



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

Weekly Report - Snowpack / Drought Monitor Update Date: 15 January, 2009

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date shows a few areas (coastal Oregon Mountains and eastern Nevada) with extreme deficits this week. Most of Arizona, New Mexico, eastern Utah, northeastern Wyoming, and the southern half of Colorado have excessive surpluses (Fig 1). Although early into the spring-summer runoff forecasting season, Fig 1a reflects unofficial forecast changes (improvements) over northern Colorado while a decreasing runoff forecast is noted over southwest Colorado and the Southwest during the past week based on snowfall (snowpack) or lack thereof. This past week's snow depth changes across the West shows increases over Colorado and Wyoming. Decreases occurred over the Northern Cascades, eastern Oregon Mountains (due to precipitation falling mostly as rain), and Northern Rockies. Depths continue to decrease over the Sierra. 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 5 degrees above normal (± 4 deg F) with below normal values over the high country of Colorado during the past week (Fig. 2). Specifically, the greatest positive temperature departures occurred over the Central Montana Rockies ($> +20F$) and the greatest negative departures occurred over north central New Mexico ($< -10F$) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 14 January shows significant amounts scattered across the northern tier states and Central Rockies. Insignificant amounts fell over the remainder of the West (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 decreased about 10% over the Southwest and Eastern Great Basin (ID & NV) during the past week. Elsewhere, amounts remained pretty stable (Fig. 3a). For precipitation totals, departures, and percent of normal for several time periods. See: <http://www.water.gov/> and <http://cig.mesonet.org/~derek/public/droughtmonitoring/>.

WESTERN DROUGHT STATUS

The West

A dry, quiet weather pattern settled in the West this week, but snowpack remaining from recent storms brought many improvements in the Rocky Mountain region. Montana was improved from D1 to D0 in the far northwest, and a previously large area of D0 is now in no drought, primarily due to snowpack and precipitation for the water year thus far (October 1-present). Some reduction in D0 extent was also made in the eastern part of the state. Colorado Rockies have also received normal to above normal snowpack and precipitation for the water year thus far, enough to remove D0 from this region. The Front Range and plains remain in D0 or D1. In the far west, low streamflow and precipitation this season in the Salinas River justified an extension of D2 over this area south of Monterey Bay. Author: Laura Edwards, Western Regional Climate Center.

A comprehensive narrative describing drought conditions for the nation can be found at the end of this document.

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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/cqibin/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

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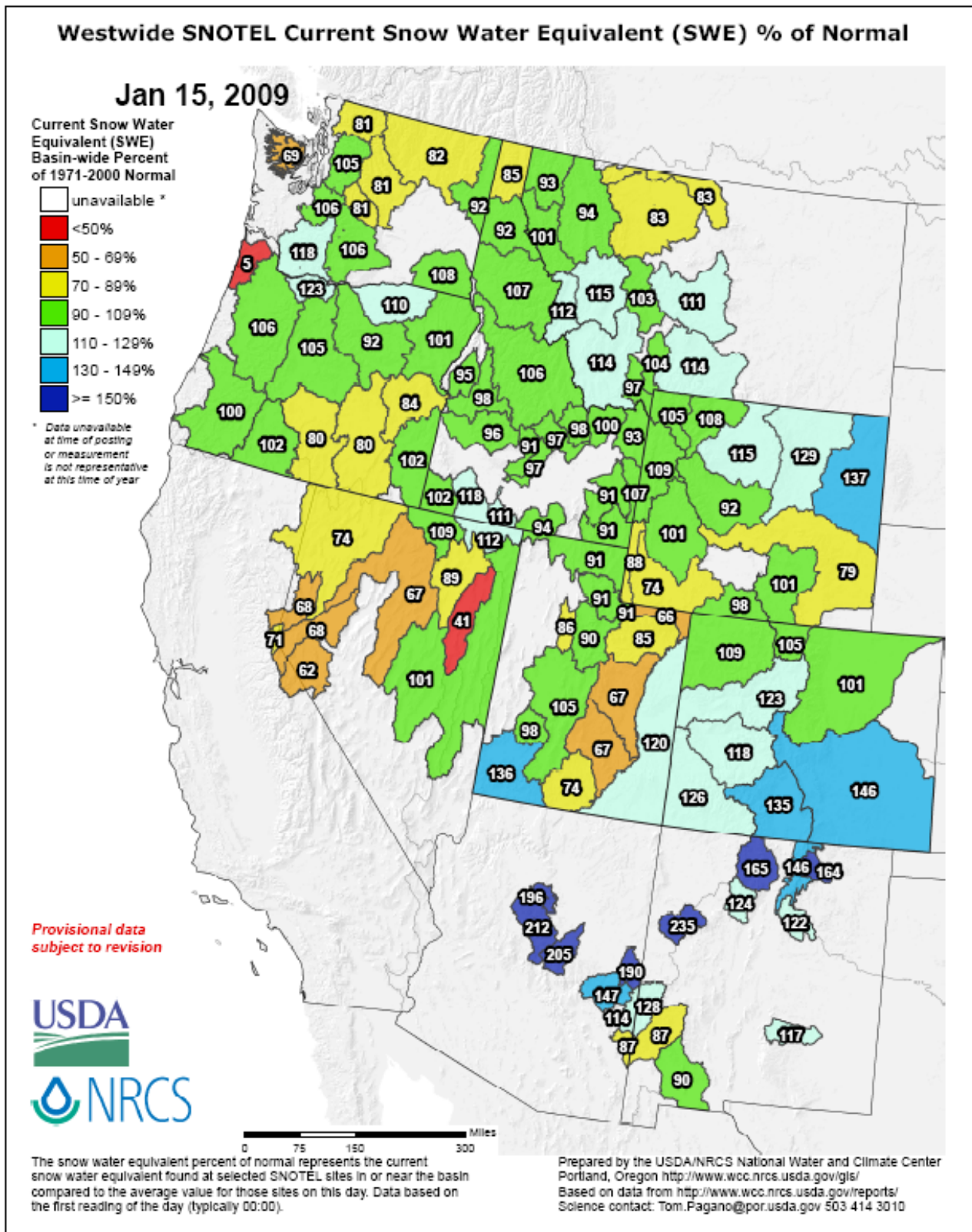


Fig. 1. Snow-water equivalent percent to date shows a few areas (coastal Oregon Mountains and eastern Nevada) with extreme deficits this week. Most of Arizona, New Mexico, eastern Utah, northeastern Wyoming, and the southern half of Colorado have excessive surpluses.

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

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

Jan 15, 2009

For guidance only

7-Day Guidance
Forecast Change
(% normal)

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

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

Provisional Data
Subject to Revision

0 50 100 200 Miles



Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/wsf/daily_forecasts.html
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

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SNOTEL 7-Day Snow Depth Change (Inches)

Jan 15, 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. Note increases over Colorado and Wyoming. Decreases occurred over the Northern Cascades, eastern Oregon Mountains (due to precipitation falling mostly as rain), and Northern Rockies. Depths continue to decrease over the Sierra. 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

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

Jan 15, 2009

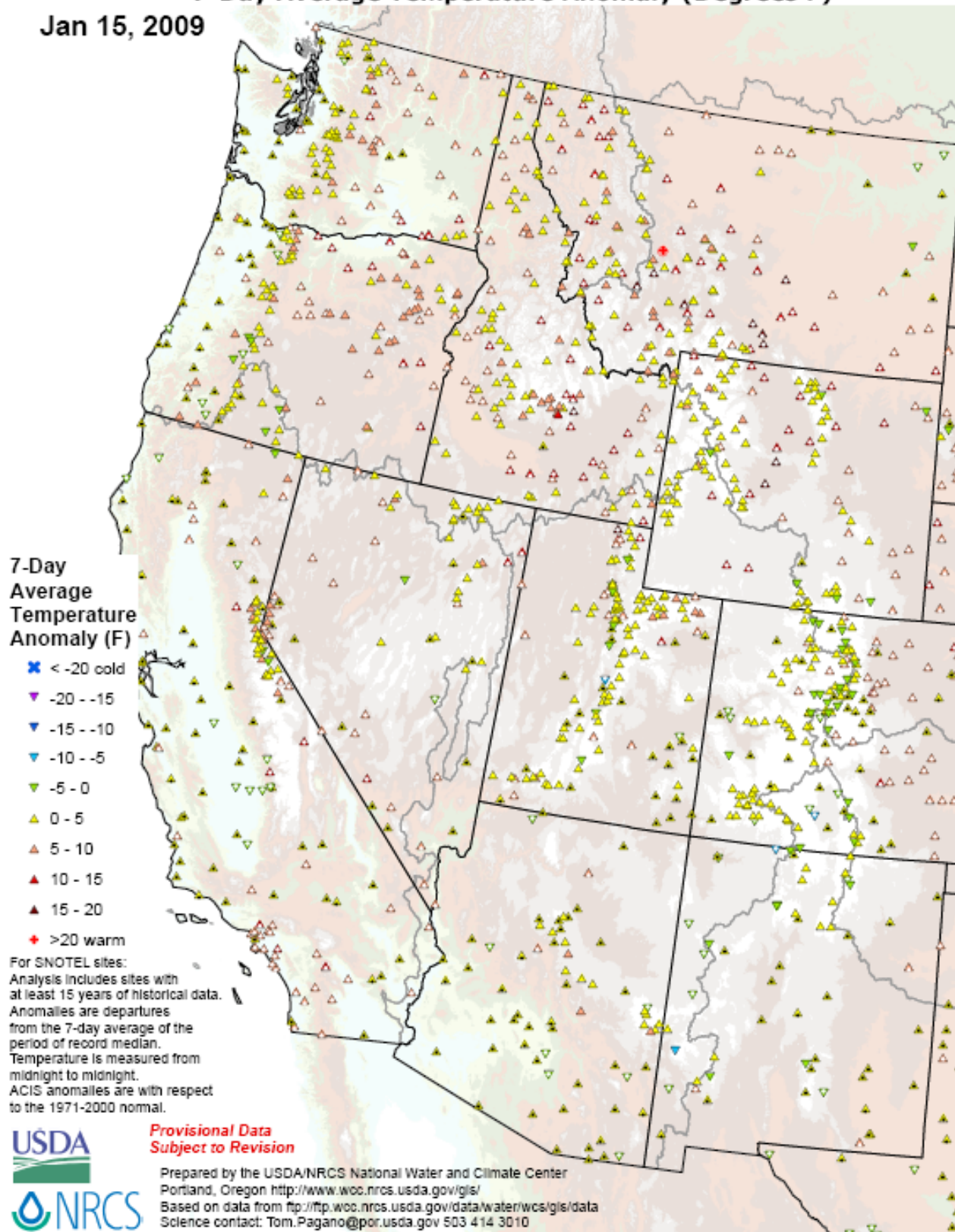
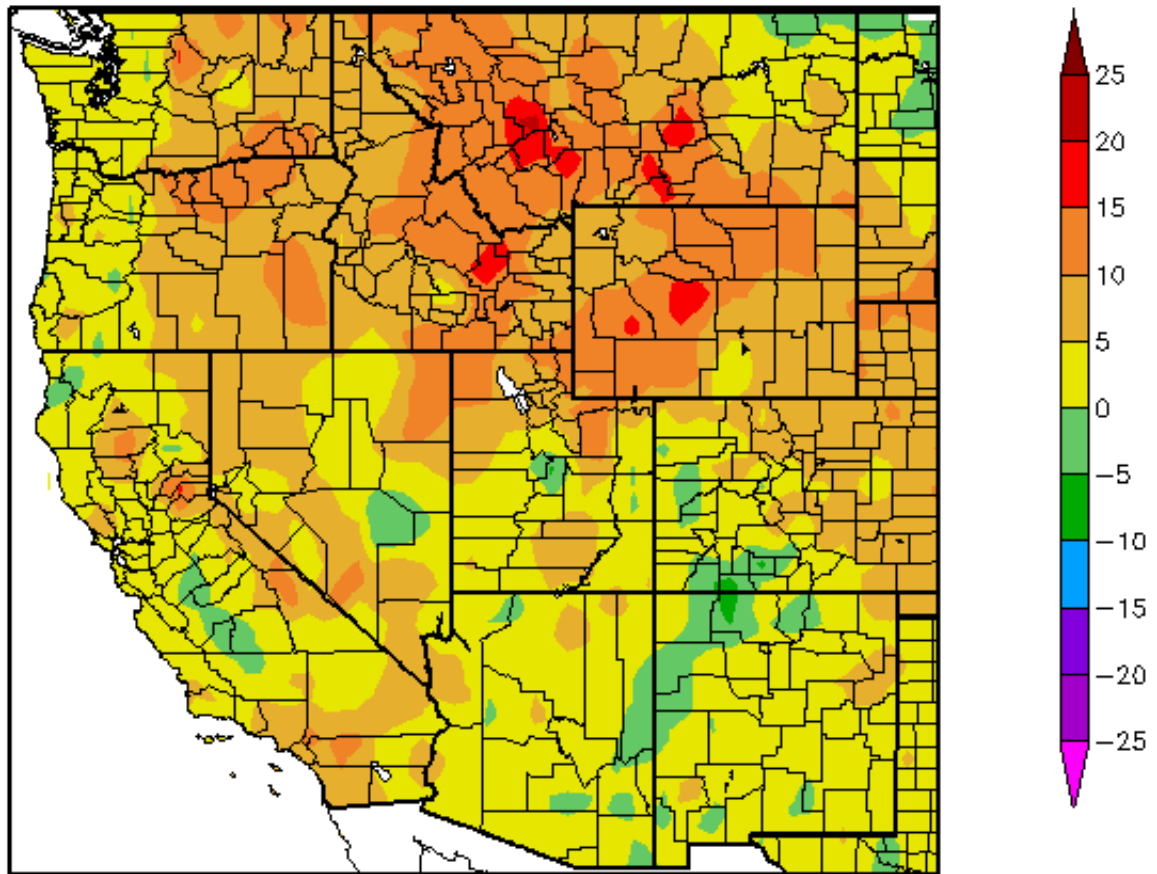


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were generally 5 degrees above normal (+/-4 deg F) with below normal values over the high country of Colorado during the past week.

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

Departure from Normal Temperature (F)
1/8/2009 – 1/14/2009



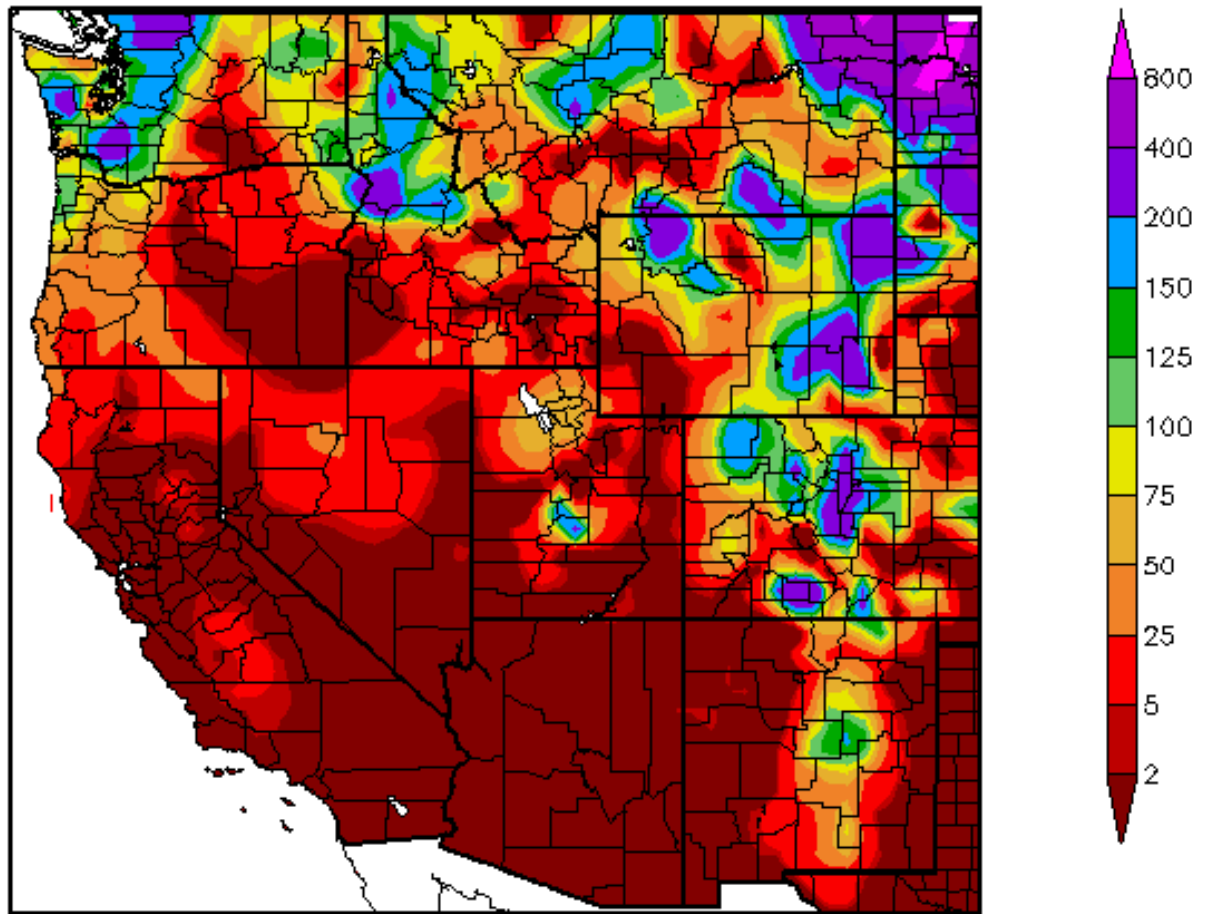
Generated 1/15/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over the Central Montana Rockies (>+20F) and the greatest negative departures occurred over north central New Mexico (<-10F).

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

Percent of Normal Precipitation (%)
1/8/2009 – 1/14/2009



Generated 1/15/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 14 January shows significant amounts scattered across the northern tier states and Central Rockies. Insignificant amounts fell over the remainder of the West.

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

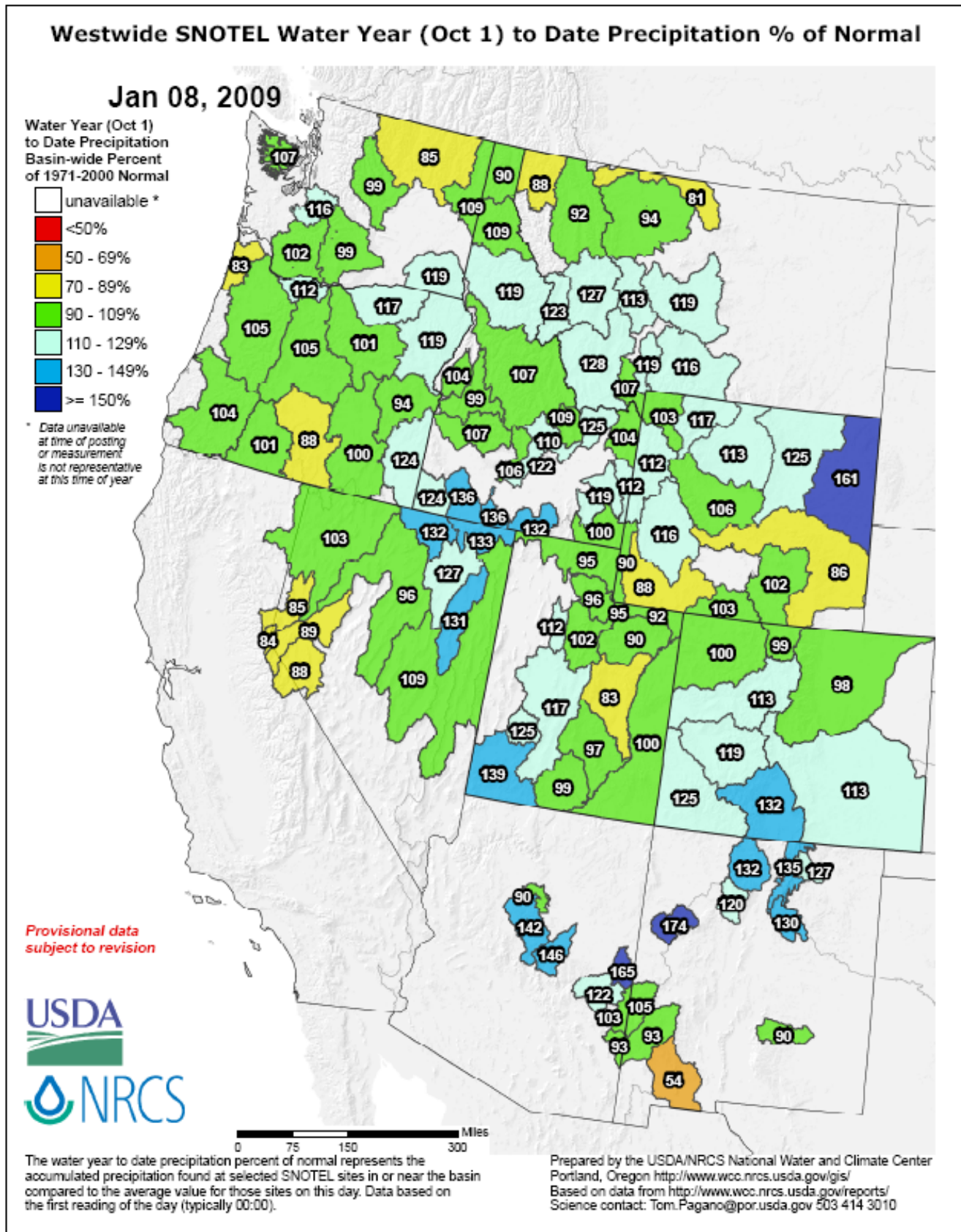
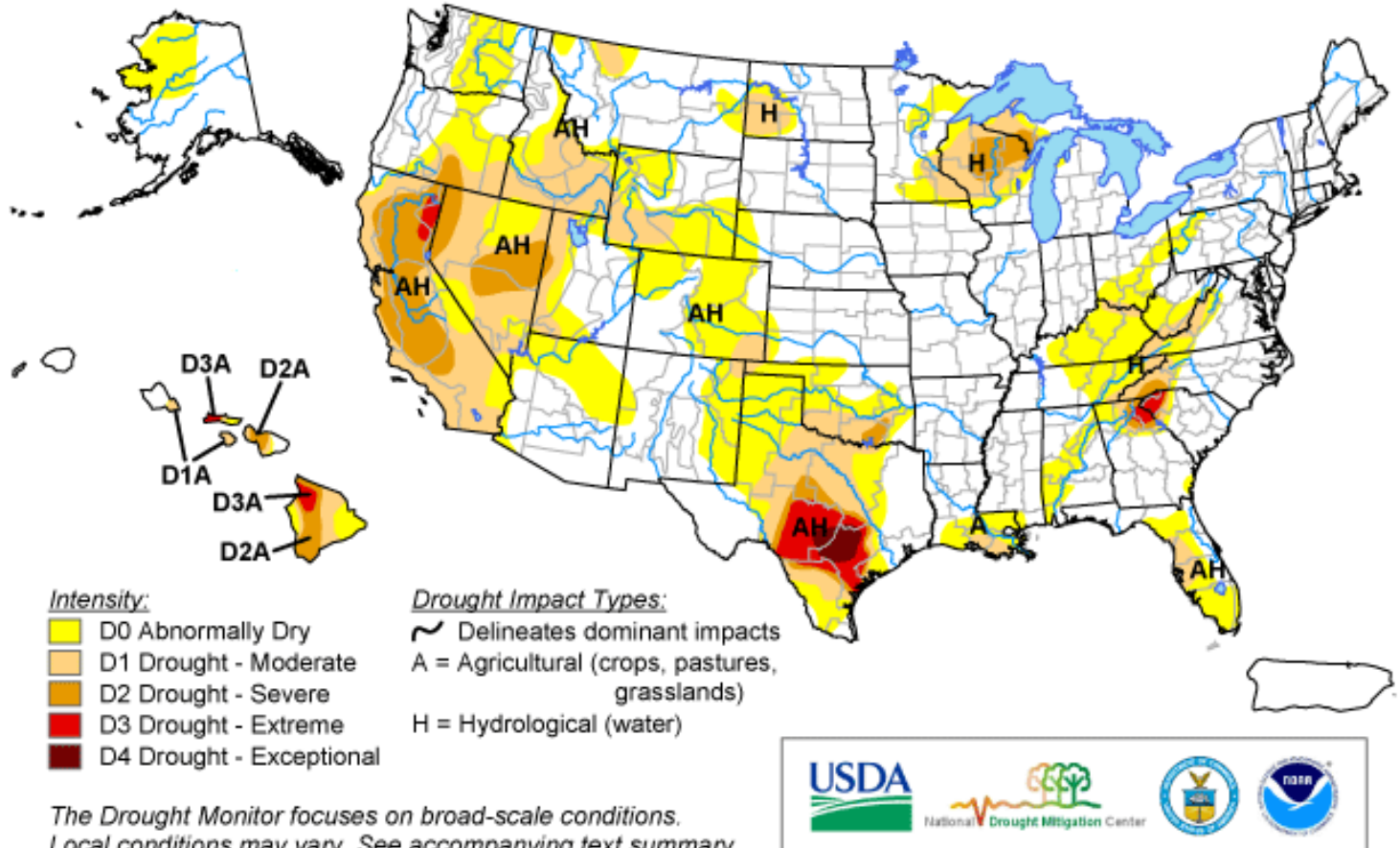


Fig 3b. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values decreased about 10% over the Southwest and Eastern Great Basin (ID & NV) during the past week. Elsewhere, amounts remained pretty stable.

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

U.S. Drought Monitor

January 13, 2009
Valid 8 a.m. EST



Released Thursday, January 15, 2009

Author: Laura Edwards, Western Regional Climate 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

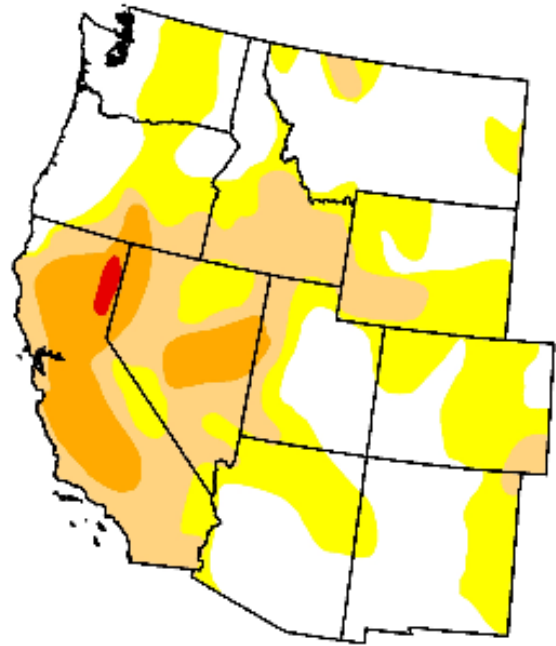
January 13, 2009

Valid 7 a.m. EST

Drought Conditions (Percent Area)						
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	41.9	58.1	28.5	9.1	0.4	0.0
Last Week (01/06/2009 map)	37.4	62.6	28.9	8.8	0.4	0.0
3 Months Ago (10/21/2008 map)	40.5	59.5	30.0	10.4	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 (01/15/2008 map)	27.3	72.7	53.6	28.5	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 15, 2009

Author: Laura Edwards, Western Regional Climate 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

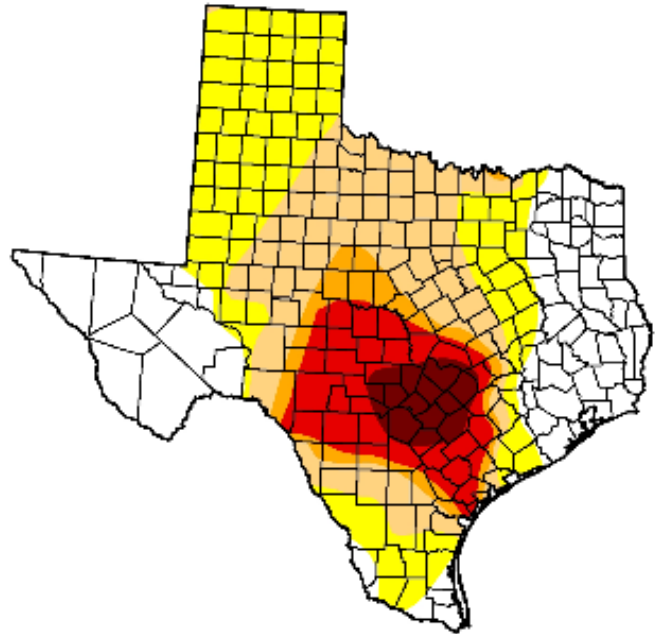
U.S. Drought Monitor

Texas

January 13, 2009

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	29.0	71.0	43.0	20.6	15.1	4.2
Last Week (01/06/2009 map)	41.7	58.3	24.5	15.0	9.1	4.2
3 Months Ago (10/21/2008 map)	71.3	28.8	17.6	11.7	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 (01/15/2008 map)	29.2	70.8	27.1	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 15, 2009

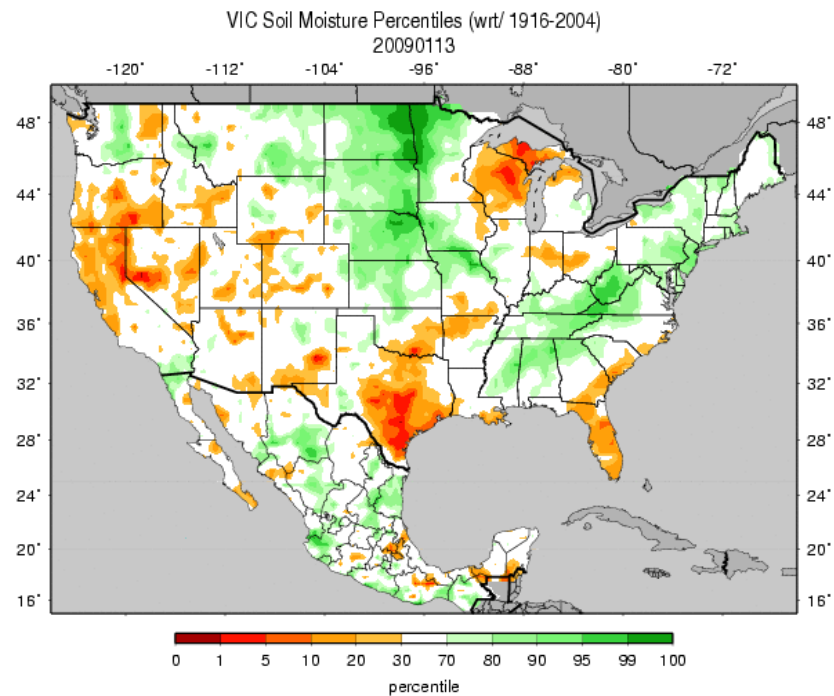
Author: Laura Edwards, Western Regional Climate Center

Fig. 4b: Texas now stands alone as the only state with D4 drought condition. Note significant worsening since last week. Since 2004, Texas has gone from having periods of ample rain to periods of not enough. For example, Victoria in 2007 got 71.8 inches of rain, the second wettest year on record. Last year Victoria got just 21.7 inches, the fifth driest year.

Additional news: <http://www.chron.com/disp/story.mpl/ap/business/6207141.html>.

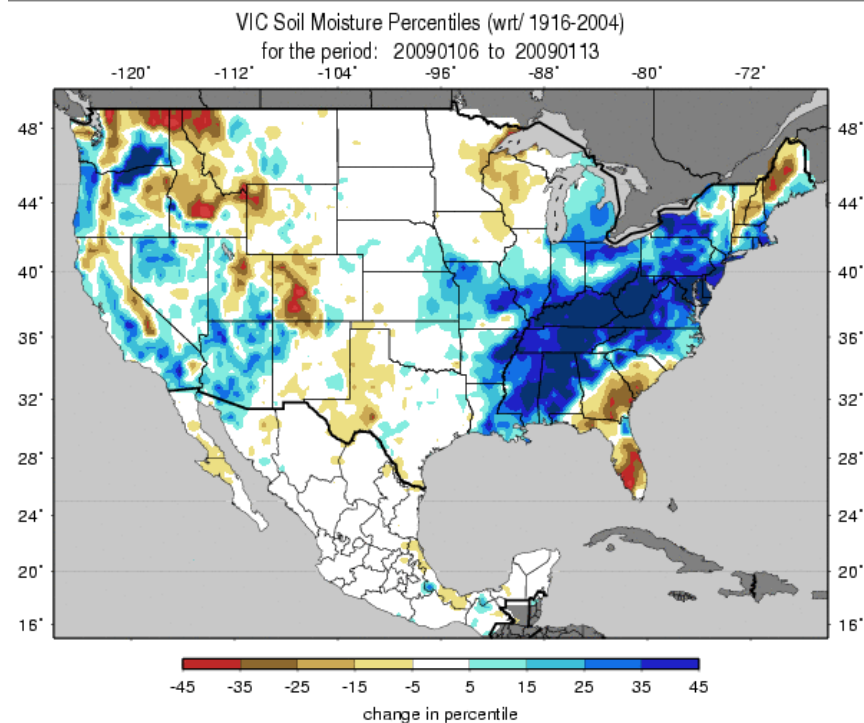
Ref: http://www.drought.unl.edu/dm/DM_southeast.htm

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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 some improvement over Oregon and Washington as of 13 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 significant increase in moisture over eastern third of the country and west of the Continental Divide while drying is accelerating over Florida, Maine, and the northern Pacific Northwest.

Ref: http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.1wk.gif

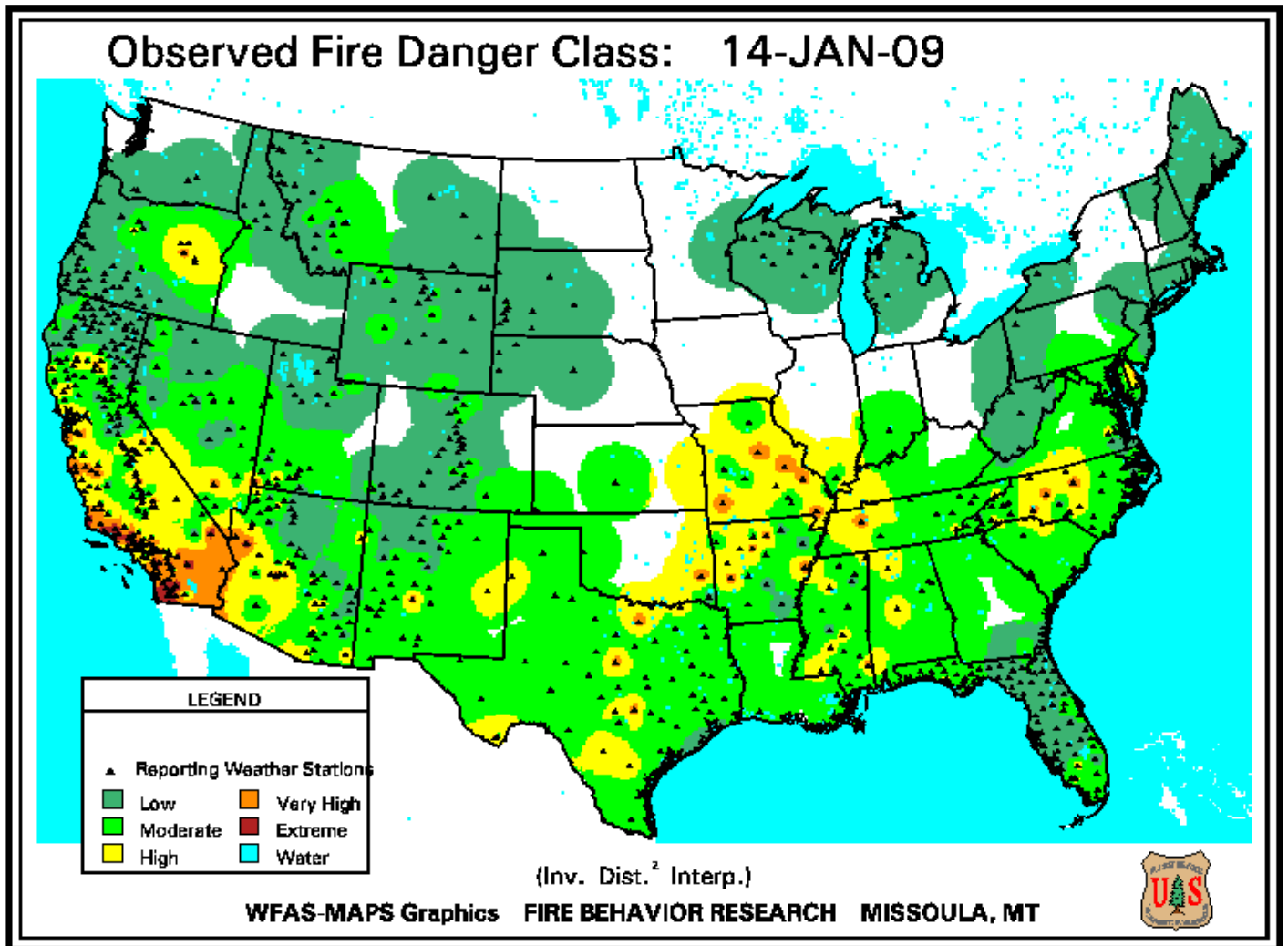


Fig. 6. Observed Fire Danger Class. Conditions have deteriorated over coastal and southern California and improved over western Texas since last week. Source: Forest Service Fire Behavior Research – Missoula, MT. Ref: http://www.fs.fed.us/land/wfas/fd_class.gif

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Wednesday, January 14, 2009

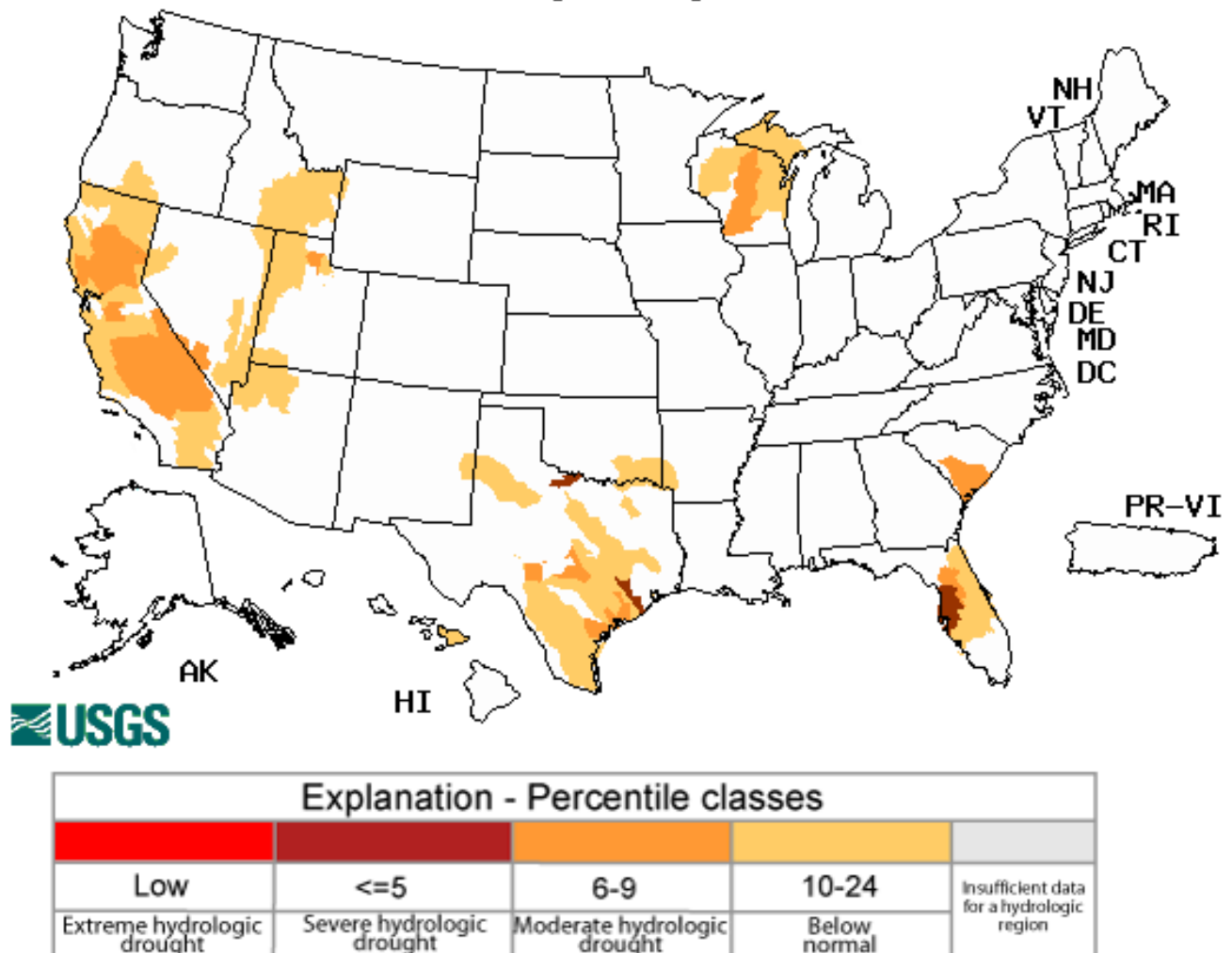


Fig. 7. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. California shows an expanding area of moderate stream flows during this past week. Cold temperatures over the Great Lakes probably have frozen rivers and thus do not necessarily reflect accurate flows. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

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National Drought Summary -- January 13, 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 Southeast

Significant precipitation in the last 7 days improved drought conditions throughout the region, leaving the Appalachian Mountains in D1 or better. Reductions in D1 were made in Tennessee, Virginia, and Georgia. A reduction of D3 in South Carolina and Georgia, as well as 1-category improvements were made in the surrounding areas. Substantial long-term dryness remains. D0 was also spread to the far southwest of Alabama.

The Midwest and Northeast

Further improvements were made this week in Kentucky, West Virginia and areas east of here due to significant precipitation in this region in the last few months. This rainfall did not benefit southern Ohio as much, so D1 lingers there. Long-term dryness remains, however, since the severe drought of 2007, so D0 was kept in Kentucky. Some reduction of the extent of D0 in Pennsylvania is also depicted this week. No other changes were made in the Great Lakes region.

The Plains

Dry conditions continue to plague Texas and Oklahoma. This week D0 was brought out to cover all of the Texas and Oklahoma panhandles that were previously in no drought category. This also extended into eastern New Mexico where precipitation in 2008 was from 68-76 percent of normal. In west central Texas, many rangeland and farm reports indicate worsening conditions, and 1-category changes were made in this region. The north and central Texas regions were degraded 1 category as well to D1, primarily west of I-35. Burn restrictions or bans are in place in 95 Texas counties, as well as most of those in south central Oklahoma. In Oklahoma, precipitation deficits over the last 90 days, and little measurable precipitation of any type during that period justified further degradation in south central Oklahoma and the panhandle.

The West

A dry, quiet weather pattern settled in the West this week, but snowpack remaining from recent storms brought many improvements in the Rocky Mountain region. Montana was improved from D1 to D0 in the far northwest, and a previously large area of D0 is now in no drought, primarily due to snowpack and precipitation for the water year thus far (October 1-present). Some reduction in D0 extent was also made in the eastern part of the state. Colorado Rockies have also received normal to above normal snowpack and precipitation for the water year thus far, enough to remove D0 from this region. The Front Range and plains remain in D0 or D1. In the far west, low streamflow and precipitation this season in the Salinas River justified an extension of D2 over this area south of Monterey Bay.

Hawaii, Alaska and Puerto Rico

No changes were made this week.

Looking Ahead:

In the next 6-10 days, warm and dry conditions are forecast for the southwest region around Arizona and New Mexico. The high pressure currently over the western states will gradually weaken. Below normal temperatures are expected in the Pacific Northwest and east of the Mississippi. An area of wetter than normal conditions is forecast in the northern Rockies. In Alaska, above normal precipitation is forecast over the Aleutians and western part of the state, along with above normal temperatures, which could help alleviate current D0 there. Below normal

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precipitation could occur along the Canadian border. Looking further, in the 8-14 day range, below normal temperatures are forecast throughout the lower 48 states as Arctic air is forecast to dip down. Southeast and northern Alaska are expected to be warmer than average for this time of year with a strong ridge over the state. Precipitation could be above normal from the northern Rockies to the western Appalachian region with a more active storm track, and below normal along the west coast, southern tier, eastern seaboard and southern Alaska.

Author: Laura Edwards, Western Regional Climate 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: 15 January 2009