



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

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**Weekly Report - Snowpack / Drought Monitor Update**

**Date: 17 February 2011**

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** SNOTEL Snow-Water Equivalent percent of Normal values for 17 February 2011 shows several basins across the West have deteriorated by one category during the past week (noted by red circles). Blue circles show one category improvements (Fig. 1). SNOTEL Snow-Water Equivalent percent of Normal peak shows that most basins have 50% or less of peak values at this point (we are about 60% through the snow accumulation season; 75% for the Southwest). Parts of the Uinta and Wasatch are at peak values as of this week. However, most SNOTEL sites (especially the Cascades) will need much more snow this season in order to finish with near normal amounts (Fig. 1a). SNOTEL 7-day snow depth changes show significant gains in accumulation across Cascades and Sierra, lesser so over the Great Basin, and are generally down over the Central and Southern Rockies (Fig. 1b).

**Temperature:** Average SNOTEL temperatures were much above normal over the Northern Rockies and lesser so across the remainder of the West (Fig. 2). ACIS 7-day average temperature anomalies that do not reflect SNOTEL sites show the greatest positive temperature departures over parts of central Montana (>+15°F) and the greatest negative departures over extreme northwest Colorado (<-15°F) (Fig. 2b).

**Precipitation:** ACIS 7-day average precipitation amounts for the period ending 16 February shows the bulk of the heaviest precipitation confined to northwestern Washington and California (Fig. 3). In terms of percent of normal, the precipitation pattern was extremely wet over northern California to western Montana (Fig. 3a). For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, and the Northern and Central Rockies. One-category deterioration is noted by the red circles. Blue circles reflect marginal one-category improvements over Washington (Fig. 3b).

**Rockies and Southwest:** Inputs from the NIDIS: Upper Colorado River Basin Pilot Project reflected some recent precipitation and increased snowpack measurements across south-central Colorado. In response, the western edge of the area of D2 (severe drought) was trimmed. Author: Matthew Rosencrans, NOAA/NWS/NCEP/CPC

***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

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developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 4 and 4a).

### SOIL MOISTURE

Soil moisture (Figs. 5a and 5b) is estimated by a one-layer hydrological model ([Huang et al., 1996](#), [van den Dool et al., 2003](#)). The model takes observed precipitation and temperature and calculates soil moisture, evaporation and runoff. The potential evaporation is estimated from observed temperature.

[http://www.cpc.ncep.noaa.gov/soilmst/index\\_jh.html](http://www.cpc.ncep.noaa.gov/soilmst/index_jh.html)

### U.S. HISTORICAL STREAMFLOW

[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).

This map, (Fig. 6) 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.

### 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/> and <http://drought.gov>.

### FOR MORE INFORMATION

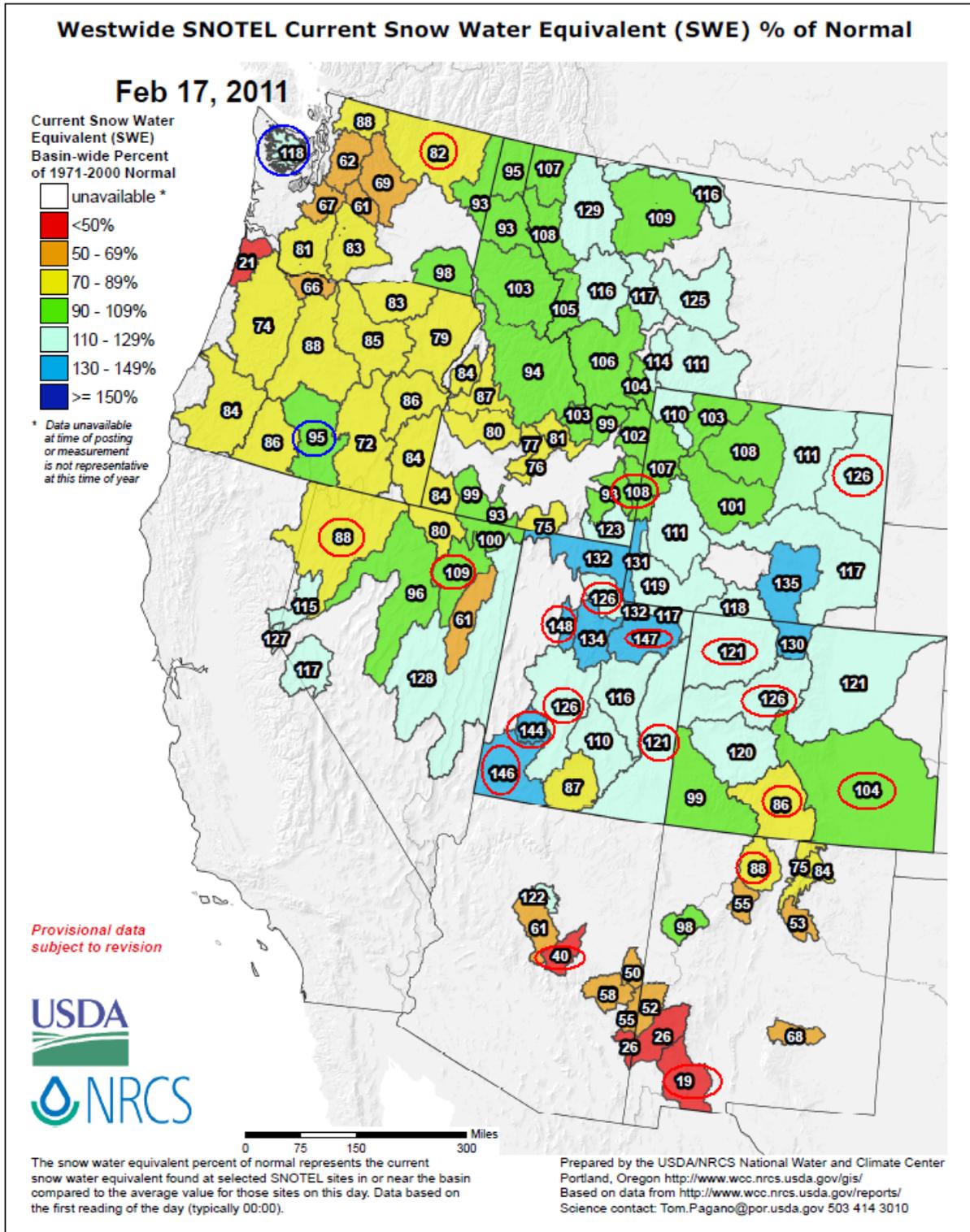
The National Water and Climate Center Homepage provide the latest available snowpack and water supply information. Please visit us at <http://www.wcc.nrcs.usda.gov>. This document is available from the following location on the NWCC homepage - <http://www.wcc.nrcs.usda.gov/water/drought/wdr.pl>

This report uses data and products provided by the Interagency Drought Monitor Consortium members and the National Interagency Fire Center.

/s/ JEFF GOEBEL

Acting Director, Resource Inventory Division

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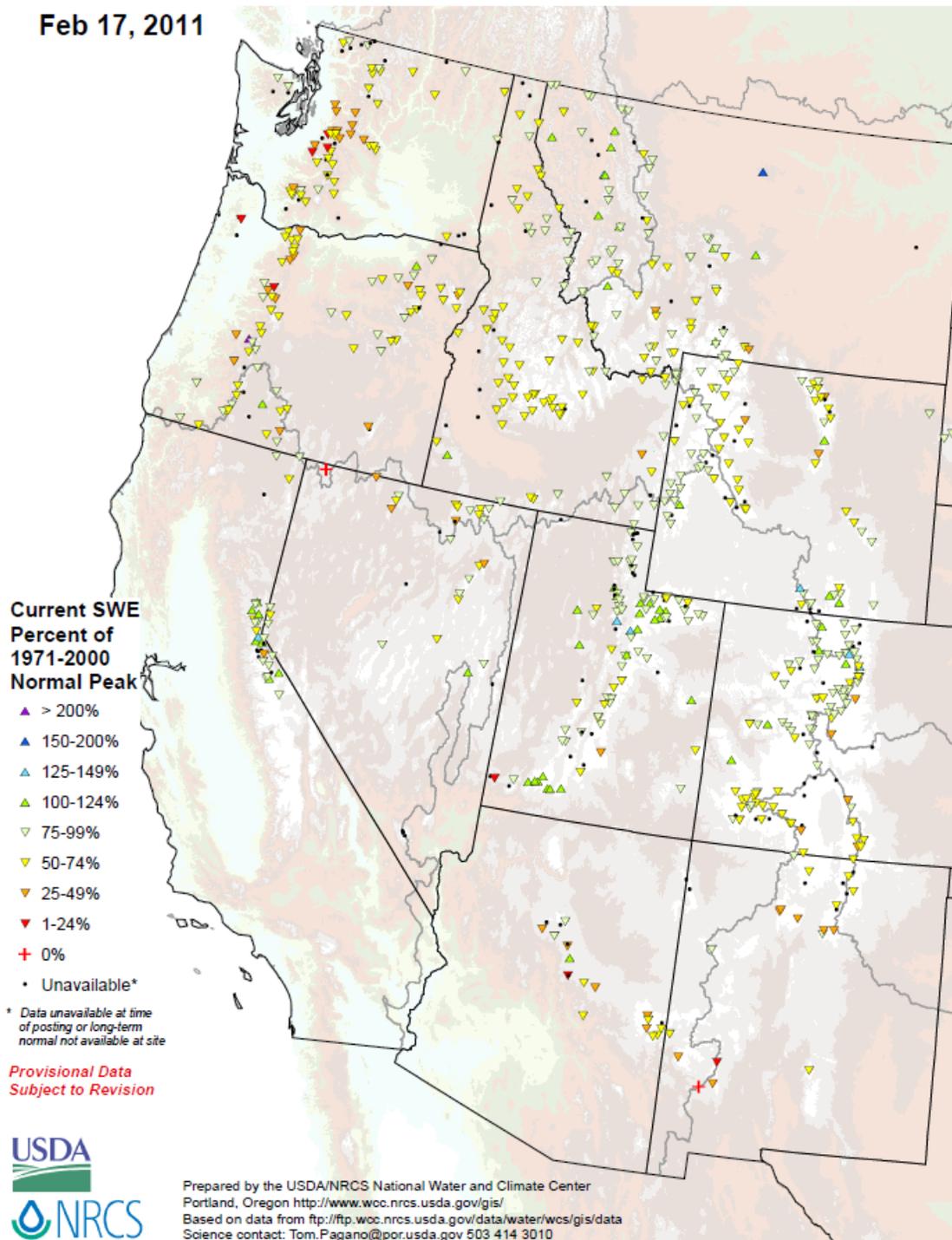


**Fig. 1: SNOTEL Snow-Water Equivalent percent of normal values for 17 February 2011 shows several basins across the West have deteriorated by one category during the past week (noted by red circles). Blue circles show one category improvements**

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

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## SNOTEL Current Snow Water Equivalent (SWE) Percent of Normal Peak Feb 17, 2011



**Fig. 1a: SNOTEL Snow-Water Equivalent percent of Normal peak shows that most basins have 50% or less of peak values at this point (we are about 60% through the snow accumulation season; 75% for the Southwest). Parts of the Uinta and Wasatch are at peak values as of this week. However, most SNOTEL sites (especially the Cascades) will need much more snow this season in order to finish with near normal amounts. Ref:**

<http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/WestwideSWEPercentPeak.pdf>

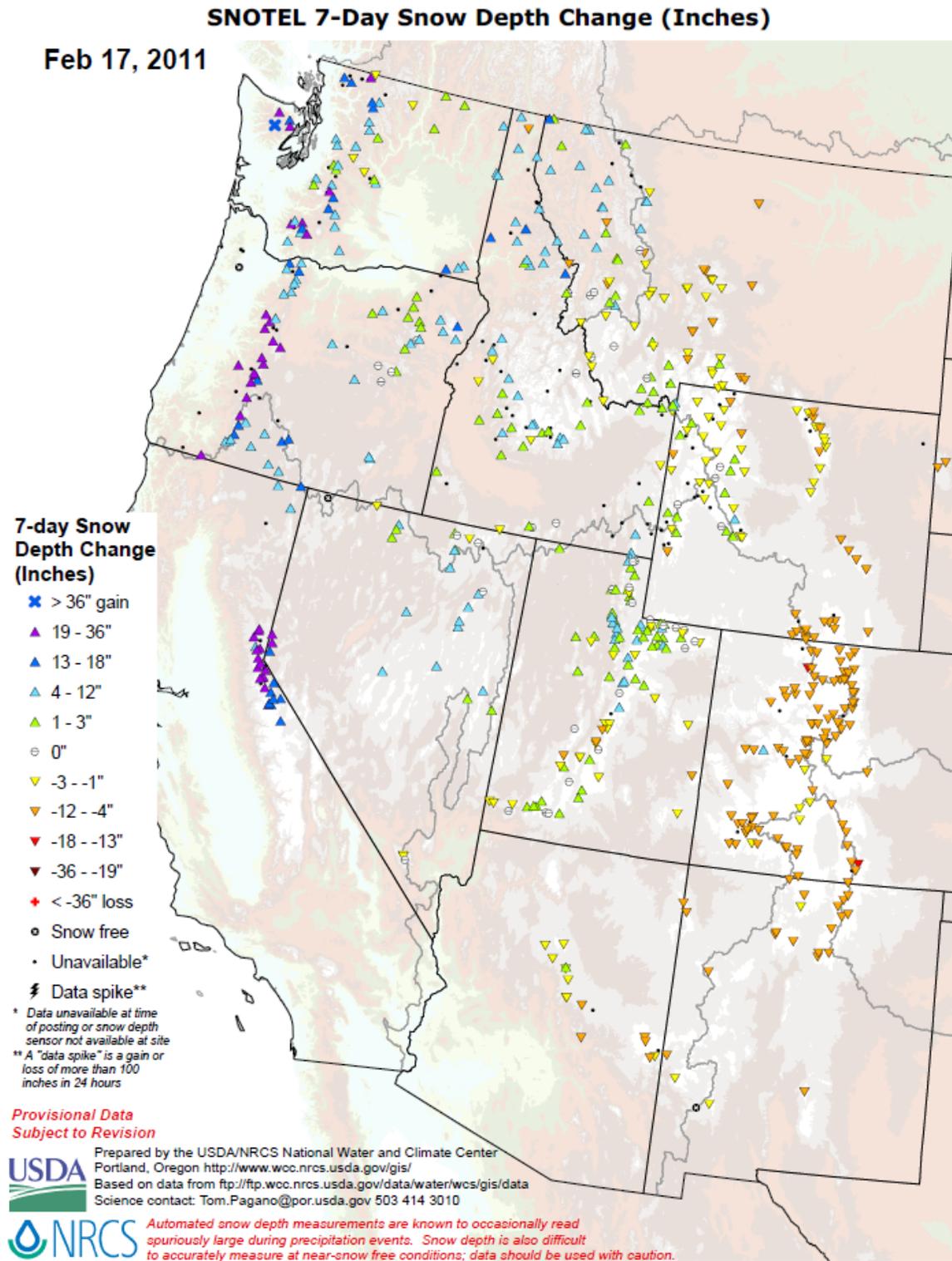
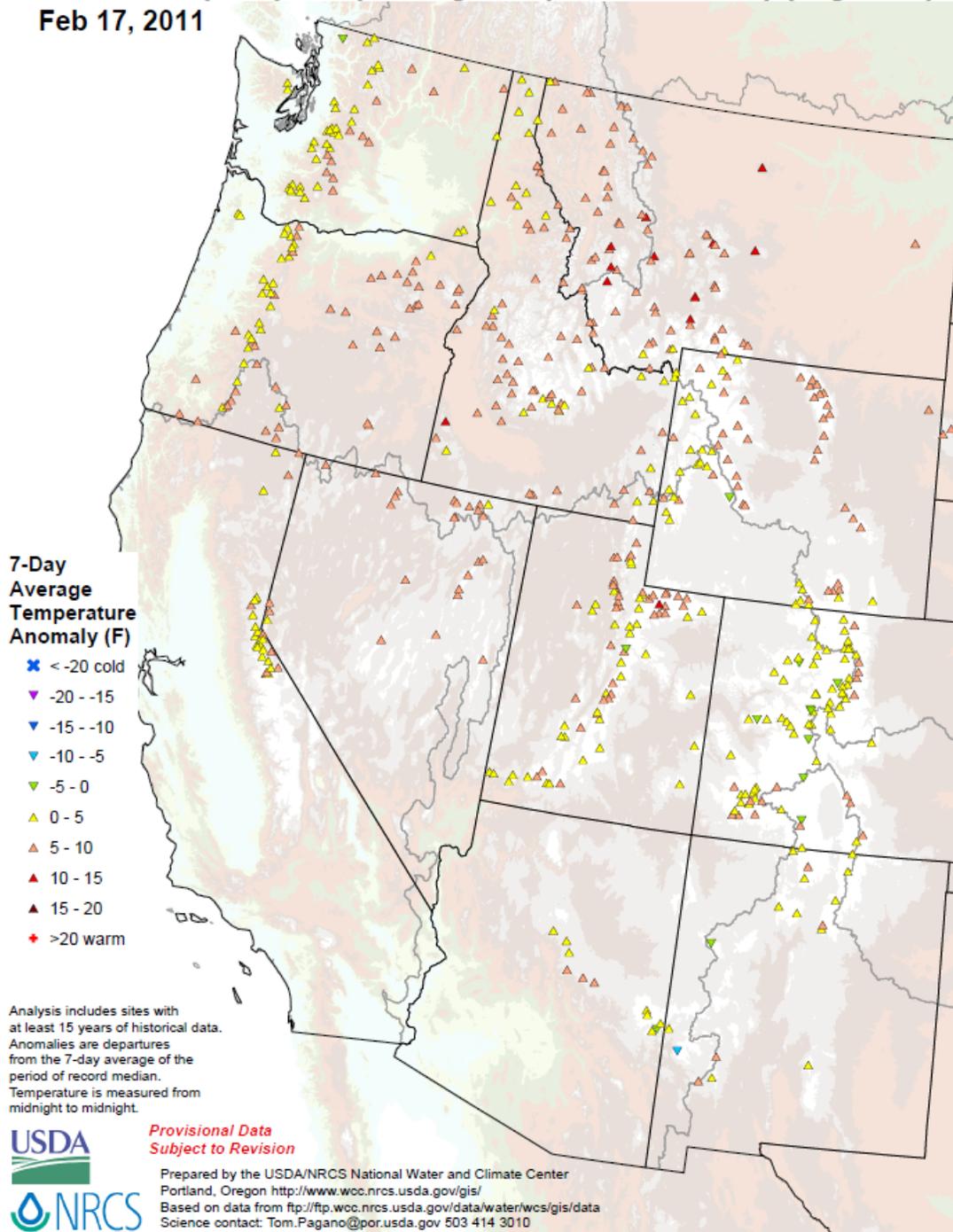


Fig. 1b: SNOTEL 7-day snow depth changes show significant gains in accumulation across Cascades and Sierra, lesser so over the Great Basin, and are down over the Central and Southern Rockies.

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

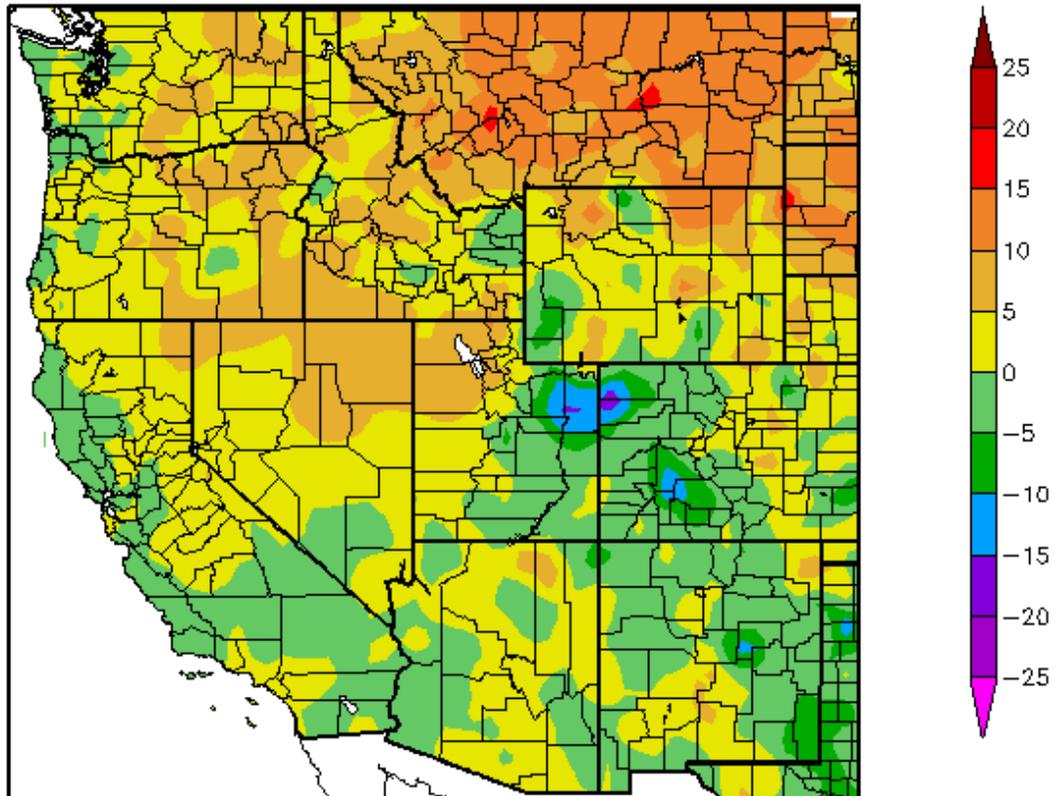
## SNOTEL (solid) 7-Day Average Temperature Anomaly (Degrees F) Feb 17, 2011



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**Fig. 2: Average SNOTEL temperatures were much above normal over the Northern Rockies and lesser so across the remainder of the West. Ref:**  
<http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/WestwideTavg7dAnomaly.pdf>

Departure from Normal Temperature (F)  
2/10/2011 – 2/16/2011



Generated 2/17/2011 at HPRCC using provisional data.

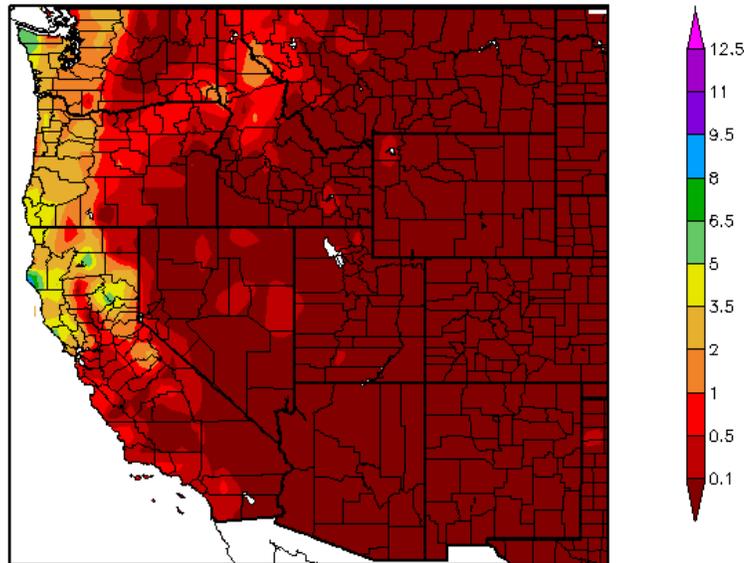
Regional Climate Centers

**Fig. 2a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures over parts of central Montana (>+15°F) and the greatest negative departures over extreme northwest Colorado (<-15°F).**

Ref: [http://www.hprcc.unl.edu/maps/current/index.php?action=update\\_daterange&daterange=7d](http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=7d)

## Weekly Snowpack and Drought Monitor Update Report

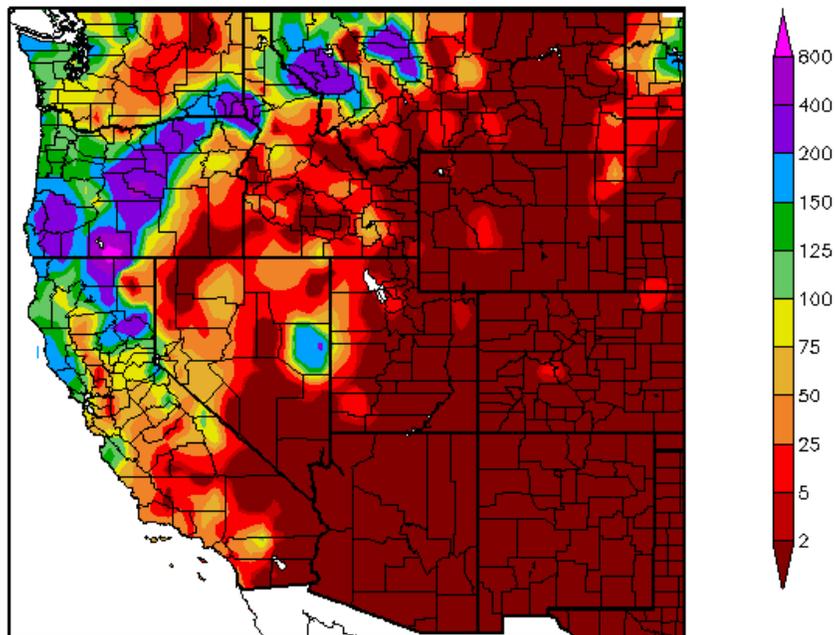
Precipitation (in)  
2/10/2011 - 2/16/2011



Generated 2/17/2011 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)  
2/10/2011 - 2/16/2011

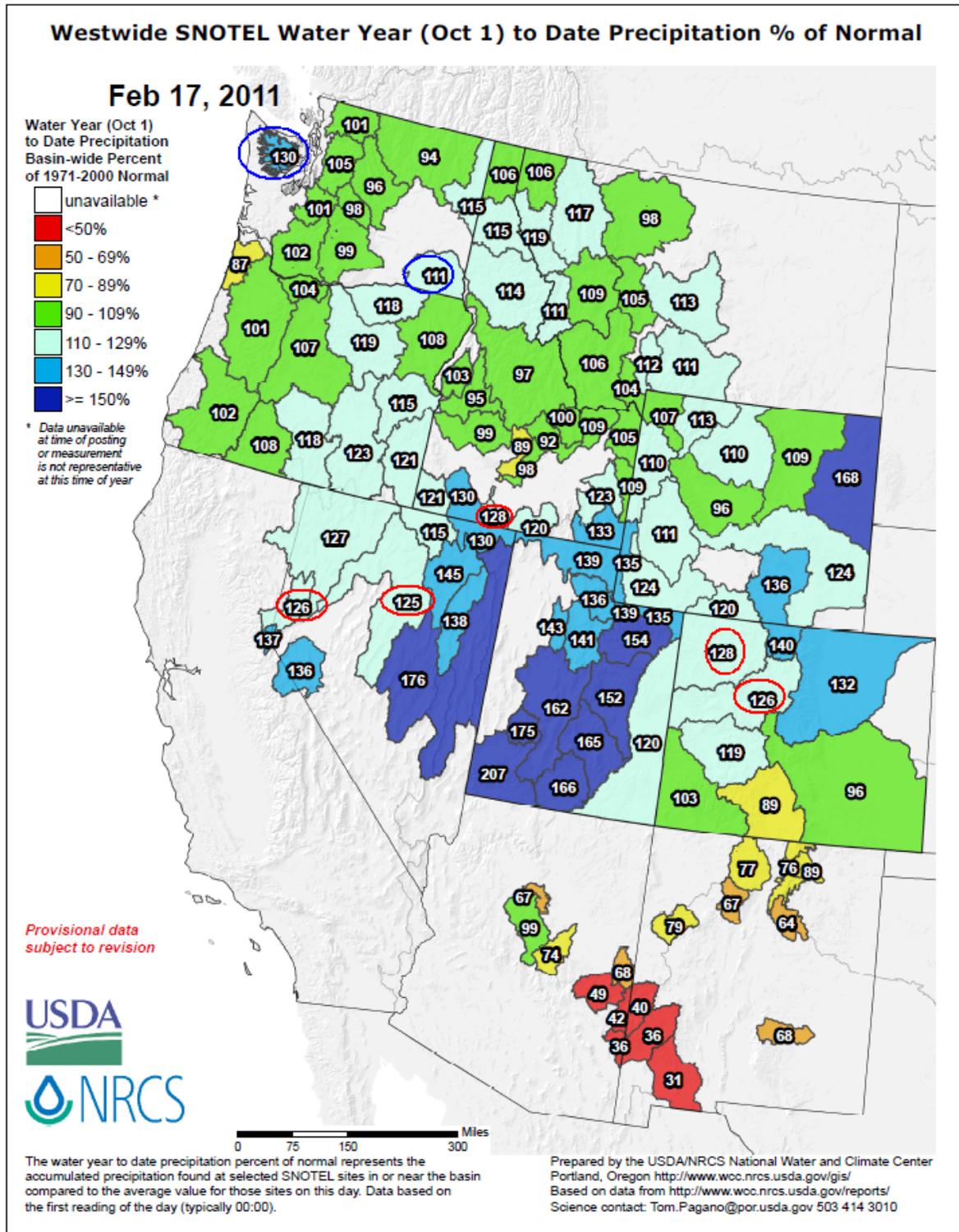


Generated 2/17/2011 at HPRCC using provisional data.

Regional Climate Centers

**Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 16 February shows the bulk of the heaviest precipitation confined to northwestern Washington and California (Fig. 3). In terms of percent of normal, the precipitation pattern was extremely wet over northern California to western Montana (Fig. 3a).** Ref: <http://www.hprcc.unl.edu/maps/current/>

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**Fig 3b:** For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, and the Northern and Central Rockies. One-category deterioration is noted by the red circles. Blue circles reflect marginal one-category improvements over Washington.

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

# U.S. Drought Monitor

February 15, 2011  
Valid 7 a.m. EST

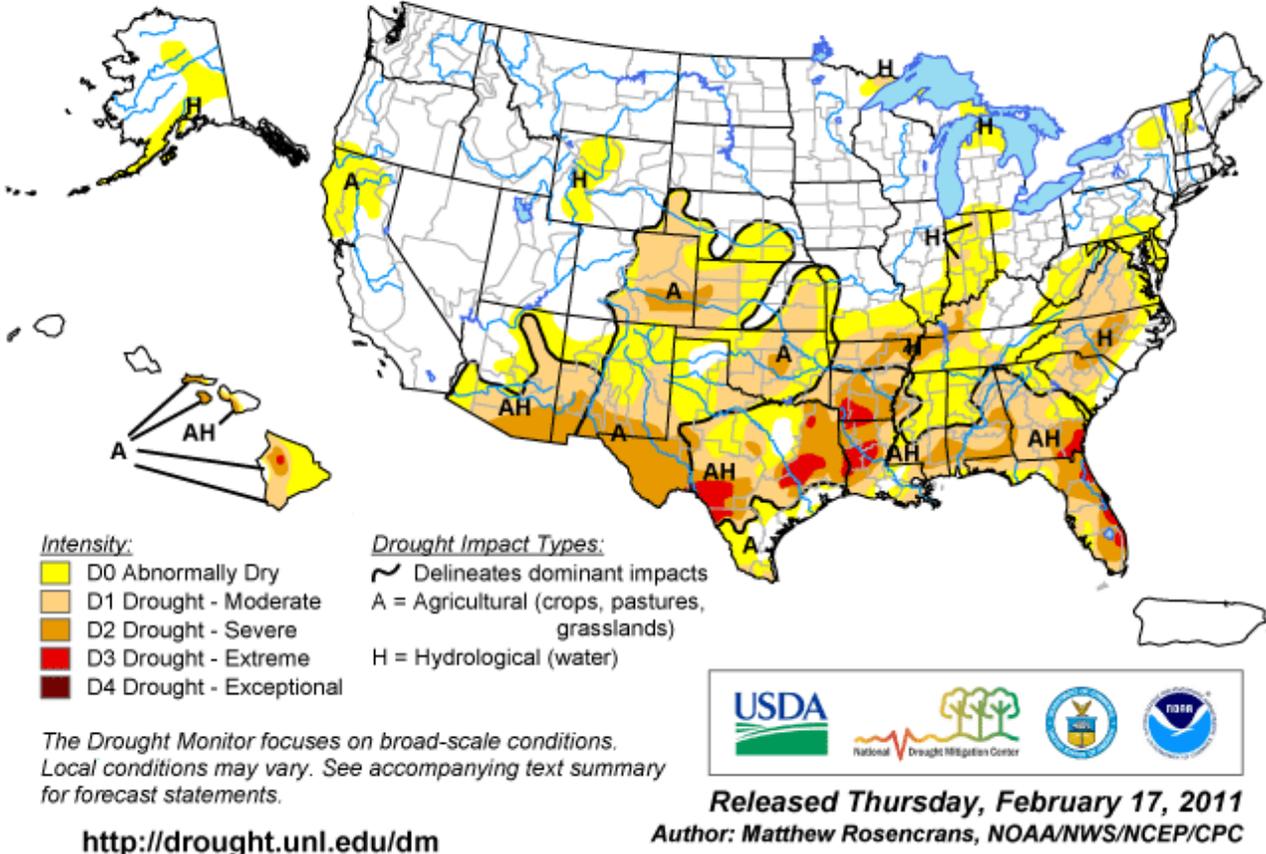


Fig. 4: Current Drought Monitor weekly summary. The severest D3 levels of drought are found on the Big Island of Hawaii and is scattered across Texas, Louisiana, Arkansas, Georgia, and Florida.

Ref: <http://www.drought.unl.edu/dm/monitor.html>

# U.S. Drought Monitor

## West

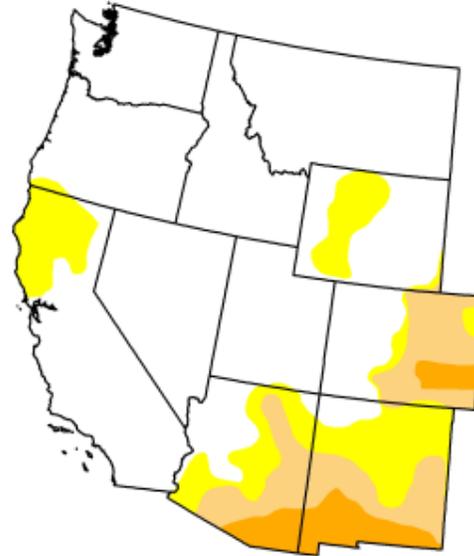
February 15, 2011  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	72.99	27.01	13.79	4.34	0.00	0.00
Last Week (02/08/2011 map)	72.75	27.25	13.79	4.44	0.00	0.00
3 Months Ago (11/16/2010 map)	68.49	31.51	6.55	0.19	0.00	0.00
Start of Calendar Year (12/28/2010 map)	73.26	26.74	11.98	0.89	0.00	0.00
Start of Water Year (09/28/2010 map)	62.50	37.50	8.14	0.56	0.00	0.00
One Year Ago (02/09/2010 map)	36.57	63.43	18.33	3.26	0.00	0.00

*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>

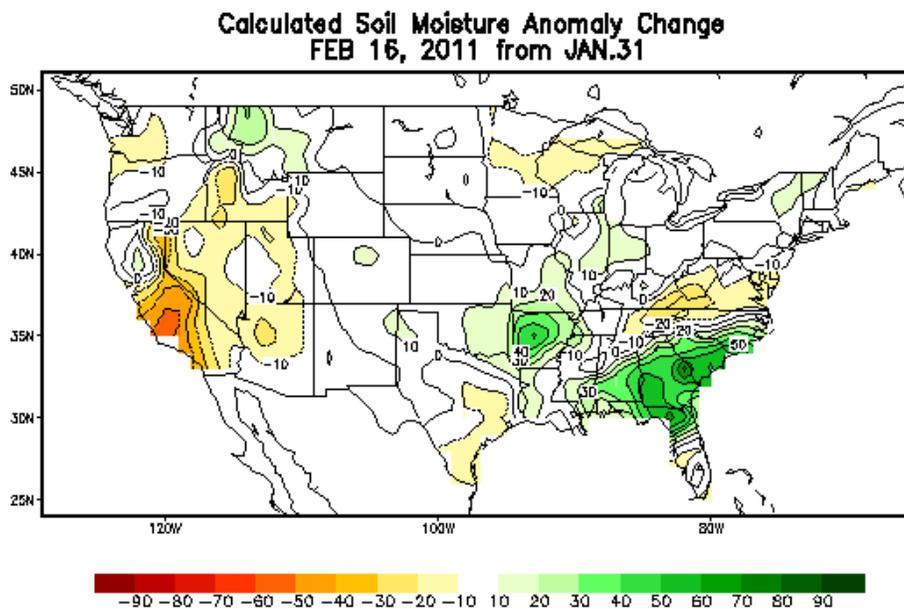
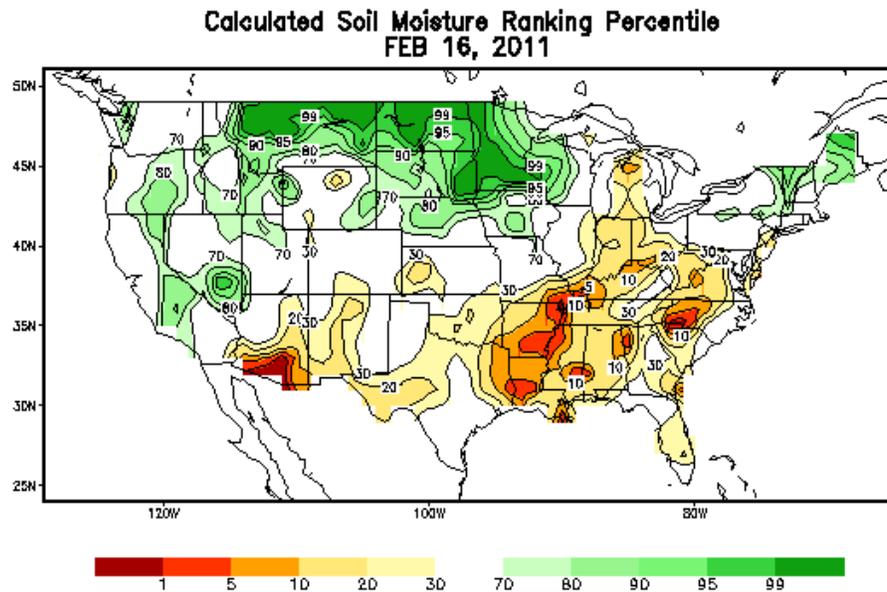


Released Thursday, February 17, 2011  
M. Rosencrans, CPC/NOAA

**Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. Regionally there were no significant changes during the past week.**

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

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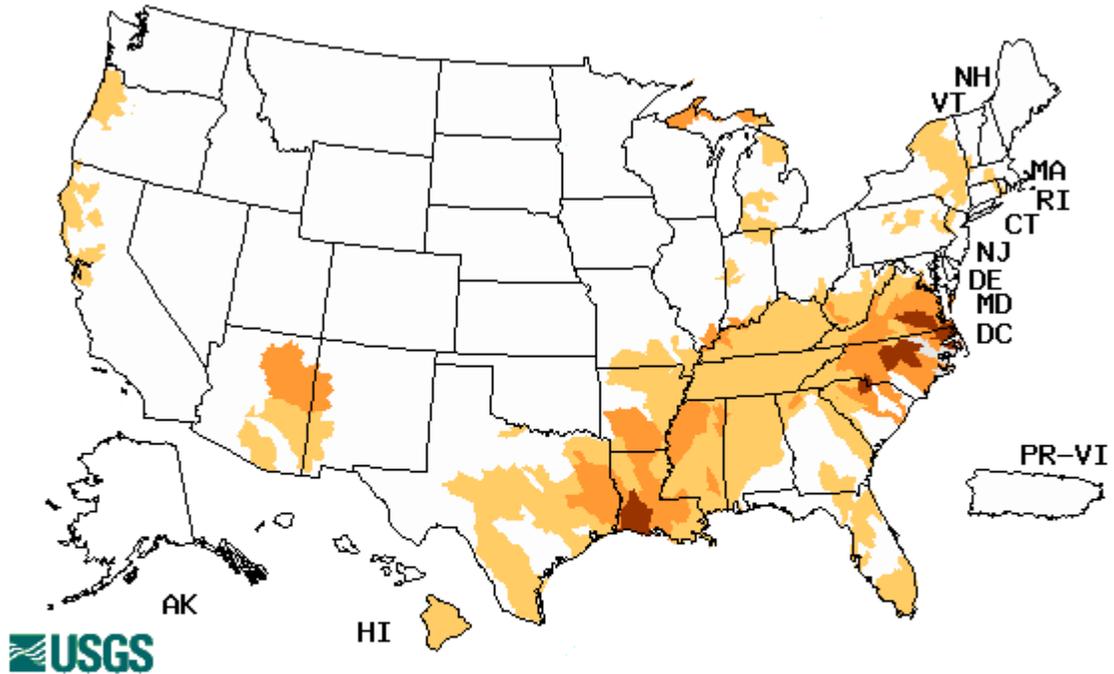


**Figs. 5a and 5b: Soil Moisture ranking in percentile as of 16 February (Fig. 5a) shows wet conditions over much of the Central Northern Tier States with dryness over Arizona and much of the Lower Mississippi River Valley and into the Mid-Atlantic States. Since the end of January, much of the Southeast has increased in moisture while dryness increased over California (Fig. 5b).**

Ref: [http://www.cpc.ncep.noaa.gov/products/Soilmst\\_Monitoring/US/Soilmst/Soilmst.shtml#](http://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#)

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Wednesday, February 16, 2011



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. 6: Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Portions of the Arizona, the Gulf States, and the Mid-Atlantic States are reflecting La Niña conditions of dryness. Note: northern site gauges are less accurate as rivers and streams freeze. Ref: <http://waterwatch.usgs.gov/?m=dryw&r>

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary -- February 15, 2011

*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/>.*

**Weekly Summary:** This week featured a fairly dry pattern for much of the contiguous US while a stormy pattern brought rains (1.0 – 5.0 inches) to southern Alaska and western Hawaii (0.5 – 4.5 inches). Across the contiguous US, a low-pressure system moved across the southern tier of the country during the middle portion of the week. By Friday, high pressure and dry conditions dominated the pattern for most of the country. Activity across the northern tier of the country picked-up later in the week with a storm system bringing snow showers and lake-effect snows to the northeast and another storm system making its way into the Pacific Northwest.

**Southeast and mid-Atlantic:** With the exception of central Tennessee and a small section across Florida, most areas received less than 0.8 inch of precipitation for the week. The continued dryness across the southeast has aided in the formation of several brush fires in places from Alabama to Virginia. Winds gusting to near 50 mph aided fires the spread across southwest and south-central Virginia, which were likened to fires from the historic February 10, 2008 event. Some precipitation (0.5 – 1.5 inches) fell across northern Florida and a stalled frontal boundary brought sparse precipitation (0.3 – 1.2 inches) to southern Florida, which was enough to maintain the current drought conditions without additional intensification.

Across western North Carolina and eastern Tennessee, continued dry conditions prompted the expansion of moderate drought (D1) conditions and abnormal dryness (D0). As reported during the North Carolina-Drought Management Advisory Council Technical Drought Advisory Team weekly teleconference, streamflows across North Carolina trended downward. SPI3 (Standardized Precipitation Index for 3 months), SPI6 (Standardized Precipitation Index for 6 months), and soil moisture values from the Climate Prediction Center indicate conditions slightly worse than the severe drought (D2) indicated across the Carolinas but relative wetness at the 9-month time frame (SPI9), some decent well and reservoir storage levels pre-empted the introduction of extreme drought (D3) conditions.

Continued dryness across most of Alabama prompted the expansion of abnormally dry conditions across all of the state and a small expansion of moderate drought across the central portions of the state. SPI6 and SPI9 indicate severe dryness while SPI3 indicates moderate drought and many streamflows are well below the 20th percentile.

**Great Plains:** Recent snows have done little to alleviate drought across Oklahoma and northern Texas as the liquid equivalent of the snowfalls have been approximately 1 inch, resulting in snow-liquid ratios of up to 20 to 1. Most of these snows fell across eastern Oklahoma. The low liquid equivalents and windy conditions followed by a warming trend later in the week contributed to an expansion of moderate drought (D1) conditions across the central portions of the state. Across the western Texas panhandle, abnormal dryness (D0) was

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expanded as SPI-3 and SPI-6 values indicated worsening drought conditions. One report of 1.5 inches of precip surrounded by a few reports of less than 1 inch of precipitation were noted, so D0 conditions were not expanded across the entire region.

**Rockies and Southwest:** Inputs from the NIDIS: Upper Colorado River Basin Pilot Project reflected some recent precipitation and increased snowpack measurements across south-central Colorado. In response, the western edge of the area of D2 (severe drought) was trimmed.

**Hawaii, Alaska, and Puerto Rico:** Rainfall across Puerto Rico was minimal in coverage with the most significant rains (1.0 – 2.0 inches) falling across the northwestern sections and east-central sections of the island. Light precipitation (generally less than 0.5 inch) was reported across most of the island with the exception of the southwestern quadrant where dryness continued.

A stormy pattern brought more rains (0.5 – 6.6 inches) across southern Alaska. This prompted a small reduction in the coverage of D0H (abnormal dryness) across south-central Alaska. Dry conditions continued across interior Alaska with less than 0.5 inch of precipitation reported at any station.

The drought status across Hawaii remained unchanged as the western islands continued to receive the most precipitation and dryness continued across the big island.

**Looking Ahead:** February 16 – February 22, 2011 – The atmospheric flow pattern is expected to bring significant precipitation to central California and the Intermountain West. The storm track should support some of this moisture moving across the central Great Plains. Most of the southeast should remain locked in a dry pattern through early next week before some precipitation is likely across the lower Mississippi River Valley. **Author:** [Matthew Rosencrans, NOAA/NWS/NCEP/CPC](#)

### 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 February 16, 2011

**For the latest Seasonal Forecast issued today by the OAA CPC, see:**

<http://www.cpc.ncep.noaa.gov/products/predictions/30day/>.