



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

Weekly Report - Snowpack / Drought Monitor Update Date: 10 September 2009

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: SNOTEL and ACIS-day station average weekly temperature anomalies were generally within 5 degrees of normal with a few exceptions scattered across the Intermountain West (Fig.1). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over the eastern Montana (>+10F) and the greatest negative departures occurred over north coastal California, southern Oregon and central Washington (<-4F) (Fig. 1a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 9 September shows a mostly dry West with the exception of very wet conditions over the Pacific Northwest and lesser rainfall totals over the Southwest (Fig 2 and 2a). Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows surplus values over southern Idaho into Wyoming and eastern Nevada with deficits over the northernmost Tier States, southwest New Mexico, and northwest Oregon. There has been no significant change during the past two weeks as expected as we near the end of the Water-Year (Fig. 2b).

WESTERN DROUGHT STATUS

The West: Widespread heavy rainfall (1 to locally 5 inches) covered western Washington and northwestern Oregon last week while moderate amounts (0.5 to 2.0 inches) fell on west-central Oregon, central Washington, and scattered locations across Arizona, New Mexico, and adjacent portions of neighboring states. Elsewhere, scattered light precipitation was observed across the Rockies and northern Intermountain West while little or none fell elsewhere. This precipitation pattern prompted the elimination of D2 conditions from westernmost Washington, and improvement from D1 to D0 in northwestern Oregon. In contrast, subnormal monsoonal precipitation so far this summer led to D1 expansion in parts of northern and eastern Arizona and adjacent New Mexico despite scattered rainfall this past week, and D0 conditions were extended into the northwestern quarter of Colorado in response to growing precipitation deficits during the past few months. Author: Rich Tinker, Climate Prediction Center, NOAA.

A comprehensive narrative describing drought conditions for the nation can be found at the end of this document.

DROUGHT IMPACTS DEFINITIONS (<http://drought.unl.edu/dm/classify.htm>)

The possible impacts associated with **D4 (H, A)** drought include widespread crop/pasture losses and shortages of water in reservoirs, streams, and wells creating water emergencies. The possible impacts associated with **D3 (H, A)** drought include major crop/pasture losses and widespread water shortages or restrictions. Possible impacts from **D2 (H, A)** drought are focused on water shortages common and water restrictions imposed and crop or pasture losses likely. The possible impacts associated with **D1 (H, A)** drought are focused

Weekly Snowpack and Drought Monitor Update Report

on water shortages developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 3, 3a, and 3b).

SOIL MOISTURE

Soil moisture (Figs. 4a and 4b), 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). Another good resource can be found at:

<http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>.

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. 5).

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 (Figure 6)

http://www.star.nesdis.noaa.gov/smcd/emb/vci/VH/vh_currentImage.php

Image Interpretation

The images are color-coded maps of vegetation condition (health) estimated by the Vegetation and Temperature Condition Index (VT). The VT is a numerical index, which changes from 0 to 100 characterizing change in vegetation conditions from extremely poor (0) to excellent (100). Fair conditions are coded by green color (50), which changes to brown and red when conditions deteriorate and to blue when they improve. The VT reflects indirectly a combination of chlorophyll and moisture content in the vegetation and also changes in thermal conditions at the surface. This new approach combines the visible, near infrared and thermal radiances in a numerical index characterizing vegetation health. This approach is extremely useful in detecting and monitoring such complex and difficult-to-identify phenomenon as drought. The VT values below 35 are used for identifying vegetation stress which is an indirect drought indicator. The VT is very useful for early drought detection, assessing drought area coverage, duration, and intensity, and for monitoring drought impacts on vegetation and agricultural crops.

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.

Weekly Snowpack and Drought Monitor Update Report

PASTURE AND RANGELAND CONDITIONS (Figure 8)

This product is produced and compiled by the NOAA's Climate Prediction Center:
<http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/pasture-range-statewide-conditions.pdf>.

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/> and <http://drought.gov>.

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

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

Sep 10, 2009

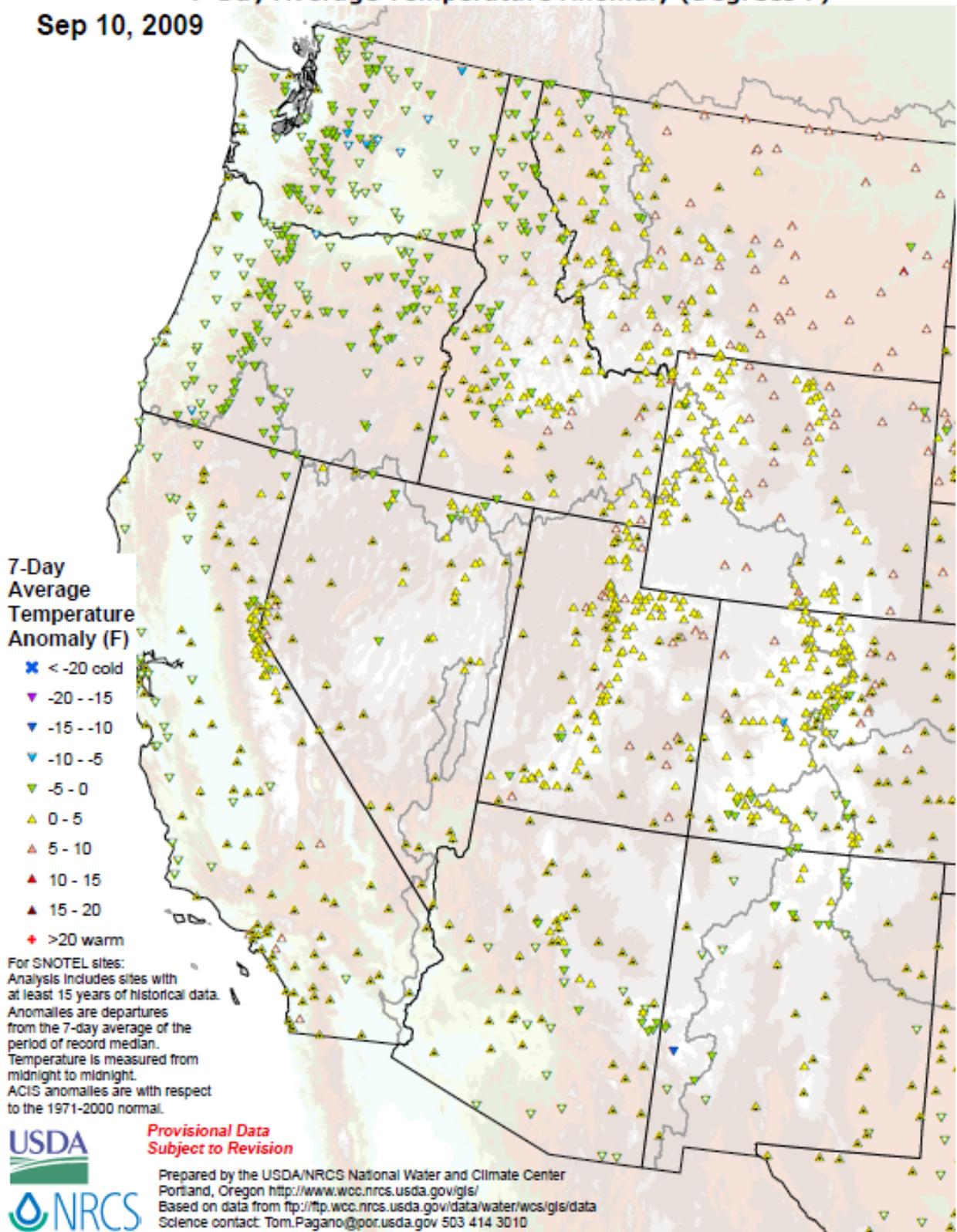
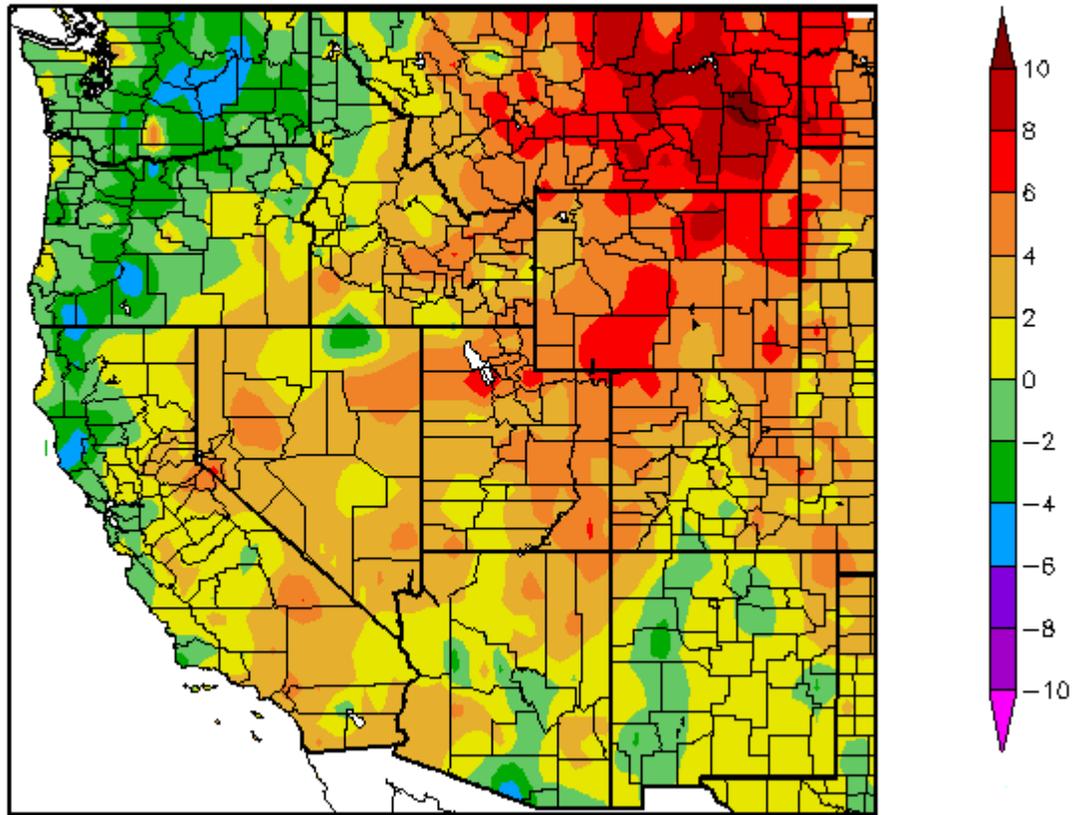


Fig. 1. SNOTEL and ACIS-day station average weekly temperature anomalies were generally within 5 degrees of normal with a few exceptions scattered across the Northern High Plains.

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

Departure from Normal Temperature (F)
9/3/2009 – 9/9/2009



Generated 9/10/2009 at HPRCC using provisional data.

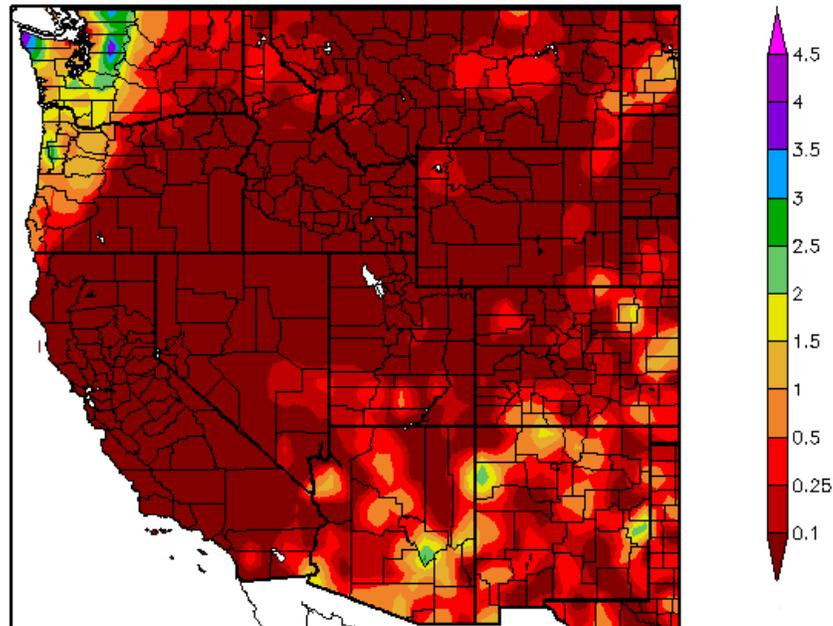
NOAA Regional Climate Centers

Fig. 1a. ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over the eastern Montana (>+10F) and the greatest negative departures occurred over north coastal California, southern Oregon and central Washington (<-4F).

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

Weekly Snowpack and Drought Monitor Update Report

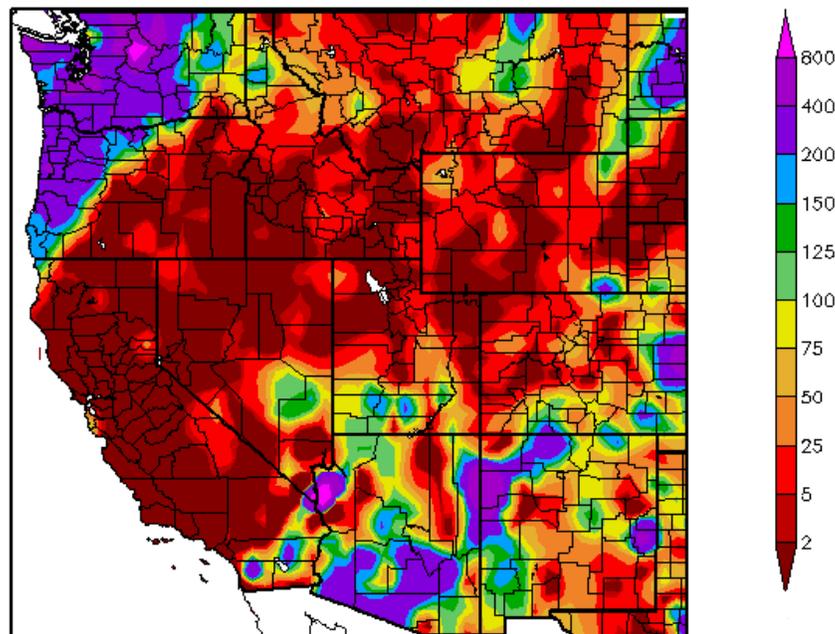
Precipitation (in)
9/3/2009 - 9/9/2009



Generated 9/10/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
9/3/2009 - 9/9/2009



Generated 9/10/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2. and 2a. ACIS 7-day average precipitation amounts for the period ending 9 September shows a mostly dry West with the exception of very wet conditions over the Pacific Northwest and lesser rainfall totals over the Southwest. Ref: <http://www.hprcc.unl.edu/maps/current/>.

Weekly Snowpack and Drought Monitor Update Report

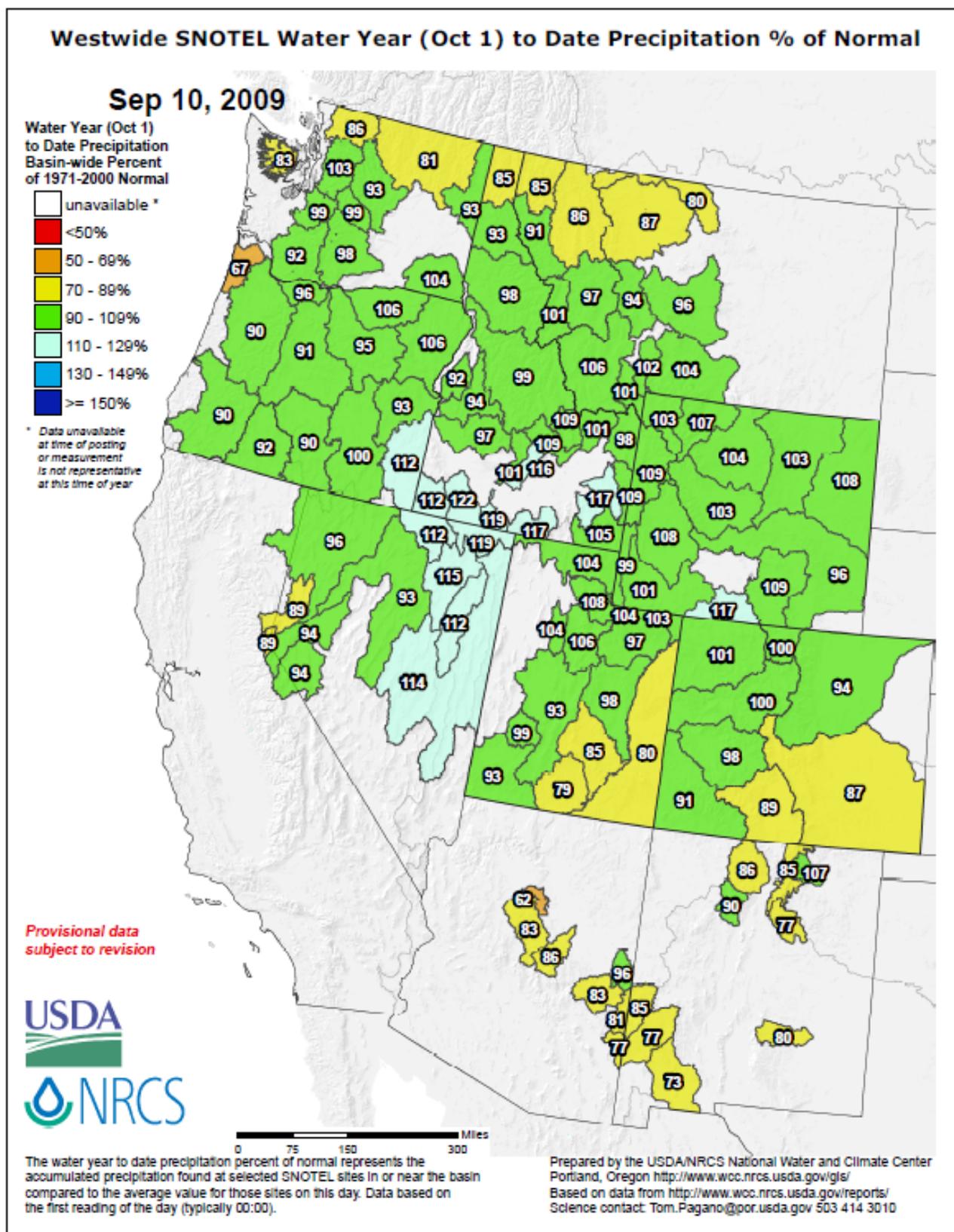
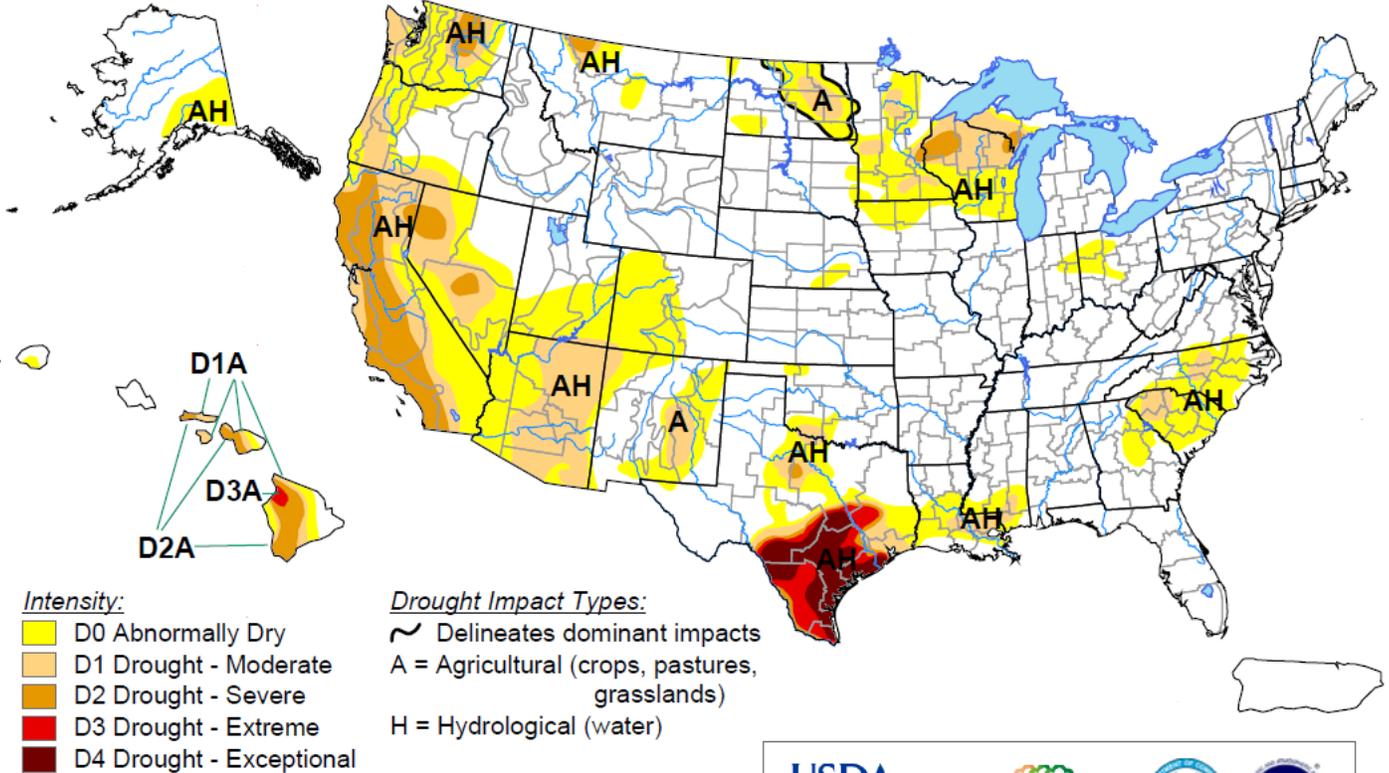


Fig 2b. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows surplus values over southern Idaho into Wyoming and eastern Nevada with deficits over the northernmost Tier States, southwest New Mexico, and northwest Oregon. There has been no significant change during the past two weeks as expected as we near the end of the Water-Year.

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

U.S. Drought Monitor

September 8, 2009
Valid 8 a.m. EDT



Intensity:

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

Drought Impact Types:

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

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



Released Thursday, September 10, 2009
Author: Rich Tinker, CPC/NCEP/NWS/NOAA

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

Fig. 3. Current Drought Monitor weekly summary.

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

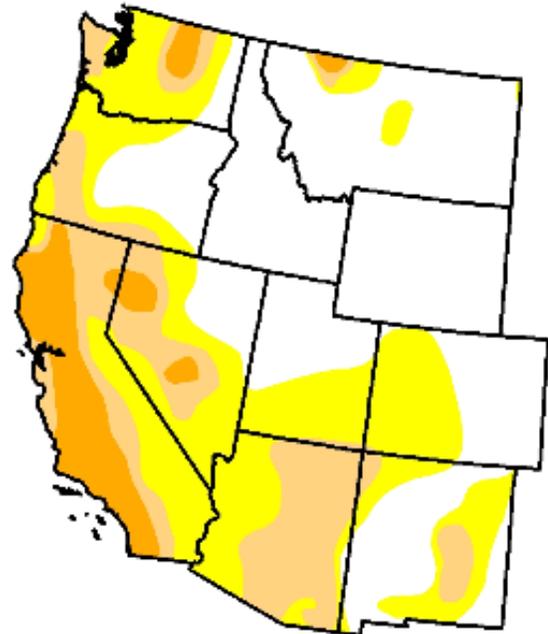
U.S. Drought Monitor

West

September 8, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	47.6	52.4	23.9	7.6	0.0	0.0
Last Week (09/01/2009 map)	49.7	50.3	22.8	8.0	0.0	0.0
3 Months Ago (06/16/2009 map)	48.3	51.7	20.8	8.0	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 (09/09/2008 map)	34.3	65.7	30.1	10.2	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

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



Released Thursday, September 10, 2009
Author: R. Tinker, CPC/NOAA

Fig. 3a. Drought Monitor for the Western States with statistics over various time periods. Regionally, there was some improvement in the D2-D4 categories during the past week.
Ref: http://www.drought.unl.edu/dm/DM_west.htm.

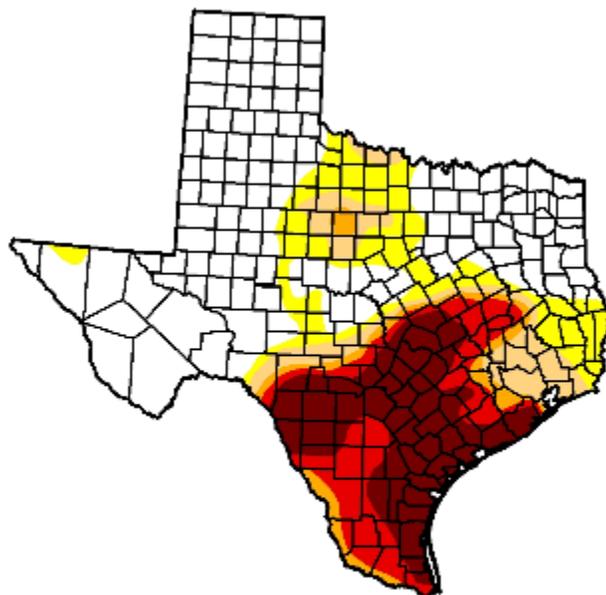
U.S. Drought Monitor

Texas

September 8, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	51.5	48.5	35.8	28.5	24.9	16.1
Last Week (09/01/2009 map)	48.3	51.7	35.3	28.8	26.5	17.3
3 Months Ago (06/16/2009 map)	27.0	73.0	45.5	27.8	16.5	7.6
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 (09/09/2008 map)	52.9	47.1	25.1	10.0	3.0	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, September 10, 2009

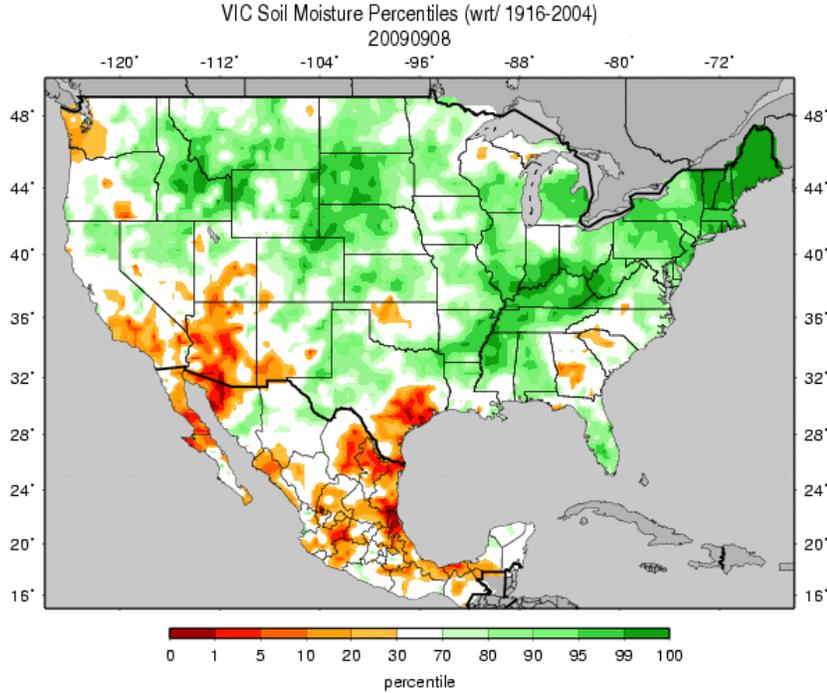
Author: R. Tinker, CPC/NOAA

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

Fig. 3b: Texas is the only state with D4 drought condition in the US. Note that there was a very slight overall improvement since last week.

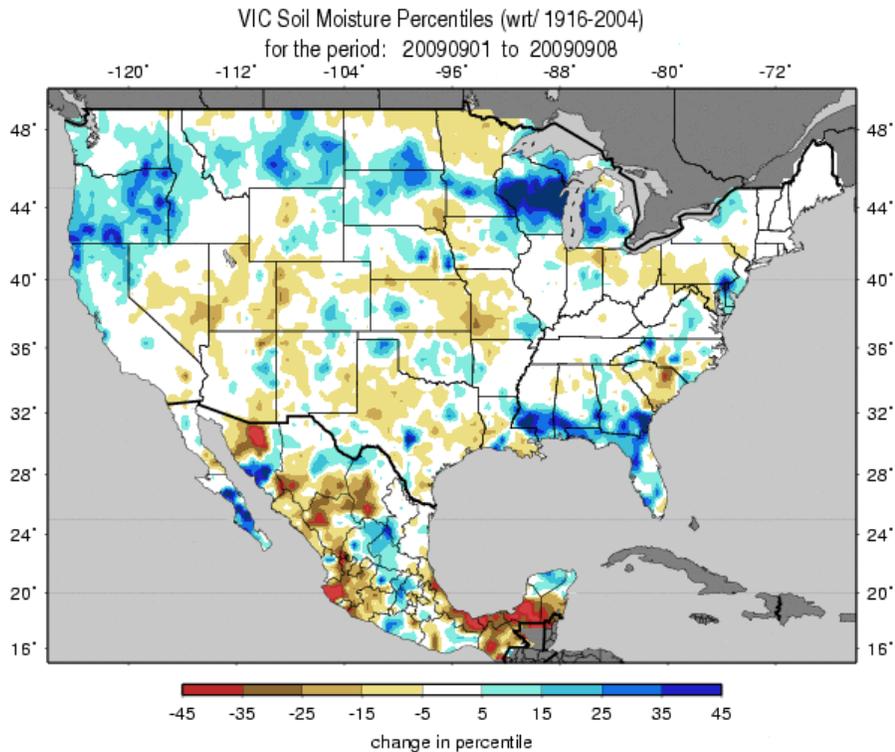
Ref: http://www.drought.unl.edu/dm/DM_state.htm?TX,S

Weekly Snowpack and Drought Monitor Update Report



Figs. 4a: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 8 September. Near saturation exists over much of the eastern half of the nation and Northern Rockies, while excessive dryness is scattered across the parts of Texas and the Southwest.

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



Figs. 4b: Soil Moisture change in percentile based on 1916-2004 climatology for this past week. Excessive drying is found over South Carolina. Excessive moistening is found over much of the Northern Tier States and eastern Gulf Coast.

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

Weekly Snowpack and Drought Monitor Update Report

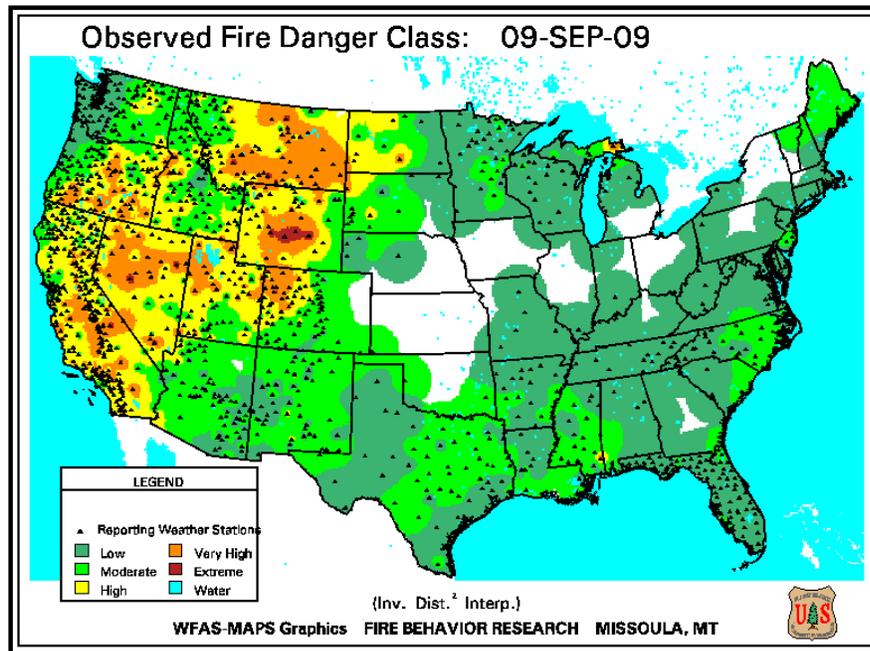


Fig. 5a. Observed Fire Danger Class. Conditions over the western regions of the West (excluding Washington and Idaho) are at very high to extreme levels, especially in Wyoming.

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

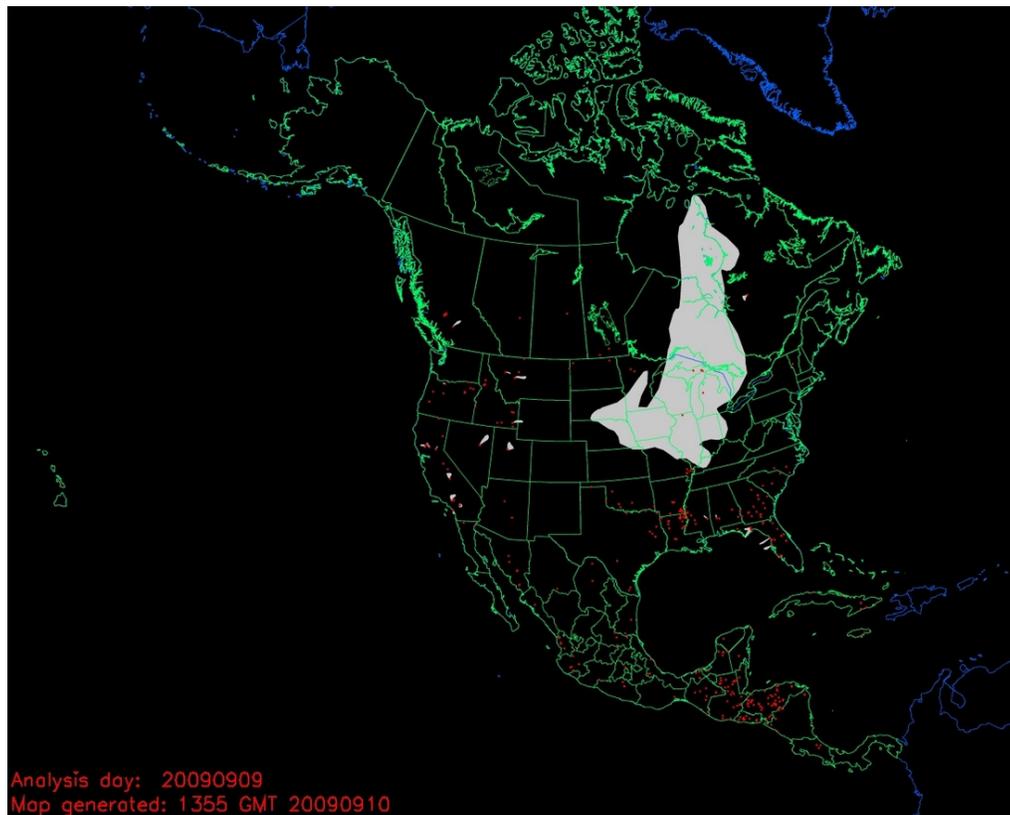


Fig. 5b. Hazard Mapping System Fire and Smoke. Analysis is for 9/09/2009 with fires shown as red dots. Smoke increased significantly over the Upper Mississippi River Valley this week. Smoke, when detected by the analyst, is in gray.

Ref: <http://www.osdpd.noaa.gov/ml/land/hms.html>.

Weekly Snowpack and Drought Monitor Update Report

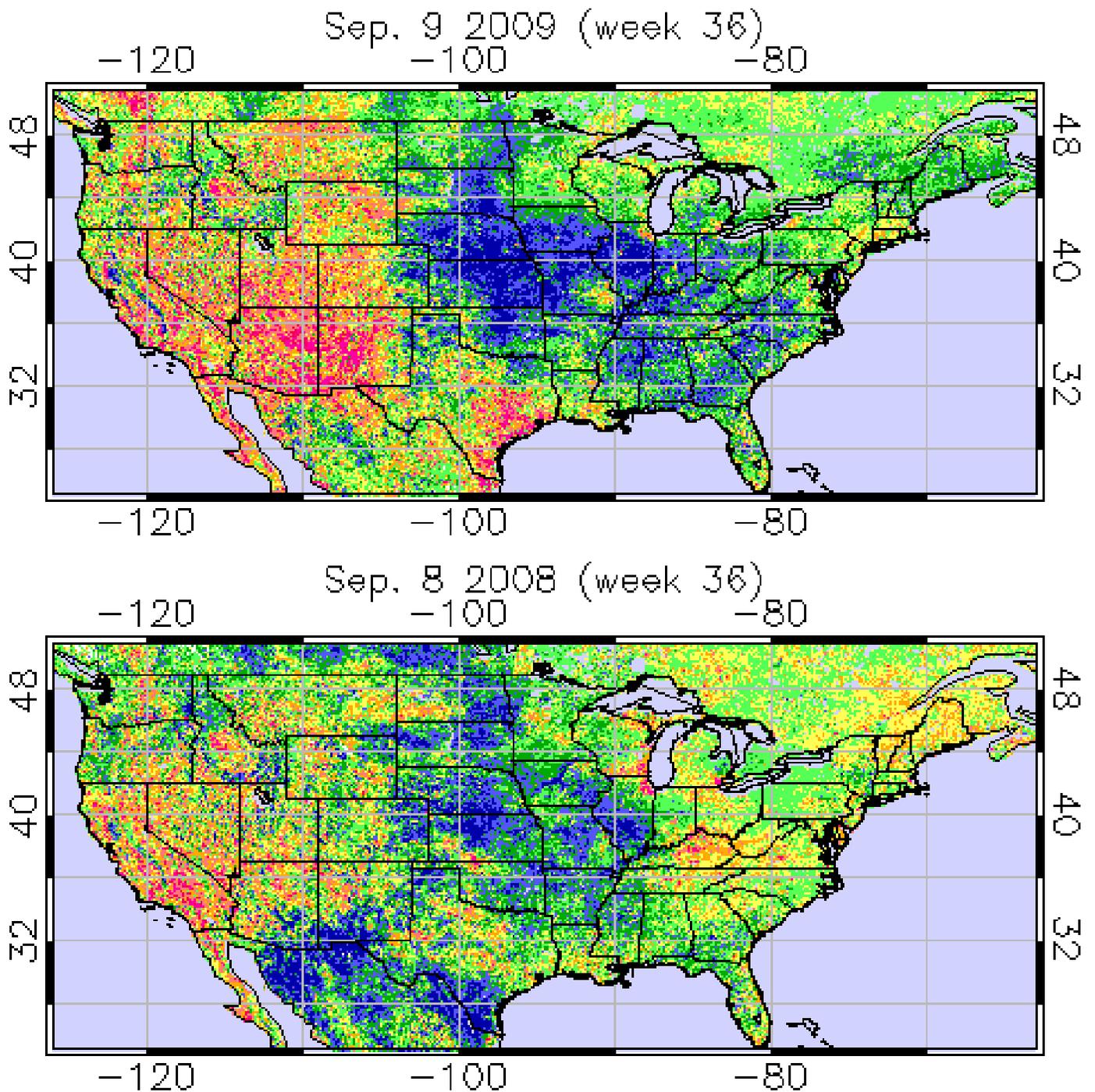


Fig. 6. Vegetation Drought Response Index: Note the comparison to last year. The Central and the Northern Great Plains show very favorable conditions while southern Texas, New Mexico, Arizona, and central Washington shows very stressed conditions past this week. Last year, California, was the most stressed area.

Ref: http://www.star.nesdis.noaa.gov/smcd/emb/vci/VH/vh_currentImage.php

Weekly Snowpack and Drought Monitor Update Report

Wednesday, September 09, 2009

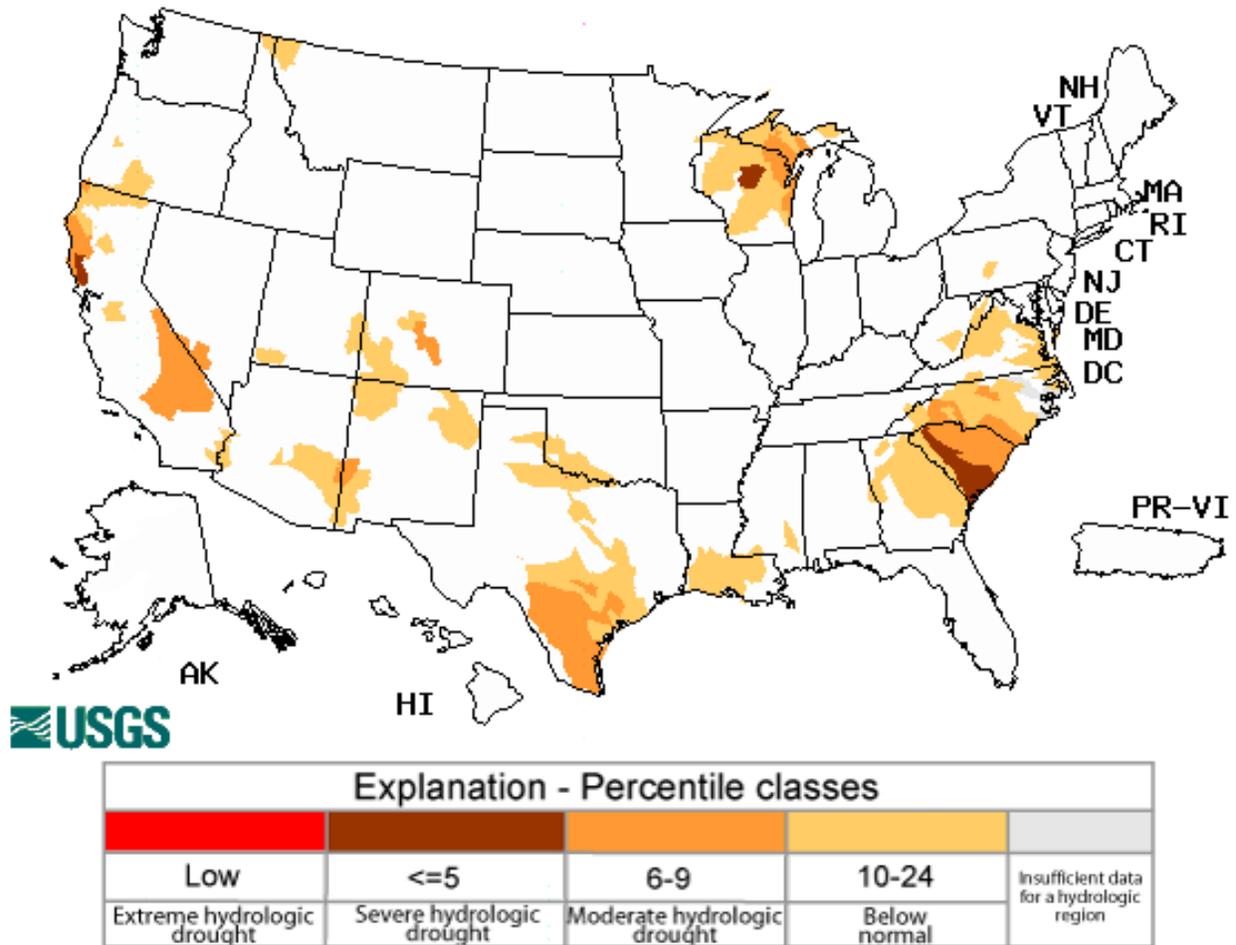


Fig. 7. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Conditions have deteriorated since last week over South Carolina and are severe over central Wisconsin.

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

Weekly Snowpack and Drought Monitor Update Report

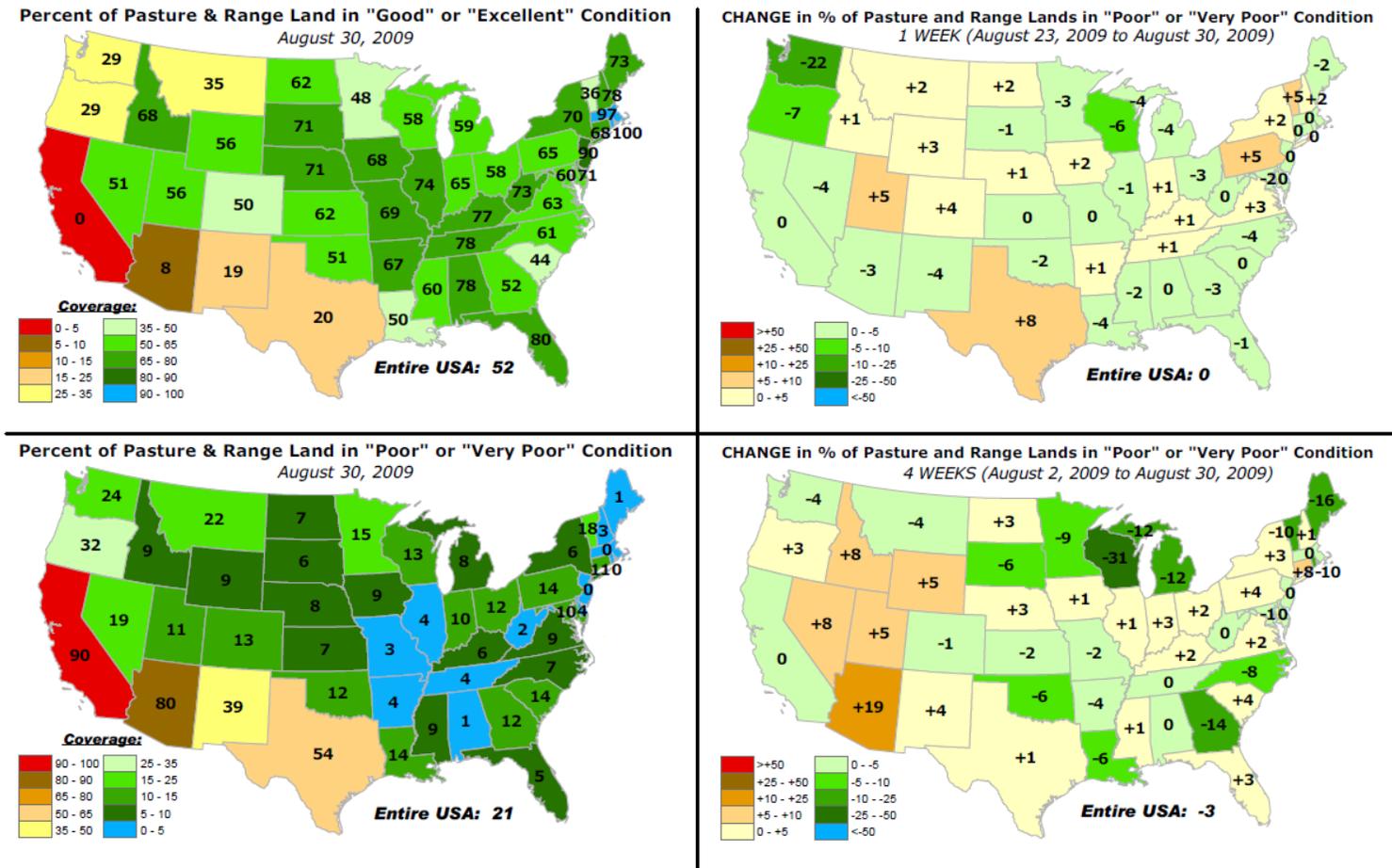


Fig. 8. Current Pasture and Range Land conditions and changes over the last week and last month. Note the sharp improvement over Washington during the past week (upper right panel) and the sharp improvement over Wisconsin during the past 4 weeks (lower right panel). A weak monsoon over Arizona has contributed to the significant worsening conditions during the past 4 weeks as of 30 August.

Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/pasture-range-statewide-conditions.pdf>.

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary – September 8, 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 Atlantic Coast States: A coastal storm brought moderate to heavy rainfall late in the period to the eastern tier of North Carolina, part of north-central North Carolina, and adjacent parts of Virginia. Between 2 and 5 inches were measured at a number of sites, and as a result, D0 conditions were eliminated in these areas. Across the rest of the Carolinas and Georgia, however, little or no precipitation fell, prompting limited expansion of the D1 areas in both Carolinas and the extension of D0 conditions through much of central and southern South Carolina.

The southern Plains and Gulf Coast Region: As is typical of this time of year, scattered moderate and isolated heavy rains were reported across Oklahoma, Texas, Louisiana, and Mississippi last week, with some locations reporting several inches of rain from locally heavy thunderstorm activity while nearby sites recorded little or none. The spotty rainfall led to a few changes in the Drought Monitor this week, though exceptional drought still covers a large part of central and southern Texas. However, D2 to D4 conditions between Houston, TX and San Antonio, TX generally improved by 1 category, and improvement was also noted along the southern Texas border with Mexico. Farther north, D0 conditions across parts of central Texas were eliminated, and D1 conditions improved in areas near Lake Pontchartrain in Louisiana and adjacent Mississippi. In addition, spotty rainfall and a re-assessment of conditions led to the removal of D0 conditions from the Panhandles of Texas and Oklahoma. Unfortunately, a dry week and growing precipitation deficits on time scales ranging from the last couple of months to the last 2 years led to D0 expansion in southwestern Oklahoma and the introduction of D1 conditions in adjacent areas near the Red River. During the last 2 years, much of this region received one foot less precipitation than normal, although shorter-term deficits are much more modest.

The Midwest: It was a dry week for most of the region, bringing an end to several weeks of generally wet weather and improvement to much of the drought-affected regions. This week, improvement was limited to part of north-central North Dakota, where a small area recorded 1 to locally 3 inches of rainfall. Most other areas of dryness and drought were essentially unchanged, but increasing short-term deficits led to the expansion of D0 conditions in southwestern and northeastern North Dakota, parts of eastern South Dakota and adjacent Minnesota, northern Iowa, and the southern half of Wisconsin. These areas received several inches less than normal precipitation for the past couple of months, although precipitation on longer time scales is generally near or above normal. Elsewhere, D1 conditions expanded into parts of northern North Dakota, and moderate drought was introduced in part of the Mississippi River headwaters in north-central Minnesota, where precipitation totals since April 1, 2009 are at least 6 inches below normal.

The Central Plains: A few locations in southeastern Nebraska recorded 0.5 to 2.0 inches of rain last week, but there was little change in the multi-month precipitation deficits affecting the region, and D0 conditions persisted.

The West: Widespread heavy rainfall (1 to locally 5 inches) covered western Washington and northwestern Oregon last week while moderate amounts (0.5 to 2.0 inches) fell on west-

Weekly Snowpack and Drought Monitor Update Report

central Oregon, central Washington, and scattered locations across Arizona, New Mexico, and adjacent portions of neighboring states. Elsewhere, scattered light precipitation was observed across the Rockies and northern Intermountain West while little or none fell elsewhere. This precipitation pattern prompted the elimination of D2 conditions from westernmost Washington, and improvement from D1 to D0 in northwestern Oregon. In contrast, subnormal monsoonal precipitation so far this summer led to D1 expansion in parts of northern and eastern Arizona and adjacent New Mexico despite scattered rainfall this past week, and D0 conditions were extended into the northwestern quarter of Colorado in response to growing precipitation deficits during the past few months.

Hawaii, Alaska and Puerto Rico: Locally heavy rainfall led to the retraction of D0 conditions from part of southern Alaska, but only scattered light to moderate amounts fell elsewhere, leading to unchanged D0 to D3 conditions across the remainder of Alaska and all of Hawaii.

Looking Ahead: For September 9 – 14, 2009, widespread moderate to heavy rainfall (1.5 to 3.5 inches) is forecast for the most severely affected areas of drought in Texas, with moderate to heavy totals anticipated for most other areas of dryness and drought from the southern High Plains eastward through the central Gulf Coast states. Moderate to heavy precipitation is also forecast for the dry areas from the eastern Dakotas eastward across Minnesota and much of Wisconsin, and for Georgia and the western Carolinas. Other parts of the country affected by dryness and drought are expecting only a few tenths of an inch of precipitation, if any. During the ensuing 5 days (September 15 – 19, 2009), the odds favor above-normal precipitation for the dry areas in the Atlantic Coast states, the central Gulf Coast, northwestern Washington, and southeastern Alaska. In contrast, below-normal totals are more likely from the Intermountain West eastward through most of the Plains above southern and easternmost Texas, and across the western Great Lakes region.

Author: Rich Tinker, Climate Prediction Center, NOAA

Dryness Categories

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

Drought Intensity Categories

D1 ... Moderate Drought

D2 ... Severe Drought

D3 ... Extreme Drought

D4 ... Exceptional Drought

Drought or Dryness Types

A ... Agricultural

H ... Hydrological

Updated: September 10, 2009