



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

Weekly Report - Snowpack / Drought Monitor Update **Date: 2 April, 2009**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date shows values within 10 percent of last week's values with a few exceptions as noted over Oregon and eastern Montana (increases >10%). Deficits persist over the areas bordering with Canada while surpluses still exist over most of the Cascades, eastern Nevada, and in a few basins in Colorado, Wyoming, and Montana (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 much of the Central and Northern Rockies, northern Wasatch and decreased over northern New Mexico, southern Colorado, and southern Utah (Fig. 1a). This past week's snow depth changes show significant increases over much of the West with the exception of the Oregon Cascades, Sierra, and Great Basin where they were down (Fig. 1b).

Temperature: SNOTEL and ACIS-day station average temperature anomalies were below average across most of the West except over California where temperatures were above normal (Fig. 2). Specifically, the greatest positive temperature departures occurred over north central California (>+6F) and the greatest negative departures occurred over southern Wyoming and eastern Montana (<-15F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 1 April shows a very wet week scattered across the Northern Tier States and over the Northern and Central Rockies. Dryness dominated California, western Nevada, western Arizona, and southern New Mexico (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 (within +/- 2 percent) of last week's values (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: It was a relatively quiet week all in all over the drought-affected areas of the West, leading to no changes this week. Seasonal and water year (since October 1) deficits still bear watching as the dry (demand) season is just around the corner now. Of additional benefit is the fact that all but California saw a cooler-than-normal week.

Author: Mark Svoboda, 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

Weekly Snowpack and Drought Monitor Update Report

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

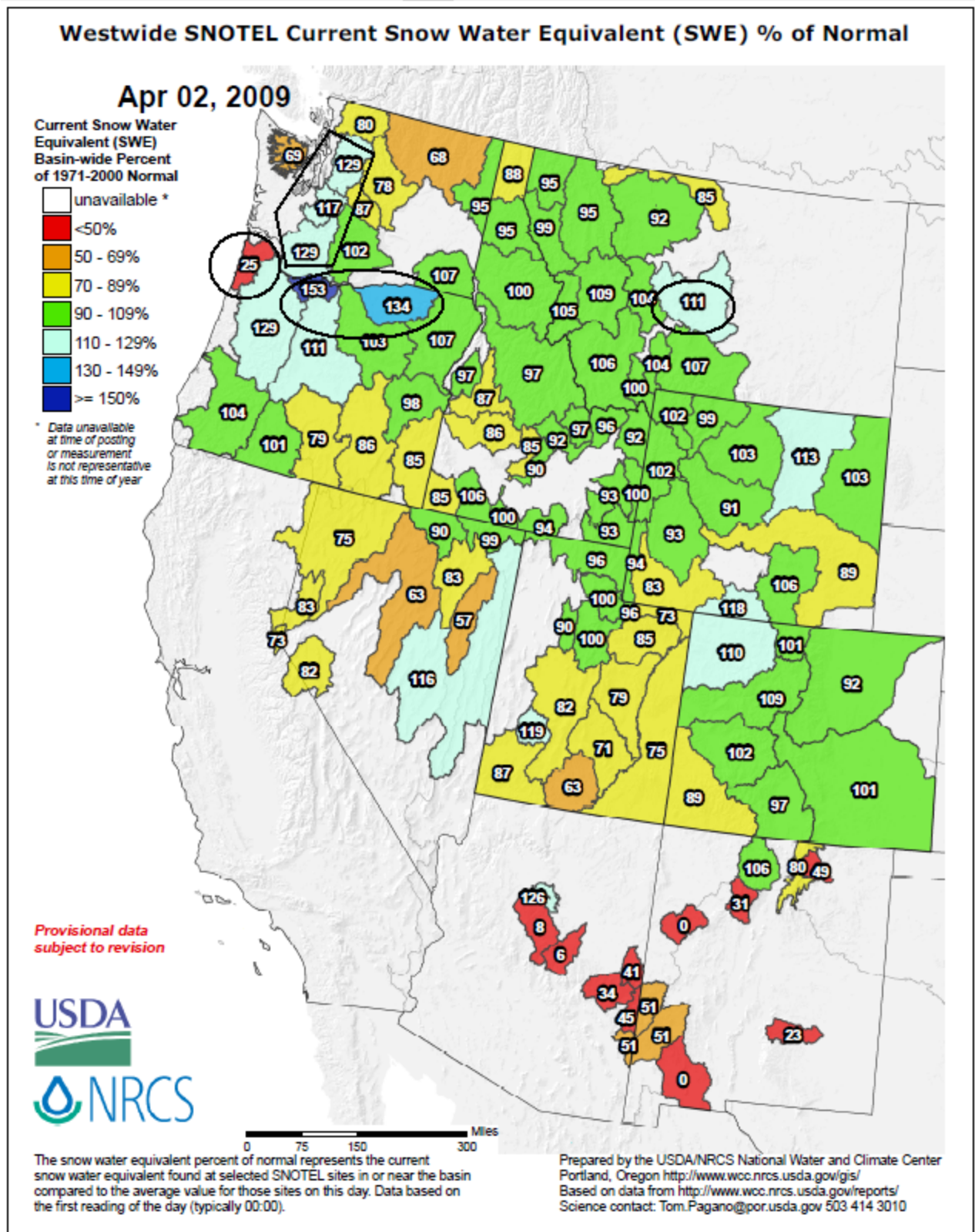
The National Water and Climate Center Homepage provide the latest available snowpack and water supply information. Please visit us at <http://www.wcc.nrcs.usda.gov>. This document is available from the following location on the NWCC homepage -

<http://www.wcc.nrcs.usda.gov/water/drought/wdr.pl>

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

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

Apr 02, 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 much of the Central and Northern Rockies, northern Wasatch and decreased over northern New Mexico, southern Colorado, and southern Utah.

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

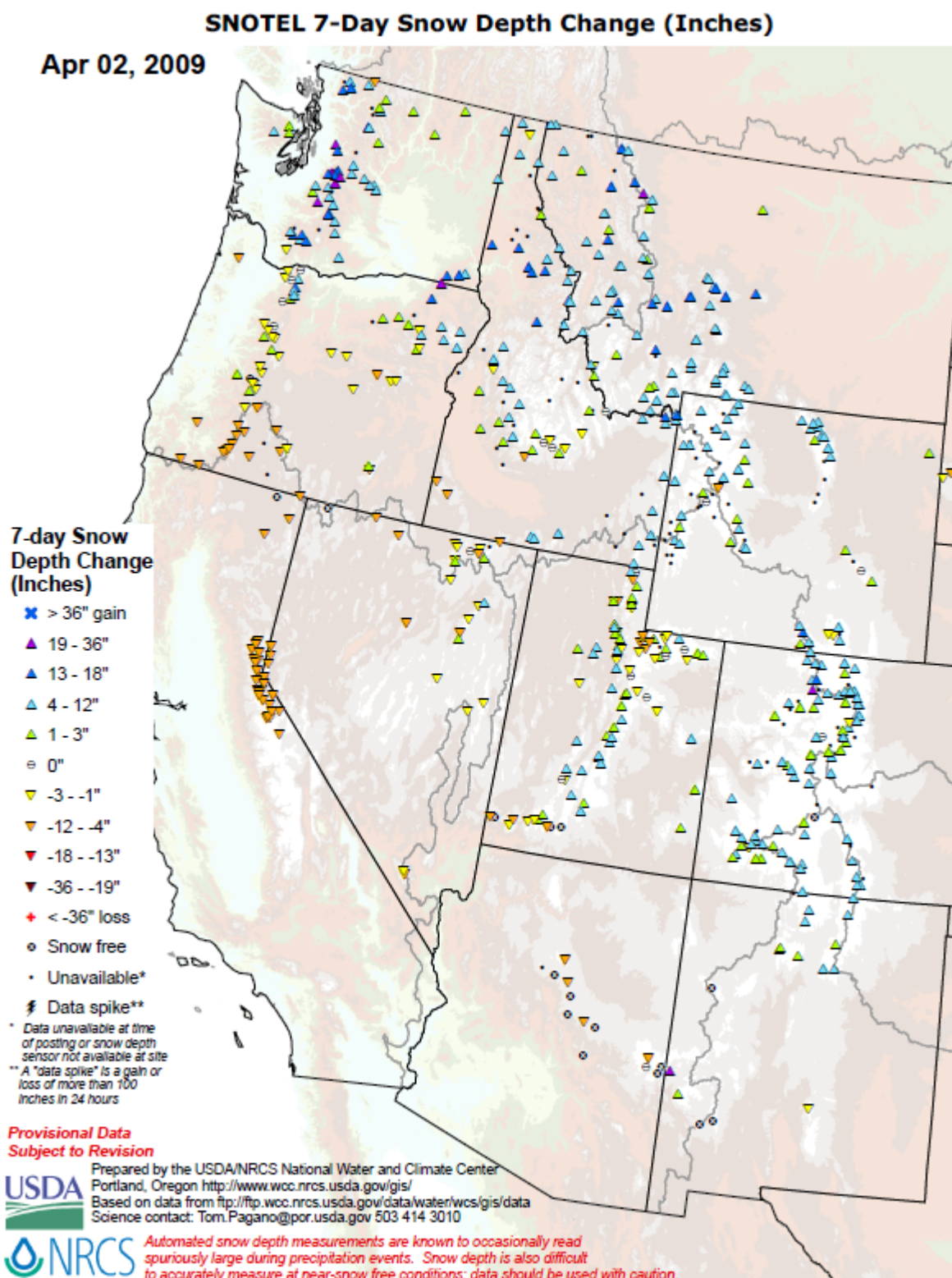


Fig. 1b: This past week's snow depth changes show significant increases over much of the West with the exception of the Oregon Cascades, Sierra, and Great Basin.

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)**

Apr 02, 2009

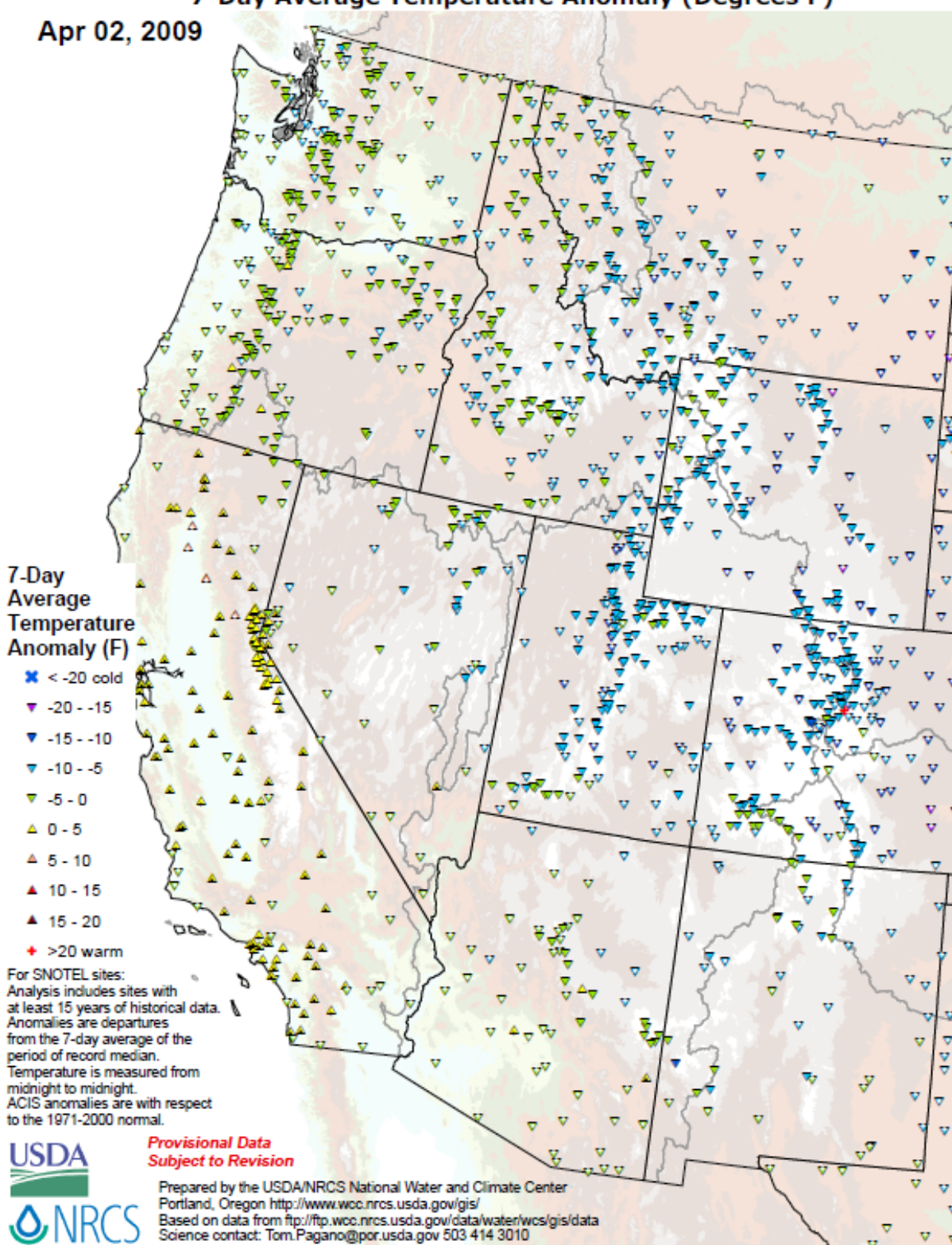
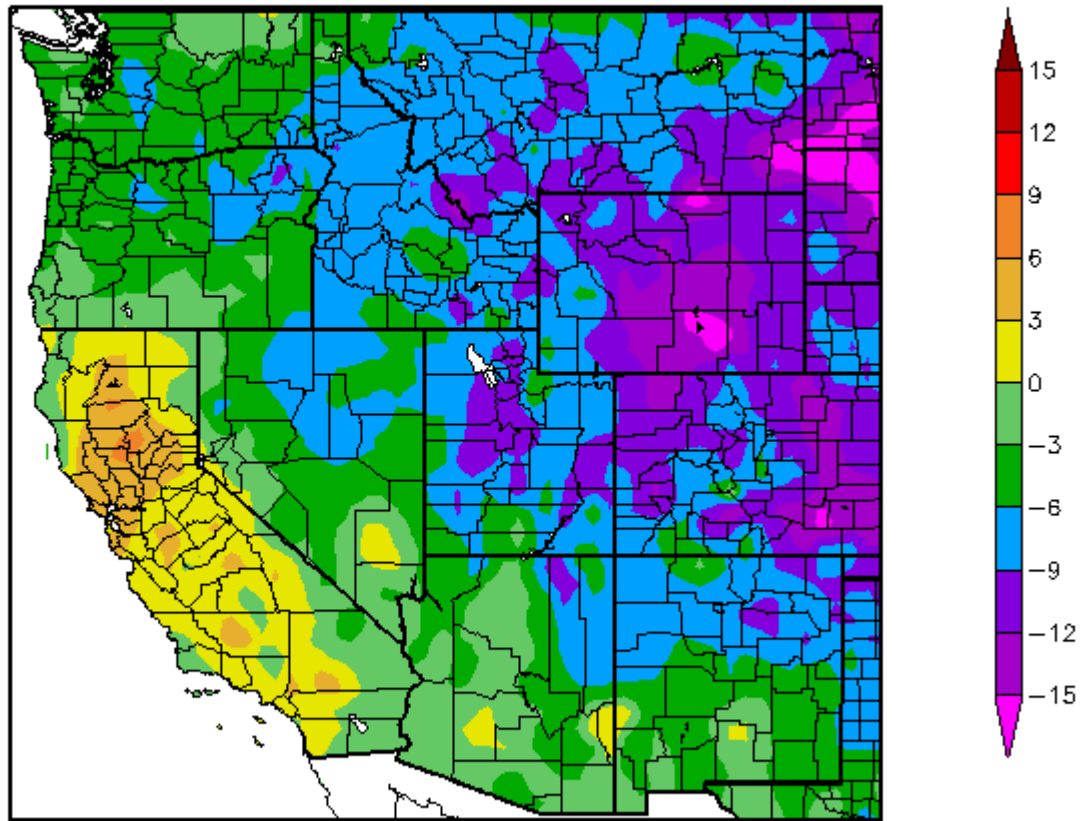


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were below average across most of the West except over California where temperatures were above normal.

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

Departure from Normal Temperature (F)
3/26/2009 – 4/1/2009



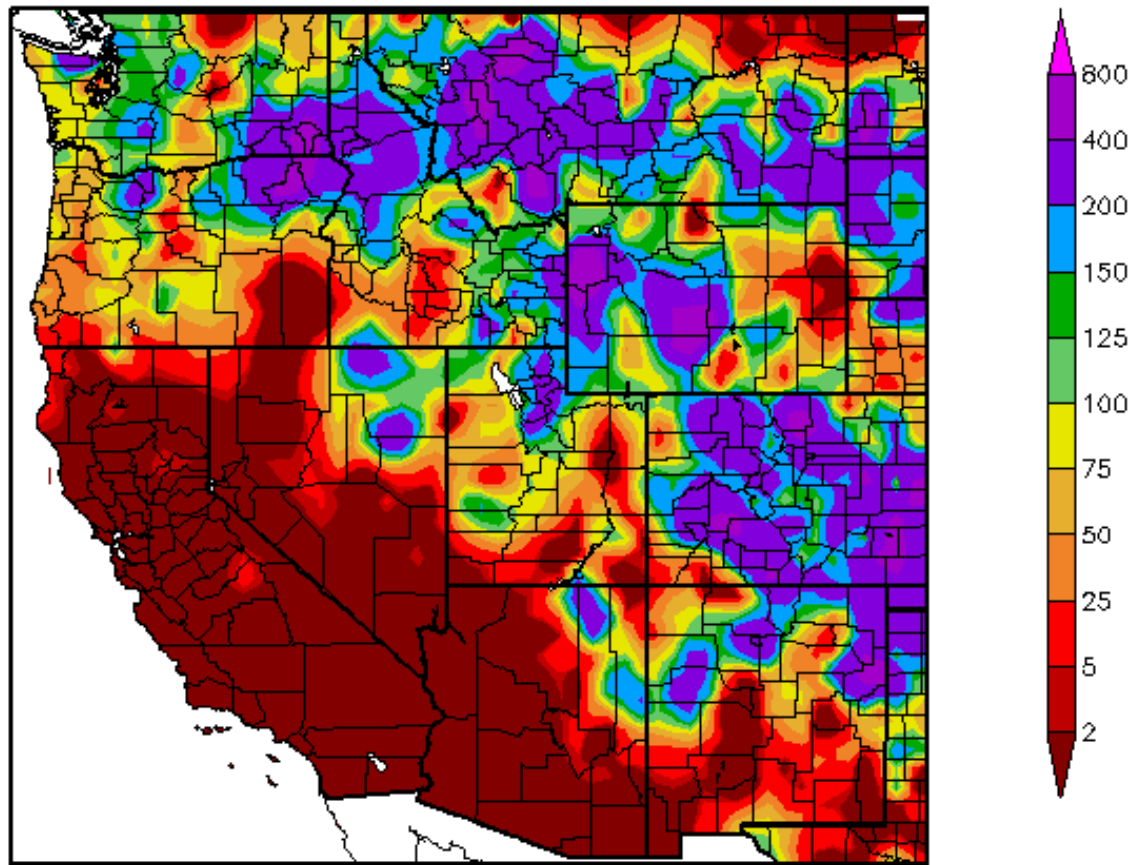
Generated 4/2/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over north central California (>+6F) and the greatest negative departures occurred over southern Wyoming and eastern Montana (<-15F).

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

Percent of Normal Precipitation (%)
3/26/2009 – 4/1/2009



Generated 4/2/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 1 April shows a very wet week scattered across the Northern Tier States and over the Northern and Central Rockies. Dryness dominated California, western Nevada, western Arizona, and southern New Mexico.

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

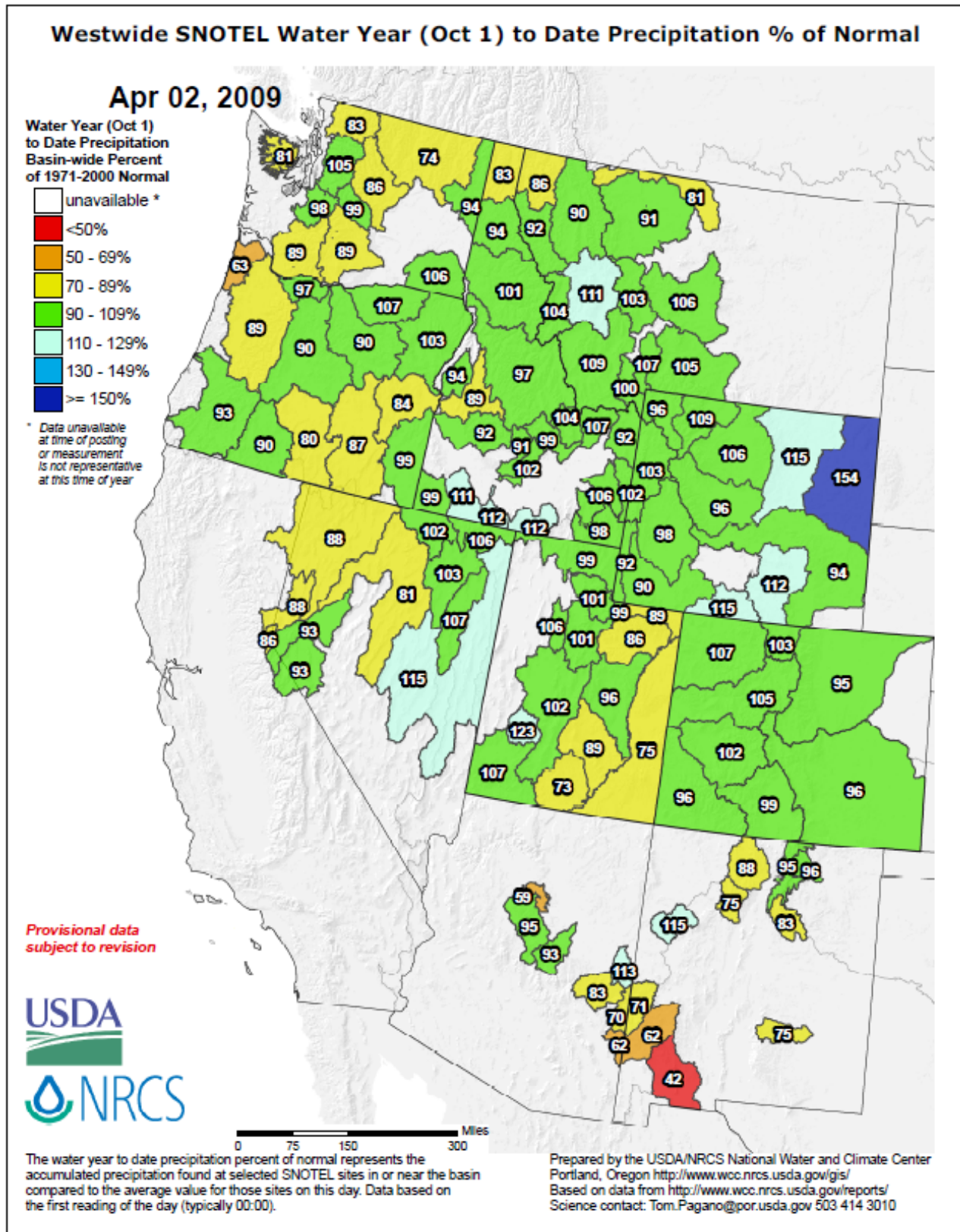


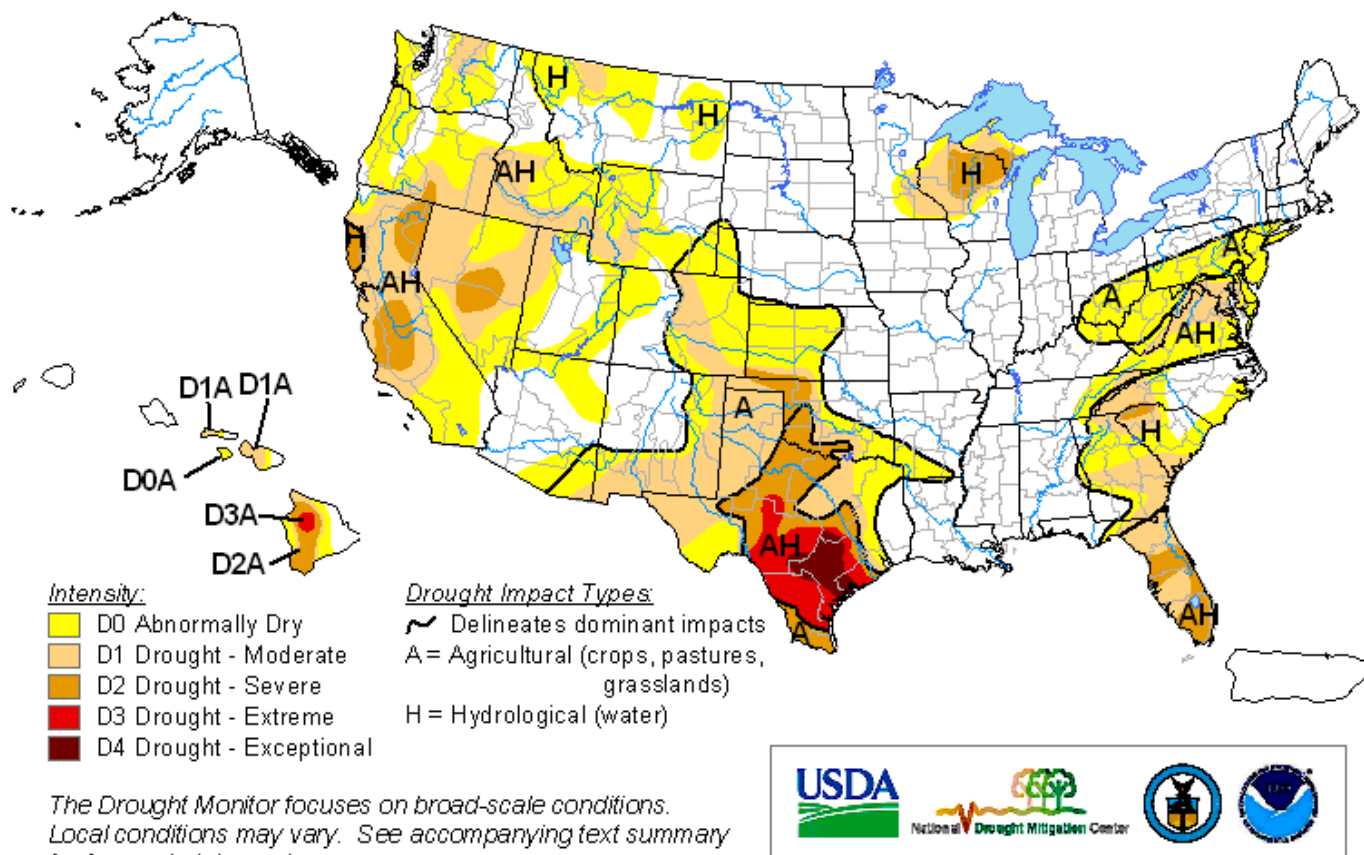
Fig 3a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values remaining pretty much unchanged this week (within +/- 2 percent) of last week's values.

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

U.S. Drought Monitor

March 31, 2009

Valid 8 a.m. EDT



Released Thursday, April 2, 2009

Author: Mark Svoboda, National Drought Mitigation Center

<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

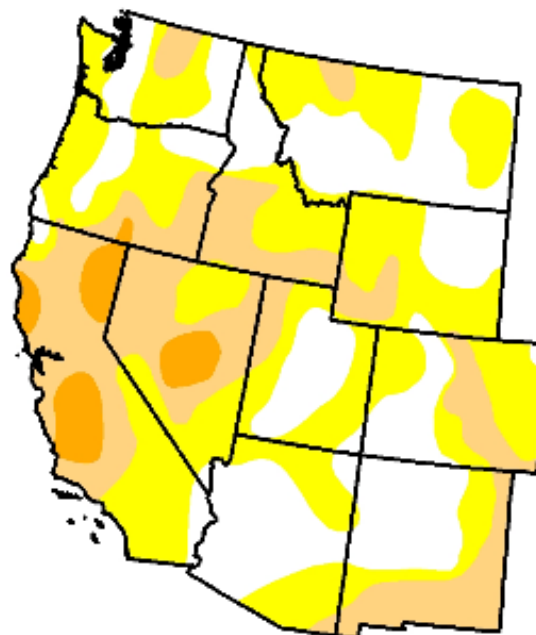
March 31, 2009

Valid 7 a.m. EST

Drought Conditions (Percent Area)						
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	31.7	68.3	28.2	4.2	0.0	0.0
Last Week (03/24/2009 map)	31.7	68.3	28.5	4.2	0.0	0.0
3 Months Ago (01/06/2009 map)	37.4	62.6	28.9	8.8	0.4	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 (04/01/2008 map)	40.6	59.4	36.3	7.5	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, April 2, 2009

Author: Mark Svoboda, National Drought Mitigation Center

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. No change this week. Ref: http://www.drought.unl.edu/dm/DM_west.htm

U.S. Drought Monitor

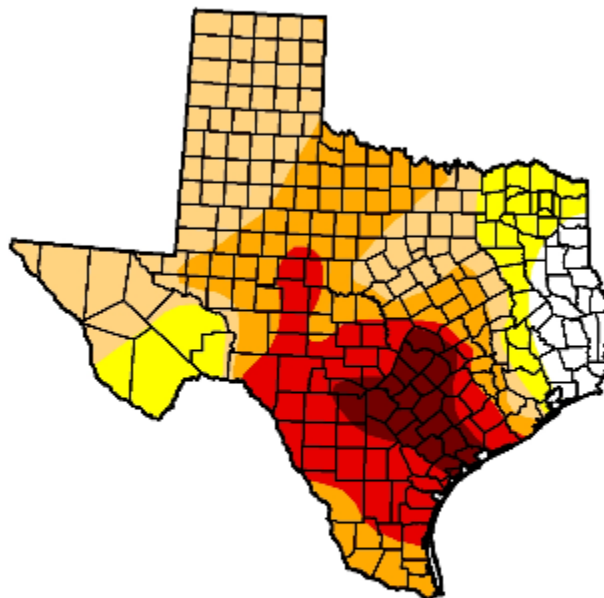
Texas

March 31, 2009

Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.7	93.3	80.6	48.3	24.6	7.1
Last Week (03/24/2009 map)	0.0	100.0	80.7	44.0	21.6	7.1
3 Months Ago (01/06/2009 map)	41.7	58.3	24.5	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 (04/01/2008 map)	33.8	66.2	44.0	11.3	3.9	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>

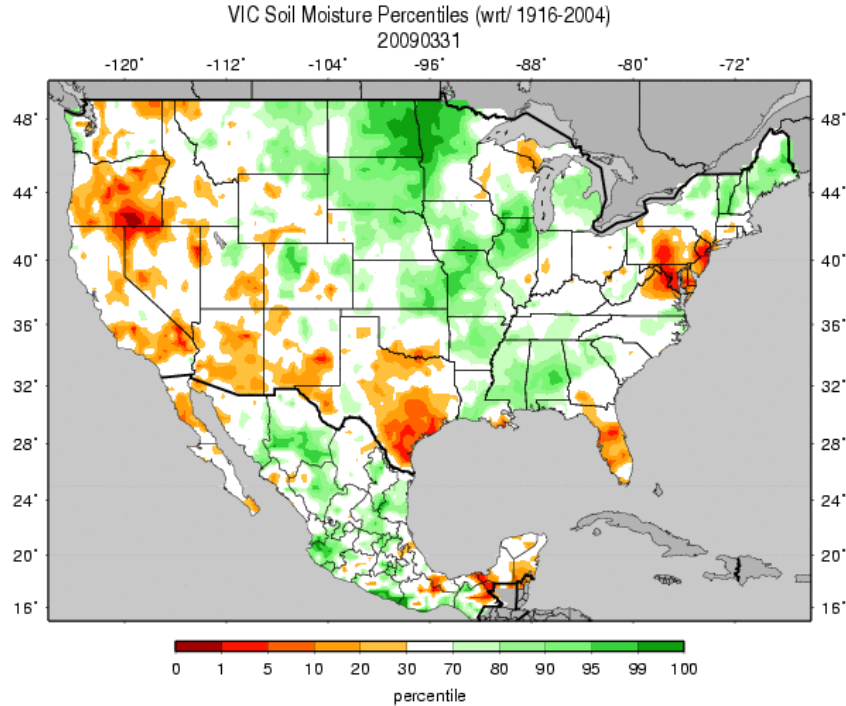


Released Thursday, April 2, 2009

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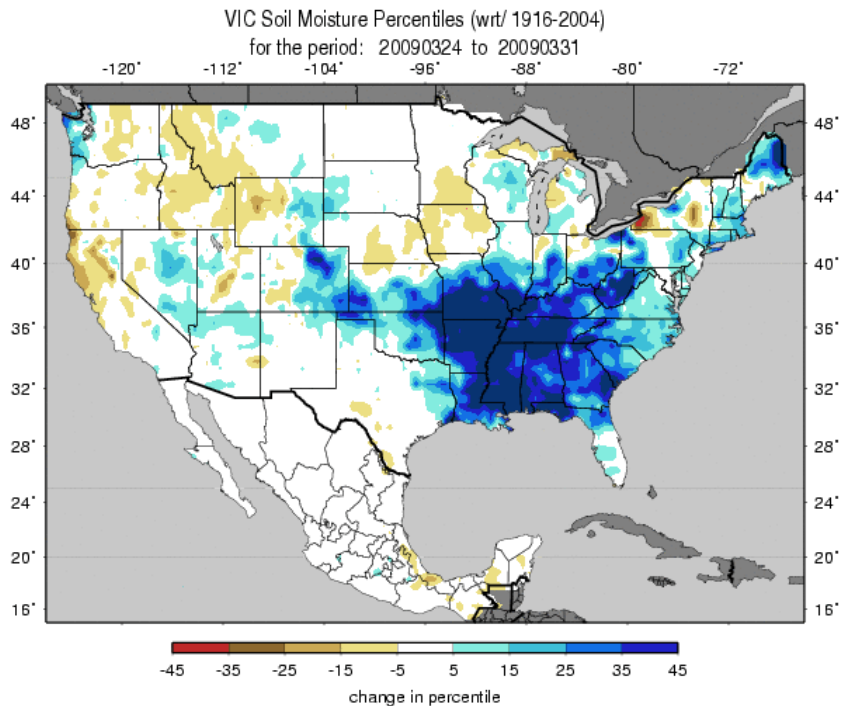
Fig. 4b: Texas is the only state with D4 drought condition in the US. Note further deterioration since last week. Ref: http://www.drought.unl.edu/dm/DM_state.htm?TX.S

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 from the Mid-Atlantic, Texas, and parts of Florida. Oregon still remains drier than average.

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 major moistening over much of the Lower Mississippi River and Ohio River Valleys.

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

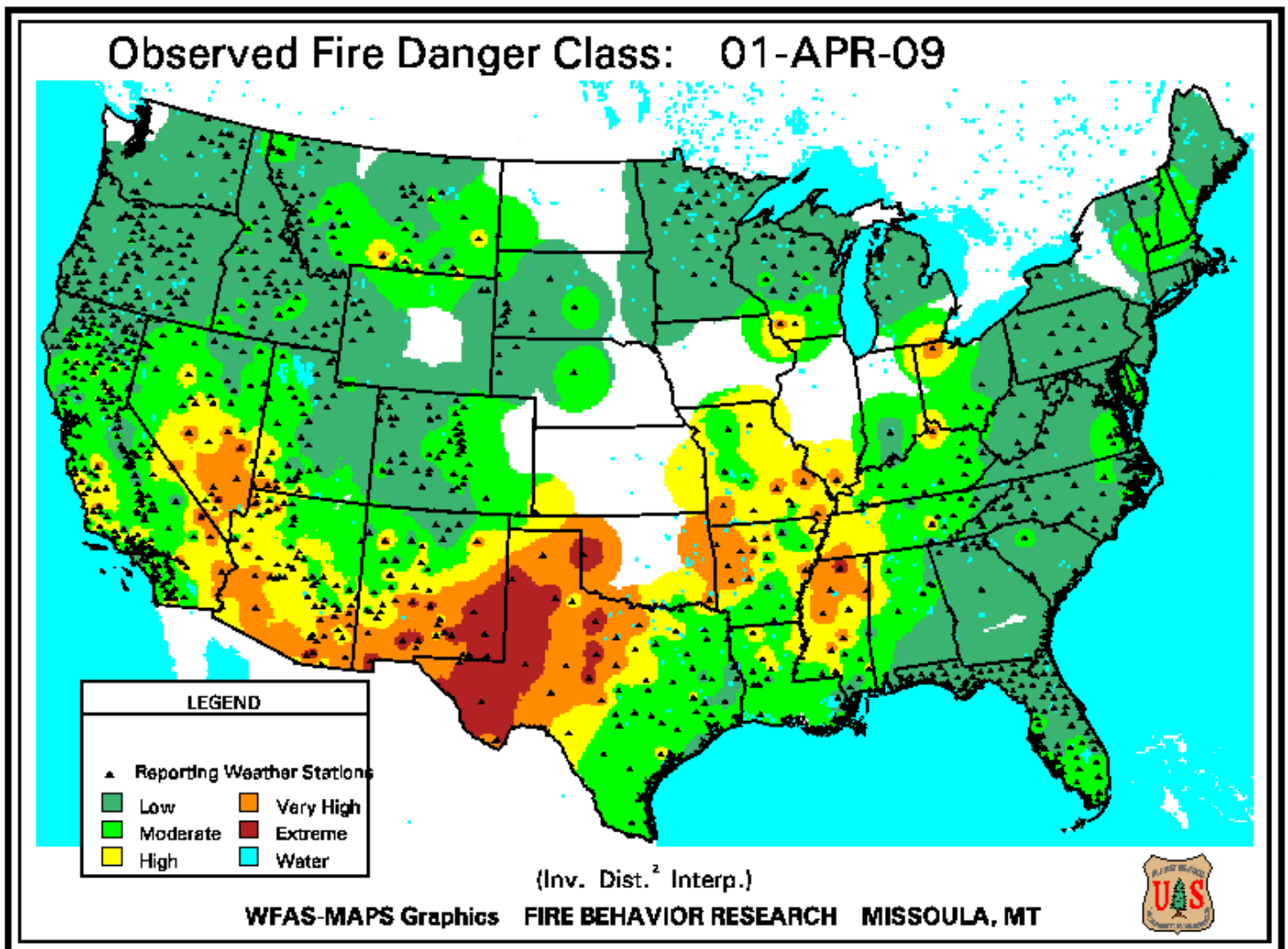


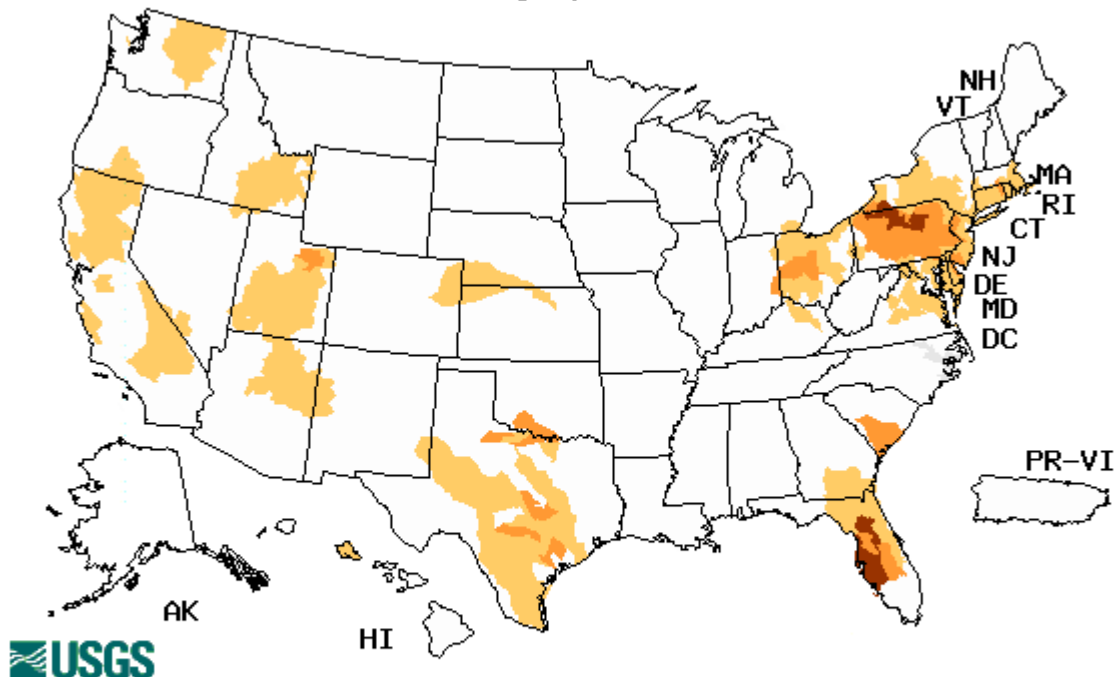
Fig. 6. Observed Fire Danger Class. Conditions continue to be extreme over western Texas and eastern New Mexico.

Source: Forest Service Fire Behavior Research – Missoula, MT.

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

Weekly Snowpack and Drought Monitor Update Report

Wednesday, April 01, 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. Conditions are very poor over north central Pennsylvania and western Florida during the past week. Elsewhere, over the Northern Tier States, cold temperatures have probably frozen rivers and therefore do not necessarily reflect accurate flows. **Note: The latest on the Red River in North Dakota flood:** http://www.google.com/hostednews/ap/article/ALeqM5hw95ek5Sllmi4SoQ_N4HJvwHE0ZAD97ACG900
Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary – March 31, 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 Southeastern and Mid-Atlantic States: After expansion into the region last week, most of the Mid-Atlantic stays as is this week, with the heavier rains falling more to the south. As a result, some minor improvements are noted in Virginia with a slight trimming of the D0-D1 in the extreme southwestern reaches of the state where the best rains (2 to 3 inches) were reported. The region still bears watching as we enter into the higher demand seasons of spring and summer.

It was a completely different story; however, in the Southeast this past week as heavy rains pounded the region and altered the landscape from one of drought to one of deluges. Widespread totals of 3 to 6 inches or more were reported across the Gulf Coast states from Louisiana to the Florida Panhandle and up into northern Georgia and the western Carolinas as well. Marked changes of improvement are noted on the heels of this drought-breaking rain, with removal of D1-D2 in Louisiana, D1 in southern Mississippi and Alabama, and D2 in northeastern Georgia and western North Carolina. A large chunk of the D1H remaining in Georgia has been pushed to the northeast corner and to the east in the central and southern parts of the state. This reflects the lagging recovery of hydrologic drought (below-normal streamflow and groundwater levels), which is typically slower to come out of drought, much in the same way it is slower going into drought. A reduced pocket of D2 remains in upstate South Carolina where streams and groundwater levels are still lagging behind in their recovery at this time. In addition, D0 was removed from all but extreme northern Louisiana, all of Mississippi, and all but a sliver of extreme east-central Alabama along with the Florida Panhandle, with the potential for more heavy rains over the next week. The rest of Florida remains unchanged this week. Abnormally dry (D0) conditions in central and southern Tennessee have been eroded away and pushed east. Worth noting is the fact that this is the first time since February 2007 that Alabama has been drought free.

The Great Lakes Region: Status quo across Minnesota and Wisconsin this week, with no changes being made in the region.

The Plains: Most of the heaviest rains fell across eastern Oklahoma and eastern Texas last week, bringing with them improvement and a westward shift of moderate drought (D1) and abnormal dryness (D0). Amounts of 3-5 inches were common across southeastern Kansas, eastern Oklahoma, and eastern Texas.

Not everyone shared in the rain, though. Deep southern Texas hasn't seen ample rains for more than six months now, leading to a deterioration and expansion of D2 and D3 into the Brownsville area.

The West: It was a relatively quiet week all in all over the drought-affected areas of the West, leading to no changes this week. Seasonal and water year (since October 1) deficits still bear watching as the dry (demand) season is just around the corner now. Of additional benefit is the fact that all but California saw a cooler-than-normal week.

Alaska, Hawaii, and Puerto Rico: Recent wetness in the central part of Maui has led to improvement there, but D1 still remains. The rest of the Hawaii remains unchanged this week.

Weekly Snowpack and Drought Monitor Update Report

Looking Ahead: For the next five days (April 2-6), cooler temperatures are expected across most of the United States except for the upper Northeast and the extreme southern reaches of Texas and Florida. As for precipitation, the best chances for significant precipitation in this period seem to be centered over the Pacific Northwest, the central Rockies, and the deep Southeast, with several systems lined up and ready to go.

The CPC 6- to 10-day forecast (April 7 – April 11) is showing a better chance for the cooler trend to continue across the country's mid-section, with better odds of above-normal temperatures in southern Florida and the chain of islands rimming the Gulf of Alaska. The best chance for above-normal precipitation mirrors the cooler temperatures across the country's mid-section. The areas expected to see below-normal precipitation include northeastern Alaska and the states along the U.S./Canada border from Washington to Wisconsin and Michigan's western Upper Peninsula. This is certainly a bit of good news for those flood-affected folks in the Red River basin in North Dakota and Minnesota.

Author: Mark Svoboda, 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: 2 April 2009