



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

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## Weekly Report - Snowpack / Drought Monitor Update

Date: 24 June 2010

### SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

**Temperature:** SNOTEL 7-day average temperature departures from normal map reveal cooler temperatures over all but the Colorado and New Mexico Rockies (Fig. 1). ACIS 7-day average temperature anomalies show that the greatest positive temperature departure was over eastern New Mexico ( $>+10^{\circ}\text{F}$ ) and the greatest negative departure occurred over central Idaho ( $<-10\text{F}$ ). The 7-day temperature pattern this week is very similar to last week's (Fig. 2a).

**Precipitation:** ACIS 7-day average precipitation amounts for the period ending 23 June shows the bulk of the heaviest precipitation falling over the Northern Tier States from Idaho to the Dakotas (Fig. 2). In terms of percent of normal, much of the Northern Tier States and eastern New Mexico had two to four times the normal precipitation this week. Little precipitation fell over parts of Arizona, the 4-Corners area, and most of California (Fig. 2b).

### WESTERN DROUGHT STATUS

**The West:** In the northern states, a one-category improvement was made across much of the Idaho panhandle and western Montana. Spring precipitation was near or above normal in this region, and water resources have been replenished. A small area of moderate hydrological drought remains along the border. Cooler than average temperatures have also alleviated drought conditions, and severe drought is no longer evident. A one-category improvement was made in and around Yellowstone National Park, Wyoming. Precipitation and streamflow for the last 30 days were cause for this depiction.

Southwestern Colorado's drought situation continues to degrade, as D0 was expanded this week to include Rio Grande, Archuleta, and La Plata and Conejos counties. Lack of precipitation over the last few months has contributed to these dry conditions, and low streamflows are also supportive of this depiction.

A slight expansion of abnormally dry conditions was made to include northern Yavapai County, Arizona. Continued lack of rainfall and increased concern over wildland fire prompted this adjustment to the map. Author: Laura Edwards, Western Regional Climate 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. 3 and 3a).

## Weekly Snowpack and Drought Monitor Update Report

### 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](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>.

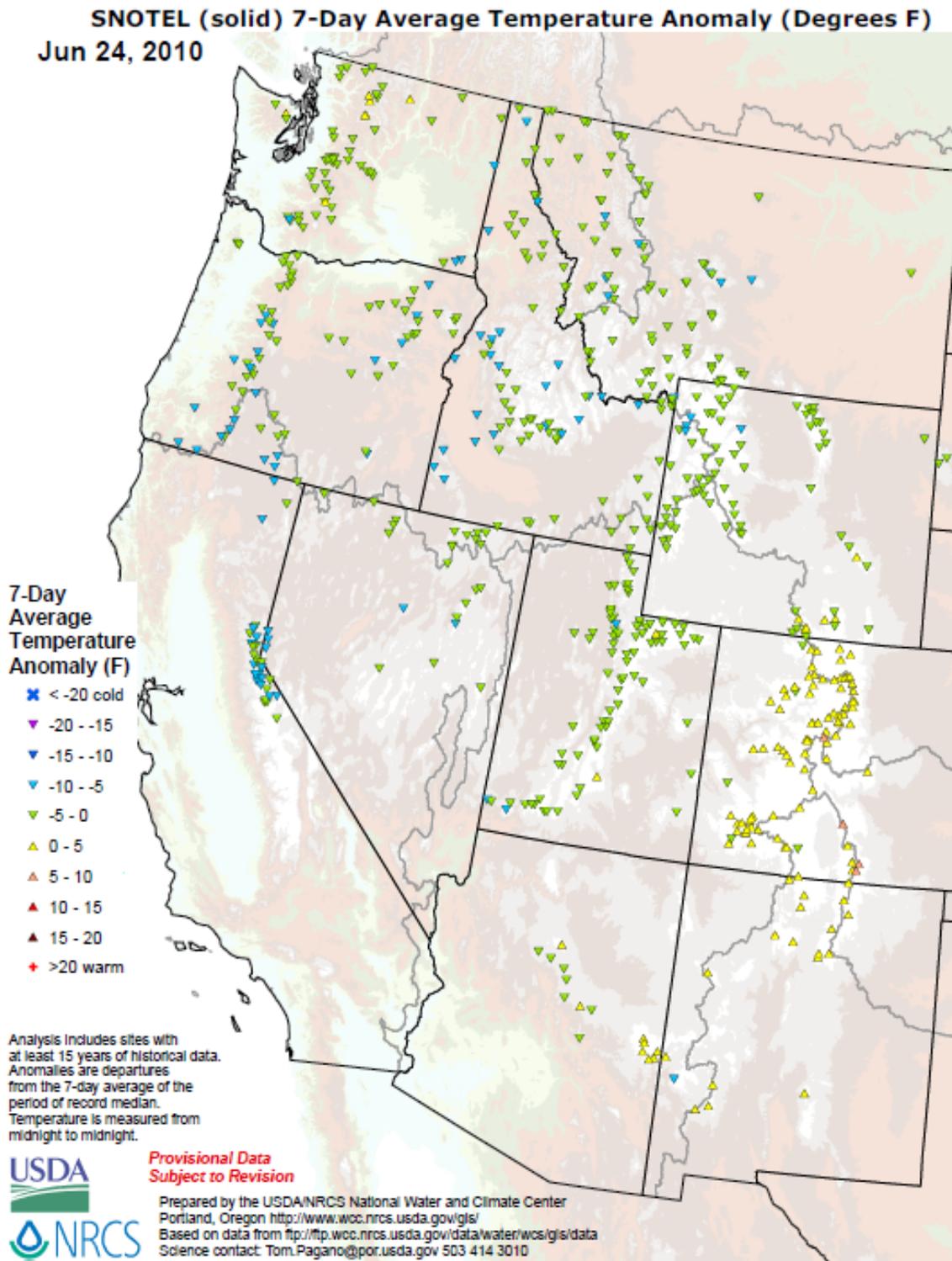
### FOR MORE INFORMATION

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>

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

/s/ NOLLER HERBERT  
Director, Conservation Engineering Division

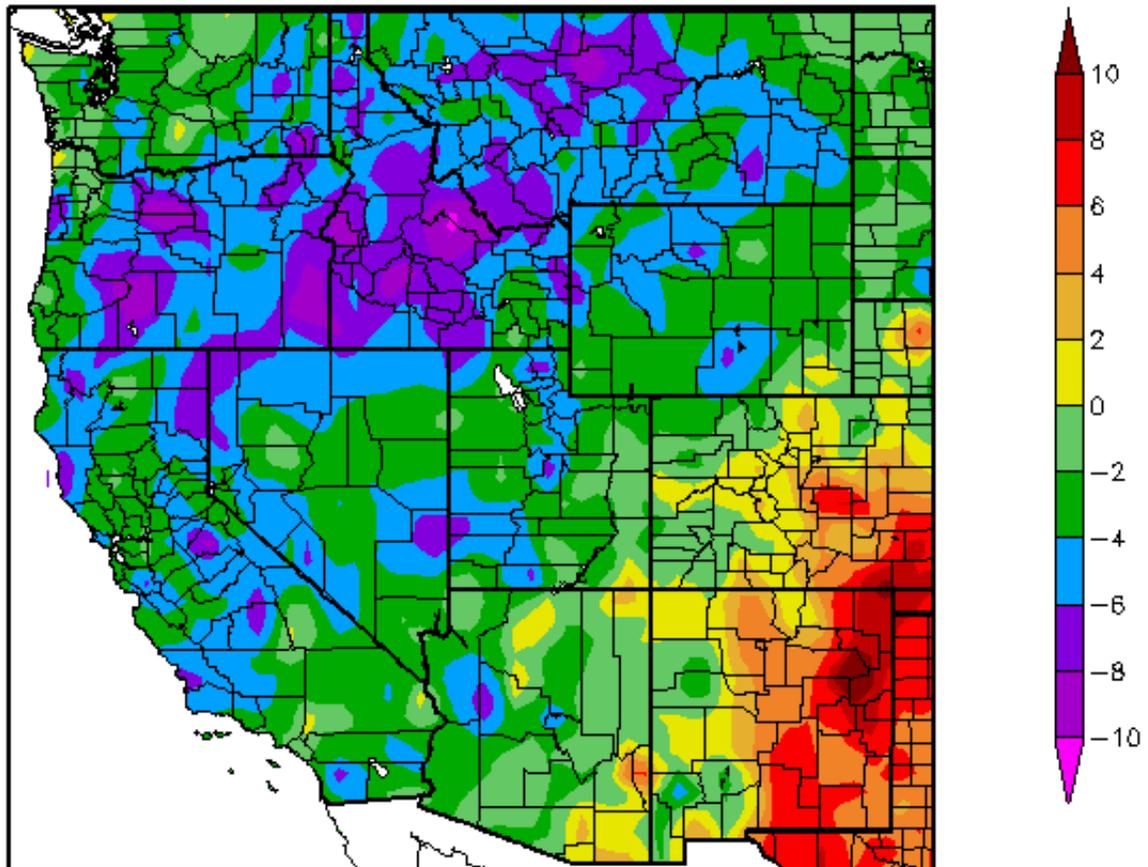
# Weekly Snowpack and Drought Monitor Update Report



**Fig. 1: SNOTEL 7-day average temperature departures from normal map reveal cooler temperatures over all but the Colorado and New Mexico Rockies.**

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

Departure from Normal Temperature (F)  
6/17/2010 – 6/23/2010



Generated 6/24/2010 at HPRCC using provisional data.

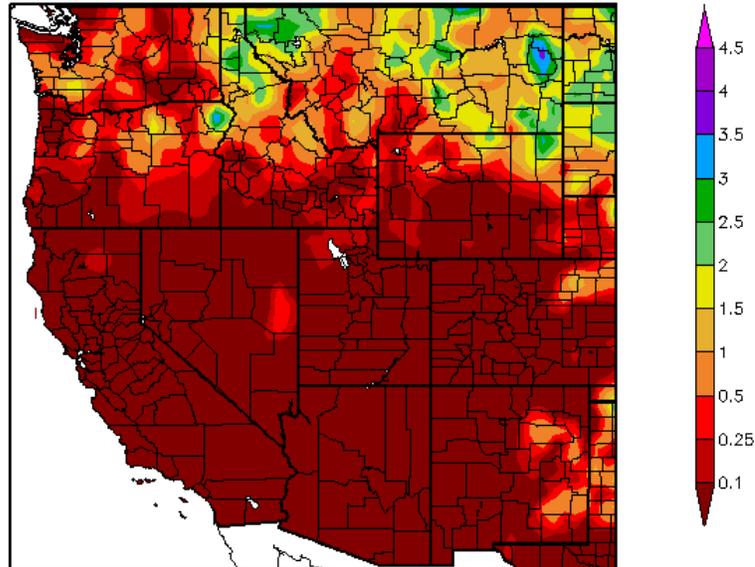
NOAA Regional Climate Centers

**Fig. 1a:** ACIS 7-day average temperature anomalies show that the greatest positive temperature departure was over eastern New Mexico ( $>+10^{\circ}\text{F}$ ) and the greatest negative departure occurred over central Idaho ( $<-10^{\circ}\text{F}$ ). The 7-day temperature pattern this week is very similar to last week's.

Ref: [http://www.hprcc.unl.edu/maps/current/index.php?action=update\\_daterange&daterange=7d](http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=7d)

## Weekly Snowpack and Drought Monitor Update Report

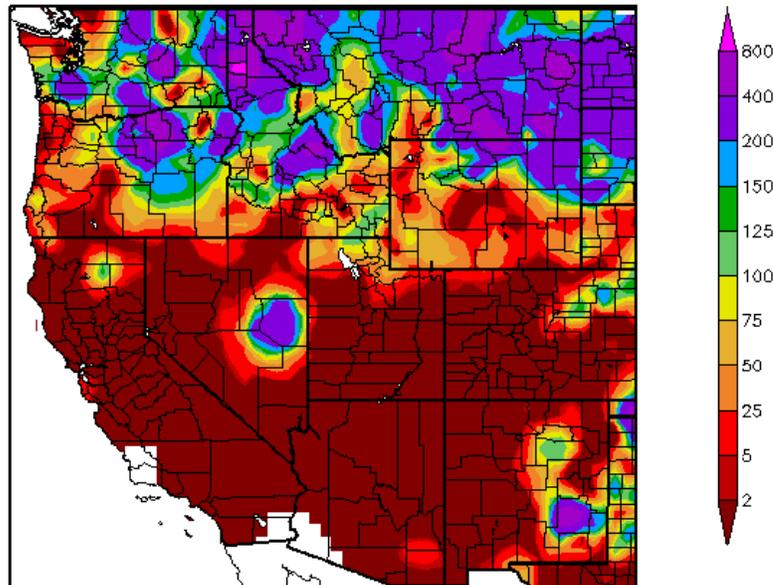
Precipitation (in)  
6/17/2010 - 6/23/2010



Generated 6/24/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)  
6/17/2010 - 6/23/2010



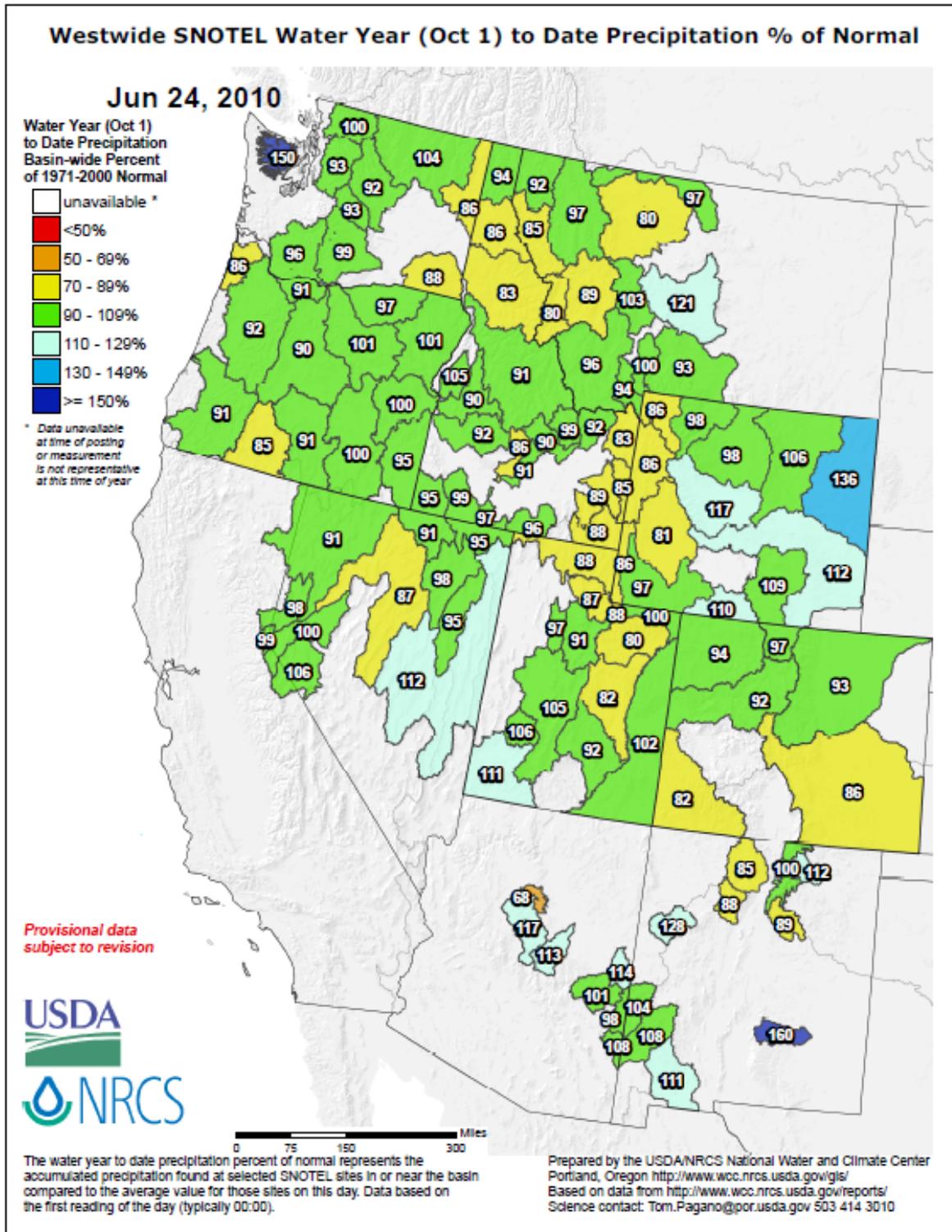
Generated 6/24/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 2 and 2a: ACIS 7-day average precipitation amounts for the period ending 23 June shows the bulk of the heaviest precipitation falling over the Northern Tier States from Idaho to the Dakotas (Fig. 2). In terms of percent of normal, much of the Northern Tier States and eastern New Mexico had two to four times the normal precipitation this week. Little precipitation fell over parts of Arizona, the 4-Corners area, and most of California (Fig. 2a).**

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

## Weekly Snowpack and Drought Monitor Update Report



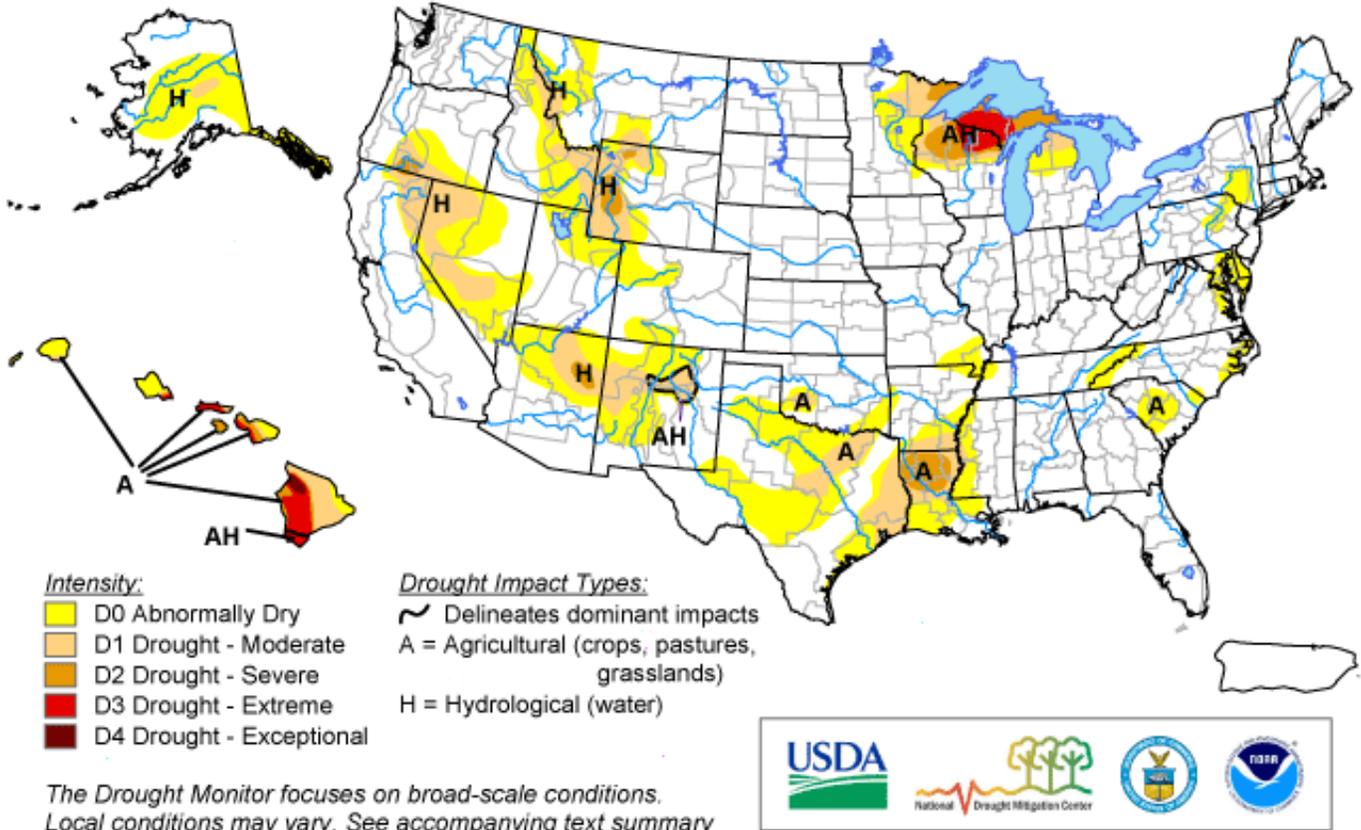
**Fig 2b:** For the 2010 Water-Year that began on 1 October 2009, Arizona, southern New Mexico, eastern Nevada, southwest Utah, the Olympic Range (WA), central Montana, and central-eastern Wyoming have the largest surpluses while much of northern Idaho, Upper Snake River, and Northern Wasatch (UT) have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

Ref: [ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west\\_wytdprecptnormal\\_update.pdf](ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_wytdprecptnormal_update.pdf)

# U.S. Drought Monitor

June 22, 2010

Valid 8 a.m. EDT



Released Thursday, June 24, 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>

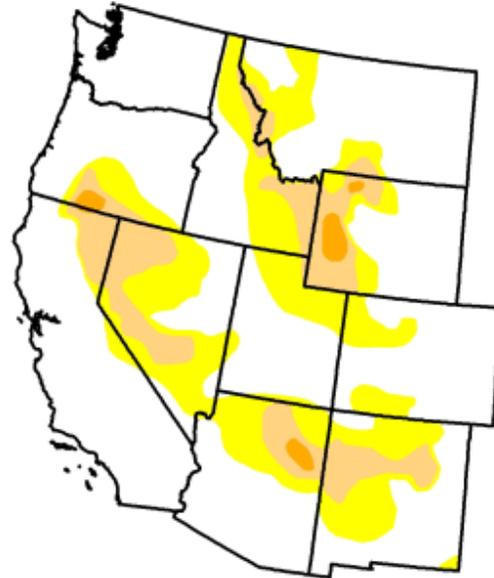
# U.S. Drought Monitor

## West

June 22, 2010  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	66.5	33.5	11.9	1.0	0.0	0.0
Last Week (06/15/2010 map)	66.0	34.0	14.0	1.6	0.0	0.0
3 Months Ago (03/30/2010 map)	42.2	57.8	21.4	4.9	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 (06/23/2009 map)	54.7	45.3	18.6	7.4	0.0	0.0



Intensity:

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

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



**Released Thursday, June 24, 2010**

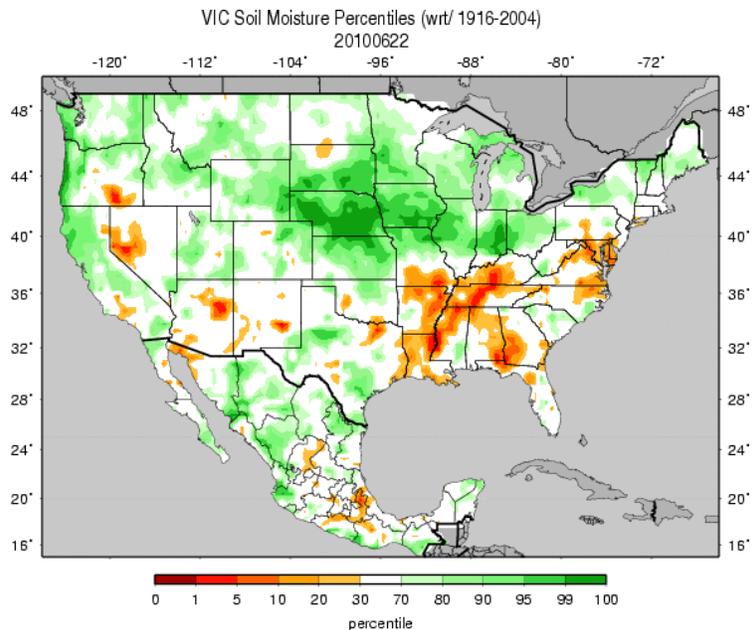
*Author: Laura Edwards, Western Regional Climate Center*

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

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

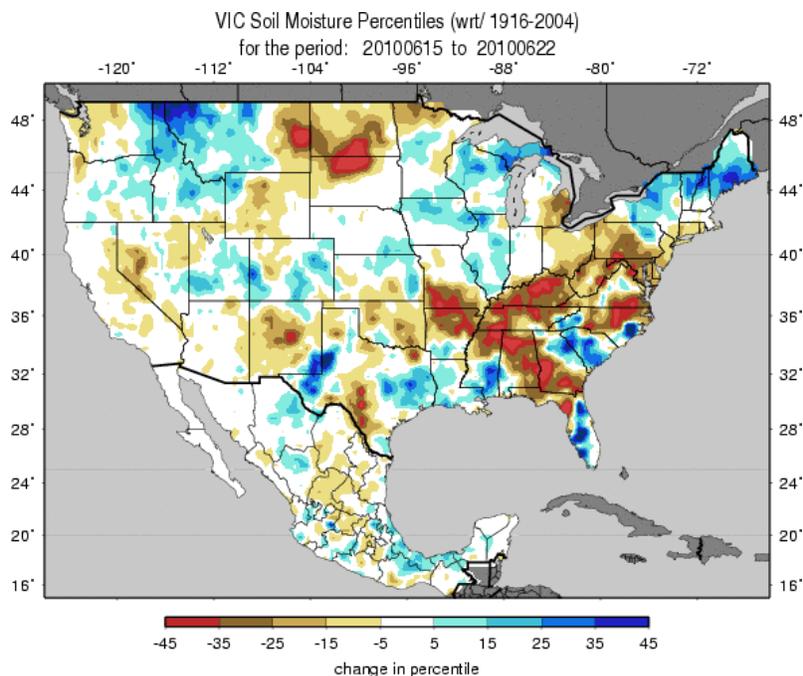
Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)

## Weekly Snowpack and Drought Monitor Update Report



**Figs. 4a:** Soil Moisture ranking in percentile based on 1916-2004 climatology as of 22 June. Excessive moisture dominates over the High Plains, Ohio Valley, and coastal Oregon and Washington. Dry soils have expanded over the Lower Mississippi River Valley since last week.

Ref: [http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm\\_qnt.gif](http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.gif)

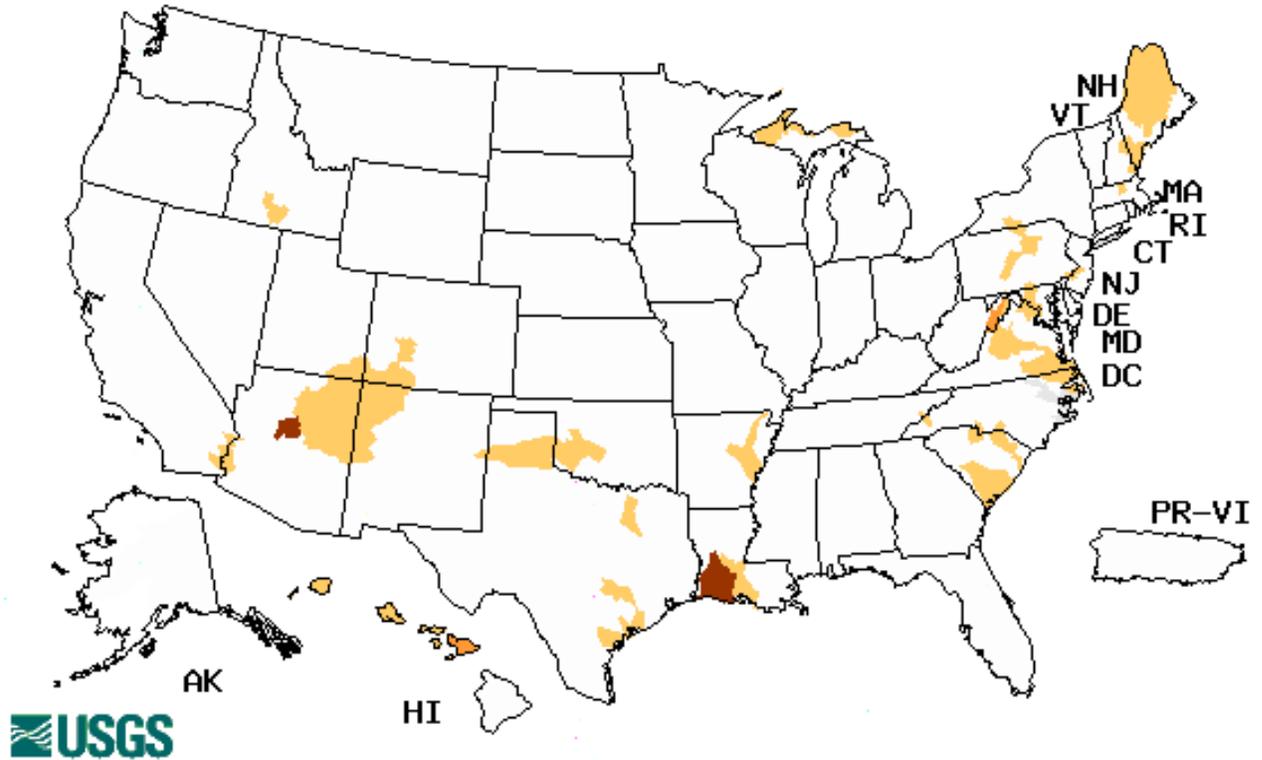


**Figs. 4b:** Soil Moisture change in percentile based on 1916-2004 climatology for the week shows intensifying drying over parts of the Southeast and Mid-Atlantic. Saturated soils are noted over the Northern Rockies, western Texas, and Maine.

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

# Weekly Snowpack and Drought Monitor Update Report

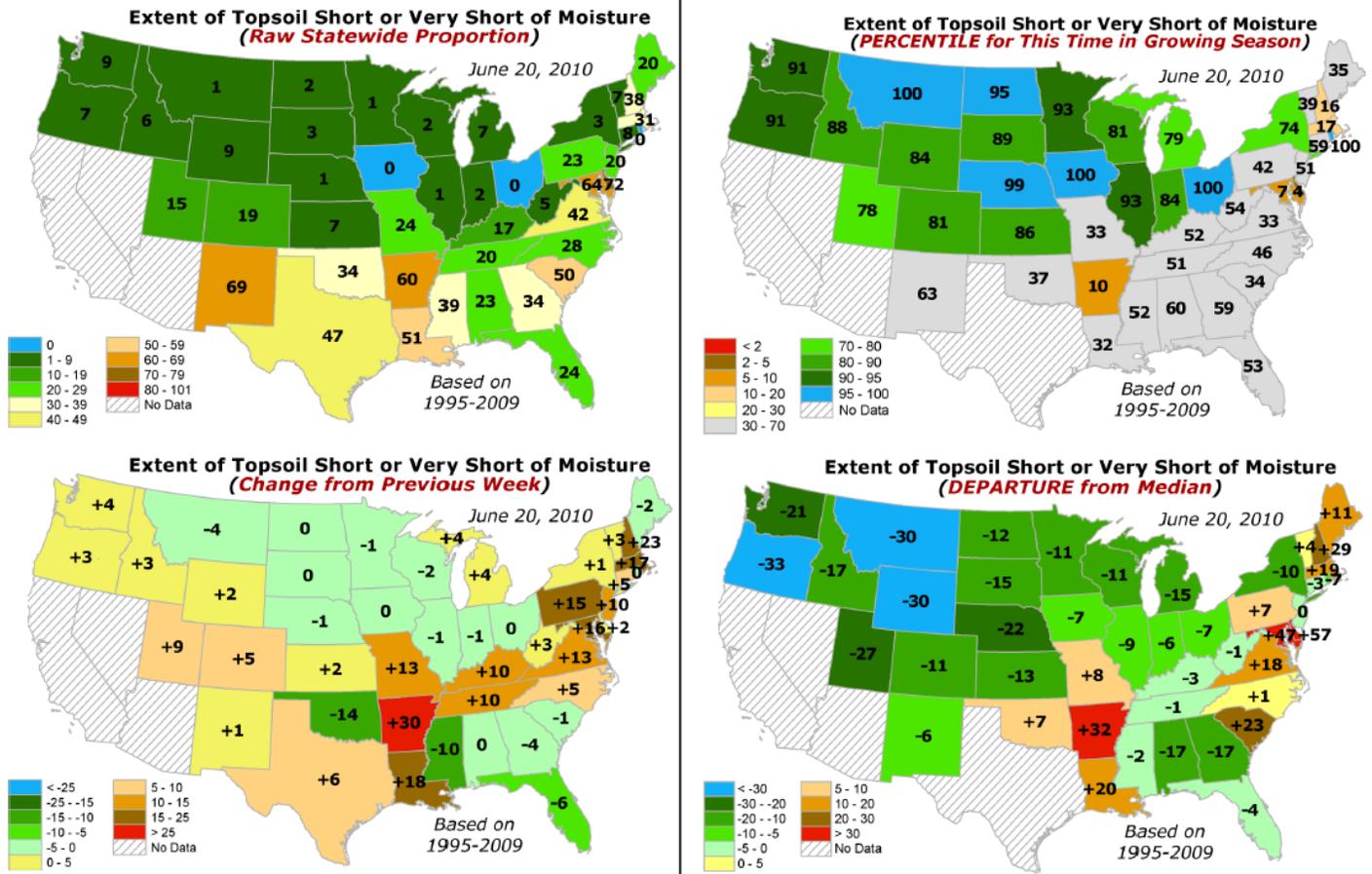
Wednesday, June 23, 2010



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. Southwest Louisiana and central Arizona are at severe levels. Ref: <http://waterwatch.usgs.gov/?m=dryw&r>

# Weekly Snowpack and Drought Monitor Update Report



**Fig. 6: Maps of Top Soil deficits in terms of percentiles. Note driest conditions over New Mexico (69) 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 22, 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/>.*

**Northeast:** A small reduction in the extent of abnormally dry conditions in Pennsylvania and New Jersey this week after an evaluation of the last 30 to 60 days. Well-timed rainfall has brought this area into drought-free conditions.

**Southern Plains and Gulf Coast:** Numerous adjustments and a large expansion of drought in Texas were made on the map. These changes are in response to continued shortages in precipitation and the Standardized Precipitation Index for the last 30-90 day periods, in addition to increasing reports of agricultural impacts. With the exception of the region that received extremely heavy rainfall two weeks ago, most of east Texas is in developing or worsening drought conditions. A large expansion of abnormally dry conditions was made along the Red River where moisture deficits are evident in rainfall and soil moisture data. In central Texas additional area of D0 was introduced from Dallas-Fort Worth curving south and west to the Pecos River. The Dallas-Fort Worth area experienced its third driest May 1 to June 20 period on record since 1899. Moisture deficits anywhere from three to nine inches are being reported for the last 90 day period. D0 is also shown in the coastal counties from Corpus Christi to Galveston. Moderate drought has been making agricultural impacts in central Texas, and an area of D1 is depicted this week from the Red River to Temple. In east Texas, moderate drought is expanded from Louisiana to cover all of the border counties and inland to Houston.

**Upper Midwest:** Improvements due to recent wet conditions in Minnesota and Wisconsin brought many southeastern Minnesota counties into drought-free status. This region reaches eastward across central Wisconsin. A tight gradient from severe to no-drought areas is evident from north to south in central Wisconsin. Lake levels continue to be low, and are being compared to those of the 1930s. Some locally heavy rain measurements of more than two inches were cause for improvement in Waseca County.

**Mississippi River Valley:** An introduction of abnormally dry conditions was needed in the Mississippi River Valley in southeastern Missouri and the surrounding areas of Tennessee and Arkansas. A combination of heat and lack of rainfall prompted this new area of D0. Some cities such as Bloomfield, Glennonville and Alton, MO have had no measurable precipitation for June to date. Missouri has been drought-free since Christmas 2008, with the exception of one week in October 2009.

A tongue of abnormally dry conditions was extended up river along the Arkansas/Mississippi border as well. This is a reflection of continuing precipitation deficits over the last 30-60 days and lower than average streamflow for this time of year.

**Mid-Atlantic:** Abnormally dry conditions have been developing in the Baltimore-Washington, DC area, and eastward over Delaware. This week D0 is depicted on the map to reflect rainfall deficits of up to four or five inches in areas over the last 30 days. Some impacts are also being reported, such as deteriorating vegetation health.

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In North Carolina, dry conditions are also developing along the Tennessee border and D0 was introduced this week. Lower than normal streamflow and lack of precipitation have been notable in this region.

**The West:** In the northern states, a one-category improvement was made across much of the Idaho panhandle and western Montana. Spring precipitation was near or above normal in this region, and water resources have been replenished. A small area of moderate hydrological drought remains along the border. Cooler than average temperatures have also alleviated drought conditions, and severe drought is no longer evident. A one-category improvement was made in and around Yellowstone National Park, Wyoming. Precipitation and streamflow for the last 30 days were cause for this depiction.

Southwestern Colorado's drought situation continues to degrade, as D0 was expanded this week to include Rio Grande, Archuleta, and La Plata and Conejos counties. Lack of precipitation over the last few months has contributed to these dry conditions, and low streamflows are also supportive of this depiction.

A slight expansion of abnormally dry conditions was made to include northern Yavapai County, Arizona. Continued lack of rainfall and increased concern over wildland fire prompted this adjustment to the map.

**Hawaii, Alaska and Puerto Rico:** In Hawaii, a reassessment of conditions on the Big Island prompted a one category improvement on the eastern slopes, removing moderate drought from that area. Degradation of conditions on Maui motivated an expansion of moderate and severe drought categories on that island. Water quality is being impacted in this area due to the continuing drought.

Alaska and Puerto Rico had no change in drought conditions this week.

**Looking Ahead:** Over the next two days, a cold frontal system will push across the Great Lake states and the Northeast, which could possibly bring some much-needed relief to the drought-stricken areas in that region. Excessive heat will continue to be a factor in the Gulf Coast states over the next U.S. Drought Monitor period. In general a trough will begin to settle in the West and the East, and a ridge will form in the central states over the next week and beyond. Warmer than average temperatures will then dominate the Heartland going into the extended six to ten day period.

Over the next six to ten day period, outlooks are projecting above normal temperatures throughout the central United States, including many areas that have been in developing drought conditions, from the Dakotas to Texas. Warmer temperatures in combination with the forecast below normal precipitation centered on Kansas will be a welcome change for those in Nebraska and South Dakota who have experienced large scale flooding this spring. But this same forecast could worsen drought in western Oklahoma and northern Texas. Above average precipitation is forecast in the Southeast for this period.

Author: Laura Edwards, Western Regional Climate 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

## Weekly Snowpack and Drought Monitor Update Report

D1 ... Moderate Drought  
D2 ... Severe Drought  
D3 ... Extreme Drought  
D4 ... Exceptional Drought

### **Drought or Dryness Types**

A ... Agricultural  
H ... Hydrological

Updated June 23, 2010