

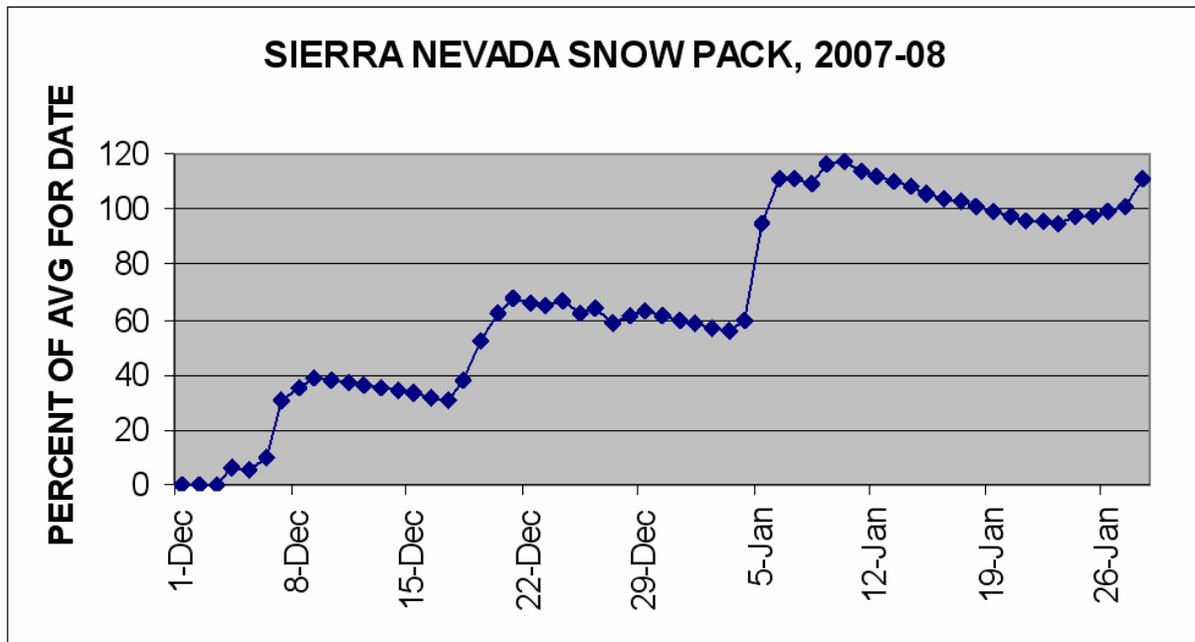


Natural Resources Conservation Service  
 P.O. Box 2890  
 Washington, D.C. 20013

**Weekly Report - Snowpack / Drought Monitor Update**      **Date:**    **January 31, 2008**

**SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** During the past week, snowfall accumulations were up significantly across all but the Eastern Slope of the Northern Rockies. An increase in excess of 20% in forecasted spring-summer runoff occurred this week over the southern Utah, southern Colorado and northern New Mexico (Fig 1). 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 Arizona, New Mexico and Utah. Below normal values exist over the Great Basin (NV and ID), and over much of Wyoming and extreme southwest New Mexico (Fig. 1a).



**Source:** California Department of Water Resources, California Data Exchange Center

This slide depicts how the Sierra Nevada has benefited from four stormy periods since December 1. However, the April 1st snowpack percent of average for California is only 68% of normal. For more details as of 30 January 2008, see: <http://cdec.water.ca.gov/cgi-progs/snow/DLYSWEQ.20080130>.

**Temperature:** For the past seven days, station average temperature anomaly shows most stations in the West were between -5F to -10F (below normal) with coldest departures over the Cascades and Northern Plains (Fig. 2). The greatest negative temperature departures is over Washington (>-15F) and the greatest positive departures is over the Colorado (>+6F) (Fig. 2a).

**Precipitation:** Preliminary precipitation totals for the 7-day period ending 30 January shows significant increase in precipitation across much of the West as compared to last week's report. The Eastern Plains also experienced a reversal from the previous week with significantly less precipitation falling (Fig. 3). Seasonal precipitation (rain & snow water equivalent) as a percent of

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve maintain and improve our natural resources and environment

## Weekly Snowpack and Drought Monitor Update Report

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, Utah, Nevada, Oregon, and Washington. Values are up 15% or more from last week's map over the Southern Rockies and Southwest (Fig. 3a).

### WESTERN DROUGHT STATUS

**The Rockies, Intermountain West, and Far West:** A strong, slow-moving, meandering upper-air low off the California coast funneled subtropical moisture into much of the Southwest while unseasonably cold air remained entrenched over the West. This resulted in very heavy rains along the central and southern California coast (11 to 12 inches near Santa Barbara and Ojai), heavy low-elevation snows in southern California, Sierra Nevada, and southern Intermountain Plateau, and widespread, moderate to heavy precipitation throughout California, western and southern Nevada, Arizona, and southern Utah. In California's Sierra Nevada, the NRCS average basin water year-to-date precipitation rose in one week from 79-82% to 90-98%, and the snow water content went from 86-98% to 100-114%. Accordingly, much of California saw a 1-category improvement, with a 2-category improvement near Santa Barbara where a foot of rain fell. The few areas that remained status-quo (D2) were the southern San Joaquin Valley near Bakersfield and extreme southeastern California. Rainfall was much lower in both areas, with a rain shadow affecting the southern San Joaquin Valley (totals ranged from 0.2 to 1 inch). With totals less than 0.5 inch in the desert Southwest, long-term deficits (6-months and longer) still remained. In Arizona, this was the fourth major system to hit the state this water year, and with top soils already moist, the heavy rains (2 to 6 inches) produced widespread flash flooding. Even arid desert locations in the southwest and west-central received 0.5 to 1 inch (normal annual totals are 3 to 7 inches), and ample standing water was reported. This also warranted a general 1-category improvement across the state. For the three central Arizona basins, the Jan. 29 NRCS average snow water content was 134-170%, and Oct. 1-Jan. 29 precipitation was 128-170%. According to WFO Phoenix, water was being spilled from the Verde River reservoirs, and with snowmelt runoff this spring, these reservoirs will be effectively at capacity through at least the end of May. Runoff from this storm and future snowmelt will fill the Salt River reservoirs, including Roosevelt Lake, with both the Verde and Salt reservoirs major water suppliers to Phoenix. In addition to the Southwestern storm, another late-week system brought light to moderate precipitation to the Northwest and northern Rockies, maintaining conditions there.

In addition, the recent spate of precipitation required a re-examination of short-term wetness versus long-term drought, especially in data-sparse areas. For long-term hydrologic drought, 12- and 24-months precipitation and SPI values were compared with 6-months and less periods. The results from this included expanded long-term severe drought (D2) in northeastern California and south-central Oregon, and some improvement in southwestern Nevada and southwestern Utah. Moderate drought (D1) was left along parts of the California coast, namely south of Los Angeles (Orange County) and in southern San Luis Obispo and northern Santa Barbara, which have missed out on the heavier rains that surrounding locations have observed. A more complete analysis of the West can be made in early February when additional information becomes available in the February 1 Western Snow Pack Conditions and Water Supply Forecasts. Author: [David Miskus, Joint Agricultural Weather Facility, CPC/NCEP/NWS/NOAA](#)

***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, 4b, and 4c).

### **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/>.

### **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 the 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/>

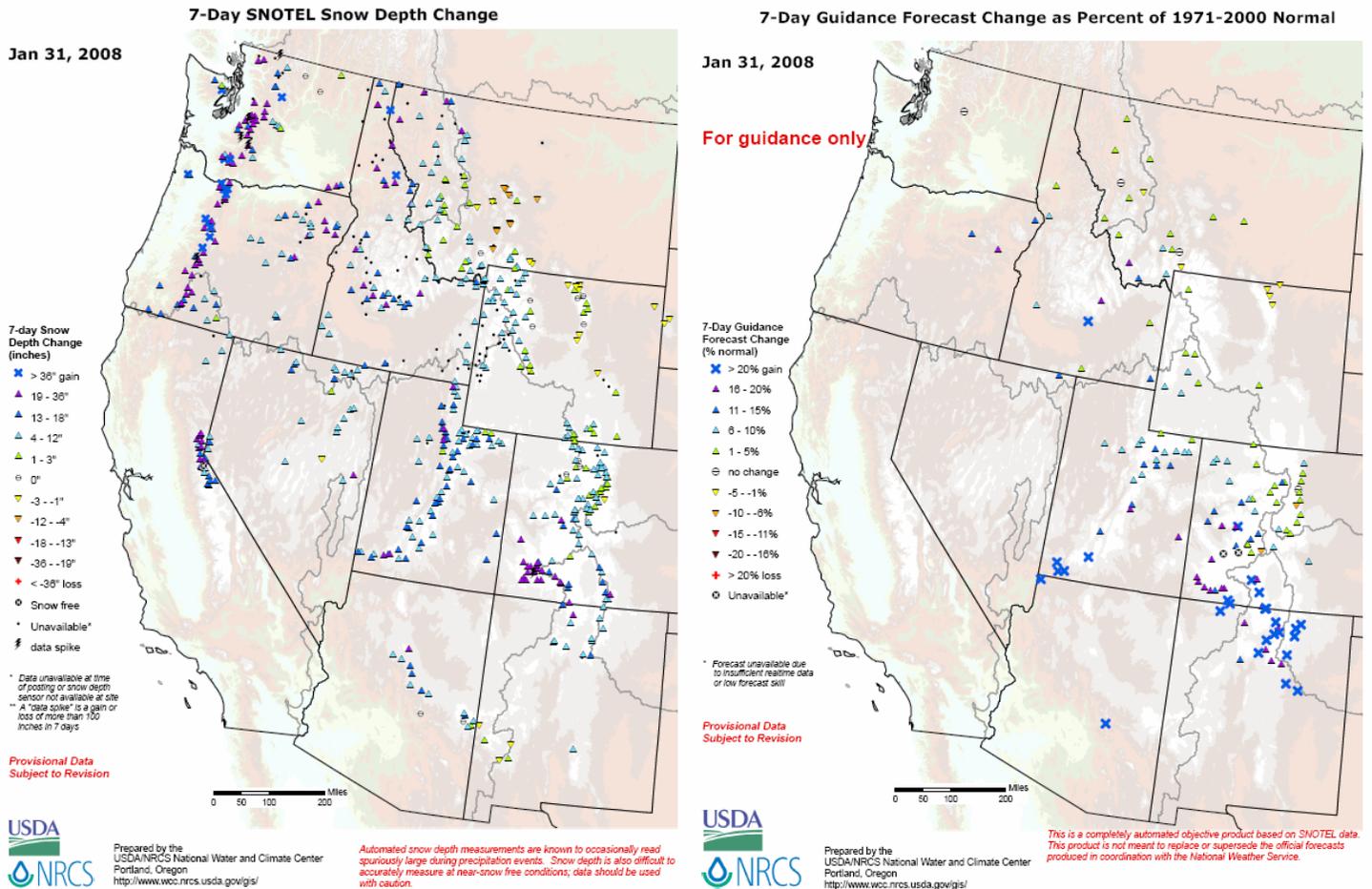
### **FOR MORE INFORMATION**

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

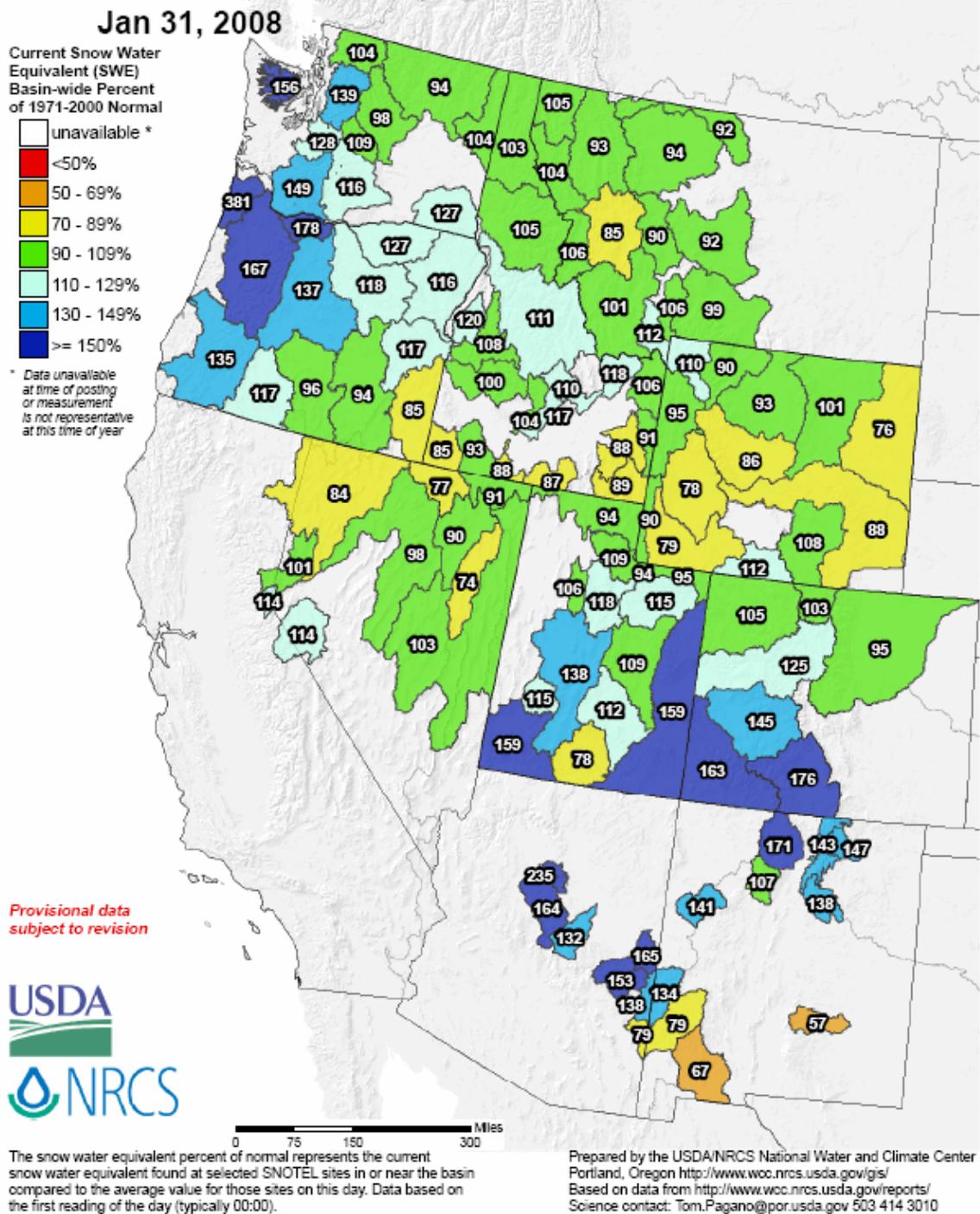


**Fig. 1. During the past week, snowfall accumulations were up significantly across all but the Eastern Slope of the Northern Rockies (left figure). A preliminary forecast increase in excess of 20% in spring-summer runoff occurred this week over the southern Utah, southern Colorado and northern New Mexico (right figure). Note: Forecast values 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. 1a. 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 Arizona, New Mexico and Utah. Below normal values exist over the Great Basin (NV and ID), and over much of Wyoming and extreme southwest New Mexico.**

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)

Jan 31, 2008

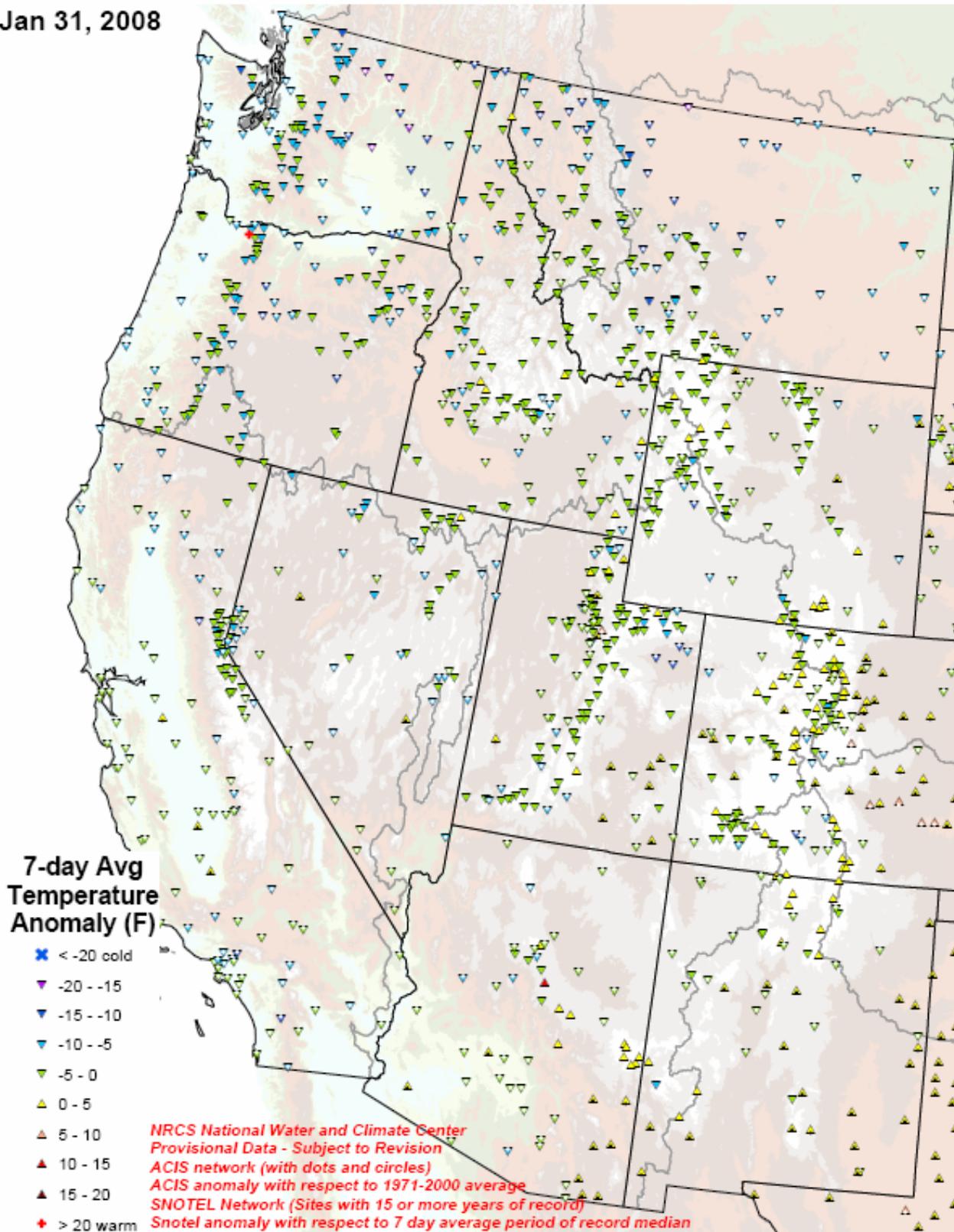
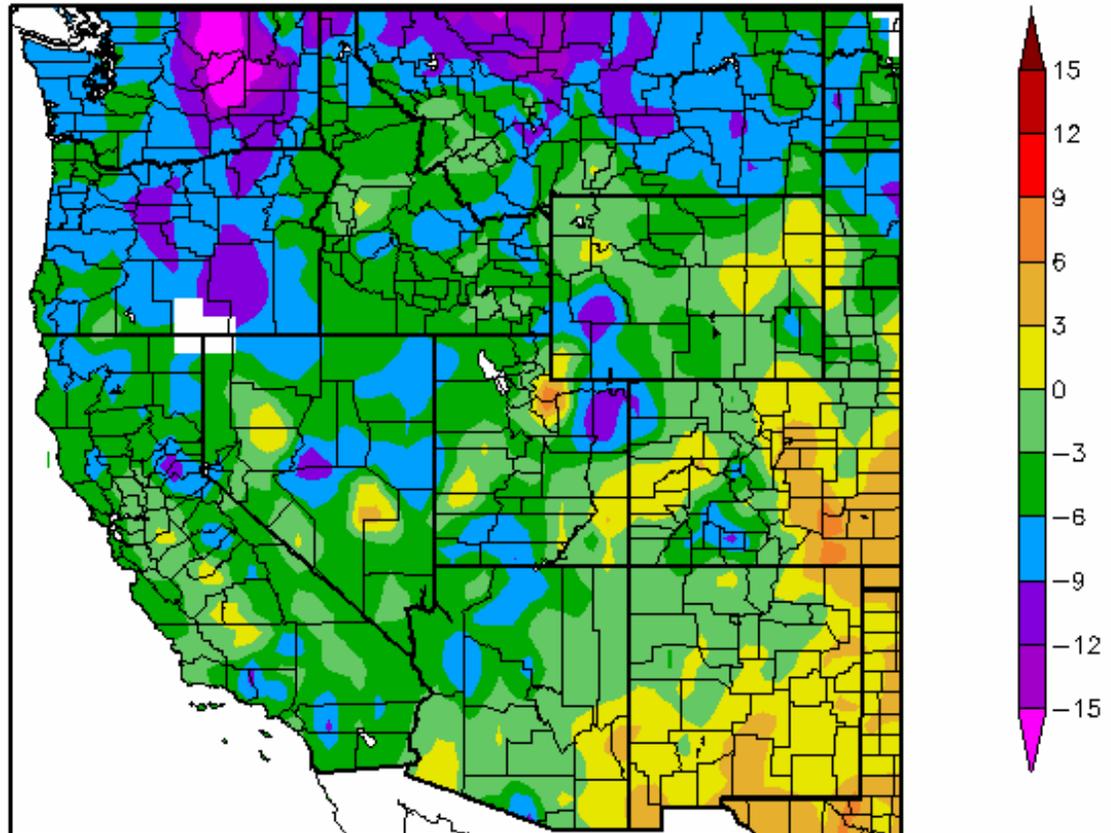


Fig. 2. SNOTEL & ACIS 7-day station average temperature anomaly shows most stations in the West were between -5F to -10F (below normal) with coldest departures over the Cascades and Northern Plains.

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

Departure from Normal Temperature (F)  
1/24/2008 – 1/30/2008



Generated 1/31/2008 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.

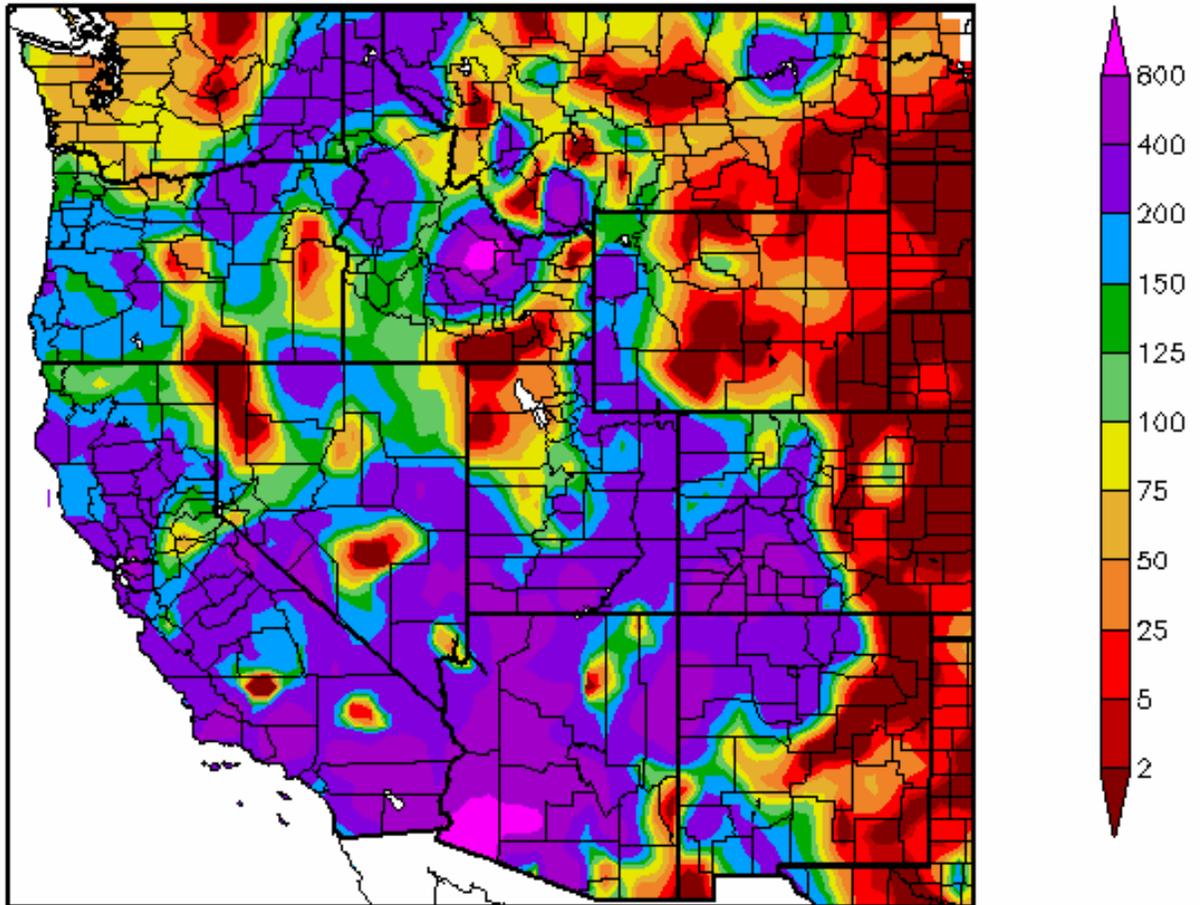
Normal refers to the 1971-2000 Climate Normal for the selected product.



**Fig. 2a. ACIS 7-day average temperature anomaly: Greatest negative temperature departures over Washington (>-15F) and greatest positive departures over the Colorado (>+6F).**

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 (%)  
1/24/2008 – 1/30/2008



Generated 1/31/2008 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.



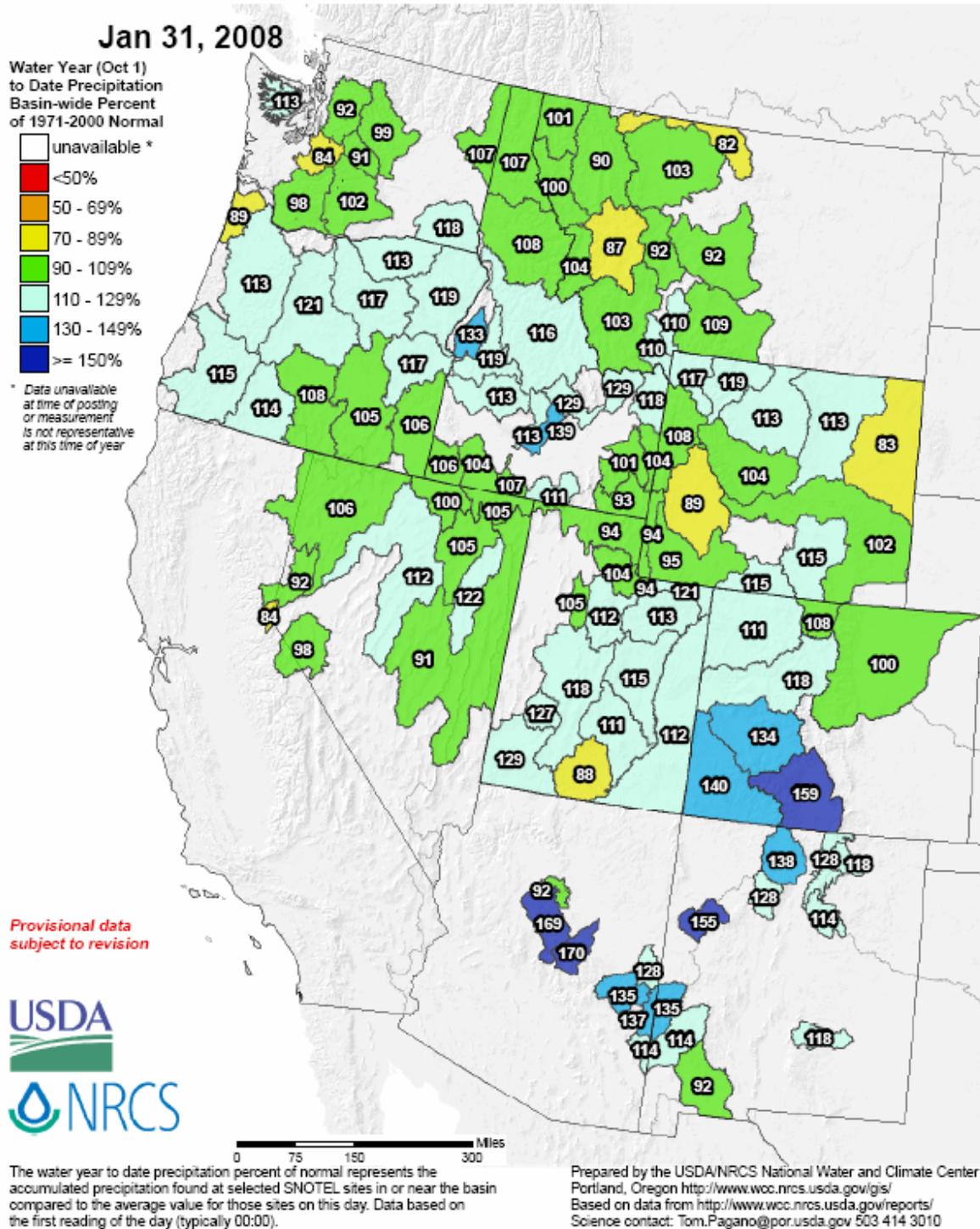
Normal refers to the 1971-2000 Climate Normal for the selected product.

**Fig. 3. ACIS 7-day average precipitation anomaly: Preliminary precipitation totals for the 7-day period ending 30 January shows significant increase in precipitation across much of the West as compared to last week's report. The Eastern Plains also experienced a reversal from the previous week with significantly less precipitation falling.**

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, Oregon, and Washington. Values are up 15% or more from last week's map over the Southern Rockies and Southwest.**

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 29, 2008  
Valid 7 a.m. EST

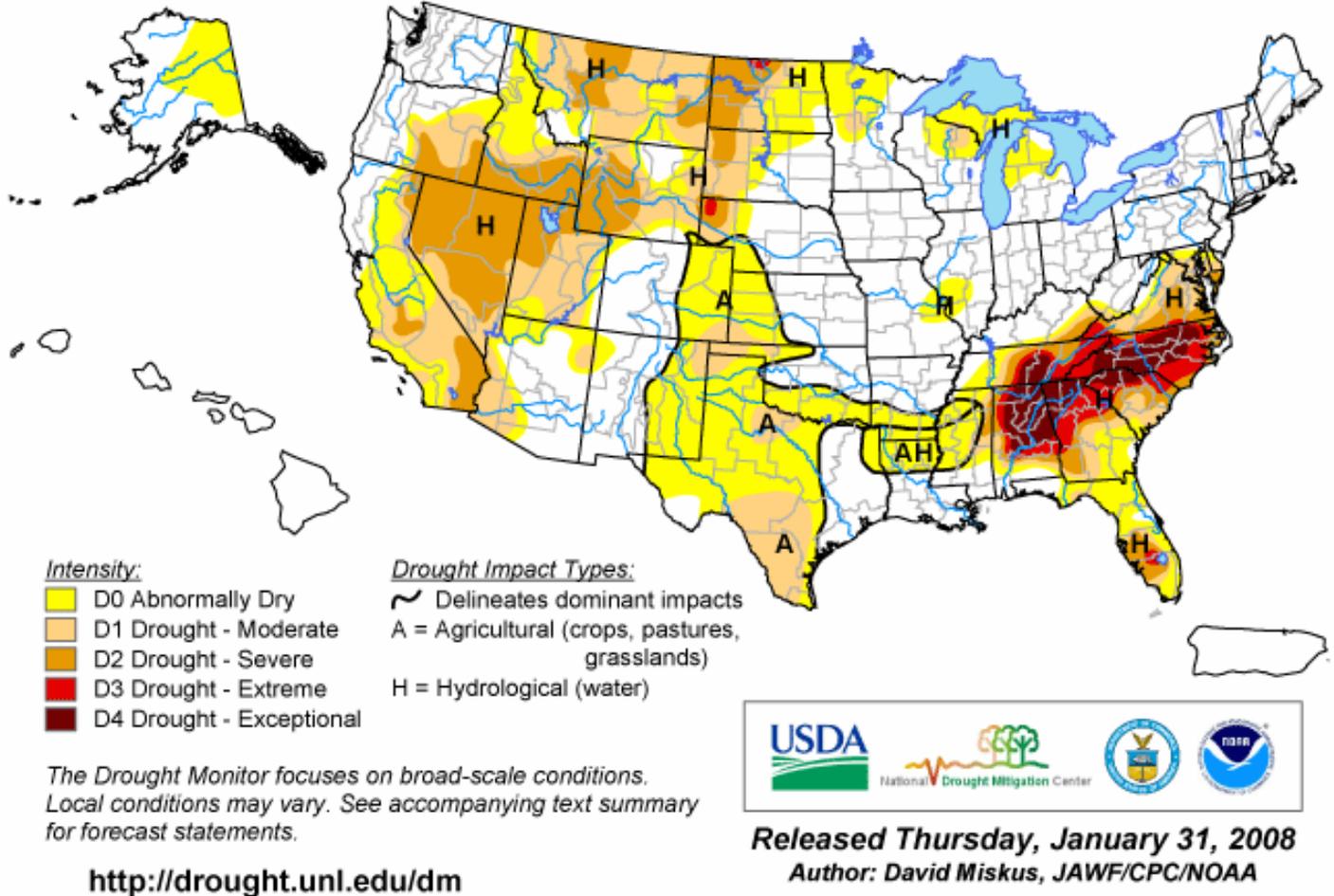
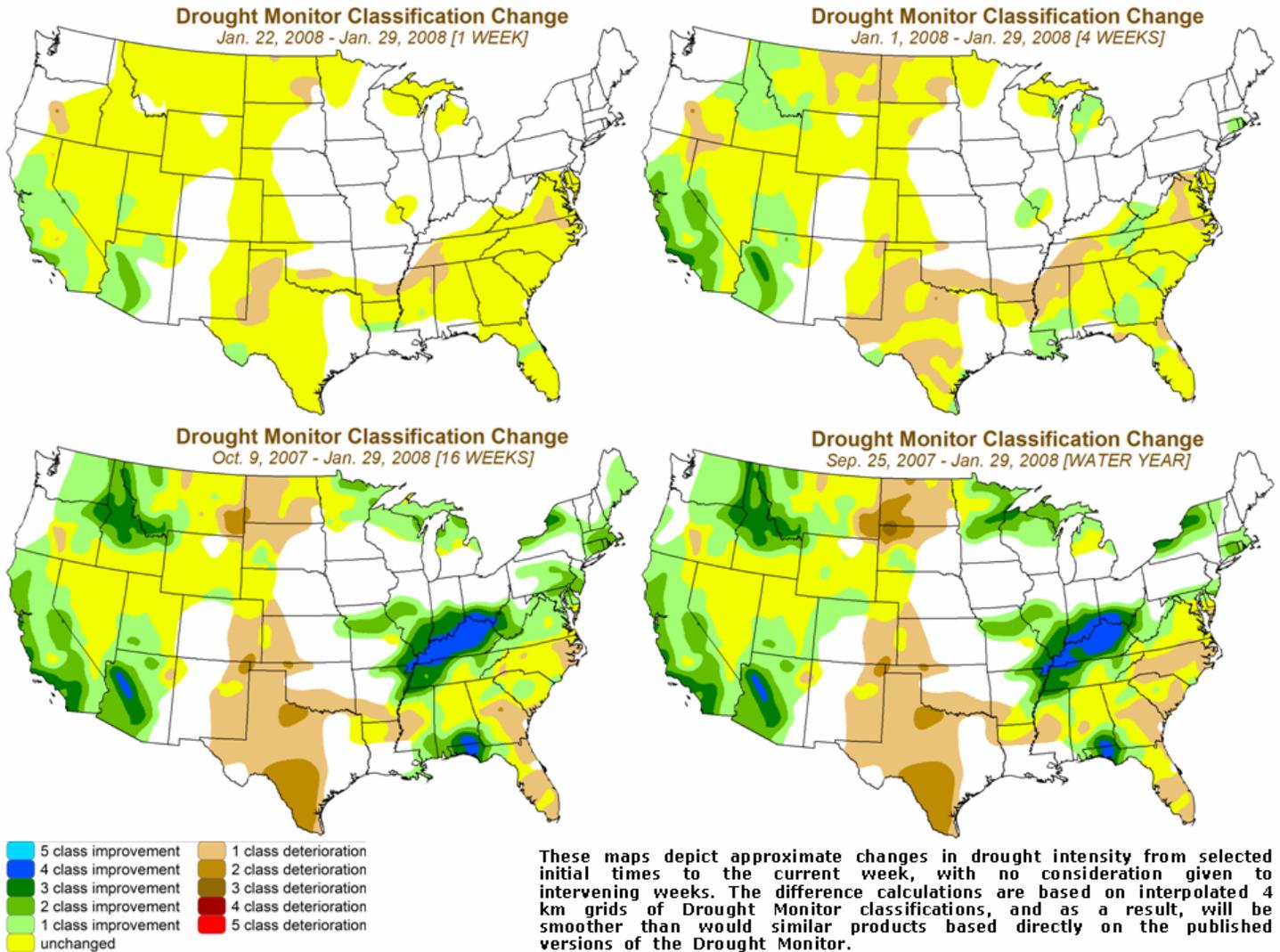


Fig. 4. Current Drought Monitor weekly summary.

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

## Weekly Snowpack and Drought Monitor Update Report



**Fig. 4a. Drought Monitor classification changes during several time periods. Note the recent improvement over California and Arizona and longer term improvement over Kentucky and northern Idaho.**

Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/dm-change-4maps.png>

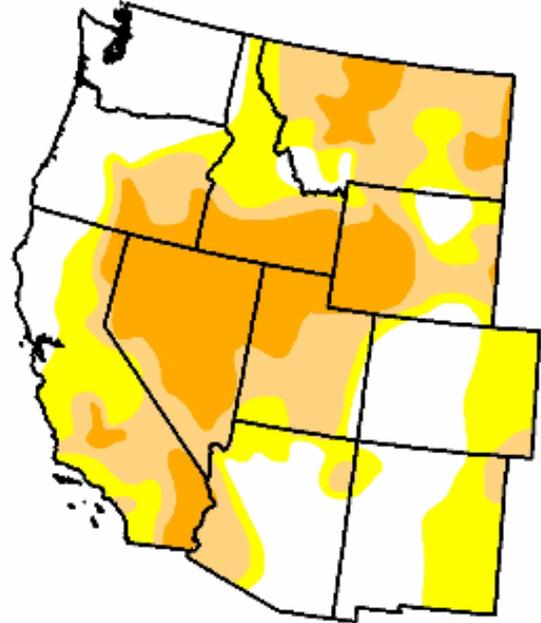
# U.S. Drought Monitor

## West

January 29, 2008  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	31.7	68.3	44.6	20.9	0.0	0.0
Last Week (01/22/2008 map)	28.7	71.3	51.8	26.2	0.0	0.0
3 Months Ago (11/06/2007 map)	27.3	72.7	57.5	41.5	10.0	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 (01/30/2007 map)	45.1	54.9	32.6	16.4	5.0	0.0



**Intensity:**

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

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



Released Thursday, January 31, 2008

Author: David Miskus, JAWF/CPC/NOAA

Fig. 4b. Drought Monitor for the Western States with statistics over various time periods. Note some improvement since last week.

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

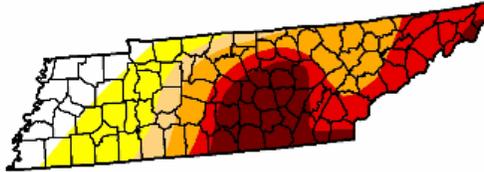
# U.S. Drought Monitor

## Tennessee

January 29, 2008  
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	14.5	85.5	67.1	59.9	39.7	17.9
Last Week (01/22/2008 map)	27.4	72.6	63.3	57.2	38.6	17.8
3 Months Ago (11/06/2007 map)	17.7	82.3	66.3	61.2	50.3	35.1
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 (01/30/2007 map)	76.0	24.0	0.0	0.0	0.0	0.0



**Intensity:**

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

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



Released Thursday, January 31, 2008  
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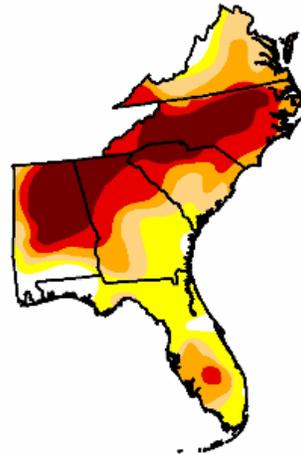
# U.S. Drought Monitor

## Southeast

January 29, 2008  
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	7.3	92.7	72.8	57.8	39.2	21.3
Last Week (01/22/2008 map)	6.3	93.7	73.8	54.5	37.4	20.2
3 Months Ago (11/06/2007 map)	13.8	86.2	67.7	48.6	32.7	20.4
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 (01/30/2007 map)	74.1	25.9	11.2	3.2	0.0	0.0



**Intensity:**

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

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



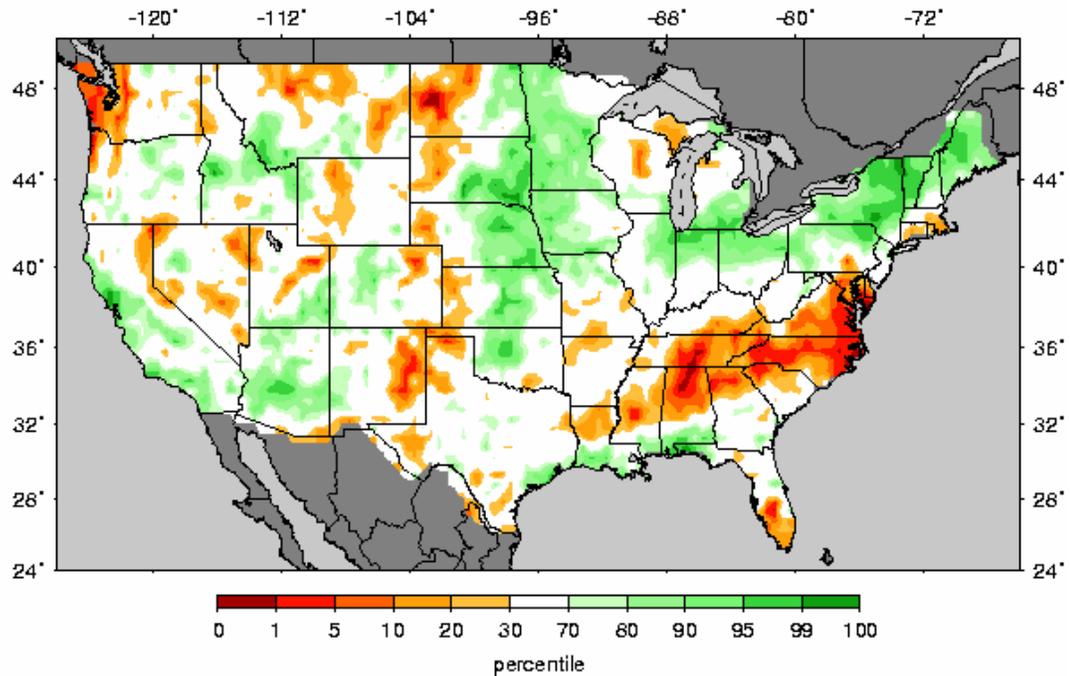
Released Thursday, January 31, 2008  
Author: David Miskus, JAWF/CPC/NOAA

**Fig. 4c. 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 some drought intensification for Tennessee and the Southeast during the past week.**

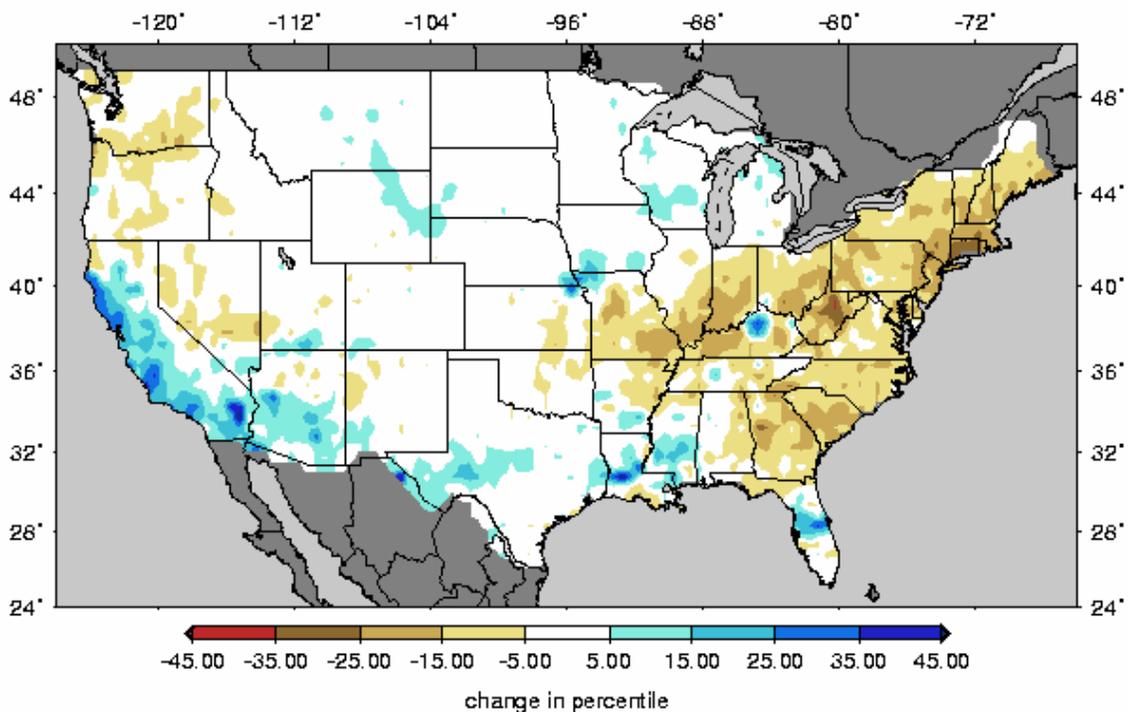
Ref: [http://www.drought.unl.edu/dm/DM\\_state.htm?TN,S](http://www.drought.unl.edu/dm/DM_state.htm?TN,S)  
[http://www.drought.unl.edu/dm/DM\\_southeast.htm](http://www.drought.unl.edu/dm/DM_southeast.htm)

# Weekly Snowpack and Drought Monitor Update Report

MULTIMODEL Soil Moisture Percentiles (wrt/ 1915-2003)  
20080128



Change in Soil Moisture Percentiles (wrt/ 1915-2003)  
for the week 20080122 to 20080129



**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 Eastern US and some improvement over the California and New Mexico during the past week. Remark: In colder regions of the West, frozen ground suggests incorrect values or missing data.**

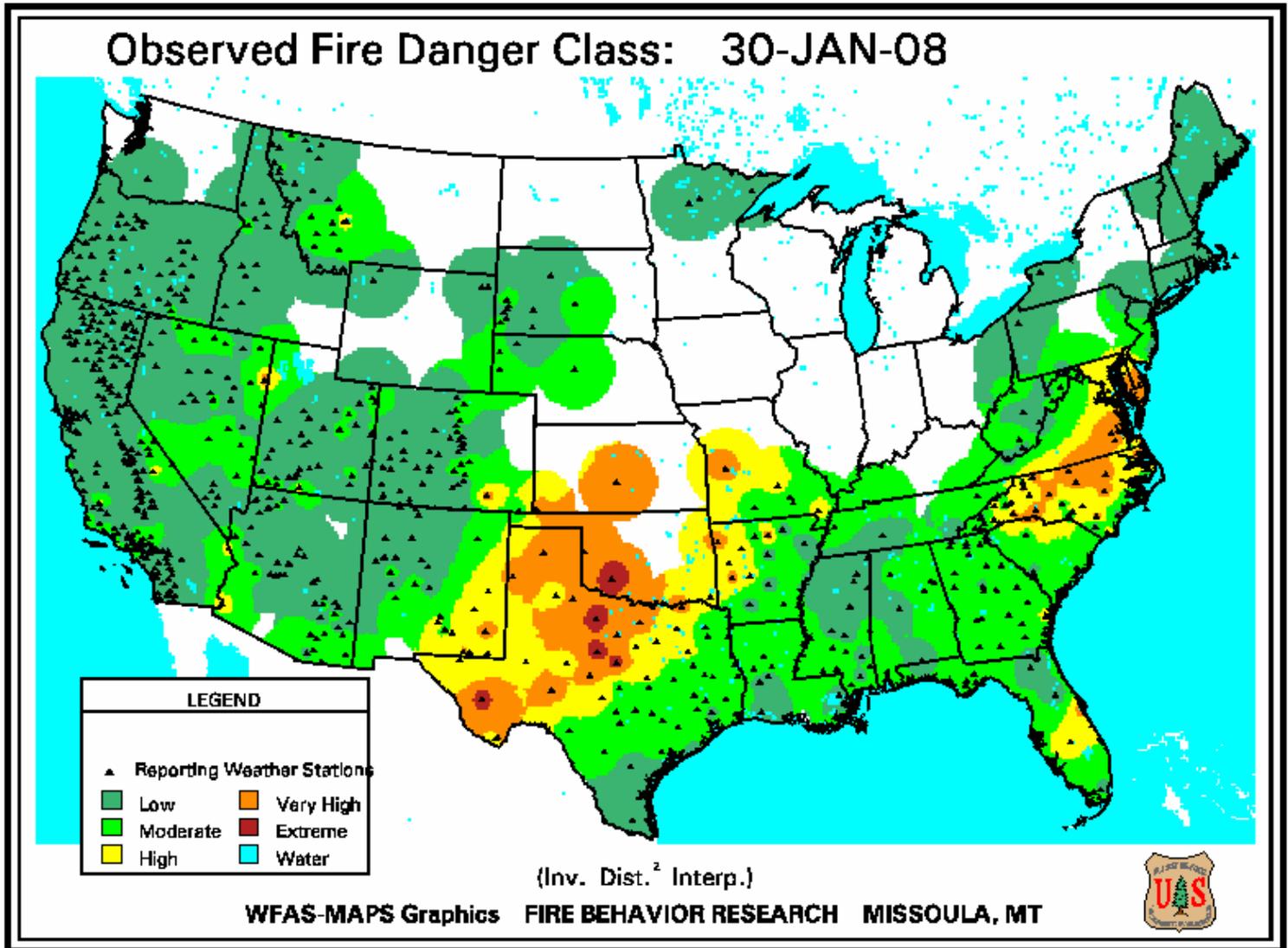


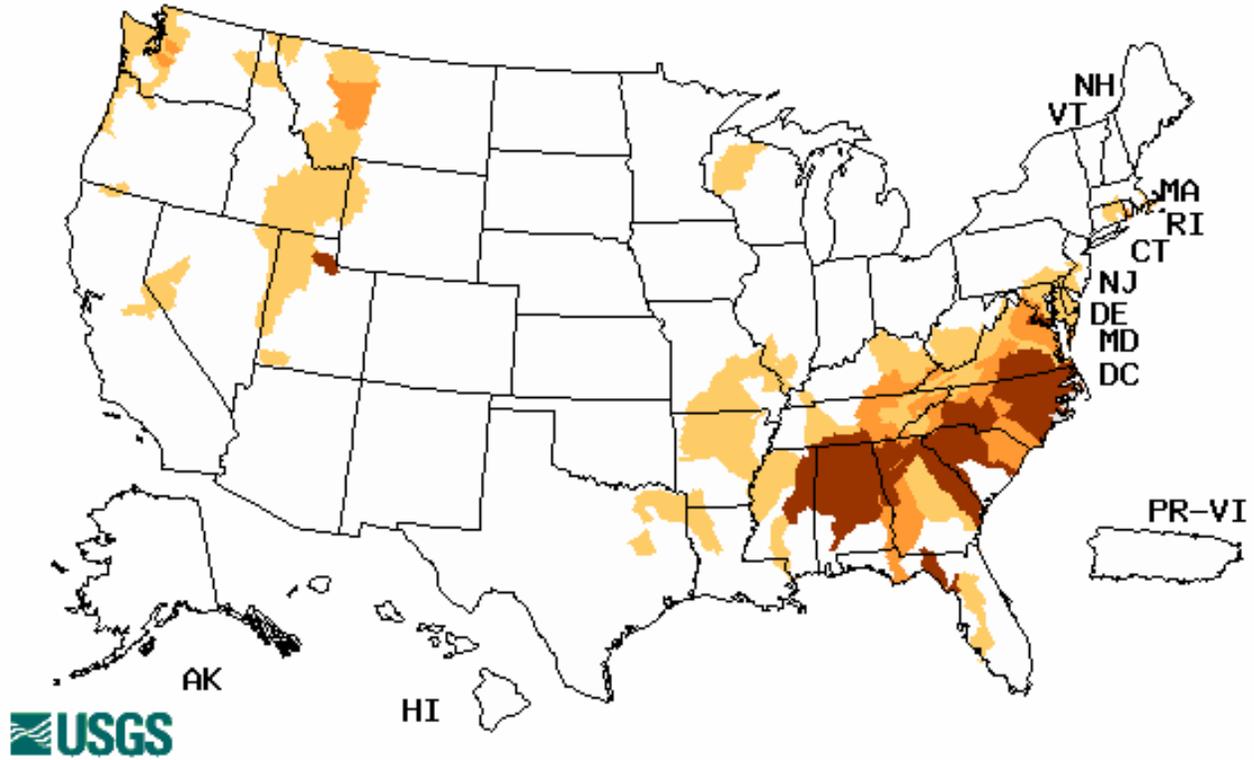
Fig. 6. Observed Fire Danger Class as of 30 January. Note some deterioration over the Southern Plains and Mid-Atlantic States since last week.

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 30, 2008



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

**Fig. 7.** This week's map shows some worsening of low stream flows over the 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 29, 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 Southeast and Mid-Atlantic:** A general decrease in the coverage and amounts of precipitation was observed this week compared to the last several weeks, although 1 to 3 inches of rain fell on southern sections of Louisiana, Mississippi, and Alabama, and in central Florida. In the latter area, the rains were quite welcome, easing wildfire conditions and falling on the Kissimmee River basin that drains into Lake Okeechobee, still at a near-record low level. The water, however, was mostly captured and held by the many lakes around the Disney World area (the Upper Chain of Lakes), and very little flowed into the Kissimmee River. With surpluses accumulated in the central Gulf Coast region and central Florida during the past 30- and 60-days, a slight reduction of D0 was made.

Meanwhile, precipitation totals were generally between 0.1 to 0.5 inch in the remainder of the Southeast, and between 0 and 0.2 inch in the mid-Atlantic and Carolinas. Normally, the winter months are ideal for soil moisture recharge, with greatly reduced levels of vegetative, agricultural, and human demands; lower temperatures; and minimal evaporation. During the past 90-days, however, less than half of normal precipitation had fallen from central Mississippi northeastward into northern Virginia. Not surprisingly, 1-, 7-, 14-, and 28-day USGS stream flows ending Jan. 29 remained or dropped into near-record (<10th percentile) or record low levels in approximately the same area, from central Mississippi northeastward into central Maryland. Based upon stream flows, short- and long-term indices, continued short- and long-term shortages, and several soil models, the following areas had expansion of: D3 and D4 in northwestern Alabama; D4 into northeastern North Carolina; D3 into extreme southern Virginia; D2 into east-central Mississippi and in central Virginia; and a general northward shift of the D0 from southern Arkansas into south-central Kentucky. Since early August, the core extreme to exceptional (D3-D4) drought has persisted in northern Alabama, central Tennessee, and northern Georgia while shifting northeastward into North Carolina, while significant relief has occurred along the southern and northwestern edges.

**The Great Lakes Region and Midwest:** After three consecutive weeks of light to moderate precipitation and some slight drought improvement last week, drier weather (0.2 inch or less) was reported in the upper Great Lakes region, keeping conditions status-quo. Farther east, slightly greater totals (0.2 to 0.6 inch) occurred in Lower Michigan, but not enough to warrant any improvement. In western Illinois and east-central Missouri, little or no precipitation maintained the small area of D0(H). USGS stream flows continued to slowly drop, as the 1-, 7-, and 14-days values (ending January 28) declined from the 25th percentile last week to below the 10th percentile, although no other impacts were reported.

**The Plains:** For the second straight week, much of the Plains, except far southern sections, saw little or no precipitation, although temperatures gradually warmed up from last week's Arctic blast and averaged close to normal. Farther south, subtropical moisture combined with a weak system, bringing light to moderate precipitation (0.2 to 1 inch, locally to 2 inches) across southern and

## Weekly Snowpack and Drought Monitor Update Report

eastern Texas. The greatest totals, however, fell on non-drought eastern Texas, while lower amounts (less than 0.3 inch) occurred to the west, doing little if anything to reduce short-term deficits. An exception to this was in the Big Bend of Texas where continued light but above-normal precipitation has accumulated surpluses at 7-, 14-, 30-, and 90-days, and also at longer time frames (6- and 12-months), and D0(A) was removed.

In contrast, after a very wet spring and summer throughout the Plains last year, much drier weather has returned to most of the region since the fall, and has continued into this winter. Although subsoil moisture appears to be adequate, the lack of precipitation and recent windy conditions have combined to generate short to very short topsoil moisture conditions across the Texas and Oklahoma High Plains. This has caused 62%, 58%, and 37% of the Texas winter wheat, oats, and pastures/ranges to be rated as poor or very poor as of Jan. 27, respectively. In addition, numerous wildfires recently broke out across northern Texas, including a 20,000 acre grass fire near Muleshoe, and a statewide burn ban was ordered for Oklahoma. With plenty of tree debris from last December's ice storm, widespread ample vegetation from last summer's wet weather, and the dry and windy weather, "Oklahoma is like a giant tinderbox", according to Assistant State Climatologist Gary McManus, "and this scenario is similar to what we saw with the genesis of the drought that began in earnest during the Winter of 2005-06". Accordingly, D0(A) was expanded into central Oklahoma and west Texas.

Farther north, minimal fall and winter precipitation has also created short- to medium-term deficiencies in parts of the Dakotas. Less than 25% of normal precipitation has fallen since the end of December from central North Dakota and northeastern South Dakota eastward across northern Minnesota, keeping snow packs below normal. Although the ground is frozen and snow covered and impacts are negligible, D0 was increased in northeastern South Dakota and eastern North Dakota as a head's up to subnormal winter precipitation and potential spring moisture shortages. Similarly, D3 was introduced in far north-central North Dakota as this area has measured very little precipitation during the past 6 months, recording less than 25% of normal precipitation.

**The Rockies, Intermountain West, and Far West:** A strong, slow-moving, meandering upper-air low off the California coast funneled subtropical moisture into much of the Southwest while unseasonably cold air remained entrenched over the West. This resulted in very heavy rains along the central and southern California coast (11 to 12 inches near Santa Barbara and Ojai), heavy low-elevation snows in southern California, Sierra Nevada, and southern Intermountain Plateau, and widespread, moderate to heavy precipitation throughout California, western and southern Nevada, Arizona, and southern Utah. In California's Sierra Nevada, the NRCS average basin water year-to-date precipitation rose in one week from 79-82% to 90-98%, and the snow water content went from 86-98% to 100-114%. Accordingly, much of California saw a 1-category improvement, with a 2-category improvement near Santa Barbara where a foot of rain fell. The few areas that remained status-quo (D2) were the southern San Joaquin Valley near Bakersfield and extreme southeastern California. Rainfall was much lower in both areas, with a rain shadow affecting the southern San Joaquin Valley (totals ranged from 0.2 to 1 inch). With totals less than 0.5 inch in the desert Southwest, long-term deficits (6-months and longer) still remained. In Arizona, this was the fourth major system to hit the state this water year, and with top soils already moist, the heavy rains (2 to 6 inches) produced widespread flash flooding. Even arid desert locations in the southwest and west-central received 0.5 to 1 inch (normal annual totals are 3 to 7 inches), and ample standing water was reported. This also warranted a general 1-category improvement across the state. For the three central Arizona basins, the Jan. 29 NRCS average snow water content was 134-170%, and Oct. 1-Jan. 29 precipitation was 128-170%. According to WFO Phoenix, water was being spilled from the Verde River reservoirs, and with snowmelt runoff

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this spring, these reservoirs will be effectively at capacity through at least the end of May. Runoff from this storm and future snowmelt will fill the Salt River reservoirs, including Roosevelt Lake, with both the Verde and Salt reservoirs major water suppliers to Phoenix. In addition to the Southwestern storm, another late-week system brought light to moderate precipitation to the Northwest and northern Rockies, maintaining conditions there.

In addition, the recent spate of precipitation required a re-examination of short-term wetness versus long-term drought, especially in data-sparse areas. For long-term hydrologic drought, 12- and 24-months precipitation and SPI values were compared with 6-months and less periods. The results from this included expanded long-term severe drought (D2) in northeastern California and south-central Oregon, and some improvement in southwestern Nevada and southwestern Utah. Moderate drought (D1) was left along parts of the California coast, namely south of Los Angeles (Orange County) and in southern San Luis Obispo and northern Santa Barbara, which have missed out on the heavier rains that surrounding locations have observed. A more complete analysis of the West can be made in early February when additional information becomes available in the February 1 Western Snow Pack Conditions and Water Supply Forecasts.

**Alaska:** Light to moderate precipitation occurred in western and southern sections of the state, while subnormal temperatures and little or no precipitation fell on the northeastern quarter of Alaska, maintaining D0 there. From the limited NRCS/USDA SNOTEL sites in northeastern Alaska, the Water Y-T-D precipitation (since October 1) was generally 35-70% of normal as of January 29, while the few Snow Water Equivalent sites were also below normal.

**Looking Ahead:** For January 31-February 4, the upper-air pattern will consist of troughing in the West and ridging in the East. This will produce cold and unsettled weather in the Pacific Northwest and Rockies, and mild and wet conditions in the eastern third of the nation. A series of Pacific storms will bring coastal rains and mountain snows to the Pacific Northwest and northern Rockies early in the period, then over the weekend, move farther south and drop light precipitation on the Southwest. In the East, a system will track from the southern Great Plains on Thursday and into New England by late Friday, producing heavy snow from the south-central Great Plains northeastward into western New England, icing in the central and northern Appalachians, and rain in the Southeast and Atlantic Coast states. By Monday, another storm will generate showers in the Delta, middle Mississippi, Tennessee, and western Ohio Valleys, and snow in the western Corn Belt.

For the ensuing 5 days (February 5-9), the odds favor wetter-than-usual weather across the northern half of the nation and northern portions of the Delta and Southeast. Subnormal precipitation is expected to return to the Southwest, and continue in southern sections of the Rockies, Plains, and Florida, and across the northern half of Alaska. Unseasonably cold conditions should persist in the western half of the U.S., while above-normal readings are anticipated in the eastern third of the nation.

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### Dryness Categories

D0 ... Abnormally Dry ... used for areas showing dryness but not yet in drought, or for areas recovering from drought.

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### **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 30, 2008