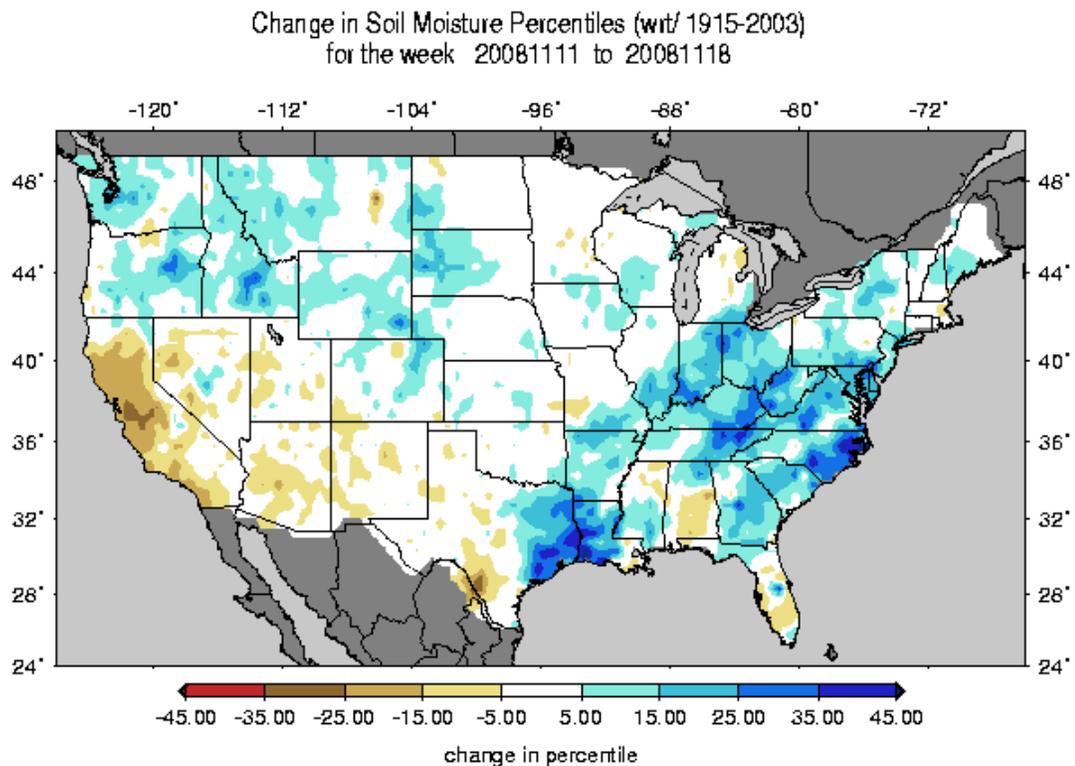
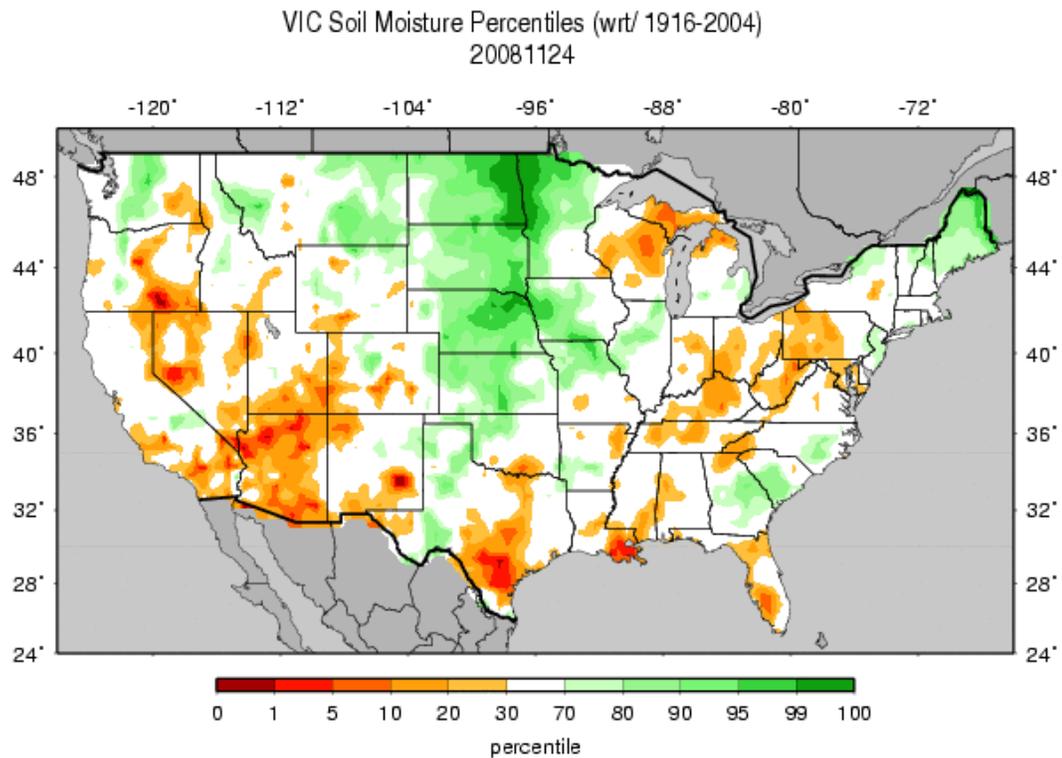
<http://drought.unl.edu/dm>



Released Wednesday, November 26, 2008
Author: Brad Rippey, U.S. Department of Agriculture

Fig. 4b: Drought Monitor for the Southeast shows some deterioration (D1-D4) since last week. The D4 area is the worst drought level currently in the US. Ref: http://www.drought.unl.edu/dm/DM_southeast.htm

Weekly Snowpack and Drought Monitor Update Report



Figs. 5a & 5b: Soil Moisture Ranking and change in percentile based on 1915-2003 climatology for this past week. Near saturation exists over the Northern Plain while excessive dryness dominates the Southwest, and South Central US (Fig. 5a). Increased soil moisture occurred over much of the eastern third of the nation and Pacific Northwest this week (Fig. 5b).

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

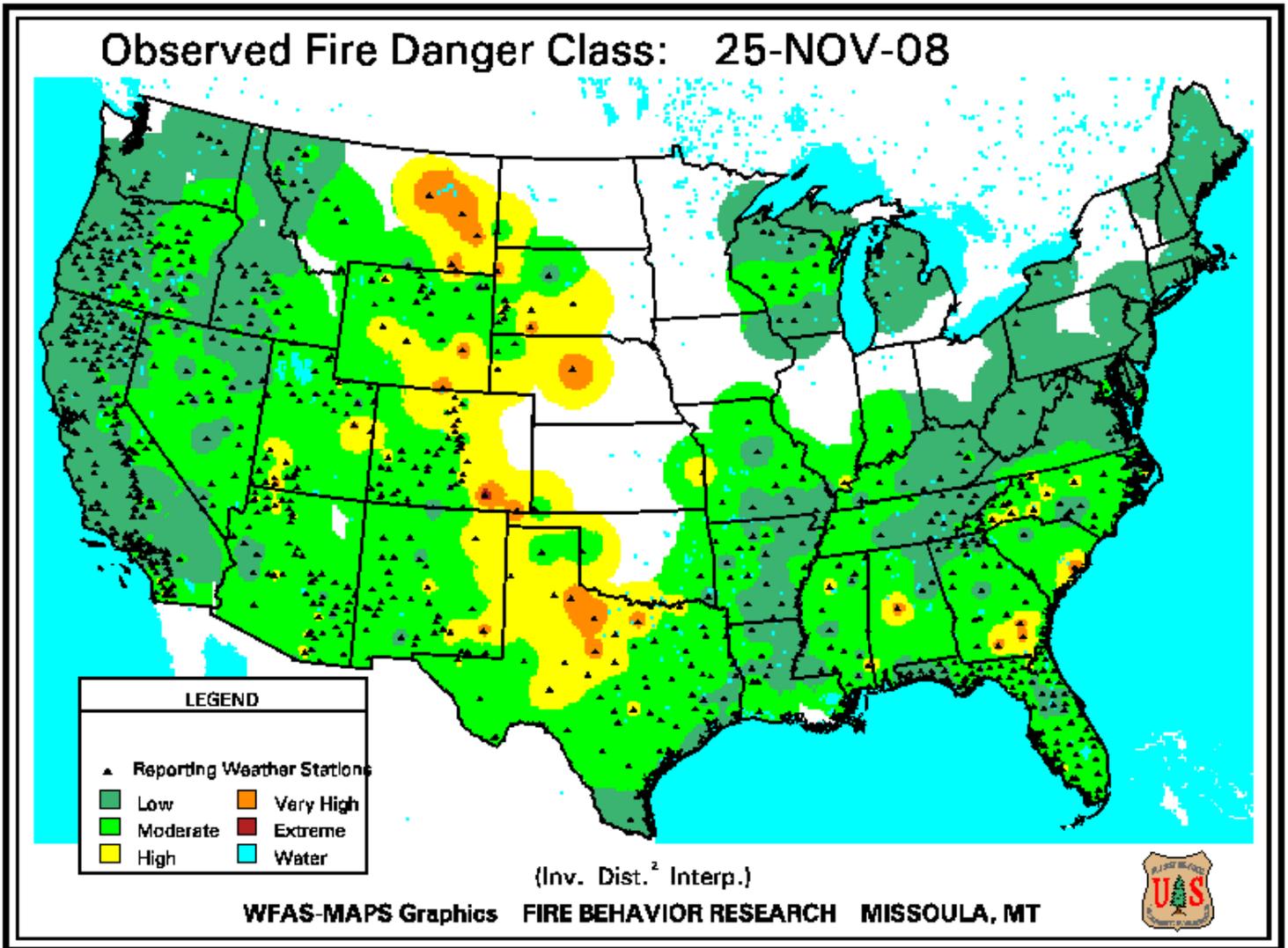
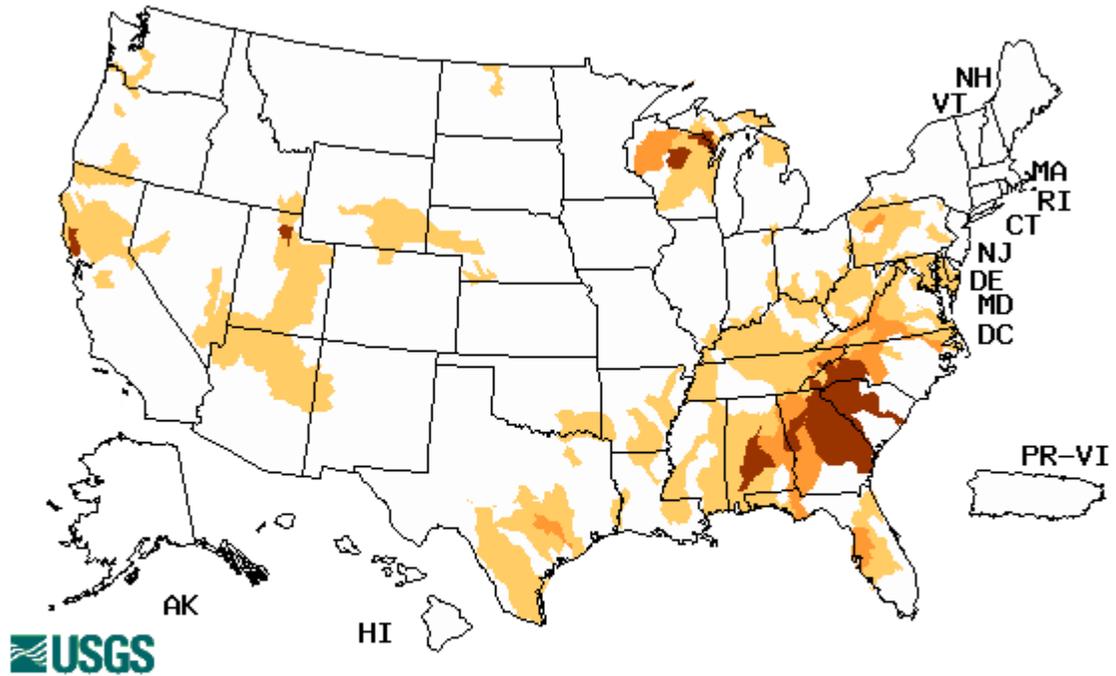


Fig. 6. Observed Fire Danger Class. Much of the West shows a marked improvement in fire risk since last week. Source: Forest Service Fire Behavior Research – Missoula, MT.

Ref: http://www.fs.fed.us/land/wfas/fd_class.gif

Weekly Snowpack and Drought Monitor Update Report

Tuesday, November 25, 2008



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. 7. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Note persistent low flows over parts the Southeastern States and over the Upper Peninsula of Michigan and northern Wisconsin. The Coastal Range of northern California is also showing signs of developing runoff deficits. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary – November 25, 2008

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 East and South: A period of remarkably quiet weather came to an end with a round of showers on November 24. Some rain and snow lingered across the Northeast into November 25. In drought-affected areas of the East and South, rainfall totals were generally an inch or less. Specific totals for the last 24 hours of the monitoring period (ending 7 am EST on November 25) included 0.94 inch in Crossville, Tennessee; 0.73 inch in Charleston, West Virginia; and 0.61 inch in Jackson, Kentucky. Totals were generally less than one-quarter inch in drought-affected areas lying east of the southern Appalachians. While the rain provided a boost in topsoil moisture, totals were insufficient to improve the long-term drought picture. In fact, there was a small expansion of the core extreme to exceptional drought (D3 to D4) area centered on the southern Appalachians. In Florida, continued dry weather led to the introduction of moderate drought (D1) in Tampa and surrounding areas. This part of Florida was bypassed by Tropical Storm Fay in August. Some other parts of northern and central Florida have been very dry since Fay's passage, and those areas are now depicted as abnormally dry (D0). Meanwhile, abnormal dryness and moderate drought conditions (D0 and D1) were expanded to the west and northwest in Tennessee and Kentucky due to various factors, including low stream flows and soil moisture shortages. Elsewhere, separate areas of abnormal dryness (D0) in southwestern Alabama and southeastern Louisiana were bridged due to mounting short-term rainfall deficits.

The Great Lakes Region: Precipitation was mostly confined to the snow-belt areas downwind of the Great Lakes. Squalls were sufficiently heavy enough to bring about a slight reduction in the coverage of abnormal dryness and moderate drought (D0 and D1) across Michigan's Upper Peninsula.

The Plains: Despite a week of dry weather and wildly fluctuating temperatures, there were few changes in the Plains' drought depiction. Some worsening of drought occurred, however, in south-central Texas, where both San Antonio and Austin (Camp Mabry) are within a few days of completing their respective fourth-driest January-November periods on record. In both San Antonio and Austin, drier January-November periods were observed only in the historic drought years of 1917, 1954, and 1956. Elsewhere on the Plains, conditions remained mostly favorable for winter wheat development, despite a recent turn toward drier conditions. In Texas, the percentage of winter wheat rated in very poor to poor condition by the U.S. Department of Agriculture has crept higher in recent weeks, from 11 to 16% between October 26 and November 23. During the same 4-week period, the percentage of wheat rated very poor to poor in Kansas remains low, but has climbed from 3 to 8%.

The West: With the entire region remaining under warm, mostly dry conditions, no changes to the drought depiction were introduced. However, such a pattern of dry weather and unusual warmth, if it were to persist, would eventually lead to further increases in the severity and areal extent of Western drought. Agriculturally, a lack of moisture remained a concern with respect to proper establishment of Northwestern winter wheat. According to the U.S. Department of Agriculture, 33% of Washington's wheat crop was rated in very poor to poor condition on November 23, along with 24% of Oregon's crop.

Alaska and Hawaii: No changes were made in Alaska, where cold, mostly dry weather prevailed. In contrast, heavy rain continued across Hawaii's western islands. Kauai's Mt. Waialeale received

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13.75 inches during the final 48 hours of the previous drought monitoring period on November 16-18, then collected another 2.41 inches on November 21-22. During the latter event, the 24-hour total reached 4.25 inches in Kokee, Kauai, while a small landslide was reported on northern Kauai near Hanalei. Lihue, Kauai, received 5.07 inches of rain during the first 10½ months of 2008, followed by 5.42 inches from November 16-23. Meanwhile on Oahu, Honolulu received nearly 40% (2.76 of 7.02 inches) of its year-to-date rainfall from November 14-23. Extreme drought (D3) was erased from Oahu, replaced by severe drought (D2).

Looking Ahead: During the next 5 days (November 26-30), the Southwest's most significant storm of the autumn will produce as much as 1 to 2 inches of rain from southern California into the Four Corners States. However, heavy rain in a short time period could cause flash flooding and mud slides, especially in areas burned by recent wildfires. Toward week's end, locally heavy rain will develop from the central Gulf Coast States into the southern Atlantic region, while snow showers will linger downwind of the Great Lakes. Meanwhile, snow could briefly affect the Rockies and adjacent High Plains on November 29-30. Elsewhere, mostly dry weather will prevail through month's end across the Northwest and the middle and upper Mississippi Valley.

The CPC 6- to 10-day forecast (December 1-5) calls for cold weather and near- to below-normal precipitation across the majority of the U.S. Near- to above-normal temperatures will be limited to the West, while dry conditions will be especially likely across the Mississippi Valley, the southeastern Plains, and areas west of the Rockies. Wetter-than-normal conditions will be confined to the northern High Plains; the lower Southeast, including northern Florida; and areas from the lower Great Lakes region into northern New England.

Author: Brad Rippey, U.S. Department of Agriculture

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 26 November 2008