

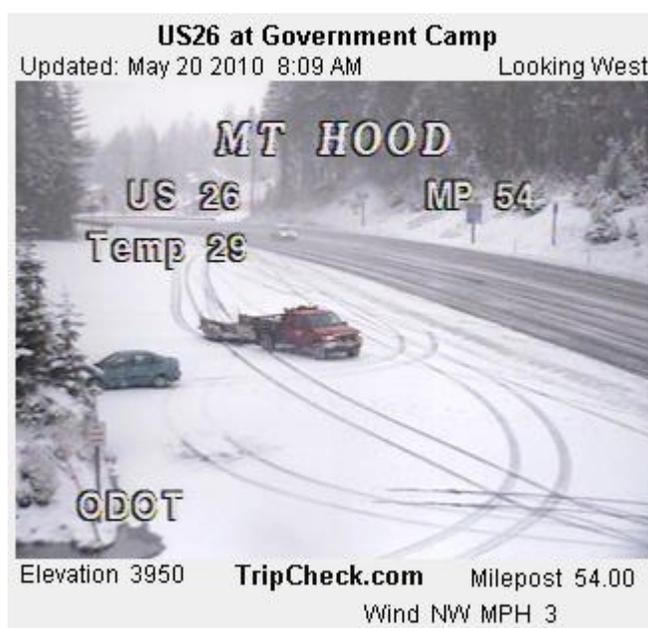


Natural Resources Conservation Service  
P.O. Box 2890  
Washington, D.C. 20013

## Weekly Report - Snowpack / Drought Monitor Update Date: 20 May 2010

### SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

**Snow:** SNOTEL Snow-Water Equivalent percent of normal values for 20 May 2010 shows a lot of basin to basin variability. Late season snowpack that is normally non-existent will result in skewed percentages. Clearly across the West, all but the Intermountain West (eastern Oregon and Idaho) is showing excessive late season snow pack (Fig. 1). SNOTEL snow depth change for the past 24 hours reveals some increases across parts of the Utah and the Colorado Rockies (Fig 1a).



**Figure shows low snow levels this morning on Mt Hood.**

**Temperature:** ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over the central Washington ( $>+8^{\circ}\text{F}$ ) and the greatest negative departure occurred over the parts of southern Utah and northeastern Colorado ( $<-6\text{F}$ ) (Fig. 2).

**Precipitation:** ACIS 7-day average precipitation amounts for the period ending 19 May shows the bulk of the heaviest precipitation falling over the Cascades and Front Range of the Rockies (Fig. 3). In terms of percent of normal, much of the Pacific NW (excluding Idaho), coastal California, Colorado, and eastern Mexico experienced two to four times the normal precipitation this week. Exceptions dominated over parts of the Northern Tier States and southern California to western New Mexico (Fig 3a). For the 2010 Water-Year that began on 1 October 2009, Arizona, New Mexico, eastern Nevada, and northeast Wyoming have the largest surpluses while the northern interior and Pacific Northwestern States have the greatest deficits (Fig. 3b).

## Weekly Snowpack and Drought Monitor Update Report

### WESTERN DROUGHT STATUS

**The West:** Late-season storminess continued over central and northern portions of the region, with locally heavy snowfall reported in eastern Nevada, central and northern Utah, and from north-central Wyoming into central Colorado. Of note, the May 11-12 spring storm dropped up to 38 inches of snow outside of Lander, Wyoming, with numerous high-elevation storm totals in excess of 30 inches. More remarkably, the state-wide snow water equivalent in Wyoming has jumped 27 percentage points since May 3rd, and stood at 104% of normal as of May 17. Consequently, widespread reductions were made in the drought coverage and intensity in central Wyoming. Despite the stormy weather, most western Severe Drought (D2) areas missed out on the precipitation, with only minor reductions made in the highest-precipitation areas (1 to 3 inches liquid equivalent) in south-central Montana. Minor reductions in drought coverage were made in California and southern Oregon, where updated streamflows, soil moisture, precipitation departures, and standardized precipitation indices indicated improving conditions. The same held true in southern California, southern Arizona, and southwestern New Mexico, where reassessment based on updated drought indices led to the removal of D0 in these areas. Author: Eric Luebehusen, United States Department of Agriculture.

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

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

The possible impacts associated with **D4 (H, A)** drought include widespread crop/pasture losses and shortages of water in reservoirs, streams, and wells creating water emergencies. The possible impacts associated with **D3 (H, A)** drought include major crop/pasture losses and widespread water shortages or restrictions. Possible impacts from **D2 (H, A)** drought are focused on water shortages common and water restrictions imposed and crop or pasture losses likely. The possible impacts associated with **D1 (H, A)** drought are focused on water shortages developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 4 and 4a).

### **SOIL MOISTURE**

Soil moisture (Figs. 5a and 5b), is simulated by the [VIC macroscale hydrologic model](#). The detailed, physically-based VIC model is driven by observed daily precipitation and temperature maxima and minima from approximately 2130 stations, selected for reporting reliably in real-time and for having records of longer than 45 years (and various other criteria). 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. 6) 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.

## Weekly Snowpack and Drought Monitor Update Report

### 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>.

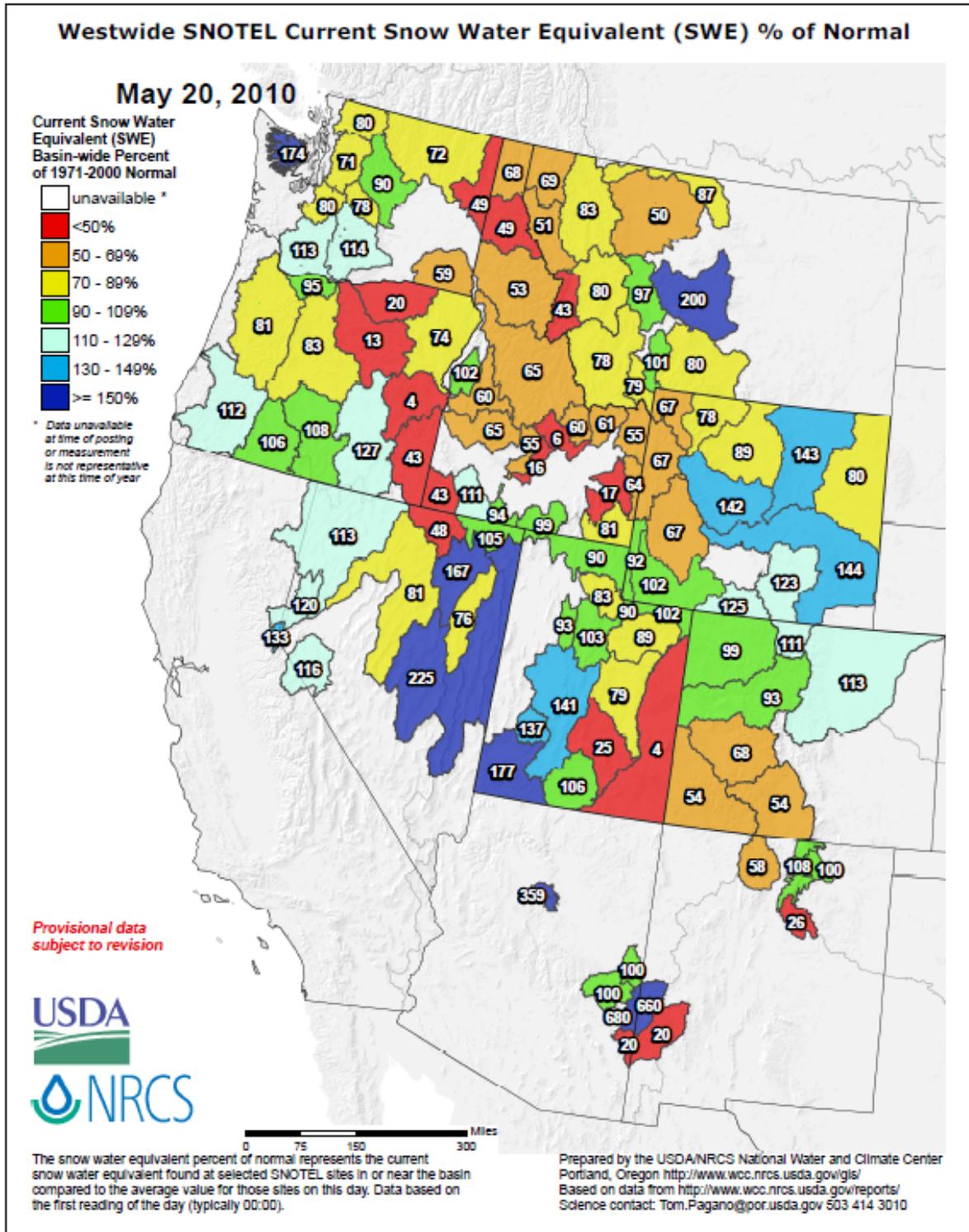
### FOR MORE INFORMATION

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

## Weekly Snowpack and Drought Monitor Update Report



**Fig. 1: SNOTEL Snow-Water Equivalent percent of normal values for 20 May 2010 shows a lot of basin to basin variability. Late season snowpack that is normally non-existent will result in skewed percentages. Clearly all but the Intermountain West (eastern Oregon and Idaho) is showing excessive late season snow pack.**

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

# Weekly Snowpack and Drought Monitor Update Report

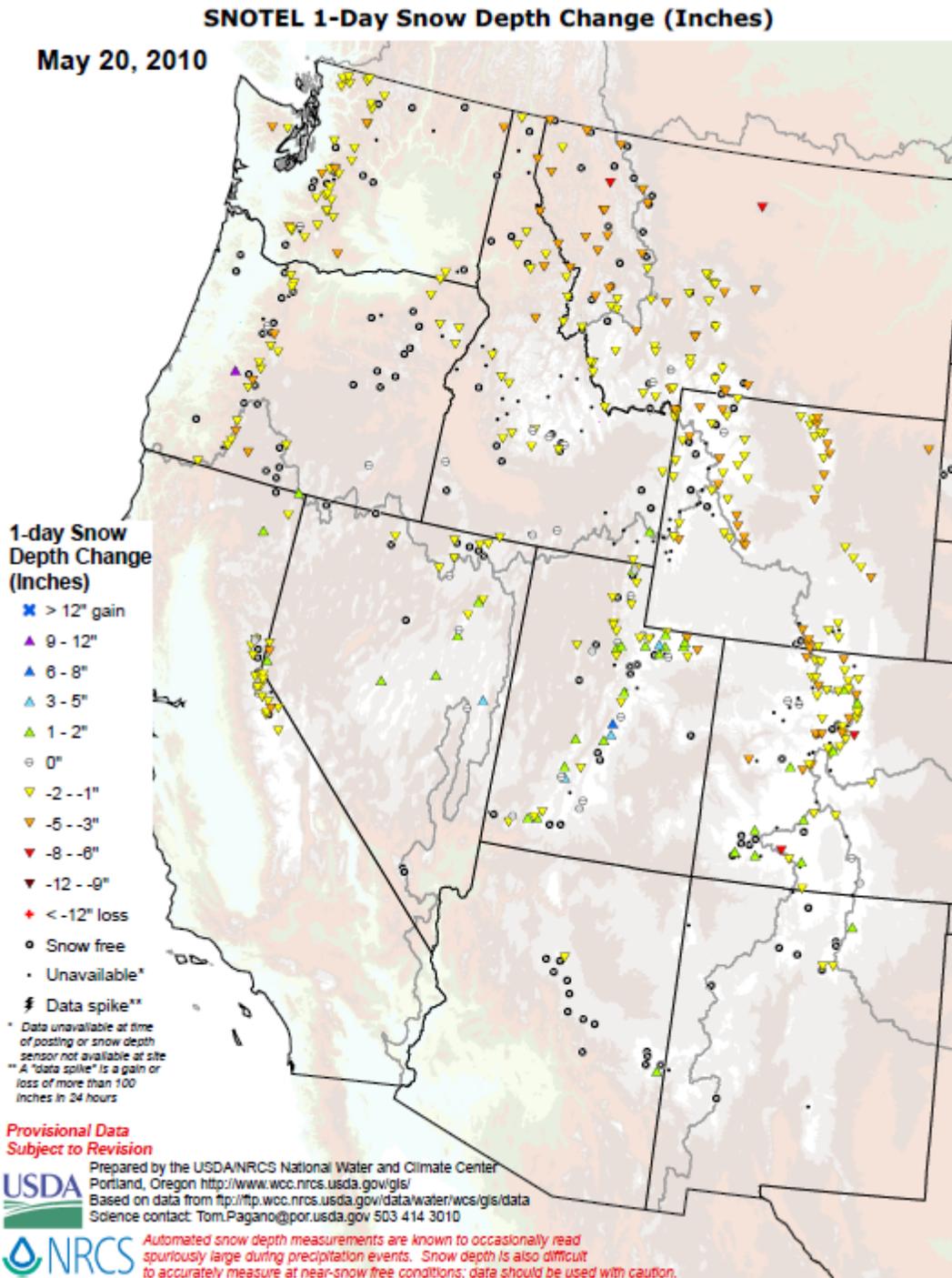
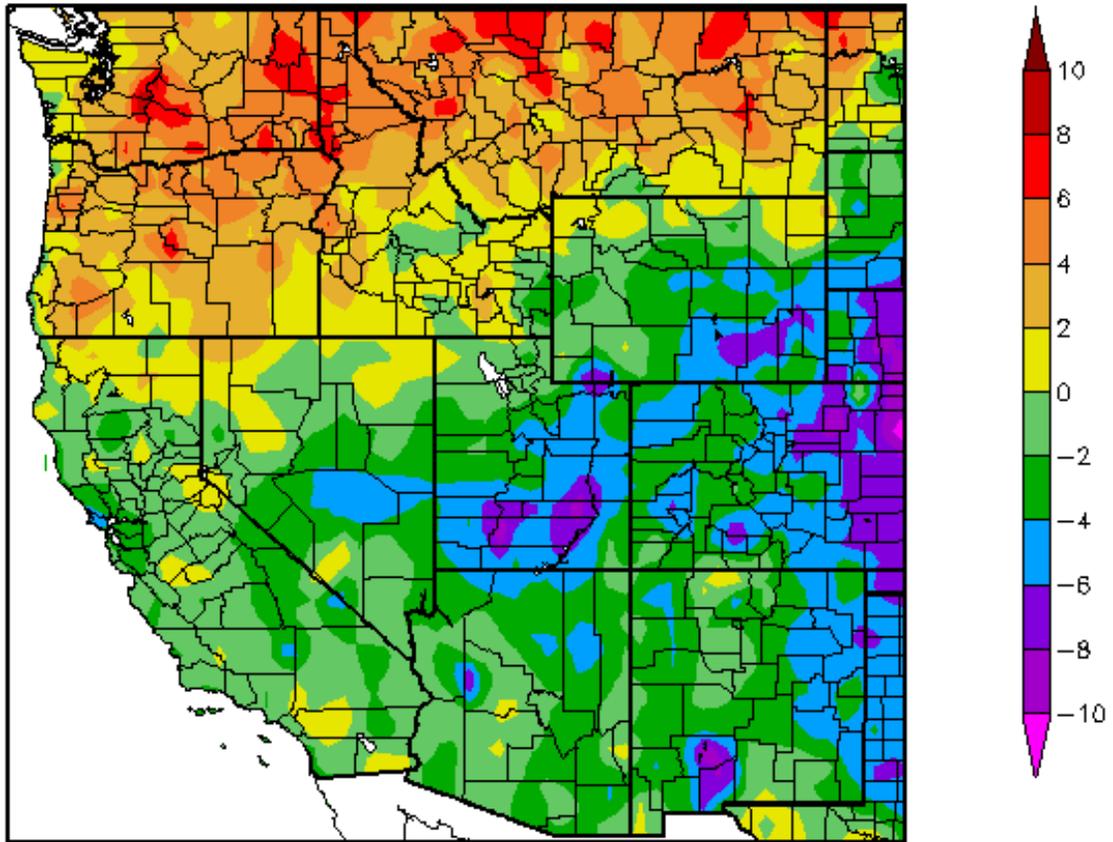


Fig. 1a: SNOTEL snow depth change for the past 24 hours reveals some increases across parts of the Utah and the Colorado Rockies.

Ref: [http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west\\_snowdepth\\_7ddelta.pdf](http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_snowdepth_7ddelta.pdf)

Departure from Normal Temperature (F)  
5/13/2010 – 5/19/2010



Generated 5/20/2010 at HPRCC using provisional data.

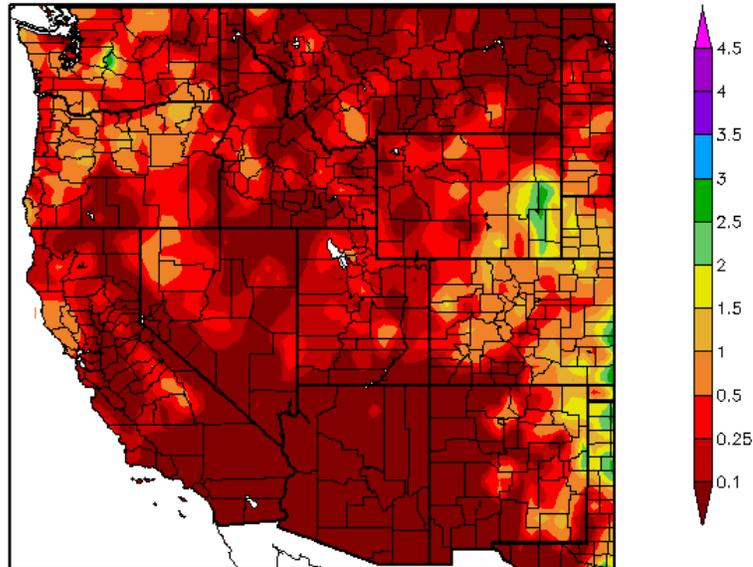
NOAA Regional Climate Centers

**Fig. 2: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over the central Washington (>+8°F) and the greatest negative departure occurred over the parts of southern Utah and northeastern Colorado (<-6F).**

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

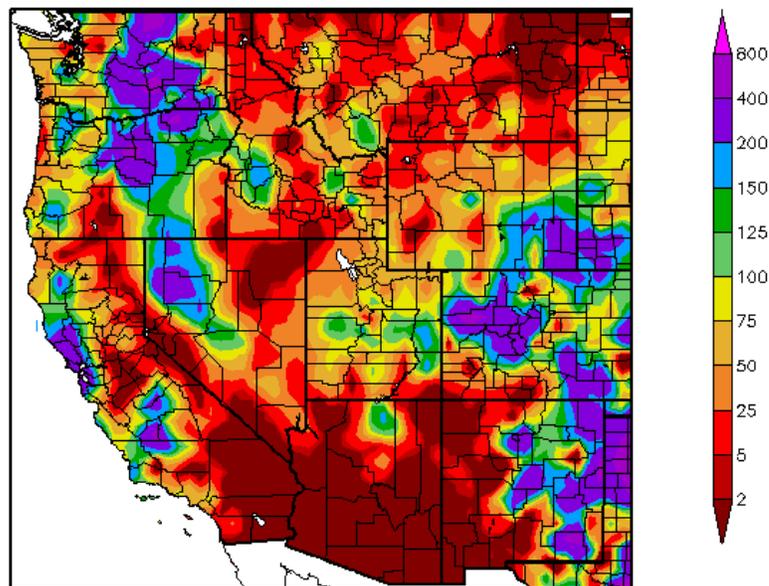
Precipitation (in)  
5/13/2010 - 5/19/2010



Generated 5/20/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)  
5/13/2010 - 5/19/2010



Generated 5/20/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 19 May shows the bulk of the heaviest precipitation falling over the Cascades and Front Range of the Rockies. In terms of percent of normal, much of the Pacific NW (excluding Idaho), coastal California, Colorado, and eastern Mexico experienced two to four times the normal precipitation this week. Exceptions dominated over parts of the Northern Tier States and southern California to western New Mexico.**  
Ref: <http://www.hprcc.unl.edu/maps/current/>

Weekly Snowpack and Drought Monitor Update Report

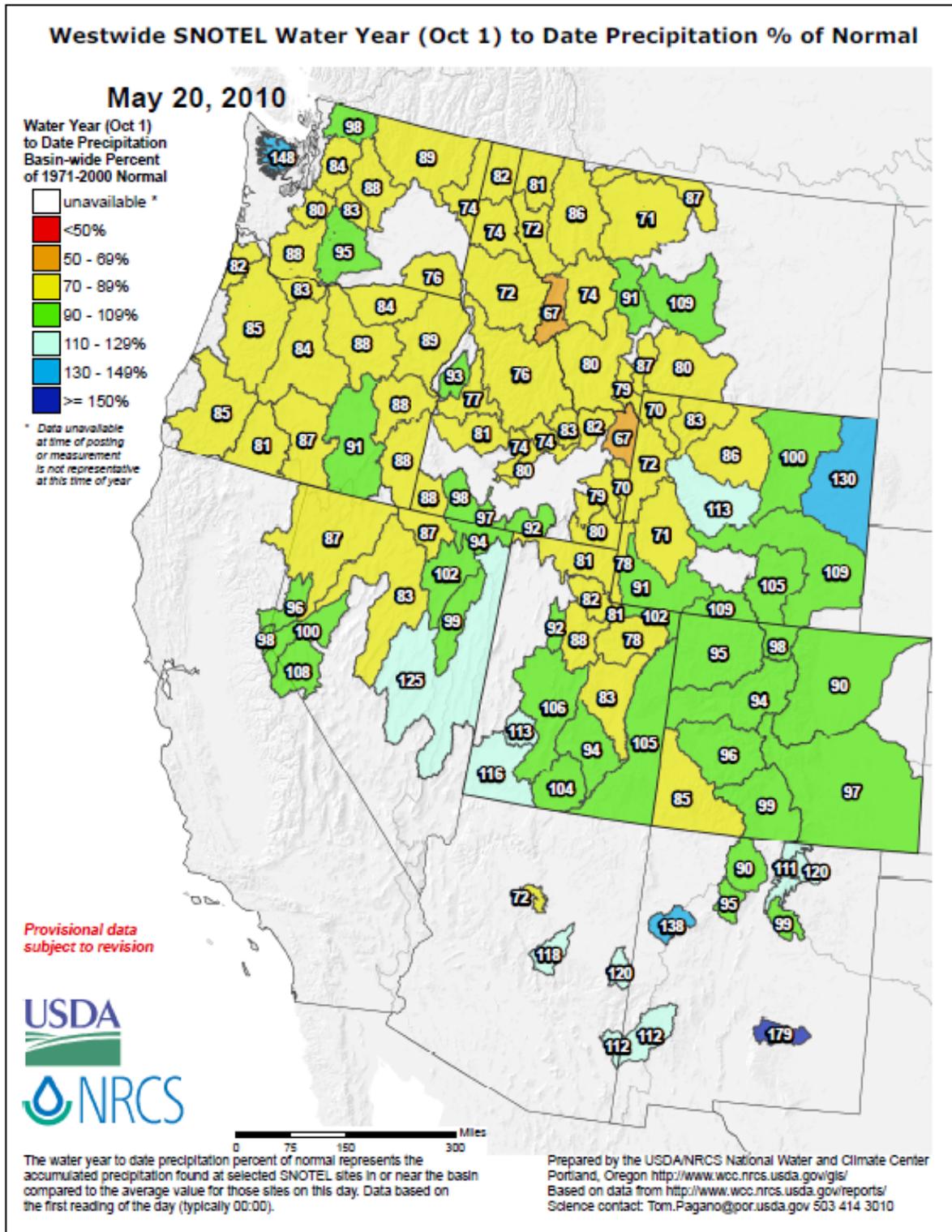
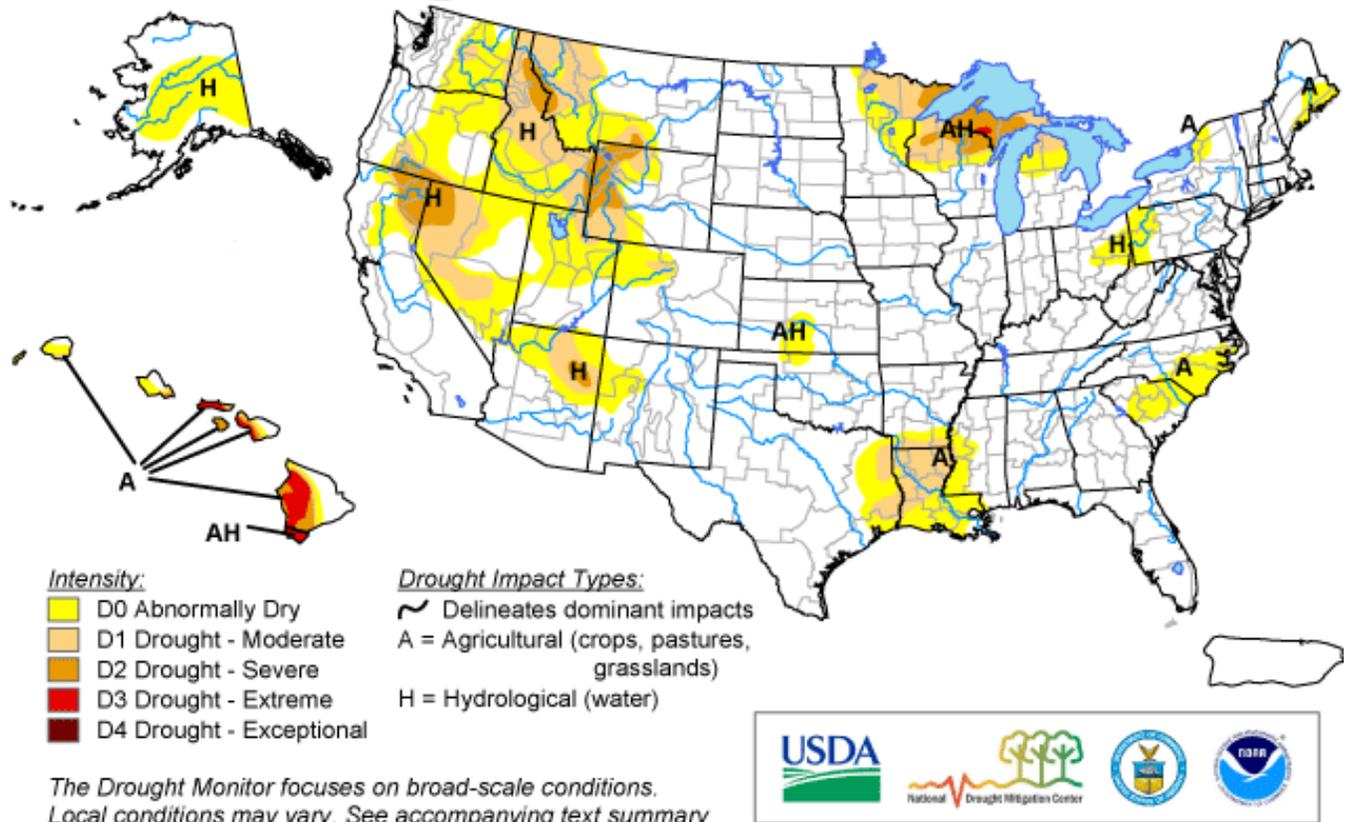


Fig 3b: For the 2010 Water-Year that began on 1 October 2009, Arizona, New Mexico, eastern Nevada, and northeast Wyoming have the largest surpluses while the northern interior and Pacific Northwestern States have the greatest deficits.

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

# U.S. Drought Monitor

May 18, 2010  
Valid 8 a.m. EDT



Released Thursday, May 20, 2010

Author: Eric Luebehusen, U.S. Department of Agriculture

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

Fig. 4: Current Drought Monitor weekly summary.

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

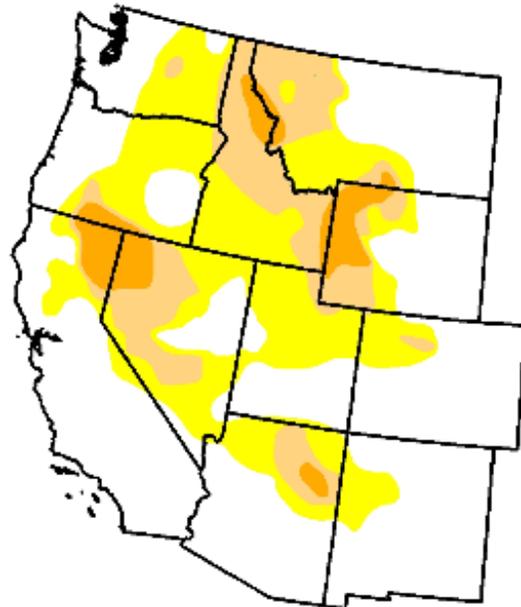
# U.S. Drought Monitor

## West

May 18, 2010  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	56.8	43.2	17.7	4.8	0.0	0.0
Last Week (05/11/2010 map)	50.7	49.3	18.6	4.9	0.0	0.0
3 Months Ago (02/23/2010 map)	34.1	65.9	21.6	3.9	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 (05/19/2009 map)	42.8	57.2	27.2	8.2	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, May 20, 2010**

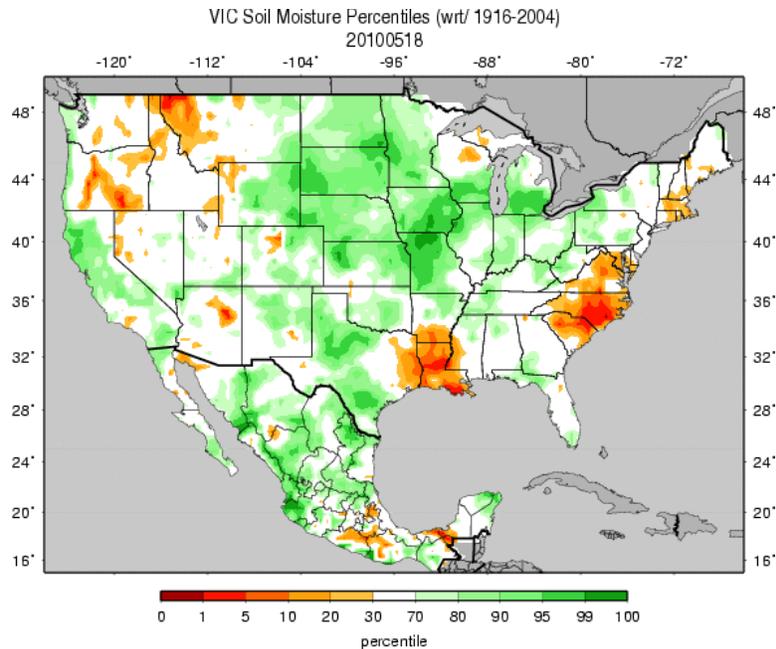
Author: Eric Luebehusen, U.S. Department of Agriculture

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

**Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. Regionally there were some improvements since last week.**

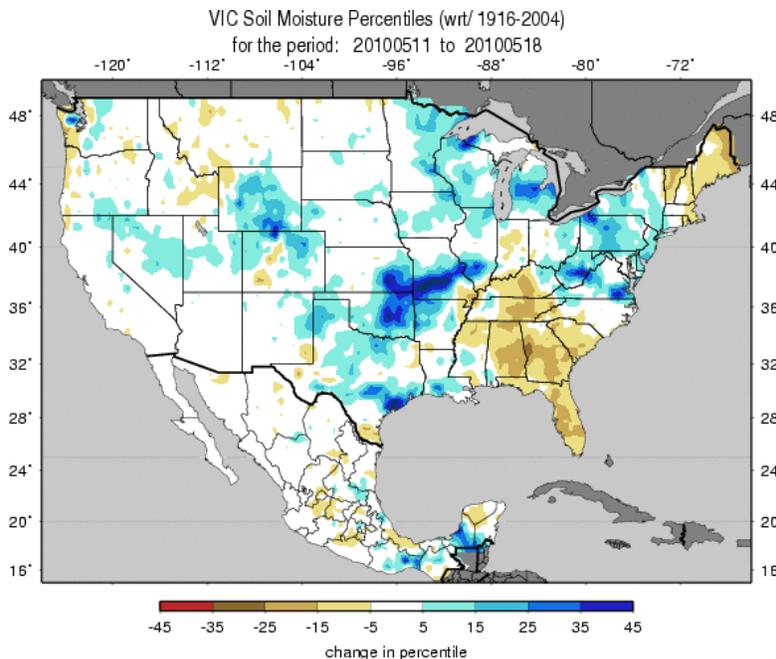
Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)

## Weekly Snowpack and Drought Monitor Update Report



**Figs. 5a:** Soil Moisture ranking in percentile based on 1916-2004 climatology as of 18 May. Excessive moisture and dryness patterns are generally mixed across the U.S with the worst conditions over Louisiana, Mid-Atlantic, and Northern Rockies and the best conditions over the Northern and Central Plains.

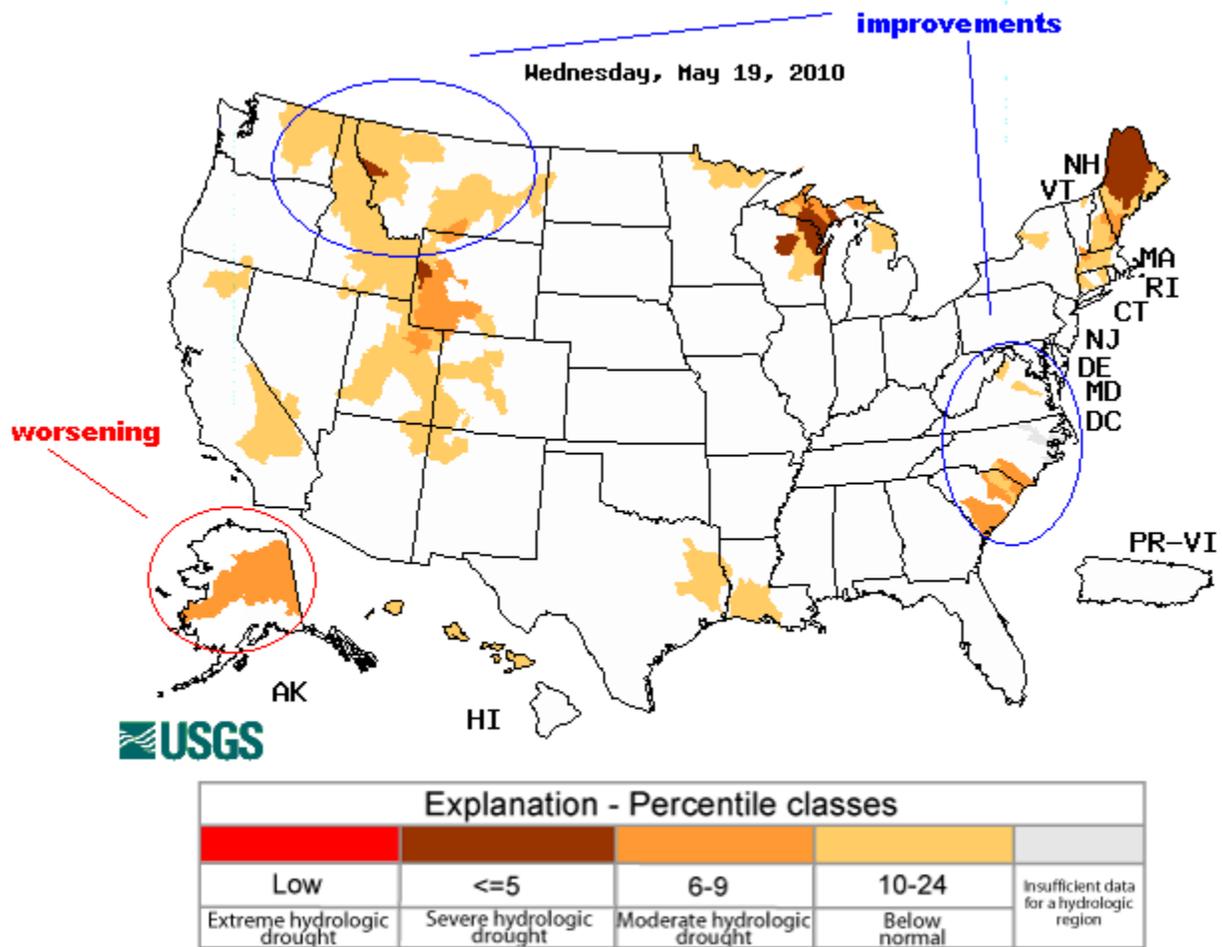
Ref: [http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm\\_qnt.gif](http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.gif)



**Figs. 5b:** Soil Moisture change in percentile based on 1916-2004 climatology for the week shows extreme moistening over the Mid-Mississippi River Valley, and parts of the Great Lakes, Mid-Atlantic, Wyoming Rockies, and southern Texas. A dry week dominated New England and the Southeast.

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



**Fig. 6:** Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Significant worsening of conditions is noted over the Alaska. Some improvements are noted over the Northern Rockies and Mid-Atlantic regions this week.

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

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary -- May 18, 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:** Cooler-than-normal conditions prevailed, with locally heavy rain in southern portions of the region contrasting with increasing dryness across eastern New England. Abnormal Dryness (D0) was introduced in eastern Maine, where declining soil moisture and streamflows were indicative of drier-than-normal weather since April. In fact, average streamflows have slipped below the 10th percentile over most of Maine. Meanwhile, widespread rain (locally more than 2 inches) soaked much of western Pennsylvania, West Virginia, and Ohio, alleviating Moderate Drought (D1) and reducing the coverage of D0. Lingering long-term deficits (last 365 days) persist in portions of Ohio and western Pennsylvania, indicating that Abnormal Dryness has not been completely erased from these areas.

**The Mid-Atlantic and Southeast:** Widespread showers were reported over most of the region, with 3 to locally more than 6 inches of rain tallied in the D0 (Abnormally Dry) areas of southern Virginia and western and northern North Carolina. Consequently, D0 was removed from much of the southern Mid-Atlantic, although 90-day precipitation deficits of 4 to 6 inches persist over South Carolina and southern North Carolina, where D0 was retained.

**Gulf Coast:** Showers returned to the central and western Gulf Coast, although pockets of dryness persisted inland. Heavy rainfall (3 to 8 inches) in southeastern Texas alleviated Abnormal Dryness (D0), while 1 to 3 inches of rain in the southern Delta provided some relief from Moderate Drought (D1). Rain bypassed areas along the northern Texas-Louisiana border; consequently, D1 was expanded in response to streamflows in the lowest 10th percentile as well as increasing precipitation deficits noted on numerous time scales. Despite generally beneficial rainfall over the past week, more precipitation will be needed to prevent the expansion and intensification of drought across Louisiana and eastern Texas, where 90-day rainfall deficits continue to average 8 inches or more (precipitation less than 50 percent of normal).

**Great Plains:** Locally heavy showers (up to 2 inches) in southwestern Oklahoma helped recharge stock ponds and alleviate lingering Abnormal Dryness (D0). Farther north, scattered showers in southern Kansas and north-central Oklahoma were sufficient to prevent any further expansion of D0 in this region, although precipitation deficits persist in the short and longer term.

**Upper Midwest:** Drought reduction in western portions of the region contrasted with expanding drought farther east. Moderate to heavy rain (0.5 to 2 inches) in northwestern Wisconsin and eastern Minnesota eased Moderate (D1) to Severe Drought (D2), although little if any rain fell on the D0 areas in Minnesota. Locally more than one inch of rain also eased Abnormal Dryness in central Michigan. Drought expanded and intensified in northeastern Wisconsin and the Upper Peninsula of Michigan, with Extreme Drought (D3) now noted along the Wisconsin-Michigan border. Numerous drought indicators - including streamflows, soil moisture, precipitation departures, and standardized precipitation indices (SPI) - point to rapidly deteriorating conditions across north-central Wisconsin and northern Michigan.

## Weekly Snowpack and Drought Monitor Update Report

**The West:** Late-season storminess continued over central and northern portions of the region, with locally heavy snowfall reported in eastern Nevada, central and northern Utah, and from north-central Wyoming into central Colorado. Of note, the May 11-12 spring storm dropped up to 38 inches of snow outside of Lander, Wyoming, with numerous high-elevation storm totals in excess of 30 inches. More remarkably, the state-wide snow water equivalent in Wyoming has jumped 27 percentage points since May 3rd, and stood at 104% of normal as of May 17. Consequently, widespread reductions were made in the drought coverage and intensity in central Wyoming. Despite the stormy weather, most western Severe Drought (D2) areas missed out on the precipitation, with only minor reductions made in the highest-precipitation areas (1 to 3 inches liquid equivalent) in south-central Montana. Minor reductions in drought coverage were made in California and southern Oregon, where updated streamflows, soil moisture, precipitation departures, and standardized precipitation indices indicated improving conditions. The same held true in southern California, southern Arizona, and southwestern New Mexico, where reassessment based on updated drought indices led to the removal of D0 in these areas.

**Hawaii, Alaska and Puerto Rico:** In Hawaii, rapidly dropping reservoir levels due to dry, warm conditions led to the introduction of Severe Drought (D2) in eastern Oahu. In Alaska, warm, showery weather (precipitation totaling locally more than an inch) kept D0 from expanding, although snow water equivalents are still averaging less than 30 percent of normal over south-central Alaska. In Puerto Rico, moderate to heavy showers (2-6 inches, locally more) were reported across much of the island, maintaining favorable streamflows and soil moisture.

**Looking Ahead:** A slow-moving storm system will generate locally heavy showers across the central U.S., but rain will largely bypass drought areas of the Upper Midwest. Showers from this system will reach the East Coast States over the weekend, although rain will be generally light across the Southeast and lower Delta. Meanwhile, a pronounced southward dip in the jet stream will bring cold, unsettled weather to much of the West, with potentially heavy rain and mountain snow from the northern High Plains westward into the northern Rockies and Northwest.

The CPC 6-10 day forecast (May 25–29) calls for above-normal temperatures over most of the central and eastern U.S., with below-normal temperatures expected west of the Rockies. Wetter-than-normal weather is anticipated across northern portions of the Plains, Rockies, and Pacific Coast States, while drier-than-normal conditions prevail across the Northeast and southern Plains.

**Author:** [Eric Luebehusen, United States Department of Agriculture](#)

### 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 May 19, 2010