



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

Weekly Report - Snowpack / Drought Monitor Update **Date:** 8 January, 2009

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date shows a vast improvement across areas north of central Wyoming to central Oregon since last week (Fig 1). Although early into the spring-summer runoff forecasting season, Fig 1a reflects unofficial forecast changes (improvements) over northern New Mexico, Northern Rockies, and Intermountain West while a decreasing runoff forecast is noted over southwest Utah during the past week based on snowfall (snowpack) or lack thereof. This past week's snow depth changes shows most areas across the West increasing. Exceptions include the Sierra and Oregon Cascades. Amounts would have been considerably greater had it not been for a strong warm rain pattern over the Washington Cascades. Snowfall totals do not consider snow density changes, sublimation, or wind driven effects but are still of interest to the skiing community and other stakeholders (Fig. 1b).

Temperature: SNOTEL and ACIS-day station average temperature anomalies were generally within 5 degrees of normal during the past week with a few exceptions (Fig. 2). Specifically, the greatest positive temperature departures occurred over parts of southeastern Colorado (>+9F) and the greatest negative departures occurred over northeast Montana and northwest Colorado (<-12F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 7 January shows significant amounts falling over the northern tier states and scattered across the Rockies, western New Mexico, and north central Nevada. Lesser amounts fell over portions of the western High Plains, California, and southern Nevada (Fig. 3). Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values increasing by at least 10% over portions of the Pacific Northwest and Northern Rockies with totals falling by at least 10% over central Arizona during the past week (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/>.

Special Note: The National Integrated Drought Information System (NIDIS) website: <http://www.drought.gov/portal/server.pt/community/drought.gov> has just updated its contents (http://www.drought.gov/portal/server.pt/community/drought.gov/release_notes) with vast improvements.

WESTERN DROUGHT STATUS

The West: With a continuing active weather pattern, some areas of the region were improved while others showed some worsening. D0 was improved in western Oregon and extreme northern California and eastern Washington where recent increases in precipitation and snow have been recorded. D0 was expanded into central and north-central Washington as this region has not had the good snows that other regions in the area have received. In southern California, the D2 in the desert regions around Los Angeles and San Bernardino counties was improved slightly as the short-term rains in the last 90 days have been in the 200-300 percent of normal range. Long-term issues here, where precipitation deficits over the last 2-3 years are approaching 20 inches below normal, discouraged further improvements at this time. D0 was improved in southwest Colorado into northwest New Mexico, refining improvements made last week in

Weekly Snowpack and Drought Monitor Update Report

response to the very good snowpack in this area. Author: Brian Fuchs, National Drought Mitigation Center

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. 5a and 5b), is simulated by the [VIC macroscale hydrologic model](#). The detailed, physically-based VIC model is driven by observed daily precipitation and temperature maxima and minima from approximately 2130 stations, selected for reporting reliably in real-time and for having records of longer than 45 years (and various other criteria).

OBSERVED FIRE DANGER CLASS

The National Interagency Coordination Center provides a variety of products that describe the current wildfire status for the U.S. - http://activefiremaps.fs.fed.us/lq_fire2.php. 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.

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>

Weekly Snowpack and Drought Monitor Update Report

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

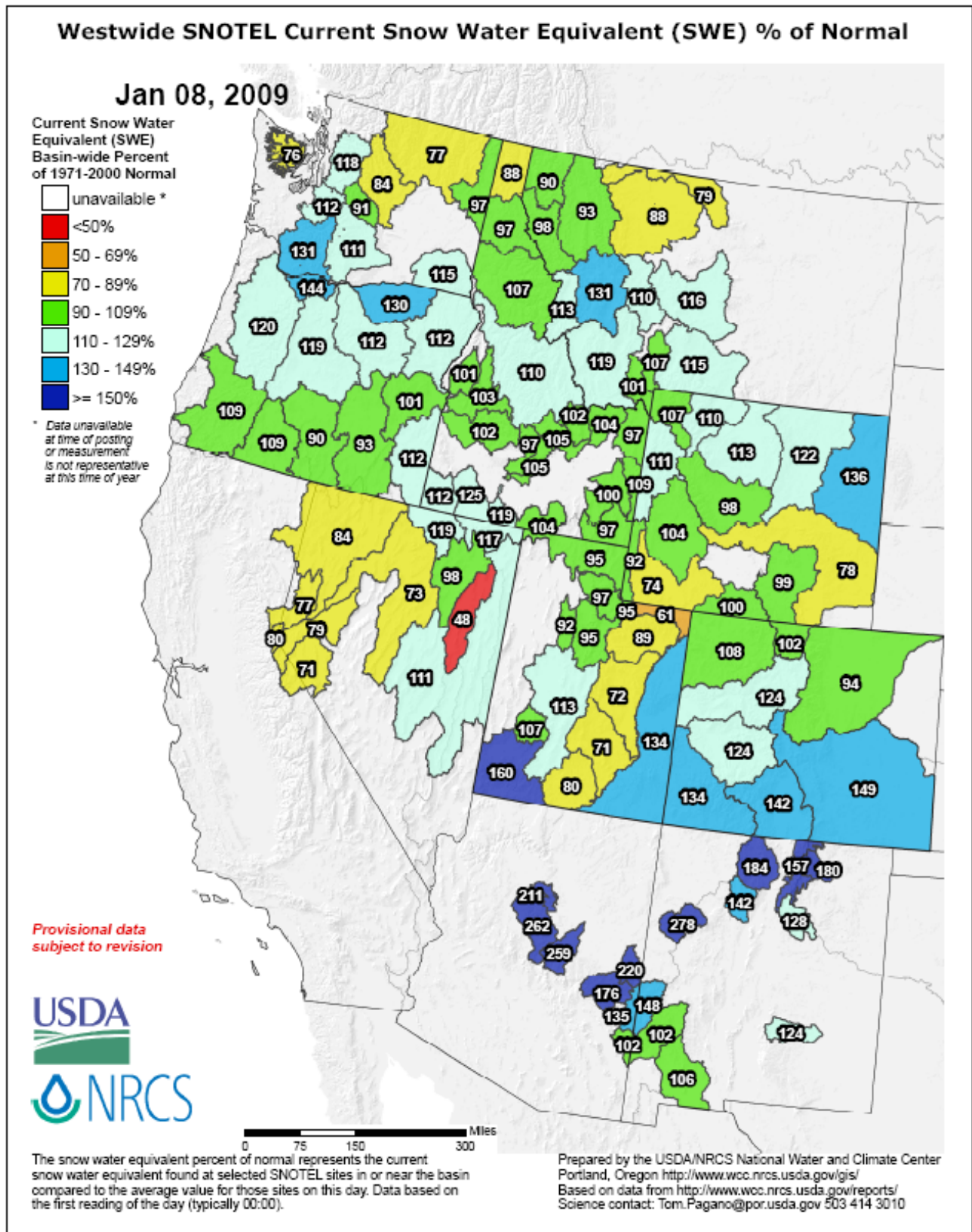


Fig. 1. Snow-water equivalent percent to date shows a vast improvement across areas north of central Wyoming to central Oregon since last week.

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

Weekly Snowpack and Drought Monitor Update Report

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

Jan 08, 2009

For guidance only

7-Day Guidance
Forecast Change
(% normal)

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

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

Provisional Data
Subject to Revision

0 50 100 200 Miles



Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/wsf/daily_forecasts.html
Based on data from
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 during the past week based in part on measured snowfall as noted in Fig. 1b that follows.

Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/daily_forecast/maps/west_dailyfcst_7daych.pdf

SNOTEL 7-Day Snow Depth Change (Inches)

Jan 08, 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. Amounts do not consider snow density changes, sublimation, or wind driven effects.

Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_snowdepth_7ddelta.pdf

Weekly Snowpack and Drought Monitor Update Report

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

Jan 08, 2009

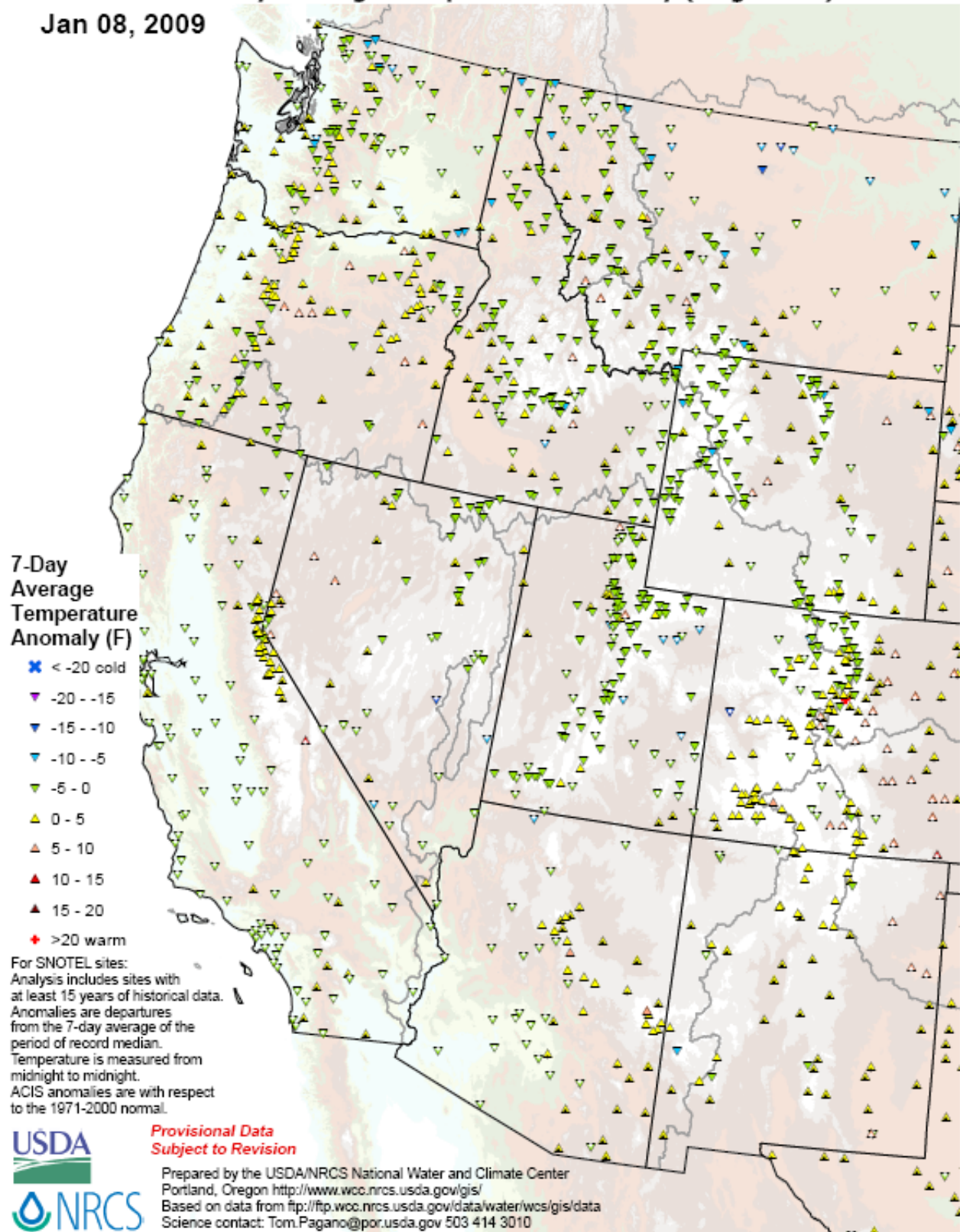
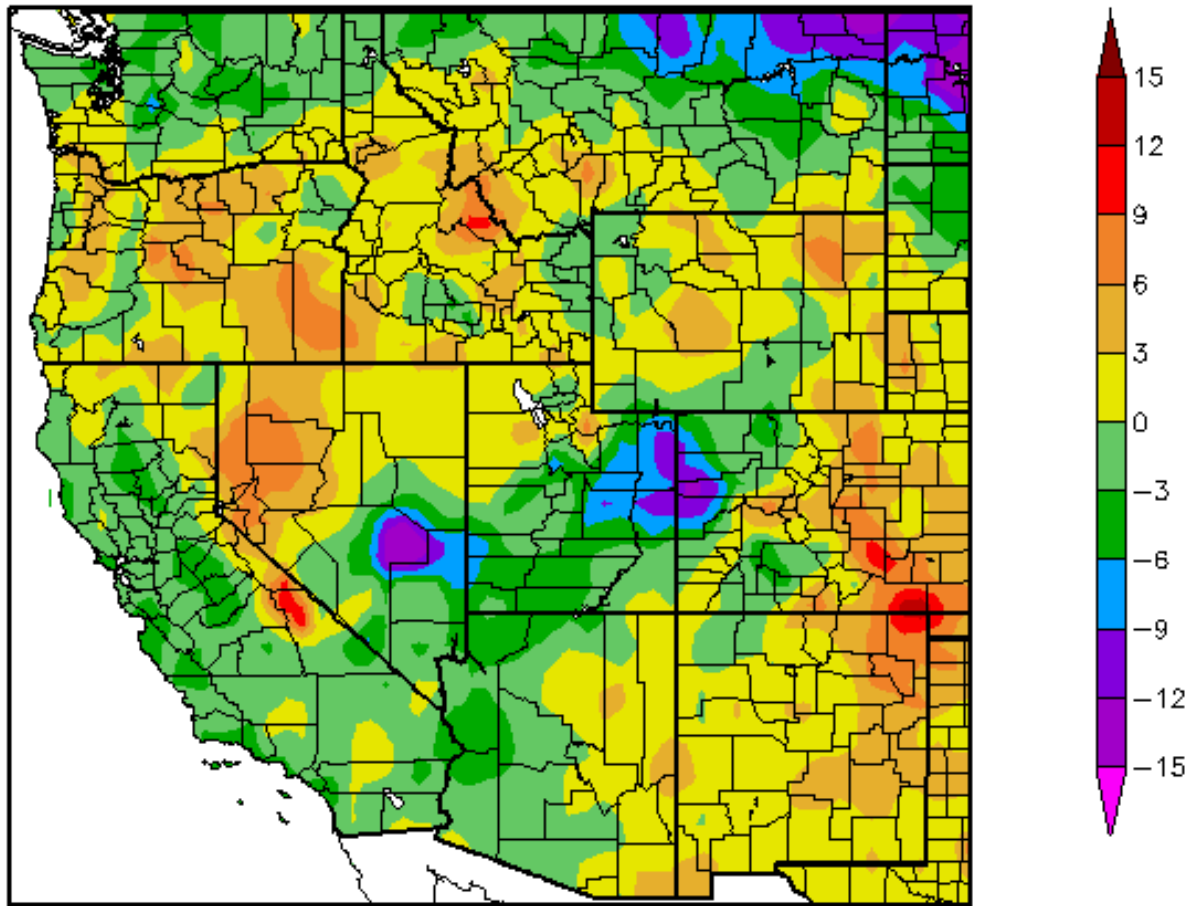


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were generally within 5 degrees of normal during the past week with a few exceptions.

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

Departure from Normal Temperature (F) 1/1/2009 – 1/7/2009



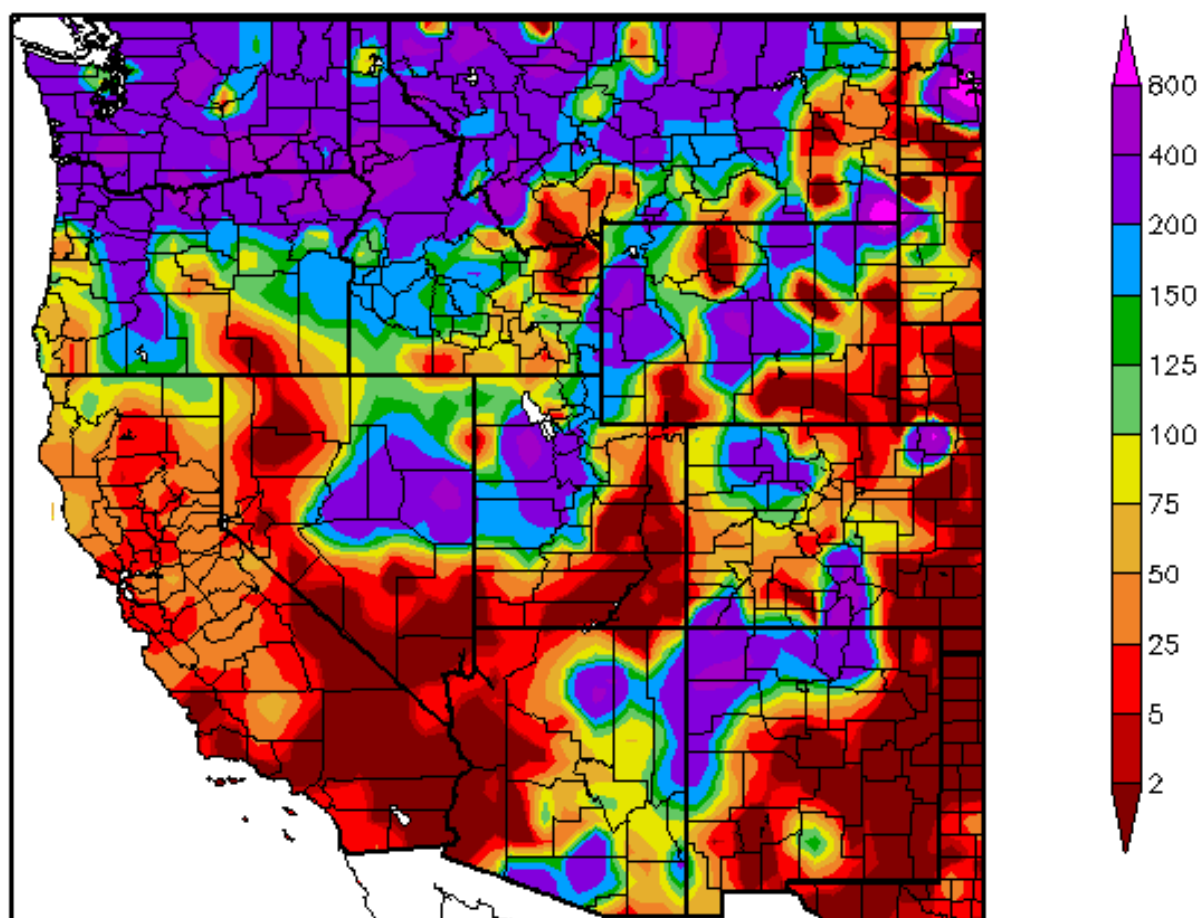
Generated 1/8/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over parts of southeastern Colorado (>+9F) and the greatest negative departures occurred over northeast Montana and northwest Colorado (<-12F).

Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_product&product=TDdept

Percent of Normal Precipitation (%)
1/1/2009 – 1/7/2009



Generated 1/8/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 7 January shows significant amounts falling over the northern tier states and scattered across the Rockies, western New Mexico, and north central Nevada. Lesser amounts fell over portions of the western High Plains, California, and southern Nevada.

Ref: http://www.hprcc.unl.edu/maps/index.php?action=update_product&product=PNorm

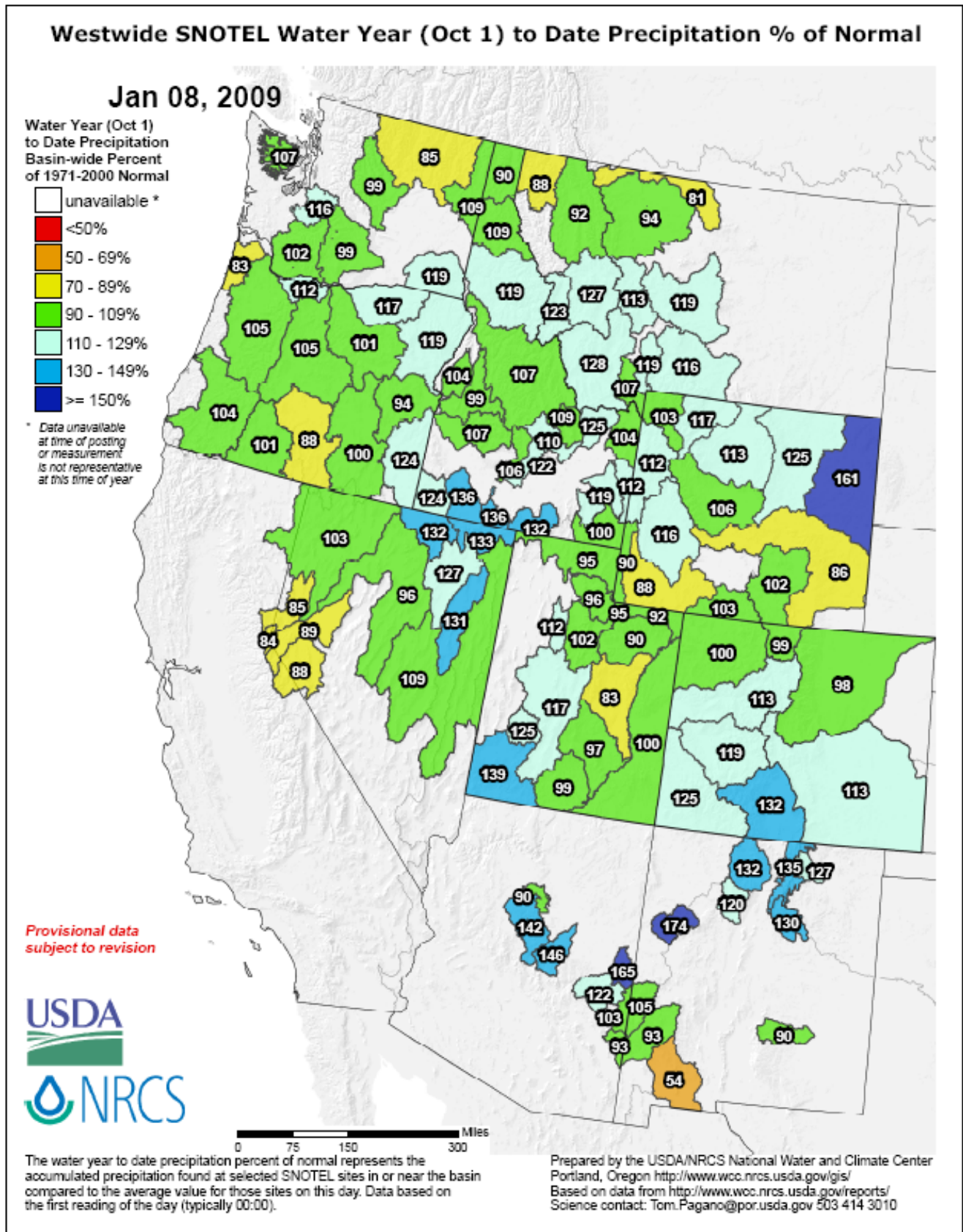
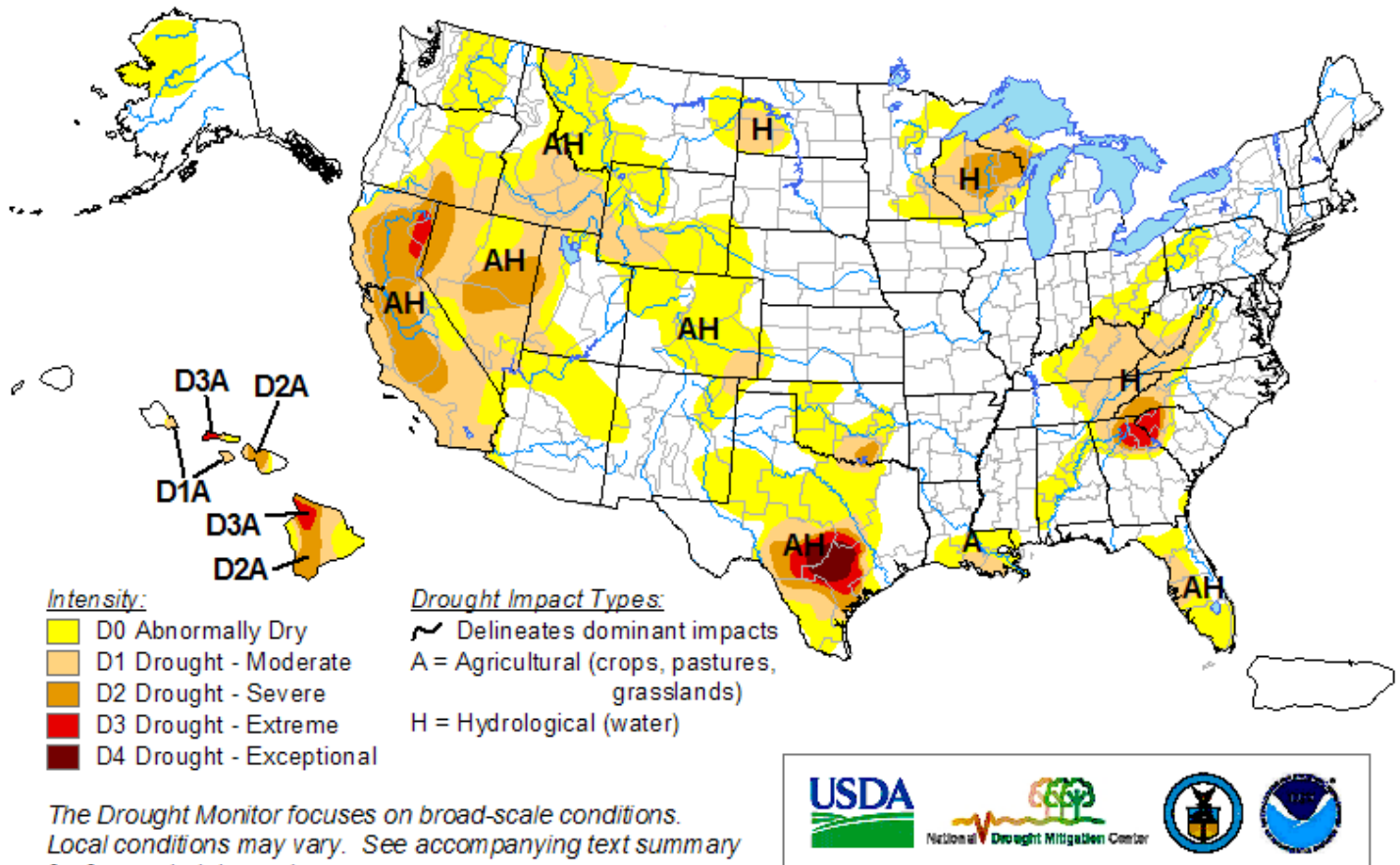


Fig 3b. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values increasing by at least 10% over portions of the Pacific Northwest and Northern Rockies with totals falling by at least 10% over central Arizona during the past week. Ref: http://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_wytdprecpcnormal_update.pdf

U.S. Drought Monitor

January 6, 2009
Valid 8 a.m. EST



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

Released Thursday, January 8, 2009

Author: Brian Fuchs, National Drought Mitigation Center

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

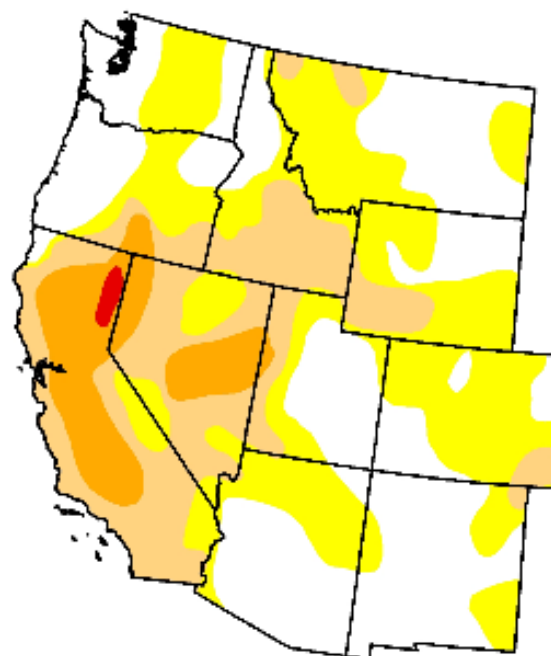
January 6, 2009

Valid 7 a.m. EST

| | Drought Conditions (Percent Area) | | | | | |
|---|-----------------------------------|-------|-------|-------|-------|-----|
| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
| Current | 37.4 | 62.6 | 28.9 | 8.8 | 0.4 | 0.0 |
| Last Week (12/30/2008 map) | 35.4 | 64.7 | 28.9 | 9.0 | 0.4 | 0.0 |
| 3 Months Ago (10/14/2008 map) | 44.1 | 55.9 | 27.5 | 9.8 | 0.0 | 0.0 |
| Start of Calendar Year (01/06/2009 map) | 37.4 | 62.6 | 28.9 | 8.8 | 0.4 | 0.0 |
| Start of Water Year (10/07/2008 map) | 41.3 | 58.7 | 28.6 | 10.4 | 0.1 | 0.0 |
| One Year Ago (01/08/2008 map) | 26.9 | 73.1 | 54.9 | 26.7 | 0.0 | 0.0 |

Intensity:

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



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

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



Released Thursday, January 8, 2009

Author: Brian Fuchs, National Drought Mitigation Center

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note only a slight improvement since last week. Ref: http://www.drought.unl.edu/dm/DM_west.htm

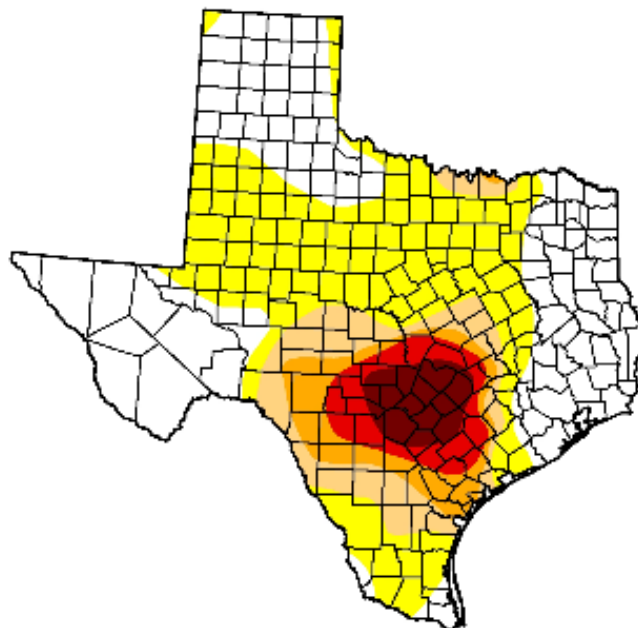
U.S. Drought Monitor

Texas

January 6, 2009

Valid 7 a.m. EST

| | Drought Conditions (Percent Area) | | | | | |
|---|-----------------------------------|-------|-------|-------|-------|-----|
| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
| Current | 41.7 | 58.3 | 24.5 | 15.0 | 9.1 | 4.2 |
| Last Week (12/30/2008 map) | 48.1 | 51.9 | 24.5 | 15.0 | 9.1 | 4.2 |
| 3 Months Ago (10/14/2008 map) | 70.1 | 29.9 | 17.7 | 11.1 | 4.5 | 0.0 |
| Start of Calendar Year (01/06/2009 map) | 41.7 | 58.3 | 24.5 | 15.0 | 9.1 | 4.2 |
| Start of Water Year (10/07/2008 map) | 67.2 | 32.8 | 20.5 | 11.0 | 3.6 | 0.0 |
| One Year Ago (01/08/2008 map) | 35.7 | 64.3 | 16.9 | 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>

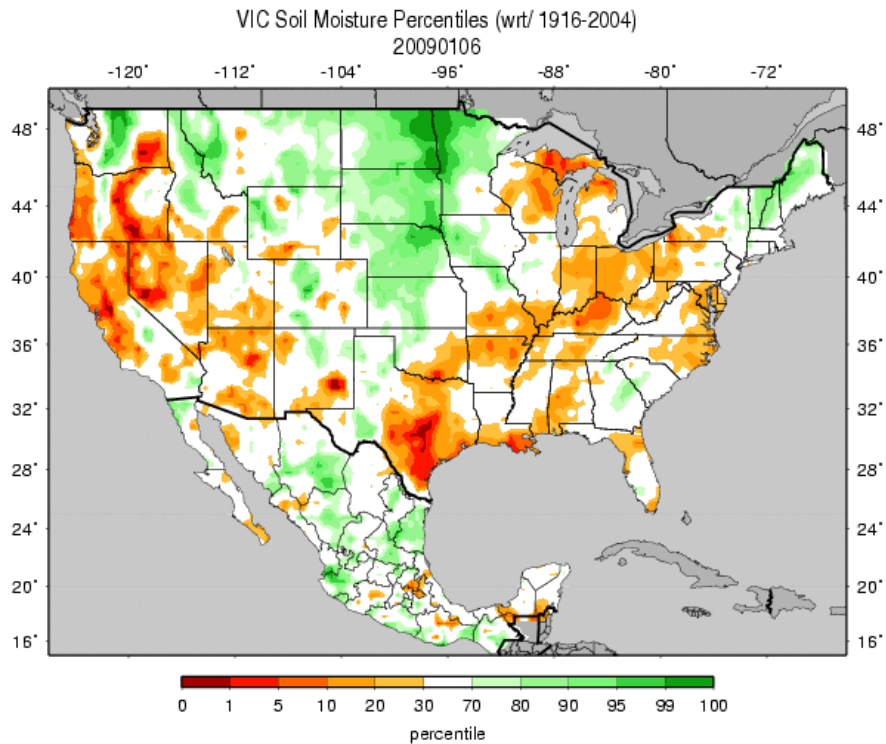


Released Thursday, January 8, 2009

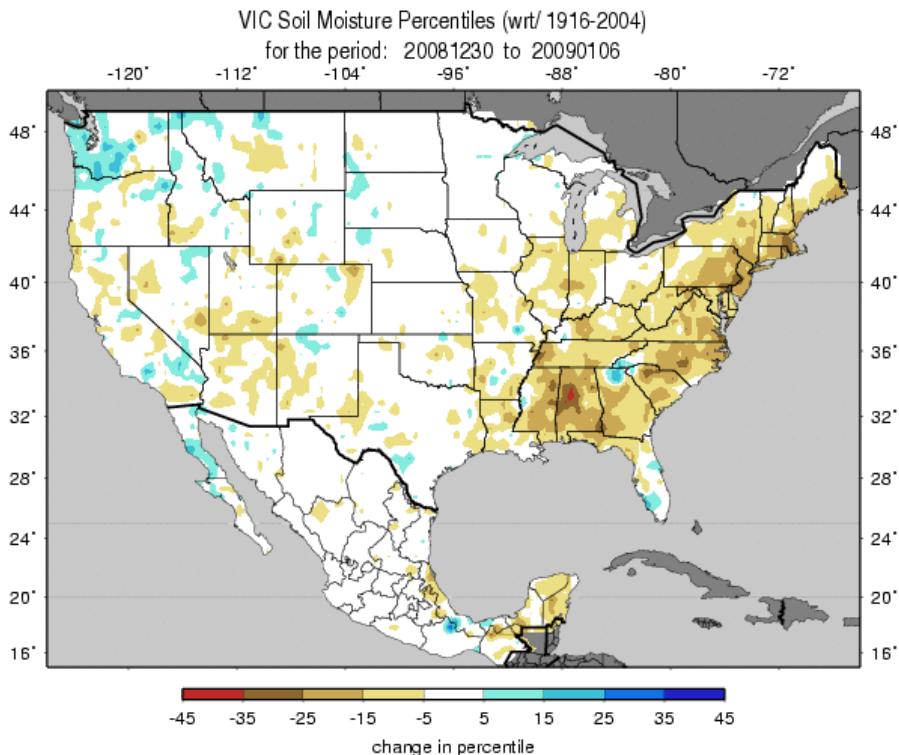
Author: Brian Fuchs, National Drought Mitigation Center

Fig. 4b: Texas now stands alone as the only state with D4 drought condition. Note expansion of D0 since last week. Ref: http://www.drought.unl.edu/dm/DM_southeast.htm

Weekly Snowpack and Drought Monitor Update Report



Figs. 5: Soil Moisture Ranking and change in percentile based on 1915-2003 climatology for this past week. Near saturation exists over the Northern Plain while excessive dryness dominates the central-southern Texas, the Upper Peninsula of Michigan, and much of the Pacific states as of 6 January. Ref: http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.gif



Figs. 5a: Soil moisture change for this past week. Note eastern third of the country drying while Washington State is increasing in water content.

Ref: http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.gif

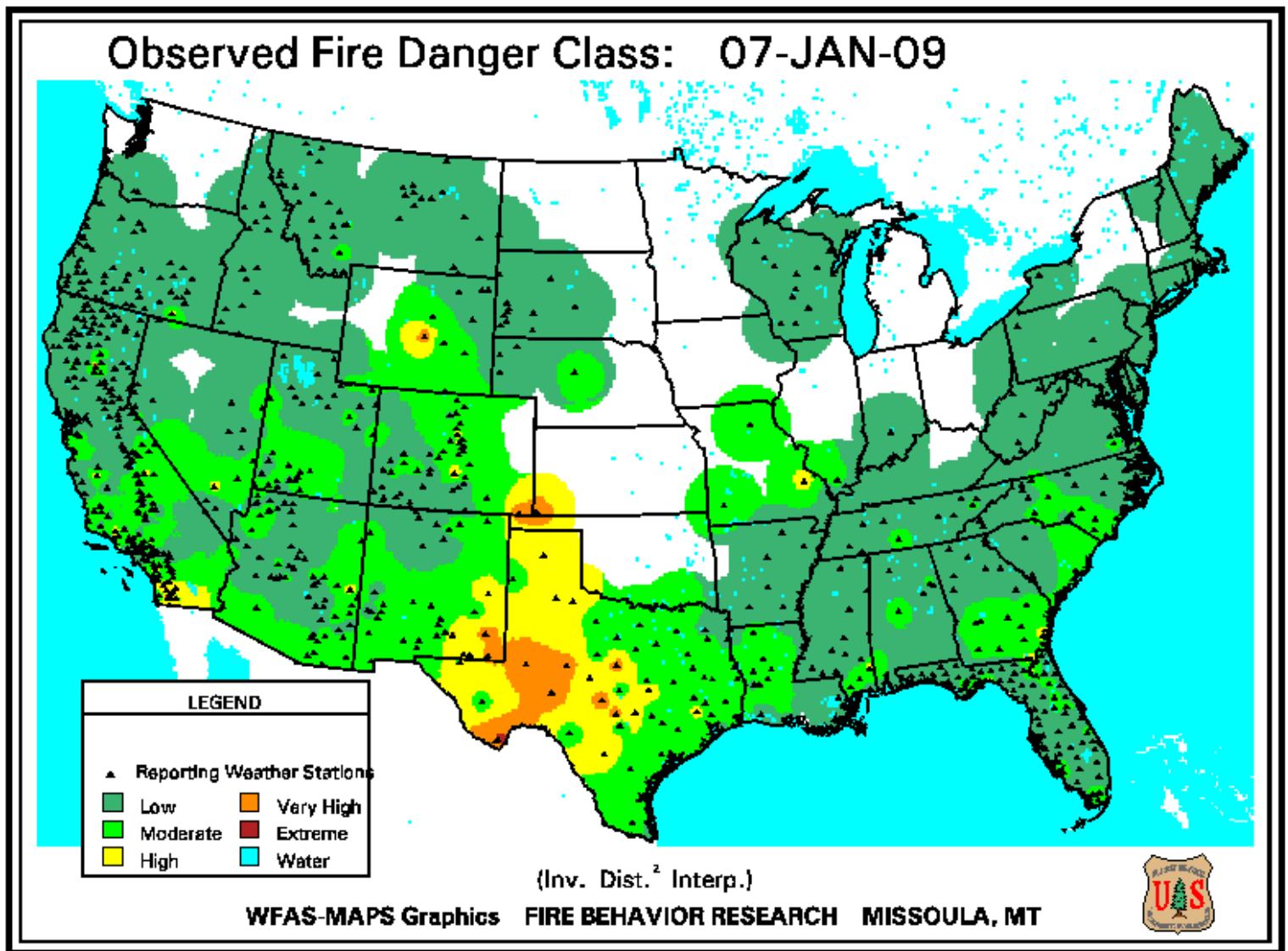
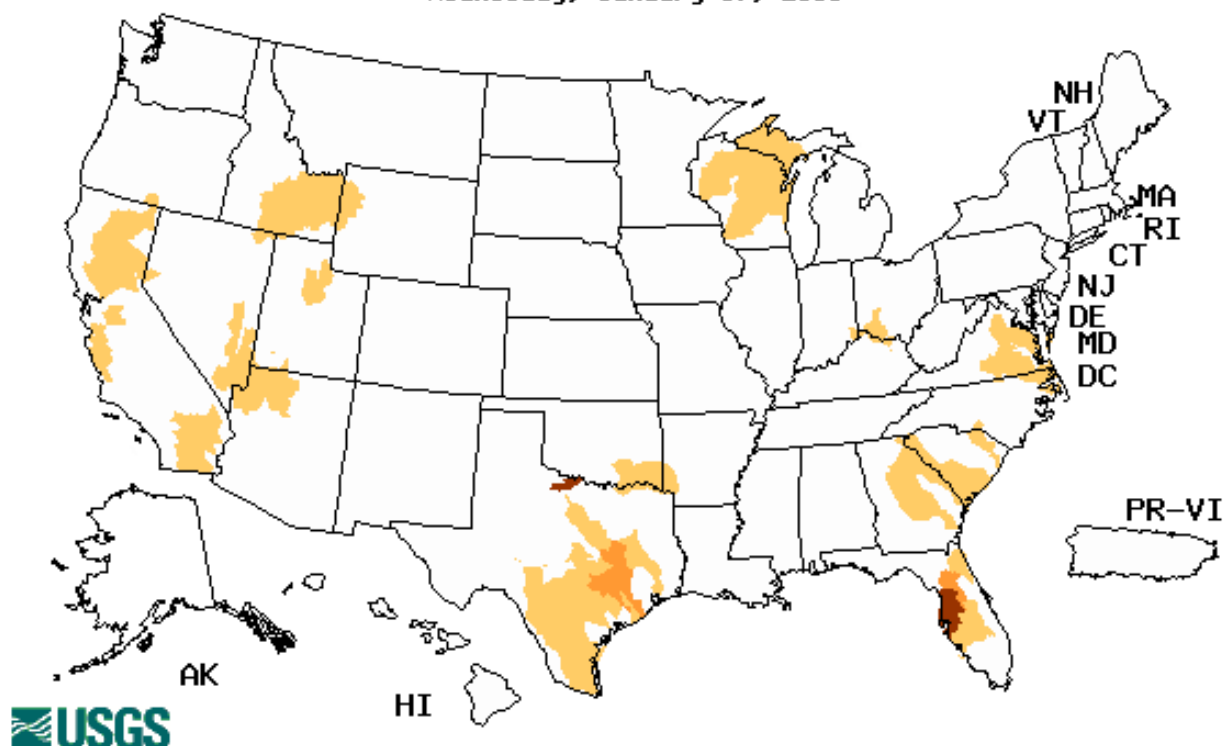


Fig. 6. Observed Fire Danger Class. Conditions have improved over Texas and the Central Eastern States since last week. Source: Forest Service Fire Behavior Research – Missoula, MT.

Ref: http://www.fs.fed.us/land/wfas/fd_class.gif

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Wednesday, January 07, 2009



| 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. Florida shows an expanding area of severe stream flows while moderate conditions are expanding over Texas during this past week. Western areas may have frozen rivers and thus do not necessarily reflect accurate flows. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

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National Drought Summary – January 6, 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: Short-term conditions continue to improve over the region, with many areas at or slightly above normal over the last several months for precipitation totals. D2 was removed from Kentucky and D1 was slightly improved in West Virginia and Ohio. Longer-term issues still exist in the region, and additional precipitation will be needed to continue improvements.

The Southeast: With La Nina conditions continuing to develop and projected to be in place through the first part of 2009, the drought situation in Florida is expected to follow a La Nina pattern with warm and dry conditions throughout winter and into spring. D0 was expanded to include all of south Florida while D1 was expanded to the east. The drought designation was changed from H (hydrological) to AH (agricultural/hydrological) to show both short- and long-term concerns. D1 was introduced into southern Louisiana this week and D0 was expanded as well. Several indicators are showing the dryness and precipitation deficits over the last three months at 8-10 inches below normal. In extreme northeast Georgia, D3 was pushed south in response to recent rains. Reservoir levels in Georgia are still a concern.

The Plains: Another dry week over the Plains and dryness over the last few months has started to impact the region. D0 was expanded over west Texas and into southeast New Mexico. Lubbock, Texas, recorded just 0.01 inches of precipitation in December, which followed only 0.08 inches in November for a total of 1.29 inches below normal for those two months. Several days in December, Lubbock reported blowing dust with the most intense days being December 8th and 14th. Crops are being impacted in Texas with winter wheat and oats being the main concern. The condition of winter wheat in Texas continues to decline with 46 percent rated poor to very poor while oats are 74 percent poor to very poor.

The West: With a continuing active weather pattern, some areas of the region were improved while others showed some worsening. D0 was improved in western Oregon and extreme northern California and eastern Washington where recent increases in precipitation and snow have been recorded. D0 was expanded into central and north-central Washington as this region has not had the good snows that other regions in the area have received. In southern California, the D2 in the desert regions around Los Angeles and San Bernardino counties was improved slightly as the short-term rains in the last 90 days have been in the 200-300 percent of normal range. Long-term issues here, where precipitation deficits over the last 2-3 years are approaching 20 inches below normal, discouraged further improvements at this time. D0 was improved in southwest Colorado into northwest New Mexico, refining improvements made last week in response to the very good snowpack in this area.

Hawaii: Recent precipitation has allowed for some improvements over Hawaii this week. In central Maui, D3 was improved to D2 while D0 over east Maui was improved as well. On the east side of the Big Island, a categorical improvement was made this week, and a slight improvement to the D2 and D3 conditions along the northeast slopes. On Oahu, the area that was D0 was changed to D1 due to continued water restrictions on irrigation water use at the Waimanalo

Weekly Snowpack and Drought Monitor Update Report

Reservoir. December rainfall helped to improve reservoir levels, but irrigation water restrictions are still in place.

Looking Ahead: During the next 5 days (January 7-11) a potent storm system will continue to move over the eastern United States, bringing with it widespread precipitation from the Southeast up into New England. Another system will also come ashore in the Pacific Northwest, bringing widespread precipitation through the region and into the northern Rocky Mountains. Temperatures during this time will be above normal for most of the United States outside of upper New England. Temperatures are expected to be 6-9 degrees Fahrenheit above normal over much of the West and Plains and 3 degrees Fahrenheit above normal in the Southeast. Temperatures in the Great Lakes and New England should be 3-9 degrees Fahrenheit below normal. The National Weather Service 6- to 10-day outlook for January 12-16 continues with the best chances for colder than normal temperatures over the eastern half of the country as a large trough settles in over the region. A ridge over the west will likely allow temperatures to warm up, with temperatures from Alaska through Arizona to be above normal. Dry conditions will dominate the western and central United States under the ridge, while there are good chances for above-normal precipitation in Alaska, the northern Plains, the Great Lakes, and portions of Florida.

Author: Brian Fuchs, National Drought Mitigation Center

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 8, 2009