

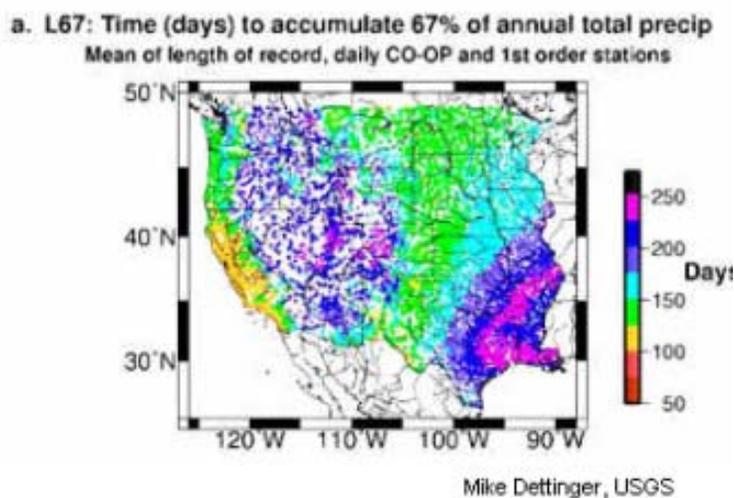


Natural Resources Conservation Service  
P.O. Box 2890  
Washington, D.C. 20013

**Weekly Report - Snowpack / Drought Monitor Update**      **Date:**    **4 December, 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 the long term average for this time of year (Fig 1). As noted by the figure below, the West receives two thirds of its annual precipitation in three typical durations: <100 days over western California, >100 to <150 days over the Sierra Mountains, Washington, and Oregon, and >150 days over the Intermountain West, Great Basin, and Rocky Mountains from the start of the Water Year (1 October). Despite a very slow start of mountain snow accumulation, we still have much of the winter to recover to near normal values.



**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 western Wyoming, southeastern Idaho, and central Washington (>+15F) and the greatest negative departures occurred over northeast New Mexico and southeast Colorado (<-1F) (Fig. 2a).

**Precipitation:** ACIS 7-day average precipitation anomaly for the period ending 3 December shows significant amounts falling (mostly as rain) across the 4-Corners States, southern California, and Montana. 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 shows values falling more than 10 percent across most of the West since last week. The ACIS 7-day precipitation anomaly reveals that much of the West is well below normal with above normal amounts over southern California falling mostly as rain (Fig 3a). Above normal amounts are also noted over portions of northeast Wyoming and southwest Montana (Fig. 3b). 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/>.

## Weekly Snowpack and Drought Monitor Update Report

### WESTERN DROUGHT STATUS

**The West:** A storm swept through the Southwest November 26 – 27 bringing beneficial precipitation to the area. Portions of southern California and Nevada and western Arizona received over 600% of their normal precipitation. This had little impact on the long-term dryness in the area though. Conditions improved slightly in southern Nevada. Conditions worsened in northern Colorado and southern Wyoming with abnormally dry conditions (D0) expanding there.

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).

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

## Weekly Snowpack and Drought Monitor Update Report

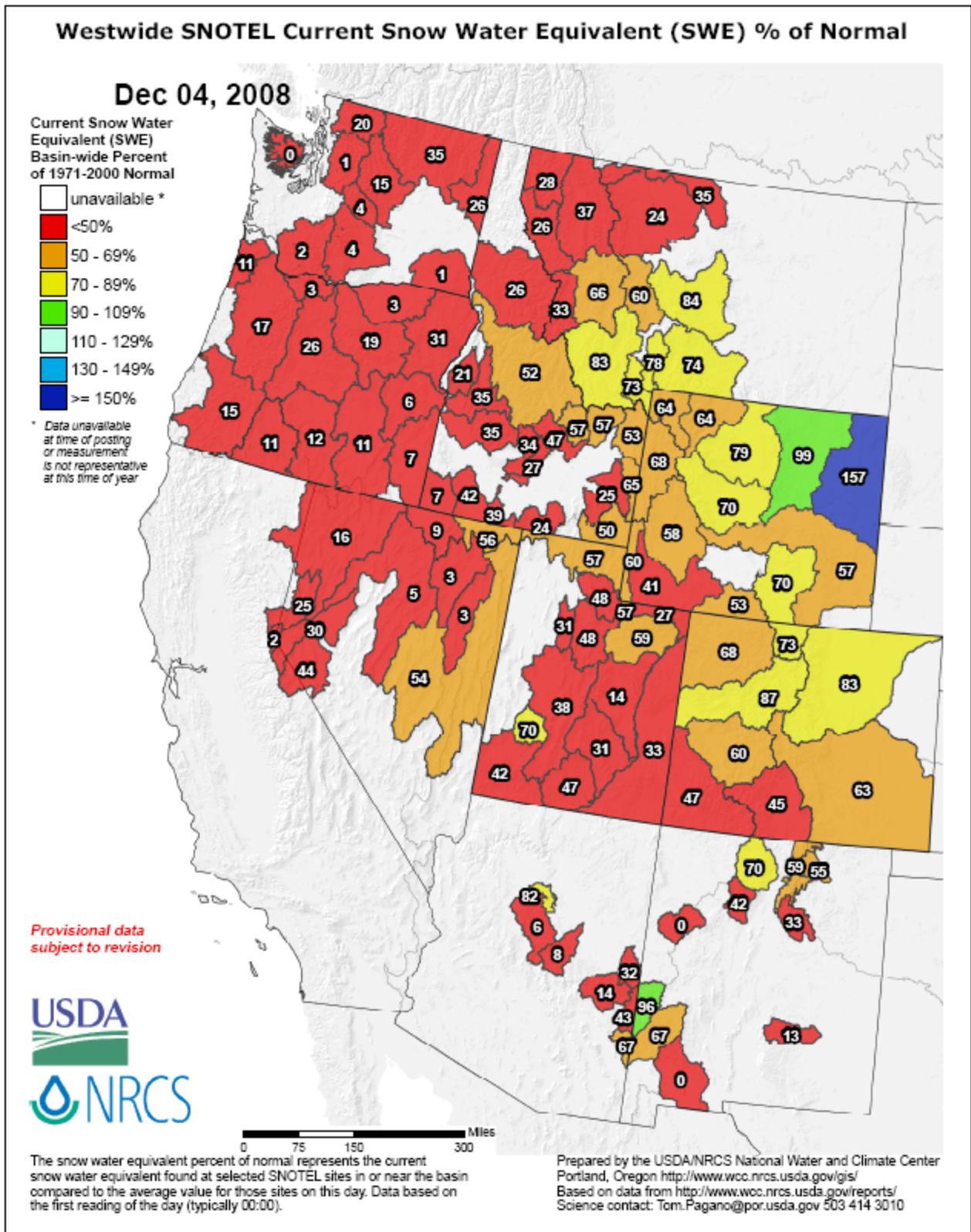
### FOR MORE INFORMATION

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

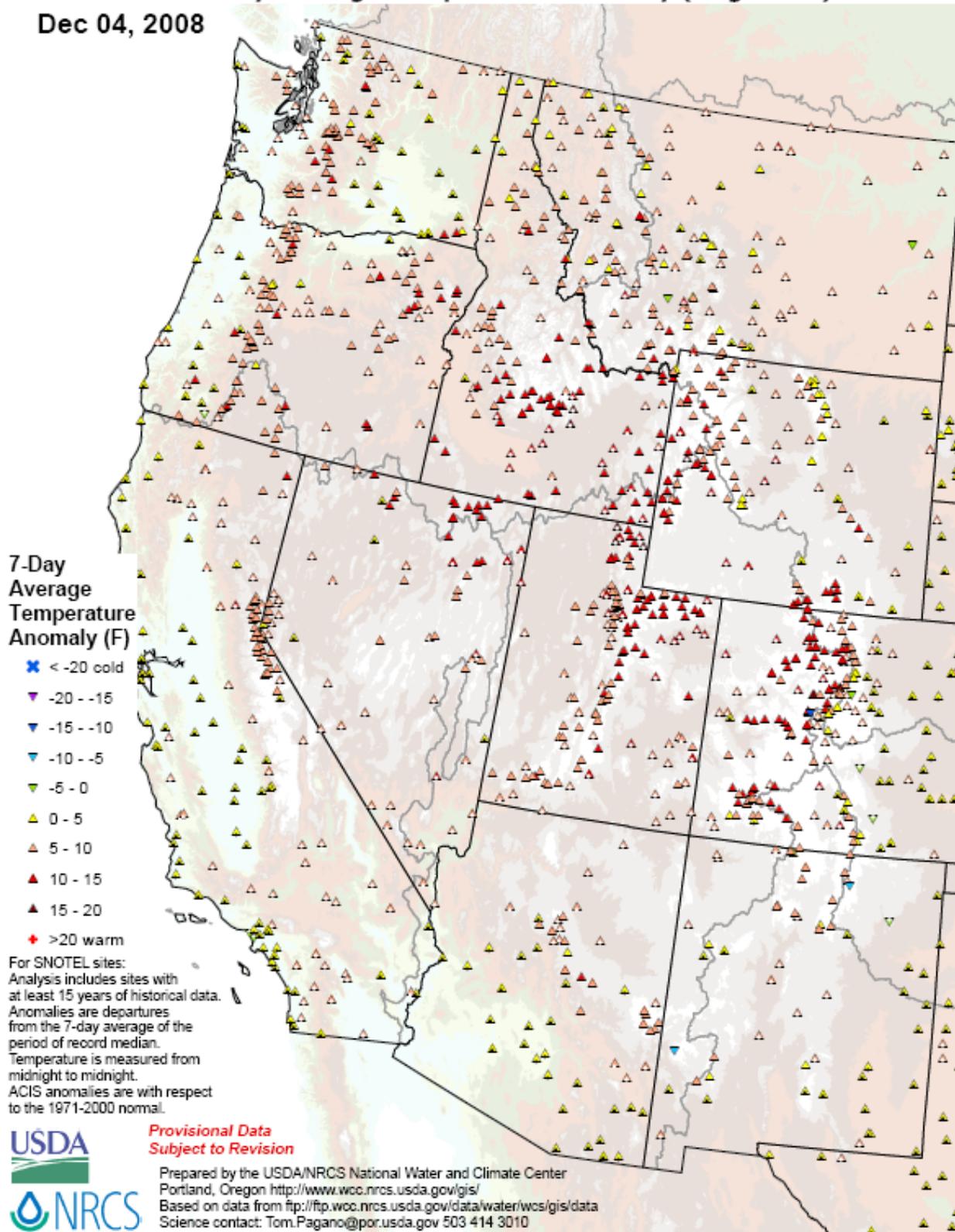


**Fig. 1. Snow-water equivalent percent to date continues to show a decline across the West since last week. Few water basins are near or above the long term average for this time of year.**  
Ref: [http://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west\\_swepctnormal\\_update.pdf](http://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_swepctnormal_update.pdf)

# Weekly Snowpack and Drought Monitor Update Report

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

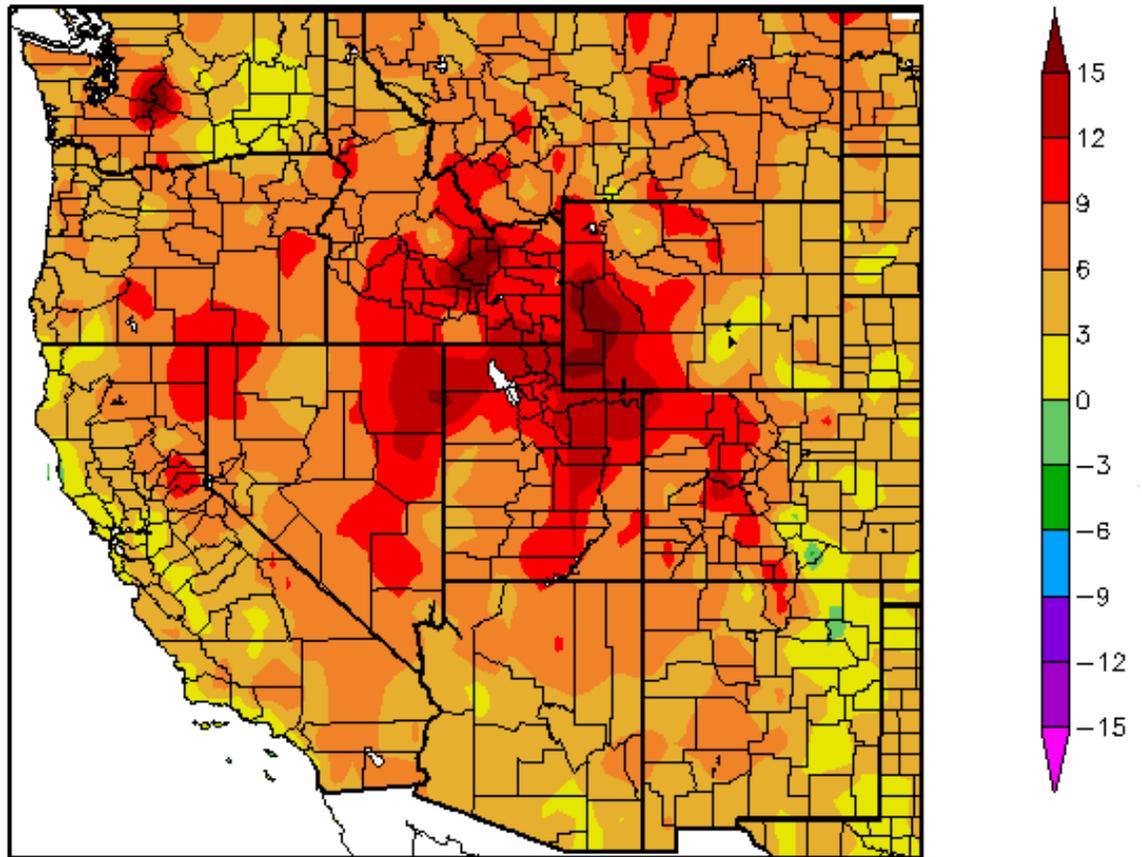
Dec 04, 2008



**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/maps/WestwideTavq7dAnomalyAcis.pdf>

Departure from Normal Temperature (F)  
11/27/2008 – 12/3/2008



Generated 12/4/2008 at HPRCC using provisional data.

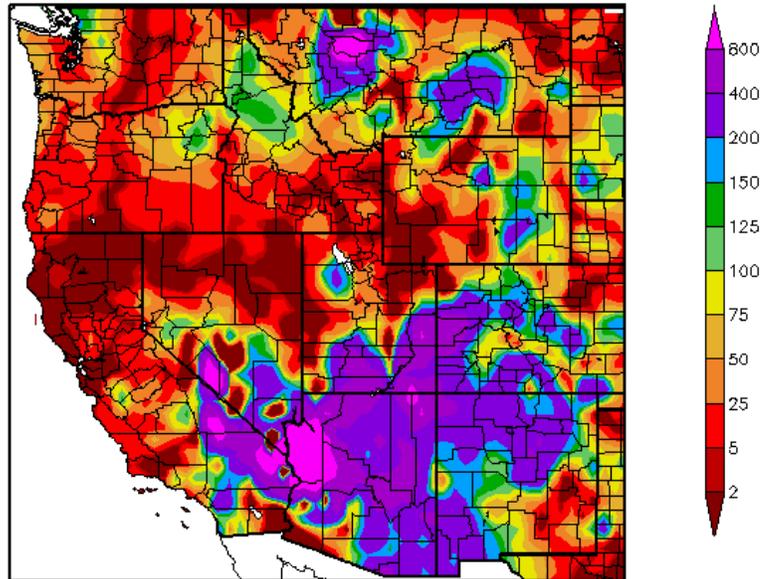
NOAA Regional Climate Centers

**Fig. 2a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over western Wyoming, southeastern Idaho, and central Washington (>+15F) and greatest negative departures occurred over northeast New Mexico and southeast Colorado (<-1F).**

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)

## Weekly Snowpack and Drought Monitor Update Report

Percent of Normal Precipitation (%)  
11/27/2008 – 12/3/2008



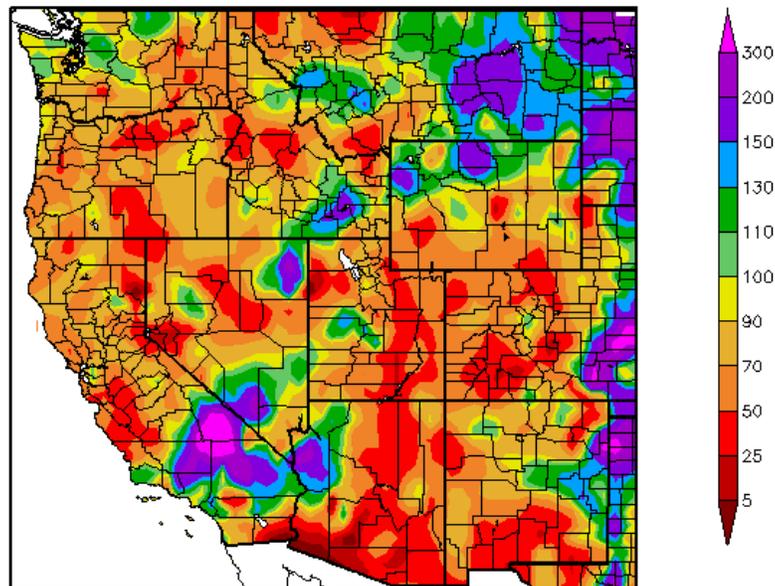
Generated 12/4/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 3 December shows significant amounts falling (mostly as rain) across the 4-Corners States, southern California, and Montana. Mostly dry conditions prevailed over the remainder of the West.**

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)

Percent of Normal Precipitation (%)  
10/1/2008 – 12/3/2008

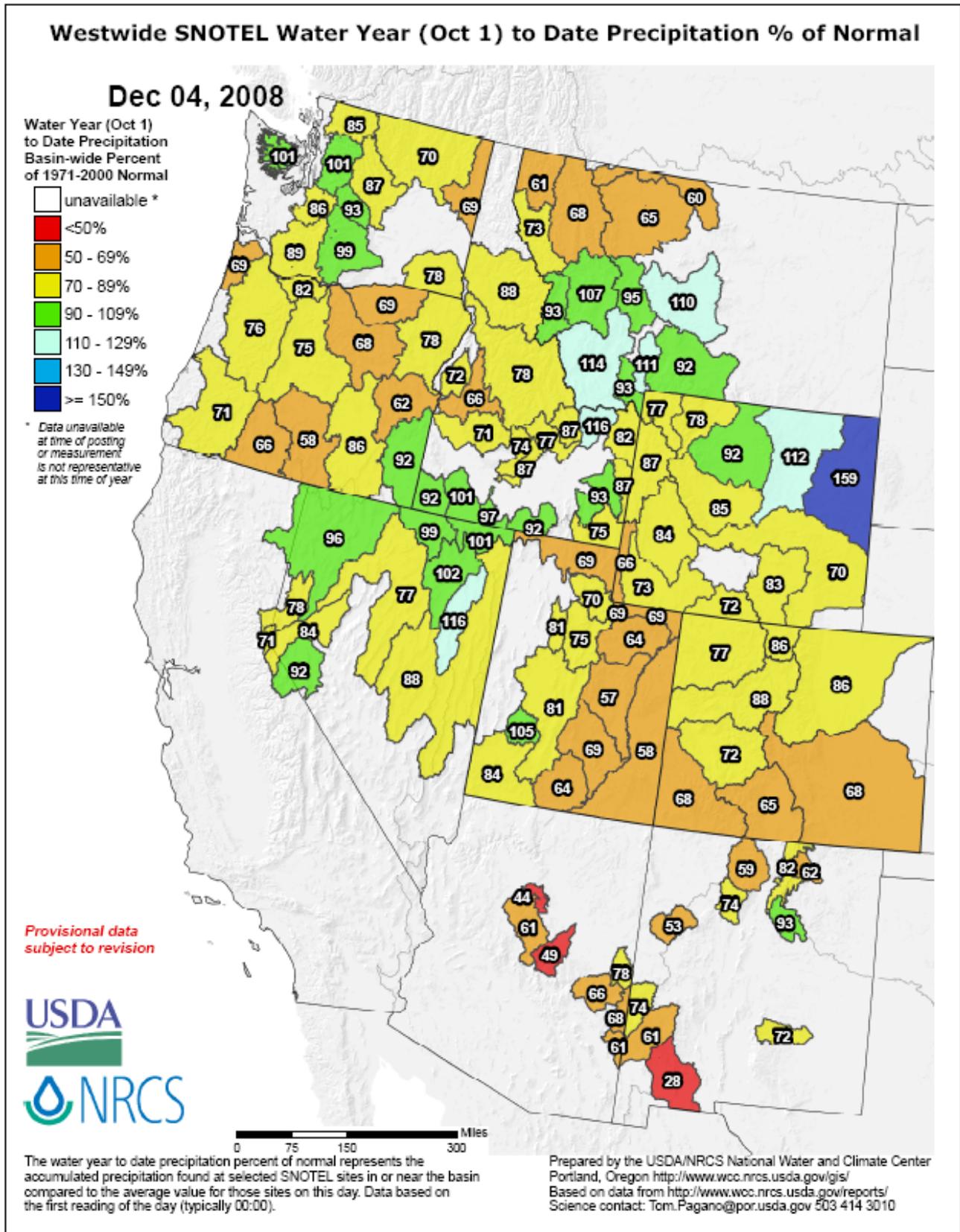


Generated 12/4/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 3a. ACIS 7-day precipitation anomaly for the 2009 Water Year reveals that much of the West is well below normal with above normal amounts over southern California falling as rain.**

Ref: [http://www.hprcc.unl.edu/maps/current/index.php?action=update\\_daterange&daterange=Water](http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=Water)

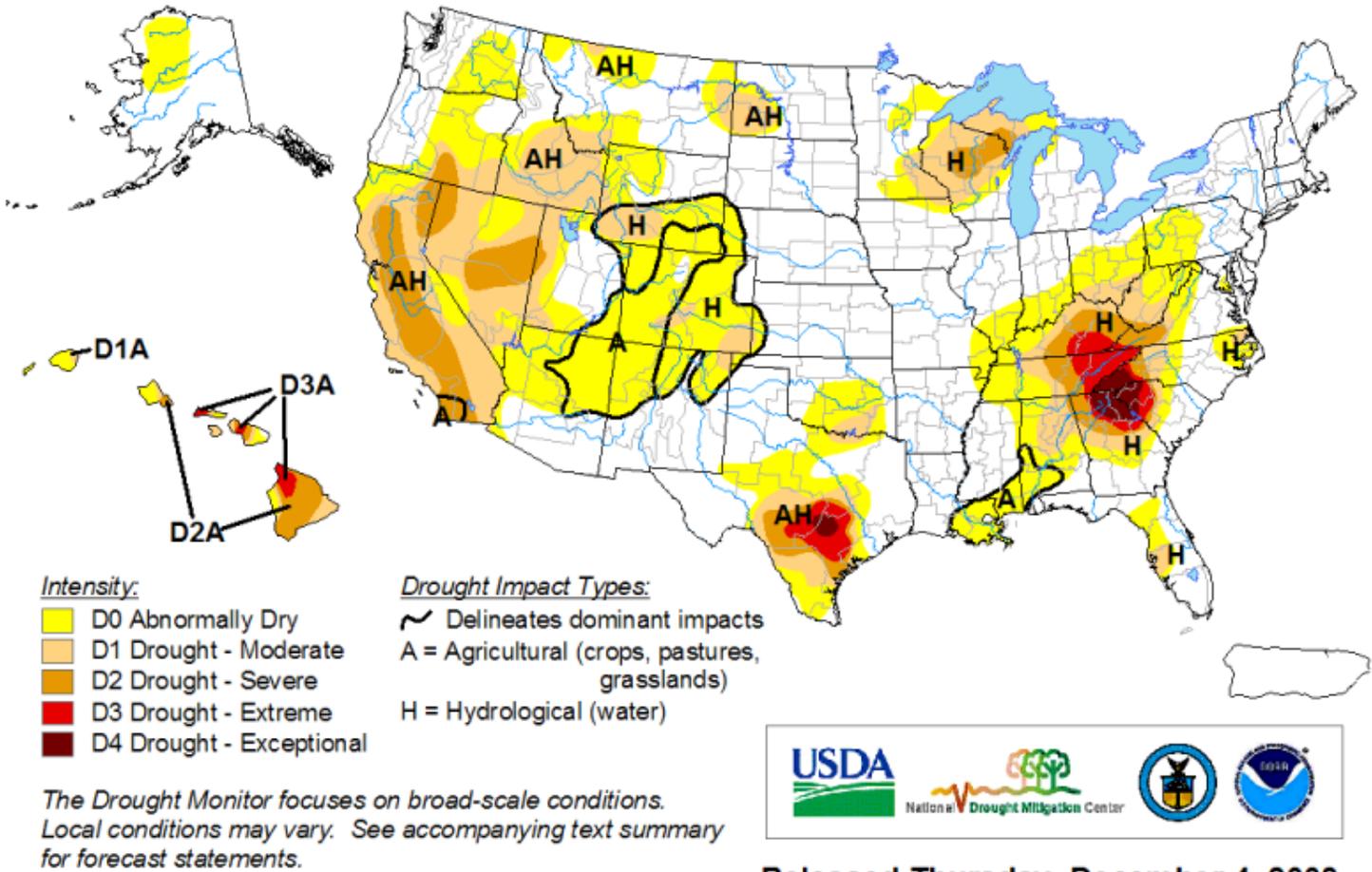


**Fig 3b. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values fall by one category (legend) across most of the West since last week. Above normal amounts are noted over portions of northeast Wyoming and southwest Montana.**

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

# U.S. Drought Monitor

December 2, 2008  
Valid 7 a.m. EST



Released Thursday, December 4, 2008

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

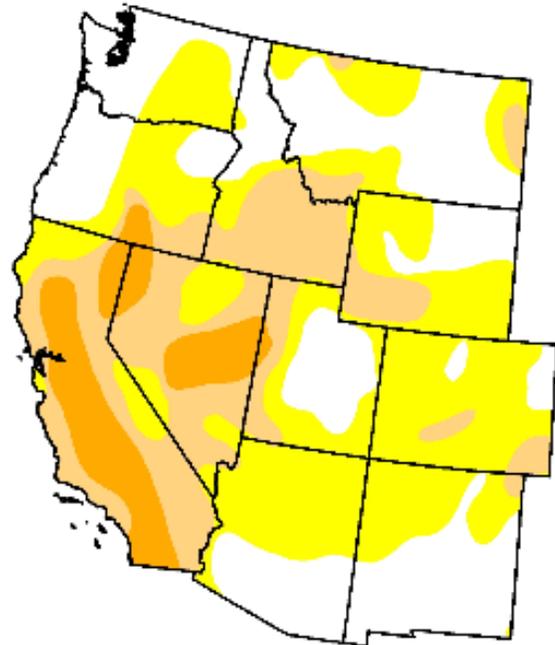
# U.S. Drought Monitor

## West

December 2, 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	29.6	8.6	0.0	0.0
Last Week (11/25/2008 map)	36.0	64.0	29.3	8.6	0.0	0.0
3 Months Ago (09/09/2008 map)	34.3	65.7	30.1	10.2	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 (12/04/2007 map)	26.1	73.9	54.8	32.8	2.7	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 Thursday, December 4, 2008**  
Author: M. Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note some increase in D0 conditions since last week. Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)

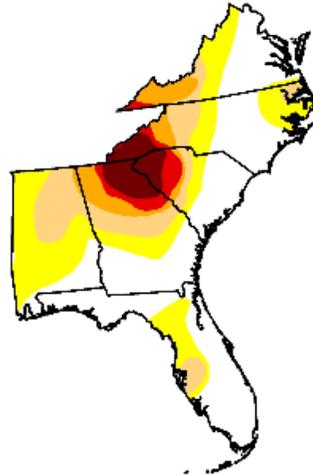
# U.S. Drought Monitor

## Southeast

December 2, 2008  
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	46.2	53.8	28.5	15.0	8.6	5.3
Last Week (11/25/2008 map)	45.7	54.3	30.2	18.4	8.6	5.3
3 Months Ago (09/09/2008 map)	43.3	56.7	35.1	18.7	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 (12/04/2007 map)	12.3	87.7	77.9	59.7	45.2	31.5



**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, December 4, 2008

Author: M. Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC

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

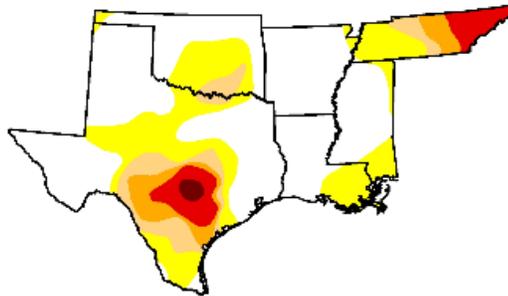
# U.S. Drought Monitor

## South

December 2, 2008  
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	57.2	42.8	18.6	11.0	6.1	0.7
Last Week (11/25/2008 map)	62.1	37.9	18.1	11.0	5.9	0.0
3 Months Ago (09/09/2008 map)	65.8	34.2	18.9	8.9	2.7	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 (12/04/2007 map)	50.3	49.7	11.3	4.3	3.8	1.3



**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



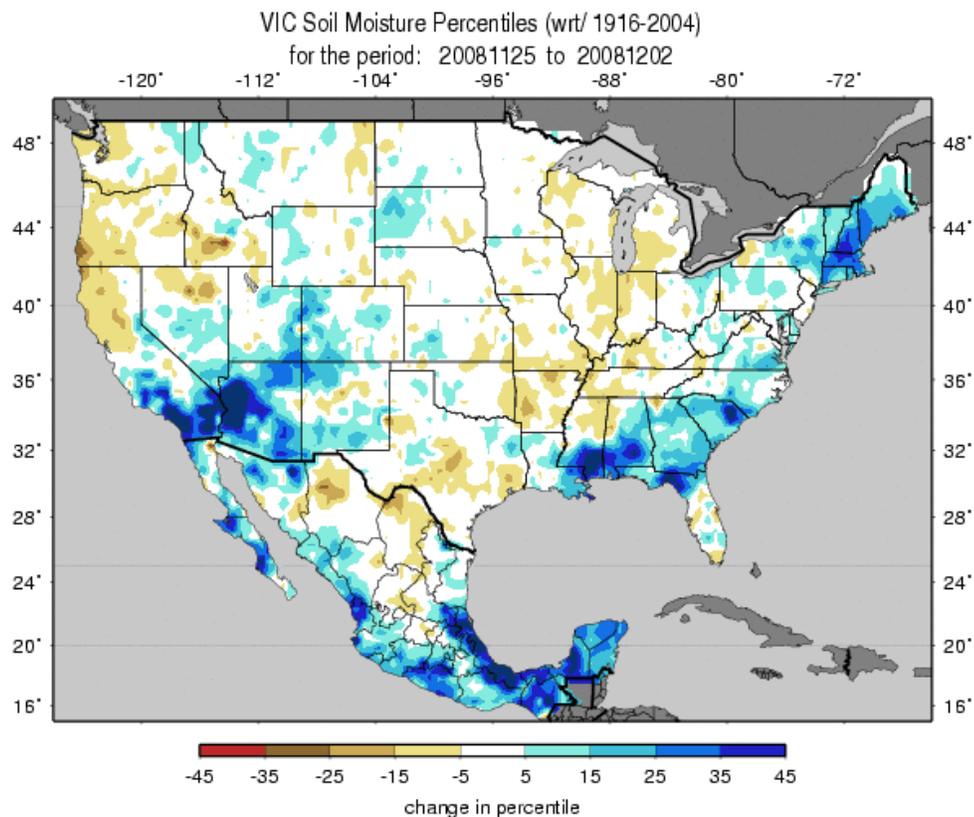
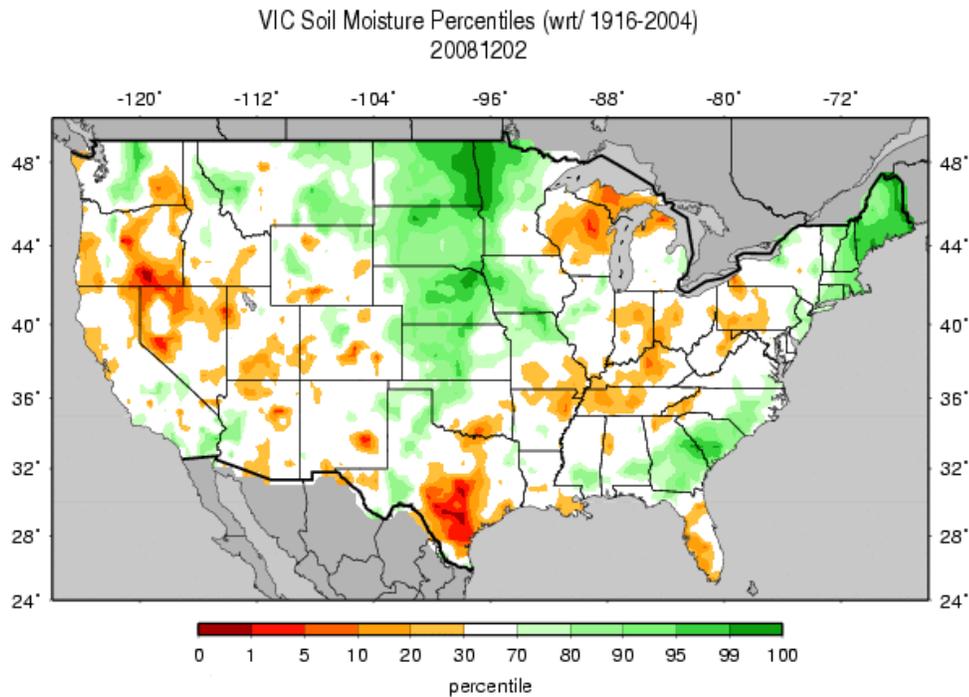
Released Thursday, December 4, 2008

Author: M. Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC

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

**Fig. 4b: Drought Monitor for the Southeast shows no significant change since last week. The introduction of D4 over Texas reflects worsening conditions in the state. 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 (Fig. 5a). Increased soil moisture occurred over much of the Southeast, Northeast, and Southwest 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)

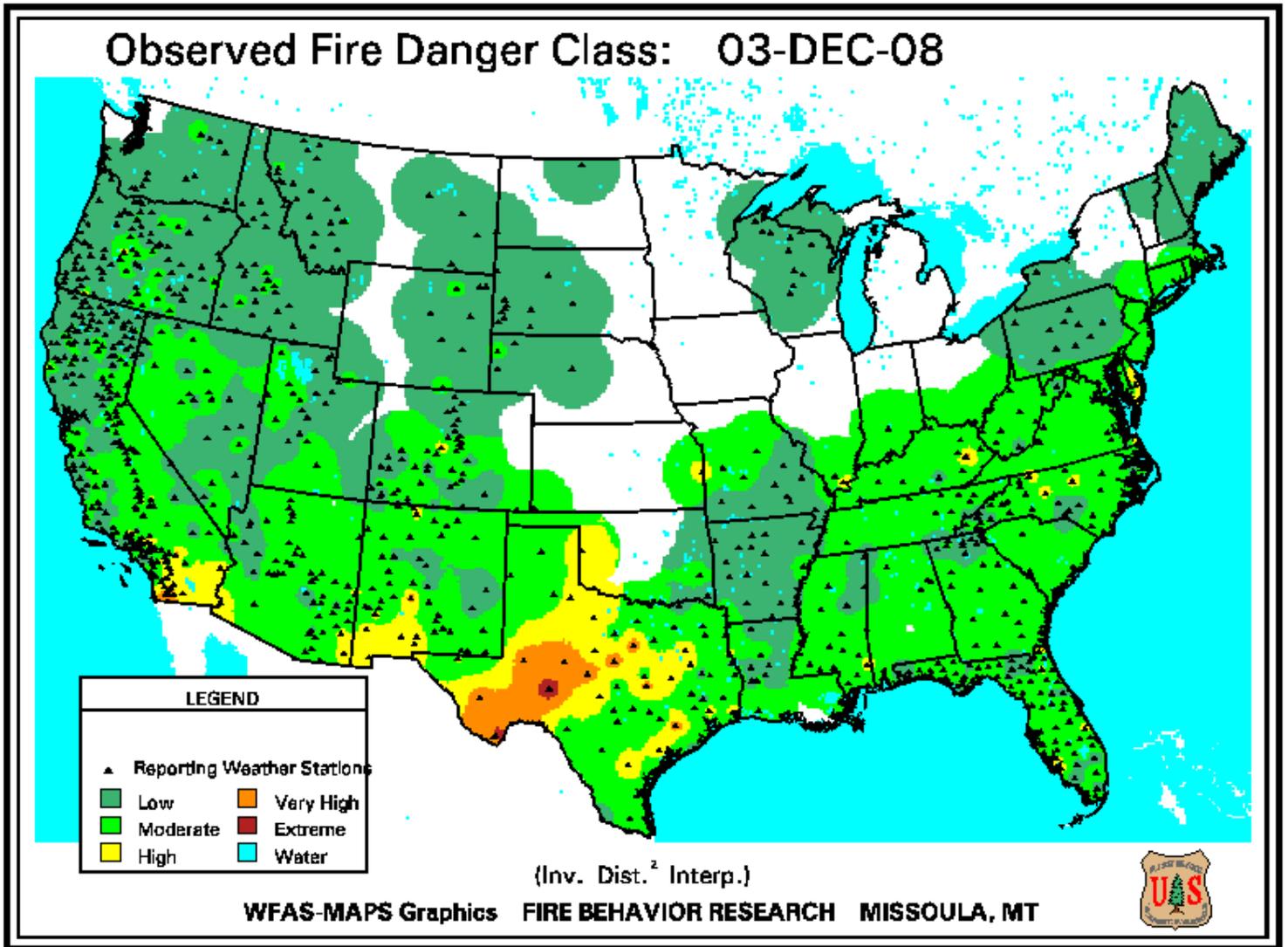
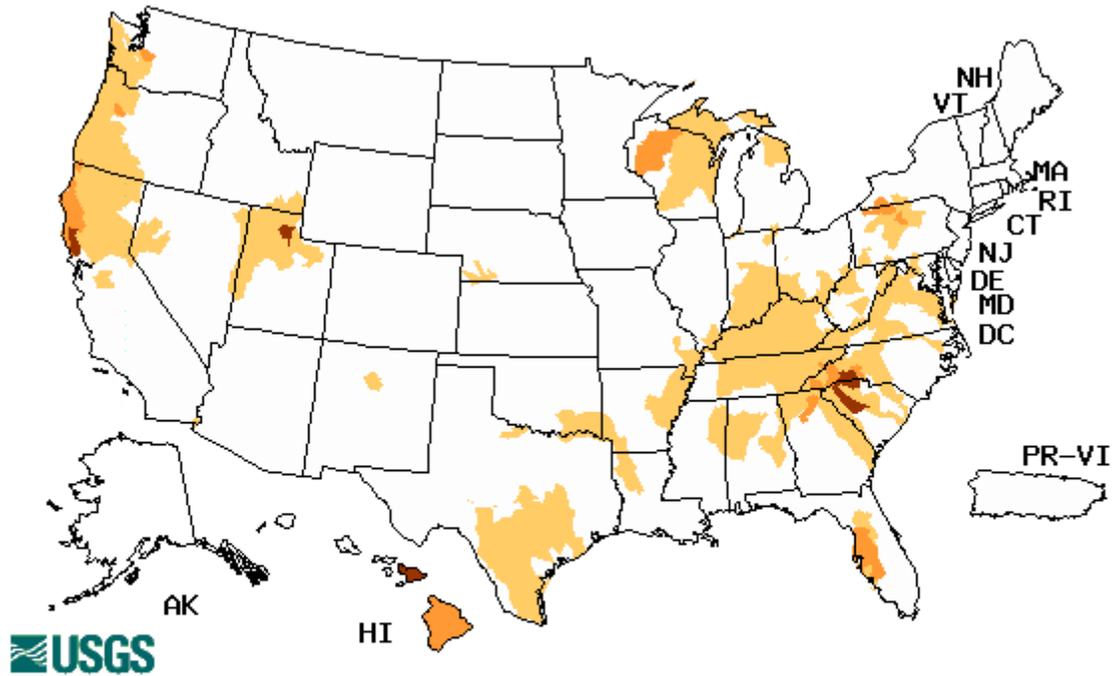


Fig. 6. Observed Fire Danger Class. Much of the West shows a marked improvement in fire risk since last week. The only exception is over west-central Texas where conditions have deteriorated. Source: Forest Service Fire Behavior Research – Missoula, MT. Ref: [http://www.fs.fed.us/land/wfas/fd\\_class.gif](http://www.fs.fed.us/land/wfas/fd_class.gif)

# Weekly Snowpack and Drought Monitor Update Report

Wednesday, December 03, 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 the Coastal Range of northern California. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary – December 2, 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/>.*

Heavy precipitation fell across much of the Southwest during this U.S. Drought Monitor (USDM) period while a dry week was experienced from the Northwest, through the High Plains, and into the Ohio River Valley. Conditions across the East Coast and into the South were dominantly wet, with the notable exception of Florida which continues to experience dry conditions except in the panhandle. Exceptional drought continues to be experienced in North Carolina, South Carolina, and Georgia and was introduced this week into south-central Texas.

**The Northeast:** A series of fronts passed through the Northeast this USDM period resulting in the majority of the region receiving above normal precipitation. Most of the region received over an inch of rain and areas of northern Maine and north-central New York received 4 – 4.5 inches. Warm temperatures dominated northern New England this week while cool temperatures were experienced across the southern part of this region.

**Mid-Atlantic and Southeast:** Cool temperatures dominated the Mid-Atlantic and Southeast this week, with much of the area seeing temperatures 2 - 6 degrees Fahrenheit below normal. Much of the region from Maryland down to northern Florida saw above normal precipitation associated with a November 30 frontal passage. The heaviest precipitation fell across southern Mississippi, Alabama, and Georgia and across much of coastal South Carolina, resulting in some alleviation of drought conditions in these areas. Long-term deficits and near-record low stream flows are still being felt across western North Carolina, South Carolina, and northern Alabama and Georgia, resulting in no change to the exceptional (D4) drought there. Improvements in New Jersey, Delaware, and the eastern shore of Maryland resulted in removal of the abnormally dry (D0) categories there. Portions of central Virginia, which did not receive the heavy precipitation, saw conditions become abnormally dry (D0).

**The Plains and Upper Midwest:** Again this week, rainfall largely evaded this region with little to no precipitation falling from the Dakotas down through Texas. This resulted in expansion of drought in Oklahoma and Texas. Exceptional drought (D4) was introduced into central Texas and extreme (D3) and abnormally dry conditions (D0) expanded in southern Texas. San Antonio has had the driest January – November period since 1954 and the fourth driest since 1871. Oklahoma saw expansion of abnormally dry (D0) and moderate drought (D1) across the central portions of the state.

**The West:** A storm swept through the Southwest November 26 – 27 bringing beneficial precipitation to the area. Portions of southern California and Nevada and western Arizona received over 600% of their normal precipitation. This had little impact on the long-term dryness in the area though. Conditions improved slightly in southern Nevada. Conditions worsened in northern Colorado and southern Wyoming with abnormally dry conditions (D0) expanding there.

**Hawaii, Alaska and Puerto Rico:** Recent rains have led to status quo conditions across most of Hawaii with the exception of the Big Island. Drought conditions intensified with expansion of severe drought (D2) there.

## Weekly Snowpack and Drought Monitor Update Report

Across Alaska, precipitation was mixed with above normal in the southern and northern parts of the state, and near to below normal precipitation in the western and central portions of the state. Drought conditions remain unchanged.

Little to no rain fell over most of Puerto Rico this week. Areas of drought remained unchanged.

**Looking Ahead:** From December 3 - 7, 2008, normal to cooler than normal temperatures are expected for most of the contiguous. The only exception is the far Southwest which is expected to see above normal conditions. Alaska is expecting above normal temperatures to the south and below normal to the north and west. Above normal precipitation is expected in the South and across portions of Montana, Wyoming, and the Dakotas, as well as in southern Alaska. Below normal precipitation is expected from the Northwest down to central California and across the Mid-Atlantic and most of the Plains

From December 5 - 11, 2008, the odds favor continued below-normal temperatures across most of the country from New England down to the Mid-Atlantic and into the High and Upper Great Plains, as well as across all of Alaska. The West Coast will likely see above normal temperatures. Precipitation is expected to be normal or below across the entire contiguous U.S. with the exception of the Upper Plains from Idaho to Minnesota. Alaska can expect above normal precipitation along the southern part of the state and below normal precipitation to the west.

**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 4, 2008