



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

Weekly Report - Snowpack / Drought Monitor Update Date: 17 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 Uinta and Colorado Rockies (as of the 13th)(Fig.1). By the 16th, the week's average temperatures warmed up a bit. The ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over the eastern Oregon and northeastern Montana (>+10F) and the greatest negative departures occurred over eastern New Mexico (<-2F) (Fig. 1a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 16 September shows a mostly dry West with the exception of some scattered rain over parts of northern California and over New Mexico and Colorado (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 week as expected as we near the end of the Water-Year (Fig. 2b).

WESTERN DROUGHT STATUS

The West: With the exception of light rains (up to a third of an inch) across western Washington, little if any precipitation fell across the Pacific Northwest, California, and Nevada. A reassessment of the dryness in Utah resulted in the decrease in coverage of D0 conditions. Light amounts of rain also fell over portions of Arizona, with localized areas receiving as much as 1.0 to 2.0 inches of rain, especially across the elevated terrain of south-central Arizona. Showers and thunderstorms resulted in moderate to locally heavy rains (0.5 to 2.0 inches) across primarily southwestern and north-central New Mexico.
Author: Anthony Artusa, 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 on water shortages developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 3, 3a, and 3b).

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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.

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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/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/> 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

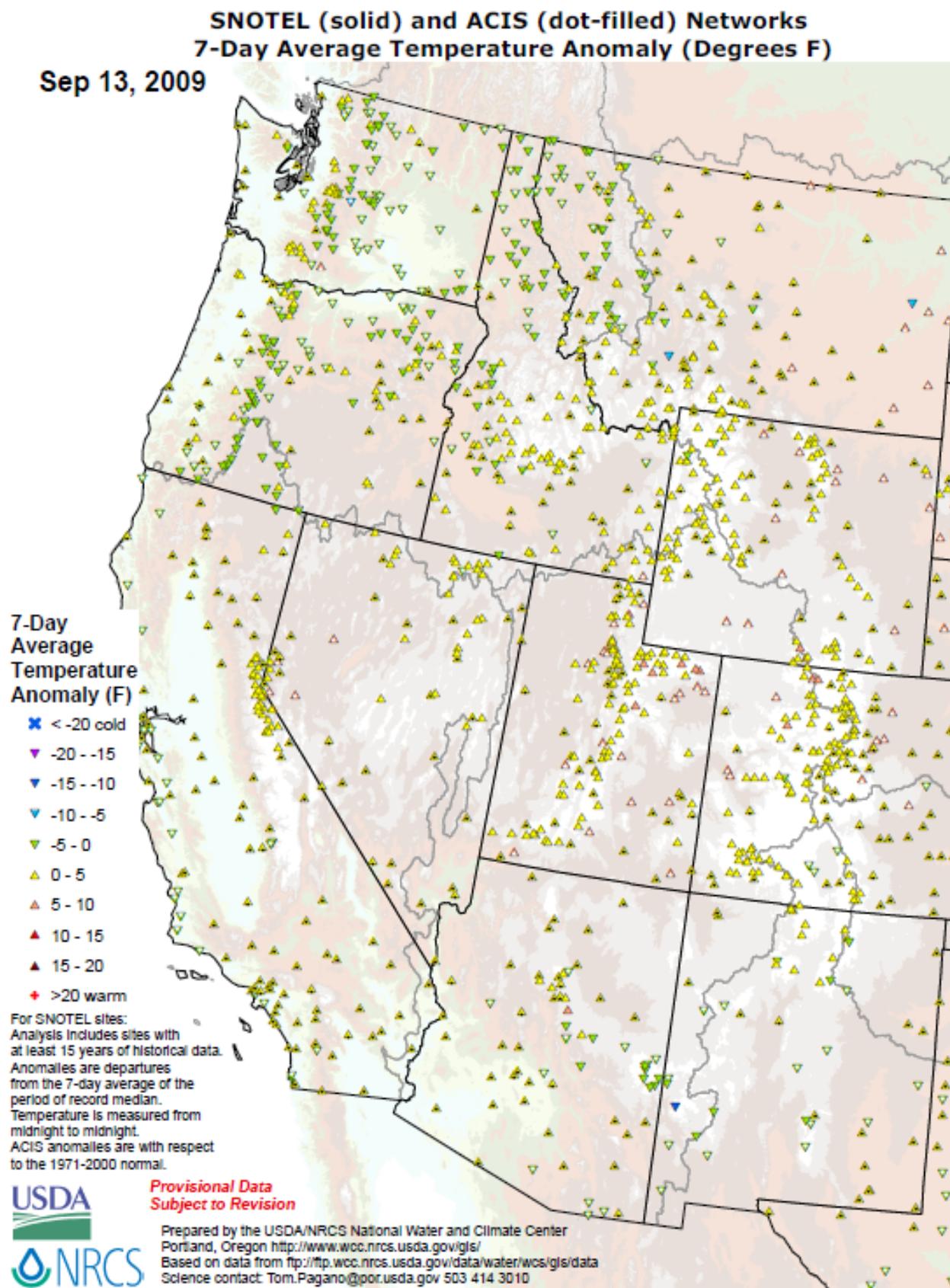
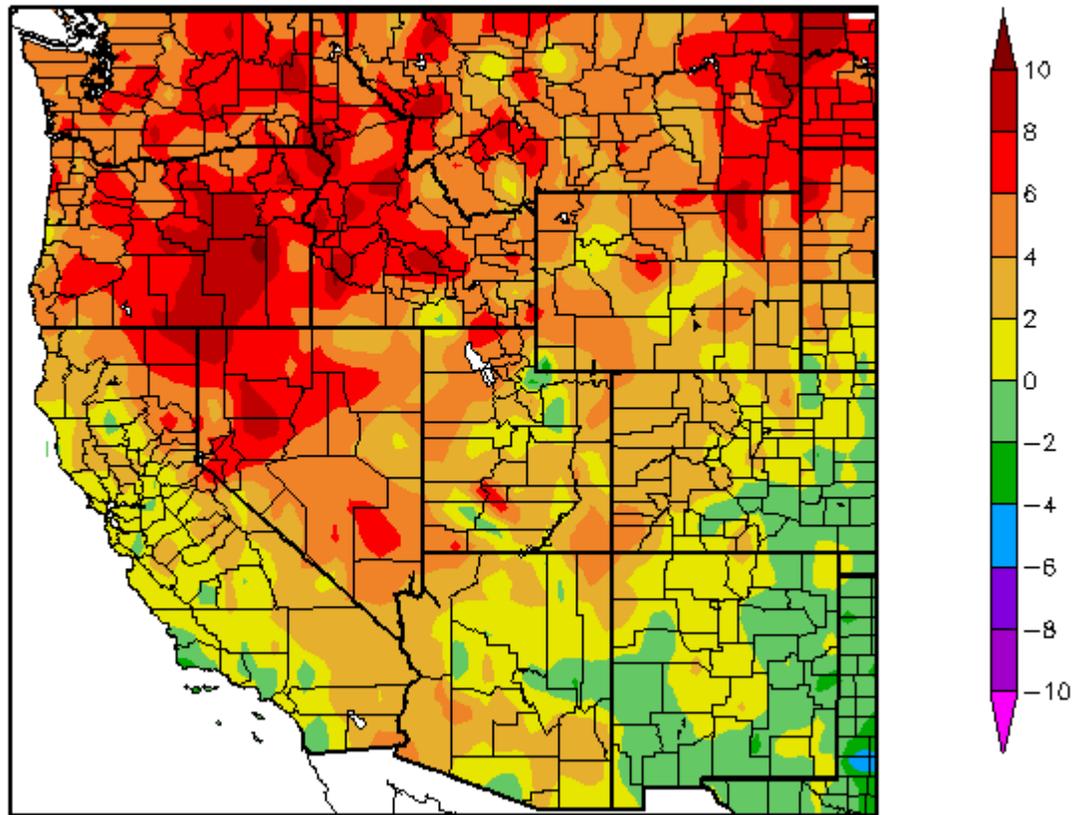


Fig. 1. SNOTEL and ACIS-day station average weekly temperature anomalies were generally within 5 degrees of normal with a few exceptions scattered across the Uinta and Colorado Rockies (as of the 13th). <http://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavg7dAnomalyAcis.pdf>

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Departure from Normal Temperature (F)
9/10/2009 – 9/16/2009



Generated 9/17/2009 at HPRCC using provisional data.

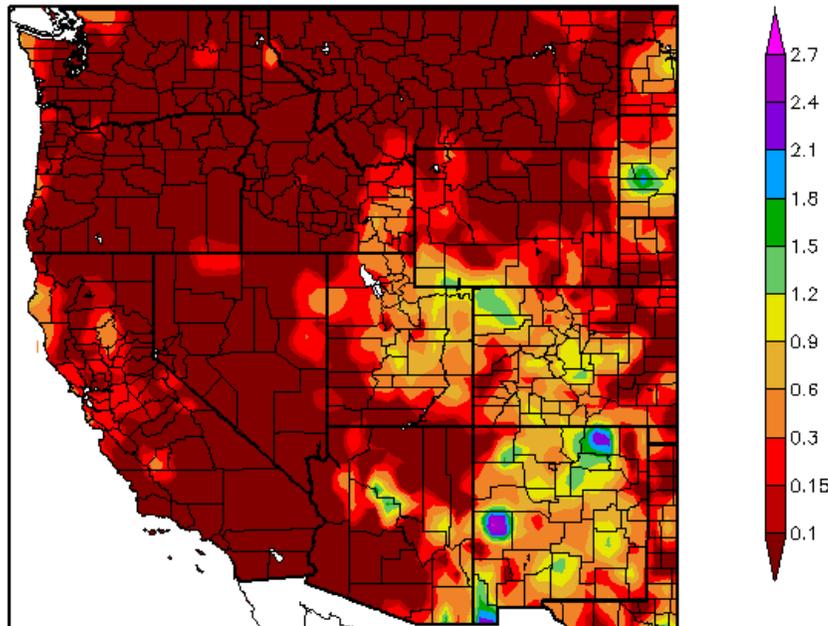
NOAA Regional Climate Centers

Fig. 1a. ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over the eastern Oregon and northeastern Montana (>+10F) and the greatest negative departures occurred over eastern New Mexico (<-2F).

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

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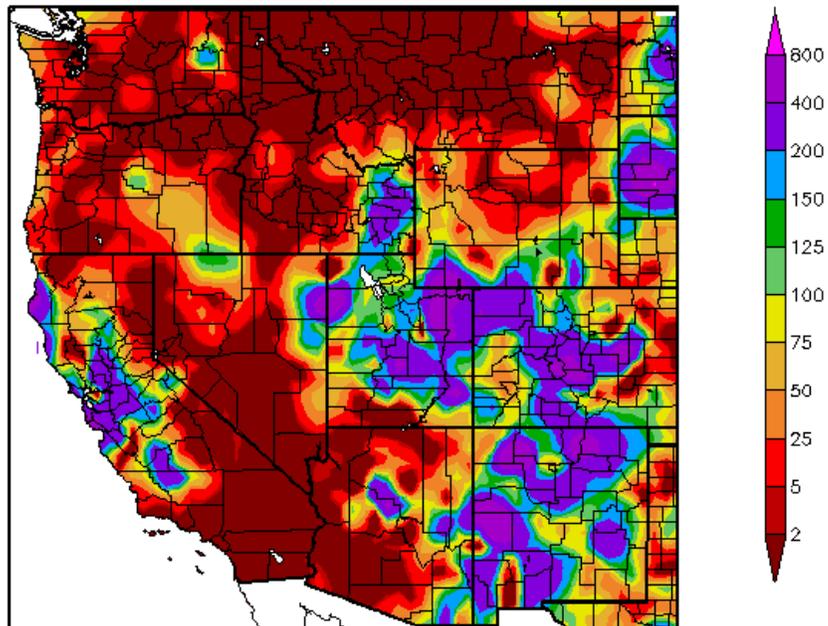
Precipitation (in)
9/10/2009 - 9/16/2009



Generated 9/17/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
9/10/2009 - 9/16/2009



Generated 9/17/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2. and 2a. ACIS 7-day average precipitation amounts for the period ending 16 September shows a mostly dry West with the exception of some scattered rain over parts of northern California and over New Mexico and Colorado. Ref: <http://www.hprcc.unl.edu/maps/current/>.

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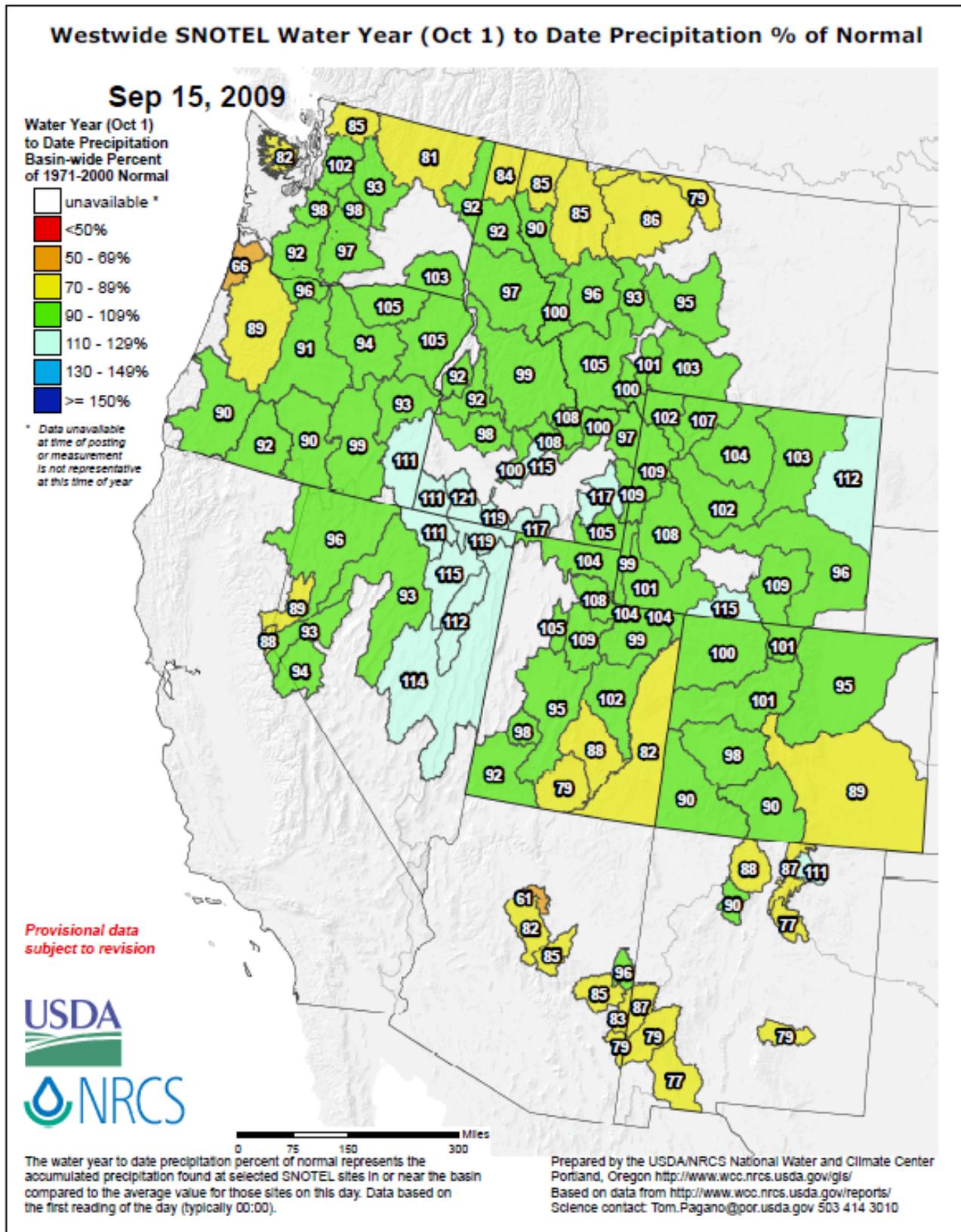
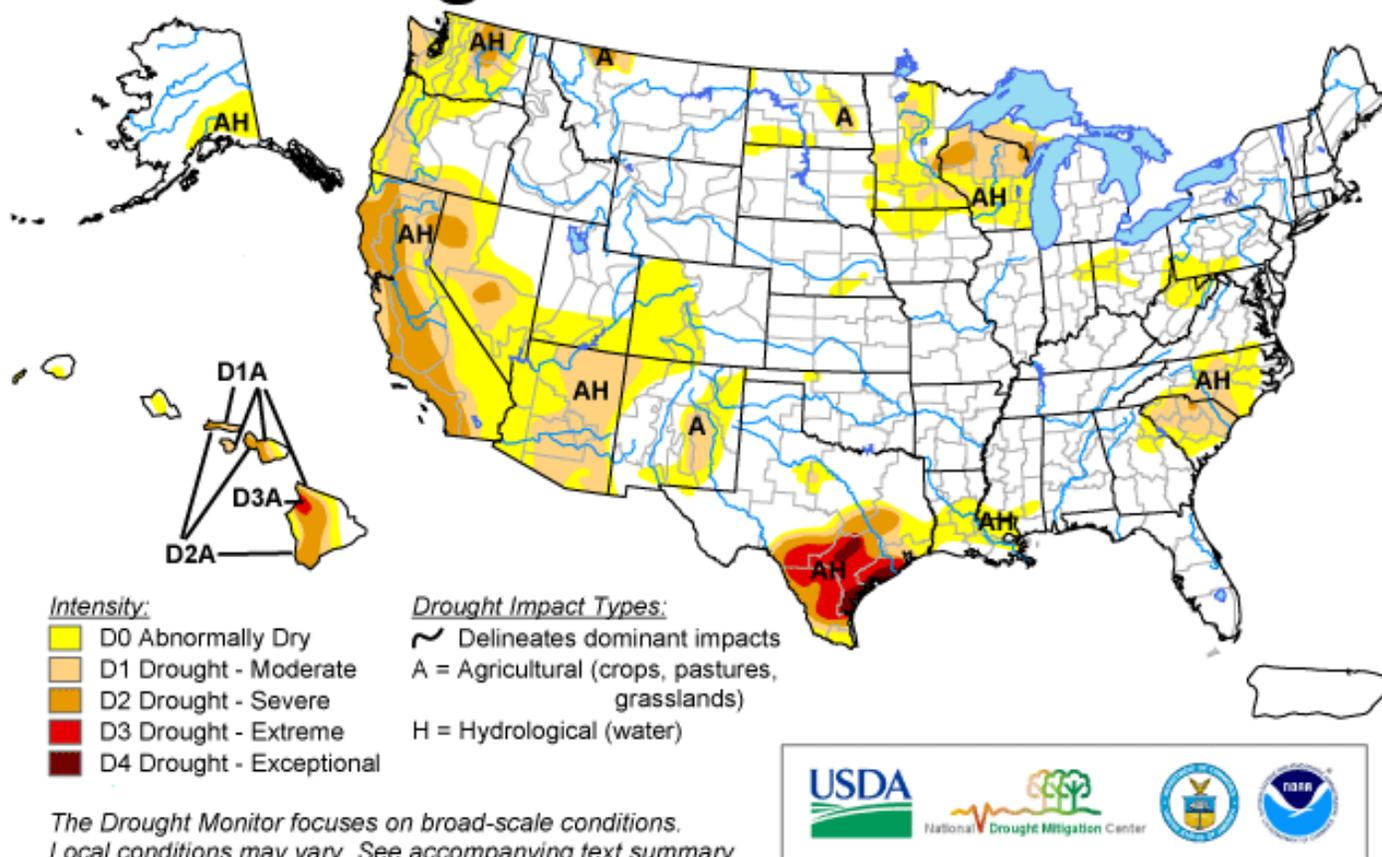


Fig 2b. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows surplus values over southern Idaho into Wyoming and eastern Nevada with deficits over the northernmost Tier States, southwest New Mexico, and northwest Oregon. 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 15, 2009
Valid 8 a.m. EDT



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

Released Thursday, September 17, 2009
Author: Anthony Artusa, CPC/NCEP/NWS/NOAA

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

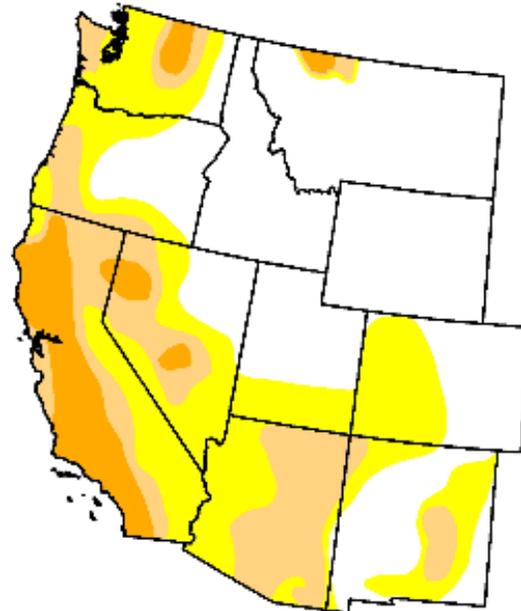
West

September 15, 2009

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	49.4	50.6	23.7	7.7	0.0	0.0
Last Week (09/08/2009 map)	47.6	52.4	23.9	7.6	0.0	0.0
3 Months Ago (06/23/2009 map)	54.7	45.3	18.6	7.4	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 (09/16/2008 map)	34.2	65.8	29.7	10.1	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, September 17, 2009

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

Fig. 3a. Drought Monitor for the Western States with statistics over various time periods. Regionally, there was little change during the past week.

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

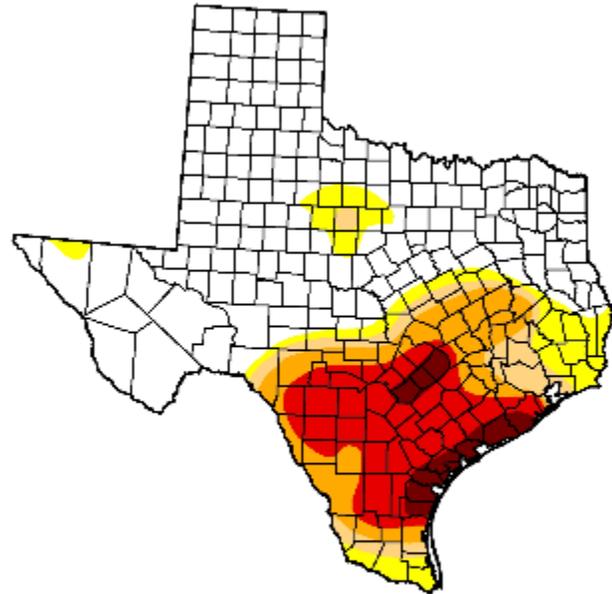
U.S. Drought Monitor

Texas

September 15, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	60.7	39.3	30.6	25.2	15.8	3.4
Last Week (09/08/2009 map)	51.5	48.5	35.8	28.5	24.9	16.1
3 Months Ago (06/23/2009 map)	29.7	70.3	38.9	24.1	15.5	8.2
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 (09/16/2008 map)	69.0	31.0	20.9	8.3	2.4	0.0



Intensity:

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

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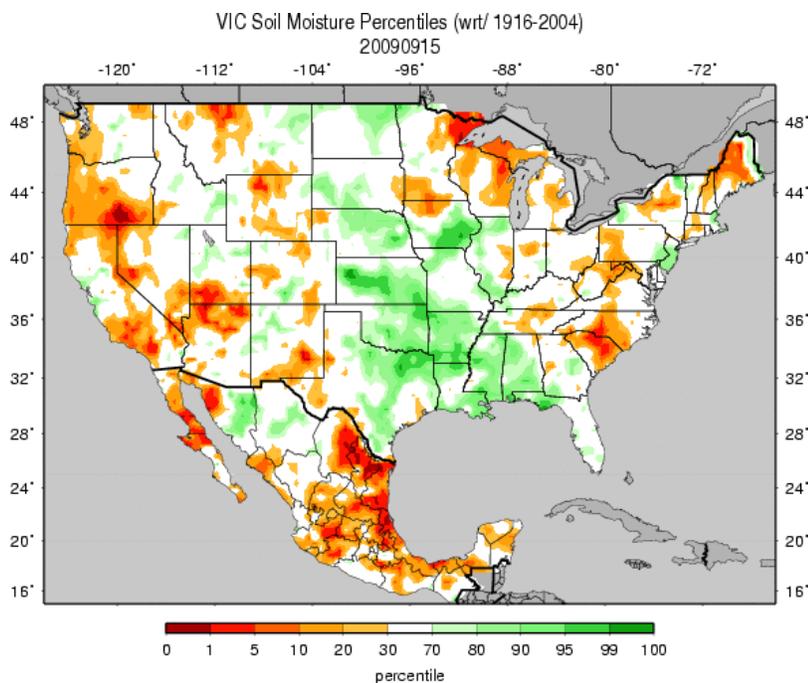
Released Thursday, September 17, 2009
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<http://drought.unl.edu/dm>

Fig. 3b: Texas is the only state with D4 drought condition in the US. Note that there was a **dramatic improvement** in all categories since last week.

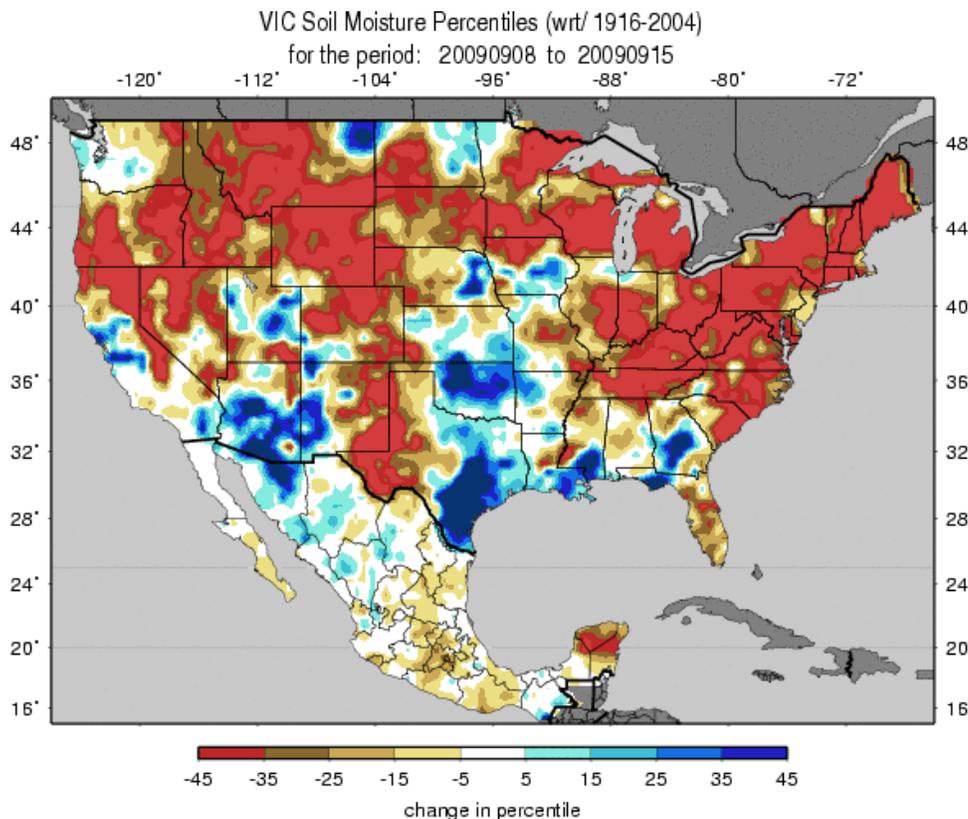
Ref: http://www.drought.unl.edu/dm/DM_state.htm?TX.S

Weekly Snowpack and Drought Monitor Update Report



Figs. 4a: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 15 September. Note the Central Plains are the wettest areas while the driest areas are scattered across much of the remainder of the nation.

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 much of the country. Excessive moistening is found over much of Texas and the Central Plains, the Northern Gulf Coast, and Arizona.

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

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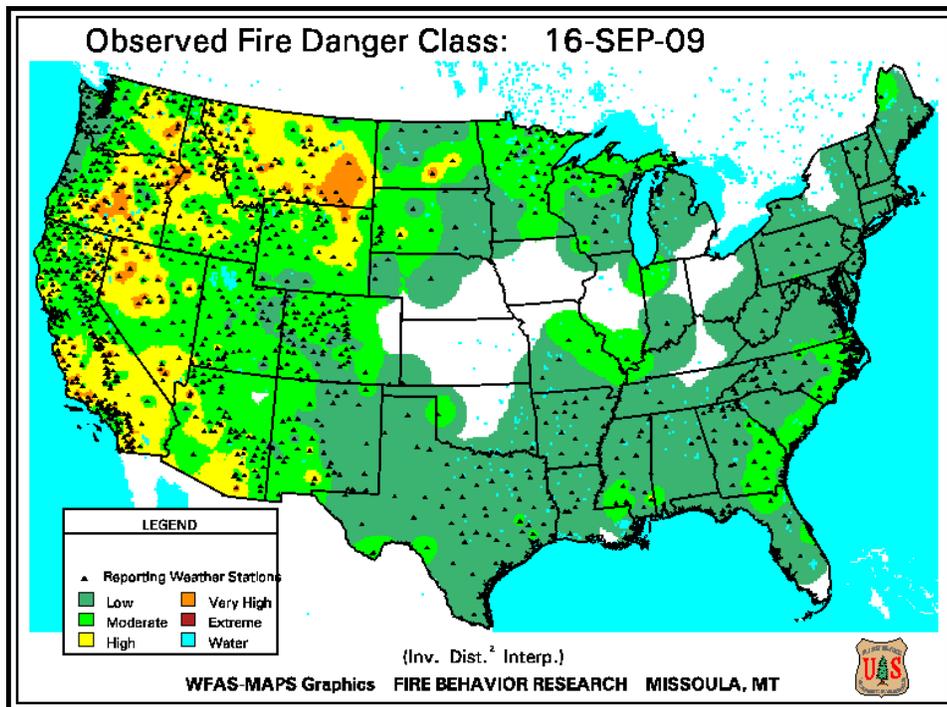


Fig. 5a. Observed Fire Danger Class. Conditions over the western region have improved this week.

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

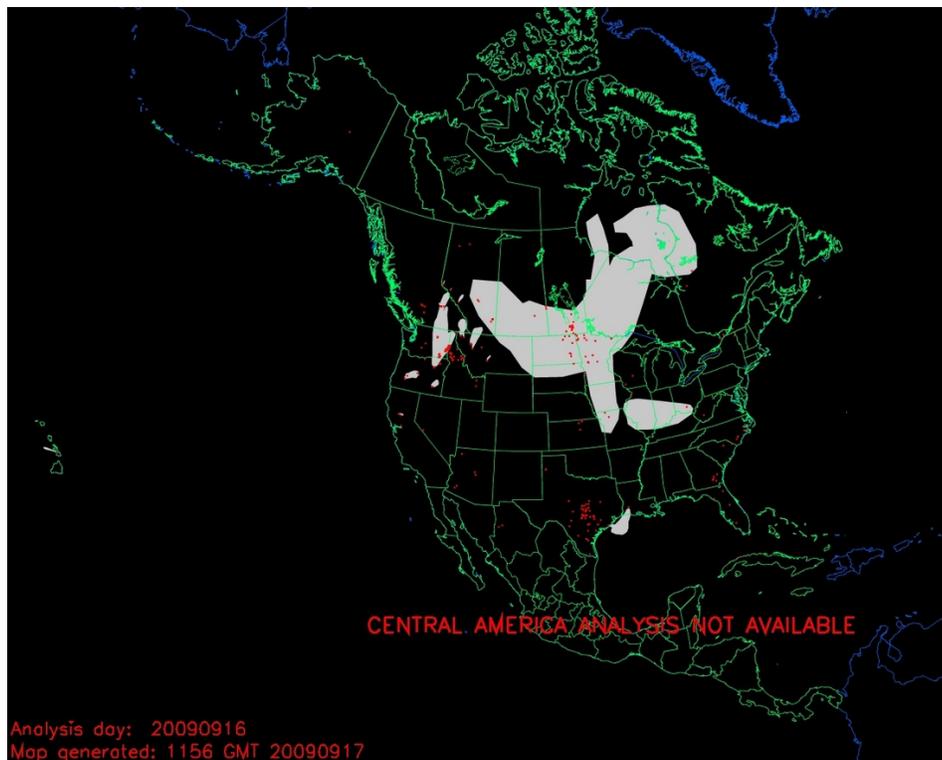


Fig. 5b. Hazard Mapping System Fire and Smoke. Analysis is for 9/16/2009 with fires shown as red dots. Smoke is noted over much of the North-Central Tier States. Smoke, when detected by the analyst, is in gray.

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

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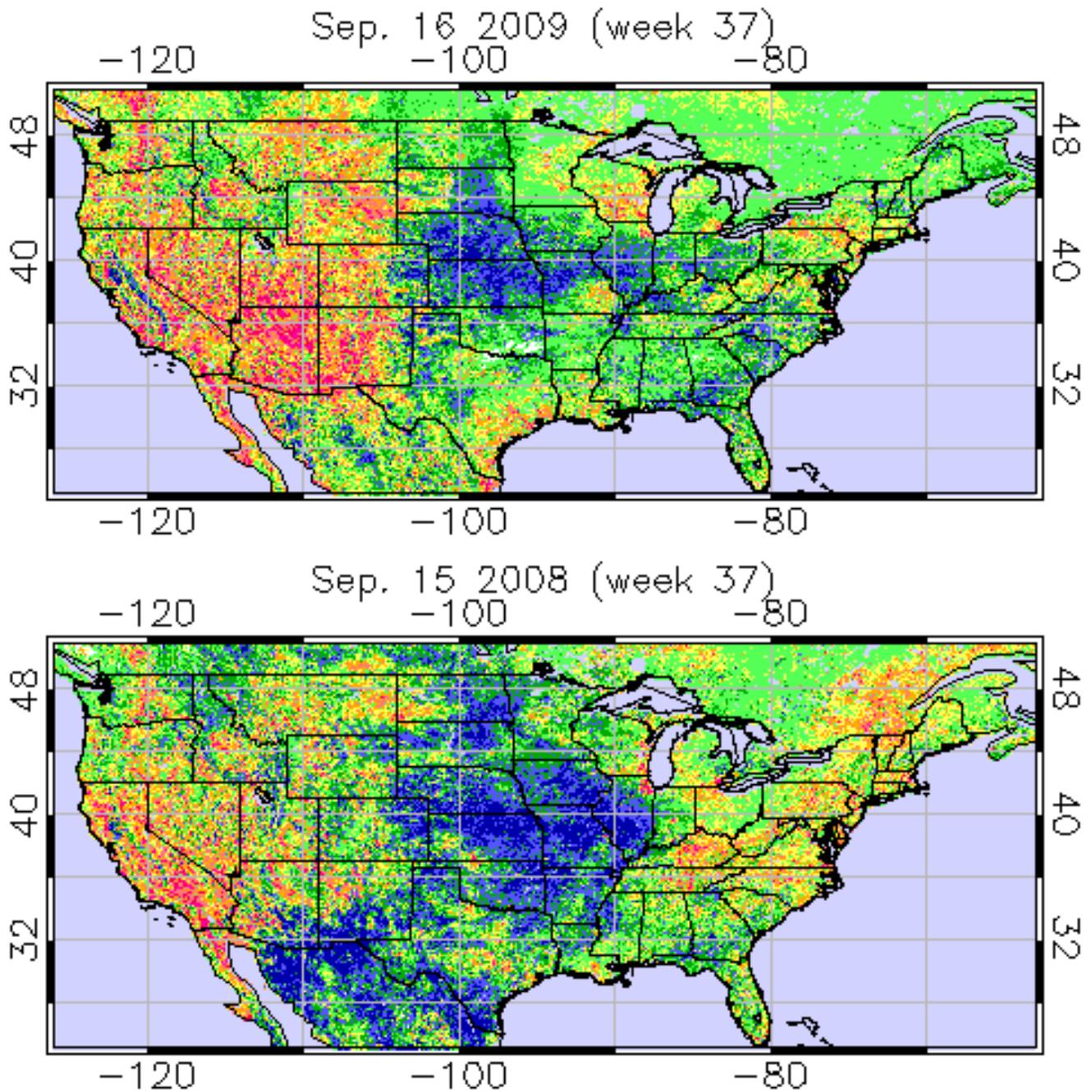
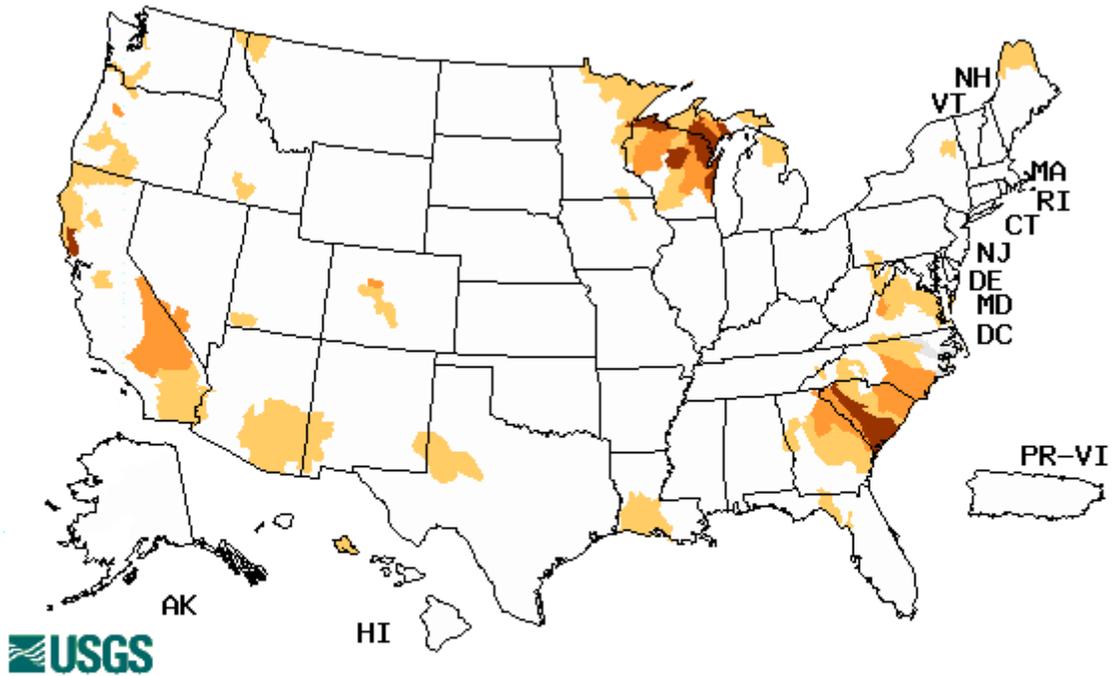


Fig. 6. Vegetation Drought Response Index: Note the comparison to last year. The Central Plains show very favorable conditions while the Southwest shows very stressed condition this week. Last year, California, was the most stressed area.

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

Weekly Snowpack and Drought Monitor Update Report

Wednesday, September 16, 2009



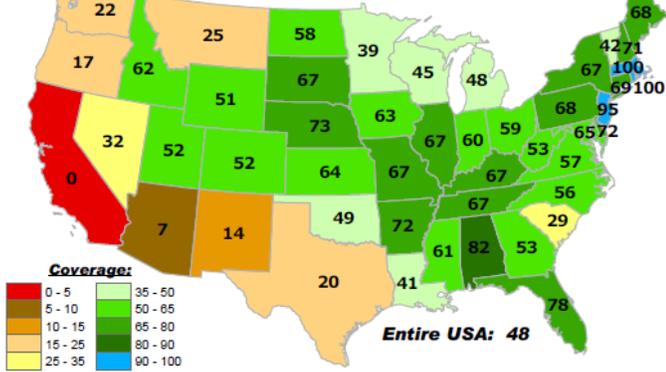
Explanation - Percentile classes				
Low	≤5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

Fig. 7. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Conditions are severe over South Carolina, Wisconsin, and the Upper Michigan Peninsula.

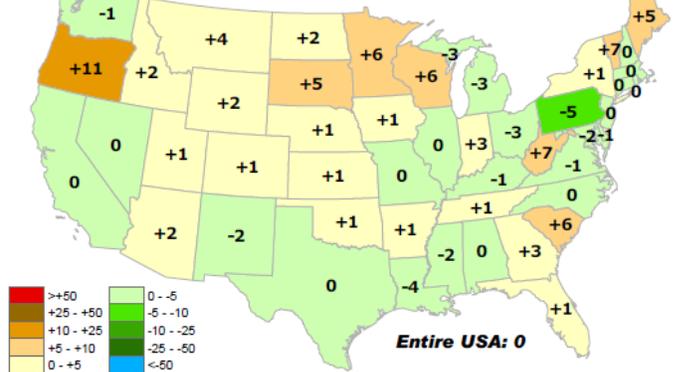
Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>.

Weekly Snowpack and Drought Monitor Update Report

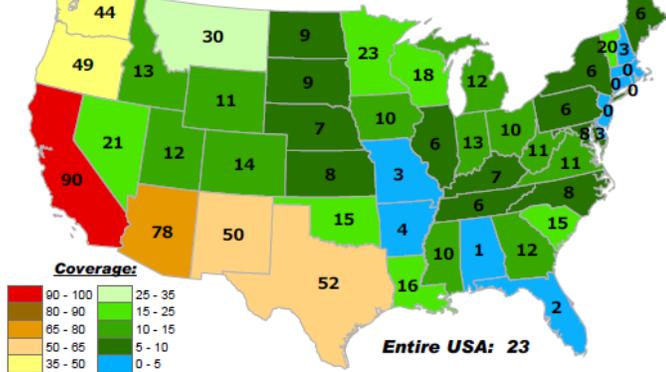
Percent of Pasture & Range Land in "Good" or "Excellent" Condition
September 13, 2009



CHANGE in % of Pasture and Range Lands in "Poor" or "Very Poor" Condition
1 WEEK (September 6, 2009 to September 13, 2009)



Percent of Pasture & Range Land in "Poor" or "Very Poor" Condition
September 13, 2009



CHANGE in % of Pasture and Range Lands in "Poor" or "Very Poor" Condition
4 WEEKS (August 16, 2009 to September 13, 2009)

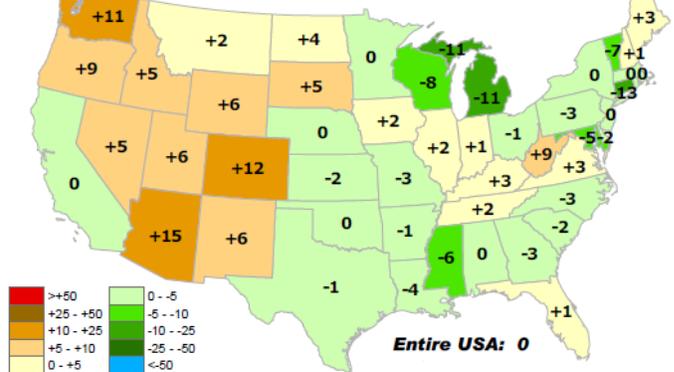


Fig. 8. Current Pasture and Range Land conditions and changes over the last week and last month.

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

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National Drought Summary – September 15, 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 slow moving storm off the mid-Atlantic coast brought moderate (0.5 to 1.5 inch) amounts of rain to central and southern sections of both the Appalachians and the adjacent eastern foothills, and the Tidewater area of southeast Virginia. Little if any rain fell across central portions of North Carolina and eastern South Carolina. Very spotty areas of moderate to heavy rain (1.0 to 2.0 inches) were reported over parts of eastern Georgia. The area of D1 conditions was expanded over central North Carolina, and much of South Carolina. Stream flows for the past few weeks have also been abnormally low for this region. In the central Appalachians, very little rainfall has been reported in the past few weeks, so an area of D0 conditions has been highlighted on the Drought Monitor map.

The Southern Plains and Gulf Coast Region: Widespread, beneficial rains (generally 2.0 to 5.0 inches, locally heavier) fell across much of central Texas, Oklahoma, and southeast Louisiana, thanks to a nearby quasi-stationary frontal system and the availability of copious Gulf moisture. In Oklahoma, the steady, soaking rains over the past few days have resulted in the removal of D0 and D1 areas in southwestern parts of the state, with little to no precipitation reported across the Panhandle region. In north-central, central, and south-central Texas, the recent rains have provided much needed short-term relief for agriculture. These rains were mostly absorbed by dry soils, with a comparatively small fraction of this water being available to recharge rivers and streams. This demonstrates that the longer-term, hydrologic drought is still far from over in this region. Selected rainfall amounts include 4.51 inches at Corpus Christi (September 9-12), 2.51 inches at Austin (September 9-12), 4.66 inches at San Antonio (September 8-12), and 5.60 inches at Brownsville (September 7-11). Localized amounts of 6 to 10 inches or more have been received in southern Dallas County and portions of nearby counties, and these heavy rain totals continue southward along the I-35 corridor to Jarrell, TX (about 40 miles north of Austin). In addition, generally 1.0 to 3.0 inches of rain has fallen across portions of the lower Rio Grande Valley. Therefore, significant, shorter term improvement is indicated for Texas. In southeastern Louisiana and adjacent southern Mississippi, recent rainfall has resulted in the removal of D1 conditions, and decreased coverage of D0 conditions.

The Midwest: Several frontal systems brought moderate to heavy rains (0.5 to 2.5 inches) to central and eastern North Dakota, western portions of Minnesota, and parts of South Dakota. This rain supports limited improvement across much of the area. However, not all areas have received significant precipitation. D0 conditions were expanded across southwestern North Dakota and adjoining parts of South Dakota, and D1 conditions were expanded across southeastern Minnesota and neighboring Wisconsin.

The Central Plains: Localized areas of moderate to heavy rain (1.0 to 2.5 inches) were reported mainly over parts of York County in southeastern Nebraska, though the remaining portions of the area designated D0 have received normal to below normal rainfall.

The West: With the exception of light rains (up to a third of an inch) across western Washington, little if any precipitation fell across the Pacific Northwest, California, and

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Nevada. A reassessment of the dryness in Utah resulted in the decrease in coverage of D0 conditions. Light amounts of rain also fell over portions of Arizona, with localized areas receiving as much as 1.0 to 2.0 inches of rain, especially across the elevated terrain of south-central Arizona. Showers and thunderstorms resulted in moderate to locally heavy rains (0.5 to 2.0 inches) across primarily southwestern and north-central New Mexico.

Hawaii, Alaska and Puerto Rico: In Hawaii, lack of rainfall across Oahu has prompted the introduction of D0 conditions across central portions of the island. With little or no precipitation reported in southeast Alaska, no revisions were made to the existing D0 area.

Looking Ahead: For September 16-21, 2009, little or no rain (up to 0.25 inch) is expected across the drought areas in Texas. A large portion of the interior Southeast US is forecast to receive 1.5 inches or more during this period, which would be very beneficial for the D0-D2 drought areas indicated over much of the Carolinas and southern portions of both Louisiana and Mississippi. The southern portion of the developing dryness (D0) indicated over the central Appalachians is the most likely area to receive significant rainfall (0.25-0.50 inch), while prospects for more northern areas are not as favorable. Rainfall amounts of 0.10 inch or less are expected over the upper Mississippi Valley, the Dakotas, and Nebraska, doing little to alleviate dryness/drought in those areas. Light rain (0.10 - 0.50 inch) is projected for the Pacific Northwest and northern Rockies, with the heavier amounts probable over western Washington. In the Southwest, rainfall amounts generally between 0.50 - 1.50 inches are predicted over New Mexico, helping to reduce drought over portions of the state, while southeast Arizona may get up to 0.10 inch of rain.

For the ensuing 6-10 day period (from September 22-26), fairly wet and cool conditions appear to be in store for the eastern half of the country, with abnormal warmth and dryness across the western third of the nation.

Author: Anthony Artusa, 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 17, 2009