



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

**Weekly Report - Snowpack / Drought Monitor Update**      **Date: 5 February, 2009**

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** Snow-water equivalent percent to date shows values within 10 percent of last week's values. Conditions are still generally better over the Southwest and Central and Southern Rockies than areas further north (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 a complete reversal from last week. For example forecast values are now lowered between 10 to 15 percent over northern New Mexico. This past week's snow depth changes across the West shows that many locales had decreased in snow depths, especially from the Sierra to the Colorado Rockies (Fig. 1b).

**Temperature:** SNOTEL and ACIS-day station average temperature anomalies were generally above normal during the past week except below normal over Idaho's Snake River Basin (Fig. 2). Specifically, the greatest positive temperature departures occurred over northwest Montana (>+15F) and the greatest negative departures occurred over west central Idaho (<-15F) (Fig. 2a).

**Precipitation:** ACIS 7-day average precipitation anomaly for the period ending 4 February shows a very dry week across the West. This pattern shift from last week is something that could be expected with La Niña. Expect more variability in the coming weeks regarding this winter's weather pattern (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 within 10 percent of last week's values but a one category drop is noted over Oregon and western Nevada (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:** A broad ridge of high pressure maintained mostly dry weather over much of the western U.S. In California, drought designations increased north of Santa Barbara, with Extreme Drought (D3) now extending from the northern California coast to the Nevada border. In this region, streamflows are in the lowest 5<sup>th</sup> percentile while 90-day precipitation departures are approaching 16 inches. In addition, mountain snowpack in the Sierra Nevada are alarmingly low, with sustained stormy weather over the next 6 weeks needed to fully recharge water reserves. Elsewhere, abnormal dryness (D0) and moderate drought (D1) increased over northwestern Montana in response to a lack of a current snowpack, while abnormal dryness expanded northward in Oregon in response to 90-day precipitation departures of more than 8 inches. 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.***

## **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

## Weekly Snowpack and Drought Monitor Update Report

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. 5), 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/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/>

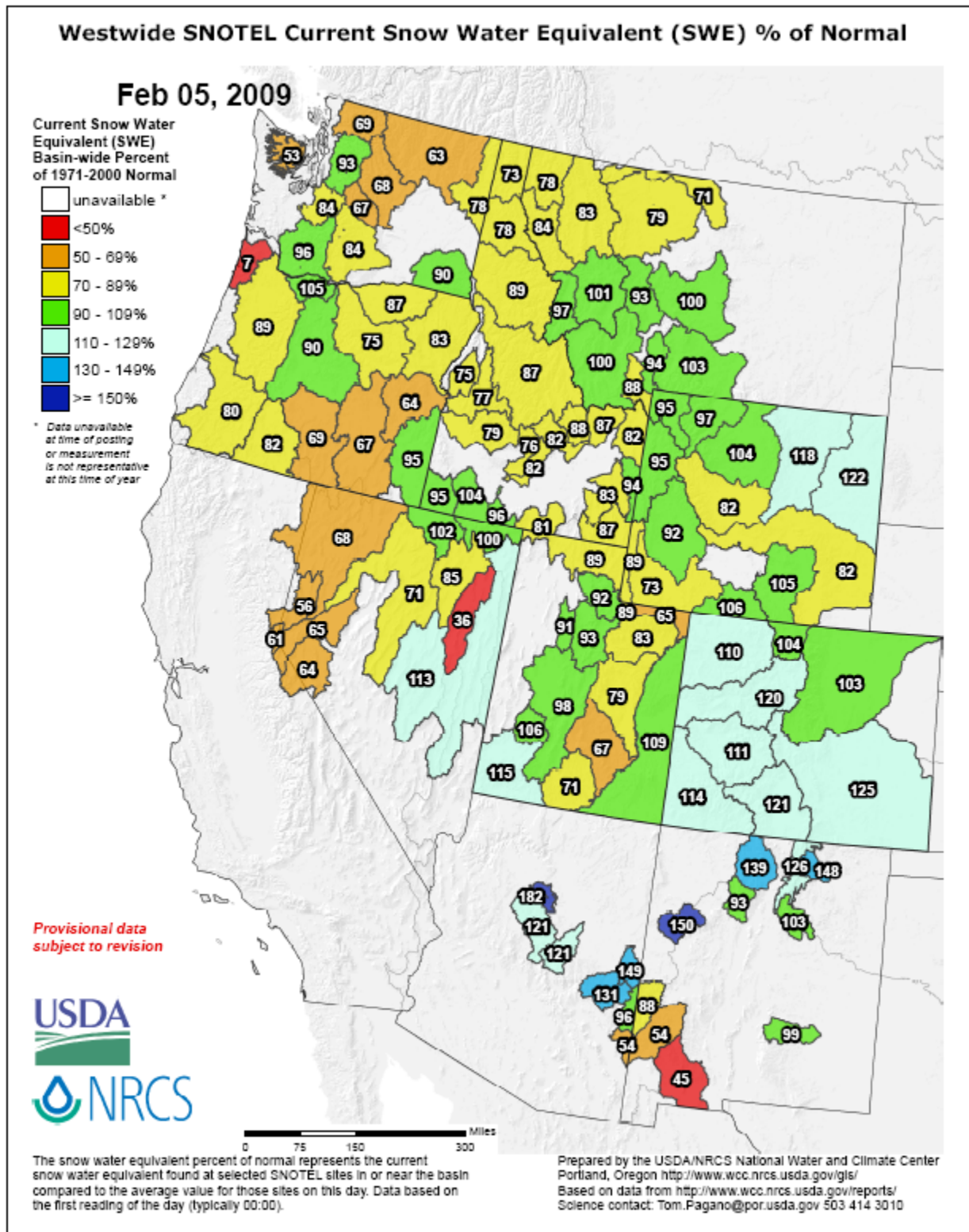
### FOR MORE INFORMATION

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 shows values within 10 percent of last week's values.**

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

## Weekly Snowpack and Drought Monitor Update Report

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

Feb 05, 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 - -6%
- ▼ -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 are a complete reversal from last week. Forecast values are now lowered between 10 to 15 percent over northern New Mexico based in part on lack of 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)**

**Feb 05, 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.*

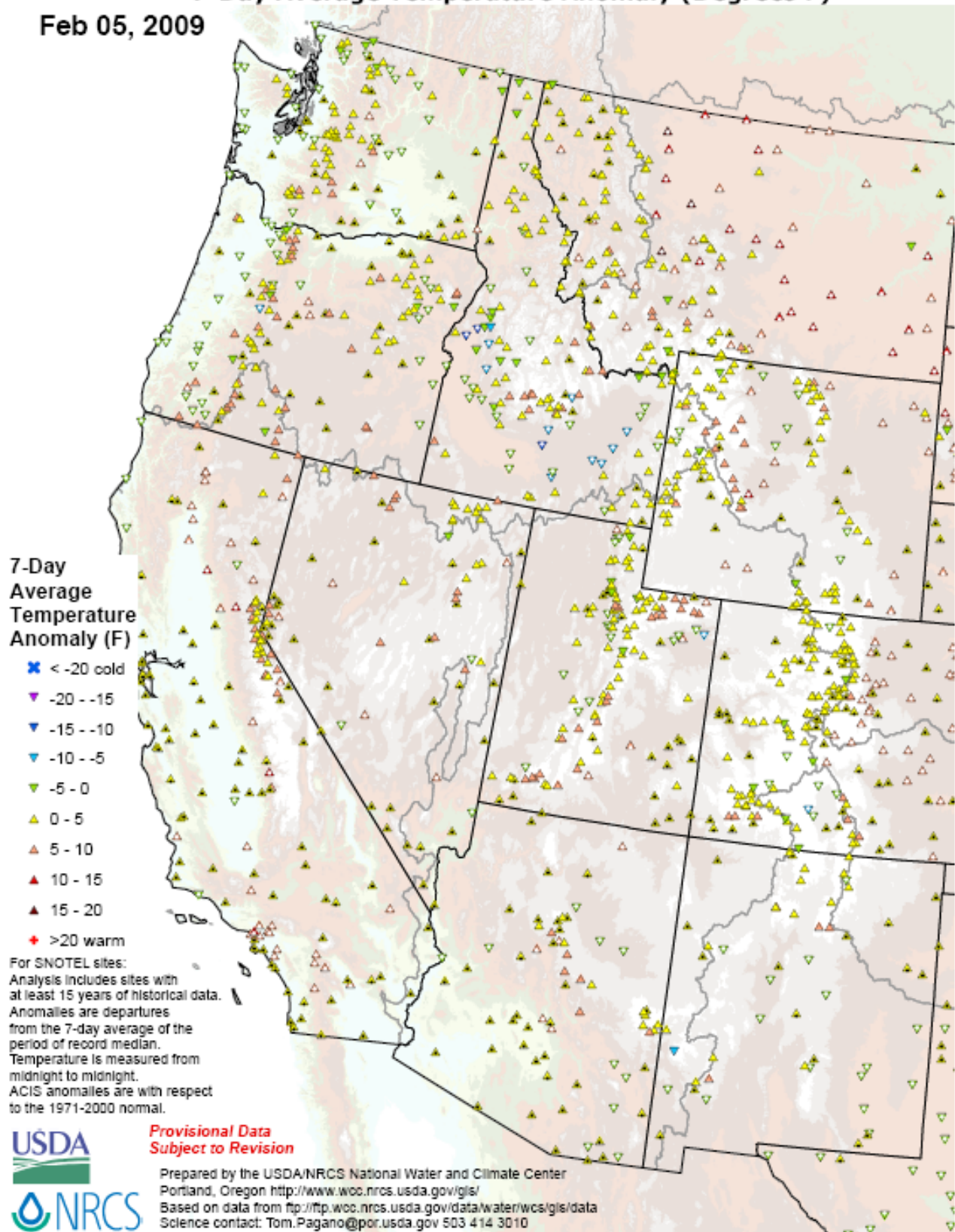
**Fig. 1b: This past week's snow depth changes across the West shows that many locales had decreased in snow depths, especially from the Sierra to the Colorado Rockies.**

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)

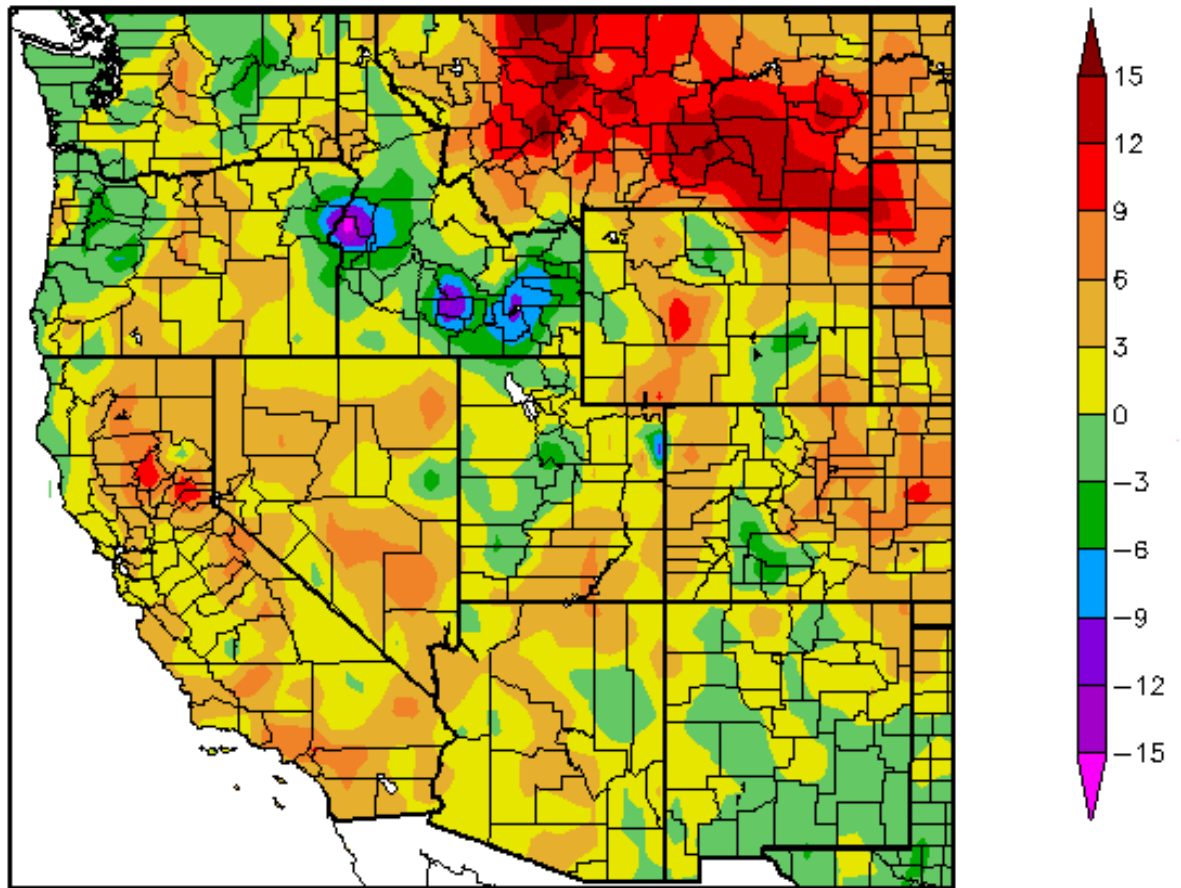
Feb 05, 2009



**Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were generally above normal during the past week except below normal over Idaho's Snake River Basin.**

Ref: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavq7dAnomalyAcis.pdf>

Departure from Normal Temperature (F)  
1/29/2009 – 2/4/2009



Generated 2/5/2009 at HPRCC using provisional data.

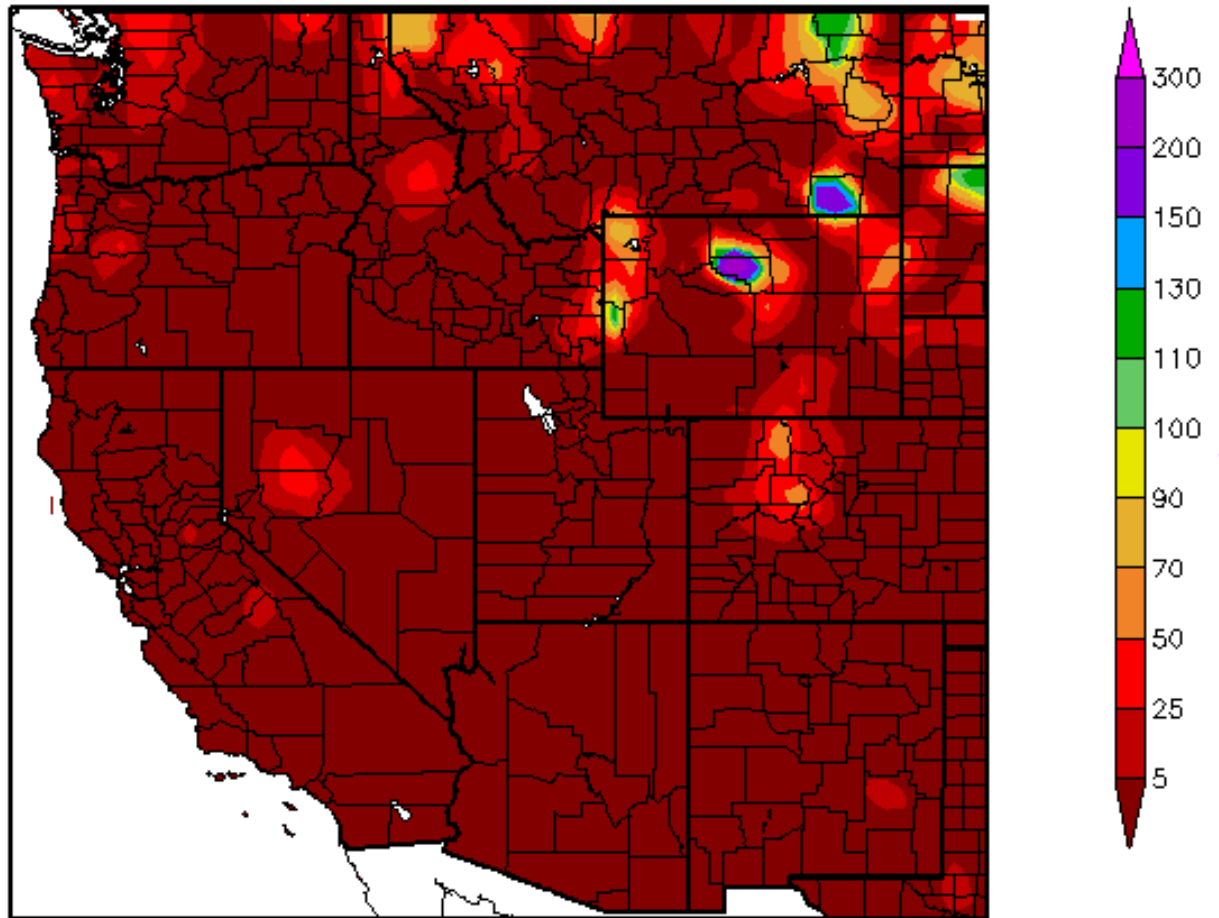
NOAA Regional Climate Centers

**Fig. 2a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over northwest Montana (>+15F) and the greatest negative departures occurred over west central Idaho (<-15F).**

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



Percent of Normal Precipitation (%)  
1/29/2009 – 2/4/2009



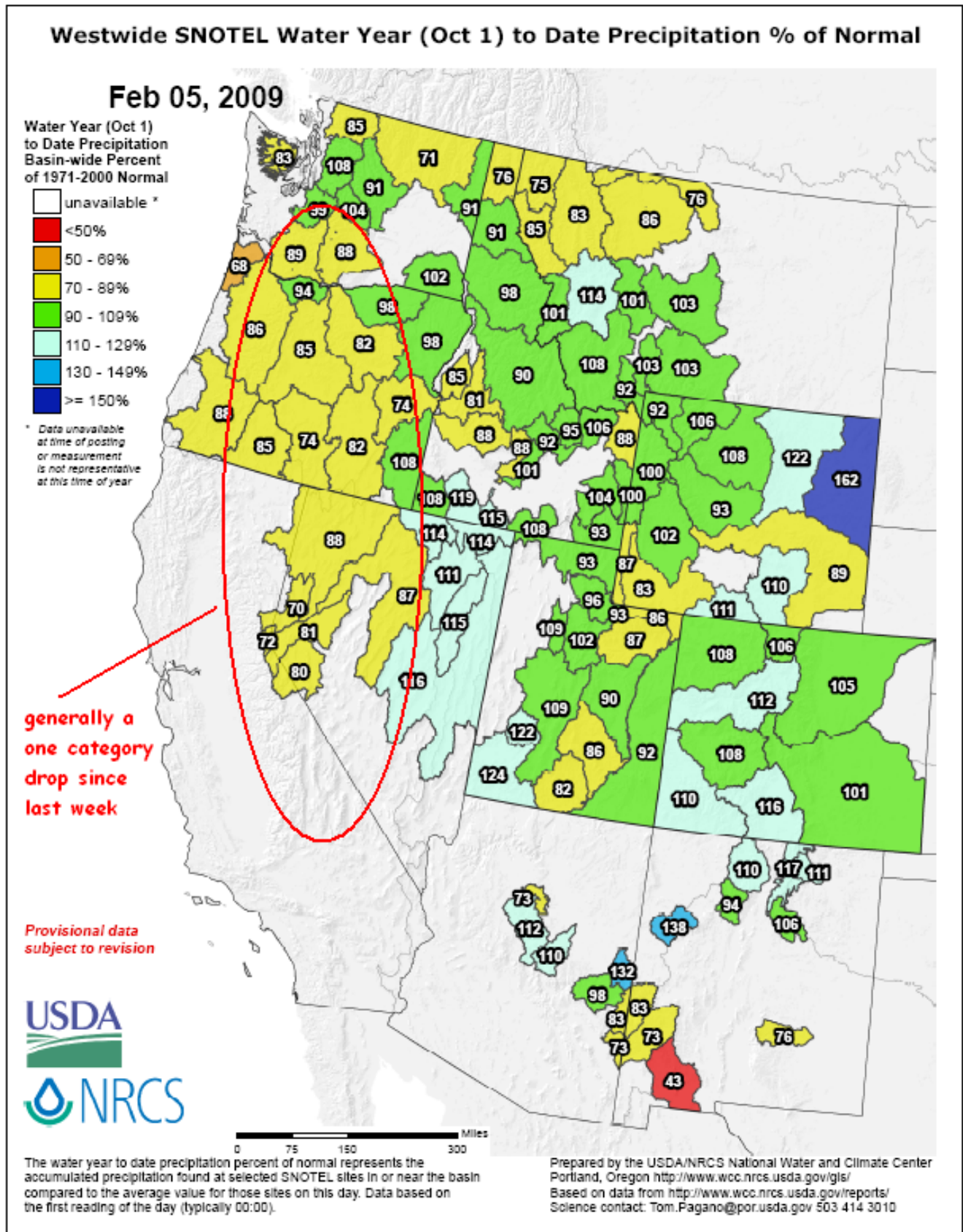
Generated 2/5/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 4 February shows a very dry week across the West. This pattern shift from last week is something that could be expected with La Niña. Expect more variability in the coming weeks regarding this winter's weather pattern.**

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 within 10 percent of last week's values but a one category drop is noted over Oregon and western Nevada.**

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

February 3, 2009  
Valid 8 am. EST

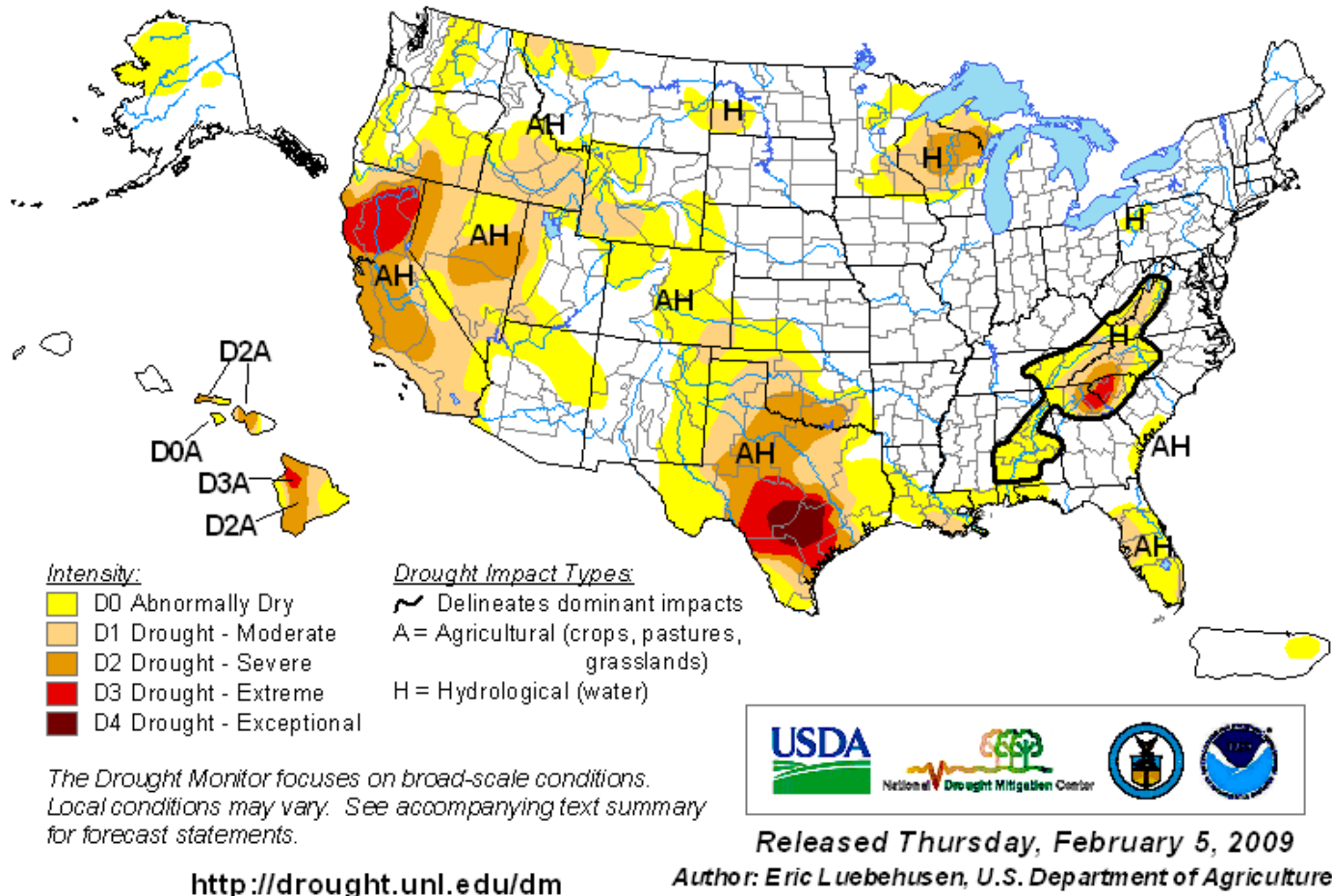


Fig. 4. Current Drought Monitor weekly summary.

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

# U.S. Drought Monitor

## West

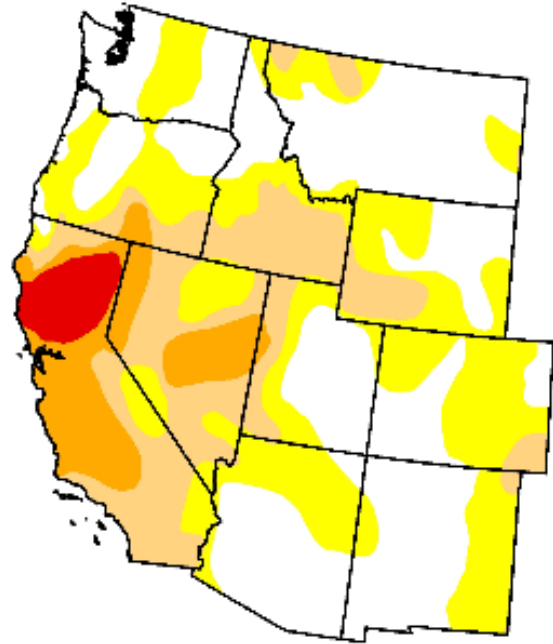
February 3, 2009

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	41.1	58.9	28.6	10.7	2.5	0.0
Last Week (01/27/2009 map)	42.0	58.0	28.2	9.8	2.1	0.0
3 Months Ago (11/11/2008 map)	41.9	58.1	28.4	8.7	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 (02/05/2008 map)	34.1	65.9	43.6	18.9	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, February 5, 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. 2009 Drought details for California can be viewed here:

<http://www.redding.com/news/2009/feb/01/balmy-january-contributes-to-drought/>

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

**Remarks:** California, statewide, has had a drier-than-average water year for 2007-2008 and 2006-2007. The current water year (Oct 2008-Jan 2009) is also starting out dry. While none of these three is a record individually, the aggregate precipitation rank for these last 28 months is a near record.

California climate division 2 (Sacramento Drainage) has had the second driest Feb-Jan, Mar-Jan, and Apr-Jan on record this year.

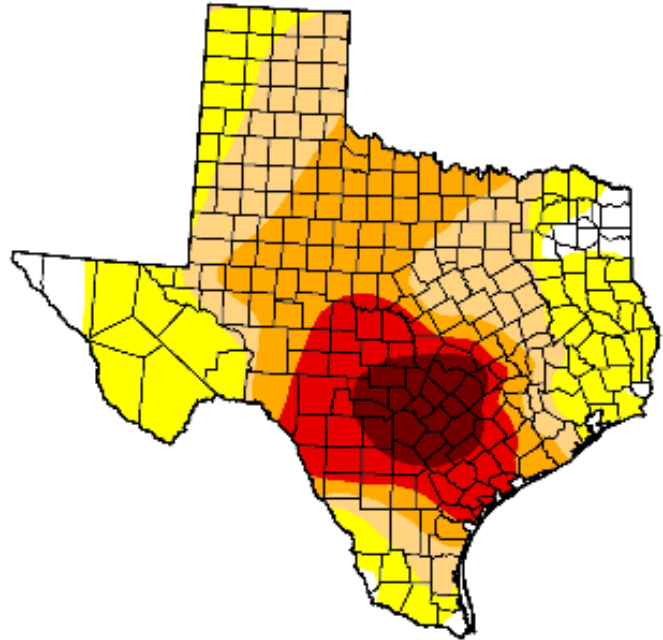
# U.S. Drought Monitor

## Texas

February 3, 2009

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	4.6	95.4	66.8	42.6	19.6	6.7
Last Week (01/27/2009 map)	11.6	88.4	62.1	37.5	16.5	4.2
3 Months Ago (11/11/2008 map)	59.2	40.8	22.4	14.5	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 (02/05/2008 map)	17.1	82.9	29.4	5.9	0.0	0.0

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, February 5, 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).

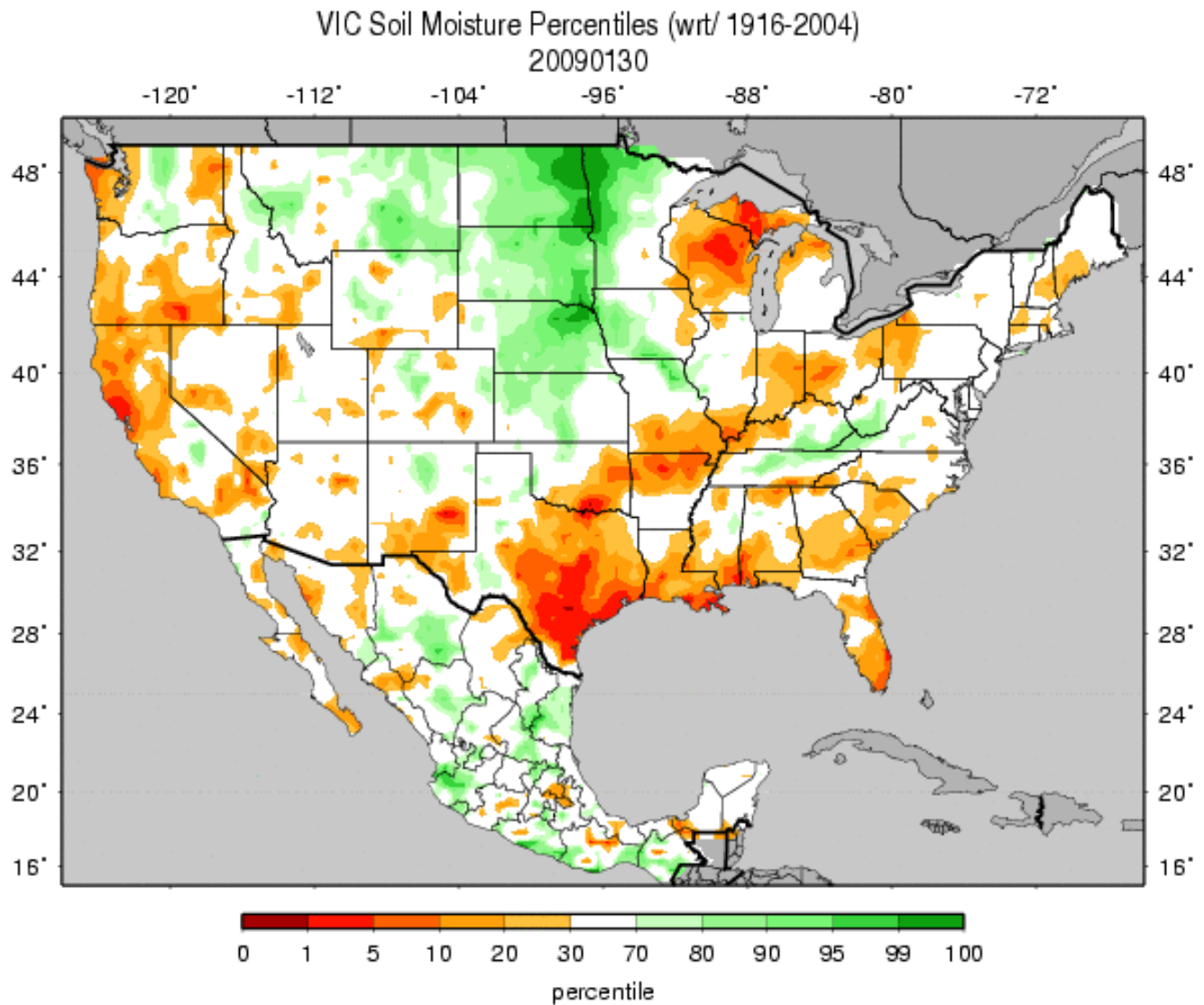
Additional news: <http://www.victoriaadvocate.com/news/regionstate/story/394226.html#>  
and <http://www.fredericksburgstandard.com/articles/2009/02/04/news/01news.txt>

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

**Remarks:** While longer-term indicators for Texas climate division 7 (South Central Texas) are not too severe, 2008-2009 short-term indicators do indicate record to near-record dryness. TX div 7 had the driest September-January on record this year, with all of the multi-month periods from Feb-Jan through Dec-Jan ranking in the top ten driest on record.



## 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 30 January.**

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

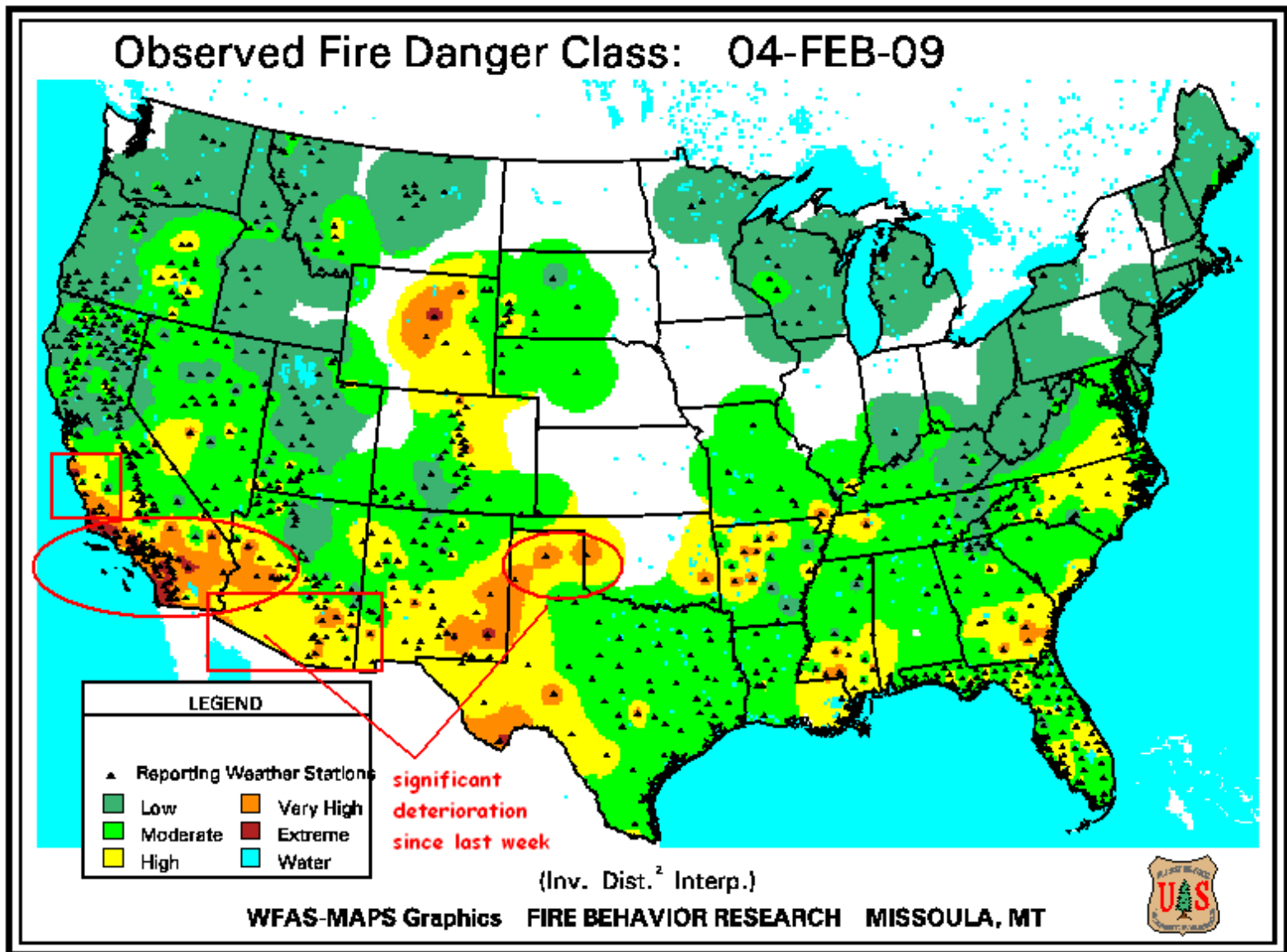
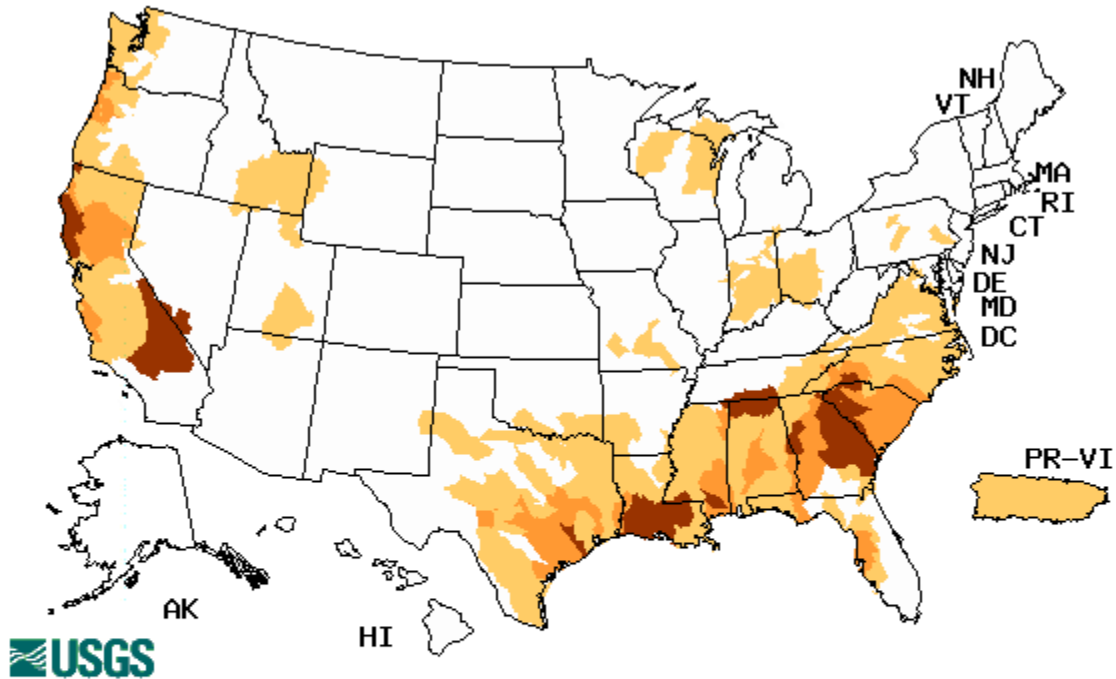


Fig. 6. Observed Fire Danger Class. Conditions have deteriorated over southern California but improved over the Wyoming and Texas since last week. Source: Forest Service Fire Behavior Research – Missoula, MT. Ref: [http://www.fs.fed.us/land/wfas/fd\\_class.gif](http://www.fs.fed.us/land/wfas/fd_class.gif)

## Weekly Snowpack and Drought Monitor Update Report

Wednesday, February 04, 2009



Choose a data retrieval option and select a state on the map

☐ State DroughtWatch, ☒ State map

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. California has worsened considerably while conditions are still very poor over the Southeast during the past week. Elsewhere, over the Northern States 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 – February 3, 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:** Dry, increasingly warm conditions over northern areas contrasted with a moisture-laden winter storm farther south. In particular, locally heavy rain, freezing rain, sleet, and snow eradicated lingering dryness from Kentucky into western Pennsylvania. However, precipitation amounts were generally light (less than half an inch) in northwestern Pennsylvania, doing little to ease D0 dryness in that portion of the state. Drought remained unchanged in the upper Midwest, where early-week cold (temperatures as low as -26 degrees F) gave way to above-freezing daytime highs by week's end.

**The Delta:** Light to moderate rain stemmed the expansion of drought in the Delta, although streamflows continued to run at lower-than-normal levels. Temperatures for the week averaged near to slightly above normal.

**The Plains:** Drought expanded under a dry weather regime across the south, although rain provided some relief in eastern Oklahoma. In Texas, wildfires, extremely low streamflows, barren pastures, and declining wheat conditions were symbolic of worsening drought over much of the state. Drought intensity and coverage expanded over most of the state, although light rain provided some relief to eastern portions of Texas. The same held true in Oklahoma, where rain eased drought in the east while dryness increased D1 and D2 drought coverage in the west. Farther north, additional snow eased long-term hydrologic drought in North Dakota, while conditions remained unchanged in eastern Montana.

**Southeast:** Showers spread over much of the region, although unfavorably dry weather prevailed in eastern portions of Georgia and South Carolina. Streamflows continued to decline in North Carolina, where D1 and D2 drought expanded over the western half of the state. In contrast, light rain across eastern North Carolina provided a temporary reprieve from expanding dryness. In western South Carolina, improving reservoir levels led to a slight reduction of Extreme Drought (D3). In eastern portions of South Carolina and Georgia, increasing abnormal dryness (D0) along the coast reflected 30- and 90-day precipitation departures in excess of 2 and 4 inches, respectively. Abnormal dryness also expanded over southern Alabama, where rain from this week's storm system (less than half an inch) did little to offset developing moisture shortages. In Florida, 1 to 2 inches of rain in the northern half of the state eased short-term dryness. Across southern Florida, a fast-moving line of showers and thunderstorms produced generally less than one-quarter inch of rain; consequently, D0 remained unchanged, while moderate drought (D1) increased slightly along the southeastern coast. D0 also expanded further into the Florida Panhandle, reflecting declining soil moisture percentiles and 90-day precipitation deficits greater than 5 inches.

**The West:** A broad ridge of high pressure maintained mostly dry weather over much of the western U.S. In California, drought designations increased north of Santa Barbara, with Extreme Drought (D3) now extending from the northern California coast to the Nevada border. In this region, streamflows are in the lowest 5<sup>th</sup> percentile while 90-day precipitation departures are approaching 16 inches. In addition, mountain snowpack in the Sierra Nevada are alarmingly low, with sustained stormy weather over the next 6 weeks needed to fully recharge water reserves. Elsewhere, abnormal dryness (D0) and moderate drought (D1) increased over northwestern



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Montana in response to a lack of a current snowpack, while abnormal dryness expanded northward in Oregon in response to 90-day precipitation departures of more than 8 inches.

**Hawaii, Alaska and Puerto Rico:** Reports from Hawaii indicated pastures in Molokai and Lanai improved with recent rainfall, although water levels in western Molokai remained low. In Puerto Rico, isolated showers (locally more than 2 inches) were reported during the past week, although amounts in the current D0 area were generally less than half an inch. Dry weather prevailed in northern Alaska, while locally heavy rain fell along the southern coast.

**Looking Ahead:** Wet weather out west will contrast with mostly dry conditions in the eastern U.S. For the rest of the week, a strong area of high pressure will maintain dry weather in the Southeast but bring a hard freeze to Florida. Meanwhile, a Pacific storm will move ashore over the weekend, bringing much-needed rain and mountain snow to the western U.S. As this system emerges over the central High Plains early next week, a large area of snow and rain will develop from the Dakotas southward into eastern Texas. Gulf moisture surging northward will lead to locally heavy rain in the middle and lower Mississippi River Valley by mid-week, while another Pacific storm impacts the Northwest.

The CPC 6-10 day forecast (February 10-14) calls for mostly warm, wet weather over the eastern half of the nation, although drier-than-normal conditions are expected to linger in Florida and southern Texas. Out west, colder-than-normal conditions are expected, with wetter-than-normal weather in the Southwest and Four Corners Region contrasting with below-normal precipitation in the Northwest.

**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: 05 February 2009