



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

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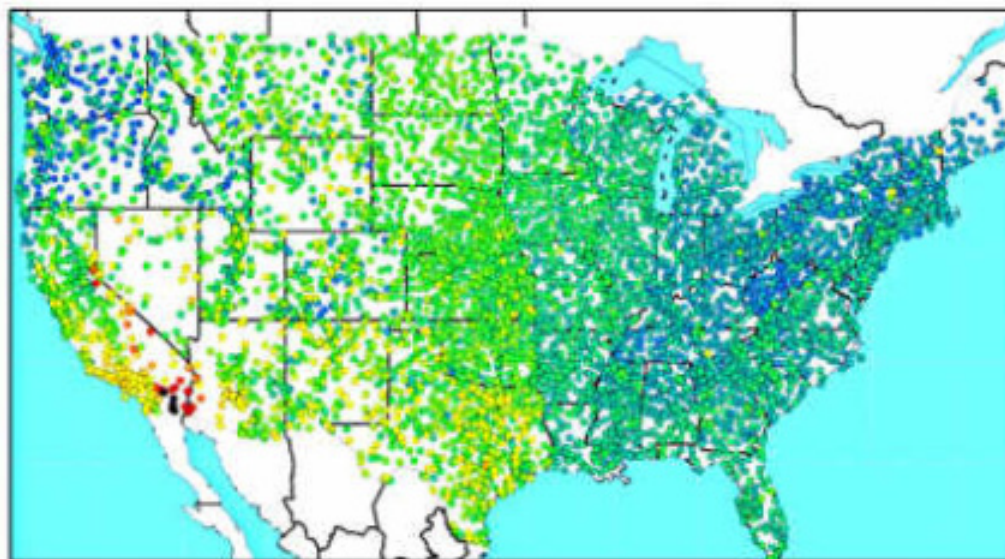
**Weekly Report - Snowpack / Drought Monitor Update**      **Date: 11 December, 2008**

### **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** Snow-water equivalent percent to date continues to show low values across the West with no significant changes since last week. Few water basins are near or above the long term average for this time of year (Fig 1). An aspect of the climatology of the West, as noted by the figure below, is that over extreme southeast California the heaviest precipitation events can result in nearly a third of the yearly total while the Pacific Northwest usually receives less than 5 percent of its annual total during its heaviest 24 hour period downpours. So despite a very slow start to this snow accumulation season, things can turn around quickly in some regions of the West.

AVERAGE MAXIMUM DAILY PRECIPITATION AS FRACTION  
OF ANNUAL TOTAL

Mike Dettinger, USGS



PERCENTAGE



**Temperature:** SNOTEL and ACIS-day station average temperature anomalies were above normal during the past week across many locales across the West with the coolest departures over the Wyoming and Montana Rockies (Fig. 2). Specifically, the greatest positive temperature departures occurred over western Wyoming and central Washington (>+12F) and greatest negative departures occurred over foothills of northern Colorado (<-6F) (Fig. 2a). It should be noted that the higher altitude SNOTEL sites appeared considerably cooler than the adjacent valley weather stations over western Wyoming.

## Weekly Snowpack and Drought Monitor Update Report

**Precipitation:** ACIS 7-day average precipitation anomaly for the period ending 10 December shows significant amounts of precipitation scattered across a large region east of the Continental Divide. Little if any precipitation fell over California and Nevada (Fig. 3). Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values continuing to fall over Washington, Oregon, southern Idaho, and western Nevada since last week (Fig. 3a). For precipitation totals, departures, and percent of normal for several time periods. See: <http://www.water.gov/> and <http://cig.mesonet.org/~derek/public/droughtmonitoring/>.

### WESTERN DROUGHT STATUS

**The West:** Western precipitation was largely constrained to the Northwest and northern tier states this past week. The most intense precipitation fell in western Washington. Light, spotty precipitation fell across Colorado as well as down into Arizona and New Mexico. Drought intensified in California and Nevada with extension of severe (D2) conditions down through Reno and Caron City and westward, joining the tongue of D2 running nearly the entire length of California. A small area of extreme drought (D3) was also introduced in northern California. Ground reports in the area have indicated impacts on grazing land and livestock as well as dry springs. Author: Mike Brewer, NOAA/NCDC

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

## Weekly Snowpack and Drought Monitor Update Report

### 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/>

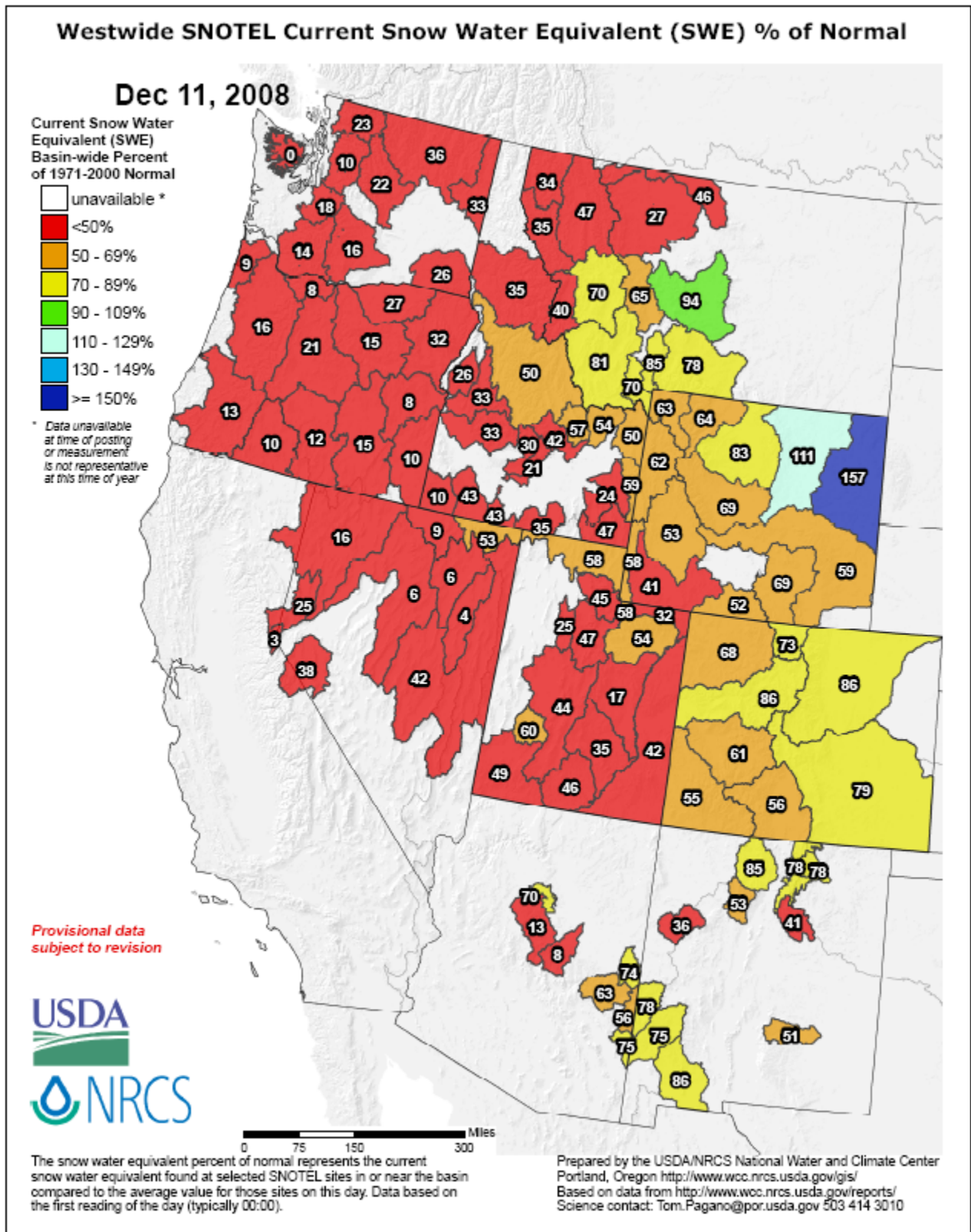
### FOR MORE INFORMATION

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 low values across the West with no significant changes since last week. Few water basins are near or above the long term average for this time of year.**

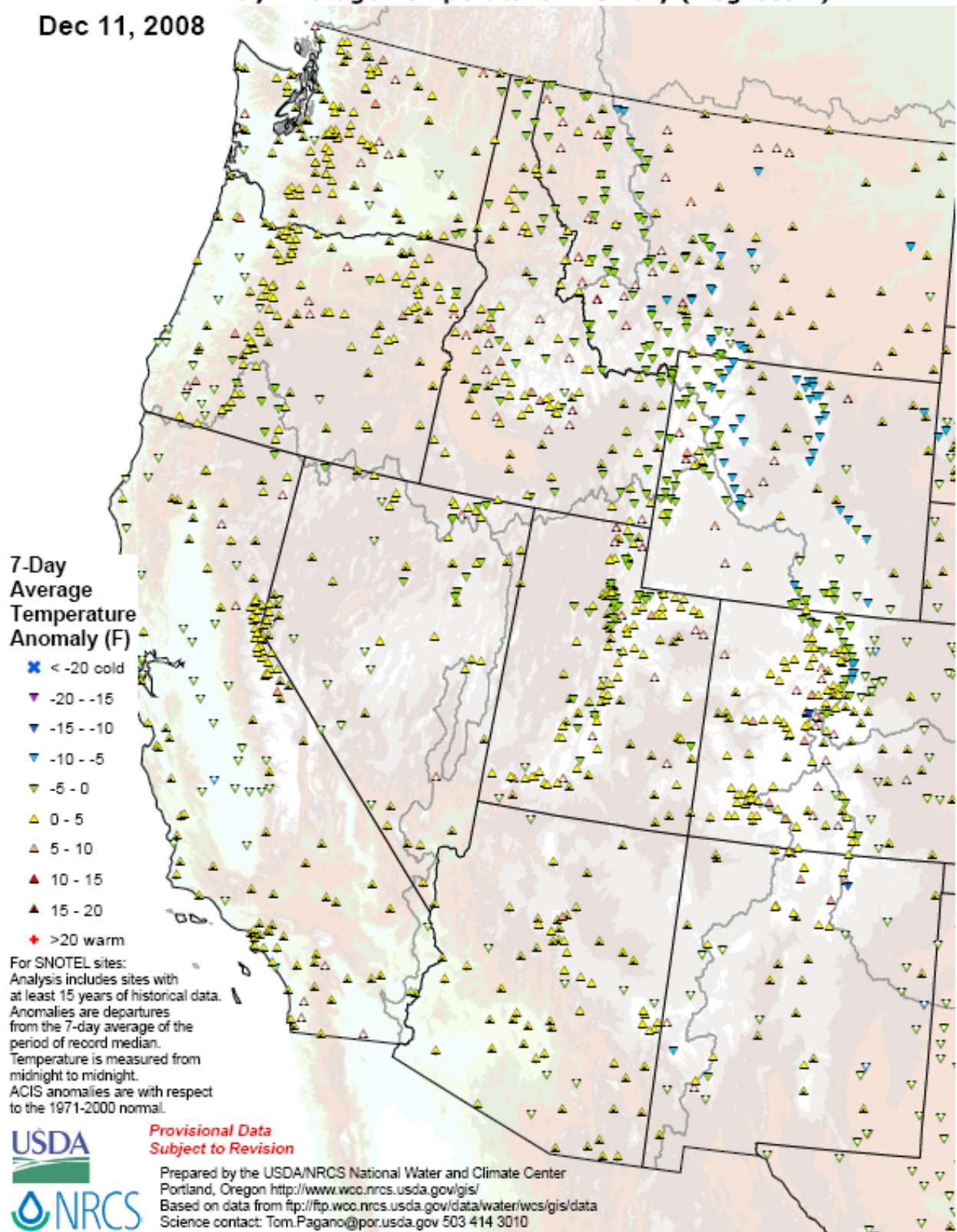
Ref: [ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west\\_sweptnormal\\_update.pdf](ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_sweptnormal_update.pdf)



## Weekly Snowpack and Drought Monitor Update Report

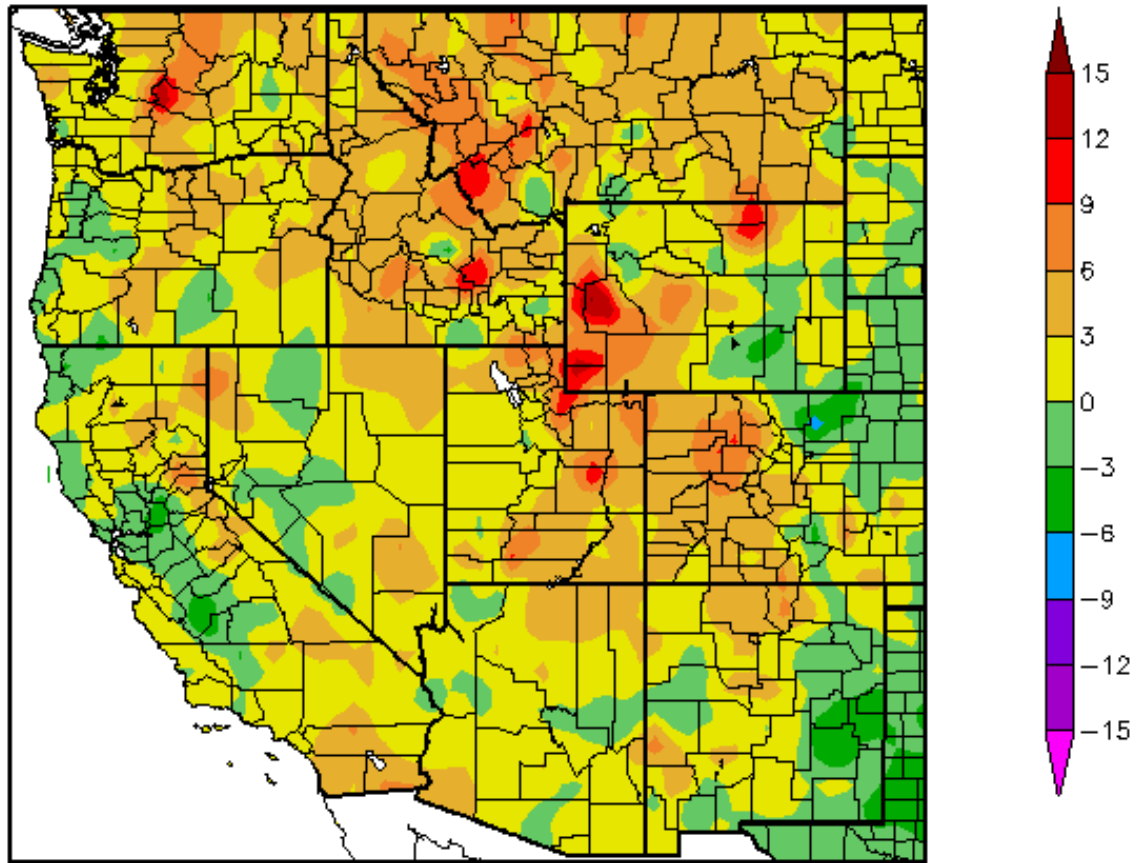
### SNOTEL (solid) and ACIS (dot-filled) Networks 7-Day Average Temperature Anomaly (Degrees F)

Dec 11, 2008



**Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were above normal during the past week across many locales across the West with the coolest departures over the Wyoming and Montana Rockies.** Ref: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcc/gis/maps/WestwideTavg7dAnomalyAcis.pdf>

Departure from Normal Temperature (F)  
12/4/2008 – 12/10/2008

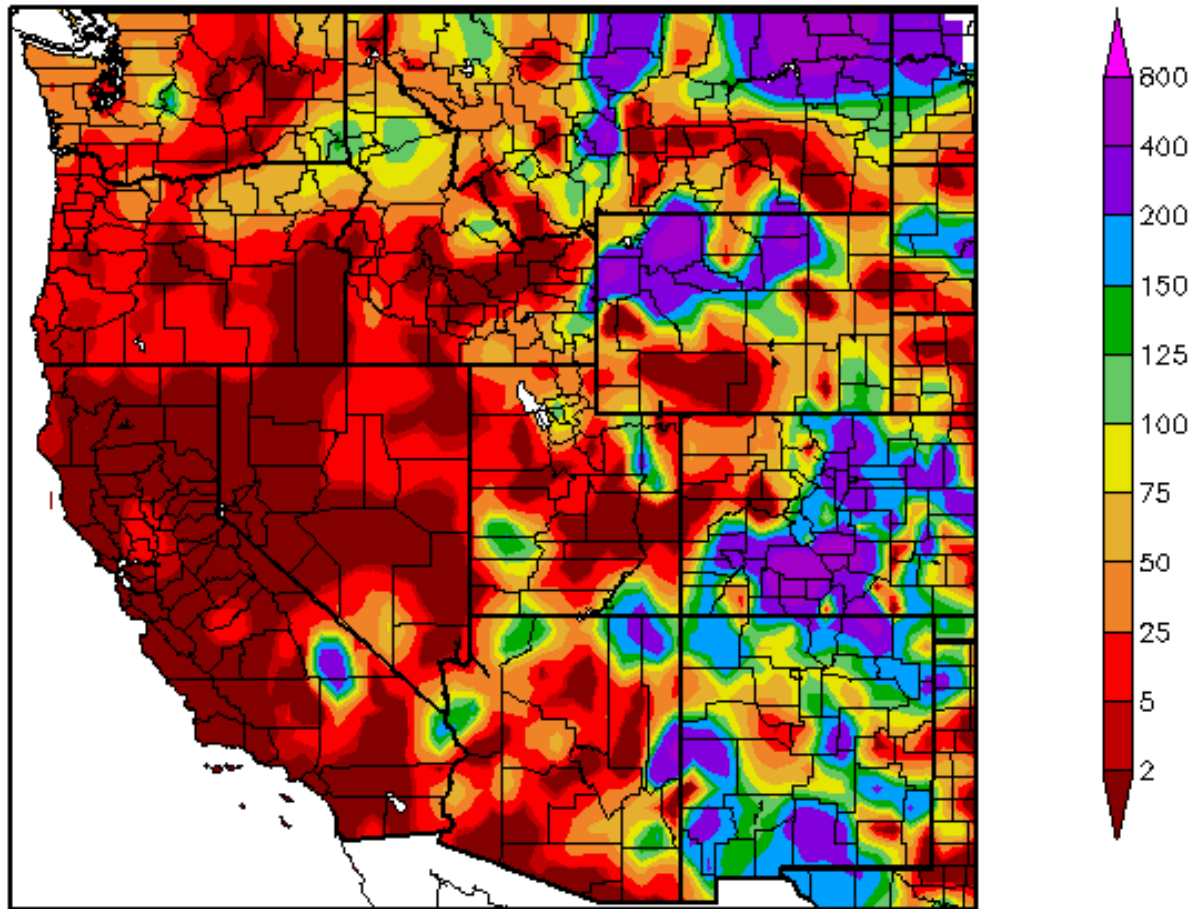


Generated 12/11/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 2a. ACIS 7-day average temperature anomalies:** Greatest positive temperature departures occurred over western Wyoming and central Washington ( $>+12^{\circ}\text{F}$ ) and greatest negative departures occurred over foothills of northern Colorado ( $<-6^{\circ}\text{F}$ ). It should be noted that the higher altitude SNOTEL sites appeared considerably cooler than the adjacent valley weather stations over western Wyoming (see Fig. 2 above). Ref: [http://www.hprcc.unl.edu/maps/current/index.php?action=update\\_product&product=TDept](http://www.hprcc.unl.edu/maps/current/index.php?action=update_product&product=TDept)

Percent of Normal Precipitation (%)  
12/4/2008 – 12/10/2008



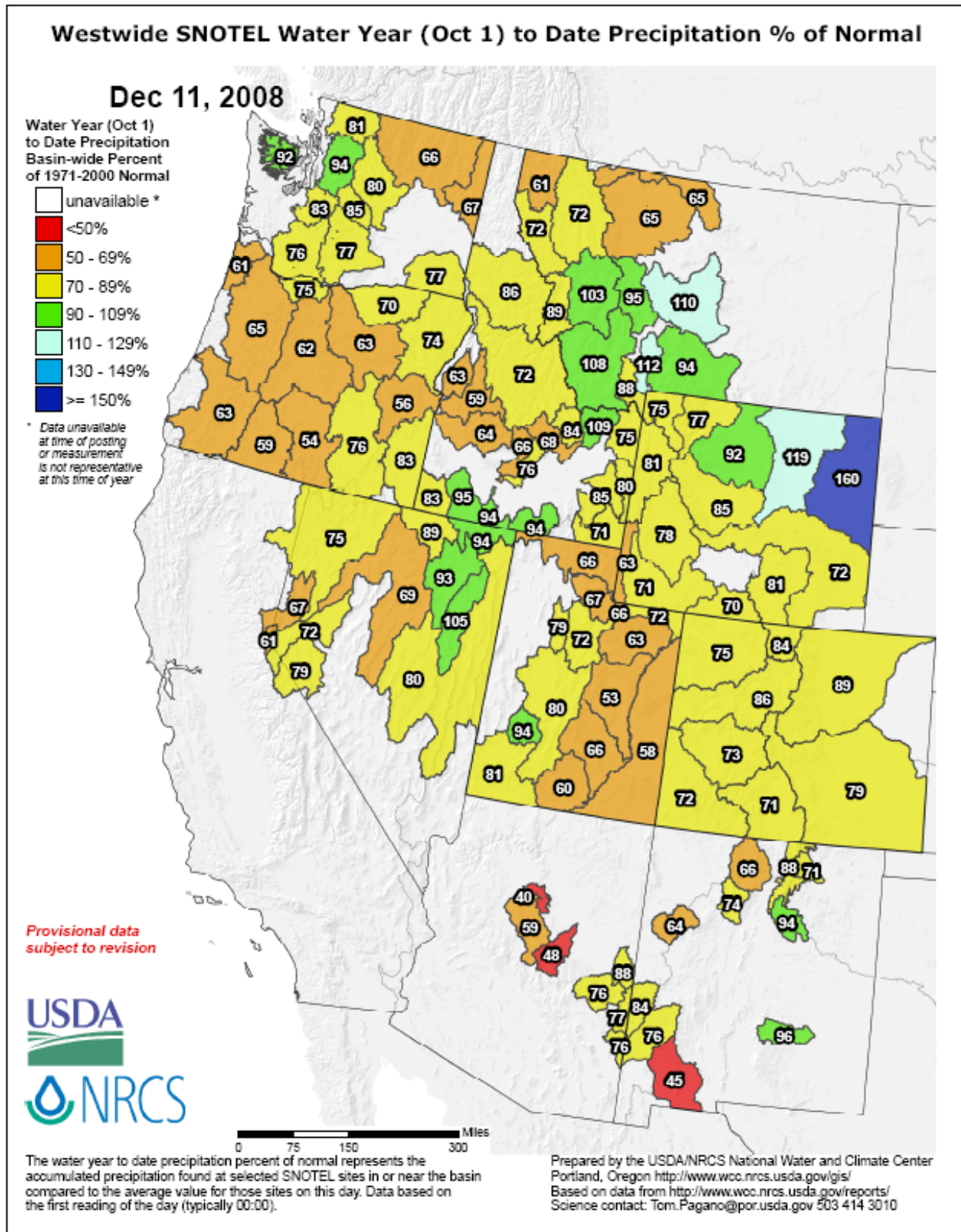
Generated 12/11/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 10 December shows significant amounts of precipitation scattered across a large region east of the Continental Divide. Little if any precipitation fell over California and Nevada.**

Ref: [http://www.hprcc.unl.edu/maps/index.php?action=update\\_product&product=PNorm](http://www.hprcc.unl.edu/maps/index.php?action=update_product&product=PNorm)





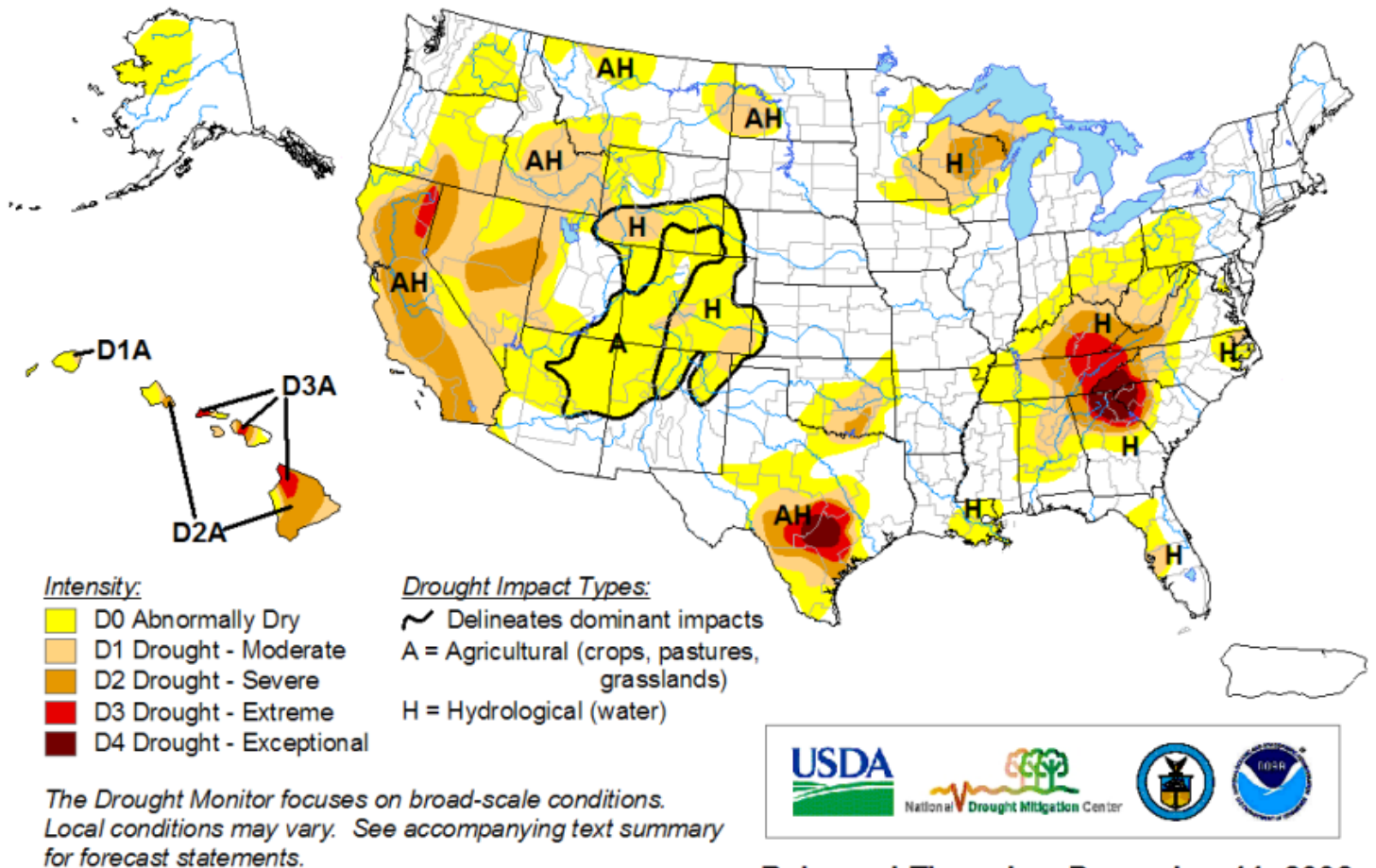
**Fig 3b. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values continuing to fall over Washington, Oregon, southern Idaho, and western Nevada since last week.**

Ref: [http://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west\\_wytdprecptnormal\\_update.pdf](http://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_wytdprecptnormal_update.pdf)



# U.S. Drought Monitor

December 9, 2008  
Valid 7 a.m. EST



Released Thursday, December 11, 2008  
Authors: Michael Brewer/Liz Love-Brotak NOAA/NESDIS/NCDC

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

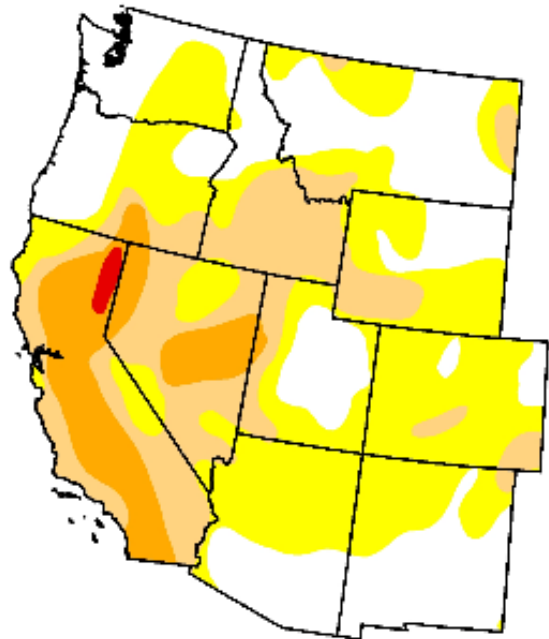
December 9, 2008

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	32.8	67.2	29.9	9.8	0.4	0.0
Last Week (12/02/2008 map)	32.8	67.2	29.6	8.6	0.0	0.0
3 Months Ago (09/16/2008 map)	34.2	65.8	29.7	10.1	0.1	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 (12/11/2007 map)	27.7	72.3	54.2	32.8	2.7	0.0

### Intensity:

<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D0 Abnormally Dry	<span style="background-color: red; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D3 Drought - Extreme
<span style="background-color: orange; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D1 Drought - Moderate	<span style="background-color: darkred; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D4 Drought - Exceptional
<span style="background-color: darkorange; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D2 Drought - Severe	



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 Thursday, December 11, 2008

Author: National Drought Mitigation Center

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note the introduction of D3 over northeast California last week. Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)

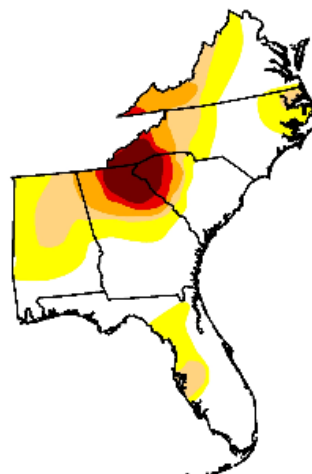
# U.S. Drought Monitor

## Southeast

December 9, 2008

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	50.6	49.4	25.5	14.0	7.6	5.0
Last Week (12/02/2008 map)	46.2	53.8	28.5	15.0	8.6	5.3
3 Months Ago (09/16/2008 map)	43.3	56.7	35.1	17.0	6.9	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 (12/11/2007 map)	8.6	91.4	79.3	63.2	47.9	36.2

Intensity:

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 Thursday, December 11, 2008

Author: National Drought Mitigation Center

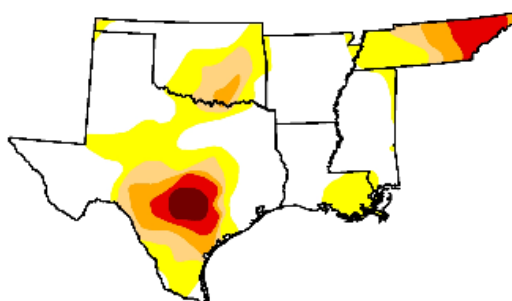
# U.S. Drought Monitor

## South

December 9, 2008

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	56.5	43.5	20.6	12.0	6.3	1.6
Last Week (12/02/2008 map)	57.2	42.8	18.6	11.0	6.1	0.7
3 Months Ago (09/16/2008 map)	76.0	24.0	16.7	7.7	2.2	0.0
Start of Calendar Year (01/01/2008 map)	57.5	42.5	12.9	4.3	3.8	1.6
Start of Water Year (10/07/2008 map)	73.3	26.7	17.3	10.7	2.9	0.0
One Year Ago (12/11/2007 map)	55.7	44.3	11.3	4.3	3.8	1.7

Intensity:

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

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



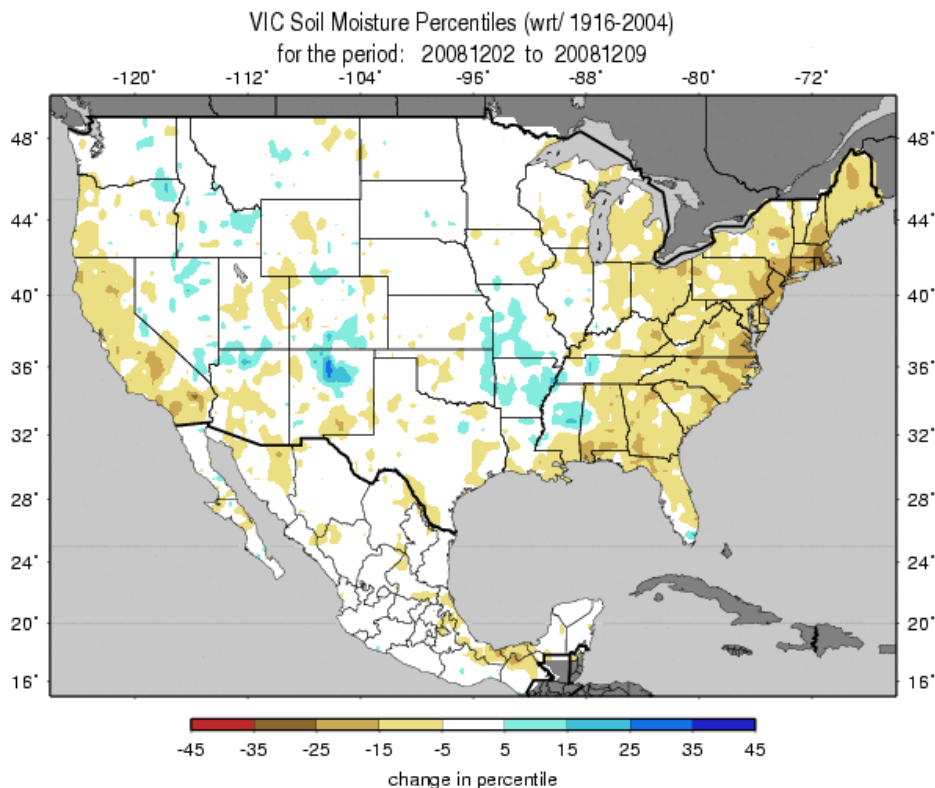
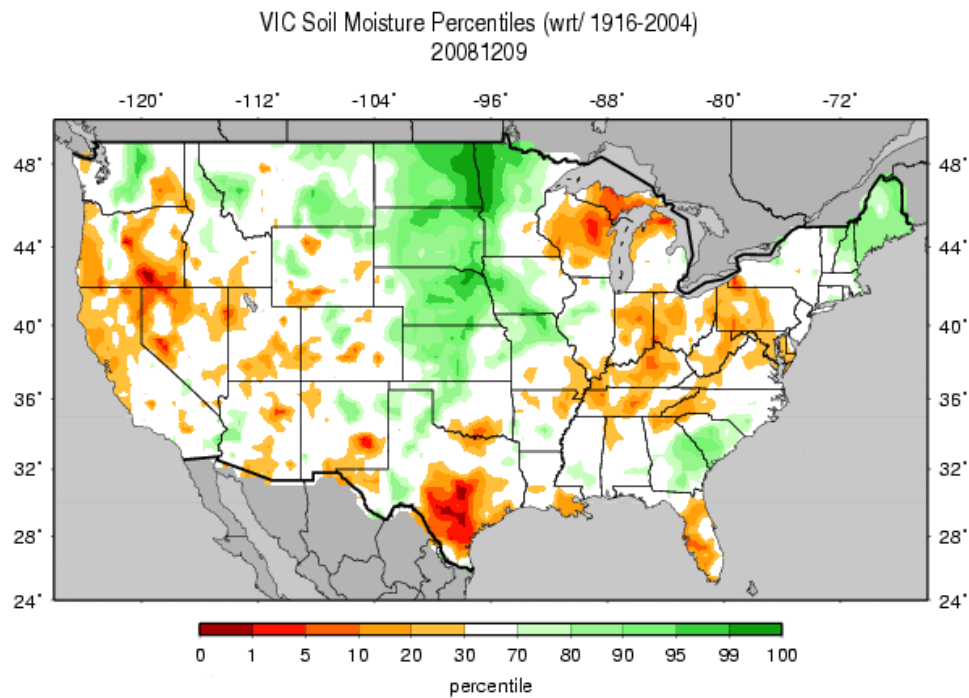
Released Thursday, December 11, 2008

Author: National Drought Mitigation Center

**Fig. 4b: Drought Monitor for the Southeast shows some improvement since last week. However, additional rainfall from a system just began to impact the Southeast during this period (this storm's impact will be addressed largely on the Dec 16, 2008 USDM). No significant changes over Texas this week. These are the only two areas in the US that are at D4 levels. Ref:**

[http://www.drought.unl.edu/dm/DM\\_southeast.htm](http://www.drought.unl.edu/dm/DM_southeast.htm) and [http://www.drought.unl.edu/dm/DM\\_south.htm](http://www.drought.unl.edu/dm/DM_south.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 southern Texas and the northern Great Basin (Fig. 5a). Increased soil moisture occurred over northern New Mexico while a drying trend was noted over the Eastern States and California 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/CONUS.vic.sm_qnt.gif),  
[http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm\\_qnt.1wk.gif](http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.1wk.gif)



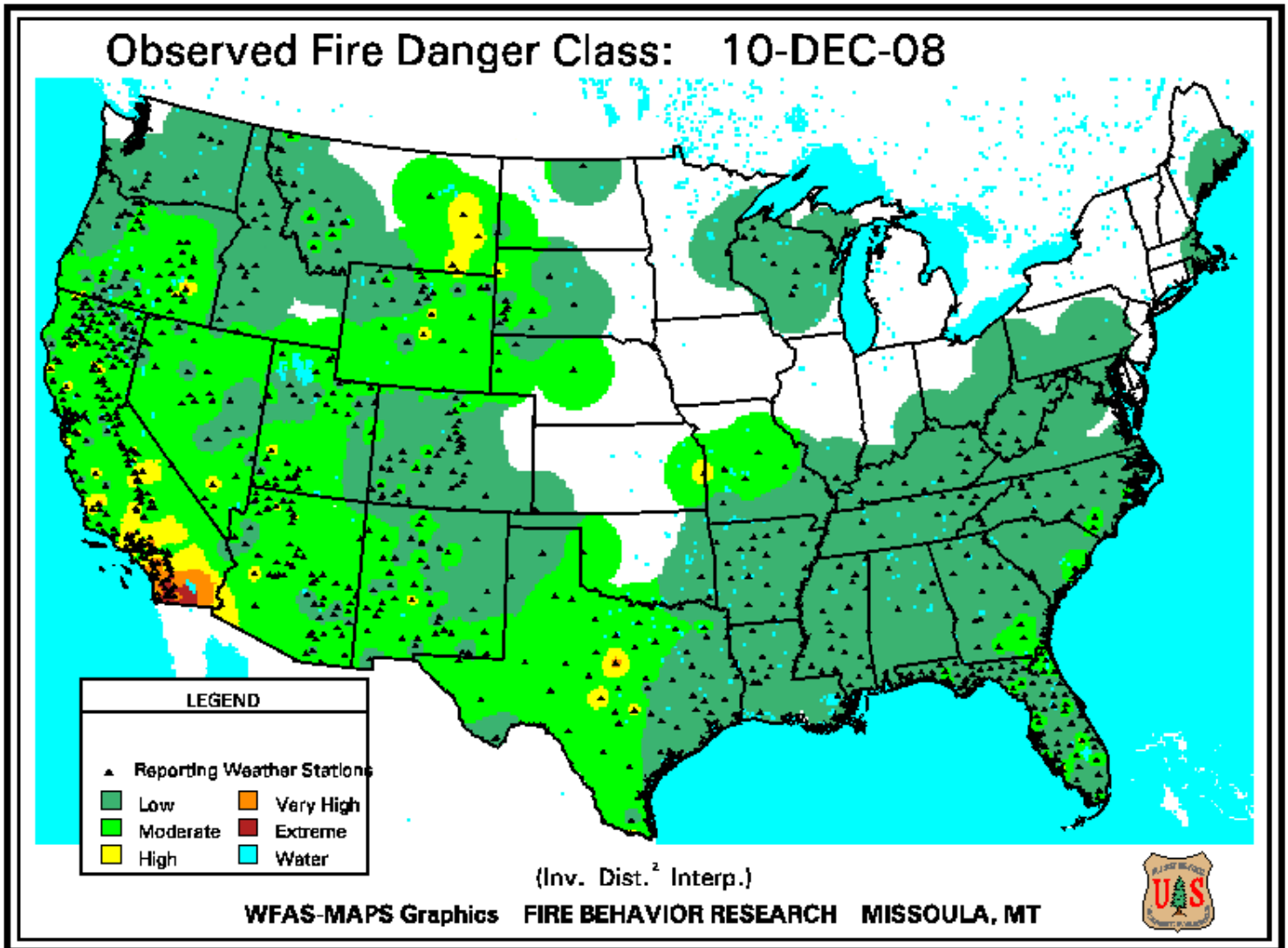
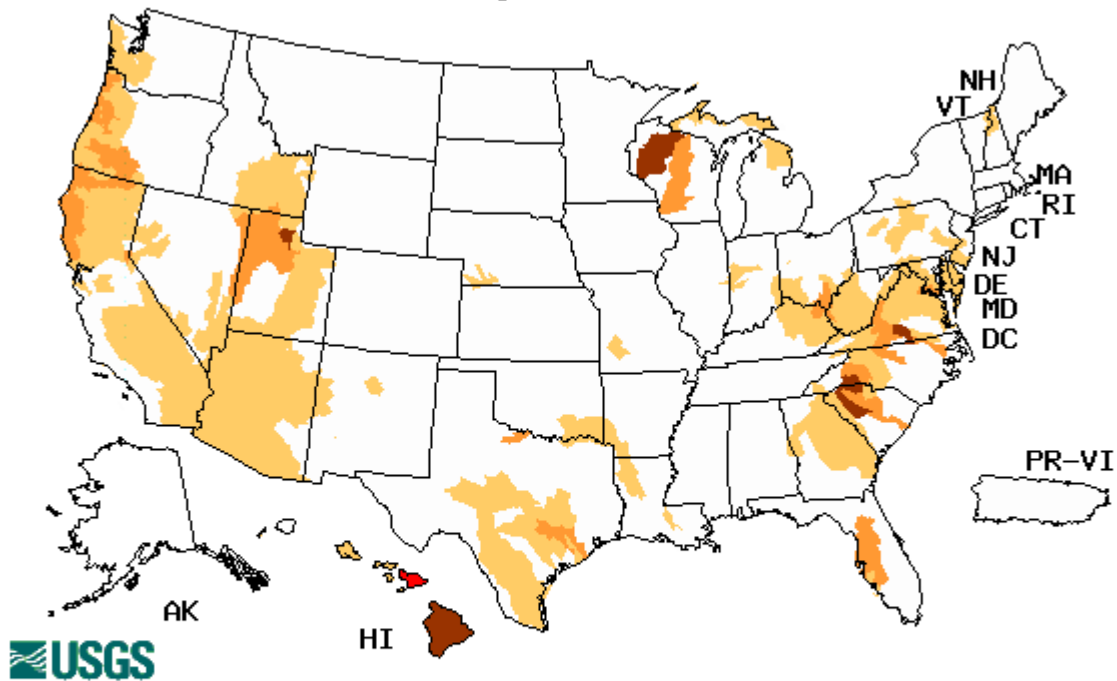


Fig. 6. Observed Fire Danger Class. This week, the only extreme fire potential is over southern California. Source: Forest Service Fire Behavior Research – Missoula, MT.

Ref: [http://www.fs.fed.us/land/wfas/fd\\_class.gif](http://www.fs.fed.us/land/wfas/fd_class.gif)

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Wednesday, December 10, 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 severe low flows over parts the Southeastern States, northern Wisconsin, northern Utah, and the Big Island of Hawaii. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

## Weekly Snowpack and Drought Monitor Update Report

National Drought Summary – December 9, 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/>.*

Across the country this week, above normal precipitation was limited to the Upper Midwest, the Northern Plains, and areas of lake effect precipitation in Michigan and New York. Even though a weather system moved through the eastern half of the country this U.S. Drought Monitor (USDM) period, with the exception of small areas of Arkansas and Alabama, precipitation for the week was below normal. Additional rainfall from a second system just began to impact the Southeast during this period (this storm's impact will be addressed largely on the Dec 16, 2008 USDM).

Temperatures were generally near to above normal west of the Mississippi River and near to below normal to the east, with the exception of northern New England. The West and southern Plains continue to be dry. Exceptional drought improved slightly through South Carolina and Georgia but expanded in south-central Texas.

**The Northeast:** A series of fronts passed through the Northeast again this USDM period. This resulted in the majority of the region receiving just slightly below normal precipitation. With the exception of the extreme northeast, this region also experienced below normal temperatures. No changes in drought conditions were made.

**Mid-Atlantic and Southeast:** A storm passed through the Mid-Atlantic and Southeast December 5 – 6 bringing another week of beneficial rains to Mississippi, southern Alabama, and Georgia. This eliminated abnormally dry (D0) conditions across much of the extreme southern part of this area. Further, these rains, combined with cool temperatures, contributed to improvements in Moderate Drought (D1) in southeast Ohio and western West Virginia as well as some slight improvements in exceptional (D4), extreme (D3), severe (D2), and moderate (D1) drought in South Carolina.

**The Plains and Upper Midwest:** This week, precipitation fell across much of the Upper Midwest. The Southern Plains received some precipitation but the drought areas of Texas and Oklahoma largely missed the rain. Abnormally dry (D0) and moderate drought (D1) expanded in Oklahoma and severe drought (D2) was introduced there this week. Exceptional (D4) and extreme (D3) drought both expanded in Texas.

**The West:** Western precipitation was largely constrained to the Northwest and northern tier states this past week. The most intense precipitation fell in western Washington. Light, spotty precipitation fell across Colorado as well as down into Arizona and New Mexico. Drought intensified in California and Nevada with extension of severe (D2) conditions down through Reno and Caron City and westward, joining the tongue of D2 running nearly the entire length of California. A small area of extreme drought (D3) was also introduced in northern California. Ground reports in the area have indicated impacts on grazing land and livestock as well as dry springs.

**Hawaii, Alaska and Puerto Rico:** Little rain fell across the Hawaiian Islands this U.S. Drought Monitor period. Drought conditions remained unchanged.

Across Alaska, precipitation was mixed with above normal in the southern islands and central part of the state, and near to below normal precipitation to the north and south. Abnormal dryness (D0)

## Weekly Snowpack and Drought Monitor Update Report

was expanded across the Seward Peninsula where Nome is experiencing its eighth driest year on record.

Notable rain fell in extreme northeast Puerto Rico with additional, lesser rains across the eastern and central parts of the island. Areas of drought remained unchanged.

**Looking Ahead:** From December 9 - 13, 2008, normal to cooler than normal temperatures are expected for most of the contiguous U.S. The only exceptions are the far Southwest, which is expected to see near to above normal conditions and New England and southern Florida, which are expected to be near normal. Alaska is expecting below normal temperatures to the south and near normal to above normal temperatures to the north and west. Precipitation is expected to be near to above normal across the contiguous U.S. with the exception of the Southwest and most of the West Coast, which are expected to be below normal. Alaska is expecting below above normal precipitation to the south, around Juneau, and near to below normal precipitation across the rest of the state.

From December 11 - 17, 2008, the odds favor continued below-normal temperatures across most of the country, including southern Alaska. The East Coast, from Maine down to Florida, and north and central Alaska are favoring near to above normal temperatures. The odds favor near to above normal precipitation across the continental U.S. with the exceptions of southern Florida, the extreme South, centered on western Texas, and the Northwest up to Juneau, Alaska.

**Author:** Mike Brewer, NOAA/NCDC

### 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 December 11, 2008