



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

Weekly Report - Snowpack / Drought Monitor Update **Date: 4 June 2009**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date shows surplus conditions continuing over parts of the Northern Cascades. Elsewhere, values continue to dwindle rapidly (Fig 1).

Temperature: SNOTEL and ACIS-day station average temperature anomalies were above average over the Cascades and Northern Rockies and below average over the Central and Southern Rockies (Fig. 2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over areas of central Washington (>+20F) and the greatest negative departures occurred over the south central Colorado (<-5F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 3 June shows exceptional moisture falling from southern Oregon eastward to the Colorado High Plains and from the Great Basin to western New Mexico. The remainder of the West was very dry. Note that during this time of year when rainfall is generally light, it doesn't require very much precipitation to exaggerate the percent of normal value (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 a few percentage points of last week's values (Fig 3a) (the only exception noted is a significant decrease over northeastern Wyoming; falling 14%).

WESTERN DROUGHT STATUS

The West: D0 was improved slightly in north-central Arizona in response to recent rains in the region. D0 was added to several locations in Montana in response to abnormally dry conditions for the current agricultural season. A reassessment of conditions in California going into the dry season led to the expansion of D2 down along the southern coast of the state. In Oregon, D2 was expanded into the southern portion of the state as several indicators were showing this region to be worse than was currently being depicted. Author: Brian Fuchs, 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).

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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 [adjective class rating](#) is a method of normalizing rating classes across different fuel models, indexes, and station locations. It is based on the primary fuel model cataloged for the station, the fire danger index selected to reflect staffing levels, and climatological class breakpoints. This information is provided by local station managers. About 90% use the Burning Index (BI); others use Energy Release Component (ERC). Staffing class breakpoints are set by local managers from historical fire weather climatology (Figs. 6).

Only reporting station locations are indicated with a marker on the maps. Values between stations are estimated with an inverse distance-squared technique on a 10-km grid. This works pretty well in areas of relatively high station density, but has obvious shortcomings in other areas.

VEGETATION STRESS (<http://ivm.cr.usgs.gov/viewer/viewer.htm>)

The greenness maps (Fig. 7) show the health and vigor of the vegetation. Generally healthy vegetation is considered an indicator of favorable climatic and environmental conditions. While poor vegetation condition is indicative of droughts and diminished productivity. The USGS greenness maps can be used to evaluate the vegetation condition of a region. The greenness maps are produced with a spatial resolution of 1-km. At this scale the greenness maps are most useful for countywide, statewide, and regional evaluation of vegetation condition.

One of the most important aspects of the USGS greenness mapping is the more than 20-year history of information. Over the last 20 years, droughts have come and gone, there have been years when the vegetation has been lush from ample rain, and there have been the "normal" years. From all of this information it is possible to determine the departure from normal for vegetation condition, much like is done for precipitation.

As a result, it is possible to compare this week's vegetation condition with normal conditions. An above normal condition could indicate wetter or warmer than normal conditions while a below normal condition could indicate colder or dryer than normal conditions. The interpretation of departure from normal will depend on the season and geography of a region.

U.S. HISTORICAL STREAMFLOW

This map, (Fig. 8) 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

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media with appropriate SS/WSF information - <http://www.wcc.nrcs.usda.gov/cgi-bin/bor.pl>. Additional information describing the products available from the Drought Monitor can be found at the following URL: <http://drought.unl.edu/dm/>

FOR MORE INFORMATION

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

This report uses data and products provided by the Interagency Drought Monitor Consortium members and the National Interagency Fire Center.

/s/ NOLLER HERBERT
Director, Conservation Engineering Division

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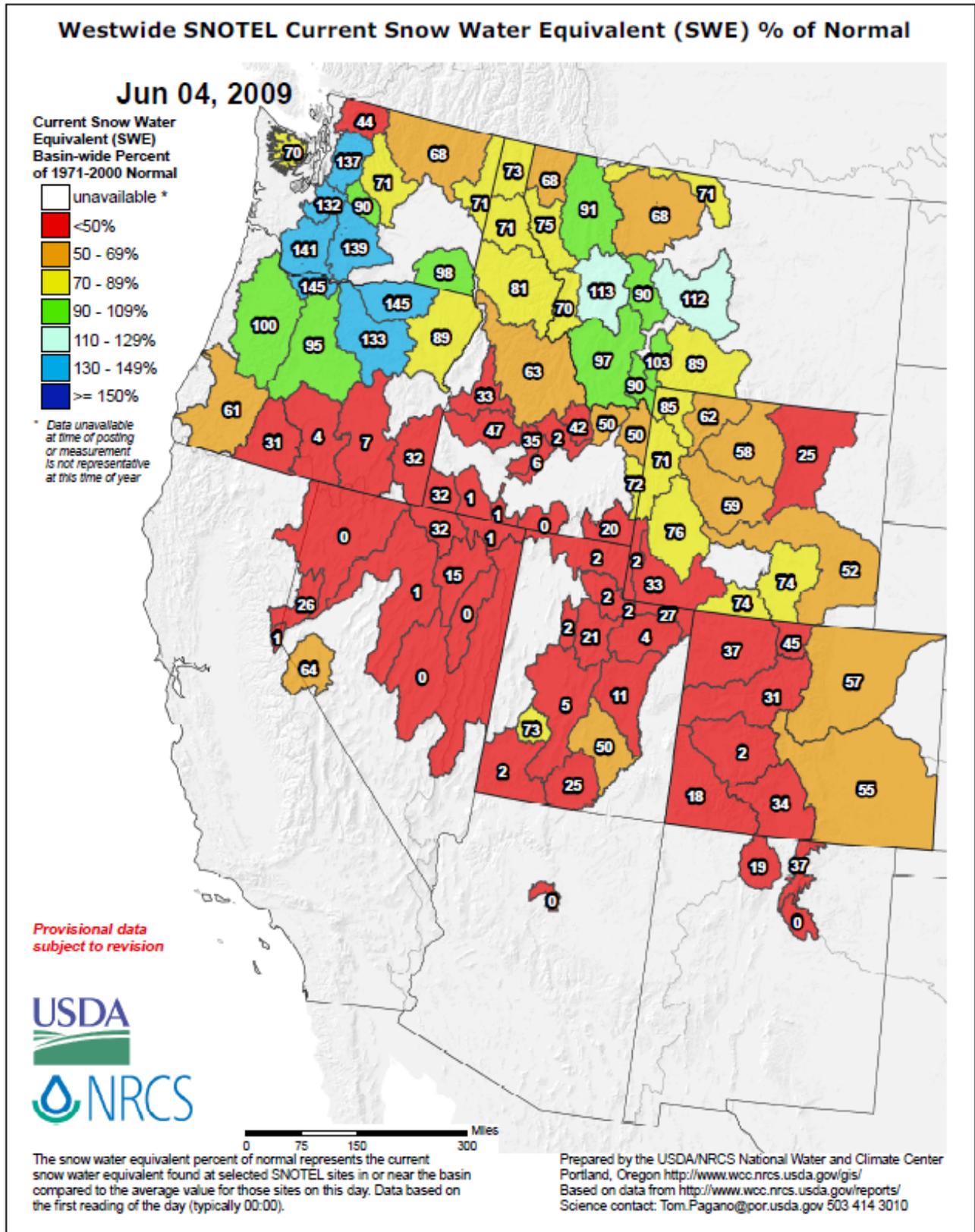


Fig. 1. Snow-water equivalent percent to date shows surplus conditions continuing over parts of the Northern Cascades. Elsewhere, values continue to dwindle rapidly.
Ref: http://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_swepctnormal_update.pdf

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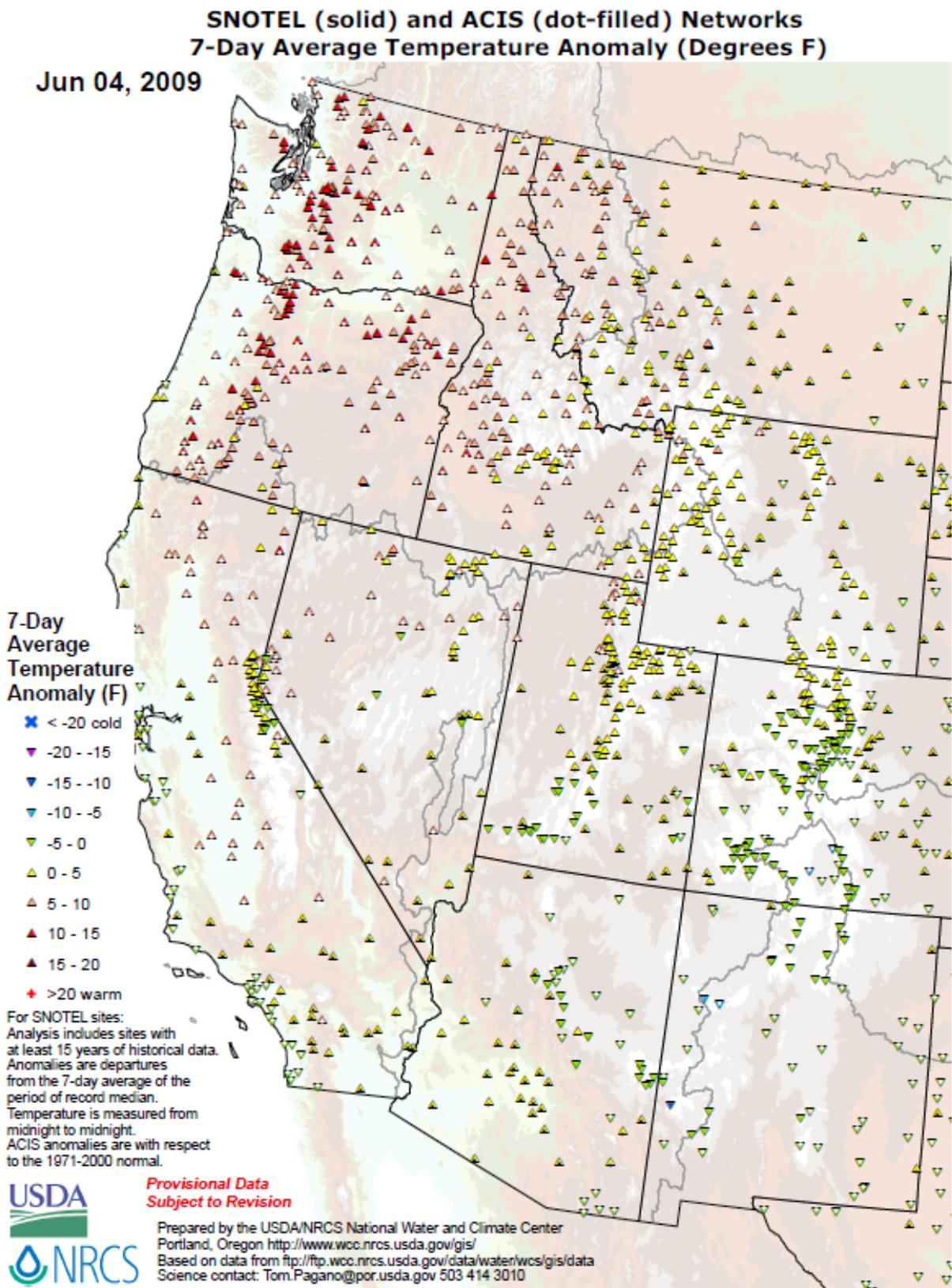
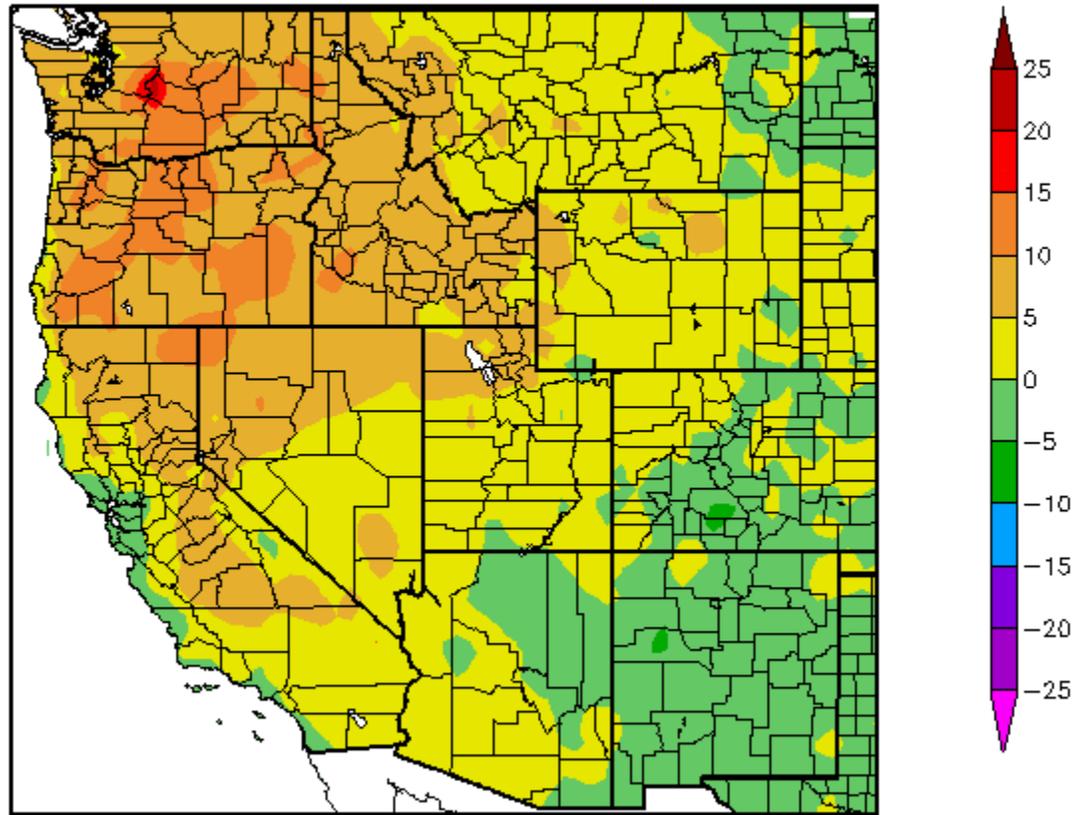


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were above average over the Cascades and Northern Rockies and below average over the Central and Southern Rockies.

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

Departure from Normal Temperature (F)
5/28/2009 – 6/3/2009



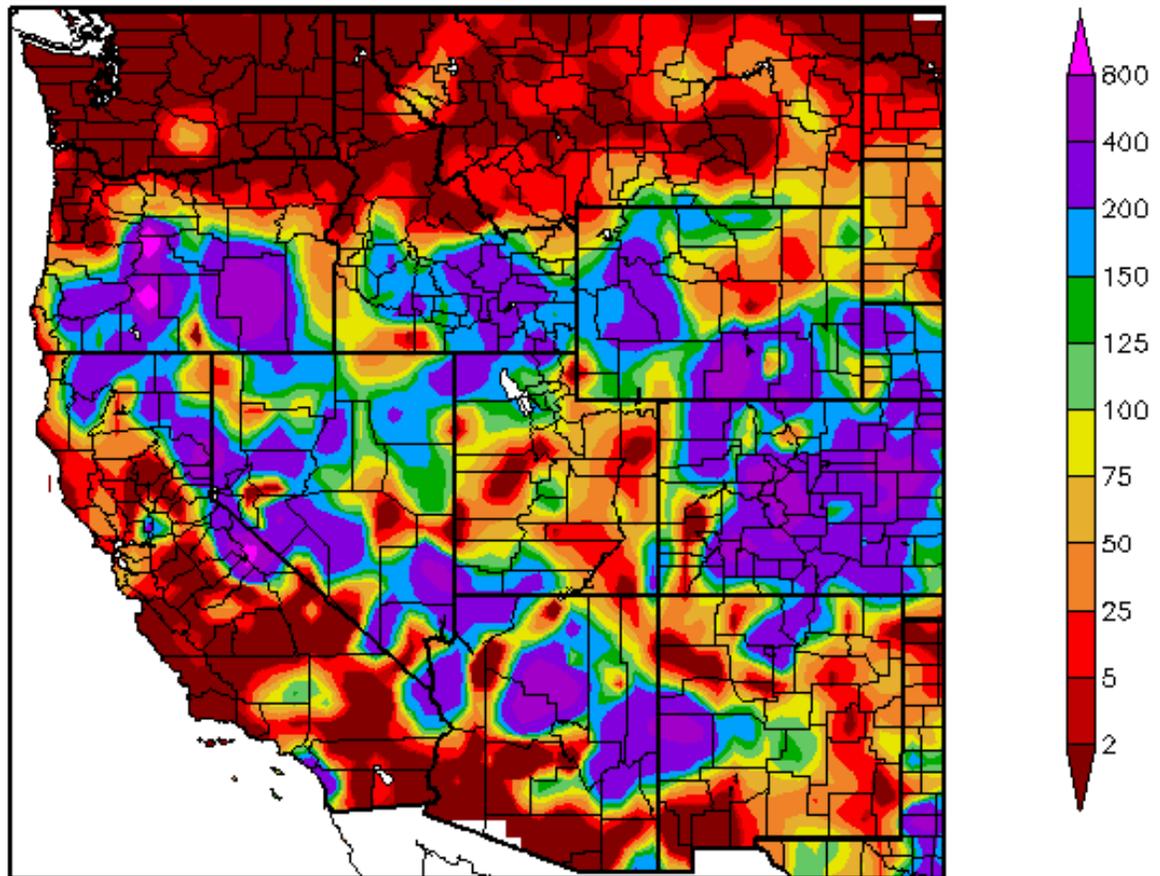
Generated 6/4/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over areas of central Washington (>+20F) and the greatest negative departures occurred over the south central Colorado (<-5F).

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

Percent of Normal Precipitation (%)
5/28/2009 – 6/3/2009



Generated 6/4/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 3 June shows exceptional moisture falling from southern Oregon eastward to the Colorado High Plains and from the Great Basin to western New Mexico. The remainder of the West was very dry. Note that during this time of year when rainfall is generally light, it doesn't require very much precipitation to exaggerate the percent of normal values. Ref: http://www.hprcc.unl.edu/maps/index.php?action=update_product&product=PNorm

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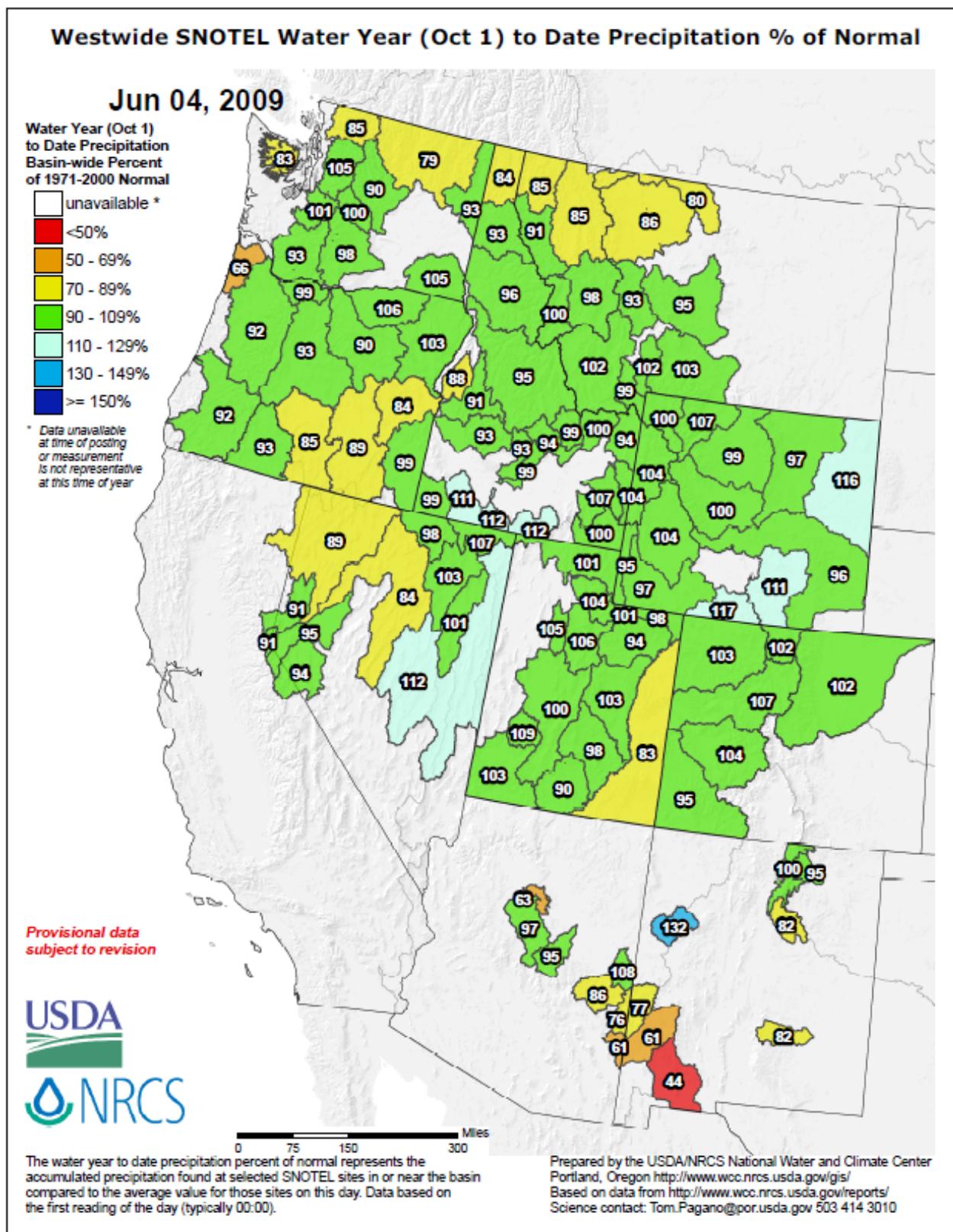
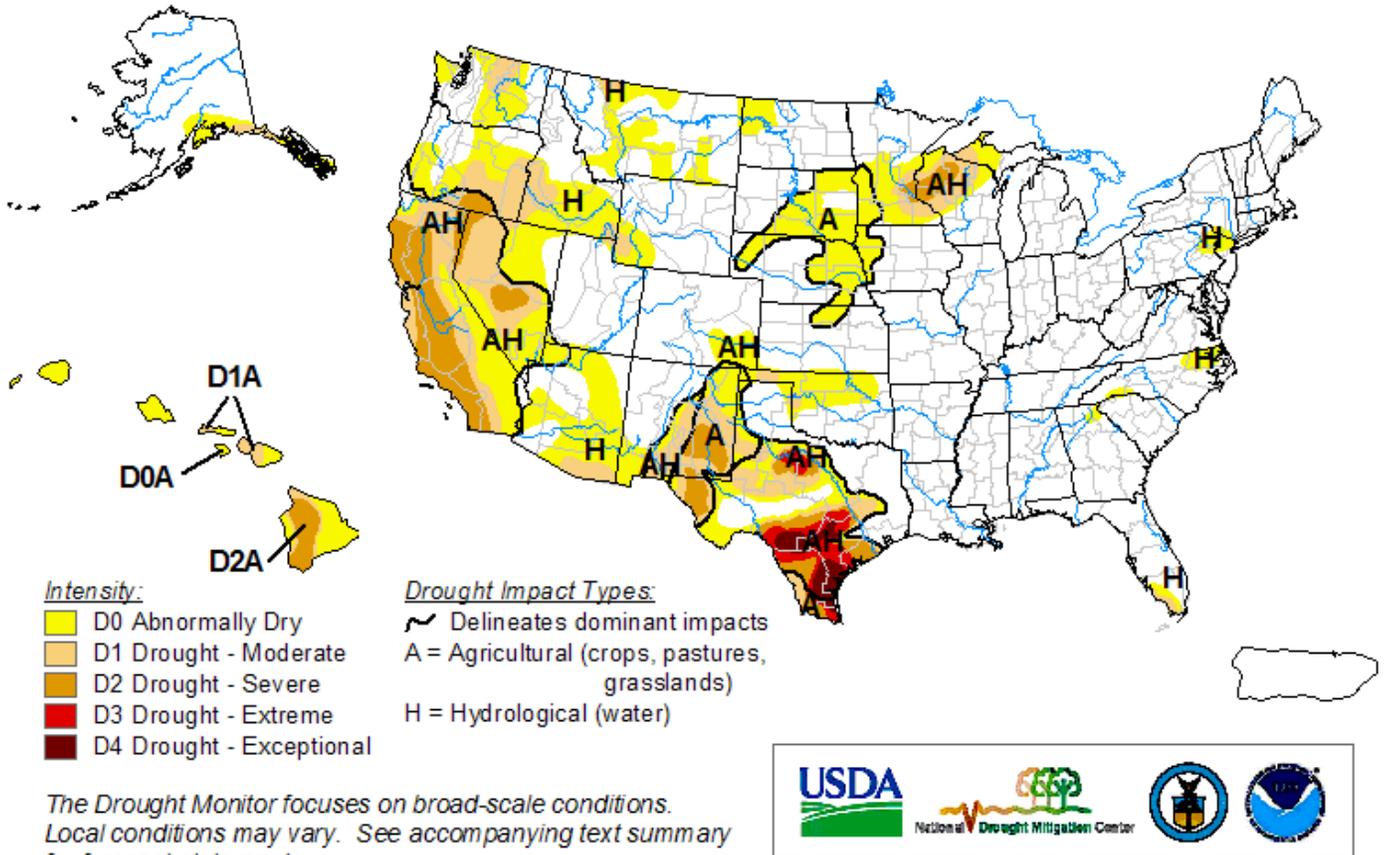


Fig 3a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values within a few percentage points of last week's values. The only exception noted is a significant decrease over northeastern Wyoming (fell 14%).

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

U.S. Drought Monitor

June 2, 2009
Valid 8 a.m. EDT



Released Thursday, June 4, 2009

Author: Brian Fuchs, 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>

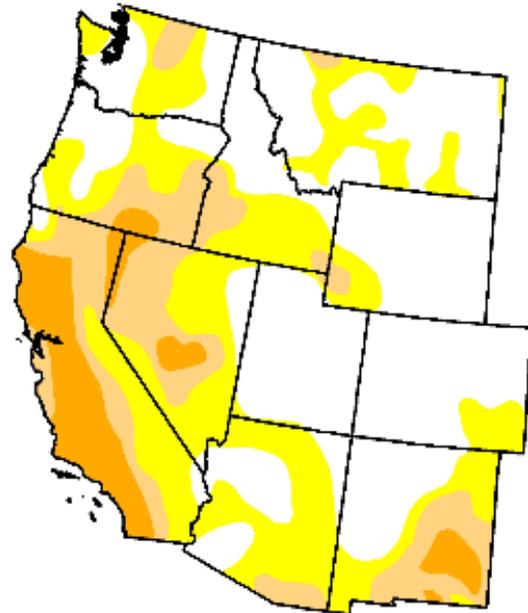
U.S. Drought Monitor West

June 2, 2009

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	47.5	52.5	23.1	8.2	0.0	0.0
Last Week (05/26/2009 map)	50.7	49.3	22.6	6.6	0.0	0.0
3 Months Ago (03/10/2009 map)	33.7	66.3	25.1	4.2	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 (06/03/2008 map)	43.0	57.0	29.2	5.3	0.1	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, June 4, 2009

Author: Brian Fuchs, National Drought Mitigation Center

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

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Regionally, conditions have deteriorated slightly as a result of excessive warmth during the past week. Ref: http://www.drought.unl.edu/dm/DM_west.htm

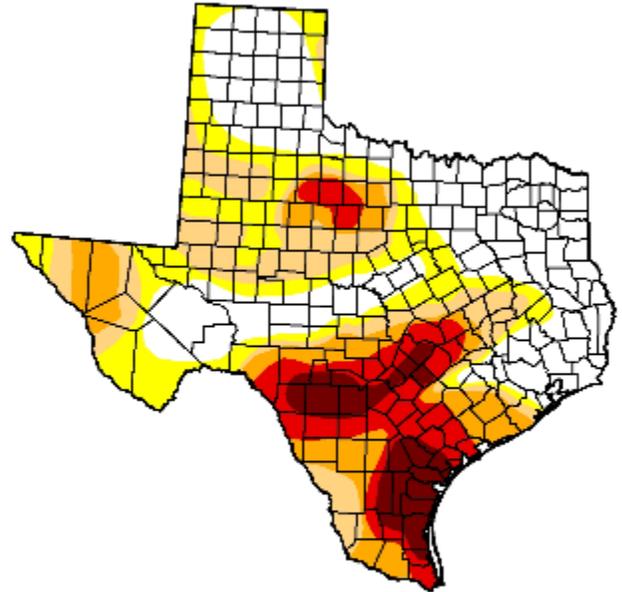
U.S. Drought Monitor

Texas

June 2, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	36.6	63.4	44.3	28.4	16.6	6.5
Last Week (05/26/2009 map)	32.9	67.1	47.8	31.6	17.4	6.7
3 Months Ago (03/10/2009 map)	0.0	100.0	84.3	45.8	22.4	9.6
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 (06/03/2008 map)	37.9	62.1	44.9	28.6	1.5	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>

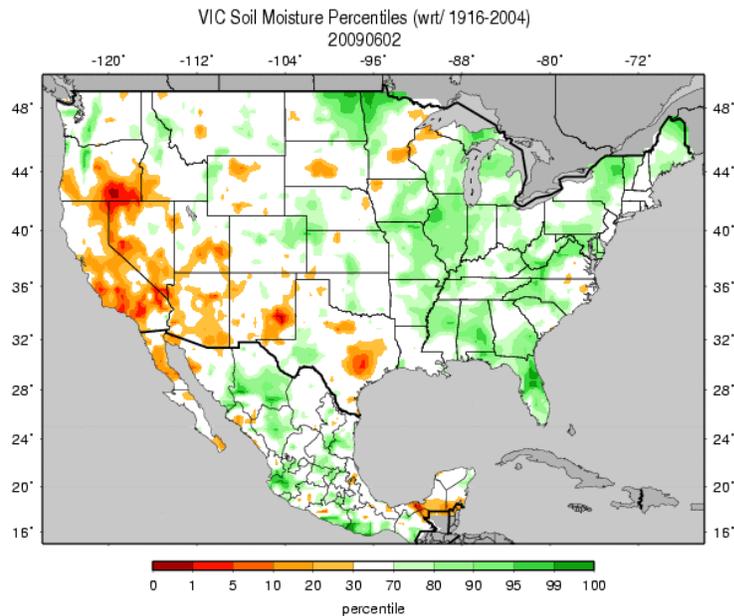


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Author: Brian Fuchs, National Drought Mitigation Center

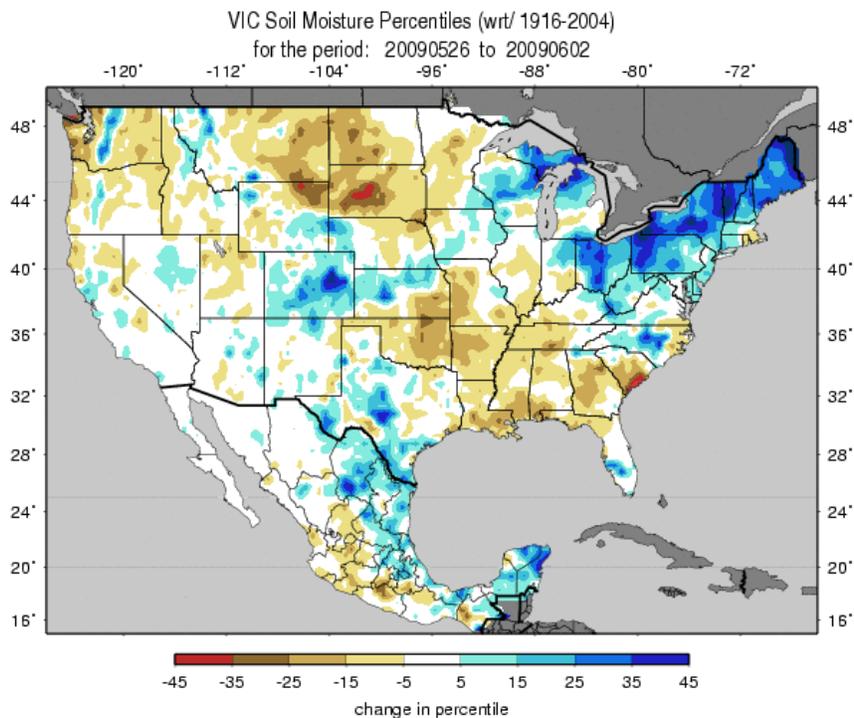
Fig. 4b: Texas is the only state with D4 drought condition in the US. Note some improvement in all categories since last week. Ref: http://www.drought.unl.edu/dm/DM_state.htm?TX,S

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Figs. 5a: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 26 May. Near saturation exists over the extreme Northern Plain and much of the mid-West into Florida while excessive dryness is scattered across the West from Texas to Oregon. Little change is noted since last week.

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. There was significant moistening over the East Coast, Central Great Lake States, Colorado, and Texas. Excessive drying is noted over the Northern High Plains and over much of the Southeast. Ref:

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

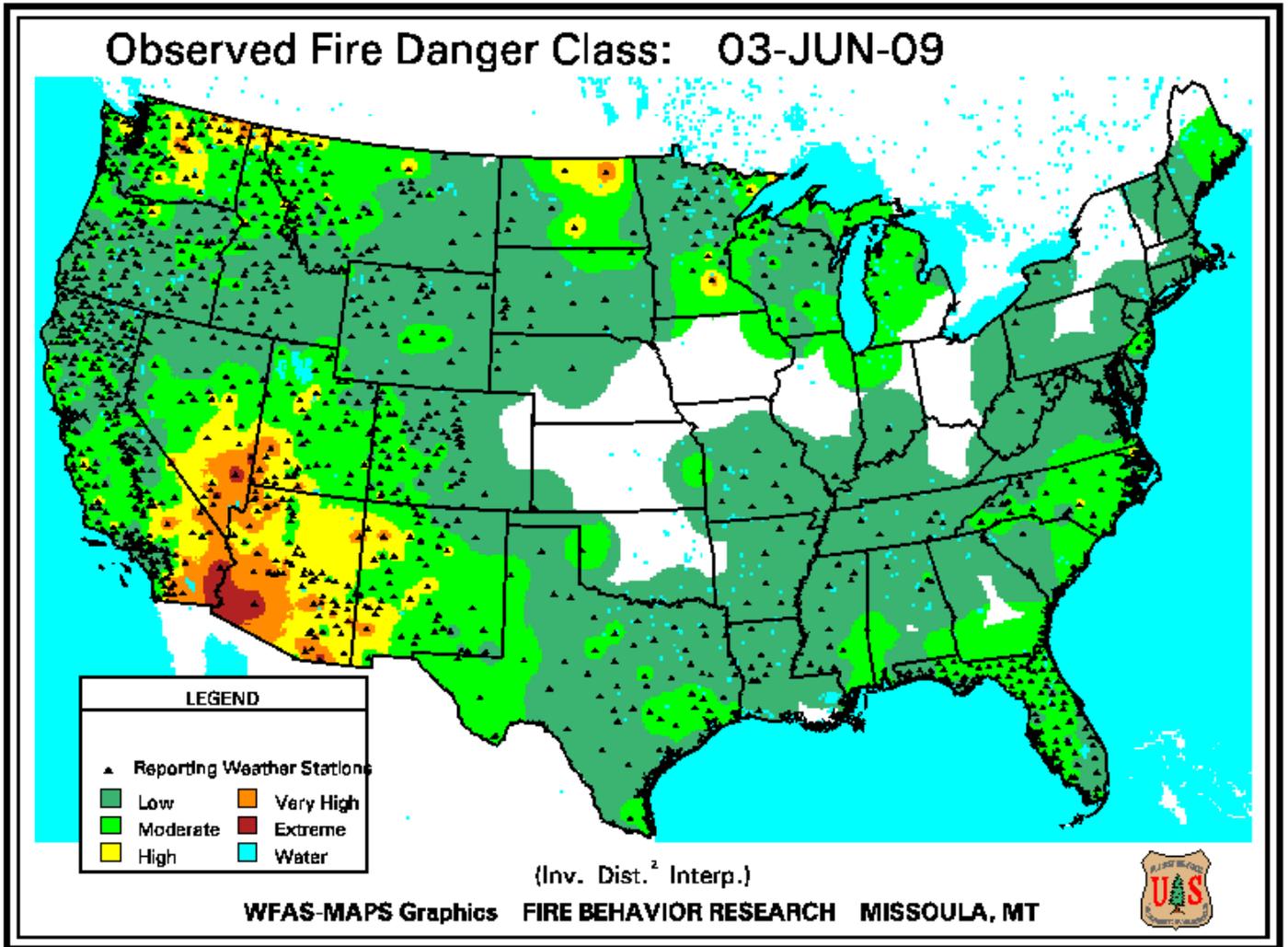


Fig. 6. Observed Fire Danger Class. Note extreme conditions over the Lower Colorado River Basin.

Ref: http://www.wfas.net/images/firedanger/fd_class.gif

**Vegetation Drought Response Index
Complete**

June 1, 2009

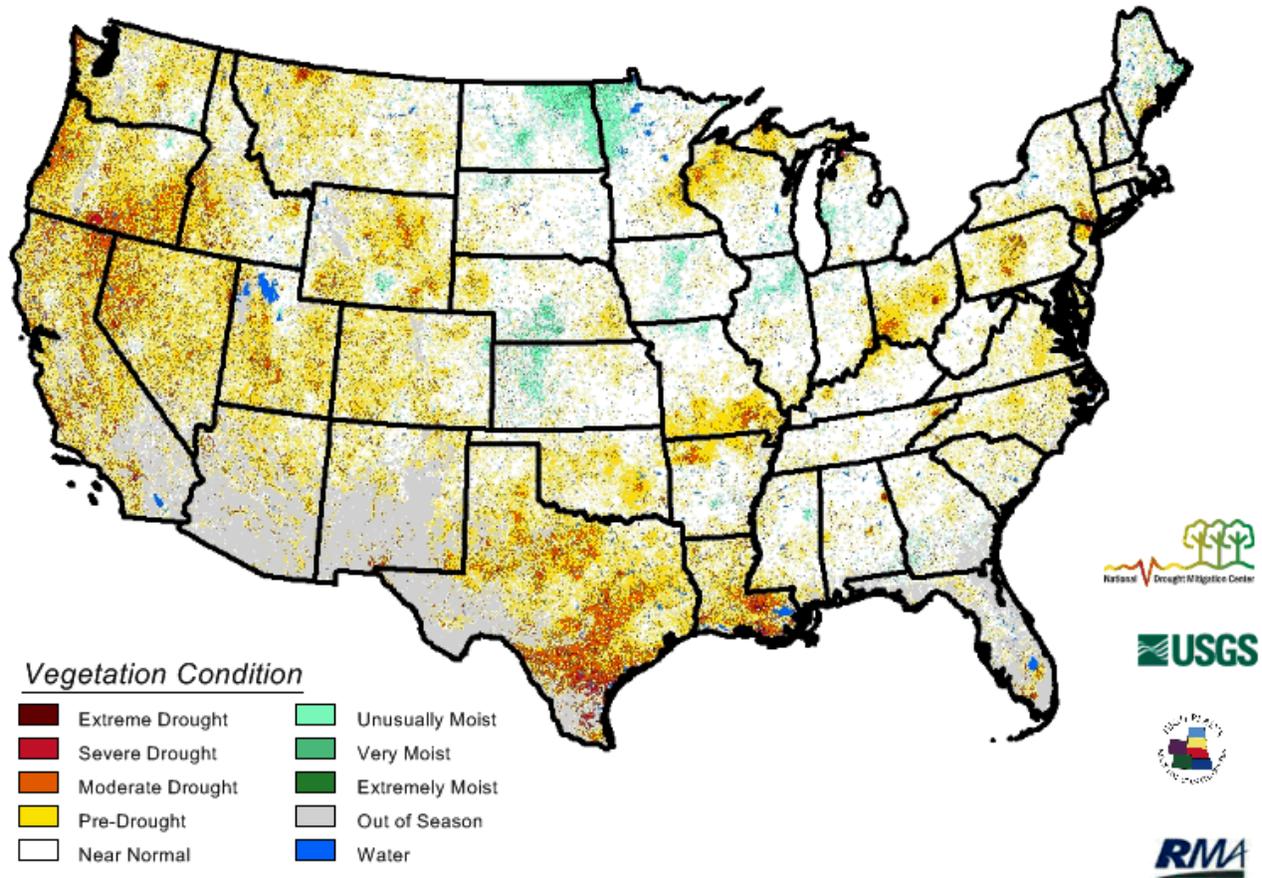


Fig. 7. Vegetation Drought Response Index: This is a new product being developed here at the NDMC along with several partners to show vegetation stress.
Ref: http://drought.unl.edu/vegdiri/VegDRI_Main.htm?EV.

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Wednesday, June 03, 2009

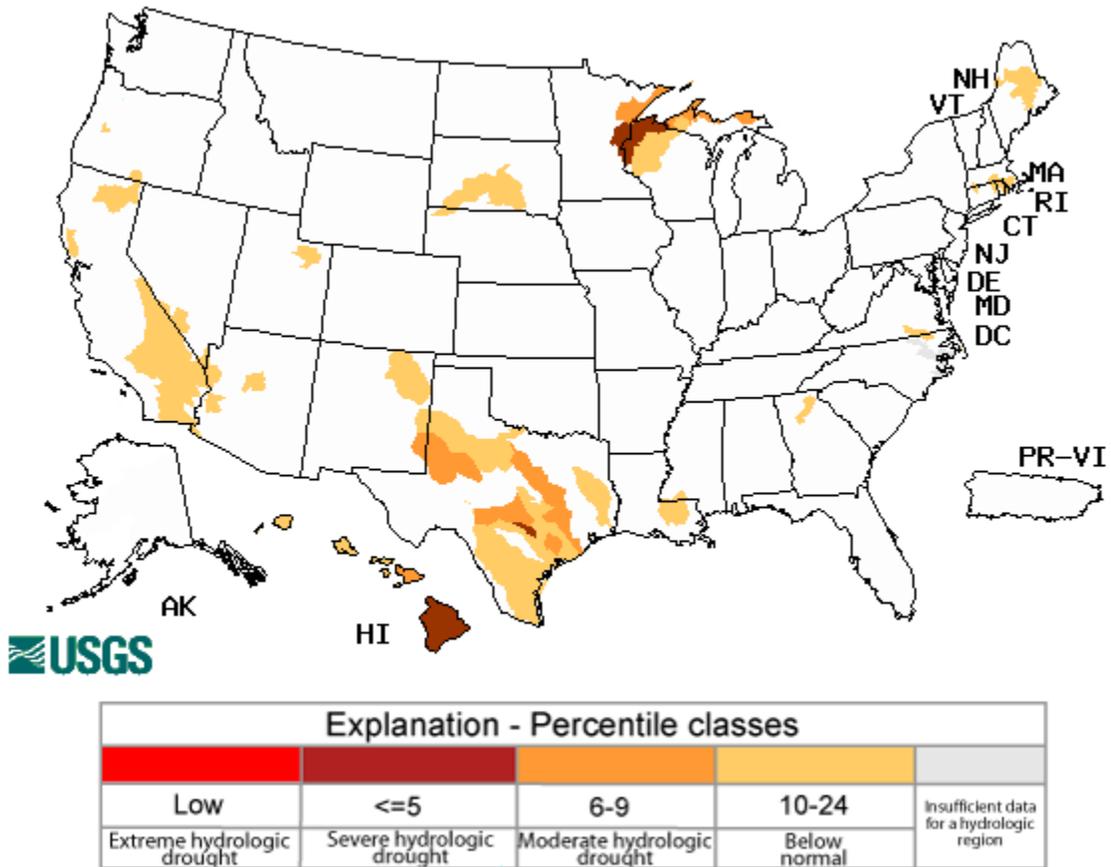


Fig. 8. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Conditions are lower than average over parts of Texas, and over much of northwestern Wisconsin and central eastern Minnesota during the past week. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

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National Drought Summary – Jun 2, 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/>.

Northeast and Mid-Atlantic, and Carolinas: D0 was expanded to include all of northern New Jersey and into extreme southeastern New York. D0 was eliminated from western New York and all of western Pennsylvania this week. The region has recorded several rain events over the last few weeks that have been enough to remove the abnormally dry (D0) conditions from the region. There is still a pocket of dryness in the Buffalo, New York, area that will need to be watched if the recent rains do not persist. In the Carolinas, the D0 in eastern North Carolina was expanded to the west as hydrological impacts are still persisting even with the recent rains. Along the North and South Carolina border, the D0 was reduced and split from a separate pocket of D0 in extreme northeast Georgia.

Florida: The wet season continued to arrive in full force over much of Florida. All drought was eliminated outside of a small pocket of D0/D1 along the southwest coast that the recent rains have missed. Several records were broken for May precipitation across southern Florida, including some that had stood for more than 75 years. For the month of May, Daytona Beach recorded 22.33 inches (685 percent of normal), Sanford 17.00 inches, Ponce Inlet 17.74 inches, and Kissimmee 17.09 inches, compared to just 3.92 inches in Naples and 3.87 inches in Key West.

Upper Midwest: For the most part, the drought regions of Minnesota and Wisconsin were missed by any significant rains this week. The southern edge of the drought in Wisconsin did record up to 3 inches of rain, which led to improvements to the D0/D1 regions along the southern edge of the drought. D1 and D2 were expanded around the Twin Cities, while D0 was expanded in southwest Minnesota.

The Plains: May was dry over much of the Plains region. Locally heavy rains did take place at the end of Drought Monitor period over southwest Nebraska, southeast Nebraska and northeast Kansas. Many locations are 5 to 6 inches below normal for the calendar year and only cool temperatures have kept crop stress to a minimum at this point. Most locations started this agricultural season with a full soil moisture profile, but topsoils are being depleted rapidly and some areas are already seeing stress on emerging crops and smaller heads filling in on the wheat crop. D0 was expanded into most of eastern Nebraska, western Iowa and South Dakota. An area of D0 was also extended south out of South Dakota and into western Nebraska. At the end of the current Drought Monitor period, slow-moving showers were pushing through many of the newly added D0 areas in South Dakota. These rains may improve conditions enough to eliminate portions of the D0 in the next week. D0 was also added into extreme northwest North Dakota this week. As temperatures continue to warm and water demand increases, this area is ripe for moderate drought in the near future.

D0 was also expanded this week in Oklahoma as the northern portions of the state have not received normal precipitation during the peak precipitation period for them. In Texas, improvements were made in the central portion of the state, expanding the drought-free region and overall showing a categorical improvement to the region. In south Texas, a categorical

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improvement was made along the D2/D3 regions, while D3/D4 was improved along Matagorda Bay in response to the recent rains. Improvements were also made in north-central Texas, where D0/D1/D2 regions were shifted to the west. In west Texas, D1 and D2 were improved in response to good rains over the last few weeks. D3 and D4 were expanded near Austin because after some improvements in this region, the area is showing deterioration again.

The West: D0 was improved slightly in north-central Arizona in response to recent rains in the region. D0 was added to several locations in Montana in response to abnormally dry conditions for the current agricultural season. A reassessment of conditions in California going into the dry season led to the expansion of D2 down along the southern coast of the state. In Oregon, D2 was expanded into the southern portion of the state as several indicators were showing this region to be worse than was currently being depicted.

Alaska and Hawaii: No changes in either state this week. Conditions in Hawaii continue to deteriorate and expansion of drought severity may be needed in the near term.

Looking Ahead: During the next 5 days (June 4-8) temperatures are expected to be below normal over most of the United States. High temperatures will be 12 to 15 degrees Fahrenheit below normal over the northern Plains and up to 10 degrees Fahrenheit below normal in the Southwest. Temperatures in Texas are expected to range 3 to 6 degrees Fahrenheit above normal. A widespread and active precipitation pattern is forecasted over much of the United States with maxima precipitation amounts showing up over the Mid-Atlantic, Florida and the Midwest. Precipitation looks promising over northern California and Oregon and into Idaho as well. The Climate Prediction Center 6-10 day forecast (June 9-13) shows temperatures continuing to be below normal over the northern half of the United States, with the coolest temperatures expected over the northern Plains, Great Lakes, and New England. Above-normal temperatures are expected over the Gulf Coast and into Texas. The coolest areas are also expected to be the wettest, with a good chance for above-normal precipitation from New England and the Mid-Atlantic, through the Midwest and Great Plains and into the Rocky Mountains. The best chances for drier-than-normal conditions are over south Texas and Alaska during this time frame.

Author: Brian Fuchs, 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: 4 June 2009