



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

Weekly Report - Snowpack / Drought Monitor Update **Date: 9 April, 2009**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date shows values within 5 percent of last week's values. 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 Rockies, northern Wasatch and Uinta Mountains and decreased over the eastern slope of Montana (Fig. 1a). This past week's snow depth changes show the effects of warmer and drier weather. Decreases are noted over much of the West with the exception of some increases over northern Nevada and parts of northern Utah and northern Wyoming (Fig. 1b).

Temperature: SNOTEL and ACIS-day station average temperature anomalies were below average across most of the West except over the Cascades where temperatures were slightly above normal (Fig. 2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over north central California (>+3F) and the greatest negative departures occurred over northern Colorado to eastern Montana (<-12F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 8 April shows a scattered precipitation pattern across the northern two-thirds 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 remaining pretty much unchanged this week (within +/- 2 percent) of last week's values (Fig. 3a). Week to week changes become less frequent as the Water Year advances. 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: The Pacific NW was the recipient of cooler temperatures and more than ample precipitation this past week as heavy snows fell in the northern Cascades. This has brought up some of the basins' snowpack, but there are still some lingering pockets of D0-D1 in northern Washington State where basins are still only running at 70-89 percent of normal for the winter, according to USDA-NRCS. The good news is that these numbers reflect a positive increase in projected streamflow compared to a month ago. In fact, this is the case across much of Oregon, Washington, Idaho, Montana and northwestern Wyoming. On the flip side, March wasn't as kind to the Southwest, where projected streamflows have been adjusted lower for the remainder of the runoff season, particularly in Arizona and New Mexico where snowpack has only been running at around 50% or less in most cases. Reductions in streamflow volume forecasts are also expected in basins across southern Utah and Colorado.

This has resulted in several changes to this week's map. Of note, D0 and D1 have been significantly reduced in Montana and western Idaho. This is also the case in northern Washington State on the western slopes of the northern Cascades where precipitation was abundant and a slight trimming of D0 and D1 is noted. Pockets of dryness and drought remain, though, including an

Weekly Snowpack and Drought Monitor Update Report

introduction of D1 in eastern Idaho where streamflows along the Big Lost and Little Wood rivers are running at historical or near-historical lows.

Improvements are noted this week in both Wyoming and Colorado where cooler temperatures and good precipitation are bringing a late boost to the snowpack there. Both D0 and D1 have been trimmed slightly in western Wyoming, and even more so in extreme southeastern Wyoming near Cheyenne, where they are not in drought as of this week. To the south, conditions have also improved on the water year in central and western Colorado with the trimming of D1 and a reduction of D0 in the west as well.

California has taken a step back this week after a month of very little in the way of precipitation across the valleys and coastal areas. The snows and rains in the eastern part of the state have been enough to stave off a worsening of conditions thus far. This is noted in an encroachment of D2 to the south and a connection of the D2 in the south with the D2 north of San Francisco on the northwest coast and up into the northern Sacramento Valley. Precipitation deficits of 6-16 inches (25-75% of normal) of rain have accumulated since October 2008 in these parts. This is on top of longer-term deficits going back almost three years now.

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 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.

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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

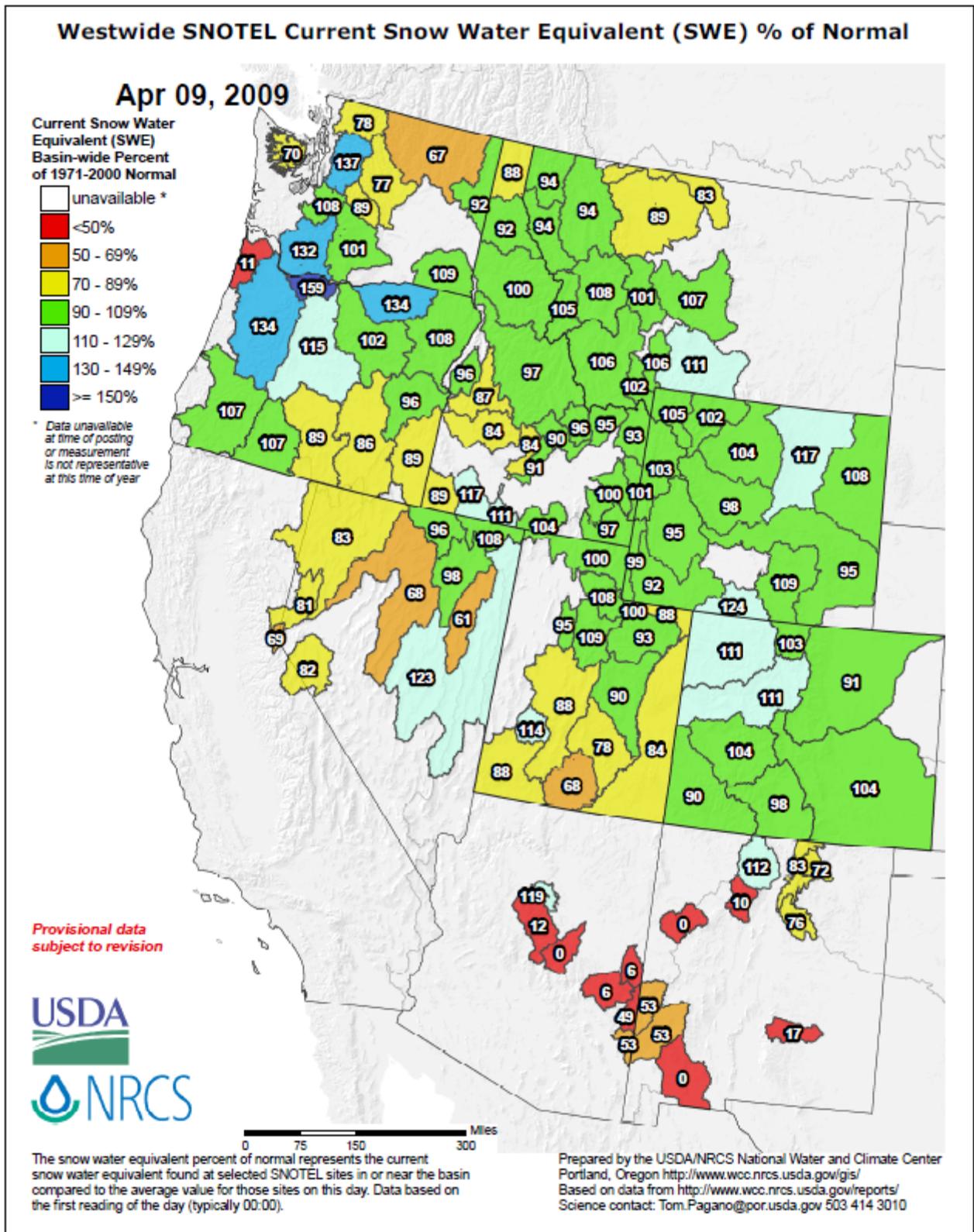


Fig. 1. Snow-water equivalent percent to date shows values within 5 percent of last week's values. Deficits persist over the areas bordering with Canada while surpluses still exist over most of the Cascades, eastern Nevada, and in a few basins in Colorado, Wyoming, and Montana.

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

Weekly Snowpack and Drought Monitor Update Report

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

Apr 08, 2009

For guidance only

7-Day Guidance
Forecast Change
(% normal)

- ✕ > 20% gain
- ▲ 16 - 20%
- ▲ 11 - 15%
- ▲ 6 - 10%
- ▲ 1 - 5%
- ⊖ no change
- ▼ -5 - -1%
- ▼ -10 - -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 have increased over much of the Central Rockies, northern Wasatch and Uinta Mountains and decreased over the eastern slope of Montana.

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)

Apr 09, 2009

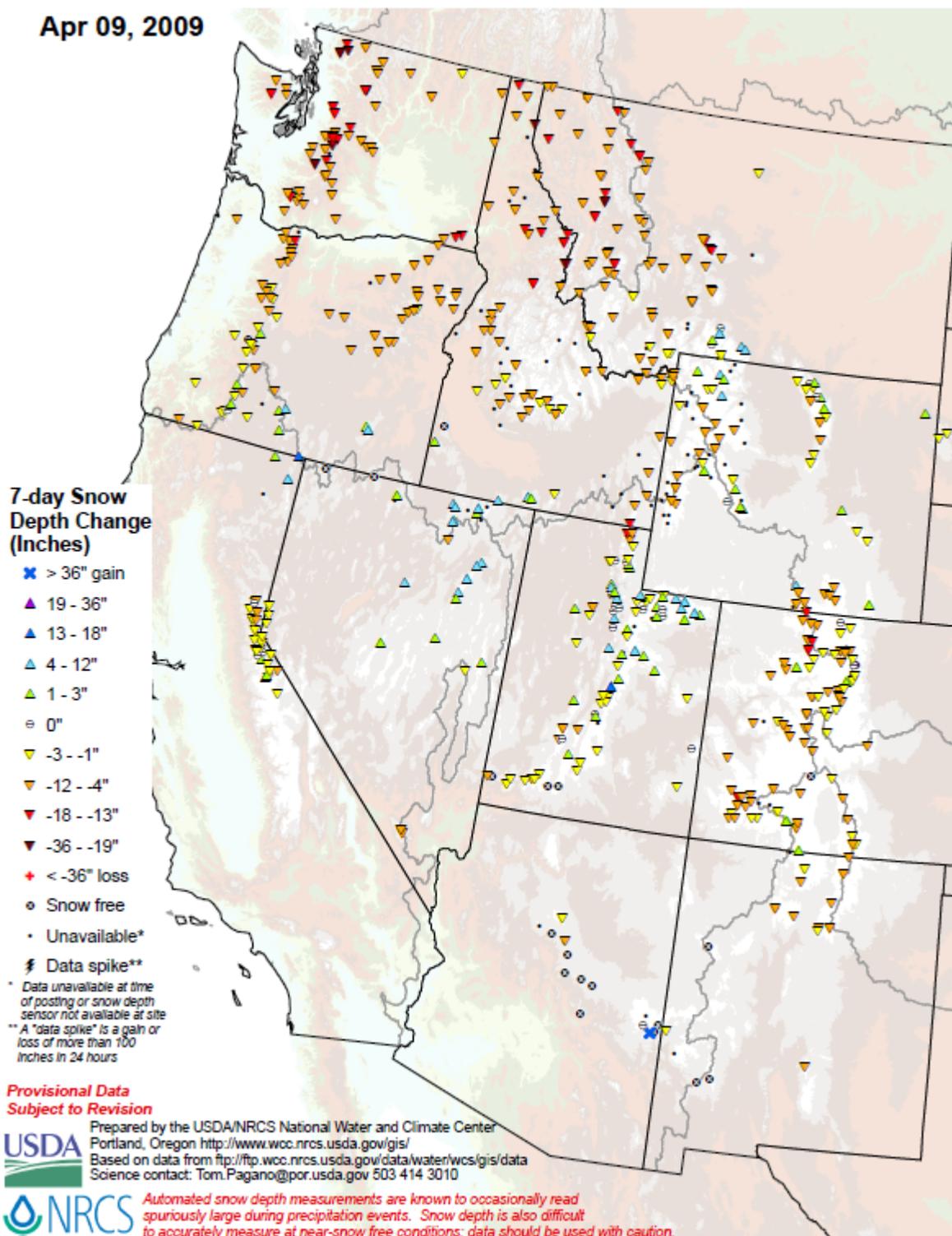


Fig. 1b: This past week's snow depth changes show the effects of warmer weather. Decreases are noted over much of the West with the exception of some increases over northern Nevada and parts of northern Utah and Wyoming.

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

Weekly Snowpack and Drought Monitor Update Report

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

Apr 09, 2009

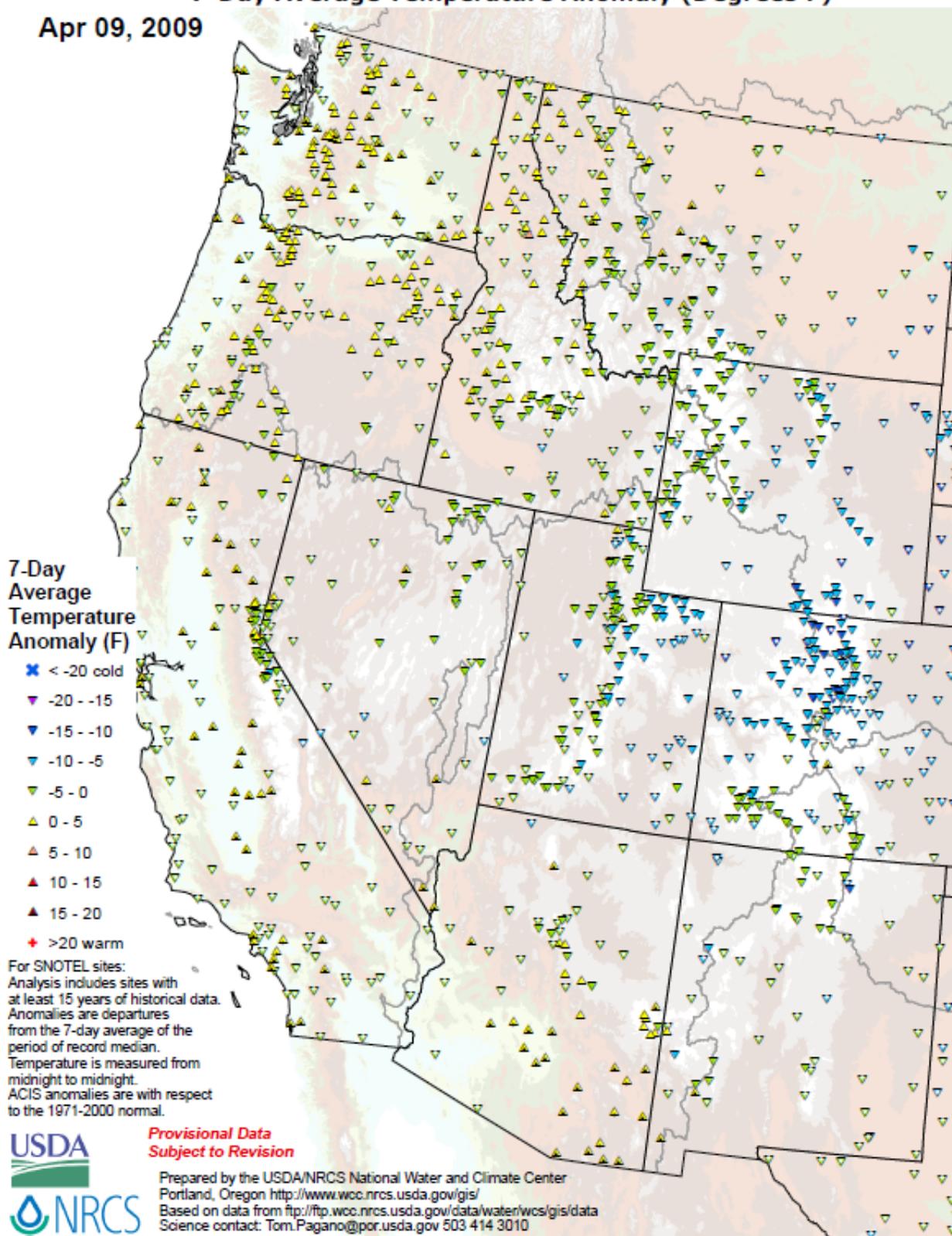
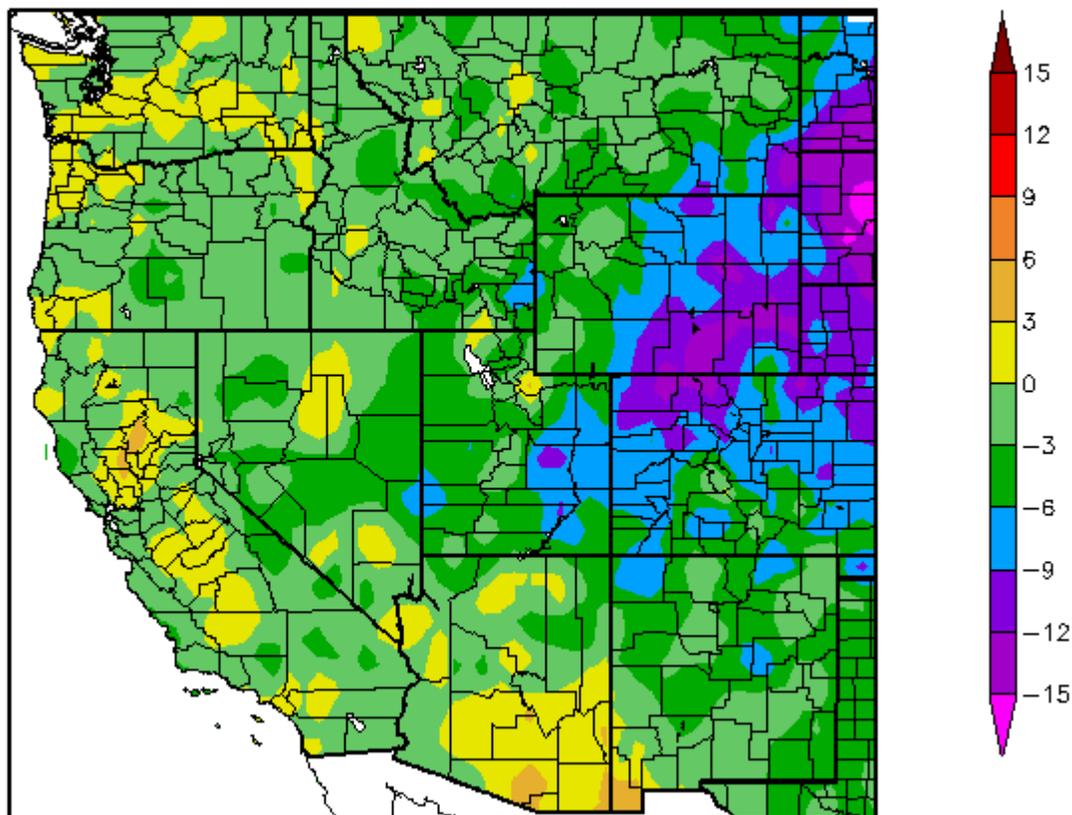


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were below average across most of the West except over the Cascades where temperatures were slightly above normal. Valley temperatures were cooler in some regions of the West compared to higher elevations.

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

Departure from Normal Temperature (F)
4/2/2009 – 4/8/2009



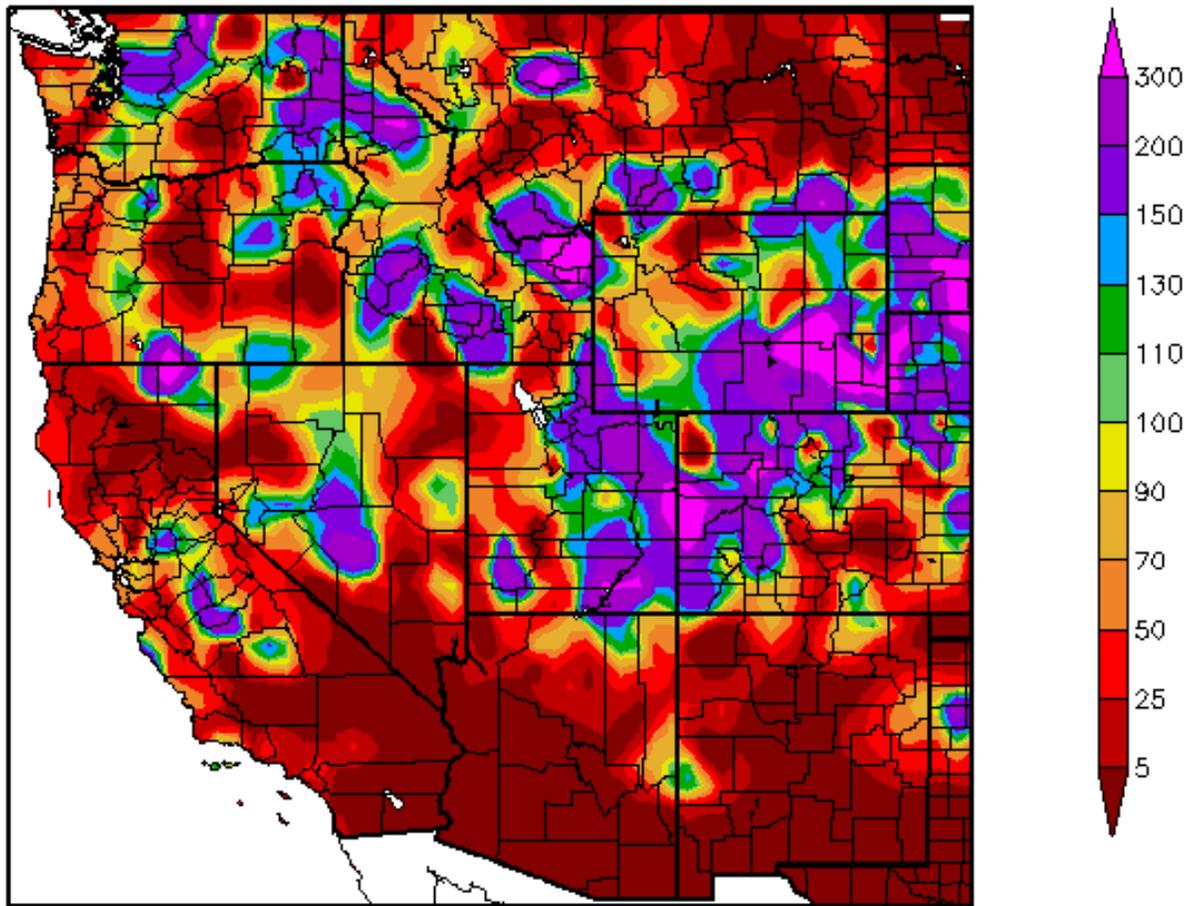
Generated 4/9/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over north central California (>+3F) and the greatest negative departures occurred over northern Colorado to eastern Montana (<-12F).

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

Percent of Normal Precipitation (%)
4/2/2009 – 4/8/2009



Generated 4/9/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 8 April shows a scattered precipitation pattern across the northern two-thirds of the West.

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

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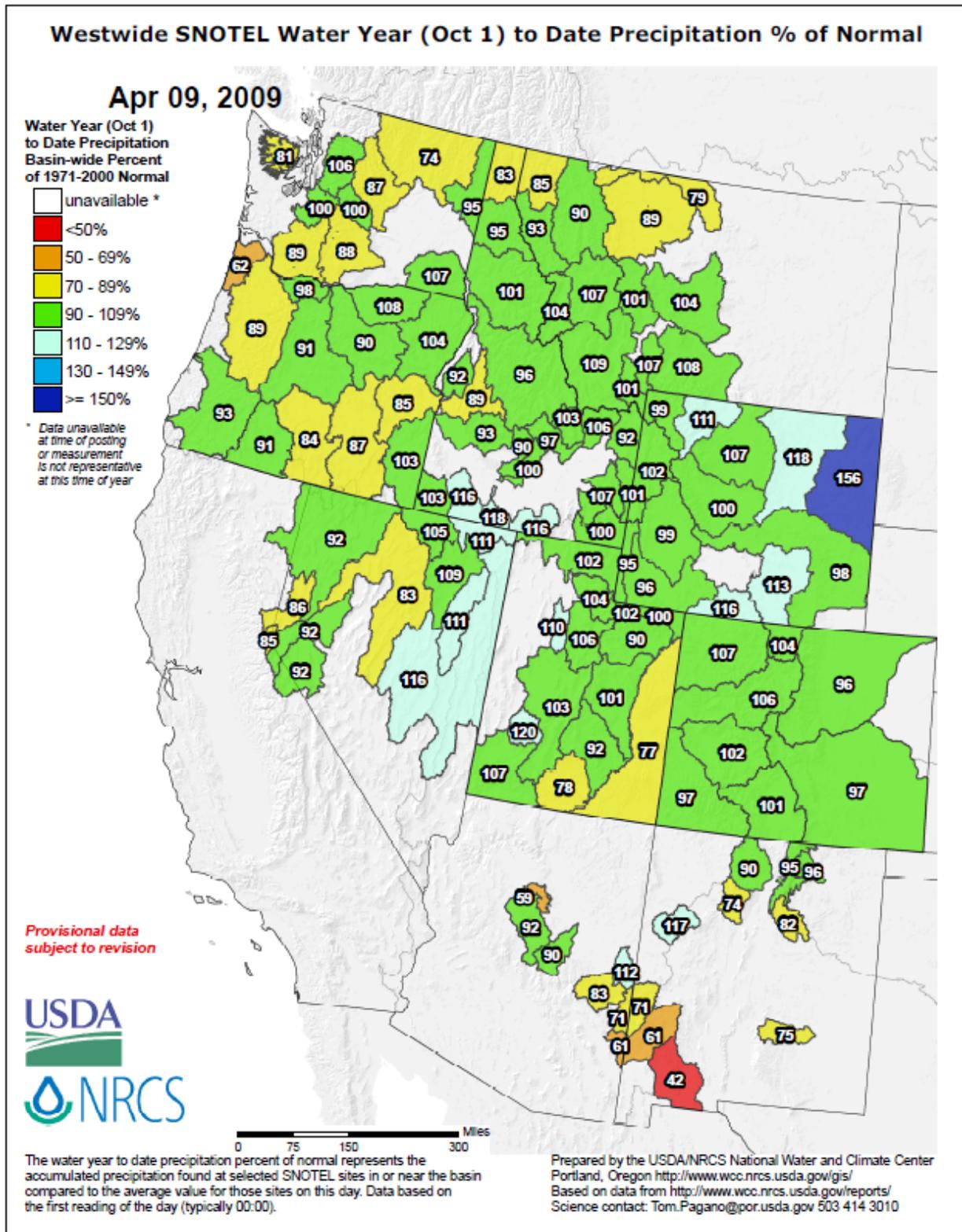
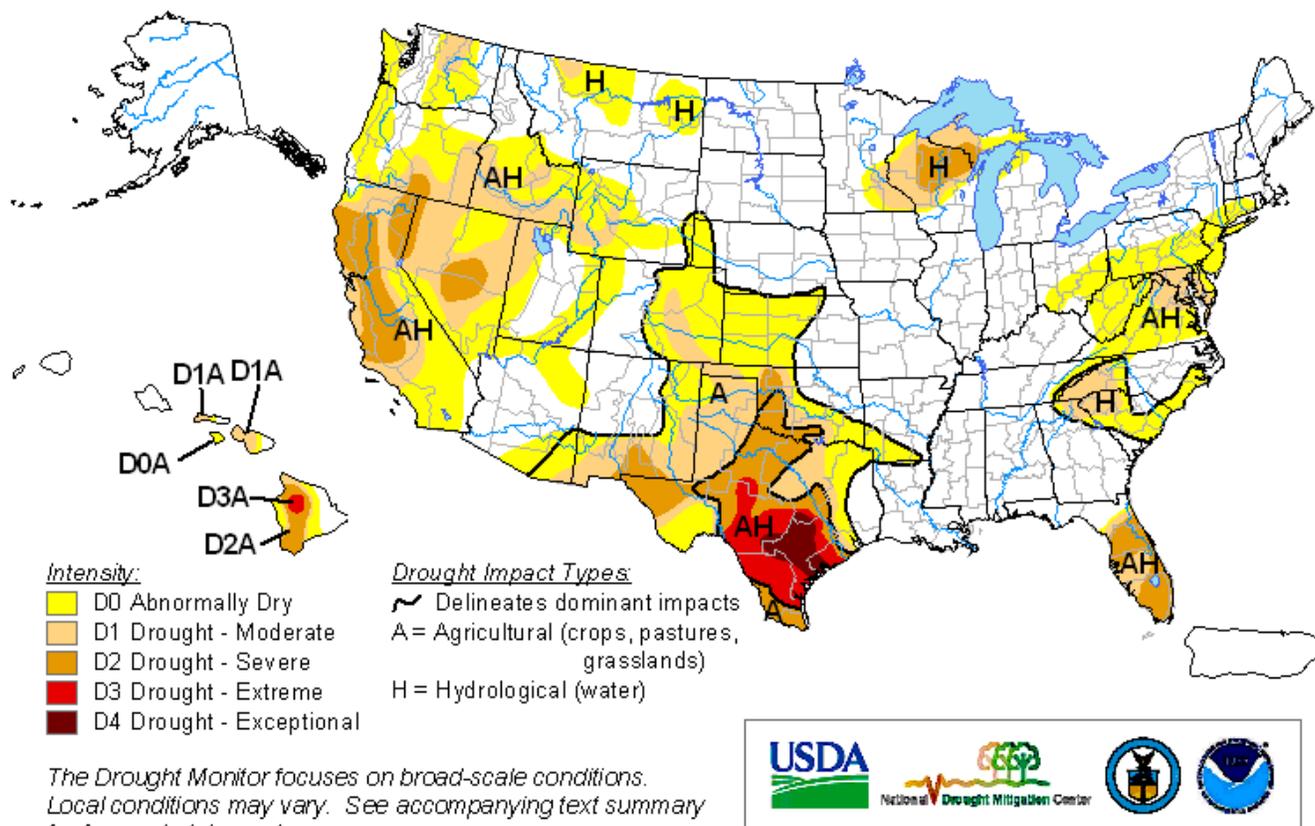


Fig 3a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values remaining pretty much unchanged this week (within +/- 2 percent) of last week's values. Week to week changes become less frequent as the Water Year advances.

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

U.S. Drought Monitor

April 7, 2009
Valid 8 a.m. EDT



Released Thursday, April 9, 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>

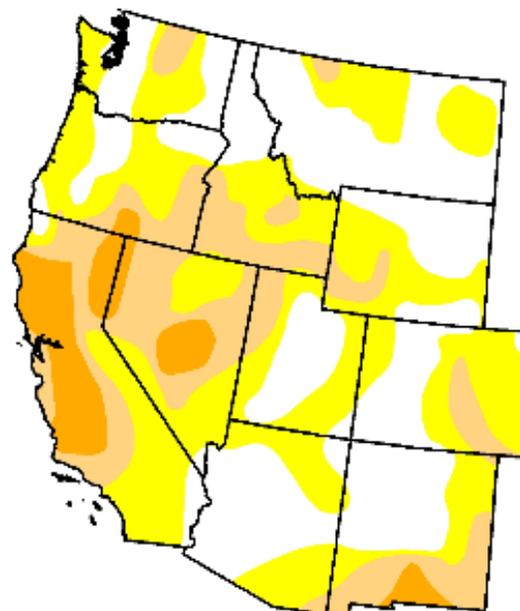
U.S. Drought Monitor

West

April 7, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	36.5	63.5	26.3	7.1	0.0	0.0
Last Week (03/31/2009 map)	31.7	68.3	28.2	4.2	0.0	0.0
3 Months Ago (01/13/2009 map)	41.9	58.1	28.5	9.1	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 (04/08/2008 map)	42.4	57.6	33.7	5.4	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



Released Thursday, April 9, 2009

Author: Mark Svoboda, National Drought Mitigation Center

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

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note slight deterioration (mostly in California) this week. Ref: http://www.drought.unl.edu/dm/DM_west.htm

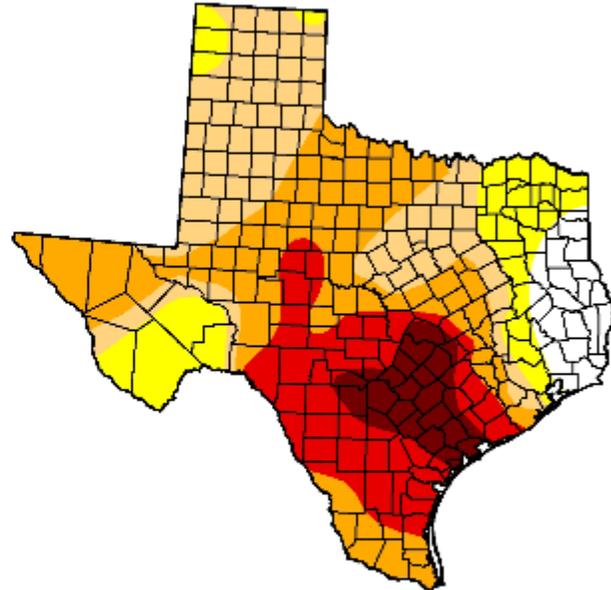
U.S. Drought Monitor

Texas

April 7, 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	79.1	53.5	24.6	7.1
Last Week (03/31/2009 map)	6.7	93.3	80.6	48.3	24.6	7.1
3 Months Ago (01/13/2009 map)	29.0	71.0	43.0	20.6	15.1	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 (04/08/2008 map)	27.9	72.1	46.7	13.9	9.9	0.0



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
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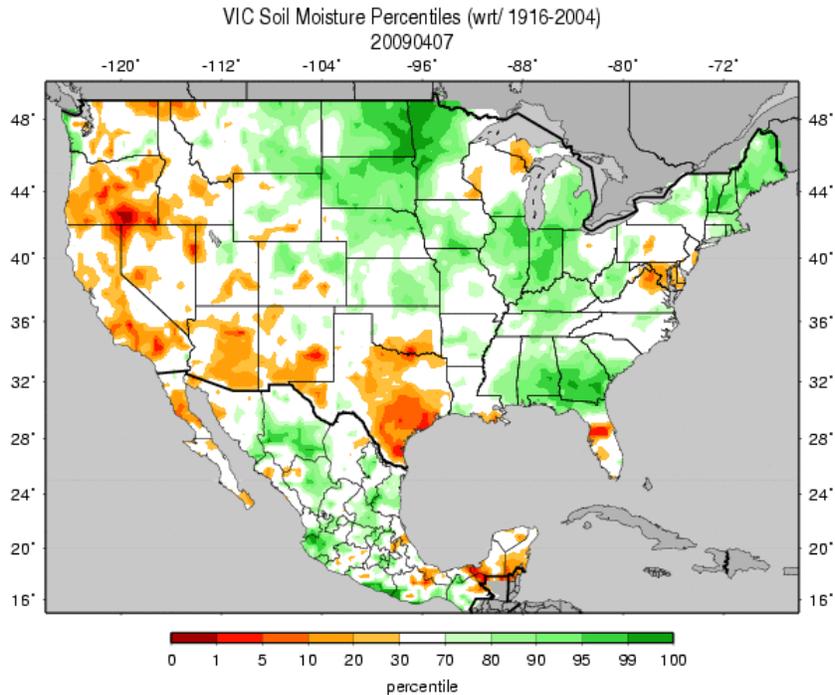
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<http://drought.unl.edu/dm>

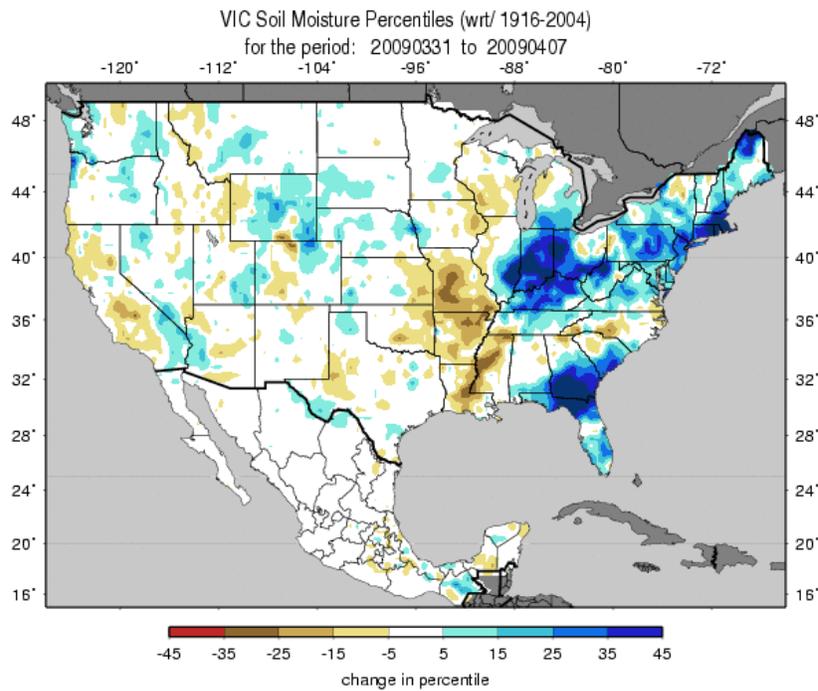
Fig. 4b: Texas is the only state with D4 drought condition in the US. Note further deterioration since last week. Ref: http://www.drought.unl.edu/dm/DM_state.htm?TX,S

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 is scattered across the West from Texas to northern Washington.

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 Southeast, Ohio River Valley to New England. Dryness returns to the Lower Mississippi River Valley.

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

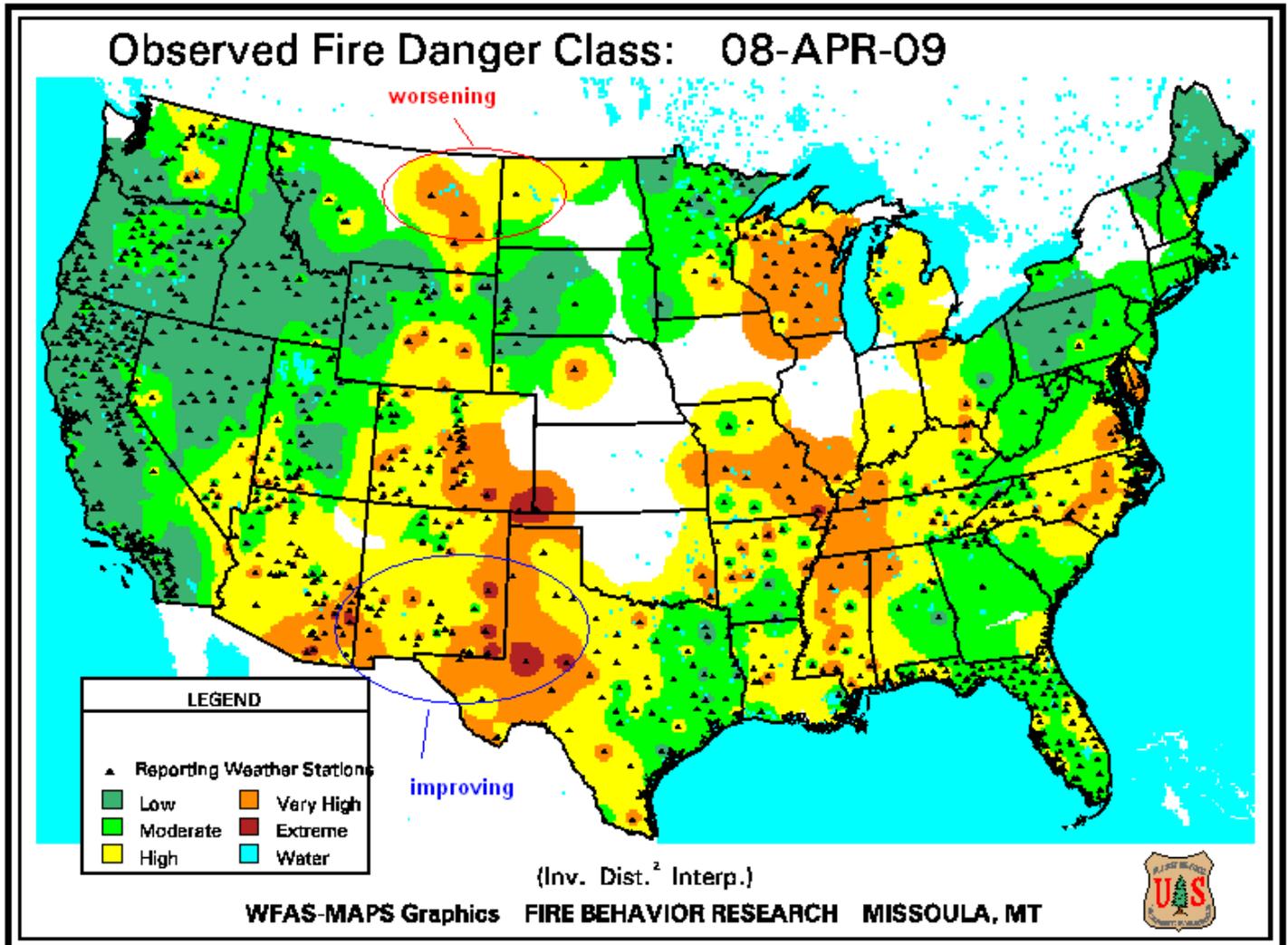


Fig. 6. Observed Fire Danger Class. Conditions continue to be extreme scattered across western Texas, eastern New Mexico, and extreme southeast Colorado.

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

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

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Wednesday, April 08, 2009

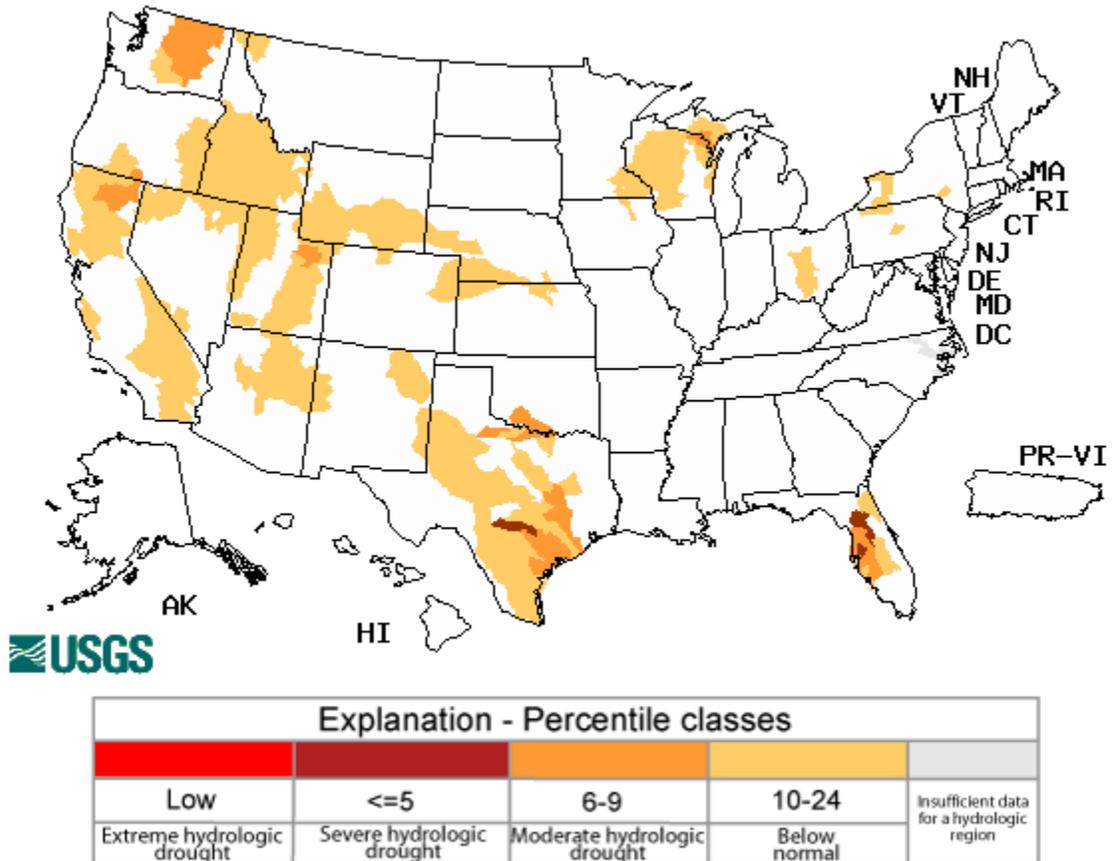


Fig. 7. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Conditions are very poor over western Florida and central Texas during the past week.

Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

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National Drought Summary – April 7, 2009

Special Announcement: This week marks the 500th release of the weekly U.S. Drought Monitor.

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: Another round of heavy rains tracked across the Southeast, bringing totals of 3 to 6 inches or more across southern Alabama, southern Georgia and northern Florida. This has led to some marked changes in southern Georgia and northern Florida on this week's map. Both D0 and D1 have been removed from these areas, leaving eastern Tennessee and the western Carolinas in D0 and D1 after the removal of D2 from upstate South Carolina. After good rains only a few weeks ago, southern Florida has slipped back again with the expansion of D2 for all areas below Lake Okeechobee except for the extreme southeastern coast around Miami, which remains in D1 for now. Temperatures also ran well above normal across southern Florida last week. This, coupled with the drought, has also served to exacerbate the fire potential across this region.

To the north in the Mid-Atlantic, the rains were welcomed, but were much more modest with totals running on the order of 1 to 3 inches across parts of western and northwestern Virginia, with lesser amounts reported in Maryland, New Jersey and Pennsylvania. Changes this week include a trimming of the D0 in northeastern Kentucky, southern Ohio and southwestern West Virginia. As a result, D1 has retreated northward out of southwestern Virginia and up into northern Virginia and eastern Maryland and has spread across into Delaware. A slight reduction of D0 occurred this week across northern Pennsylvania, but D0 expanded slightly up into southern New England via Connecticut. In addition, the entire Mid-Atlantic is now in an "AH" designation because the past 30 days have been quite dry as we move deeper into spring, carrying year-to-date deficits along as well.

The Great Lakes Region: Dryness continues to persist in the upper Great Lakes region as we move forward with the spring thaw. This pattern results in a slight expansion of D1 in the western Upper Peninsula of Michigan. Abnormally dry (D0) has also pushed eastward across the Upper Peninsula and down into the northern reaches of the Lower Michigan peninsula.

The Plains: After a pretty active pattern the past couple of weeks, it was a bit quieter across most of the Plains last week. A reassessment of the heavy snows and rains that tracked through the region before this period has resulted in a few improvements to the depiction in parts of Kansas, Colorado, western Oklahoma and the Texas Panhandle. Severe drought has been pushed out of the Oklahoma Panhandle and D0-D1 have been trimmed in these parts as well. More rain will be needed to keep the area from slipping right back into severe drought (D2). The status quo holds this week across Texas. Areas that bear watching as we head deeper into spring are central Kansas and central and eastern Nebraska, which are quite dry for the year. This week we see a slight push of D0 into southeastern Nebraska, but larger changes could be in store if spring rains continue to miss these areas.

The West: The Pacific NW was the recipient of cooler temperatures and more than ample precipitation this past week as heavy snows fell in the northern Cascades. This has brought up some of the basins' snowpack, but there are still some lingering pockets of D0-D1 in northern Washington State where basins are still only running at 70-89 percent of normal for the winter,

Weekly Snowpack and Drought Monitor Update Report

according to USDA-NRCS. The good news is that these numbers reflect a positive increase in projected streamflow compared to a month ago. In fact, this is the case across much of Oregon, Washington, Idaho, Montana and northwestern Wyoming. On the flip side, March wasn't as kind to the Southwest, where projected streamflows have been adjusted lower for the remainder of the runoff season, particularly in Arizona and New Mexico where snowpack has only been running at around 50% or less in most cases. Reductions in streamflow volume forecasts are also expected in basins across southern Utah and Colorado.

This has resulted in several changes to this week's map. Of note, D0 and D1 have been significantly reduced in Montana and western Idaho. This is also the case in northern Washington State on the western slopes of the northern Cascades where precipitation was abundant and a slight trimming of D0 and D1 is noted. Pockets of dryness and drought remain, though, including an introduction of D1 in eastern Idaho where streamflows along the Big Lost and Little Wood rivers are running at historical or near-historical lows.

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Alaska, Hawaii, and Puerto Rico: Conditions across Hawaii remain unchanged this week after some improvement last week on Maui. Both Alaska and Puerto Rico are not showing signs of any significant dryness or drought at this time.

Looking Ahead: For the next five days (April 9-13), the best chances for significant precipitation seem to be found along the coastal reaches of Oregon and Washington, northern California, the northern and central Rockies, the central and southern Plains, and the Ohio and Tennessee Valleys. Temperatures are expected to be below-normal for almost the entire country over this time period as well.

The CPC 6- to 10-day forecast (April 14 – April 18) is calling for better odds of below-normal precipitation across California, the Upper Great Lakes, and the Northeast. The prospects for rain are brighter across the Rockies, most of the Great Plains, the Southeast and the Mid-Atlantic. Temperatures are expected to be above normal across southern Florida and the Upper Great Lakes region. Cooler temperatures are forecasted for the central and southern Plains, the central Rockies, the Southwest, the Great Basin and California.

Author: Mark Svoboda, National Drought Mitigation Center

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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: 9 April 2009