



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

Weekly Report - Snowpack / Drought Monitor Update

Date: 17 June 2010

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: SNOTEL 7-day average temperature departures from normal map reveal cooler temperatures over all but the Northern Cascades and Northern and Southern Rockies (Fig. 1). ACIS 7-day average temperature anomalies show that the greatest positive temperature departure was over eastern New Mexico ($>+6^{\circ}\text{F}$) and the greatest negative departure occurred over central Wyoming ($<-8\text{F}$) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 16 June shows the bulk of the heaviest precipitation falling over the Central Western High Plains and parts of western Montana (Fig. 2). In terms of percent of normal, much of the Cascades, northern coastal California, the Northern and Central Rockies, and most of Utah had four to eight times the normal precipitation this week. Little if any precipitation fell over parts of Arizona, New Mexico, the Great Basin, and most of California (Fig. 2b).

WESTERN DROUGHT STATUS

The West: An assessment of conditions in northeastern California, southern Oregon and northwestern Nevada led to an improvement in the depiction of drought. The area of D2 Severe Drought was reduced to Klamath County and the surrounding area. Drought impacts continue to be reported in the Klamath River basin. The extent of moderate drought is now smaller in northern Nevada. The spring season was wet and cool, with some late-season snow in May. This all contributed to a delay in the peak runoff in the mountain streams, and reservoir storage is overall currently in good condition leading into the summer dry season. In California, rangeland conditions are reported as being in good to excellent condition statewide.

Conditions in Colorado improved somewhat in the northwestern part of the state, and in northeastern Utah. The Yampa River region has improved to non-drought conditions this spring. Additionally, observers in this region have measured near normal rainfall for the water year so far (since October). In the past several days, over an inch of rain has fallen at John Jarvie Ranch, UT and at a remote weather station nearby, warranting a one-category change to D0 in far northeastern Utah and northwestern Colorado.

New Mexico's drought is worsening with continued lack of precipitation over the last six weeks, and extremely high temperatures are increasing demand for water. The first two weeks of June have been the third warmest on record at Albuquerque, since 1892. Average temperatures are more than five degrees above normal across most of the state. The bulk of last week's abnormally dry region was downgraded to moderate drought, or D1. D0 was extended to cover most of northern and central New Mexico. The state is drying out quickly this spring, and pasture and rangeland conditions are deteriorating. For the month of May, some areas in this expanded drought region received less than 10 percent of normal precipitation. Just a few scattered locales received 60-80 percent of normal for the month. Author: Laura Edwards, Western Regional Climate Center,

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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).

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/>.

U.S. HISTORICAL STREAMFLOW

http://water.usgs.gov/cgi-bin/waterwatch?state=us&map_type=dryw&web_type=map.

This map, (Fig. 5) 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.

Figure 6 contains top soil moisture percentiles and weekly changes:

<http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/topsoil-statewide-statistics.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/cqibin/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>

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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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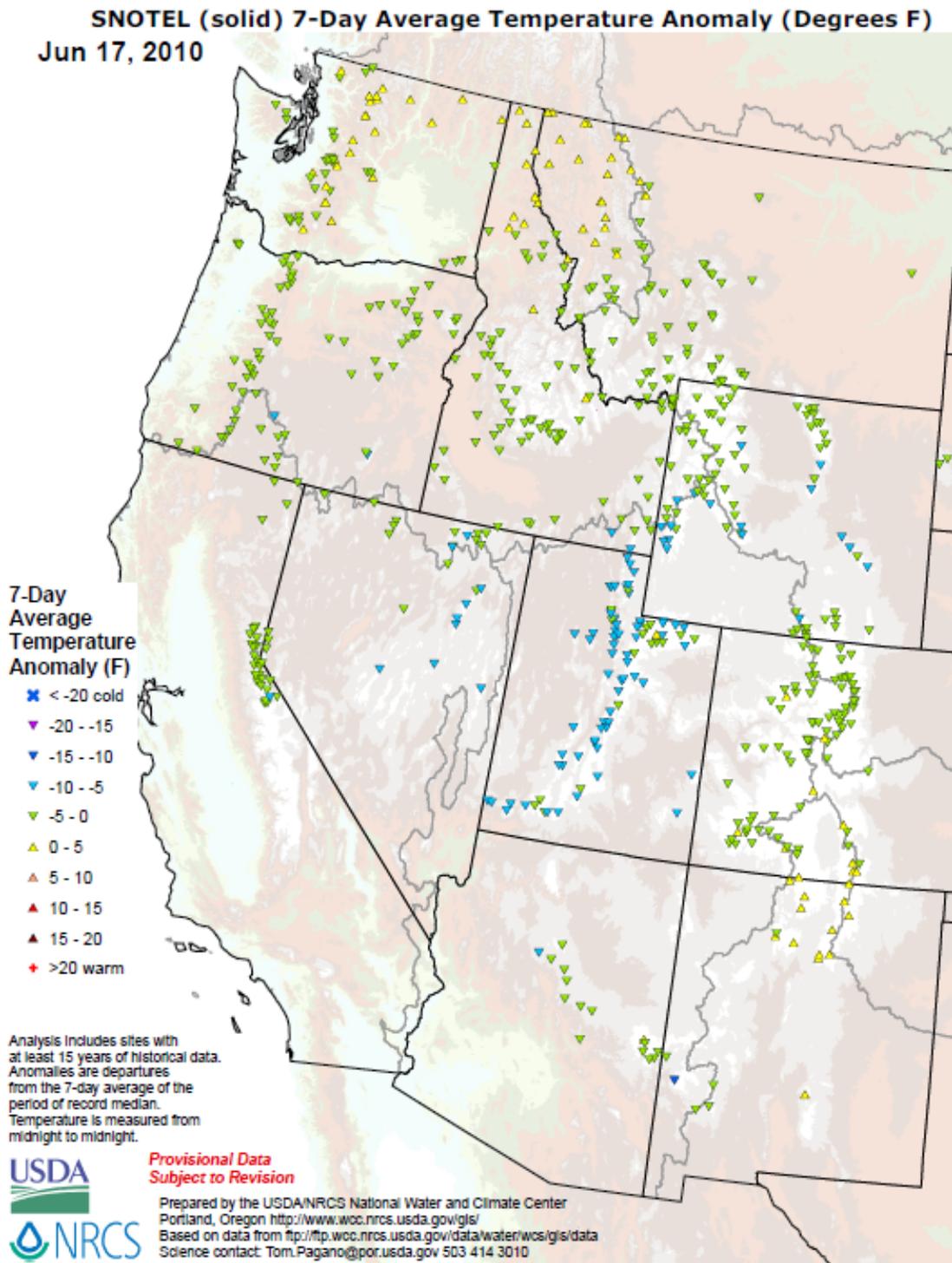
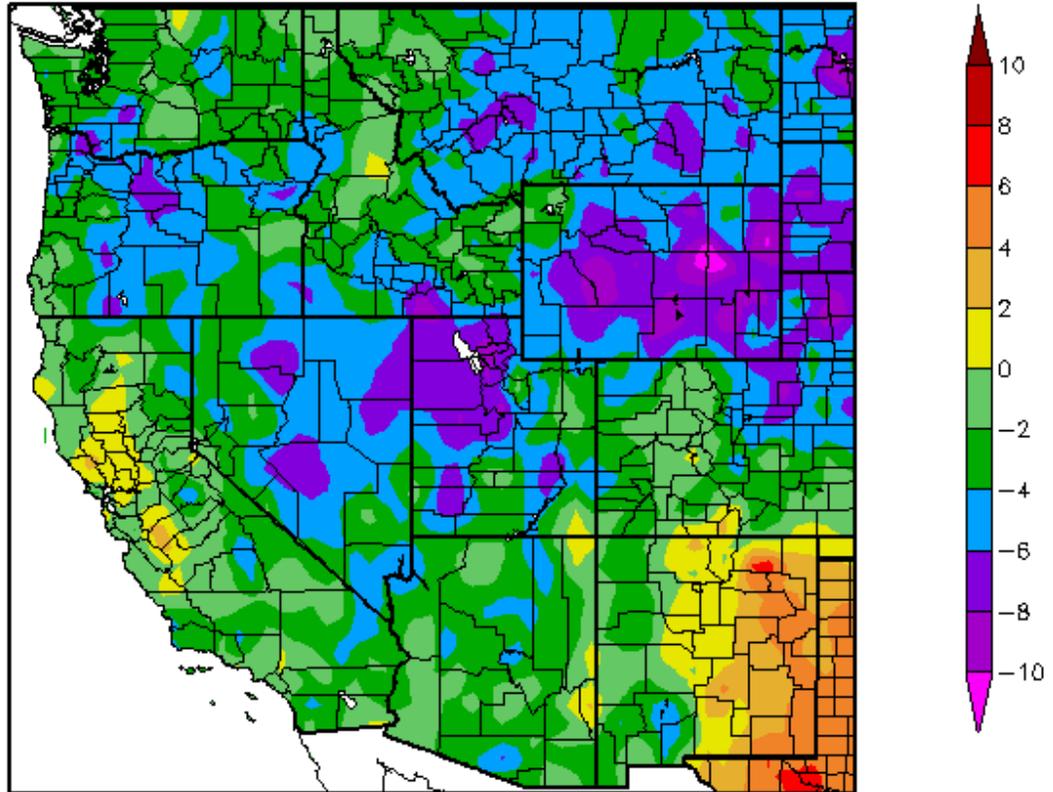


Fig. 1: SNOTEL 7-day average temperature departures from normal map reveal cooler temperatures over all but the Northern Cascades and Northern and Southern Rockies.

Ref: <http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/WestwideTavg7dAnomaly.pdf>

Departure from Normal Temperature (F)
6/10/2010 – 6/16/2010



Generated 6/17/2010 at HPRCC using provisional data.

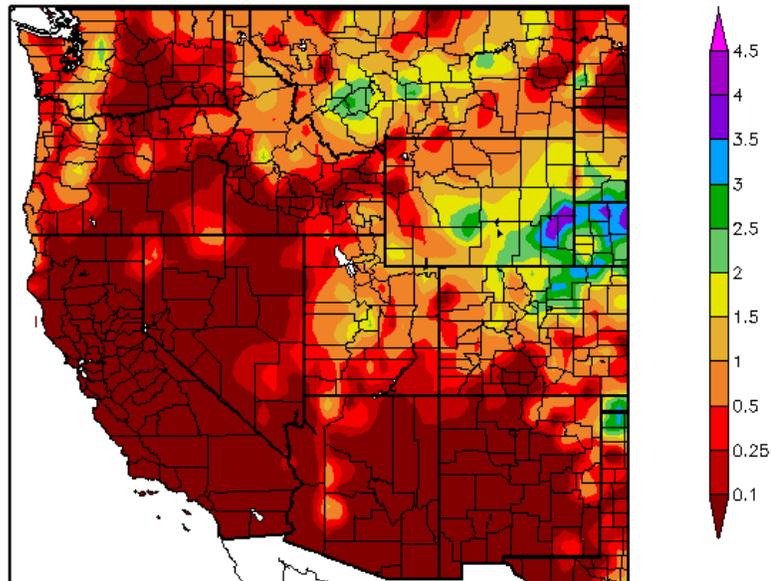
NOAA Regional Climate Centers

Fig. 1a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departure was over eastern New Mexico (>+6°F) and the greatest negative departure occurred over central Wyoming (<-8F).

Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=7d

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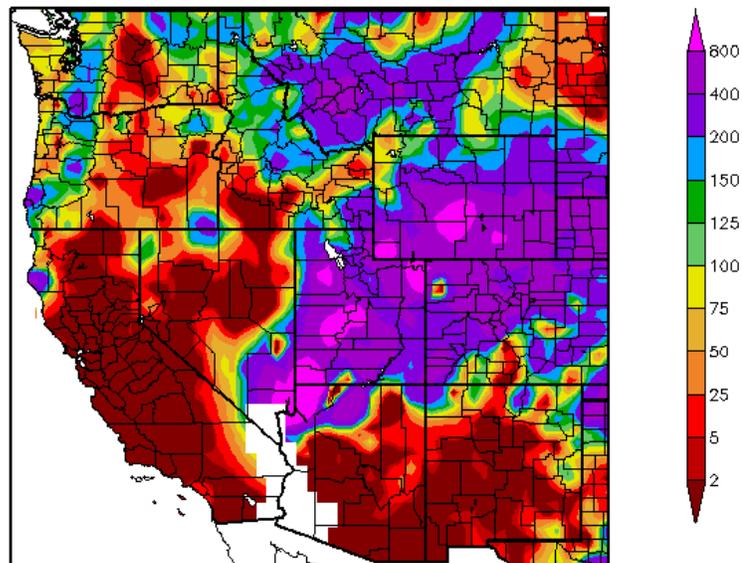
Precipitation (in)
6/10/2010 - 6/16/2010



Generated 6/17/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
6/10/2010 - 6/16/2010



Generated 6/17/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2 and 2a: ACIS 7-day average precipitation amounts for the period ending 16 June shows the bulk of the heaviest precipitation falling over the Central Western High Plains and parts of western Montana (Fig. 2). In terms of percent of normal, much of the Cascades, coastal northern California, the Northern and Central Rockies, and most of Utah had four to eight times the normal precipitation this week. Little precipitation fell over parts of Arizona, New Mexico, the Great Basin, and most of California (Fig. 2a).

Ref: <http://www.hprcc.unl.edu/maps/current/>

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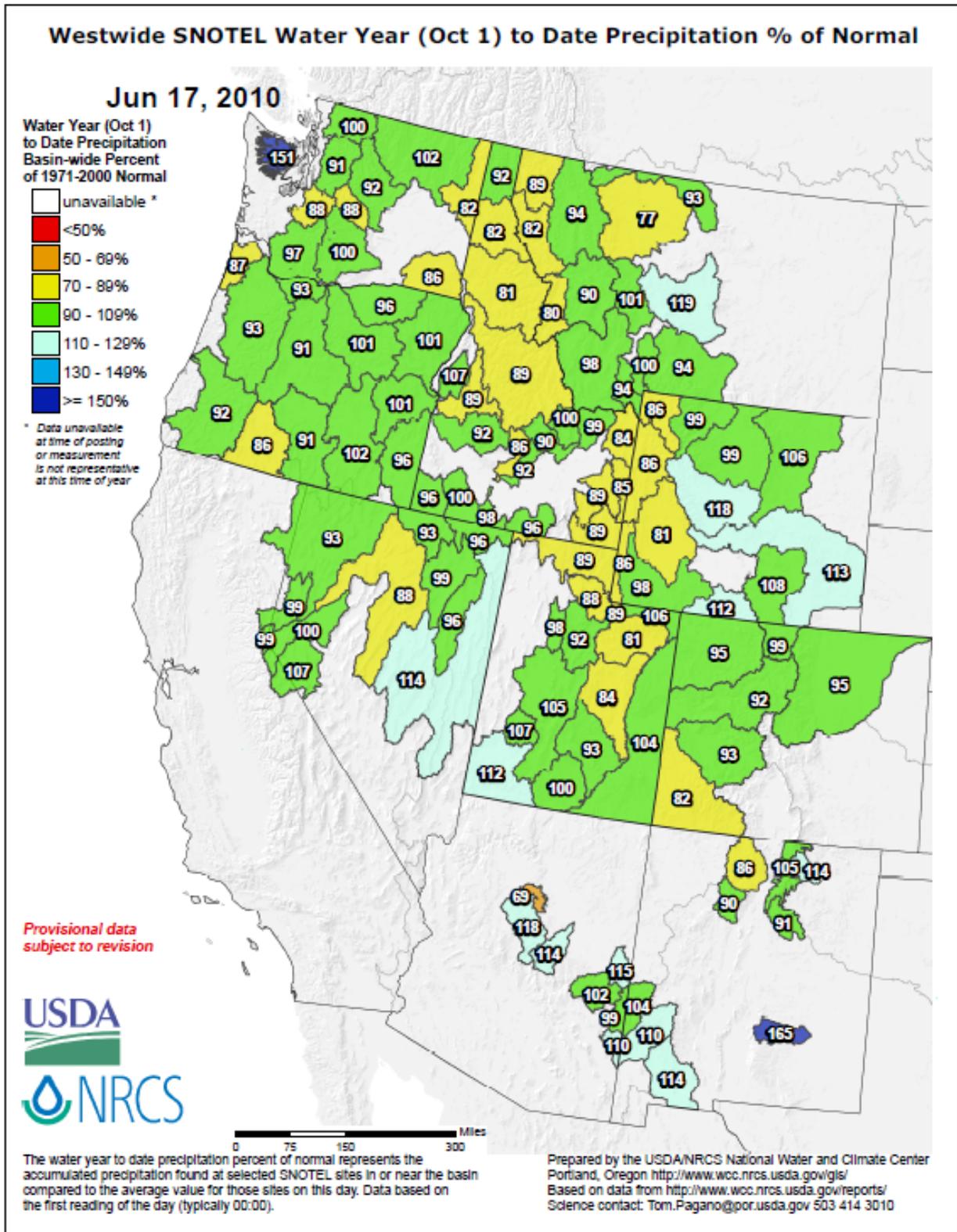
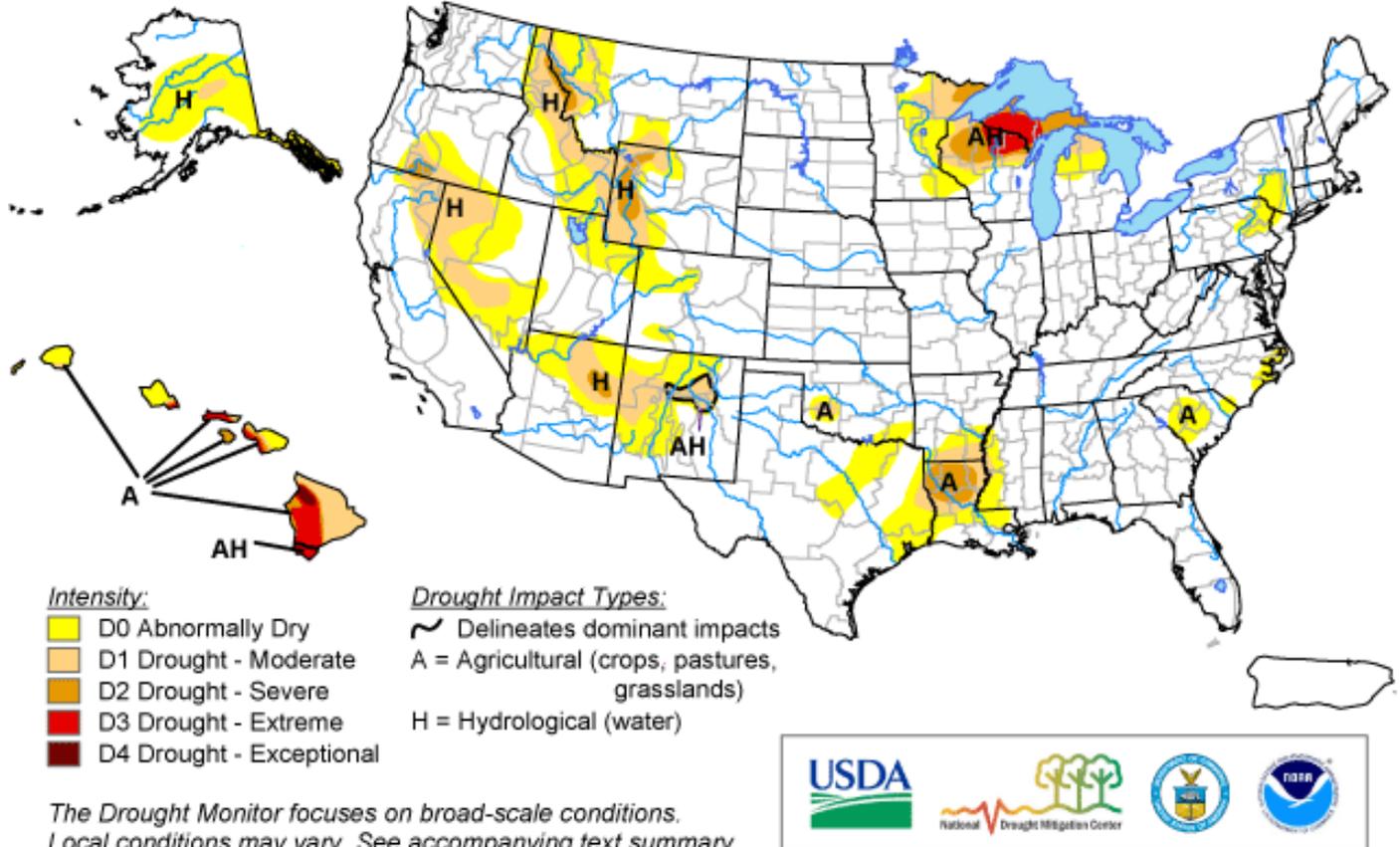


Fig 2b: For the 2010 Water-Year that began on 1 October 2009, Arizona, southern New Mexico, eastern Nevada, the Olympic Range (WA), central Montana, and central Wyoming have the largest surpluses while much of northern Idaho, Upper Snake River, and Northern Wasatch (UT) have the greatest deficits.

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

U.S. Drought Monitor

June 15, 2010
Valid 8 a.m. EDT



Released Thursday, June 17, 2010

Author: Laura Edwards, Western Regional Climate Center

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

Fig. 3: Current Drought Monitor weekly summary. Hawaii is once again the only state that has a D4 drought level. Ref: National Drought Mitigation Center (NDMC) - <http://www.drought.unl.edu/dm/monitor.html>

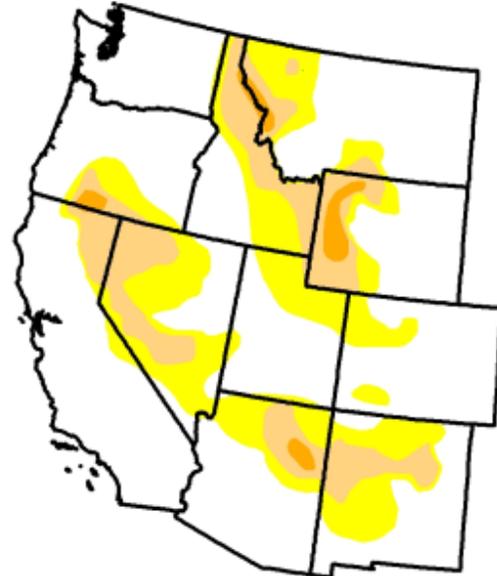
U.S. Drought Monitor

West

June 15, 2010
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	66.0	34.0	14.0	1.6	0.0	0.0
Last Week (06/08/2010 map)	68.9	31.1	13.4	3.4	0.0	0.0
3 Months Ago (03/23/2010 map)	39.9	60.1	22.4	5.4	0.0	0.0
Start of Calendar Year (01/05/2010 map)	40.1	59.9	30.6	9.9	0.5	0.0
Start of Water Year (10/06/2009 map)	42.1	57.9	25.4	8.5	0.0	0.0
One Year Ago (06/16/2009 map)	48.3	51.7	20.8	8.0	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

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



Released Thursday, June 17, 2010

Author: Laura Edwards, Western Regional Climate Center

Fig. 3a: Drought Monitor for the Western States with statistics over various time periods. Regionally there was little change since last week.

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

Drought Monitor Classification Changes for Selected Time Periods

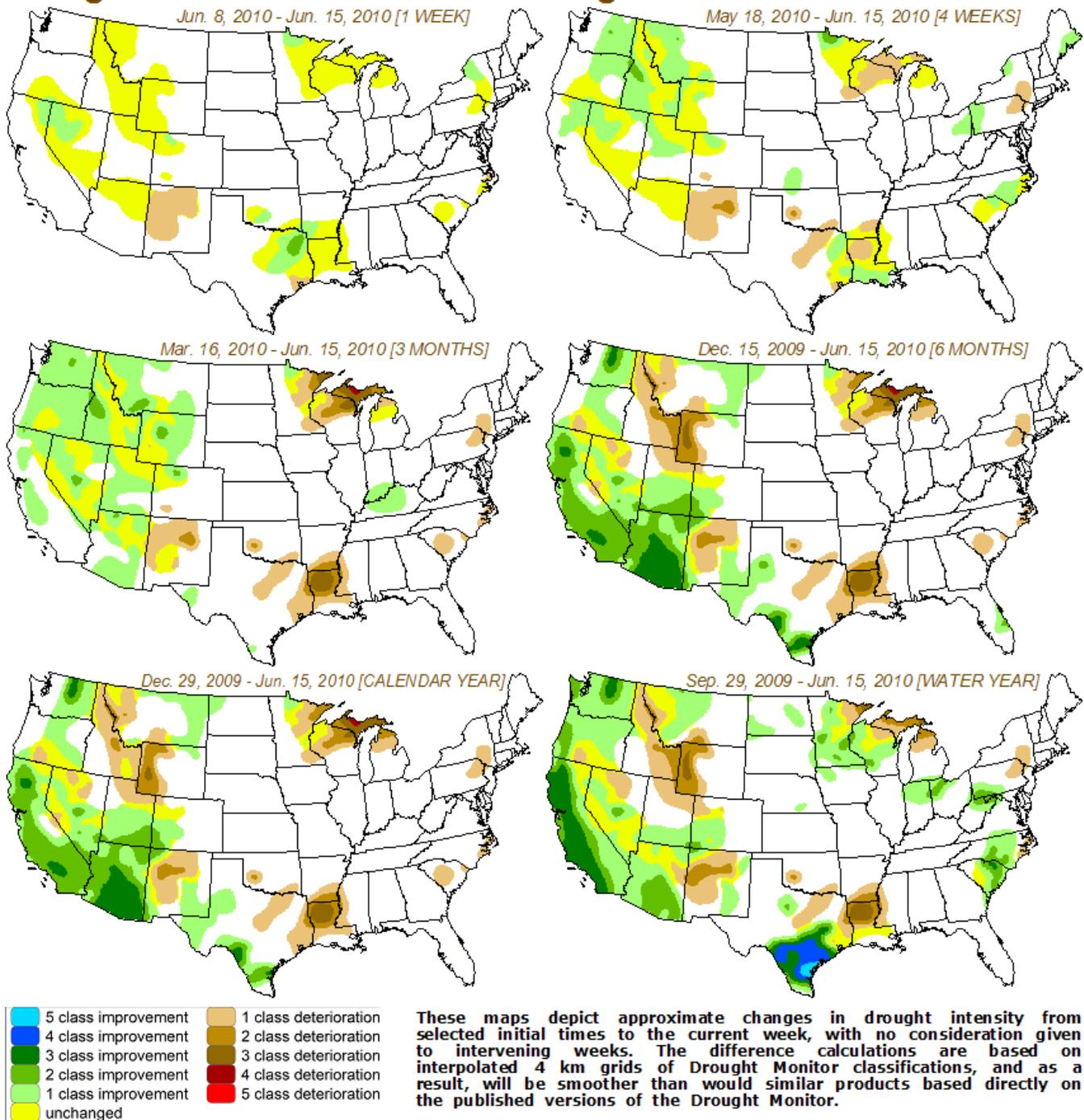
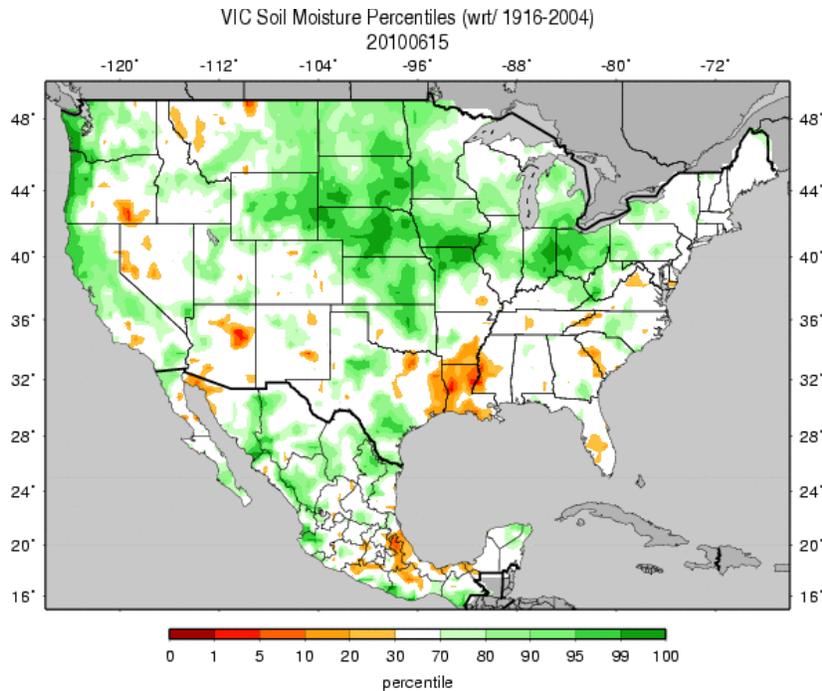


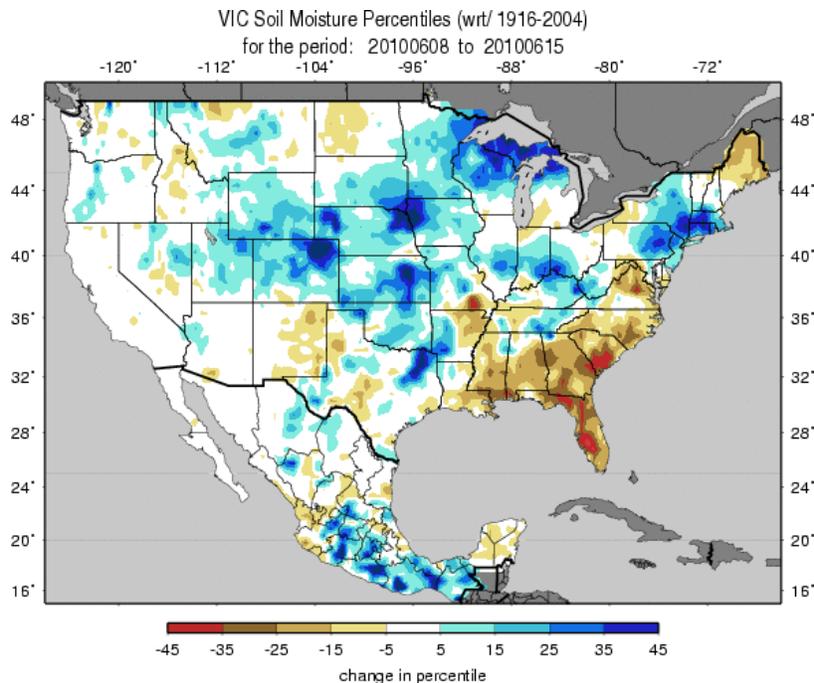
Fig. 3b : Drought Monitor Classification Changes show some change over the US as of 15 June. Note worsening conditions over New Mexico and improving conditions over northwestern Nevada last week. Regionally, the Pacific NW and Northern Rockies have seen the most improvements during the past one to three months. Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/dm-change-4maps.png>

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Figs. 4a: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 15 June. Excessive moisture dominates over the High Plains, Ohio Valley, and coastal Oregon and Washington. Dry soils persist over Louisiana

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

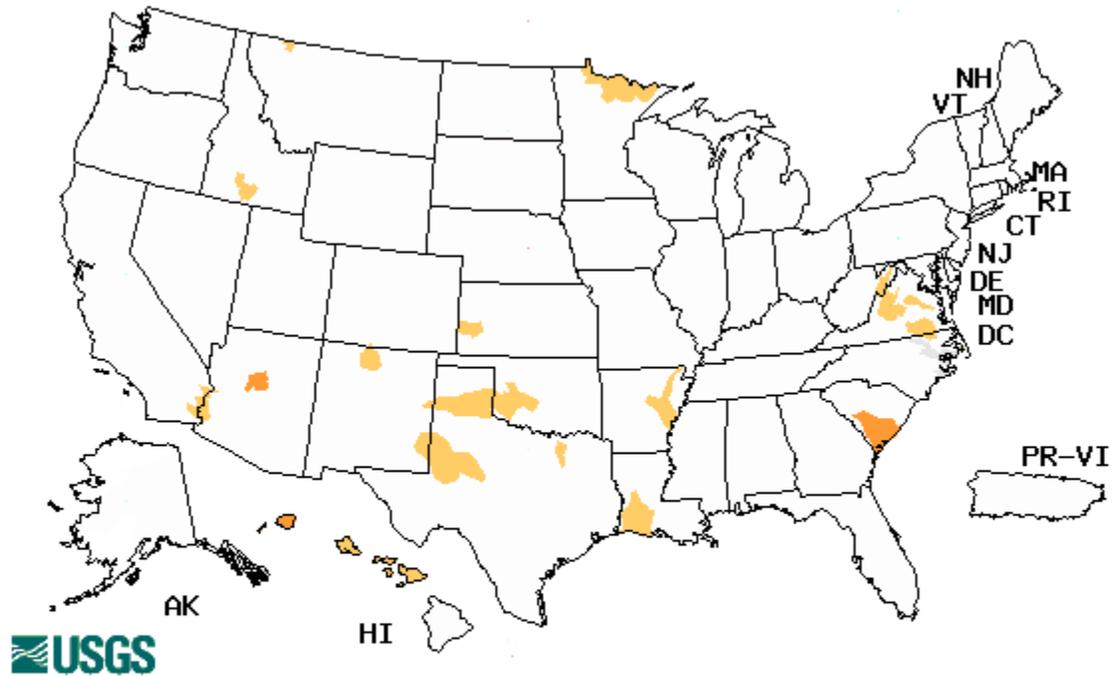


Figs. 4b: Soil Moisture change in percentile based on 1916-2004 climatology for the week shows nearly a complete reversal of the wet and dry pattern from last week. Now the Southeast and Maine are drying out and much of the Mid-section of the Nation are getting saturated.

Ref: <http://www.emc.ncep.noaa.gov/mmb/nldas/drought/> (very useful resource) and http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.1wk.gif

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Wednesday, June 16, 2010



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. 5: Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Very few regions are showing below normal flows.

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

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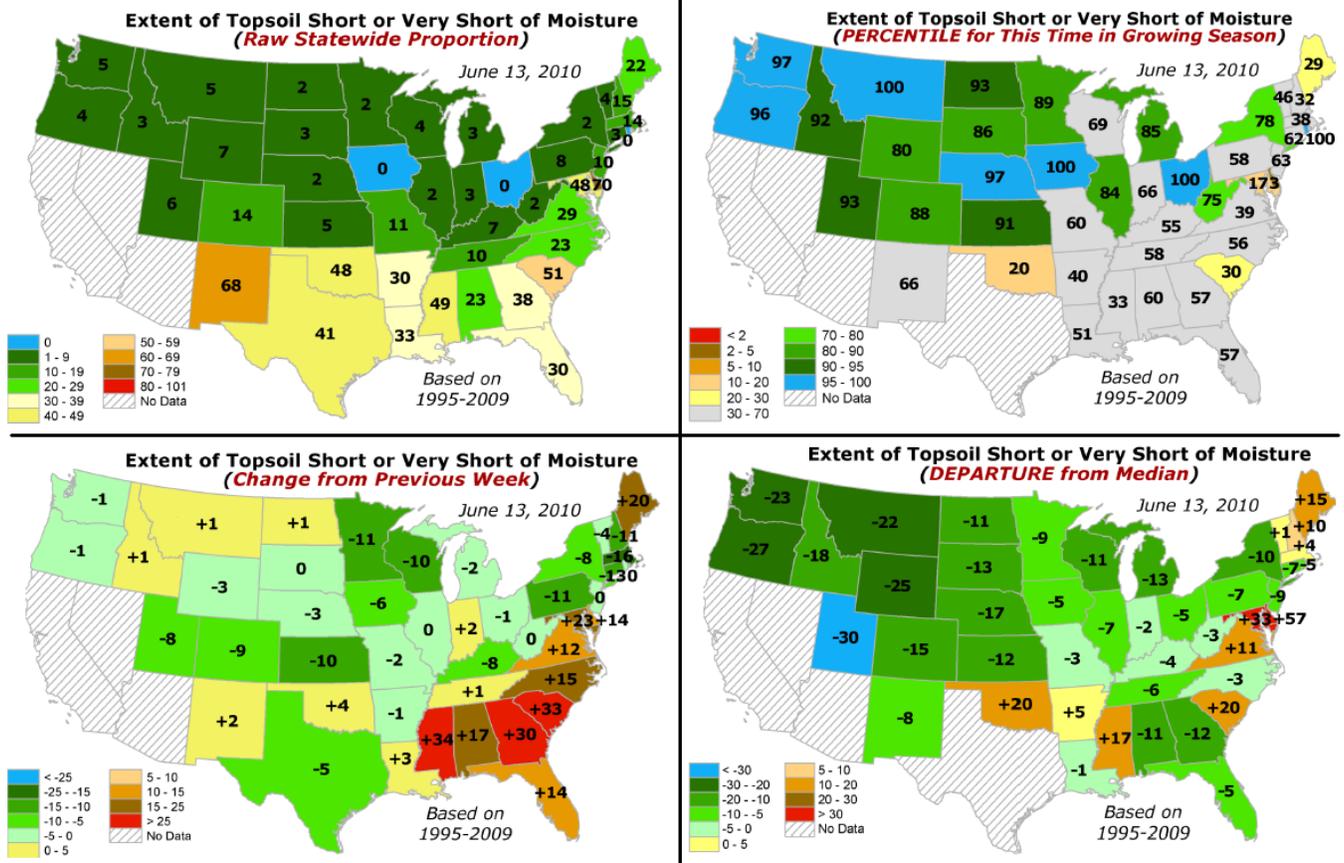


Fig. 6: Maps of Top Soil deficits in terms of percentiles. Note driest conditions over New Mexico (68) upper left panel.

Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/topsoil-statewide-statistics.pdf>

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary -- June 15, 2010

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 Northeast: Heavy rainfall over the past week and a half in the upstate New York area, including Buffalo, was reason for an improvement in drought conditions. Abnormally dry conditions were removed from this region. The Buffalo airport has already measured the tenth wettest June on record, as of the 15th of the month. Soil moisture and streamflow are improved as well. Elsewhere in the Northeast, no changes were made.

Southern Plains and Gulf Coast: Record rainfall in Texas was worthy of a one- to two-category improvement in a swath from San Antonio to Texarkana, resulting in no drought depiction. Two inches or more of rain fell along this line, with local seven-day totals of more than 10 inches. Elsewhere in Texas, the abnormally dry conditions expanded along the Gulf Coast from the Brazos River to Lake Charles, Louisiana. This new area includes Beaumont, Houston and Galveston, all of which are reporting precipitation deficits of over an inch for the month. For the year to date, Beaumont is 11.98 inches below normal, Houston Hobby 8.97 inches below normal, and Galveston 5.34 inches below normal.

In Oklahoma, significant precipitation brought reductions in the extent of dryness in the southwestern part of the state. Oklahoma Mesonet stations in the counties of Comanche and Grady and near Oklahoma City reported from two to over 11 inches of rain on June 14th. The area of D1 was reduced to Washita County and northern Caddo County.

Upper Midwest: Rainfall in Minnesota helped to alleviate dry conditions in that state. Improvements were made in the Canadian border counties of Lake of the Woods and Koochiching, as well as in the western part of the Twin Cities metropolitan area. These locations are now drought free on the map. Lake levels in the eastern Twin Cities area are still low. A one-category improvement was made along the North Shore, over Duluth and Two Harbors, as a reflection of above normal precipitation for the last 90 days.

Southeast: Dry conditions expanded this week to include more of the Coastal Plain in North Carolina. Lack of rainfall over the last 30 days, low streamflow and elevated drought indices more typical of late summer contributed to this designation.

The West: An assessment of conditions in northeastern California, southern Oregon and northwestern Nevada led to an improvement in the depiction of drought. The area of D2 Severe Drought was reduced to Klamath County and the surrounding area. Drought impacts continue to be reported in the Klamath River basin. The extent of moderate drought is now smaller in northern Nevada. The spring season was wet and cool, with some late-season snow in May. This all contributed to a delay in the peak runoff in the mountain streams, and reservoir storage is overall currently in good condition leading into the summer dry season. In California, rangeland conditions are reported as being in good to excellent condition statewide.

Weekly Snowpack and Drought Monitor Update Report

Conditions in Colorado improved somewhat in the northwestern part of the state, and in northeastern Utah. The Yampa River region has improved to non-drought conditions this spring. Additionally, observers in this region have measured near normal rainfall for the water year so far (since October). In the past several days, over an inch of rain has fallen at John Jarvie Ranch, UT and at a remote weather station nearby, warranting a one-category change to D0 in far northeastern Utah and northwestern Colorado.

New Mexico's drought is worsening with continued lack of precipitation over the last six weeks, and extremely high temperatures are increasing demand for water. The first two weeks of June have been the third warmest on record at Albuquerque, since 1892. Average temperatures are more than five degrees above normal across most of the state. The bulk of last week's abnormally dry region was downgraded to moderate drought, or D1. D0 was extended to cover most of northern and central New Mexico. The state is drying out quickly this spring, and pasture and rangeland conditions are deteriorating. For the month of May, some areas in this expanded drought region received less than 10 percent of normal precipitation. Just a few scattered locales received 60-80 percent of normal for the month.

Hawaii, Alaska and Puerto Rico: Southeastern Alaska had a very dry May, with Ketchikan recording only 2.12 inches, or 24 percent of average precipitation. Juneau measured 1.25 inches for the month, also 24 percent of normal, and the fourth driest May on record. For the last three months, Ketchikan is over eight inches below normal and Juneau is almost two inches below normal in precipitation, or 70 and 79 percent of normal respectively. Monthly average temperatures were above normal, and some daily record high temperatures were also recorded in this region, which can exacerbate drought. As a result of these factors, D0, abnormally dry conditions, was introduced this week to southeast Alaska. The depiction of drought on this week's map did not change in the Interior, where wildland fire behavior has been more like summer. Hawaii and Puerto Rico had no change in drought conditions this week.

Looking Ahead: Over the next 5 day (June 17-21) temperatures are expected to be warmer than normal over much of the eastern United States and into the High Plains. Temperatures will range from 6 to 9 degrees Fahrenheit above normal over Kansas and Oklahoma to 12 degrees Fahrenheit below normal in Montana. The western United States will have temperatures below normal during this time. An active precipitation pattern will be observed along the northern portions of the United States and along the southeastern coast. Precipitation maxima are expected over Montana, Iowa, southern Wisconsin and Florida.

The CPC 6-10 day forecast (June 22-26) has temperatures expected to be well above normal over the eastern half of the United States, with the greatest anomalies over Arkansas. Cooler than normal temperatures over California and Oregon should be expected as well. The wet pattern should persist over the northern United States and drier than normal conditions over the southern plains and into the central Rocky Mountains. Author: Laura Edwards, Western Regional Climate Center, drought summary and map; Brian Fuchs, National Drought Mitigation Center, *Looking Ahead* section

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

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D3 ... Extreme Drought

D4 ... Exceptional Drought

Drought or Dryness Types

A ... Agricultural

H ... Hydrological

Updated June 16, 2010