



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

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

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date shows values within 10 percent of last week's values. Deficits persist over the Northern Tier States while surpluses still exist over southwest Utah and eastern Nevada (Fig 1). Unofficial forecast changes for the past 7 days in spring and summer streamflow runoff for selected SNOTEL sites show that forecast values have increased over northern New Mexico and decreased over much of Colorado (Fig. 1a). This past week's snow depth changes show significant decreased over the Sierra and significant increases over the Cascades and much of the West (Fig. 1b).

Temperature: SNOTEL and ACIS-day station average temperature anomalies were well below normal across most of the West with the exception over parts of the Southwest during the past week (Fig. 2). Specifically, the greatest positive temperature departures occurred over part of eastern New Mexico (**>+10F**) and the greatest negative departures occurred over northern Montana (**<-20F**) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 11 March shows a very wet week over the Interior West and the southern border of Arizona and New Mexico. Much drier conditions prevailed over much of California and the Southern High Plains (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 remaining pretty much unchanged this week (Fig. 3a). The Northern Tier States and much of Oregon continue to be below normal. 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/>.

WESTERN DROUGHT STATUS

The West: Heavy precipitation once again fell on central and eastern California and into western Nevada further helping to ameliorate drought in the hardest hit areas of these states. Reports of one to three plus inches of precipitation were common through the area early in this US Drought Monitor period. Extreme drought (D3) was eliminated. Severe drought (D2) improved in the Sacramento and San Joaquin Basins, as well as in the Russian, Yuba, and American River watersheds and through much of western Nevada. Reservoir storage continued to increase on many rivers with Shasta Reservoir in the Sacramento Basin increasing its elevation over 10 feet this week.

Moderate drought (D1) eased slightly in southern Idaho and northwest Montana but built into northern Cascades of Washington. Abnormally dry conditions (D0) expanded in eastern Washington. Author: Michael Brewer, National Climatic Data Center, 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. 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>

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

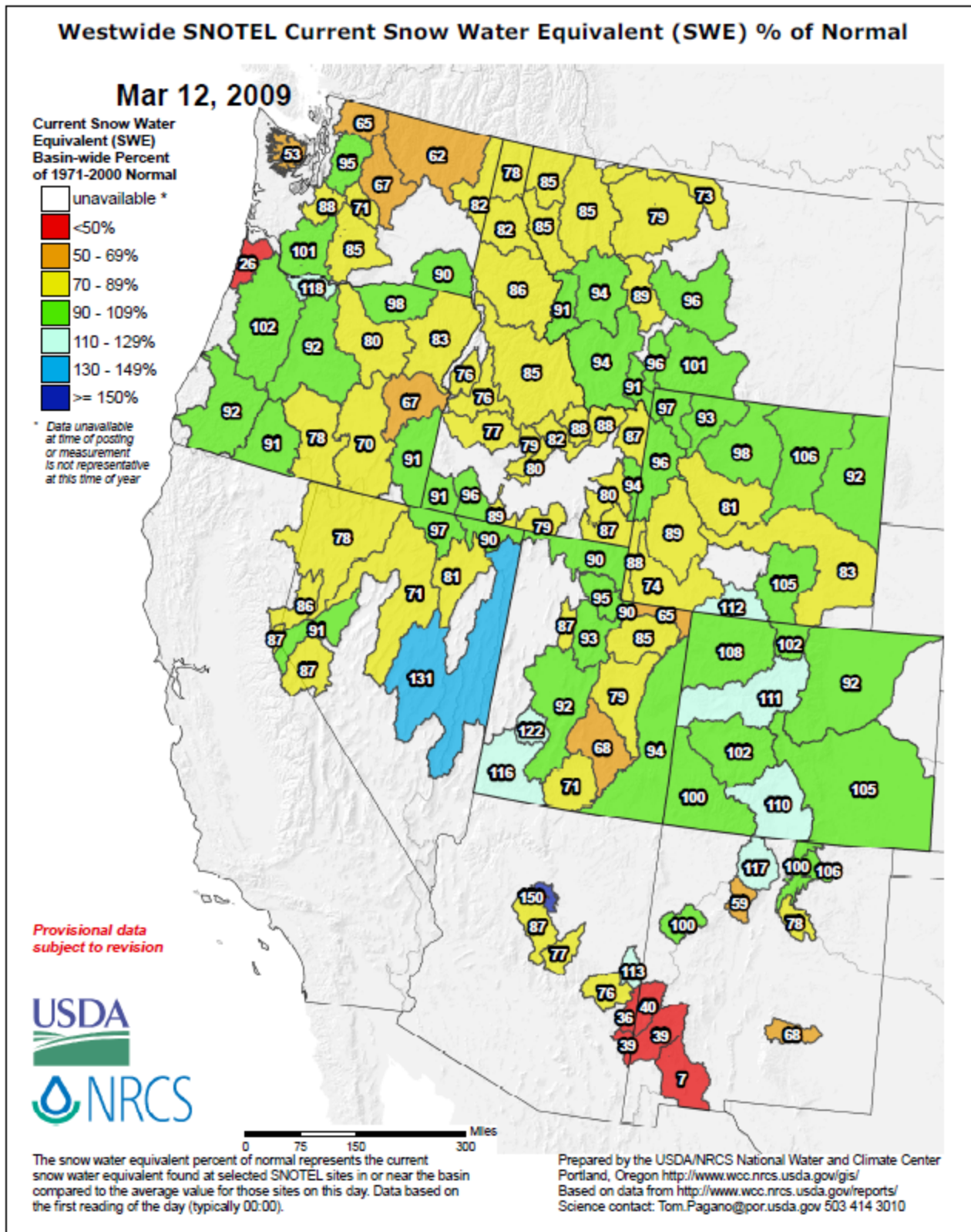


Fig. 1. Snow-water equivalent percent to date shows values within 10 percent of last week's values. Deficits persist over the Northern Tier States while surpluses still exist over southwest Utah and eastern Nevada.

Ref: http://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

Mar 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://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 have increased over northern New Mexico and decreased over much of Colorado.

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

SNOTEL 7-Day Snow Depth Change (Inches)

Mar 12, 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.

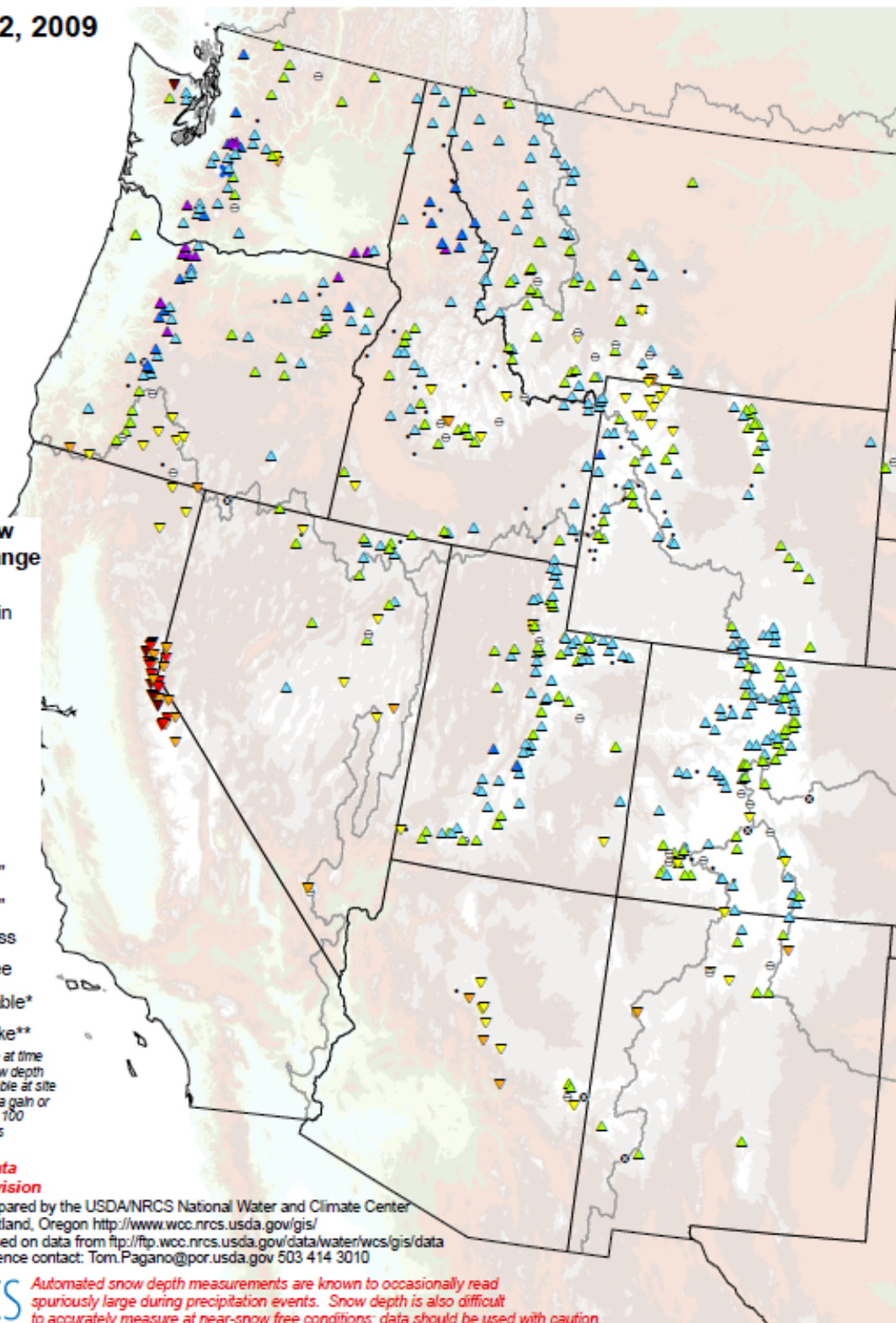


Fig. 1b: This past week's snow depth changes show significant decreased over the Sierra and significant increases over the Cascades and much of the West.

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

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

Mar 12, 2009

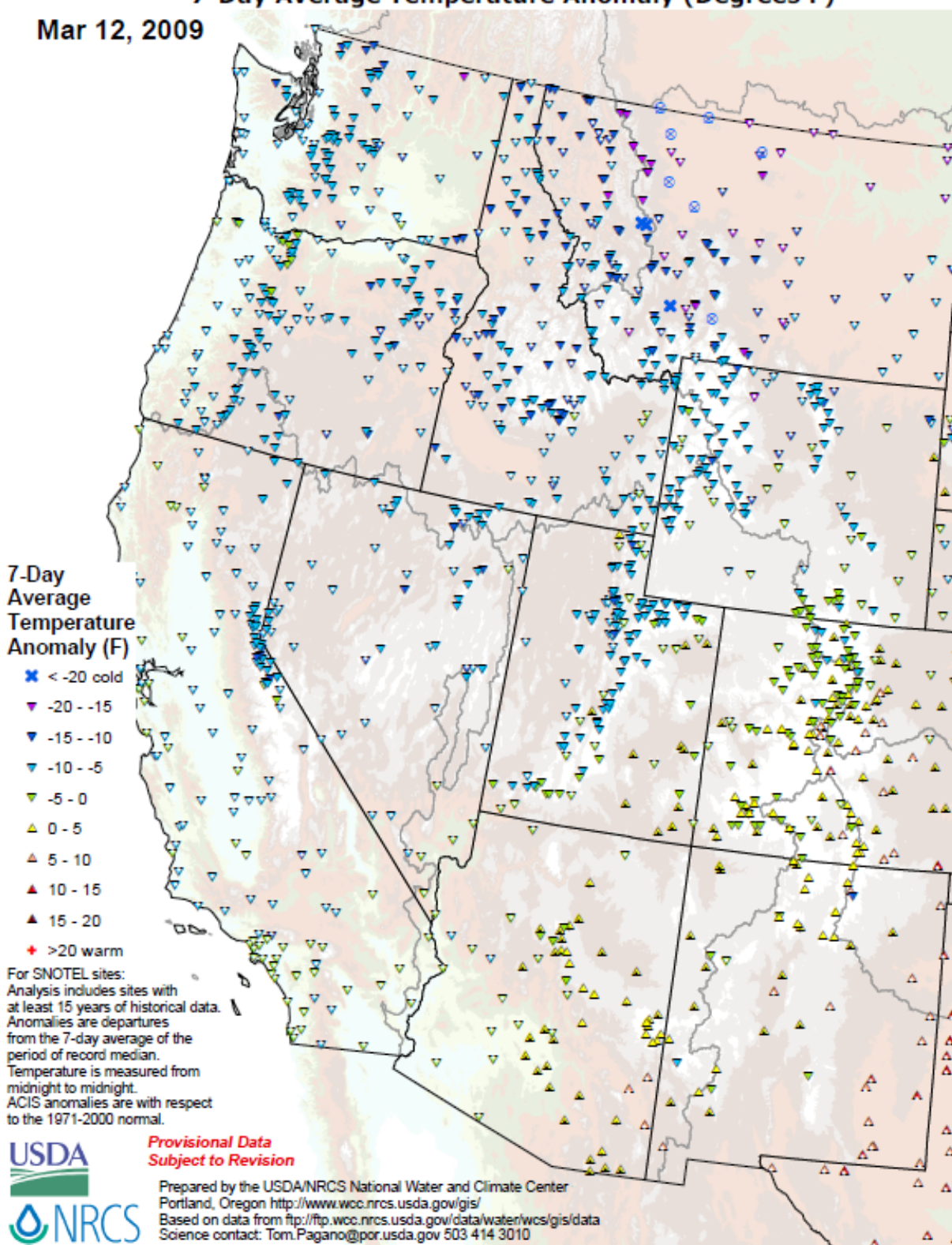
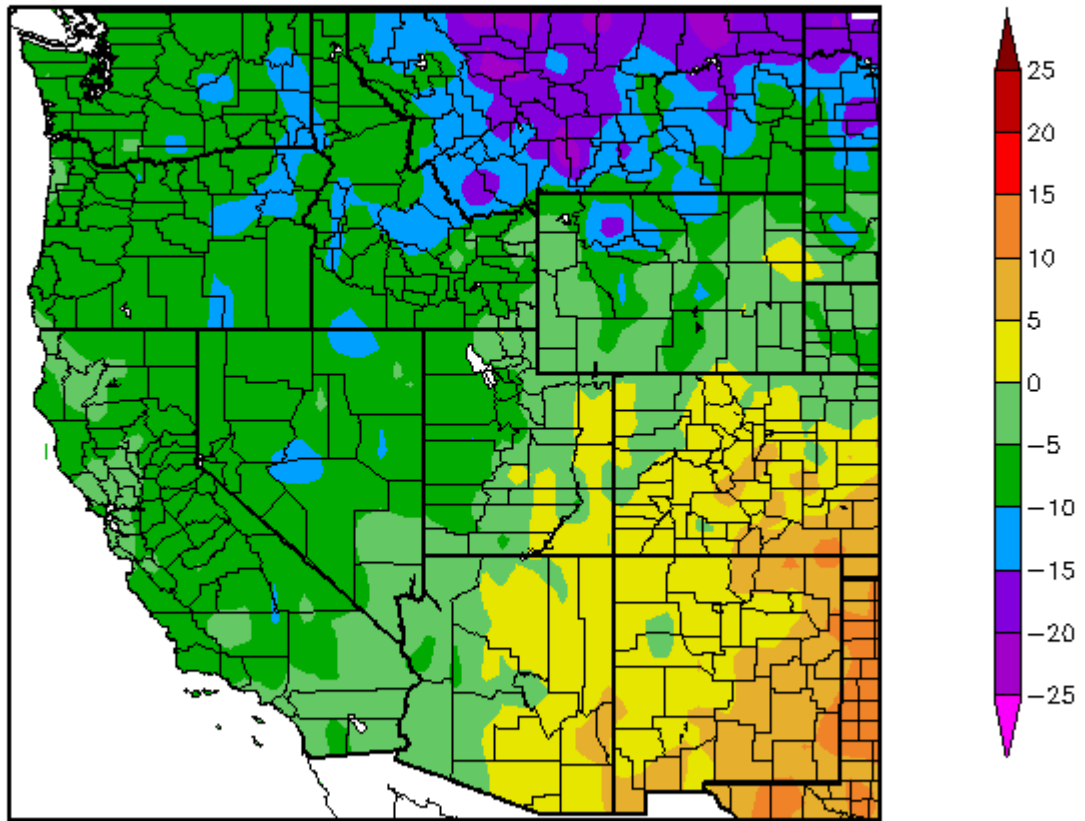


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were well below normal across most of the West with the exception over parts of the Southwest during the past week.

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

Departure from Normal Temperature (F)
3/5/2009 – 3/11/2009



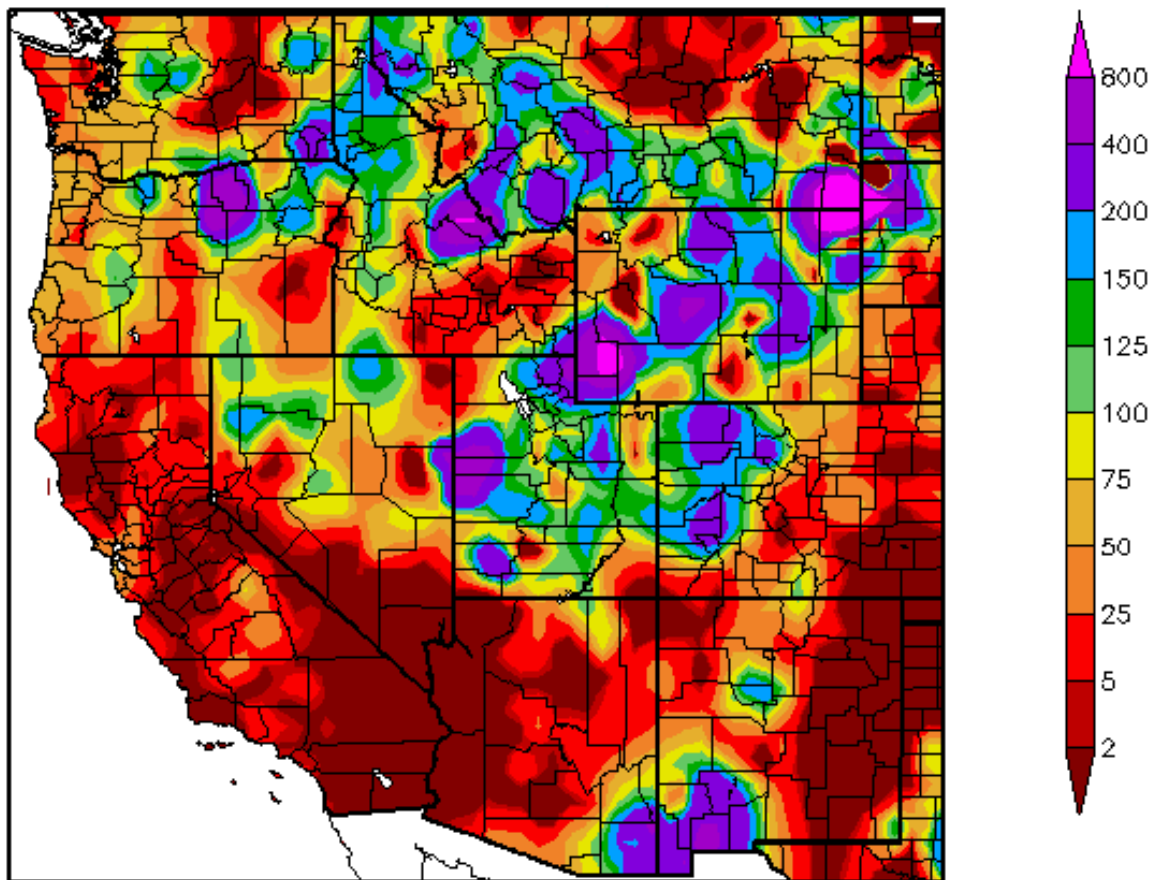
Generated 3/12/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

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

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

Percent of Normal Precipitation (%)
3/5/2009 – 3/11/2009



Generated 3/12/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 11 March shows a very wet week over the Interior West and the southern border of Arizona and New Mexico. Much drier conditions prevailed over much of California and the Southern High Plains.

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

Weekly Snowpack and Drought Monitor Update Report

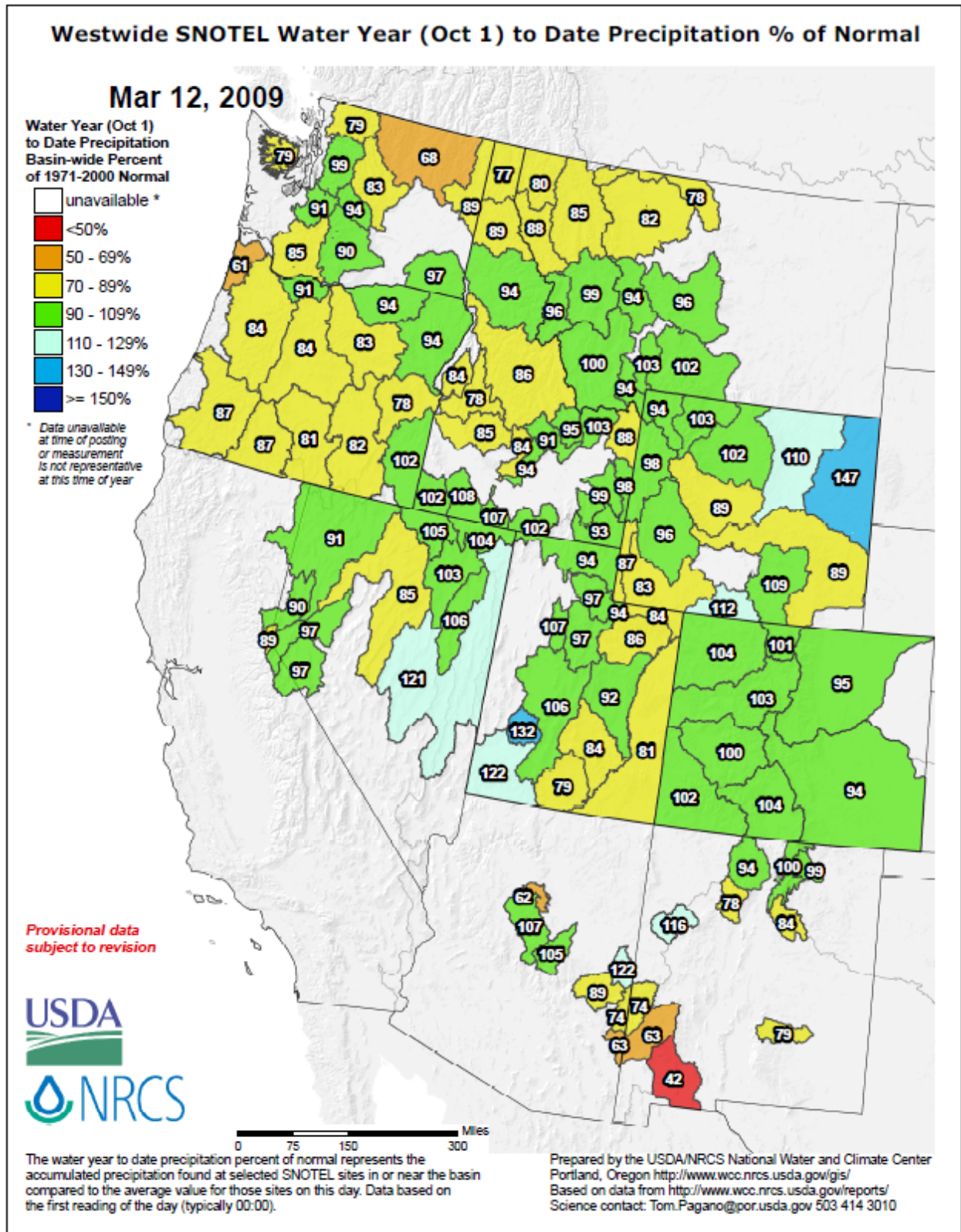


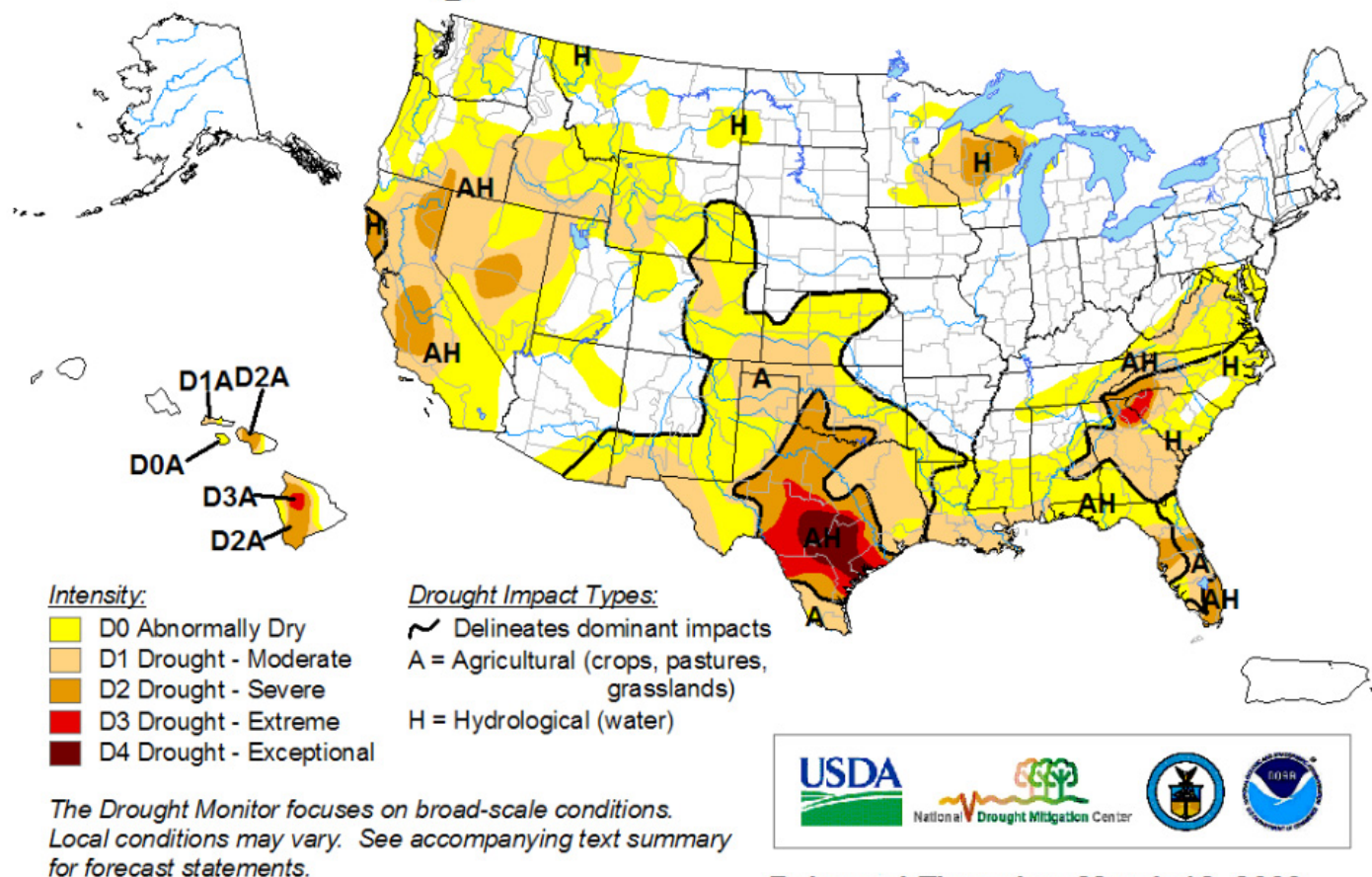
Fig 3a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values remaining pretty much unchanged this week.

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

U.S. Drought Monitor

March 10, 2009

Valid 8 a.m. EDT



Released Thursday, March 12, 2009

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

Authors: Michael Brewer/Liz Love-Brotak NOAA/NESDIS/NCDC

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

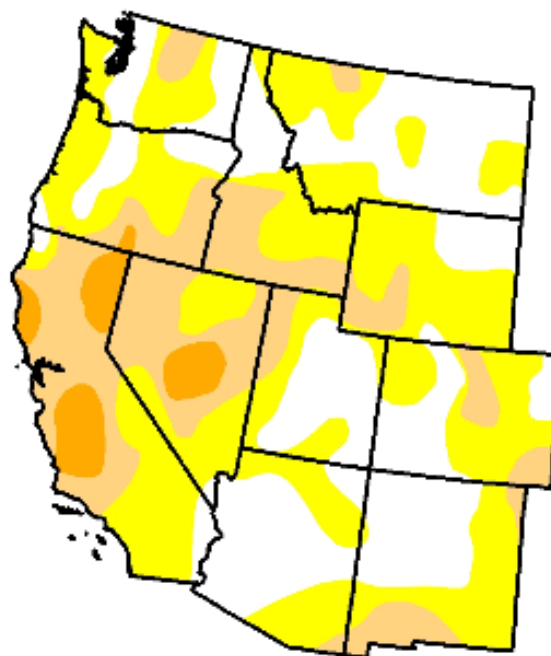
March 10, 2009

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	33.7	66.3	25.1	4.2	0.0	0.0
Last Week (03/03/2009 map)	35.1	64.9	28.0	8.0	0.6	0.0
3 Months Ago (12/16/2008 map)	27.5	72.5	31.0	10.0	0.8	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 (03/11/2008 map)	42.3	57.7	34.2	16.0	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, March 12, 2009

Author: M. Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note a slight improvement in all drought categories since last week (especially the removal of D3 over California).

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

U.S. Drought Monitor

Texas

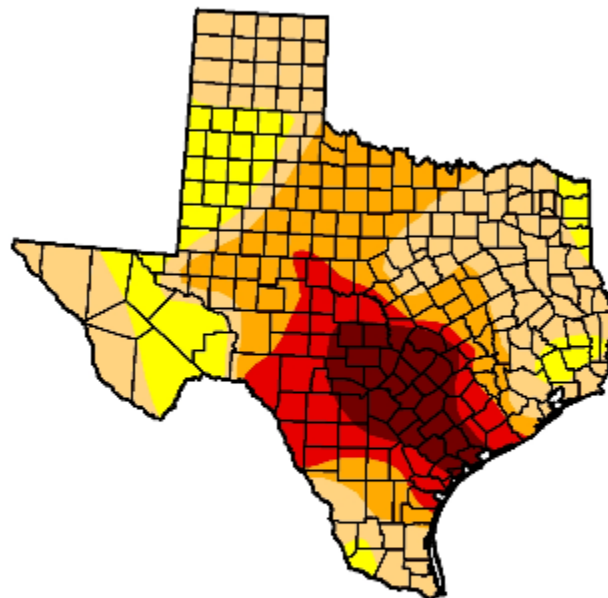
March 10, 2009

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.0	100.0	84.3	45.8	22.4	9.6
Last Week (03/03/2009 map)	0.0	100.0	74.6	44.4	21.7	9.6
3 Months Ago (12/16/2008 map)	52.9	47.1	24.6	15.0	9.1	4.2
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 (03/11/2008 map)	33.2	66.9	39.7	24.5	3.9	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>



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

Drought Monitor Classification Changes for Selected Time Periods

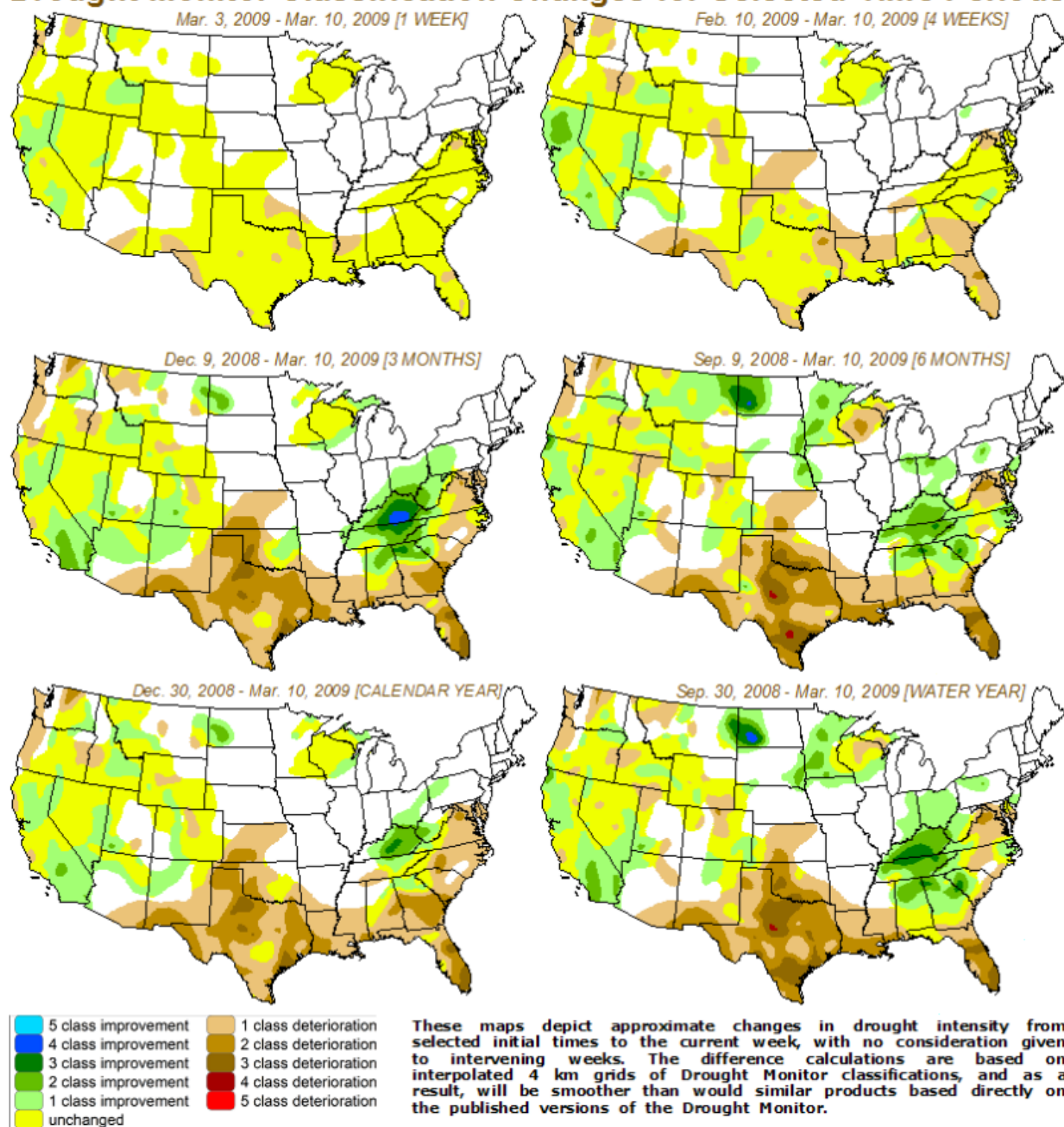
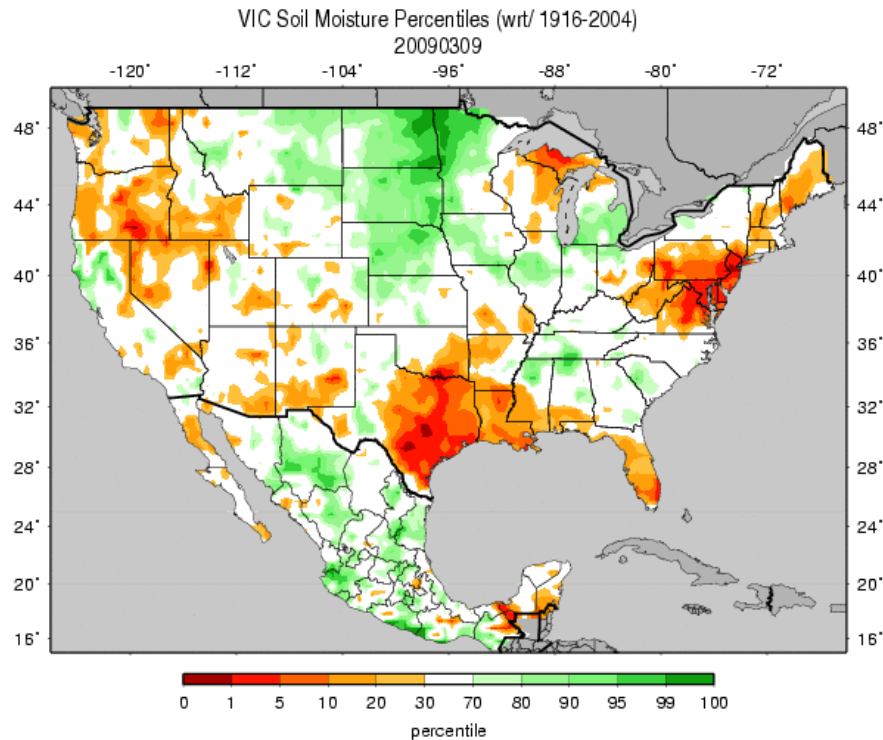


Fig. 4c: Drought Monitor Classification Changes for Selected Time Periods.

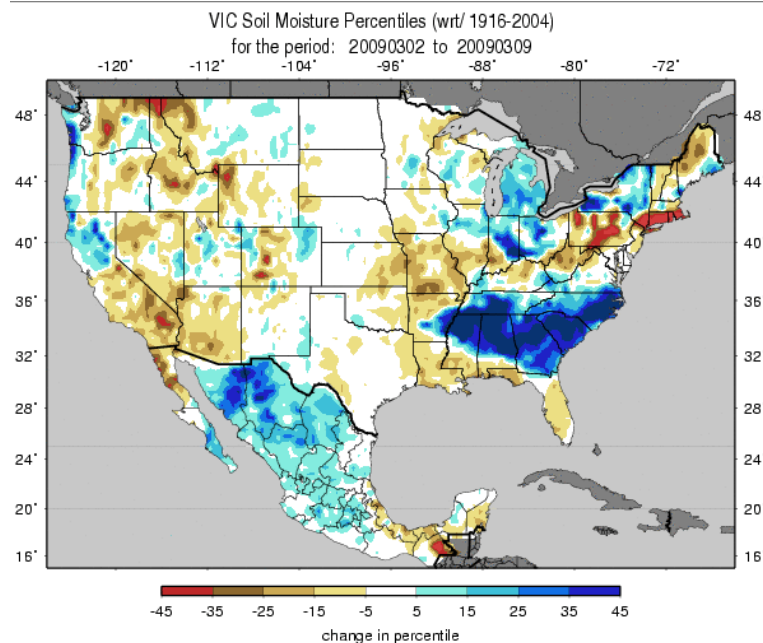
Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/dm-change-4maps.png>

Weekly Snowpack and Drought Monitor Update Report



Figs. 5a: Soil Moisture ranking in percentile based on 1916-2004 climatology for this past week. Near saturation exists over the Northern Plain while excessive dryness dominates much of the South, Mid-Atlantic, the Upper Peninsula of Michigan, and now the Pacific Northwest.

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 1916-2004 climatology for this past week. Note improvement over the West Coast of the Pacific Northwest and over the Deep South. Major worsening occurred from Pennsylvania to Massachusetts and northern Idaho.

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

Observed Fire Danger Class: 11-MAR-09

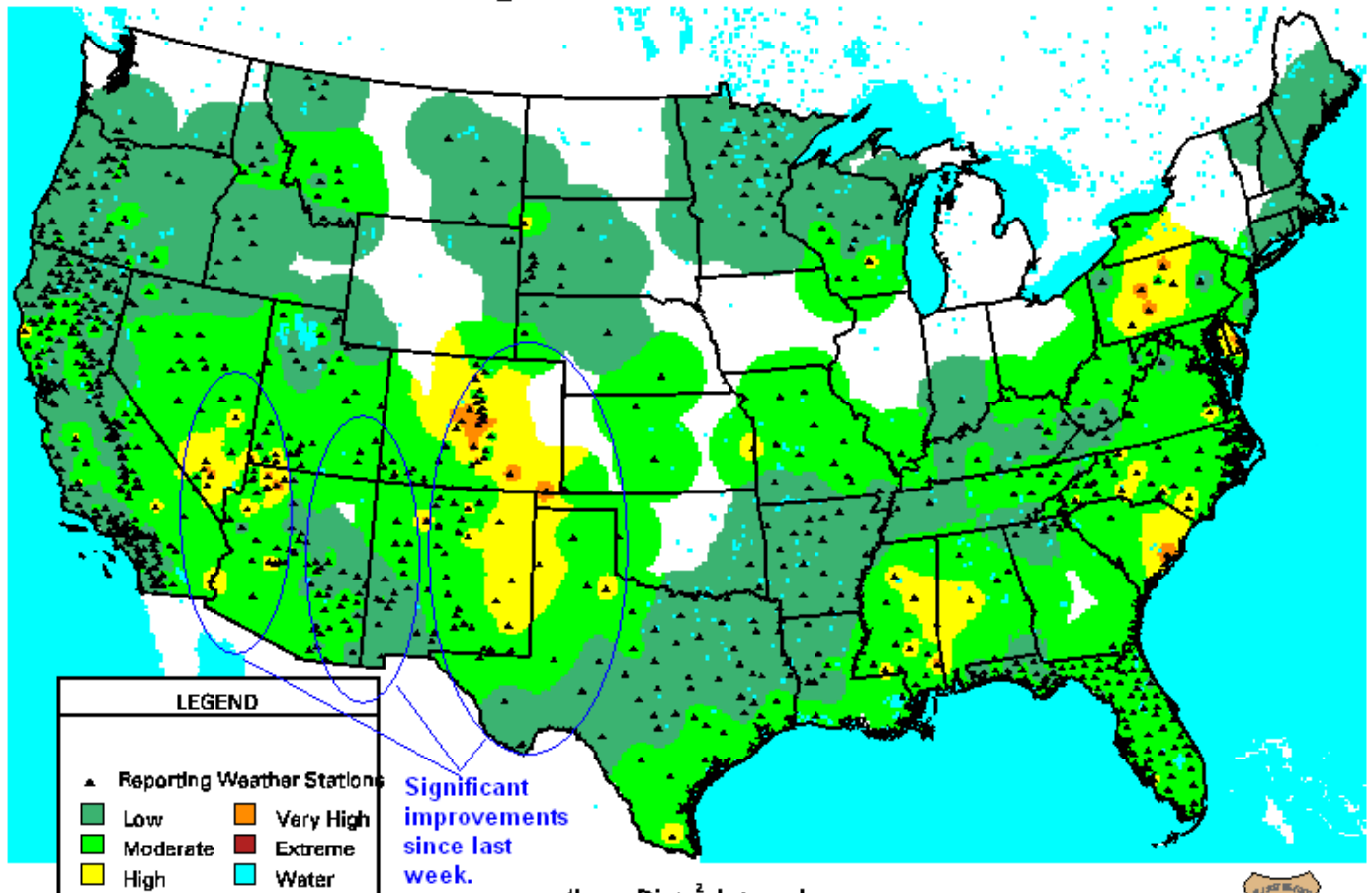


Fig. 6. Observed Fire Danger Class. Conditions have improved over Northern Texas, the Colorado Rockies and over the Lower Colorado River since last week. Source: Forest Service Fire Behavior Research – Missoula, MT. Ref: http://www.fs.fed.us/land/wfas/fd_class.gif

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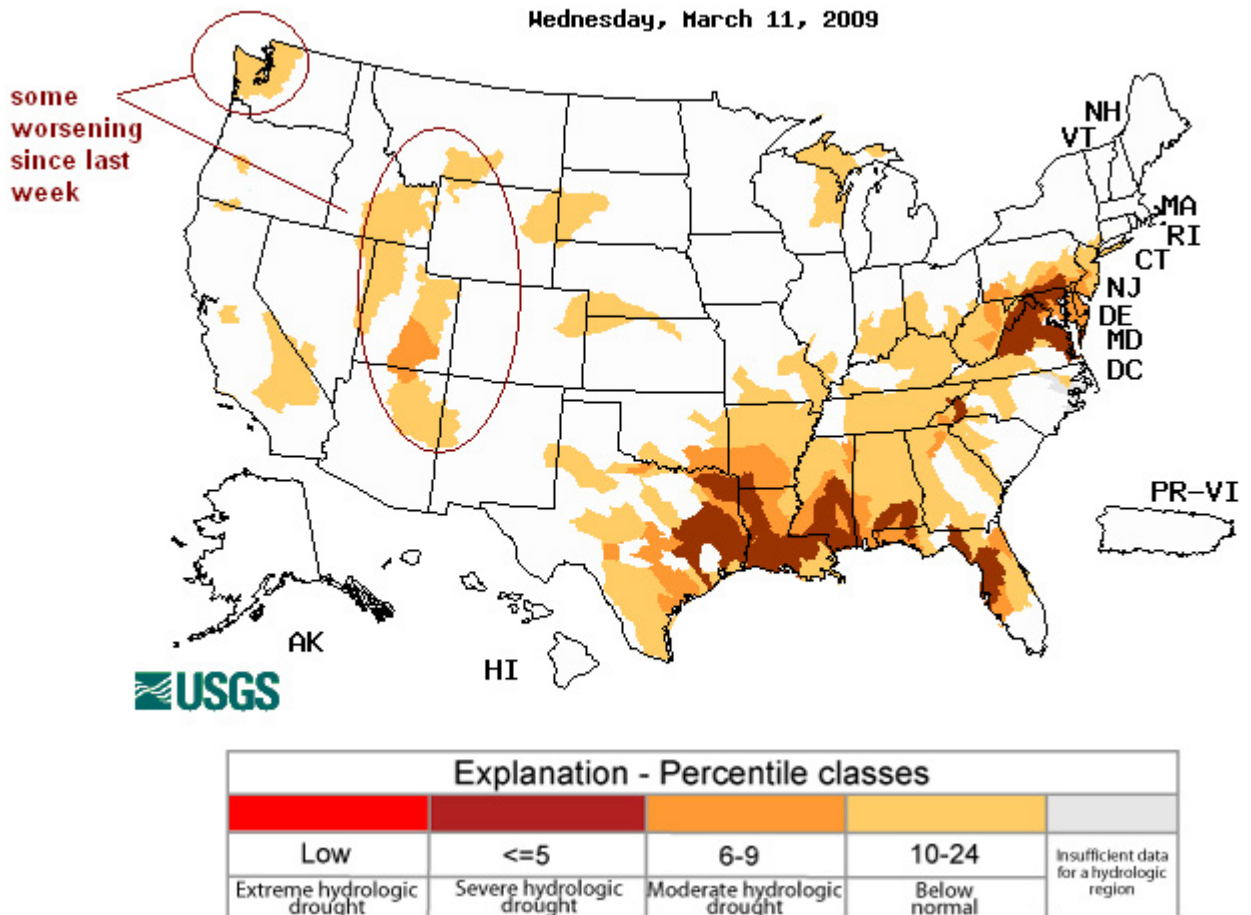


Fig. 7. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Conditions are very poor from Texas and much of the southern Gulf Coast States to the Mid-Atlantic States during the past week. Some worsening is noted over northwest Washington and the West Slope of the Rockies. Elsewhere, over the Northern Tier 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>

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary -- March 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/>.

Beneficial precipitation again fell on central and northern California and into the Northwest, east of the Cascades. Little to no precipitation fell across in from southern California to the Southeast resulting in intensifying drought particularly in the southern Plains. Storm systems brought beneficial precipitation across parts of the Midwest and into the Northeast.

The East: Moderate to locally heavy precipitation (2 inches or more) fell in the Northeast with the heaviest precipitation falling in western New York. Northern New England also benefited from above normal precipitation while southern New England saw near-normal conditions.

Rain and snow that fell last week across Alabama and Georgia had no little impact on the drought this week. Long-term drought impacts are still being felt in the area. Well levels have remained at extremely low conditions and streamflow, which pulsed following the storm, continues to subside. Many locations are already back to well below normal streamflow conditions. Additionally, the level of Lake Lanier has stabilized following a small pulse from the surface runoff.

Continued drier-than-average conditions in Florida resulted in expansion of severe drought (D2) in west-central Florida to the east coast and in southern Florida. Continued drying occurred through south and southeast Florida with increases in the extent of severe drought (D2) there as well. Additionally, wildfires are being reported in the area. In southern Florida, Lake Okeechobee continues to fall (12.56 feet on March 8). If precipitation does not increase, further degradation may be necessary in this area in the coming weeks.

The Great Lakes Region: Most of the drought-affected areas of the region missed the beneficial precipitation that fell just to their south. Continued long-term deficits resulted in unchanged drought classification in this region.

The Plains and Mississippi River Delta: A week of much below-average precipitation from Mississippi to the southern Plains led to expansion of abnormally dry conditions and moderate, severe, and extreme drought.

Abnormal dryness (D0) increased through south-central Mississippi due to increasing short-term precipitation deficits. In Louisiana, the extent of moderate drought (D1) increased northward from the Gulf Coast. Mounting deficits in the area are showing up in streamflow and well levels which are beginning to run below to well below normal.

In Texas, moderate drought conditions (D1) expanded in the east, to the south along the Mexico border, and in the west, running up into New Mexico. Severe (D2) and extreme (D3) drought both expanded from the core drought area in the south-central part of the state. According to the US Department of Agriculture, the majority acreage of the state is suffering from short topsoil moisture. Likewise, most of the wheat, oats, and range and pasture land is in poor to very poor condition.

Weekly Snowpack and Drought Monitor Update Report

In Oklahoma, abnormal dryness expanded slightly northeastward, as did moderate drought (D1). Severe drought (D2) expanded northward to the Canadian River. Wildfires are beginning to affect the area but are nowhere near as extreme as the 2005-2006 winter season.

Abnormal dry conditions (D0) expanded northward again this week through western Kansas and into southern Nebraska in keeping with 30 to 90-day precipitation totals that have been less than 25 to 50% of average.

The West: Heavy precipitation once again fell on central and eastern California and into western Nevada further helping to ameliorate drought in the hardest hit areas of these states. Reports of one to three plus inches of precipitation were common through the area early in this US Drought Monitor period. Extreme drought (D3) was eliminated. Severe drought (D2) improved in the Sacramento and San Joaquin Basins, as well as in the Russian, Yuba, and American River watersheds and through much of western Nevada. Reservoir storage continued to increase on many rivers with Shasta Reservoir in the Sacramento Basin increasing its elevation over 10 feet this week.

Moderate drought (D1) eased slightly in southern Idaho and northwest Montana but built into northern Cascades of Washington. Abnormally dry conditions (D0) expanded in eastern Washington.

Hawaii, Alaska and Puerto Rico: Drought conditions remained unchanged across the Hawaiian Islands. Recent rains in windward locations were significant and will contribute to easing drought conditions if they continue. Above normal precipitation alleviated abnormal dryness in Alaska. Recent heavy precipitation and ensuing high streamflow eased the abnormal dryness in eastern Puerto Rico.

Looking Ahead: The northern tier states are anticipated to receive the bulk of precipitation during March 12 – March 16, 2009. Much needed precipitation is expected for much of Texas in the upcoming days. Over an inch of rain is possible in central Texas with lesser amounts falling in the Plains, across the Gulf Coast, and into the Southeast and Mid-Atlantic. Additional, lesser amounts are possible in the Southwest as well as through the Midwest and into the Northeast. The Northwest may also see some relief. Much of the upper tier of the country, as well as the Southwest, is expected to see little to no precipitation.

For the ensuing 5 days (March 17 – 21, 2009), the odds favor cooler-than-normal conditions along the entire country east of the Mississippi River. Most of the Plains and the West are likely to see normal to above normal temperatures. Normal to below normal precipitation is likely over most of the country with the exception of the Northwest and the Northeast. Odds favor dry and cool for Alaska.

Author: [Michael Brewer, National Climatic Data Center, NOAA](#)

Dryness Categories

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

Weekly Snowpack and Drought Monitor Update Report

Drought Intensity Categories

D1 ... Moderate Drought

D2 ... Severe Drought

D3 ... Extreme Drought

D4 ... Exceptional Drought

Drought or Dryness Types

A ... Agricultural

H ... Hydrological

Updated March 12, 2009