



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

Weekly Report - Snowpack / Drought Monitor Update **Date: 12 February, 2009**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date shows little change since last week except for areas of significant improvement over southern Nevada, southwest Utah, and central Arizona (Fig 1). Although still early into the spring-summer runoff forecasting season, Fig. 1a reflects unofficial forecast changes for the past 7 days for selected SNOTEL sites and shows that forecast values are now lowered over the northern tier states and higher over the 4-Corners Region and central Arizona. This is somewhat atypical during La Niña. Snow depth changes during this past week shows that many locales across the West had increases (Fig. 1b).

Temperature: SNOTEL and ACIS-day station average temperature anomalies were generally above normal east of the Continental Divide and within +/- 5 degrees of normal elsewhere during the past week (Fig. 2). Specifically, the greatest positive temperature departures occurred over the High Plains (>+12F) and the greatest negative departures occurred over the southern California coast (<-9F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 11 February shows a very wet week from southern California to western New Mexico. Much drier conditions prevailed over the much of the Rockies, Inter-Mountains of Idaho, and northern Great Basin (northwest 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 within 10 percent of last week's values but a one category improvement is noted over eastern Nevada, southwestern Utah, and central Arizona (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: Moderate to heavy precipitation (over 1 inch) was widespread across the southern Cascades, the Sierra Nevada, the coastal regions of California, and the southwestern California mountains, with amounts of 3 to 6 inches fairly common in southwestern California. However, since this was the first substantial precipitation across the state in several weeks, and because reservoir levels remain low and higher-elevation snowpack is still considerably below normal, drought classification improvements were limited. Specifically, moderate drought was re-classified as abnormal dryness through most of the climatologically arid areas in southeastern California and in southern Nevada while D0 conditions retracted westward out of west-central and southwestern Arizona. For the state of California as a whole, combined reservoir storage has dropped to levels typically observed only once every 10 to 20 years in February, and some areas reliant on relatively small-scale water supply systems are bracing for mandatory water usage cutbacks for the coming spring and summer.

In other parts of the West, light precipitation was the general rule, with scattered areas of moderate precipitation and some isolated heavy amounts (1 to 3 inches) observed. Recent dryness has become an increasing concern in Montana, where D0 conditions were expanded into central, west-central, and southwestern parts of the state. Farther south, the situation changed little across

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Wyoming, but a re-assessment of conditions, particularly regional snowpack totals for the last 2 years, prompted some reduction in the extent of D1 in the southwestern part of the state and some re-configuration of D0 coverage in central and southern Wyoming as well as adjacent north-central Colorado. The latter region was one of the areas that received moderate to heavy precipitation last week. Author: Richard Tinker, Climate Prediction Center, NOAA.

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/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/>

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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

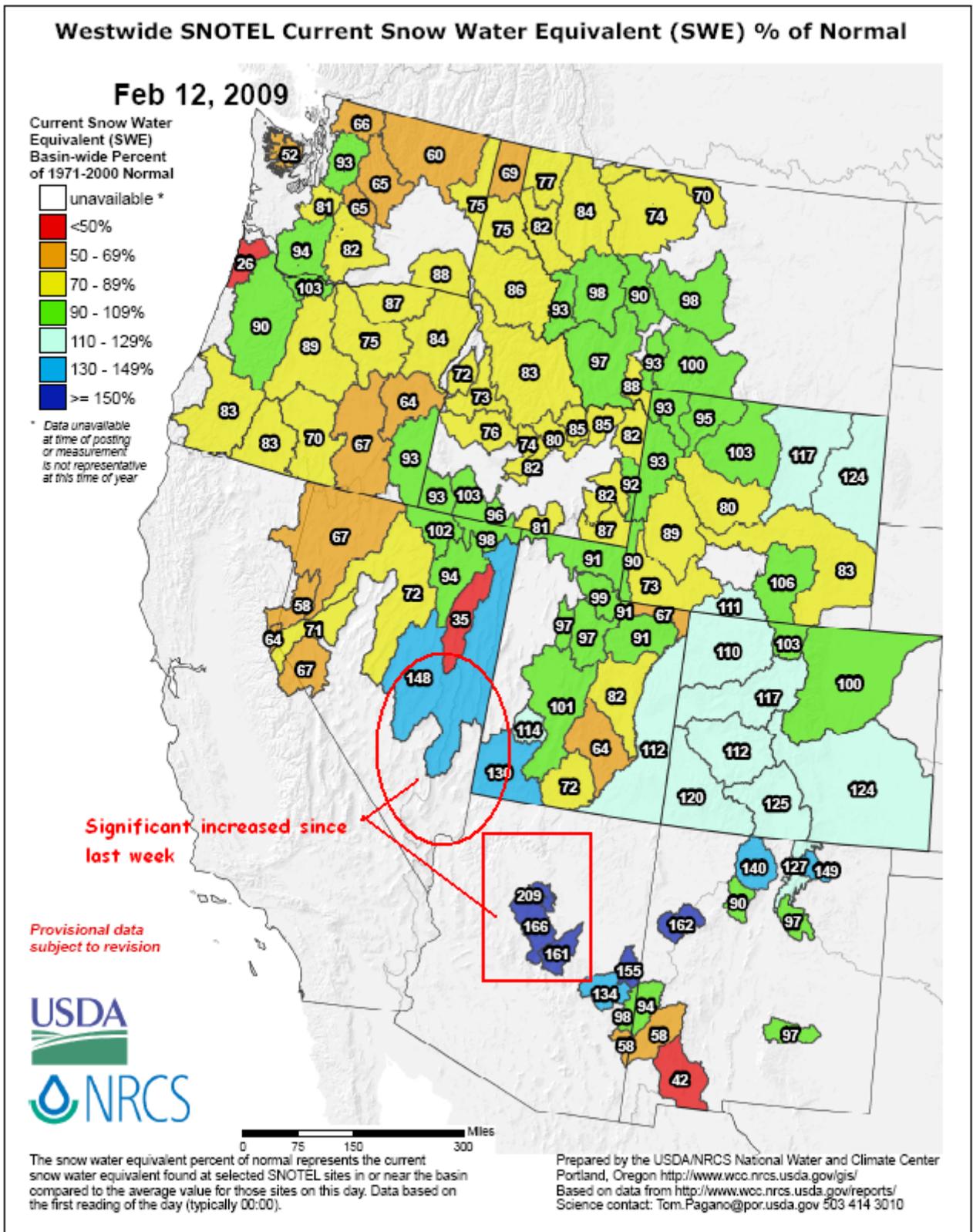


Fig. 1. Snow-water equivalent percent to date shows little change since last week except for areas of significant improvement over southern Nevada, southwest Utah, and central Arizona. Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_swepctnormal_update.pdf

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

Feb 12, 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 since last week show that forecast values are now lowered over the northern tier states and higher over the 4-Corners Region and central Arizona. This is somewhat atypical during La Niña.

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)

Feb 12, 2009

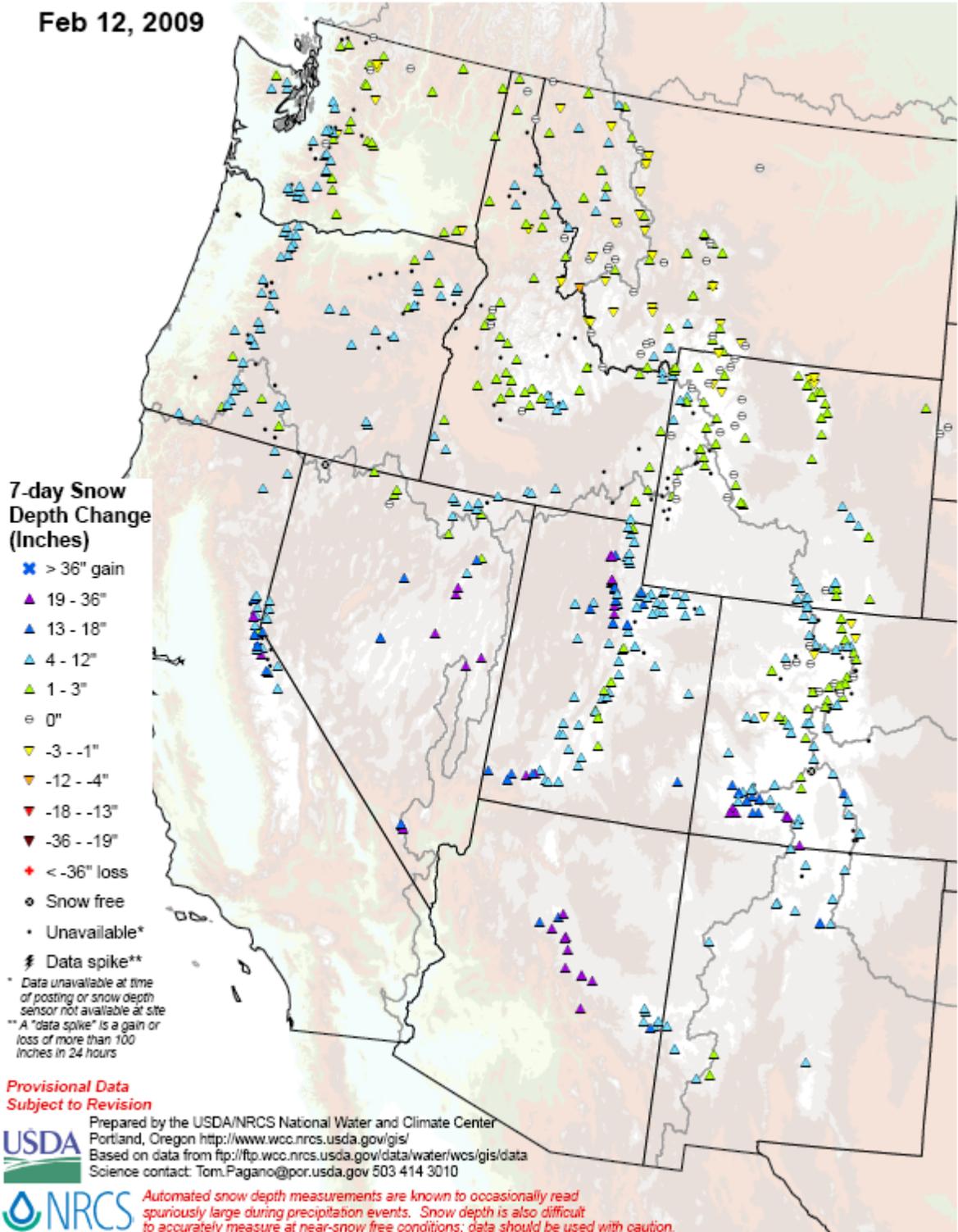


Fig. 1b: This past week's snow depth changes across the West shows that many locales had increases in snow depths.

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)

Feb 12, 2009

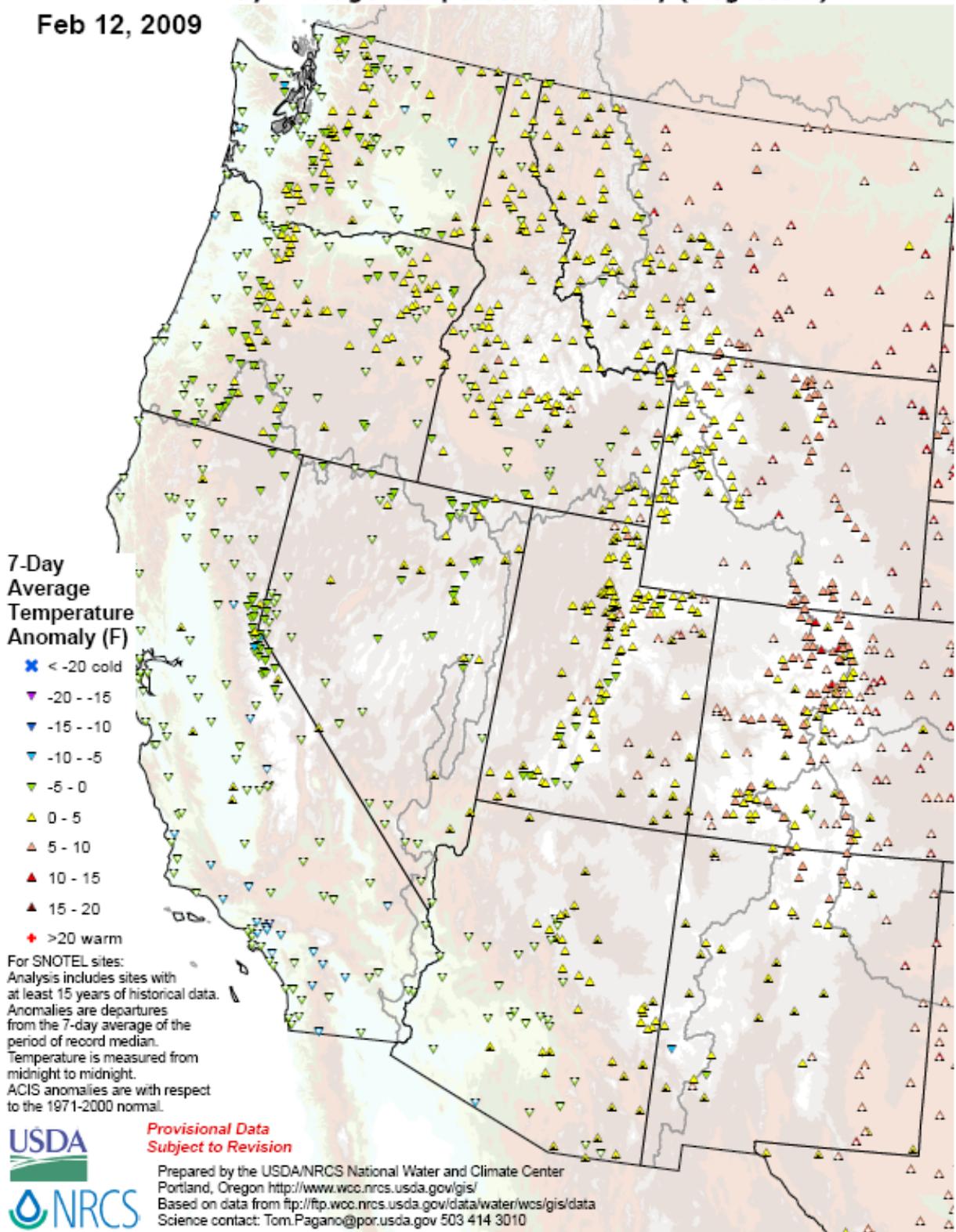
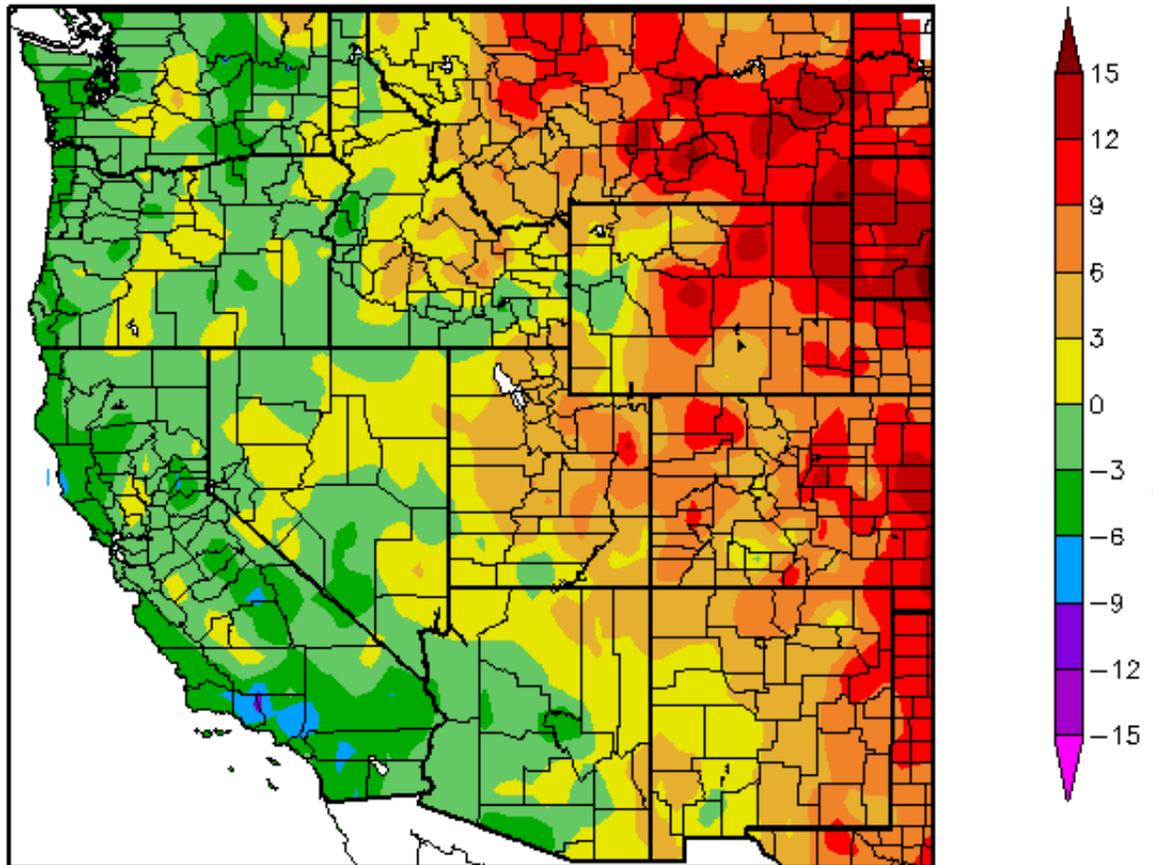


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were generally above normal east of the Continental Divide and within +/- 5 degrees of normal elsewhere during the past week.

Ref: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavq7dAnomalyAcis.pdf>

Departure from Normal Temperature (F)
2/5/2009 - 2/11/2009



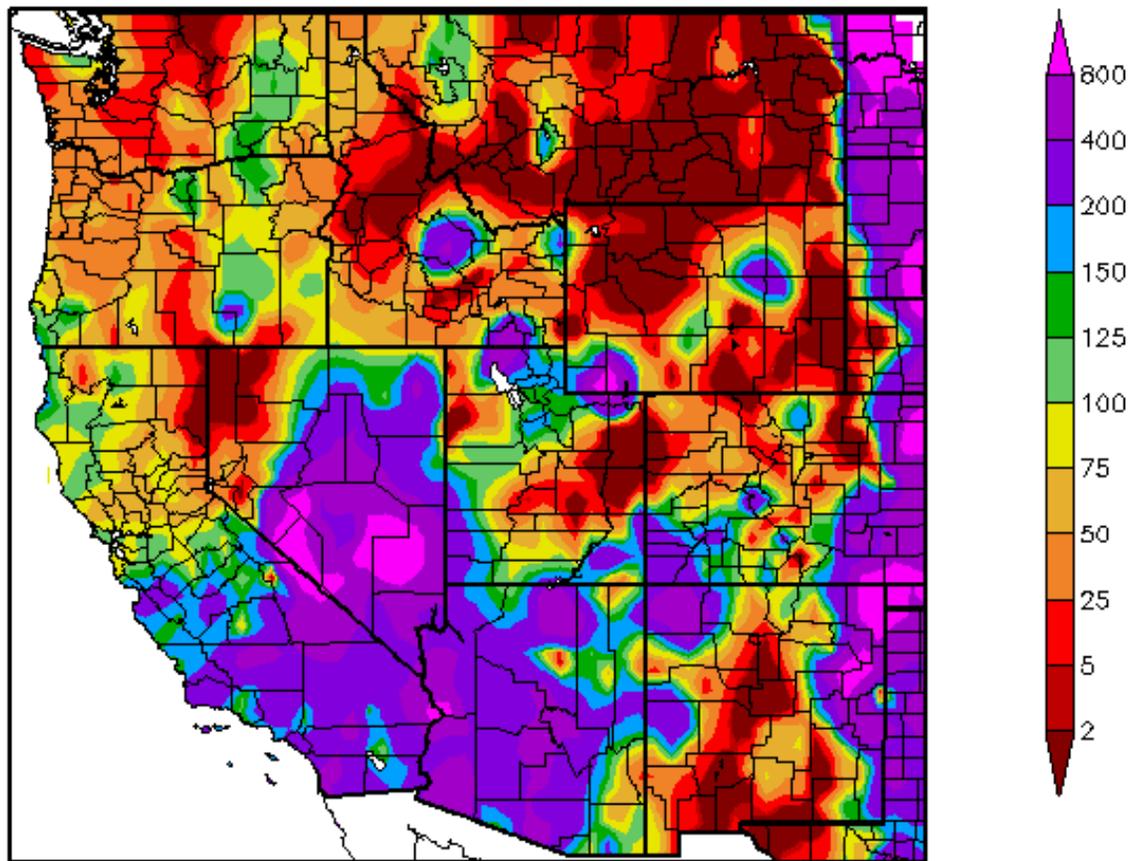
Generated 2/12/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over the High Plains (>+12F) and the greatest negative departures occurred over the southern California coast (<-9F).

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

Percent of Normal Precipitation (%)
2/5/2009 – 2/11/2009



Generated 2/12/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 11 February shows a very wet week from southern California to western New Mexico. Much drier conditions prevailed over the much of the Rockies, Inter-Mountains of Idaho, and northern Great Basin (northwest Nevada).

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

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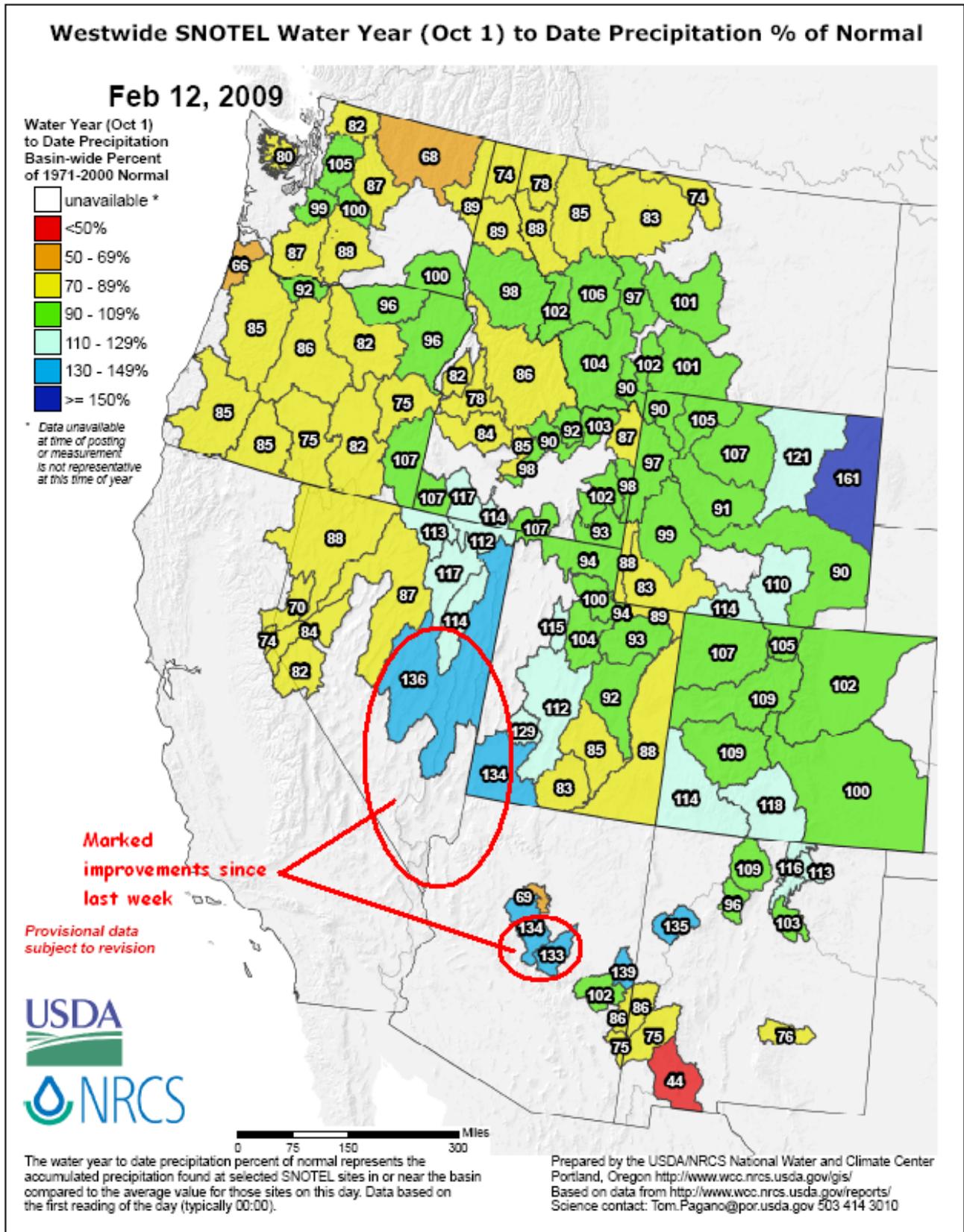
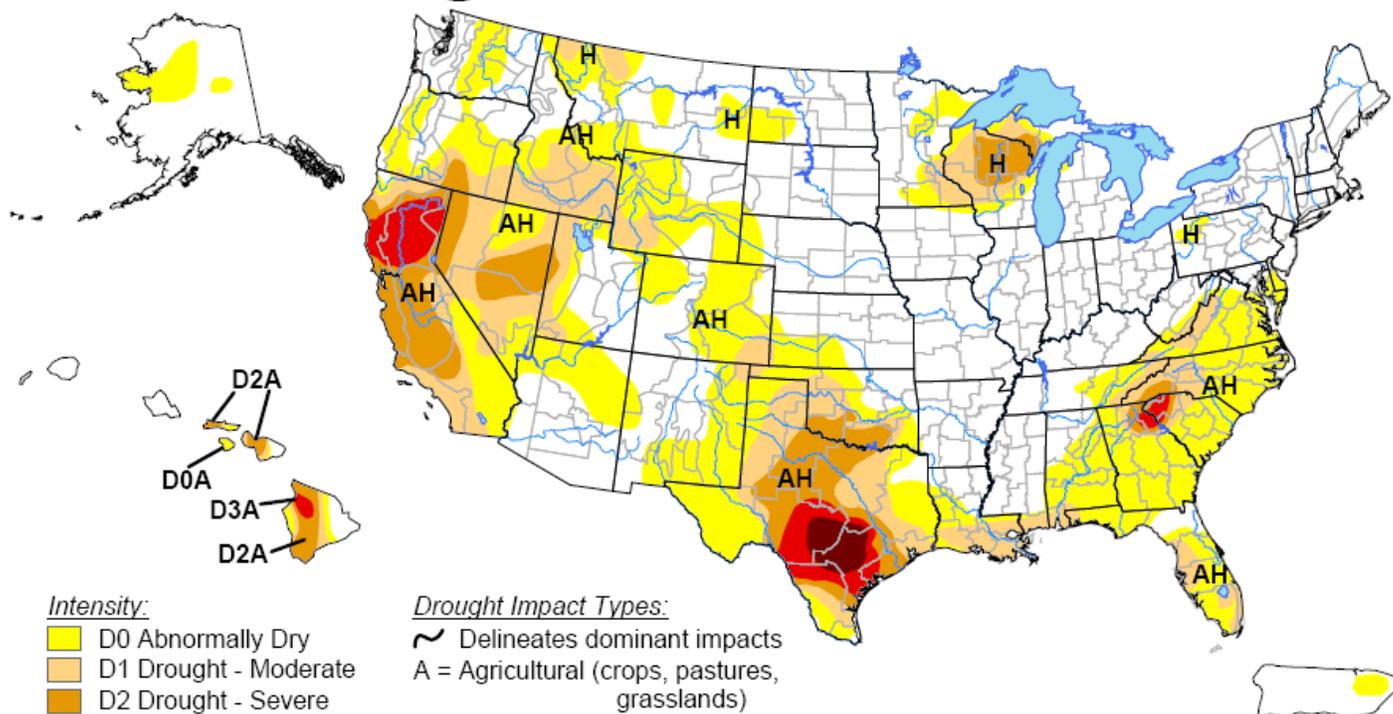


Fig 3b. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values within 10 percent of last week's values but a one category improvement as noted over eastern Nevada, southwestern Utah, and central Arizona.

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

U.S. Drought Monitor

February 10, 2009
Valid 7 a.m. EST



Intensity:

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

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

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



Released Thursday, February 12, 2009
Author: Rich Tinker, Climate Prediction Center, NOAA

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

Fig. 4. Current Drought Monitor weekly summary.

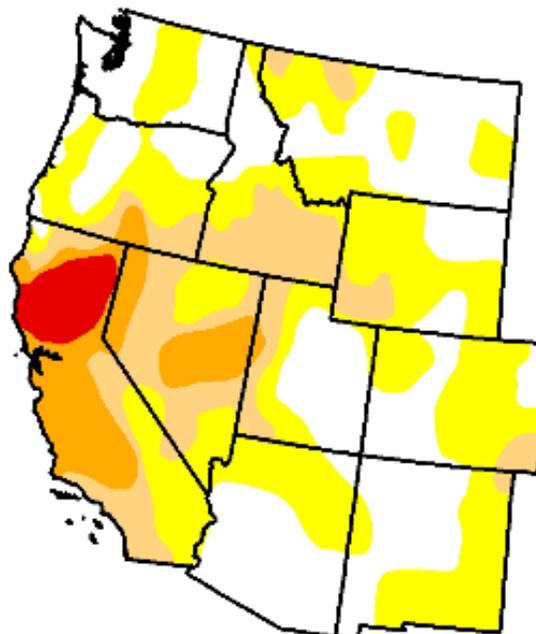
Ref: National Drought Mitigation Center (NDMC) - <http://www.drought.unl.edu/dm/monitor.html>

U.S. Drought Monitor West

February 10, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	37.1	62.9	26.2	10.7	2.5	0.0
Last Week (02/03/2009 map)	41.1	58.9	28.6	10.7	2.5	0.0
3 Months Ago (11/18/2008 map)	36.0	64.0	29.3	8.6	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 (02/12/2008 map)	33.2	66.8	37.7	16.9	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>



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Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note some deterioration in drought conditions since last week.

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

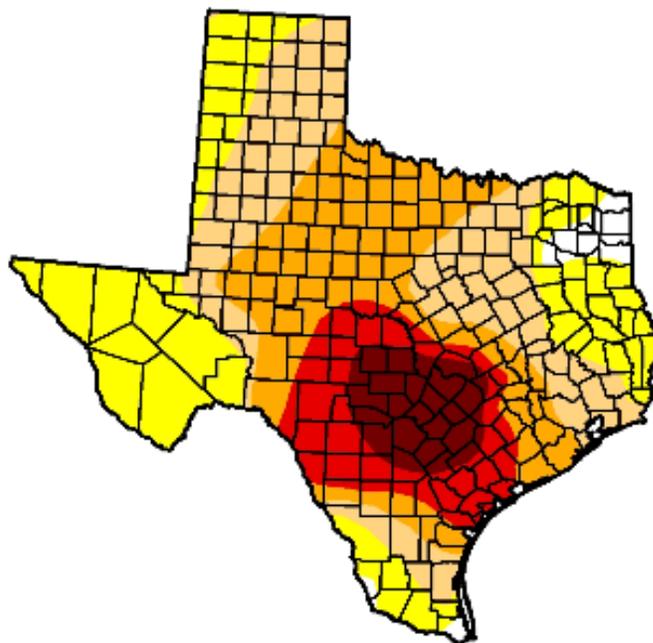
U.S. Drought Monitor

Texas

February 10, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	2.6	97.4	69.5	43.8	19.6	7.6
Last Week (02/03/2009 map)	4.6	95.4	66.8	42.6	19.6	6.7
3 Months Ago (11/19/2008 map)	59.5	40.5	22.0	14.0	6.2	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 (02/12/2008 map)	14.7	85.3	39.7	11.9	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

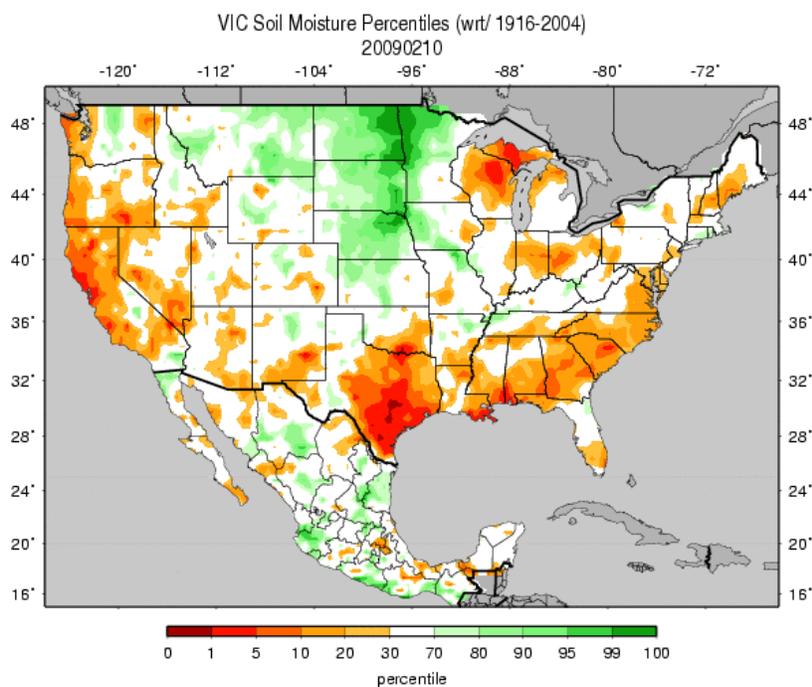
<http://drought.unl.edu/dm>



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Fig. 4b: Texas is the only state with D4 drought condition in the US. Note slight worsening since last week. Ref: http://www.drought.unl.edu/dm/DM_southeast.htm

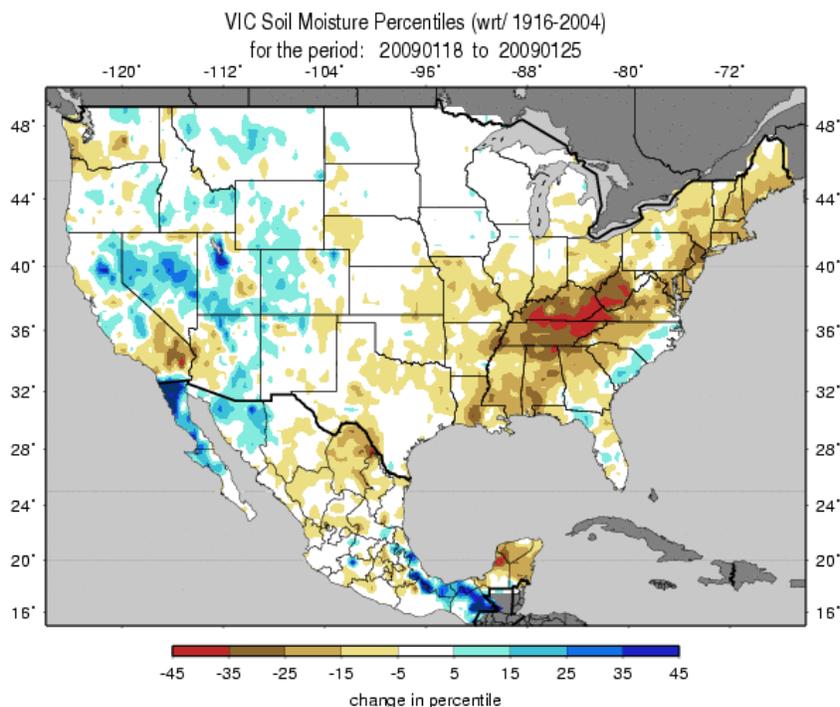
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Figs. 5a: Soil Moisture ranking in percentile based on 1915-2003 climatology for this past week. Near saturation exists over the Northern Plain while excessive dryness dominates much of California, south central Texas, the Upper Peninsula of Michigan, and the Gulf Coast States.

Ref:

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



Figs. 5b: Soil Moisture change in percentile based on 1915-2003 climatology for this past week. Note improvement over the Interior West (excluding southern California and western Washington) and major worsening over the Tennessee River Valley.

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

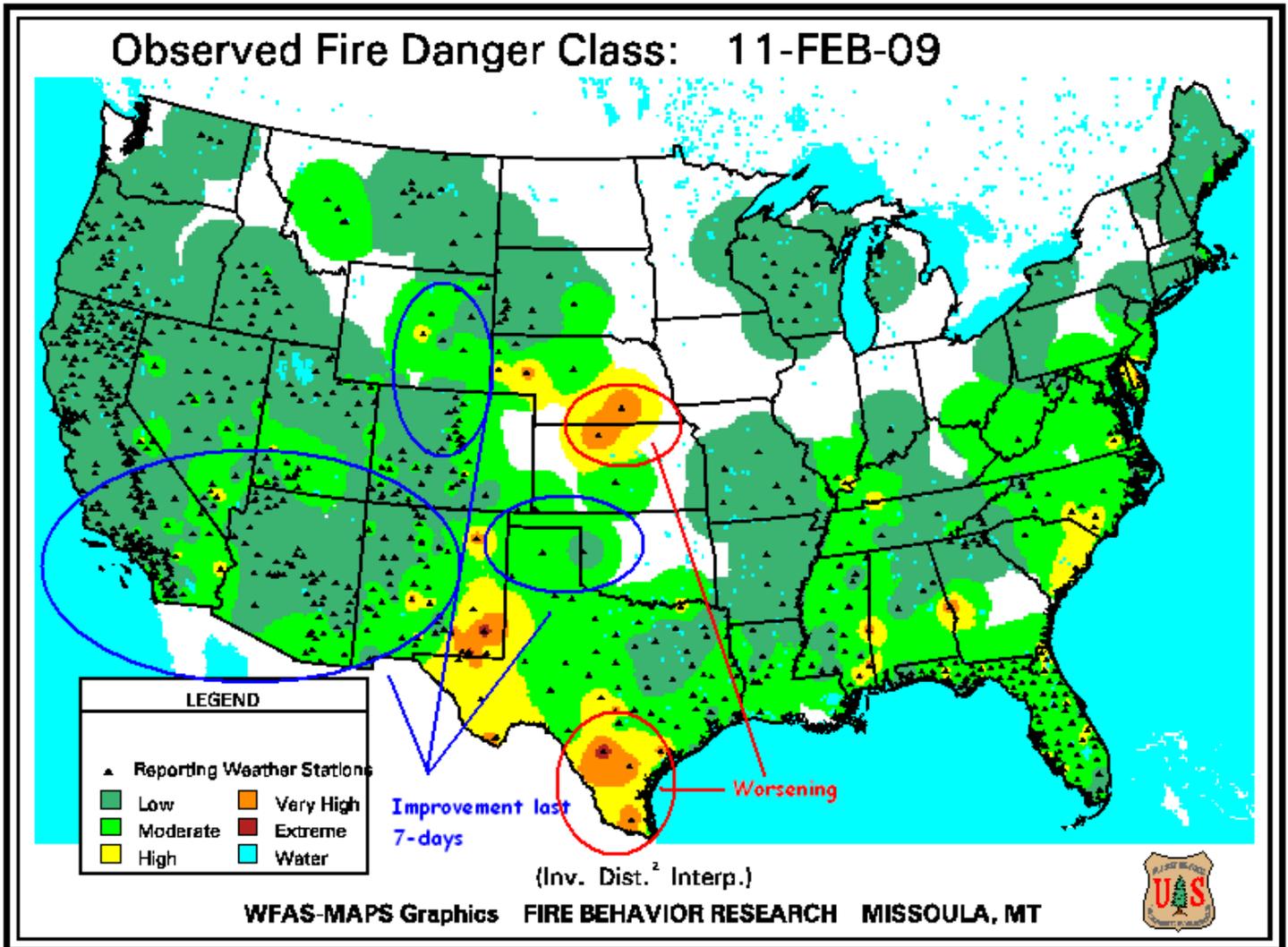
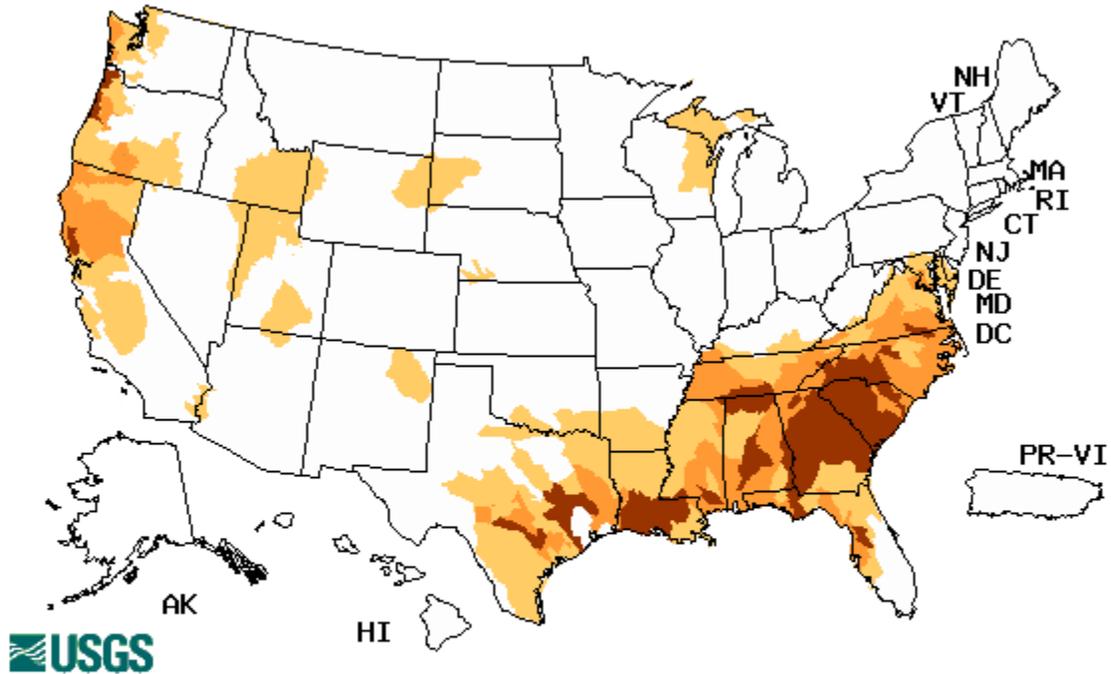


Fig. 6. Observed Fire Danger Class. Conditions have improved over southern California and the Southwest, Texas Panhandle, and central Colorado-Wyoming but have worsened over central Nebraska-Kansas and southern Texas since last week. Source: Forest Service Fire Behavior Research – Missoula, MT. Ref: http://www.fs.fed.us/land/wfas/fd_class.gif

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Wednesday, February 11, 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. California has improved considerably while conditions are very poor over the Southeast and Gulf Coastal States during the past week. Elsewhere, over the Northern States cold temperatures have probably 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 – February 10, 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/>.

For the country as a whole, it was a relatively dry week with a few important exceptions. Moderate to heavy precipitation fell on parts of California and the Southwest for the first time in several weeks, and moderate amounts with isolated heavy totals were also reported in parts of the Great Basin, the Rockies, and the Plains. The continuing dryness in most of the East and South led to dryness and drought expansion, but significant precipitation provided at least limited relief from dryness and drought in parts of the south-central and northern Plains.

The East: Little or no precipitation fell on areas east of the Mississippi River last week, fostering some marked expansion of abnormal dryness, and more limited areas of deterioration from abnormal dryness into moderate drought. At least somewhat below-normal precipitation has been observed in areas east of the Appalachians from the lower mid-Atlantic region southward since mid-November 2008, with the last 30 days bringing very little precipitation (generally less than 25 percent of normal) to most areas outside central and northern peninsular Florida. As a result, D0 conditions expanded markedly to cover all areas east of the Appalachians from northern Virginia, southern Maryland, and central Delaware southward to northern Florida. Furthermore, abnormal dryness deteriorated to moderate drought in the southernmost sections of Mississippi, Alabama, and adjacent Florida, parts of southeastern Florida, portions of the central and northwestern Carolinas, and western Virginia. Areas of severe to extreme drought remained unchanged, as did hydrologic dryness in northwestern Pennsylvania.

The Great Lakes Region: Light precipitation fell on most of the areas affected by dryness and drought, keeping drought classifications unchanged in most of the region, though a little expansion of the D2 area both to the southeast and northwest in Wisconsin seemed warranted based on a re-assessment of precipitation deficits on time scales ranging from 90 days to over a year.

The Plains: Moderate precipitation (0.5 to locally 2.0 inches) fell on scattered locations across the south-central, western, and northern Plains with little or none reported elsewhere, most notably in southern and coastal Texas, most of Louisiana, southern New Mexico, and eastern Montana. This precipitation was enough to improve former D1 to D2 conditions in parts of southern Oklahoma, and to eliminate former D1 conditions in southwestern North Dakota, although the extent of abnormal dryness was not affected. In contrast, the dry week contributed to building moisture deficits that prompted a slight northwestward expansion of the D4 area in central Texas, a northeastward expansion of D2 into parts of the Houston, TX and Galveston, TX areas, and a broad expansion of D1 into most of the upper Texas and Louisiana Gulf Coastal region. Also, increasing moisture deficits over the last 3 months led to the introduction of D0 across south-central New Mexico, and some expansion of D0 in east-central Montana.

The West: Moderate to heavy precipitation (over 1 inch) was widespread across the southern Cascades, the Sierra Nevada, the coastal regions of California, and the southwestern California mountains, with amounts of 3 to 6 inches fairly common in southwestern California. However, since this was the first substantial precipitation across the state in several weeks, and because reservoir levels remain low and higher-elevation snowpack is still considerably below normal, drought classification improvements were limited. Specifically, moderate drought was re-classified as

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abnormal dryness through most of the climatologically arid areas in southeastern California and in southern Nevada while D0 conditions retracted westward out of west-central and southwestern Arizona. For the state of California as a whole, combined reservoir storage has dropped to levels typically observed only once every 10 to 20 years in February, and some areas reliant on relatively small-scale water supply systems are bracing for mandatory water usage cutbacks for the coming spring and summer.

In other parts of the West, light precipitation was the general rule, with scattered areas of moderate precipitation and some isolated heavy amounts (1 to 3 inches) observed. Recent dryness has become an increasing concern in Montana, where D0 conditions were expanded into central, west-central, and southwestern parts of the state. Farther south, the situation changed little across Wyoming, but a re-assessment of conditions, particularly regional snowpack totals for the last 2 years, prompted some reduction in the extent of D1 in the southwestern part of the state and some re-configuration of D0 coverage in central and southern Wyoming as well as adjacent north-central Colorado. The latter region was one of the areas that received moderate to heavy precipitation last week.

Hawaii, Alaska and Puerto Rico: It was an uneventful week across Hawaii, with scattered moderate to heavy rainfall reported, but an assessment of the precipitation patterns observed during the past several weeks and current streamflow levels prompted some changes on the Big Island. Conditions now look better on the eastern half of the Island, where a significant westward retraction of D0 and a more limited pullback of D1 conditions seemed justified. In contrast, the areas of severe to extreme drought across interior parts of the Island felt no relief, and in fact a moderate expansion of extreme drought conditions was assessed in part of the interior.

Light precipitation fell on most of the abnormally dry areas in Alaska, similar to conditions noted for many of the past several weeks. In addition, snowpack in northwestern Alaska is near or above typical seasonal levels, thus D0 was removed from the northern tier and the northwestern most sections of the state.

Scattered light to moderate precipitation fell on interior northeastern Puerto Rico, keeping existing D0 conditions intact.

Looking Ahead: At least some precipitation is expected through most dry areas in the South and East during February 12 – 16, 2009, though heavy totals (exceeding 1 inch) should be limited to northwest Pennsylvania and a swath across the Gulf of Mexico and southern Atlantic Coastal states from southern portions of Louisiana and Mississippi eastward through most of Alabama, Georgia, and South Carolina. Totals of 2 to 3 inches are expected in a band from far southeastern Louisiana northeastward through central Georgia. Only southern Florida is expected to evade any precipitation during this period. Elsewhere, precipitation should be more limited from the Great Basin and the Rockies eastward through the Plains and the Great Lakes region. Most of these areas can expect light to locally moderate precipitation, with a few areas receiving up to an inch. However, the dry areas in the northern Plains and from central Texas northward through Oklahoma and westward through most of New Mexico are forecast to receive little or no precipitation. This includes the most severely dry areas in central and southeastern Texas. Finally, heavy and potentially beneficial precipitation is again expected throughout California, with 2 to 4 inches forecast for the higher elevations and most coastal sections in the state. Even the typically drier central California Valleys should receive at least 2 inches.

During the ensuing 5 days (February 17 – 21, 2009), above-normal precipitation seems most likely again across the Southeast and lower mid-Atlantic region while below-normal totals appear most probable again for southern Florida and for northwestern Pennsylvania. Farther west, below-normal precipitation also appears to be favored through the southern half of the Plains from all of Texas and southern New Mexico northward through eastern Colorado and Kansas. In contrast, the odds

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tilt toward wetter than normal conditions for the dry area in the northern Plains and westernmost Great Lakes Region. Farther west, above-normal precipitation looks to continue throughout California, extending northward and eastward through Oregon and southeastern Washington, central and western Idaho, all of Nevada, and the western halves of Utah and Arizona. Finally, the abnormally dry areas in Alaska also appear in line for above-normal precipitation.

Author: Richard Tinker, Climate Prediction Center, NOAA

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: 12 February 2009