



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

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**Weekly Report - Snowpack / Drought Monitor Update**      **Date:**    29 January, 2009

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** Snow-water equivalent percent to date shows improvement over eastern Utah and western Colorado while conditions have deteriorated over southern Arizona and New Mexico since last week. Elsewhere, values haven't changed appreciatively (Fig 1). Although still early into the spring-summer runoff forecasting season, Fig. 1a reflects unofficial forecast changes for the past 7 days for selected SNOTEL sites and shows improvement over Utah, Colorado, and northern New Mexico and decreases over the Northern Rockies and eastern Oregon. This past week's snow depth change map shows that many locales across the West have had an increase in snow depths, especially from the Sierra Mountains (near Lake Tahoe) to the Colorado Rockies (Fig. 1b). Snowfall totals do not consider snow density changes, sublimation, or wind driven effects but are still of interest to the skiing community and other stakeholders.

**Temperature:** SNOTEL and ACIS-day station average temperature anomalies were well above normal during the past week over Utah and Colorado and well below normal over the Northern Rockies (Fig. 2). Specifically, the greatest positive temperature departures occurred over southern Colorado and south central Utah (>+12F) and the greatest negative departures occurred over central Montana (<-15F) (Fig. 2a).

**Precipitation:** ACIS 7-day average precipitation anomaly for the period ending 28 January shows abundant precipitation (much falling as snow) from central California to the Black Hills of South Dakota. This pattern is not exactly what one would expect with La Niña conditions (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 increasing by more than 10% over the Upper Colorado River Basin this week. No significant changes occurred elsewhere (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:** Despite much-needed rain and snow, drought continued to expand over northern California. A Pacific storms system generated 1 to locally more than 5 inches of rain across central and northeastern California, temporarily slowing the worsening drought gripping much of the state. The rain and mountain and snow bypassed northwestern California, where extreme 90- and 180-day precipitation deficits (locally more than 12 inches) have caused an expansion of Extreme (D3) drought. Abnormal dryness (D0) also expanded into far southwestern portions of Oregon, where little if any rain fell during the past week. The remainder of the region remained unchanged, thanks in part to widespread mountain snow. Author: Eric Luebehusen, United States Department of Agriculture.

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

## Weekly Snowpack and Drought Monitor Update Report

### **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/>

### **FOR MORE INFORMATION**

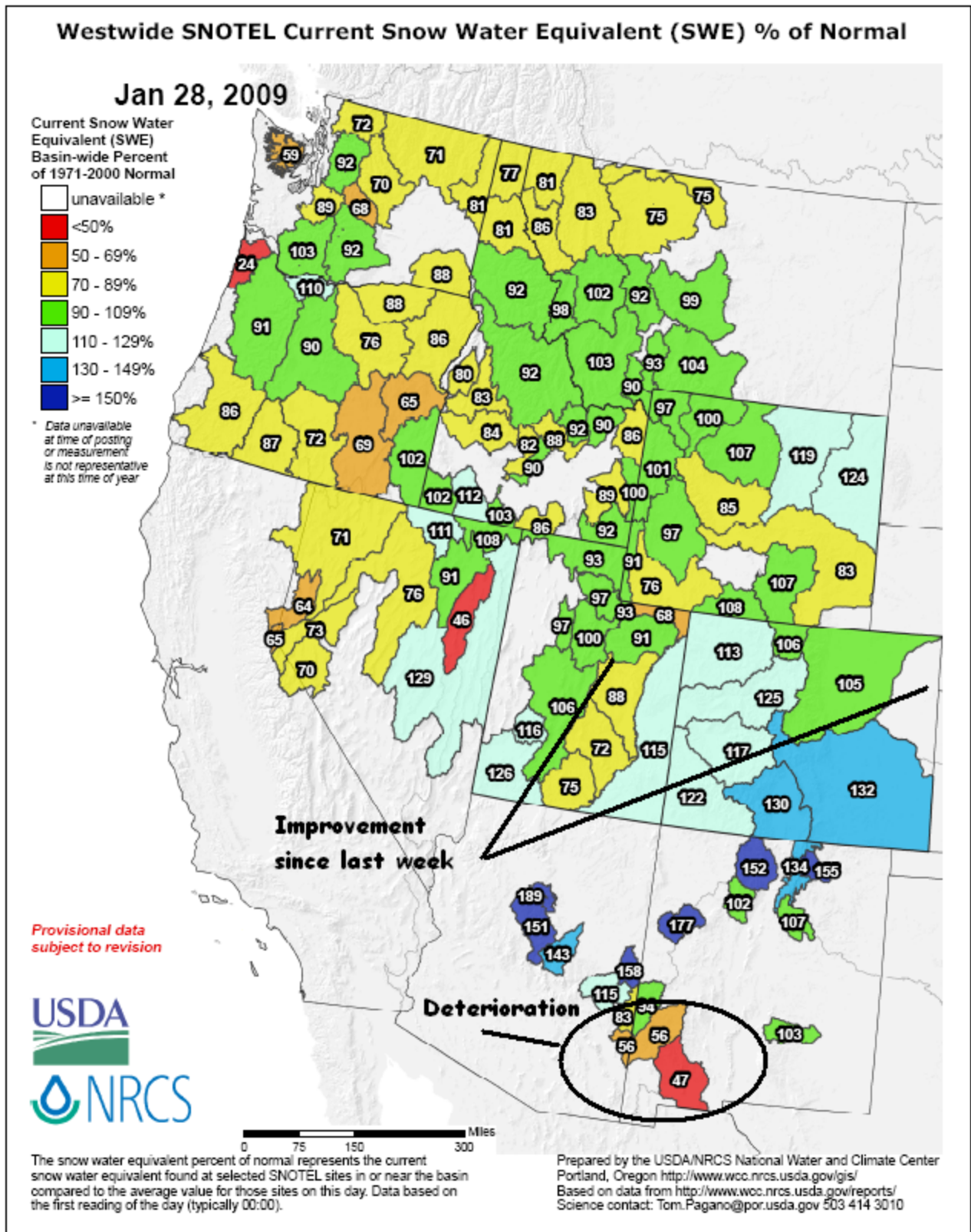
The National Water and Climate Center Homepage provide the latest available snowpack and water supply information. Please visit us at <http://www.wcc.nrcs.usda.gov>. This document is available from the following location on the NWCC homepage - <http://www.wcc.nrcs.usda.gov/water/drought/wdr.pl>

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 shows improvement over eastern Utah and western Colorado while conditions have deteriorated over southern Arizona and New Mexico since last week. Elsewhere, values haven't changed appreciatively.**

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



## Weekly Snowpack and Drought Monitor Update Report

### 7-Day Guidance Forecast Change as Percent of 1971-2000 Normal

Jan 29, 2009

For guidance only

7-Day Guidance  
Forecast Change  
(% normal)

- ✕ > 20% gain
- ▲ 16 - 20%
- ▲ 11 - 15%
- ▲ 6 - 10%
- ▲ 1 - 5%
- ⊖ no change
- ▼ -5 - -1%
- ▼ -10 - -8%
- ▼ -15 - -11%
- ▼ -20 - -16%
- ✕ > 20% loss
- ⊖ Unavailable\*

\* Forecast unavailable due  
to insufficient realtime data  
or low forecast skill

Provisional Data  
Subject to Revision

0 50 100 200 Miles



Prepared by the USDA/NRCS National Water and Climate Center  
Portland, Oregon [http://www.wcc.nrcs.usda.gov/wsf/daily\\_forecasts.html](http://www.wcc.nrcs.usda.gov/wsf/daily_forecasts.html)  
Based on data from  
[ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/daily\\_forecast/SummaryOutput.csv](ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/daily_forecast/SummaryOutput.csv)  
Science contact: Tom.Pagano@por.usda.gov 503 414 3010

*This is a completely automated objective product  
based on SNOTEL data. This product is not meant  
to replace or supersede the official forecasts produced  
in coordination with the National Weather Service.*

Fig. 1a: Selected preliminary daily water supply forecast changes improved over Utah, Colorado, and northern New Mexico during the past week but have decreased over the Northern Rockies and eastern Oregon based in part on measured snowfall as noted in Fig. 1b that follows.

Ref: [ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/daily\\_forecast/maps/west\\_dailyfcst\\_7daych.pdf](ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/daily_forecast/maps/west_dailyfcst_7daych.pdf)

**SNOTEL 7-Day Snow Depth Change (Inches)**

Jan 28, 2009

**7-day Snow Depth Change (Inches)**

- ✕ > 36" gain
- ▲ 19 - 36"
- ▲ 13 - 18"
- ▲ 4 - 12"
- ▲ 1 - 3"
- 0"
- ▼ -3 - -1"
- ▼ -12 - -4"
- ▼ -18 - -13"
- ▼ -36 - -19"
- ✕ < -36" loss
- Snow free
- Unavailable\*
- ✕ Data spike\*\*

\* Data unavailable at time of posting or snow depth sensor not available at site  
 \*\* A "data spike" is a gain or loss of more than 100 inches in 24 hours

**Provisional Data  
 Subject to Revision**



Prepared by the USDA/NRCS National Water and Climate Center  
 Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>  
 Based on data from <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/data>  
 Science contact: Tom.Pagano@por.usda.gov 503 414 3010



*Automated snow depth measurements are known to occasionally read spuriously large during precipitation events. Snow depth is also difficult to accurately measure at near-snow free conditions; data should be used with caution.*

**Fig. 1b: This past week's snow depth changes across the West shows that many locales had increases in snow depths, especially from the Sierra to the Colorado Rockies.**

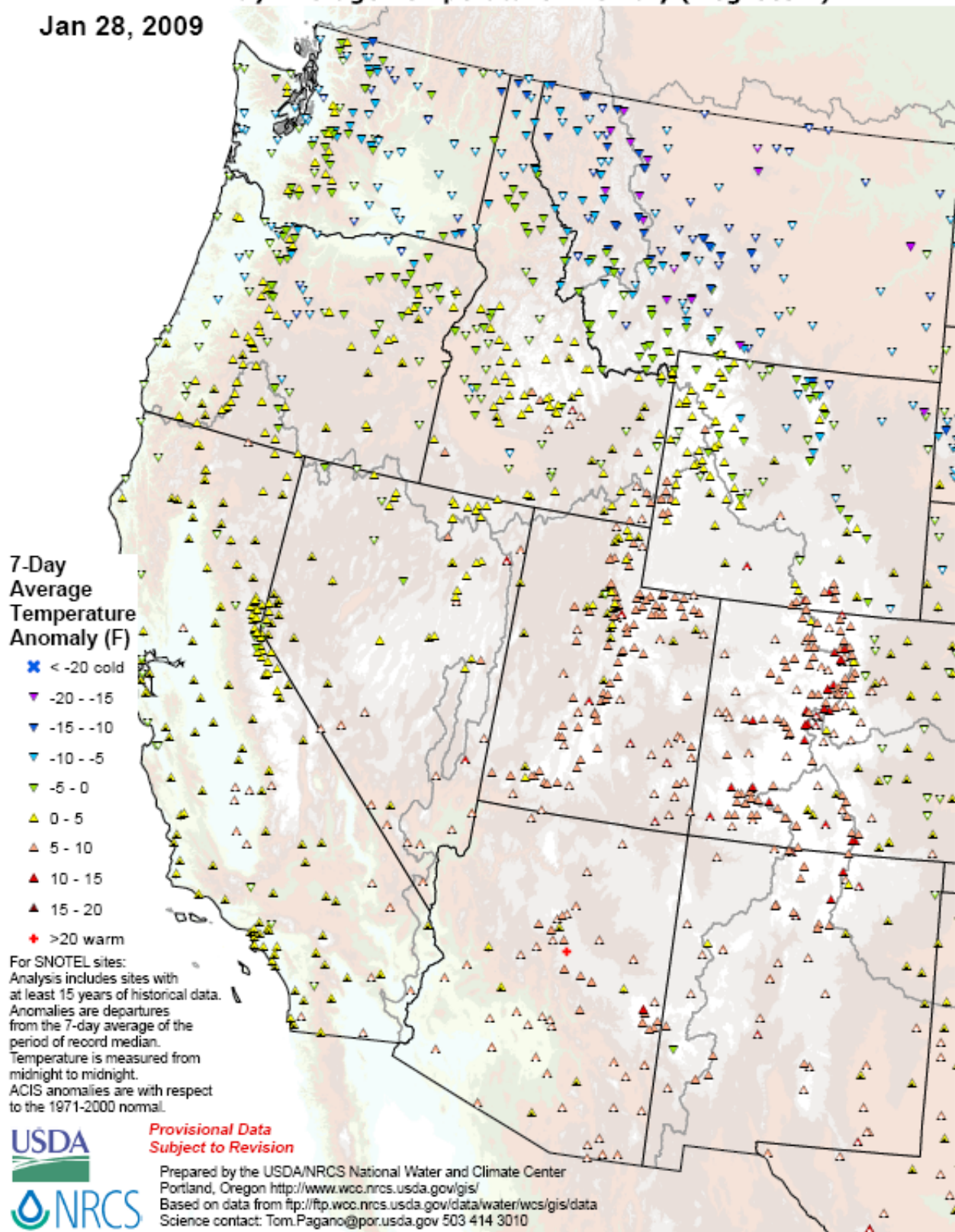
Ref: [ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west\\_snowdepth\\_7ddelta.pdf](ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_snowdepth_7ddelta.pdf)



## Weekly Snowpack and Drought Monitor Update Report

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

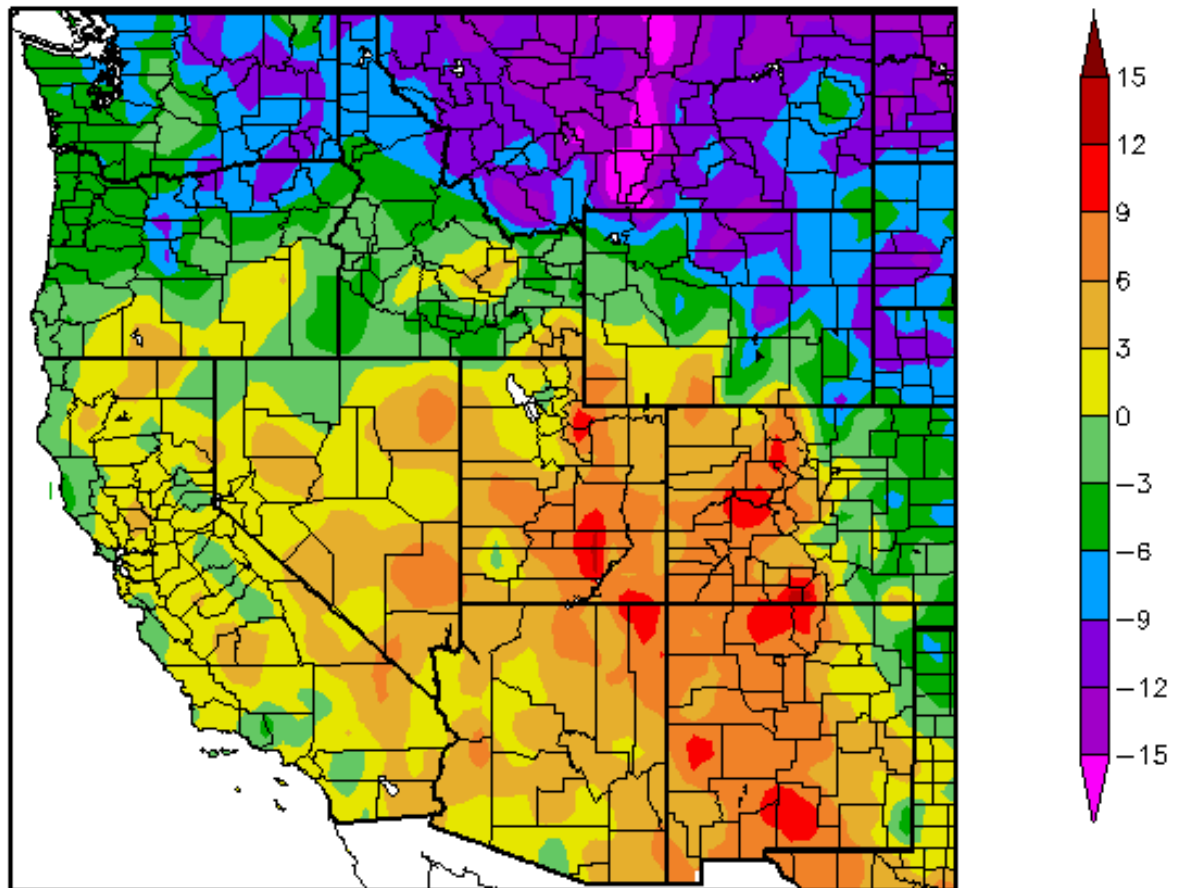
Jan 28, 2009



**Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were well above normal during the past week over Utah and Colorado and well below normal over the Northern Rockies.**

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

Departure from Normal Temperature (F)  
1/22/2009 – 1/28/2009



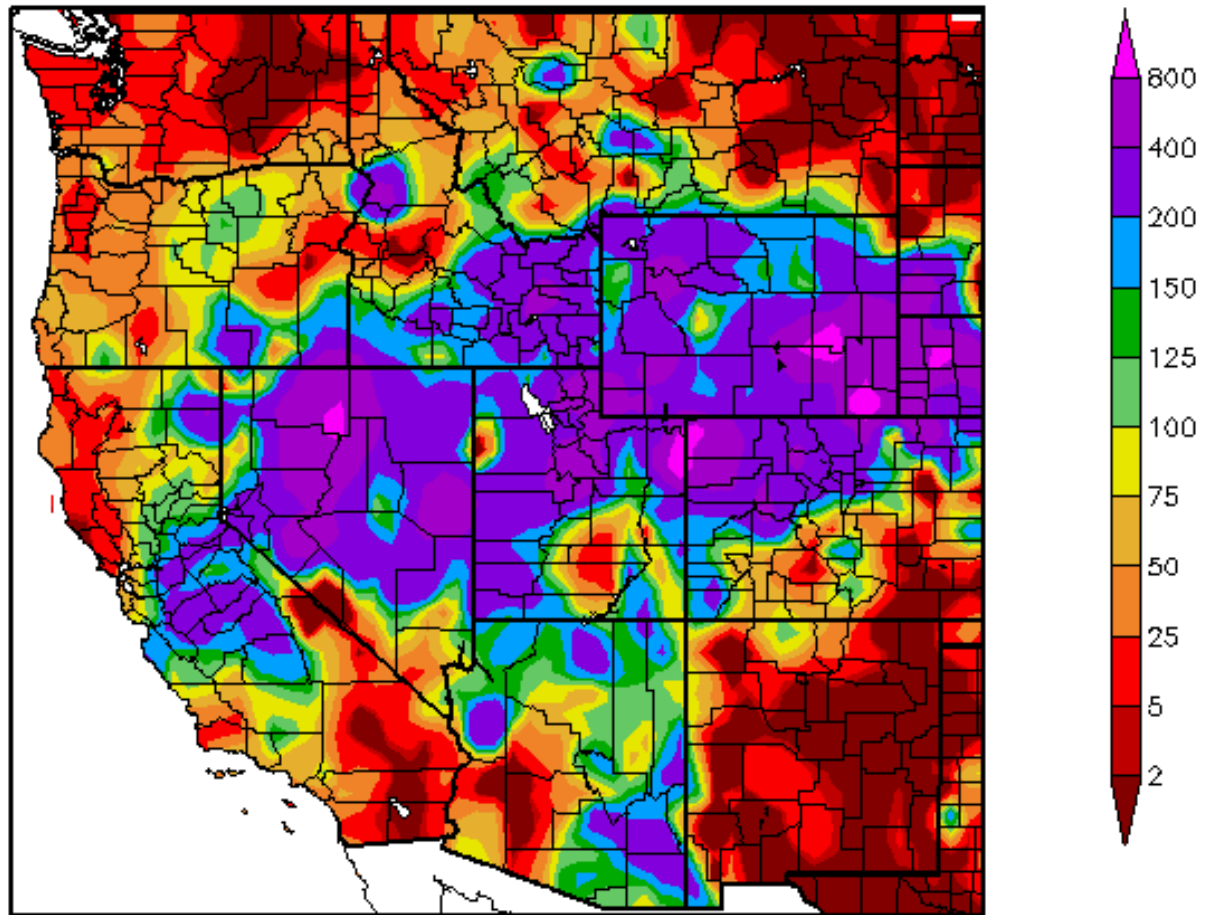
Generated 1/29/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 2a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over southern Colorado and south central Utah (>+12F) and the greatest negative departures occurred over central Montana (<-15F).**

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 (%)  
1/22/2009 – 1/28/2009



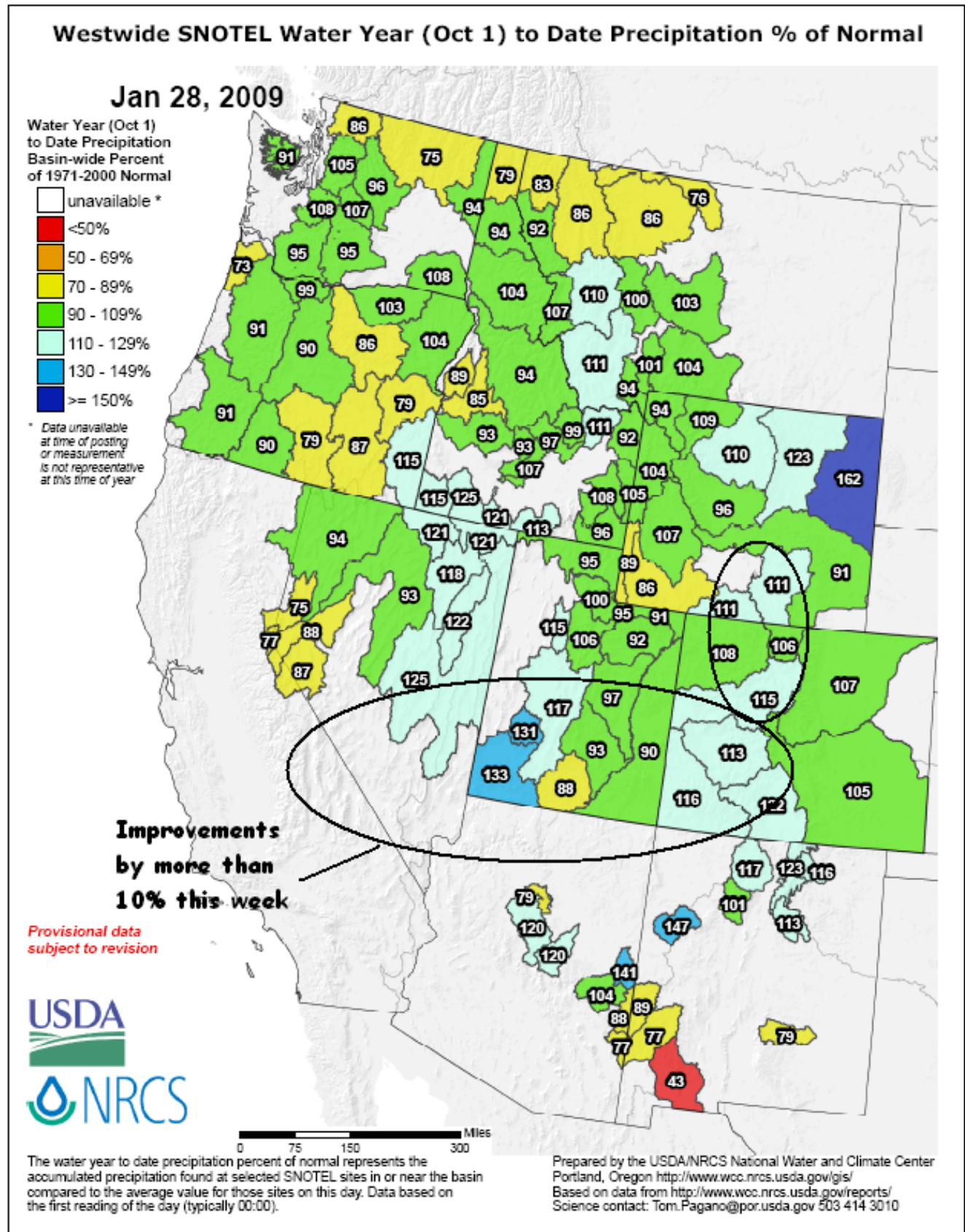
Generated 1/29/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 28 January shows abundant precipitation (much falling as snow) from central California to the Black Hills of South Dakota. This pattern is not exactly what one would expect with La Niña conditions.**

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 increasing by more than 10% over the Upper Colorado River Basin this week. No significant changes occurred elsewhere.**

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

January 27, 2009  
Valid 8 a.m. EST

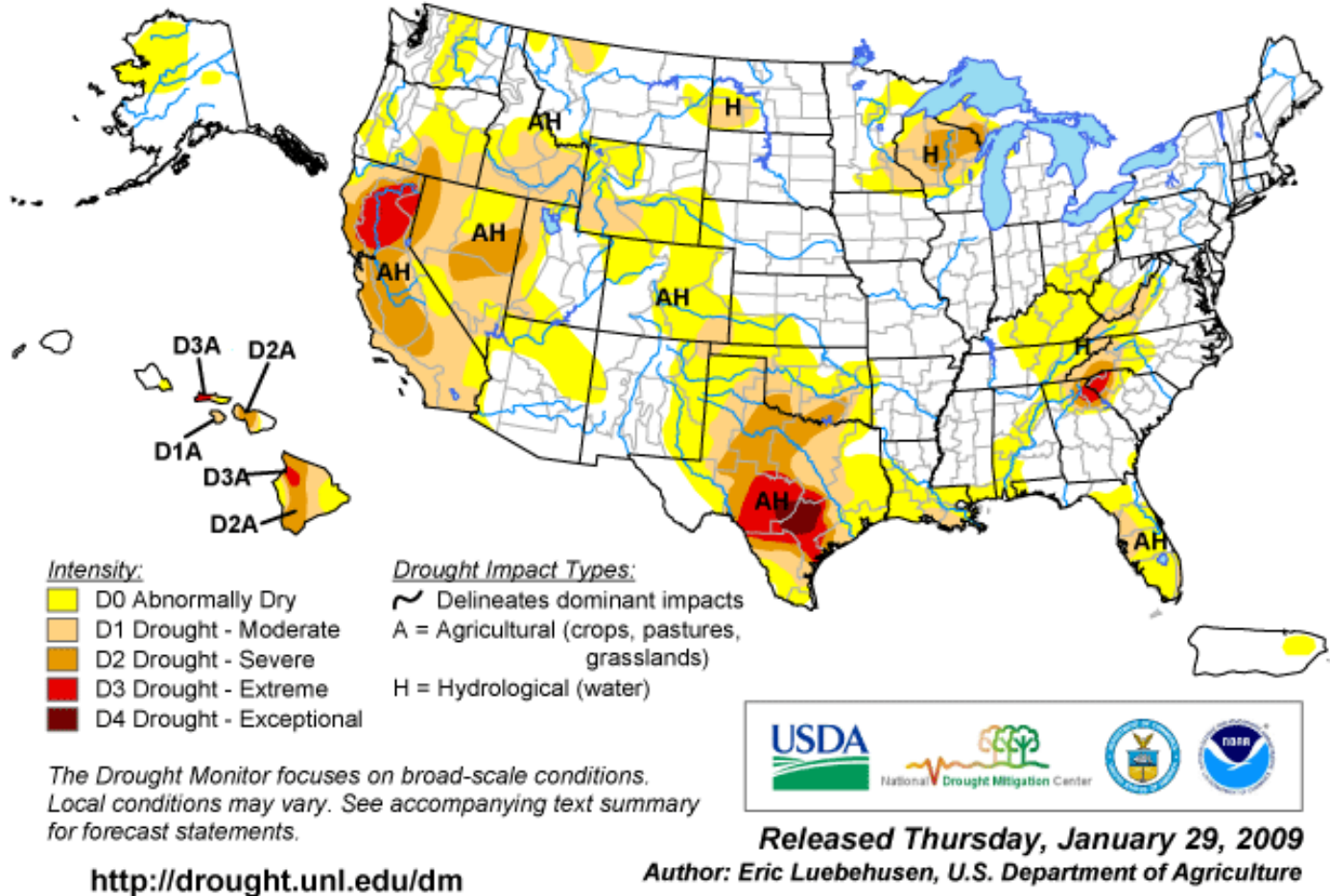


Fig. 4. Current Drought Monitor weekly summary.

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

# U.S. Drought Monitor

## West

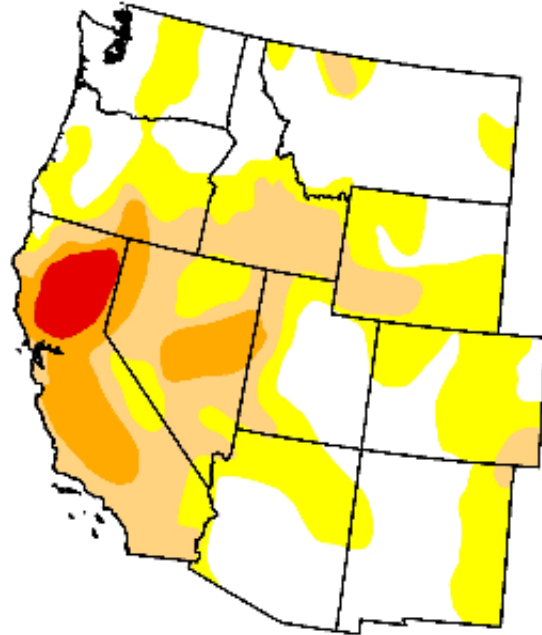
January 27, 2009

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	42.0	58.0	28.2	9.8	2.1	0.0
Last Week (01/20/2009 map)	43.2	56.8	28.2	9.8	1.7	0.0
3 Months Ago (11/04/2008 map)	39.9	60.1	29.6	8.5	0.0	0.0
Start of Calendar Year (01/06/2009 map)	37.4	62.6	28.9	8.8	0.4	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 (01/29/2008 map)	31.7	68.3	44.6	20.9	0.0	0.0

Intensity:

 D0 Abnormally Dry	 D3 Drought - Extreme
 D1 Drought - Moderate	 D4 Drought - Exceptional
 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, January 29, 2009

Author: Eric Luebehusen, U.S. Department of Agriculture

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note little change in drought conditions since last week. 2008 Drought details for California can be viewed here:

<http://cdec.water.ca.gov/cgi-progs/reports/EXECSUM>.

Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)



# U.S. Drought Monitor

## Texas

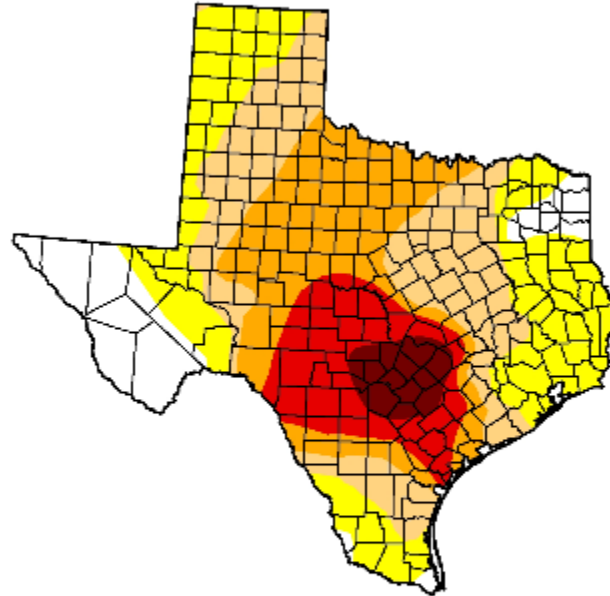
January 27, 2009  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	11.6	88.4	62.1	37.5	16.5	4.2
Last Week (01/20/2009 map)	26.9	73.1	45.8	22.2	16.0	4.2
3 Months Ago (11/04/2008 map)	52.9	47.1	23.6	15.2	6.8	0.0
Start of Calendar Year (01/06/2009 map)	41.7	58.3	24.5	15.0	9.1	4.2
Start of Water Year (10/07/2008 map)	67.2	32.8	20.5	11.0	3.6	0.0
One Year Ago (01/29/2008 map)	23.9	76.1	24.9	0.0	0.0	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: #ffcc00; 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, January 29, 2009

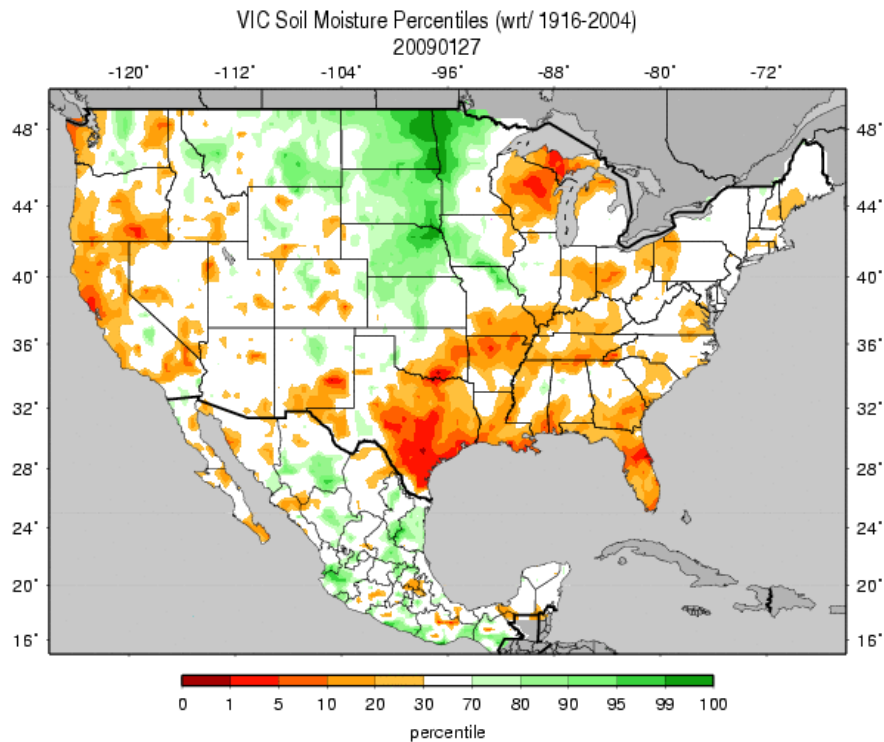
Author: Eric Luebehusen, U.S. Department of Agriculture

**Fig. 4b: Texas now stands alone as the only state with D4 drought condition. Note significant worsening since last week (red circle).**

Additional news: <http://www.victoriaadvocate.com/news/regionstate/story/394226.html#>.

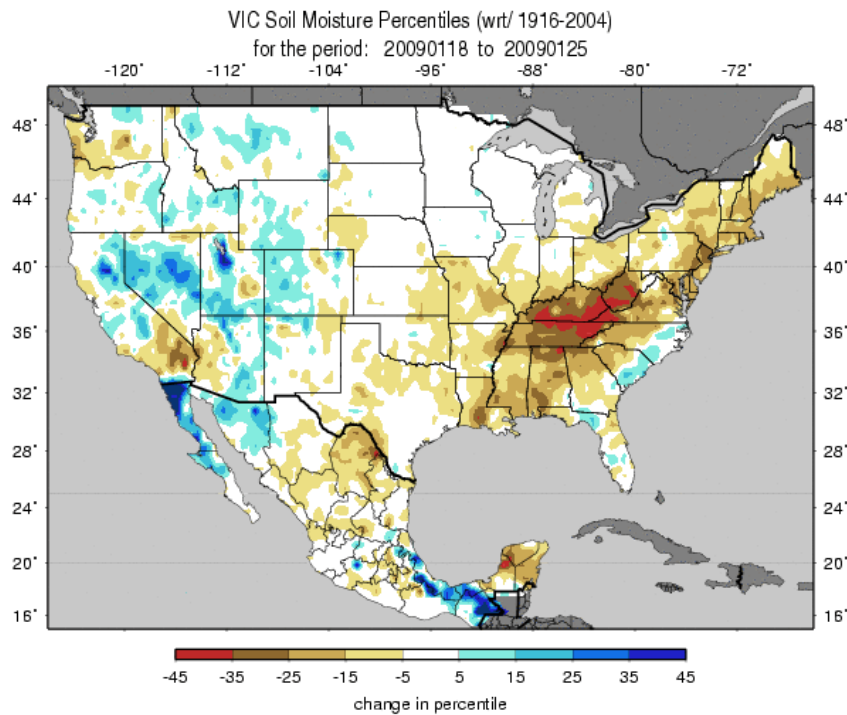
Ref: [http://www.drought.unl.edu/dm/DM\\_southeast.htm](http://www.drought.unl.edu/dm/DM_southeast.htm)

## Weekly Snowpack and Drought Monitor Update Report



**Figs. 5: 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 central-southern Texas, the Upper Peninsula of Michigan, and central Florida as of 27 January.**

Ref: [http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm\\_gnt.gif](http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_gnt.gif)



**Figs. 5a: Soil moisture change for week ending 25 January. Note significant decrease in moisture over the Tennessee River Valley and southern California while significant increases occurred from northern California to northern Utah.**

Ref: [http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm\\_gnt.1wk.gif](http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_gnt.1wk.gif)

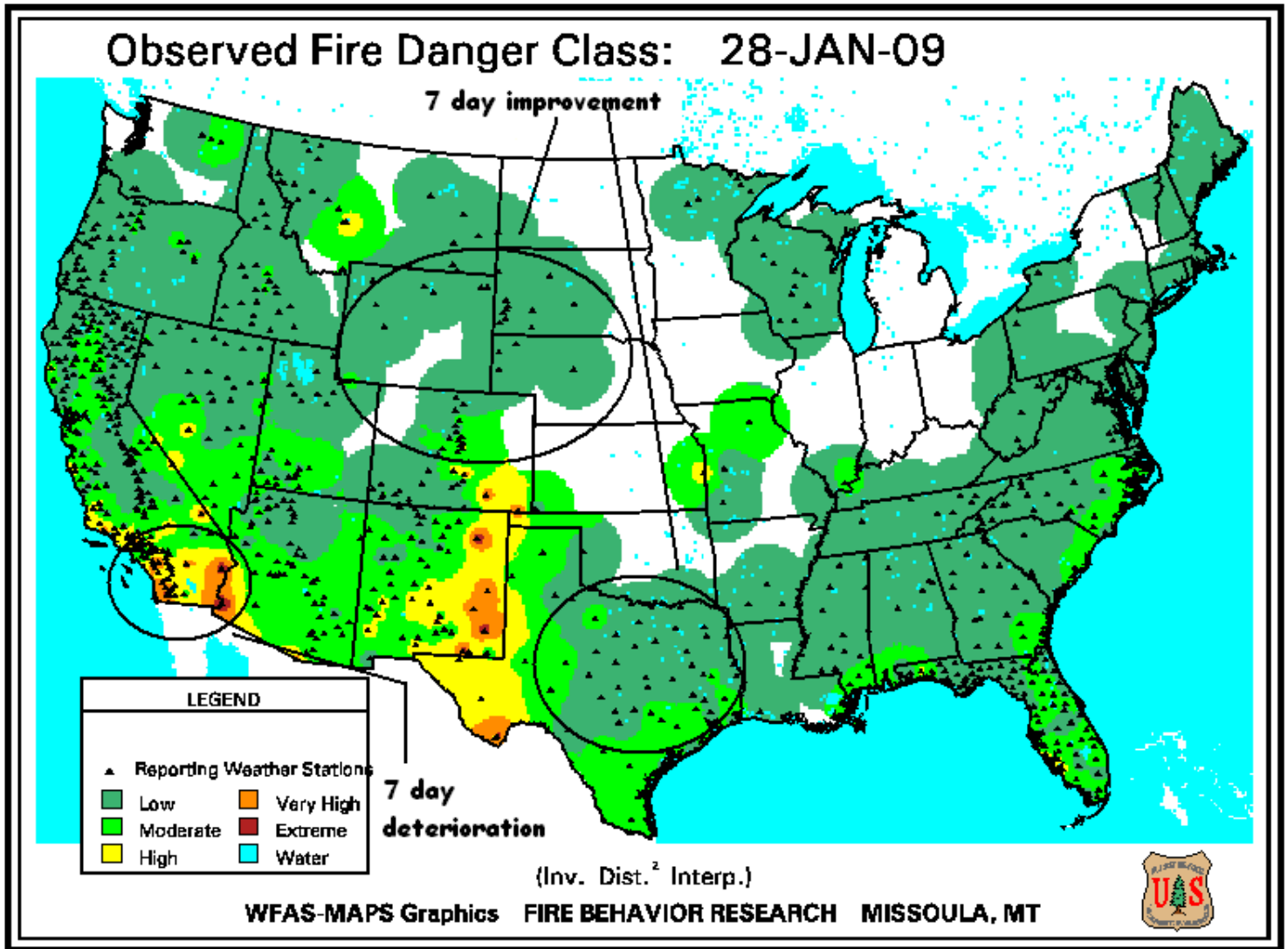
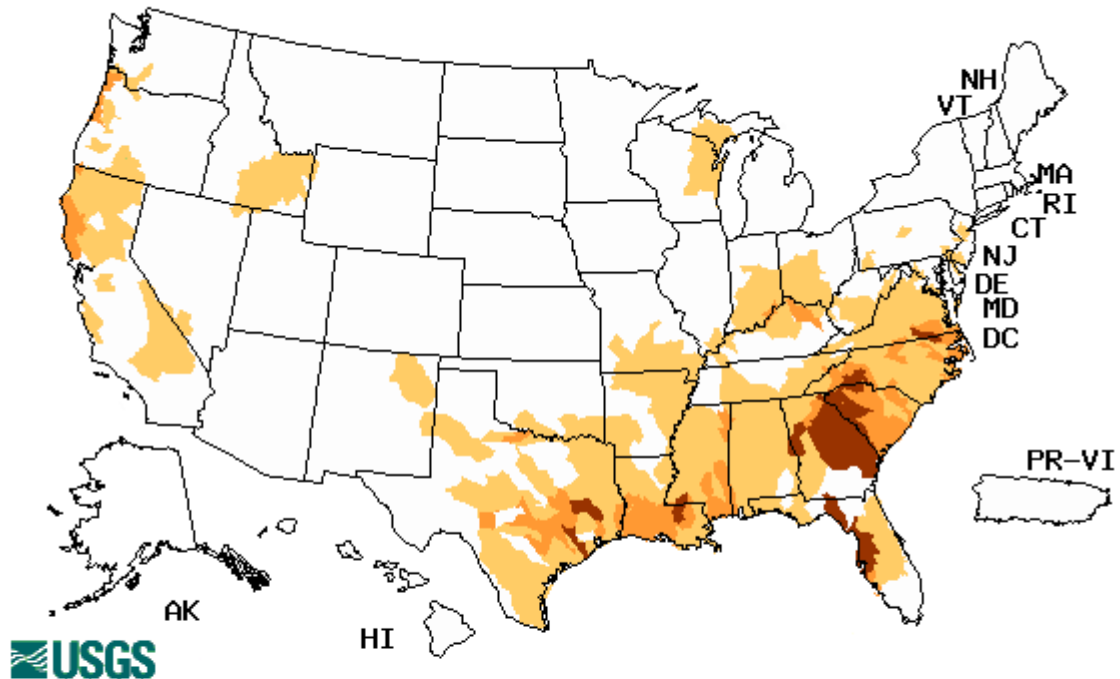


Fig. 6. Observed Fire Danger Class. Conditions have deteriorated over southern California but improved over the Wyoming and Texas since last week. Source: Forest Service Fire Behavior Research – Missoula, MT. Ref: [http://www.fs.fed.us/land/wfas/fd\\_class.gif](http://www.fs.fed.us/land/wfas/fd_class.gif)



## Weekly Snowpack and Drought Monitor Update Report

Wednesday, January 28, 2009



**Fig. 7.** Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. California has improved while conditions are still very poor over the Southeast during the past week. Elsewhere, cold temperatures have probably frozen rivers and thus do not necessarily reflect accurate flows. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary -- January 27, 2009

*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 Midwest and Northeast:** Cold, dry conditions over northern areas contrasted with late-week rain and snow farther south. Drought remained unchanged throughout the region, although a storm system currently impacting lingering D0 areas from Pennsylvania into Kentucky was providing beneficial moisture in the form of snow, sleet, and freezing rain.

**The Plains:** Drought continued to expand under a dry, unseasonably warm weather regime. In Texas, where temperatures averaged as much as 12 degrees F above normal, declining pasture and wheat conditions were symbolic of increasing rainfall deficits and depleted soil moisture supplies. Moderate (D1) and Severe (D2) drought designations were expanded northward to encompass much of central Texas, with 90-day percent of normal precipitation averaging less than 10% over much of northern Texas. In Oklahoma, large precipitation departures (more than 6 inches) over the past 90 days across the state's southern tier resulted in a similar expansion of D1 and D2, although some rain (locally more than an inch) in east-central Oklahoma mitigated the drought expansion somewhat. Abnormal dryness was also noted in southern Kansas, where highs in the lower 70s (degrees F) exacerbated the impacts of developing moisture deficits. Elsewhere, cold dry conditions over the northern Plains resulted in no change to lingering D0 and D1 drought.

**Southeast:** Generally dry albeit cool weather prevailed over the region. Streamflows continued to decline in North Carolina, where D0 was reintroduced to central portions of the state. Abnormally dry conditions expanded over much of Florida, with southeastern urban areas reporting locally less than 30 percent of normal over the past 90 days.

**The Delta:** Dry weather prevailed, with an eastward expansion of D0 along the Gulf Coast into the western-most portions of the Florida Panhandle. Temperatures for the week averaged near normal.

**The West:** Despite much-needed rain and snow, drought continued to expand over northern California. A Pacific storms system generated 1 to locally more than 5 inches of rain across central and northeastern California, temporarily slowing the worsening drought gripping much of the state. The rain and mountain and snow bypassed northwestern California, where extreme 90- and 180-day precipitation deficits (locally more than 12 inches) have caused an expansion of Extreme (D3) drought. Abnormal dryness (D0) also expanded into far southwestern portions of Oregon, where little if any rain fell during the past week. The remainder of the region remained unchanged, thanks in part to widespread mountain snow.

**Hawaii, Alaska and Puerto Rico:** Most of the Hawaiian Islands were dry on the heels of last week's beneficial rainfall, with no change made to the current drought designation. In Puerto Rico, widespread showers (locally more than 4 inches) were reported during the past week, although amounts in the current D0 area were generally less than inch. Dry weather prevailed in Alaska, with temperatures averaging more than 10 degrees F above normal across the southern half of the state.

**Looking Ahead:** A strong cold front will sweep across the eastern half of the nation, bringing the threat of another hard freeze to Florida. The surge of arctic air will set the table for yet another potential eastern U.S. winter storm early next week, as moisture from the Gulf begins to work back

## **Weekly Snowpack and Drought Monitor Update Report**

north. High pressure will maintain mostly dry, warm weather from the Plains to the Pacific Coast, although additional rain and mountain snow are expected in the Pacific Northwest. .

The CPC 6-10 day forecast (February 2-6) calls for above-normal temperatures across the central and western U.S. while near- to below-normal temperatures prevail across the east. Below-normal precipitation is expected in the Southeast and from central portions of the Plains and Rockies into the Southwest. Above-normal precipitation will be confined to the Pacific Northwest and Great Lakes Region.

**Author:** Eric Luebehusen, United States 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: 29 January 2009