



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

**Weekly Report - Snowpack / Drought Monitor Update**      **Date:**    **January 10, 2008**

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** During the past week, the West was treated to a rather wet and white period. Snowfall in the higher elevations of the Cascades, Sierra, Intermountain West (ID, NV), and Southern Rockies (CO, NM) exceeded several feet. The High Plain experienced minimal snowfall (Fig. 1). Preliminary Spring runoff forecasts are up across the Southern Rockies and Utah (Fig. 1a). For California (<http://cdec.water.ca.gov/cgi-progs/reports/EXECSUM>):

Before the storm, the 8 Station index ([http://cdec.water.ca.gov/cgi-progs/stationInfo?station\\_id=8SI](http://cdec.water.ca.gov/cgi-progs/stationInfo?station_id=8SI)) was at 12.0"; 66% of average for the season. As of 8 January, it's up to 89% of average, with 17.6". However, this was a better 'snow' storm than 8 station precipitation index would indicate. With the most impressive orographic effect over the Southern Sierra, California snowpack saw a great surge. At the first of the year (near Jan. 2), California statewide percent of normal for snow water equivalence was 60% by sensor, and 60% as course-measured at Phillips on Highway 50, near Sierra at Tahoe. On the 8th, these numbers have about doubled. Here's the breakdown for percent of average to date across the Sierra:

	Jan. 1 (Inches equivalent.)		Jan. 7 (Inches equivalent.)	
Northern	64%	7"	112%	13"
Central	53%	6"	101%	13"
Southern	69%	6"	131%	12"
Statewide	60%	6"	111%	13"

***Despite these recent impressive gains in snowpack, on average, a day without snowfall can ultimately result in a 0.5% to 1.0% daily loss in total spring-summer runoff. For example, a strong and persistent high pressure ridge is expected to form across the West next week and as a result, current snowpack will probably decrease. Any dramatic drops in snowpack will be due to rapid sublimation and/or earlier season melting.***

Snow-water equivalent percent to date shows well above normal values over portions of the Cascades (WA & OR), Southern Rockies (CO & NM), and other mountains ranges in AZ & NM. Below normal values exist over the eastern slope of Montana, the Snake River Basin (WY & ID), and over southwestern, central, and northeastern Wyoming (Fig 1b).

**Temperature:** For the past seven days, daily average temperature anomaly were within +/-5F (Figs. 2) with the greatest positive temperature departures over northeastern Montana (>+15F) and the greatest negative temperature departures over southwestern Wyoming (-12F) (Fig. 2a).

**Precipitation:** Preliminary precipitation totals for the 7-day period ending 9 January shows all but the eastern slope of the Rockies received any where between 200 to 800 percent of normal moisture. Little if any precipitation (rain or snow water equivalent) fell over the eastern slope of the Rockies (Fig. 3). For the 2008 Water-Year (started 1 October 2007), Fig. 3a shows above normal

## Weekly Snowpack and Drought Monitor Update Report

totals over much of the West. A few river basins are lower than 90% of normal over Montana, Wyoming, and scattered across Utah, Nevada, and the Sierra.

### WESTERN DROUGHT STATUS

**The West:** A series of fierce storms battered the West this period during January 3-6, with additional rain and snow on January 7 and 8. The storms inflicted the greatest impacts on California, with powerful and damaging winds, heavy rains, and impressive mountain snows. Although the extreme weather adversely affected millions of people, the moisture dramatically improved California's available water. Weekly precipitation totals ranged from 5 to over 10 inches in the Sierra and coastal mountain ranges, with over 2 inches in the northern Central Valley. Four to 6 feet of snow piled up in the Sierra Nevada, with local accumulations as high as 11 feet. The snows resulted in California's snow water equivalent jumping to 111 percent of normal. Big improvements in snow pack have also taken place in Oregon. For the 31-day period from Dec. 9 to Jan. 9, snow water equivalent (from NRCS SNOTEL) in the Willamette Basin of Oregon increased from 45 percent to 159 percent of average, the Rogue/Umpqua basins in SW Oregon from 32 percent to 130 percent of average, and the Klamath Basin east of the Cascades to 109 percent of average from only 24 percent a month ago. Heavy mountain snows and valley rains also affected Arizona, northern New Mexico, Nevada, Utah, and Colorado. Over 2 inches of moisture fell in central Idaho and the Yellowstone area of Wyoming. Drought intensity levels improved by one category in much of southern California, coastal central sections of California, western Nevada, central and southern Utah, and northwestern Arizona. **Author:** [Rich Tinker, Climate Prediction Center, NOAA/NWS](#)

***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. 5 and 5a), 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://www.nifc.gov/information.html>. The latest Observed Fire Danger Class is shown in Figs. 6 shows the current active wildfires across the West - <http://geomac.usgs.gov/>.

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### 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 -

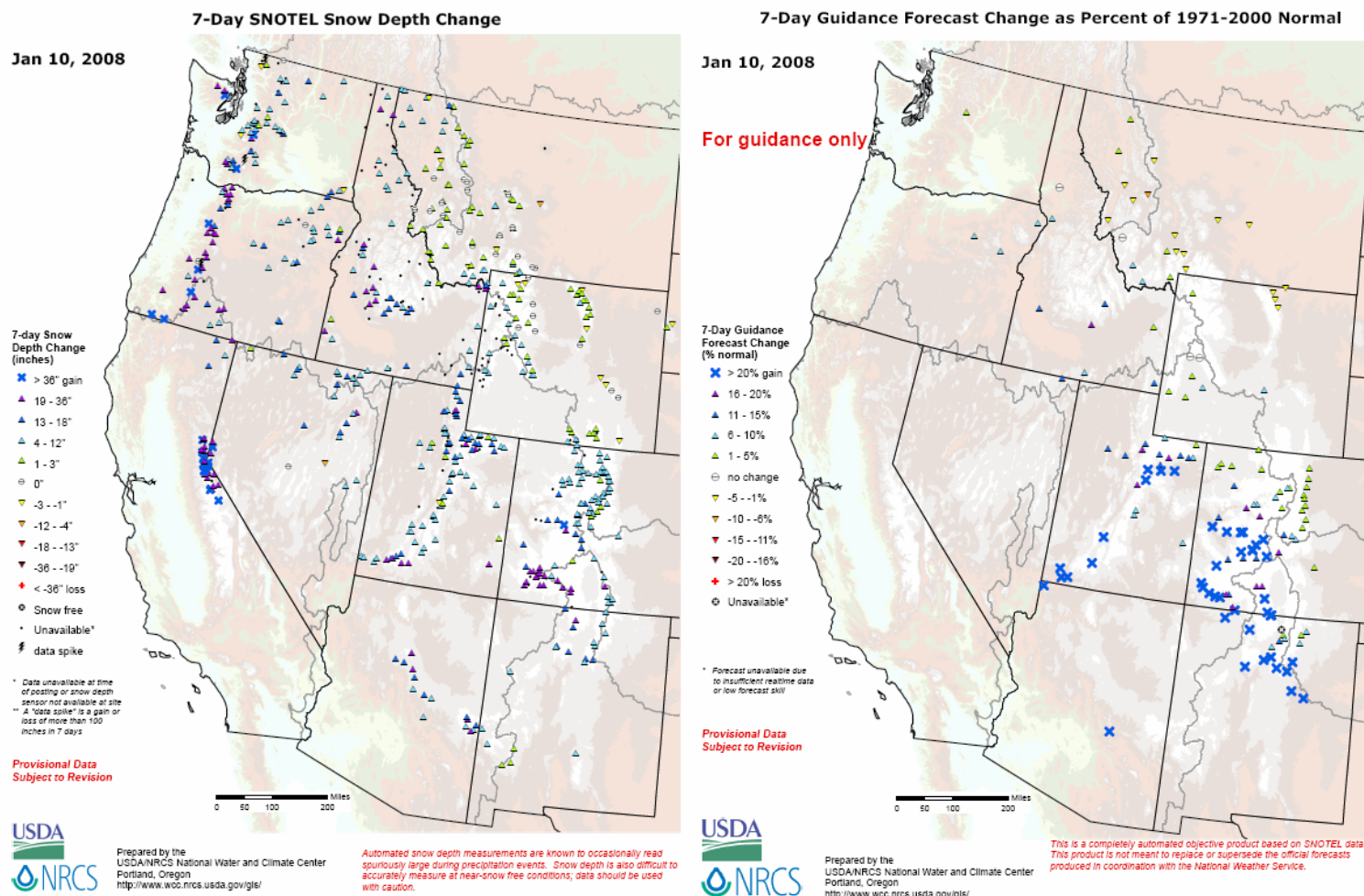
<http://www.wcc.nrcs.usda.gov/water/drought/wdr.pl>

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



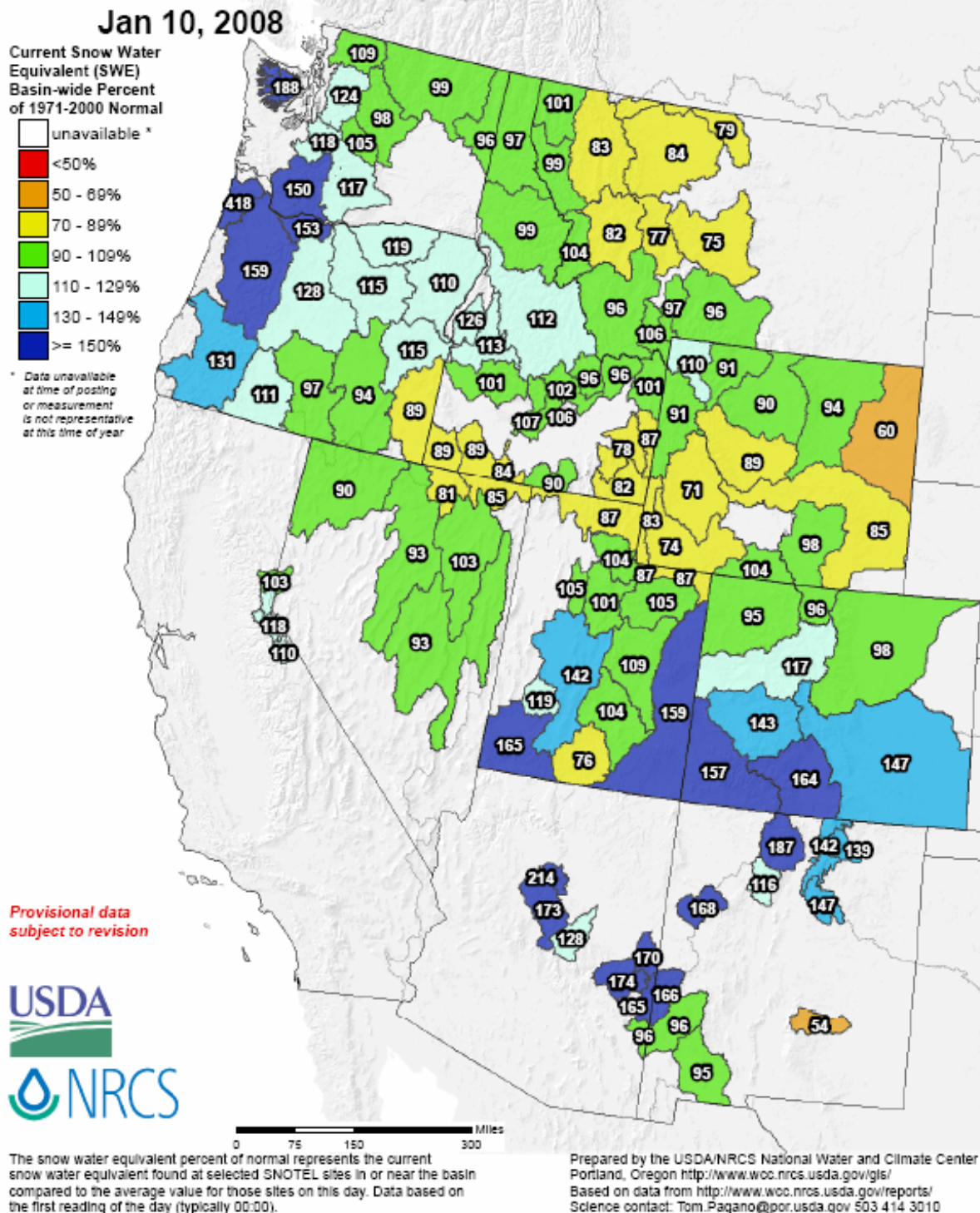
**Fig. 1 and 1a.** During the past week, snowfall accumulations were up significantly across the Cascades, Sierra, Wasatch, and portions of the Southern Rockies (Fig 1). A preliminary >20% forecast increase in spring runoff occurred this week over the Wasatch and South-Central Rockies (Fig. 1a). Note: Forecast values are higher for the Sierra and Cascades but are not shown.

Refs: [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)  
[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)



## Weekly Snowpack and Drought Monitor Update Report

### Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal



**Fig. 1b.** Snow-water equivalent percent to date shows well above normal values over portions of the Cascades (WA & OR), Southern Rockies (CO & NM), and the mountains of AZ & NM. Below normal values exist over the eastern slope of Montana, the Snake River Basin (WY & ID), and over southwestern, central, and northeastern Wyoming.

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

Jan 10, 2008

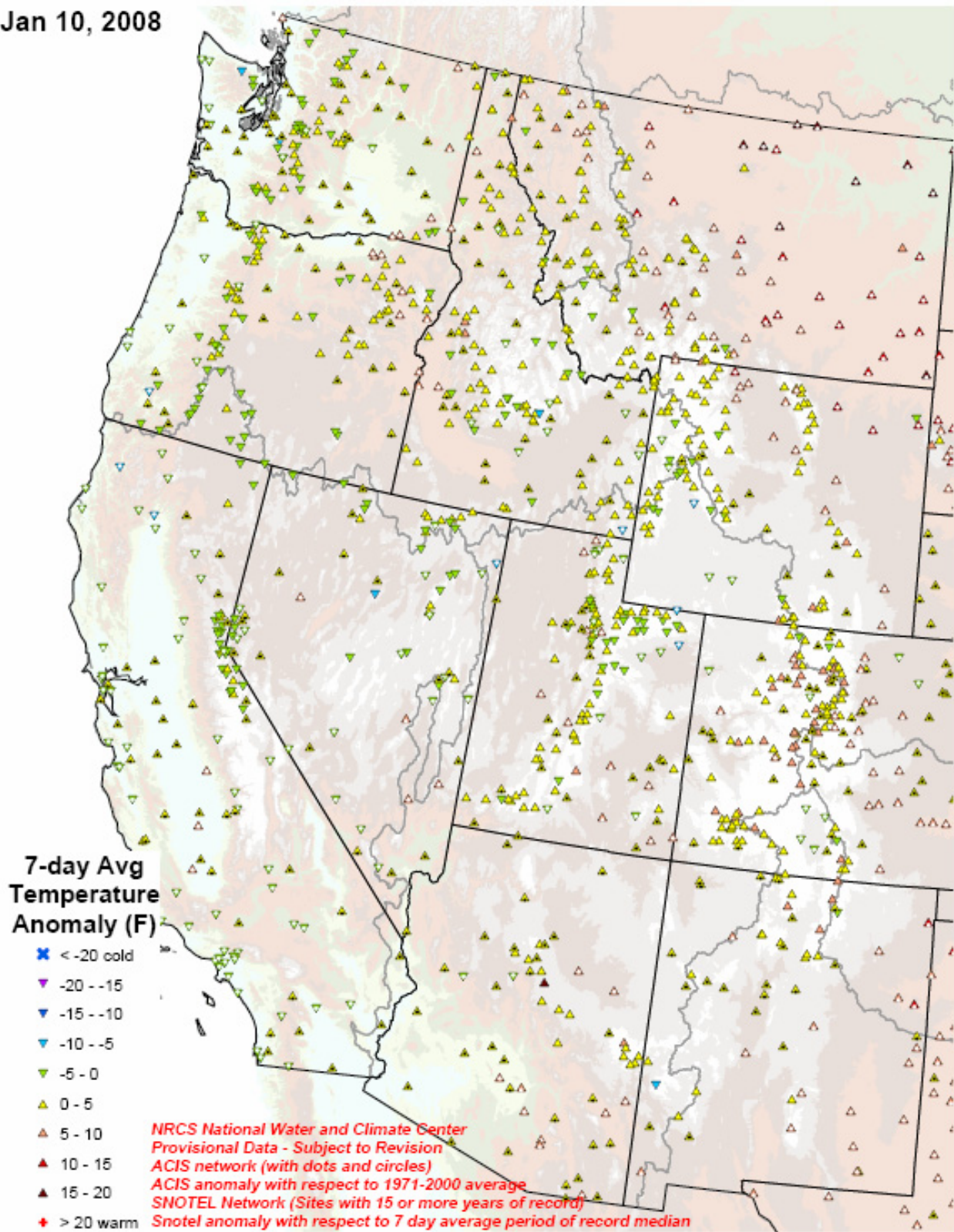
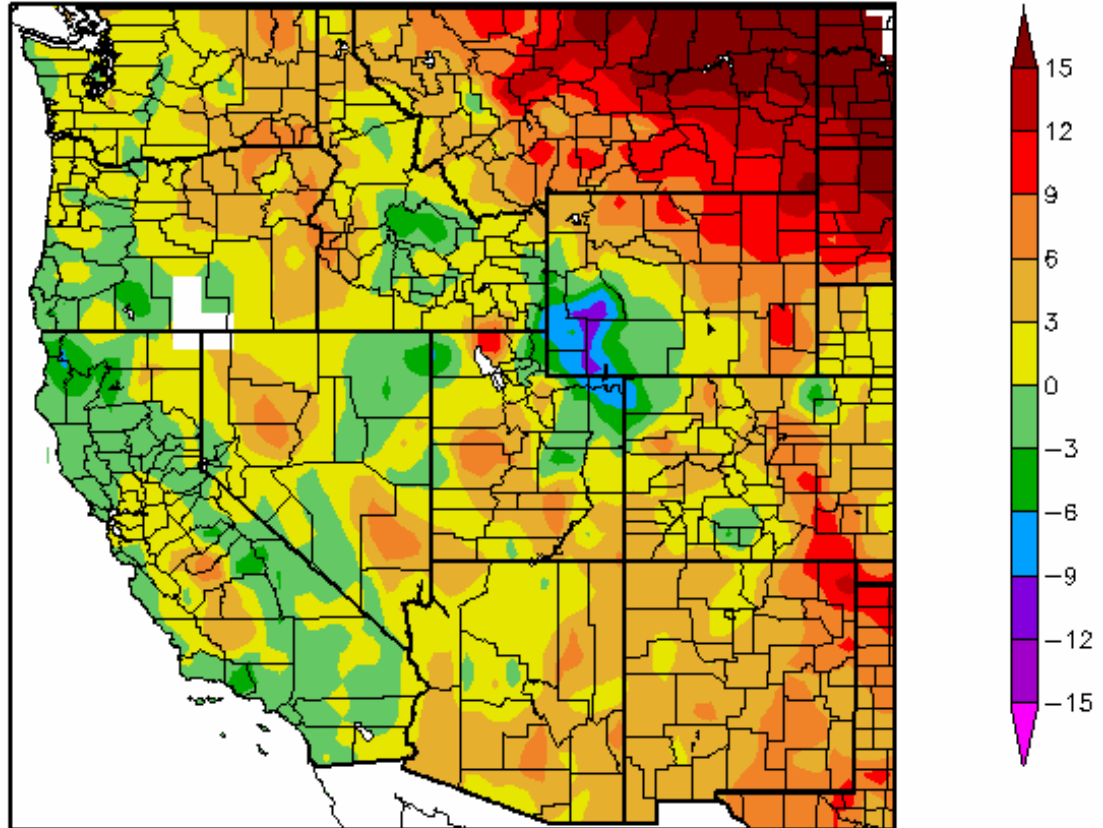


Fig. 2. SNOTEL & ACIS 7-day station daily average temperature anomaly shows within +/- 5F across the West with the exception of warmer departures across the eastern slope of the Rockies.

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

Departure from Normal Temperature (F)  
1/3/2008 – 1/9/2008



Generated 1/10/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

The Current Climate Summary Maps are produced daily using data from the Applied Climate Information System (ACIS). Stations used are from the National Weather Service Cooperative Observer Network (COOP), and the Automated Weather Data Network (AWDN). All near-real-time data are considered preliminary and should be used responsibly.

Normal refers to the 1971-2000 Climate Normal for the selected product.

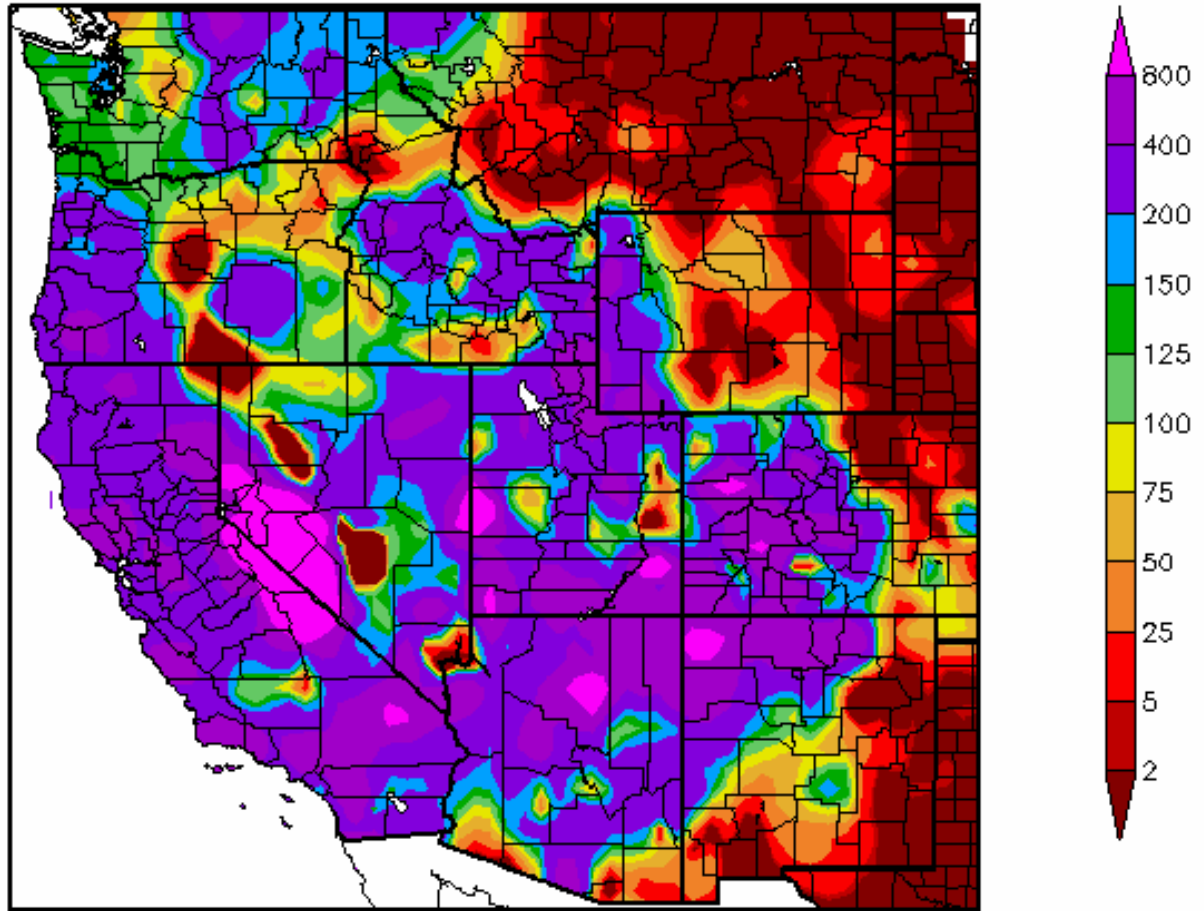


**Fig. 2a. ACIS 7-day average temperature anomaly: Greatest positive temperature departures over northeastern Montana (>15F) and greatest negative temperature departures over southwestern Wyoming (-12F).**

Ref: [http://www.hprcc.unl.edu/maps/index.php?action=update\\_region&region=WRCC](http://www.hprcc.unl.edu/maps/index.php?action=update_region&region=WRCC).



Percent of Normal Precipitation (%)  
1/3/2008 – 1/9/2008



Generated 1/10/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

The Current Climate Summary Maps are produced daily using data from the [Applied Climate Information System \(ACIS\)](#). Stations used are from the National Weather Service Cooperative Observer Network (COOP), and the Automated Weather Data Network (AWDN). All near-real-time data are considered preliminary and should be used responsibly.



Normal refers to the 1971-2000 Climate Normal for the selected product.

**Fig. 3. ACIS 7-day average precipitation anomaly: Preliminary precipitation totals for the 7-day period ending 9 January shows significant precipitation across the West. However, little rain or snow fell over the eastern slope of the Rockies.**

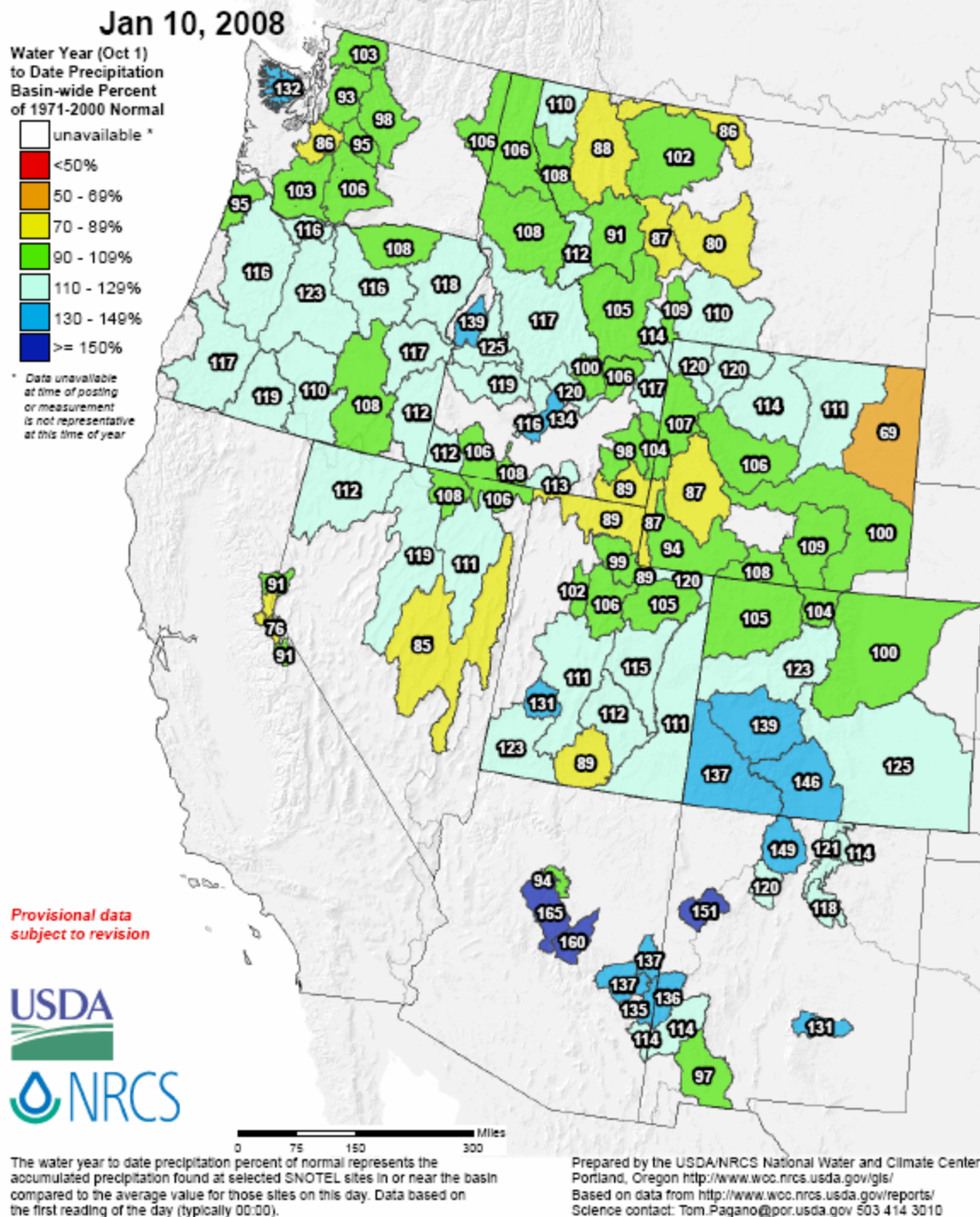
Ref:

[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).



## Weekly Snowpack and Drought Monitor Update Report

### Westwide SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal



**Fig 3a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2008 Water Year that began on October 1, 2007 shows above normal totals over much of the West. A few river basins are lower than 90% of normal over Montana, Wyoming, and scattered across Utah, Nevada, and the Sierra.**

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

January 8, 2008  
Valid 7 a.m. EST

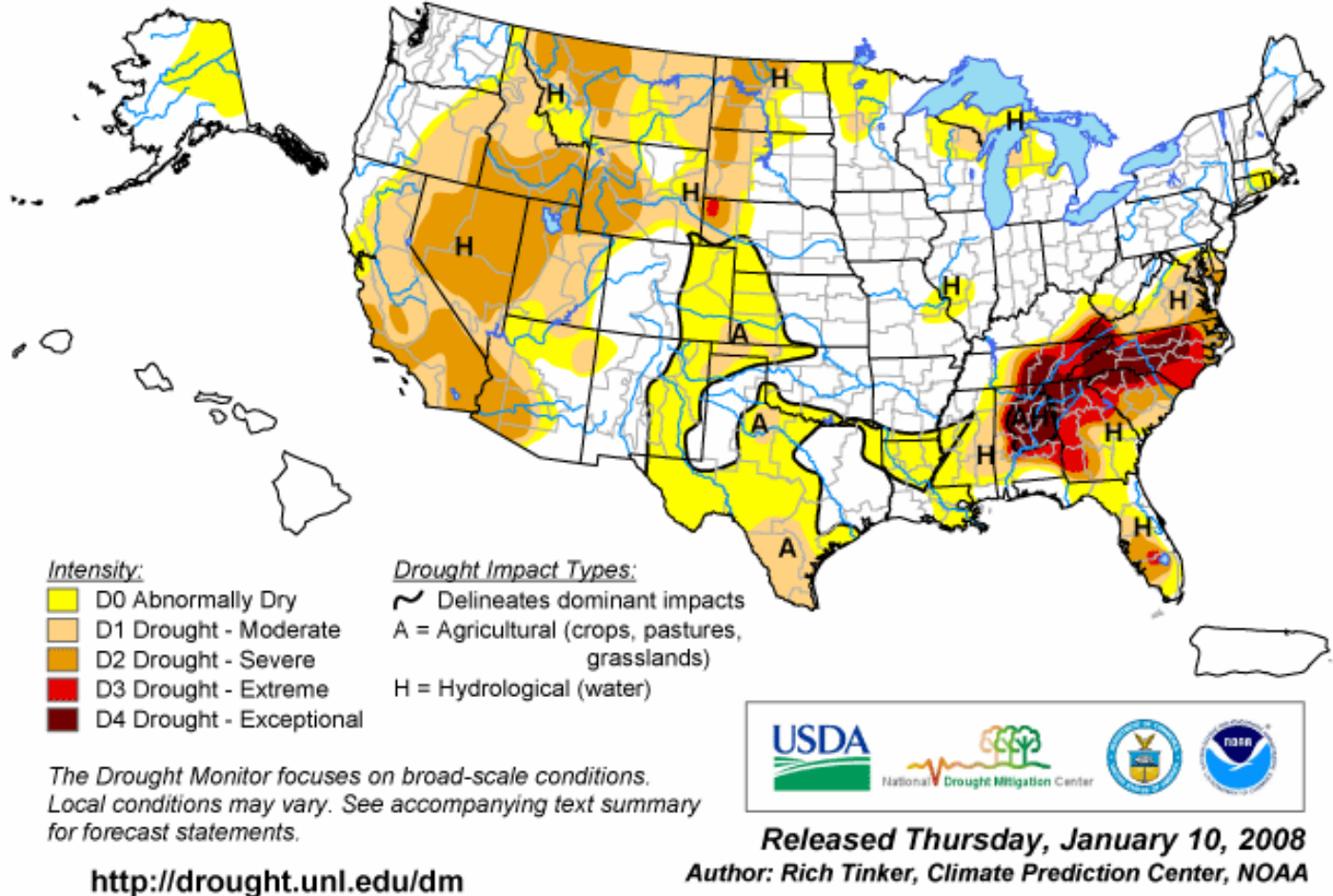


Fig. 4. Current Drought Monitor weekly summary.

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

# U.S. Drought Monitor

## West

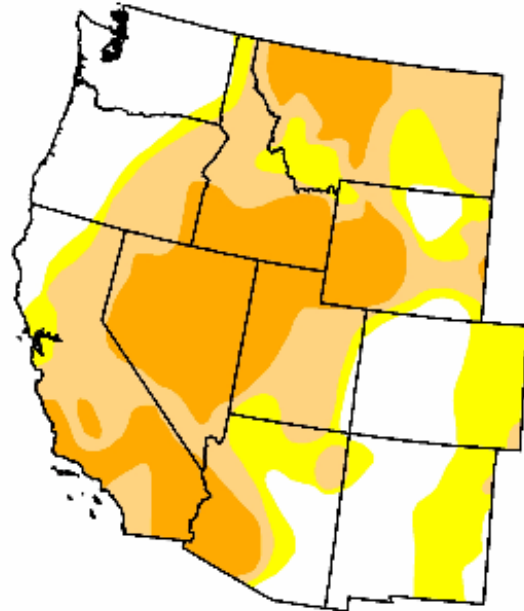
January 8, 2008

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	26.9	73.1	54.9	26.7	0.0	0.0
Last Week (01/01/2008 map)	26.3	73.7	54.7	33.1	2.7	0.0
3 Months Ago (10/16/2007 map)	23.2	76.8	60.9	44.2	12.1	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 (10/02/2007 map)	22.0	78.0	62.3	44.7	12.4	0.0
One Year Ago (01/09/2007 map)	49.1	50.9	26.8	12.5	5.0	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 10, 2008

Author: Rich Tinker, CPC/NOAA

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note that D3 intensities have been dropped since last week.

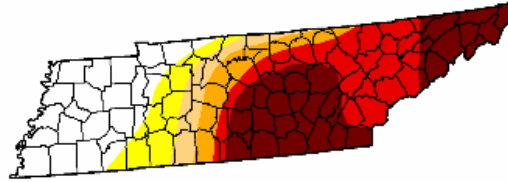
Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)

# U.S. Drought Monitor

## Tennessee

January 8, 2008  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	27.4	72.6	63.3	57.1	49.2	28.8
Last Week (01/01/2008 map)	27.4	72.6	60.8	53.8	46.8	19.9
3 Months Ago (10/16/2007 map)	0.0	100.0	100.0	100.0	99.0	70.5
Start of Calendar Year (01/01/2008 map)	27.4	72.6	60.8	53.8	46.8	19.9
Start of Water Year (10/02/2007 map)	0.0	100.0	100.0	100.0	85.7	61.3
One Year Ago (01/09/2007 map)	48.1	51.9	0.0	0.0	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, January 10, 2008

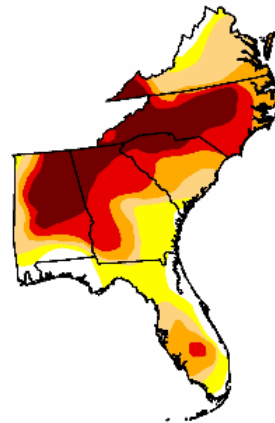
Author: Rich Tinker, CPC/NOAA

# U.S. Drought Monitor

## Southeast

January 8, 2008  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	9.6	90.4	75.1	58.5	41.0	22.0
Last Week (01/01/2008 map)	9.6	90.4	74.3	58.5	41.0	22.0
3 Months Ago (10/16/2007 map)	11.1	88.9	81.1	71.3	51.2	32.6
Start of Calendar Year (01/01/2008 map)	9.6	90.4	74.3	58.5	41.0	22.0
Start of Water Year (10/02/2007 map)	10.1	89.9	77.9	63.8	45.2	24.0
One Year Ago (01/09/2007 map)	59.3	40.7	10.6	1.3	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, January 10, 2008

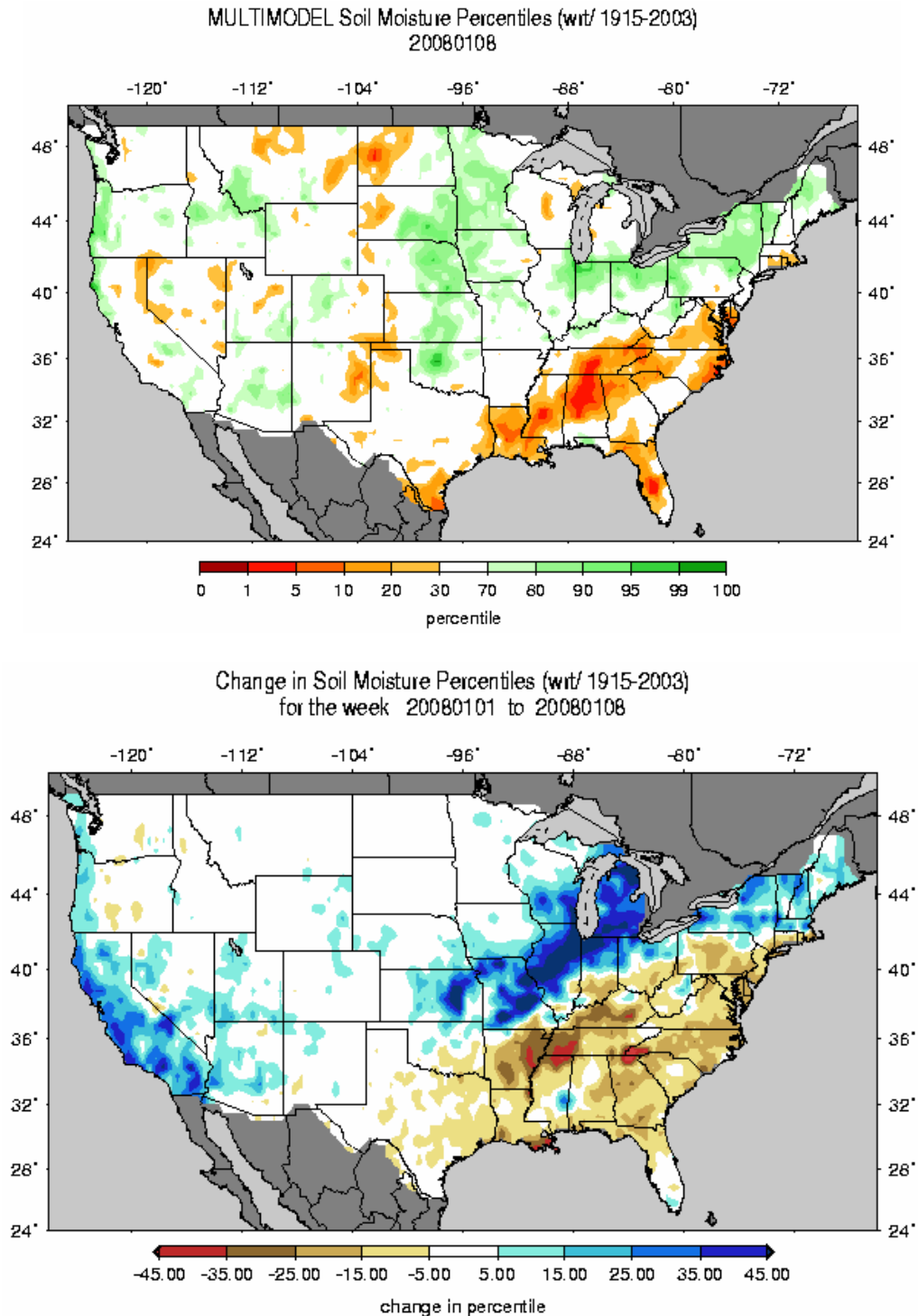
Author: Rich Tinker, CPC/NOAA

**Fig. 4b. Drought Monitor for Tennessee and the Southeastern States with statistics over various time periods shows some of the severest drought conditions in the US. Note expansion of D4 drought intensities for Tennessee but no change over the Southeast during the past week.**

Ref: [http://www.drought.unl.edu/dm/DM\\_state.htm?TN,S](http://www.drought.unl.edu/dm/DM_state.htm?TN,S)  
[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 & 5a: Soil Moisture Ranking and change in percentile based on 1915-2003 climatology for this past week. Note some worsening (drying) over of the Southeast and Mid-Atlantic States and abundant moistening over the upper Mississippi Valley, Ohio Valley, and West Coast (especially California) during the past week. Note: In colder regions of the West, frozen ground suggests incorrect values or missing data.**

Ref: [http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.multimodel.sm\\_qnt.gif](http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.multimodel.sm_qnt.gif)  
[http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.sm\\_qnt.1wk.gif](http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.sm_qnt.1wk.gif).

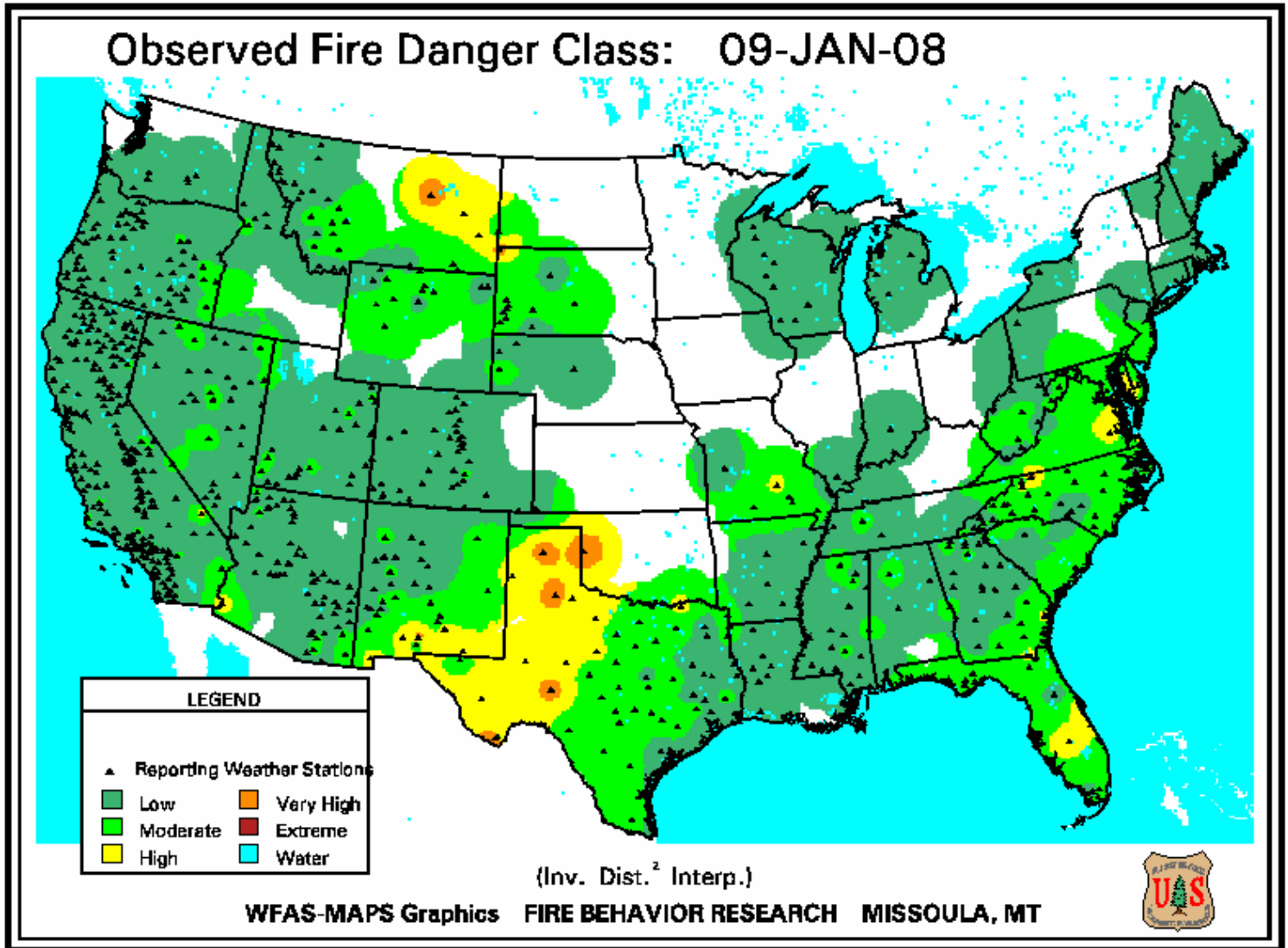
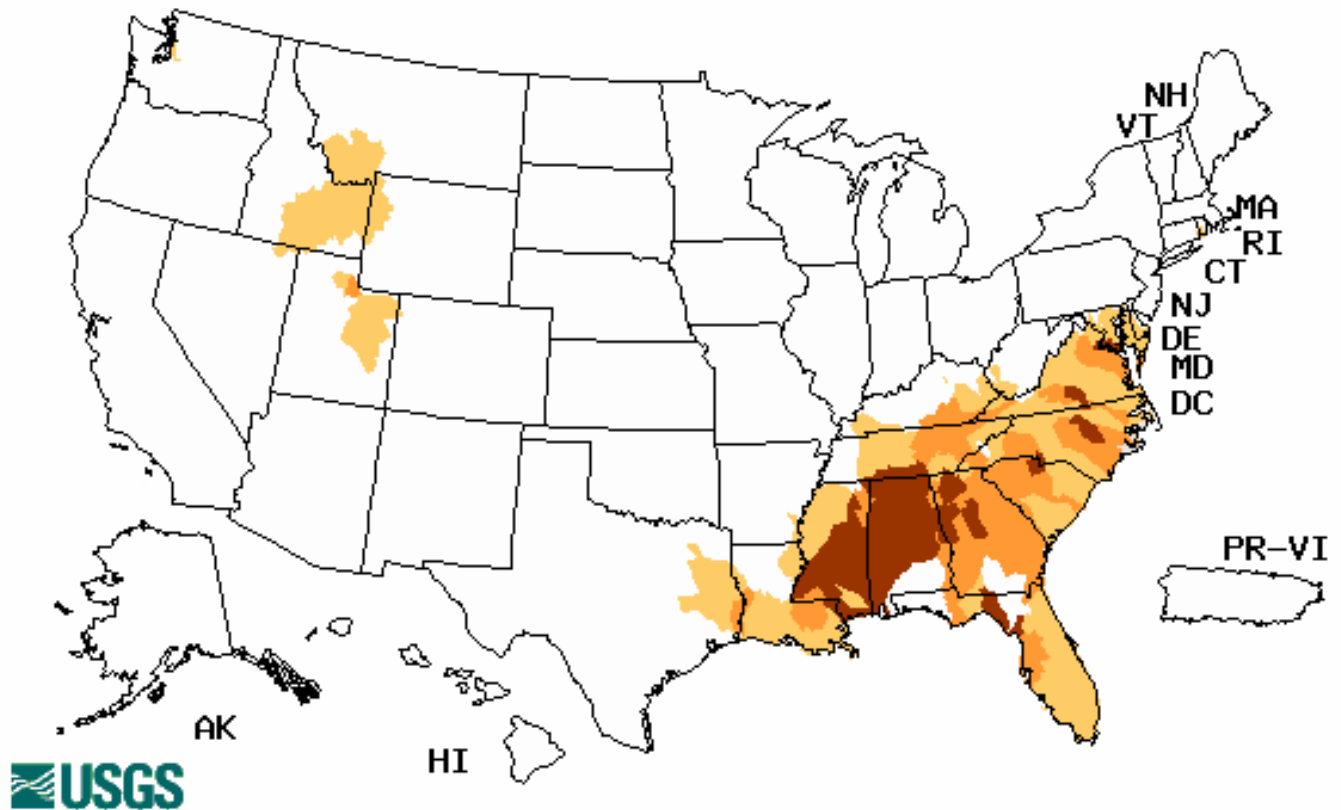


Fig. 6. Observed Fire Danger Class as of 2 January.  
Source: Forest Service Fire Behavior Research – Missoula, MT.  
Ref: [http://www.fs.fed.us/land/wfas/fd\\_class.gif](http://www.fs.fed.us/land/wfas/fd_class.gif)

## Weekly Snowpack and Drought Monitor Update Report

Wednesday, January 09, 2008



Explanation - Percentile classes				
Low	$\leq 5$	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

**Fig. 7.** This week's map shows continued low stream flows over the Southeast and Mid-Atlantic States. Values over the colder regions of the West and northern states are probably missing due to river icing and freeze-up.

Ref: USGS <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary -- January 8, 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/>.*

**The West:** A series of fierce storms battered the West this period during January 3-6, with additional rain and snow on January 7 and 8. The storms inflicted the greatest impacts on California, with powerful and damaging winds, heavy rains, and impressive mountain snows. Although the extreme weather adversely affected millions of people, the moisture dramatically improved California's available water. Weekly precipitation totals ranged from 5 to over 10 inches in the Sierra and coastal mountain ranges, with over 2 inches in the northern Central Valley. Four to 6 feet of snow piled up in the Sierra Nevada, with local accumulations as high as 11 feet. The snows resulted in California's snow water equivalent jumping to 111 percent of normal. Big improvements in snow pack have also taken place in Oregon. For the 31-day period from Dec. 9 to Jan. 9, snow water equivalent (from NRCS SNOTEL) in the Willamette Basin of Oregon increased from 45 percent to 159 percent of average, the Rogue/Umpqua basins in SW Oregon from 32 percent to 130 percent of average, and the Klamath Basin east of the Cascades to 109 percent of average from only 24 percent a month ago. Heavy mountain snows and valley rains also affected Arizona, northern New Mexico, Nevada, Utah, and Colorado. Over 2 inches of moisture fell in central Idaho and the Yellowstone area of Wyoming. Drought intensity levels improved by one category in much of southern California, coastal central sections of California, western Nevada, central and southern Utah, and northwestern Arizona.

**The Plains:** Continued dry weather led to merging of the D1 drought areas in southern Texas and expansion of the D0 in southwestern Texas and along the central Texas coast. Farther north, D2 drought expanded in southwestern North Dakota.

**Midwest:** The heavy rains that led to the unusual January tornado outbreak eliminated the D1 drought in eastern Missouri and adjacent Illinois. One to 3 inches of rain fell from northeastern Oklahoma into Illinois and northern Indiana. Totals exceeding 5 inches brought streams over their banks in Illinois and Indiana.

**Southeast and Mid-Atlantic:** Rainfall totals less than 1 inch resulted in little change to the drought status across the Southeast as well as the mid-Atlantic. Preliminary rankings issued by the National Climatic Data Center show that in 2007 North Carolina experienced its driest year in 113 years of record-keeping. Tennessee had its second driest year, Alabama its third, and Georgia its fourth.

**Northeast:** D0 dryness lingered over southern New England as wells remained low in parts of the tri-state area.

**Alaska, Hawaii, and Puerto Rico:** Additional moderate to heavy rains eliminated remaining D0 areas in Hawaii. There was no change to the D0 area in Alaska, as snowfall amounts were modest.



## Weekly Snowpack and Drought Monitor Update Report

**Looking Ahead:** Weather conditions that could affect dry or drought areas over the next 2 weeks include: 1) a cold front on January 10-11 and coastal low on January 13-14 bringing widespread rain to the Southeast, resulting in 5-day forecast amounts during January 9-14 exceeding 1 inch in Alabama, northern Georgia, coastal areas of the Carolinas, and much of Virginia, Delaware, and Maryland; 2) Pacific weather systems spreading rain and snow across the Northwest during the first 5 days, with over 1 inch of liquid precipitation in the higher elevations, but the Southwest mostly dry and the forecast storms hitting the Northwest much weaker than the recent storms; 3) the 6-10 day and week 2 forecasts indicating below-normal precipitation for most of the West and the mid-Atlantic region, but above-normal rains for southern Texas.

**Author:** [Rich Tinker, Climate Prediction Center, NOAA/NWS](#)

### **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 January 9, 2008