



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

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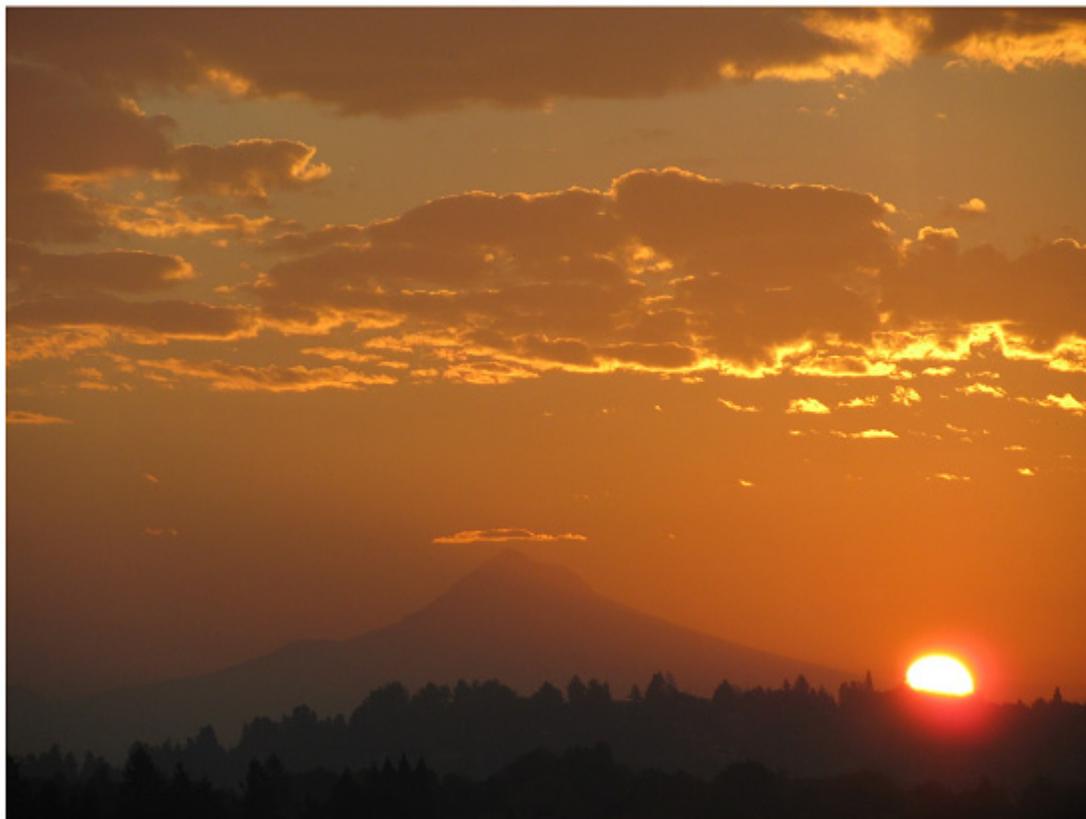
**Weekly Report - Snowpack / Drought Monitor Update**

**Date: 21 October 2010**

### **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Temperature:** SNOTEL 7-day average temperature departure from normal map shows temperatures up to 10°F above normal over Wyoming and southwest Montana and to a lesser extent above the long-term average for the remainder of the West (Fig. 1). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over parts of the southern Nevada and southern California (>+10°F) and the greatest negative departures occurred over Coastal Oregon (<-4°F) (Fig. 1a).

**Precipitation:** ACIS 7-day average precipitation amounts for the period ending 20 October shows the bulk of the heaviest precipitation confined to southern California and southern Nevada (Fig. 2). In terms of percent of normal, heavier precipitation occurred over these same areas including southwest Montana (Fig. 2a). For the new 2011 Water-Year that began on 1 October 2010, statistics are skewed to the extreme as noted by exceptionally large and small percentages. These values will be more meaningful in the coming weeks. Use this figure with caution (Fig. 2b).



**Sunrise over Mt Hood this morning. Photo Taken by Jim Marron, NRCS.**

## Weekly Snowpack and Drought Monitor Update Report

### WESTERN DROUGHT STATUS

**The West:** Due to the fact that the 2010-2011 Water Year is still young, there were no changes made to the drought designation over the West. Nevertheless, beneficial rain (locally more than an inch) was observed in southeastern Nevada and northwestern Arizona, helping to boost 7-day average streamflows. Lighter showers (less than 0.50 inch) also developed in Utah and north-central Colorado. At week's end, a slow-moving Pacific storm was generating showers from southern California into southern portions of the Four Corners Region. Temperatures averaged up to 7 degrees F above normal, with 90-degree heat preceding the storm's arrival in central and southern California. Given the ongoing La Nina (and the associated dry correlation in the western U.S.), close attention will need to be given to the evolution of the Western wet season over the next several months. 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. 3 and 3a).

### 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.

## 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/ JEFF GOEBEL  
Acting Director, Resource Inventory Division

## Weekly Snowpack and Drought Monitor Update Report

### SNOTEL (solid) 7-Day Average Temperature Anomaly (Degrees F) Oct 21, 2010

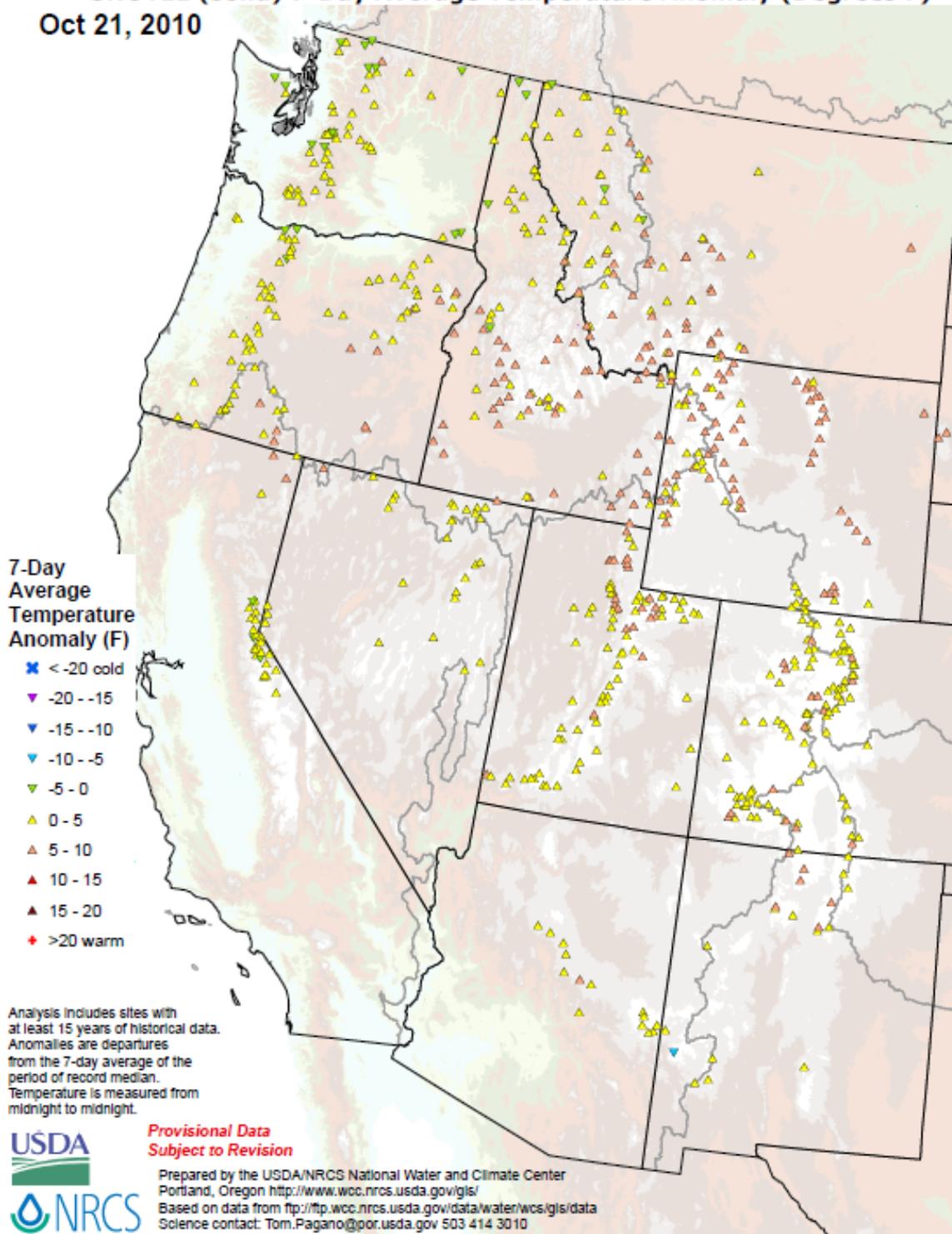
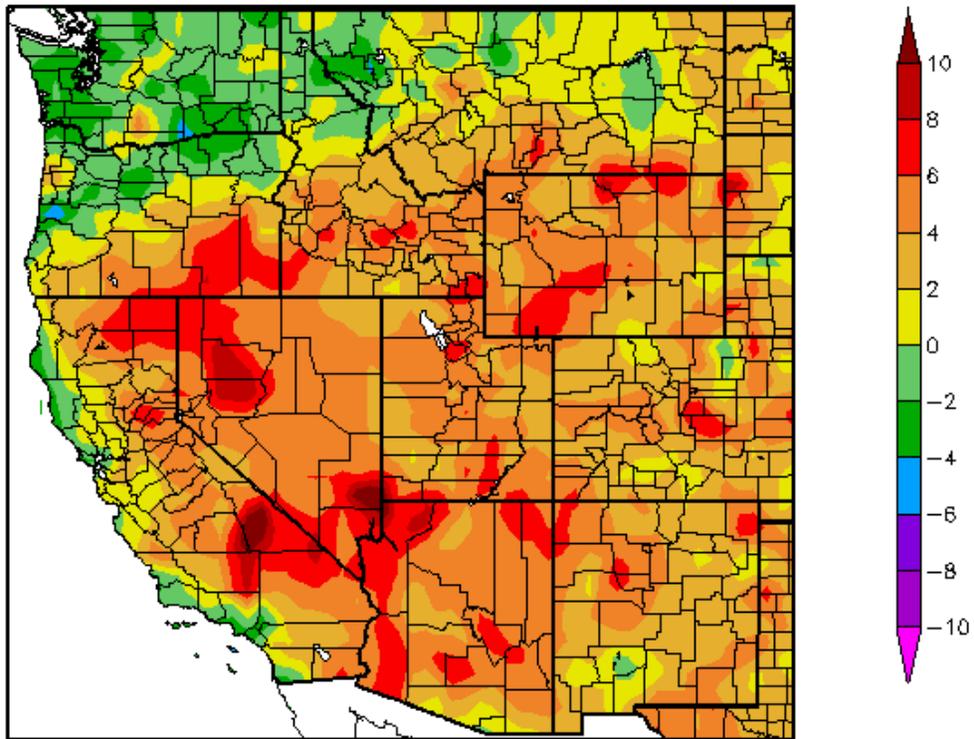


Fig. 1: SNOTEL 7-day average temperature departure from normal map shows temperatures up to 10°F above normal over Wyoming and southwest Montana and to a lesser extent above the long-term average for the remainder of the West.

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

Departure from Normal Temperature (F)  
10/14/2010 - 10/20/2010



Generated 10/21/2010 at HPRCC using provisional data.

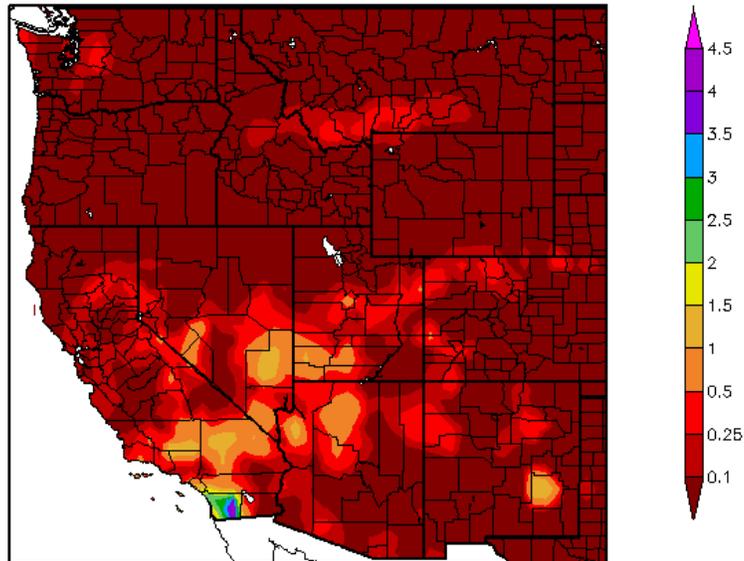
Regional Climate Centers

**Fig. 1a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over parts of the southern Nevada and southern California (>+10°F) and the greatest negative departures occurred over Coastal Oregon (<-4°F).**

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

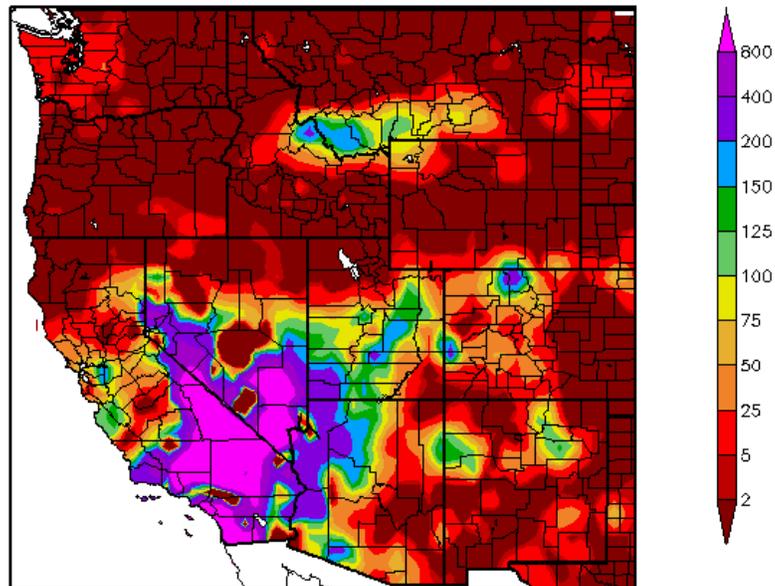
Precipitation (in)  
10/14/2010 - 10/20/2010



Generated 10/21/2010 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)  
10/14/2010 - 10/20/2010



Generated 10/21/2010 at HPRCC using provisional data.

Regional Climate Centers

**Fig. 2 and 2a: ACIS 7-day average precipitation amounts for the period ending 20 October shows the bulk of the heaviest precipitation confined to southern California and southern Nevada (Fig. 2). In terms of percent of normal, heavier precipitation occurred over these same areas including southwest Montana (Fig. 2a).**

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

Weekly Snowpack and Drought Monitor Update Report

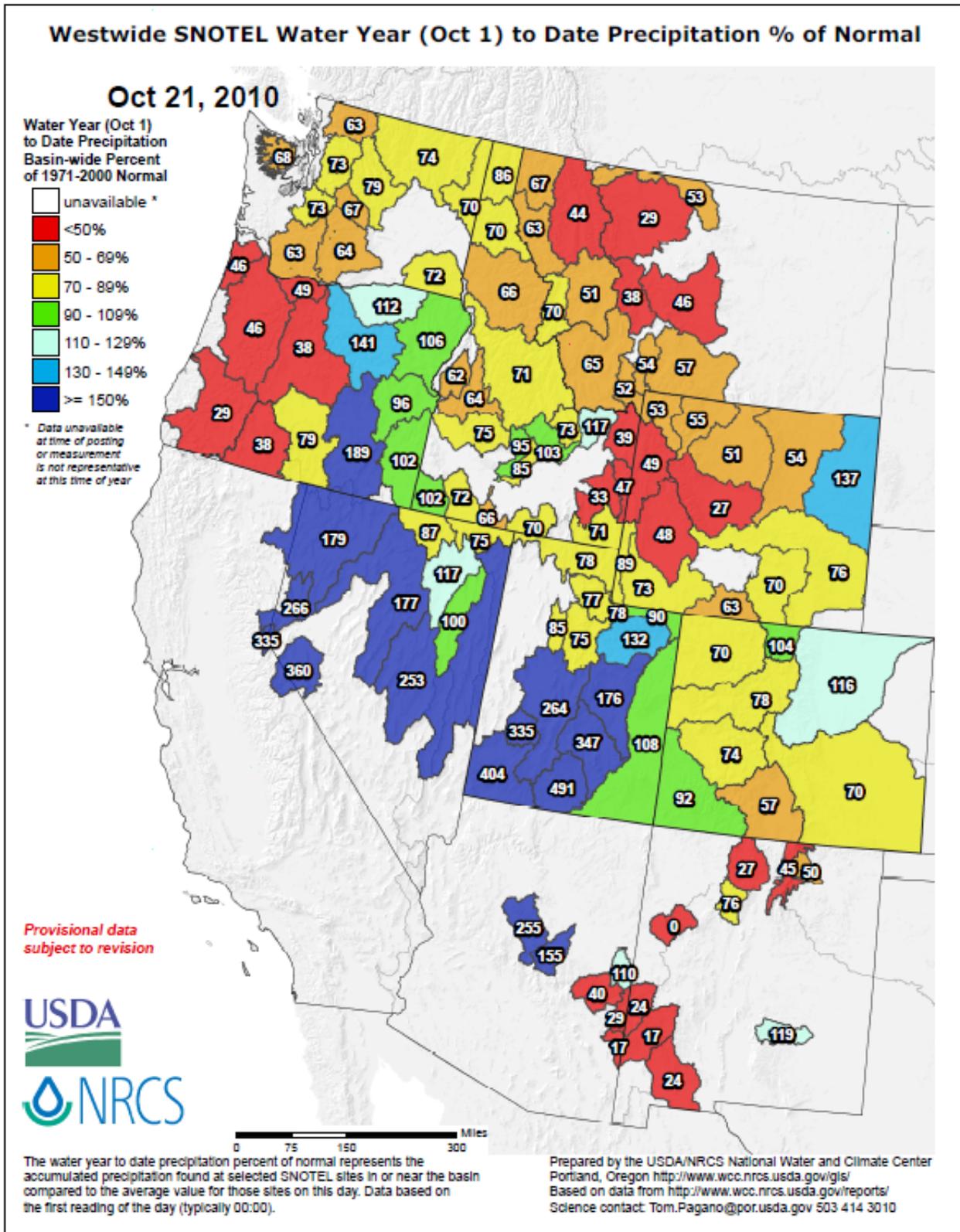


Fig 2b: For the new 2011 Water-Year that began on 1 October 2010, statistics are skewed to the extreme as noted by exceptionally large and small percentages. These values will be more meaningful in the coming weeks. Use this figure with caution!

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

# U.S. Drought Monitor

October 19, 2010  
Valid 8 a.m. EDT

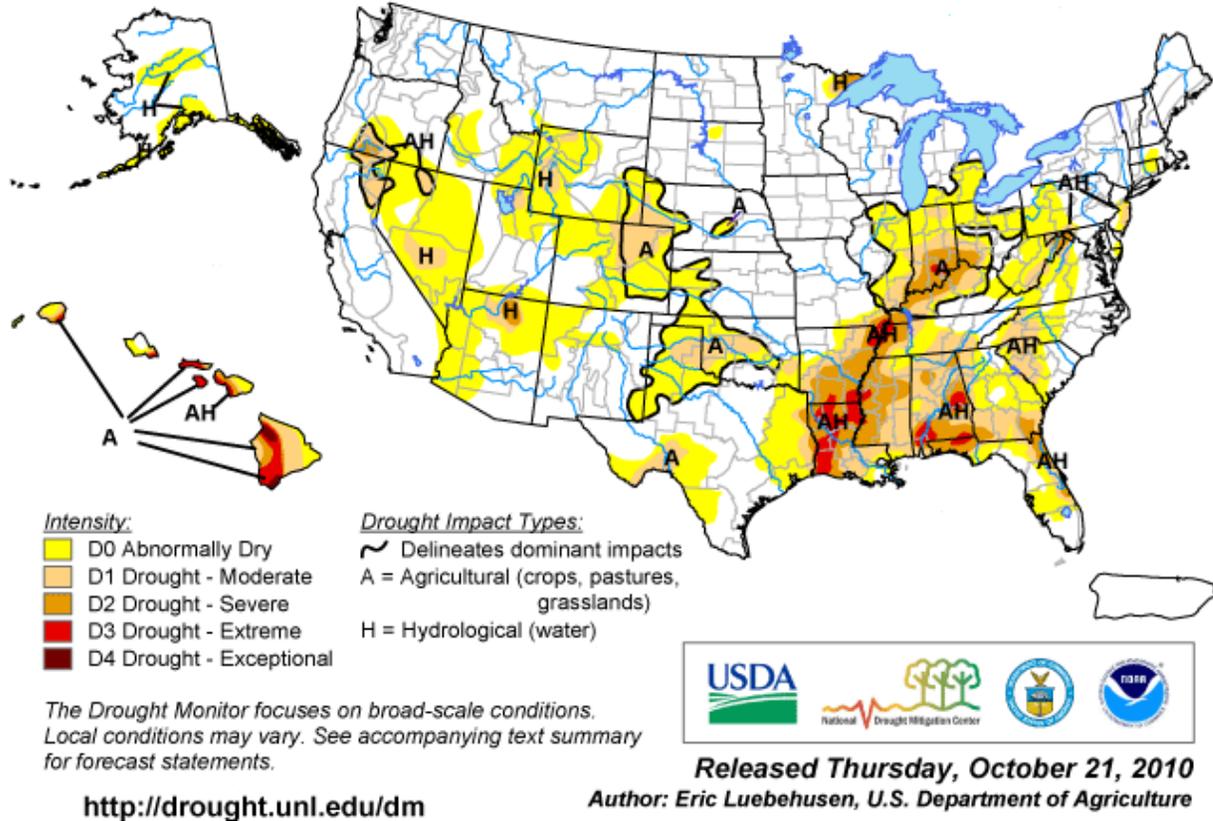


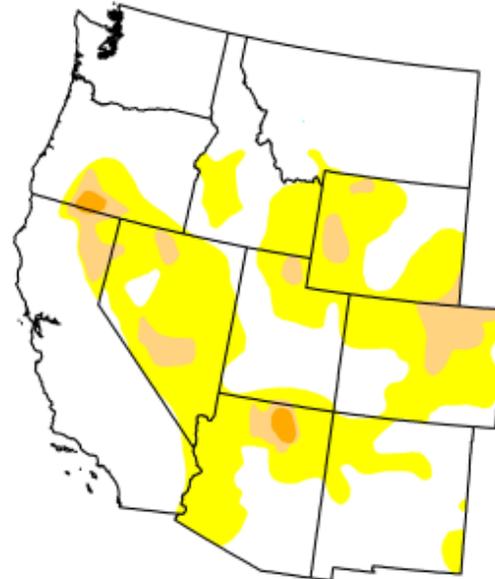
Fig. 3: Current Drought Monitor weekly summary. Hawaii is only state that has a D4 drought level. D3 levels dominate northern Louisiana, western Tennessee, and southeastern Alabama.  
Ref: <http://www.drought.unl.edu/dm/monitor.html>

# U.S. Drought Monitor West

October 19, 2010  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	62.3	37.7	6.0	0.6	0.0	0.0
Last Week (10/12/2010 map)	62.5	37.5	5.5	0.6	0.0	0.0
3 Months Ago (07/27/2010 map)	71.3	28.7	9.2	0.7	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 (10/05/2010 map)	62.5	37.5	8.4	0.6	0.0	0.0
One Year Ago (10/20/2009 map)	47.0	53.0	22.8	9.1	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>

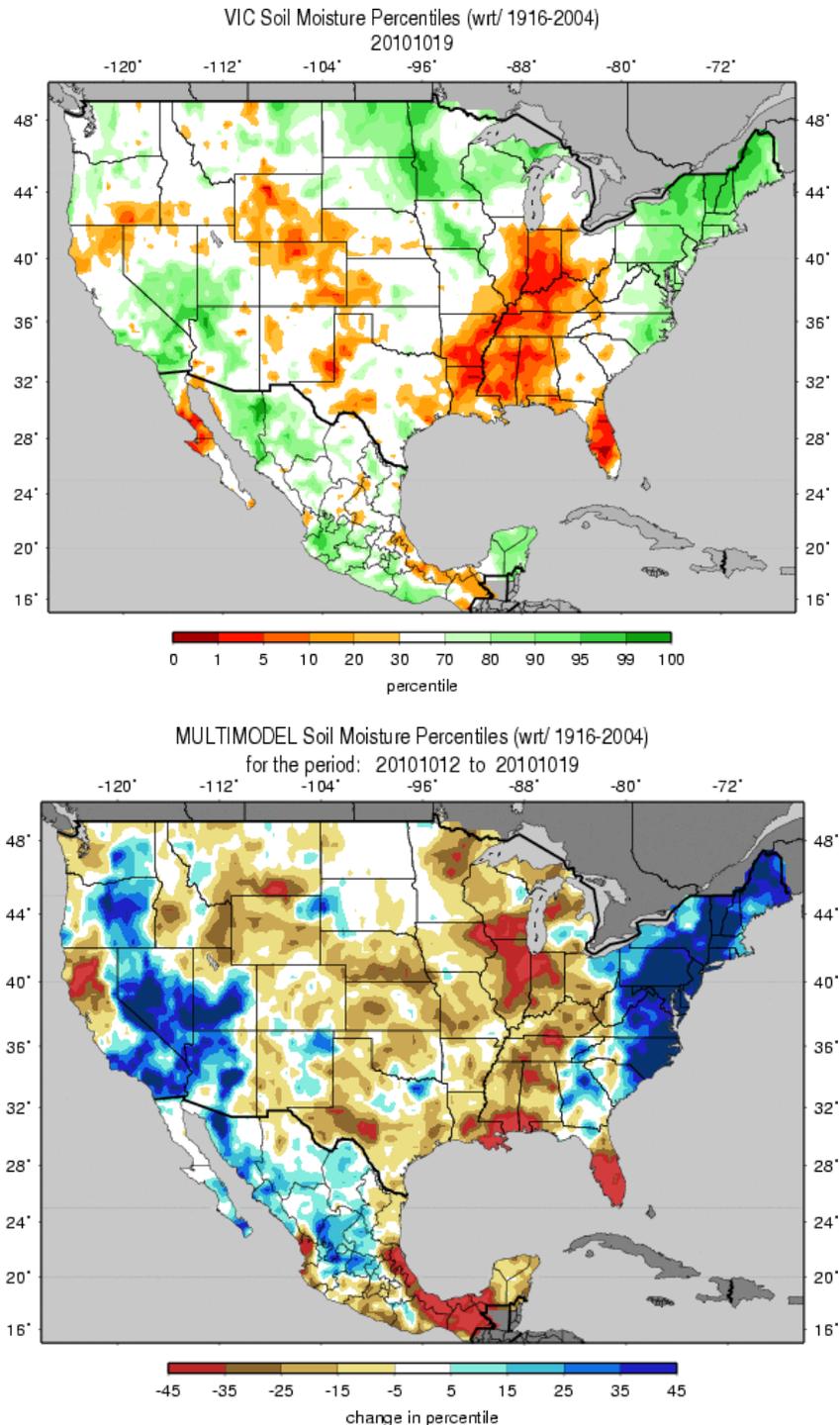


**Released Thursday, October 21, 2010**  
Author: Eric Luebehusen, U.S. Department of Agriculture

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

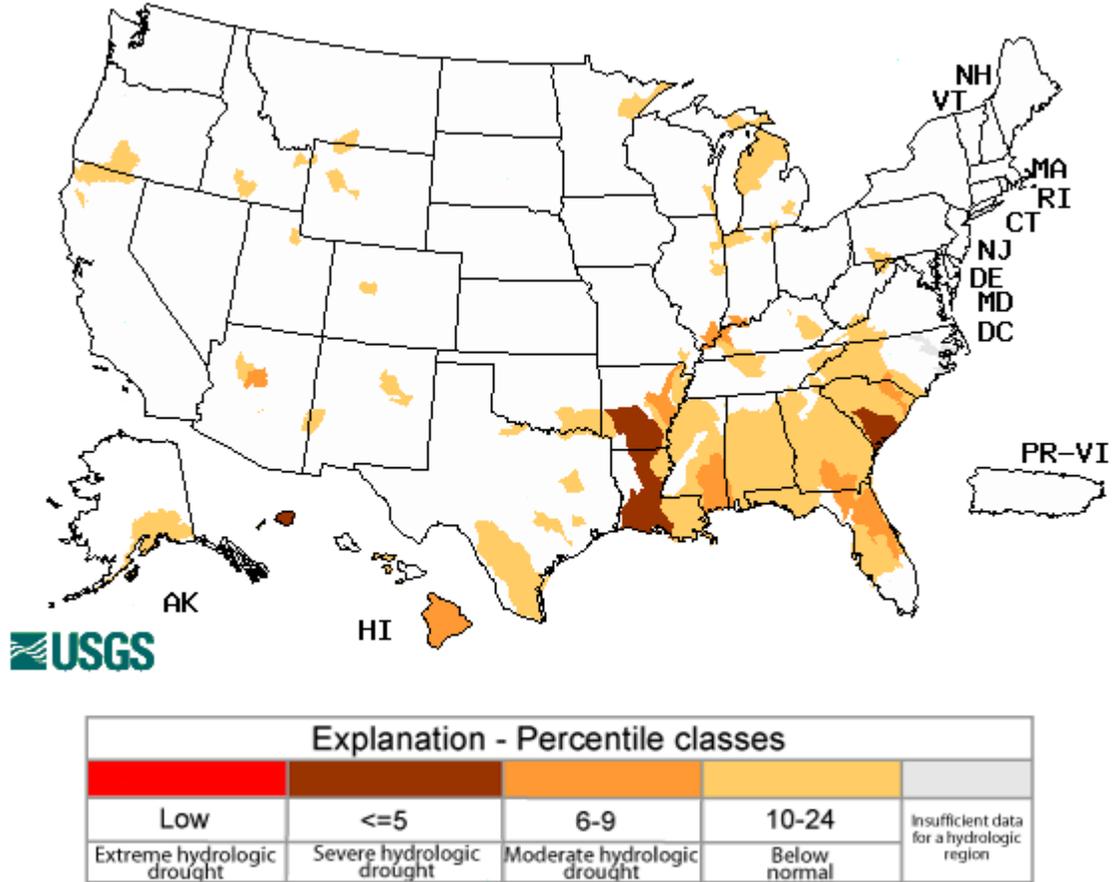


**Figs. 4a and 4b: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 19 October. Excessive moisture dominates over the Northern High Plains and New England. Dry soils have spread and intensive across the eastern third of the Nation (Fig. 4a). During the past week, moisture has increased over the eastern third of the US (except for Florida) and across the Great Basin and southern California and Arizona (Fig. 4b).**

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)

# Weekly Snowpack and Drought Monitor Update Report

Wednesday, October 20, 2010



**Fig. 5:** Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Clearly, the Lower Mississippi River region is experiencing the severest flows this week while South Carolina has now entered the severe category status.

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

# Weekly Snowpack and Drought Monitor Update Report

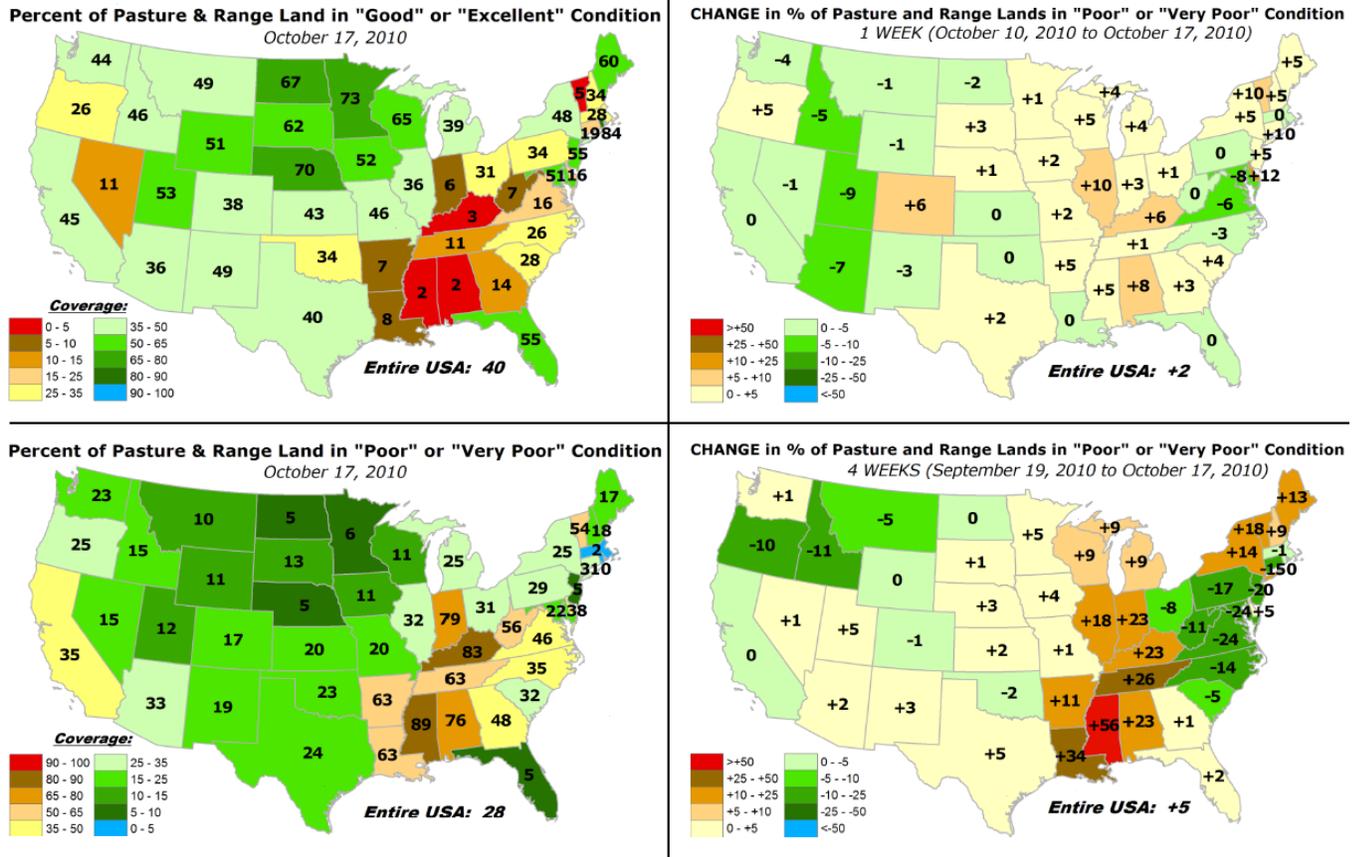


Fig. 6: Pasture and range lands are in good shape for all but Nevada and Oregon this week (upper left). During the past week, Colorado slipped 6 percentage points while Utah improved 9 percent in the total poor or very poor categories (upper right).

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary -- October 19, 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/>.*

**Overview:** Additional relief from lingering drought in the Northeast contrasted with worsening conditions across much of the South.

**The Northeast and Mid-Atlantic:** An intensifying area of low pressure brought locally heavy rain (1-3 inches) to New England. Consequently, the lingering Moderate Drought (D1) was removed, while Abnormal Dryness (D0) was reduced to a small area centered on central Massachusetts, where 90-day precipitation deficits in excess of 3 inches still exist. Farther south, Moderate Drought and Abnormal Dryness also decreased in New Jersey and along the Delmarva Coast in response to moderate to heavy showers (0.75-1.50 inches), although 90-day rainfall is still locally more than 5 inches below the norm in central New Jersey. There was no change to the current drought depiction across the remainder of the Mid-Atlantic region.

**Midwest:** Across eastern portions of the Corn Belt, varying degrees of drought persisted with limited relief. A narrow band of locally heavy showers (up to 2 inches) provided isolated relief from Abnormal Dryness in west-central Ohio. Elsewhere, generally dry weather prevailed. An area of Moderate Drought (D1) was introduced in northeastern Indiana to account for 90-day precipitation values less than 30 percent of normal. 7-day average streamflows in this area are mostly below the 15th percentile. Meanwhile, the drought designation was increased and/or expanded along the Ohio River and environs, as numerous drought indices (Streamflows, Standardized Precipitation Indices, Soil Moisture, etc) indicated intensifying drought. In the core Severe and Extreme Drought (D2-D3) areas, 90-rainfall deficits are routinely in excess of 8 inches, with some areas in southern Indiana approaching 9 inches below normal.

**The Southeast:** Mostly dry weather prevailed, although beneficial showers (locally more than an inch) were observed in central and northeastern portions of North Carolina. Elsewhere, increasingly dry conditions led to the expansion of D0 (Abnormal Dryness) and Moderate Drought (D1) in north-central North Carolina, where 7-day average streamflows are consistently below the 20th percentile. The past 60 days have presented two vastly differing scenarios in the Carolinas, with locally heavy rain in coastal areas contrasting with deficits in excess of 6 inches in the core D1 area of North and South Carolina.

**Eastern Gulf Coast:** Mostly dry, albeit cooler-than-normal weather (up to 4 degrees F below normal) prevailed across eastern portions of the region. In eastern Florida, soil moisture and 7-day average streamflows dipped below the 10th percentile in the expanded Severe Drought (D2) area, with 2-month rainfall 20 percent of normal or less in some areas (locally more than 8 inches below normal). In southern Florida, Abnormal Dryness was likewise expanded to account for the declining streamflows and increasing precipitation deficits. From the northern Florida Panhandle into Alabama, the drought designation was expanded or increased in many areas to reflect declining soil moisture, low streamflows, and below-normal rainfall. In the D3

## Weekly Snowpack and Drought Monitor Update Report

(Severe Drought) areas, precipitation over the past 90 days has averaged 20 to 40 percent of normal, with deficits locally in excess of 8 inches. Streamflows and soil moisture are likewise in the 20th percentile or lower in these areas.

**Delta:** Despite beneficial showers earlier in the month, the drought designation remained the same or increased from Louisiana into western Tennessee and the Missouri Bootheel. In southwestern Louisiana, D3 (Extreme Drought) was expanded to the Gulf Coast to reflect reports from the field as well as precipitation totals averaging 30 percent of normal over the past 3 months (deficits in excess of 8 inches). Farther north, historically low streamflows coupled with increasing precipitation departures in the short and long term led to an expansion of Moderate to Extreme Drought (D1-D3) from northern Louisiana into western Tennessee and the Missouri Bootheel. In this region, precipitation is running locally more than 12 inches below normal over the past 6 months, with shorter-term departures (90 days) of 9 inches or more. Soil moisture and Standardized Precipitation Indices (SPI) on multiple timescales not only support the current drought designation, but imply that conditions may worsen if rain does not arrive soon.

**Texas & Oklahoma:** Scattered, locally heavy showers (up to 2 inches) in northeastern Oklahoma prevented further expansion of Abnormal Dryness into this portion of the state. Farther south, additional assessment of early week showers (1-2 inches) in eastern Texas led to modest reduction of Moderate and Severe Drought areas (D1 and D2) along the Louisiana border. Meanwhile, increasingly dry conditions prevailed in southern Texas, where Moderate Drought (D1) was introduced to correspond with 90-day precipitation departures between 4 and 7 inches. Farther north, Abnormal Dryness and Moderate Drought (D0 and D1) were expanded to likewise account for increasingly dry soil moisture, which has dropped below the 20th percentile from the Texas Panhandle into central Oklahoma as winter wheat is becoming established (41 and 51 percent emerged as of October 17 in Texas and Oklahoma, respectively).

**Central Plains:** In Kansas and central Nebraska, a modest increase in Abnormal Dryness was in response to declining soil moisture and short-term dryness (less than 40 percent of normal precipitation over the past 90 days). Meanwhile, a more significant change was made from northeastern Colorado into western Nebraska, where rainfall over the past 2 months has been largely absent. In particular, the 3-month Standardized Precipitation Index (SPI) was below the 20th percentile over much of western Nebraska and northeastern Colorado. Soil moisture will be needed for winter crop establishment, with winter wheat more than 50 percent emerged as of October 17 in Colorado (73 percent), Nebraska (81 percent), and Kansas (50 percent emerged).

**The West:** Due to the fact that the 2010-2011 Water Year is still young, there were no changes made to the drought designation over the West. Nevertheless, beneficial rain (locally more than an inch) was observed in southeastern Nevada and northwestern Arizona, helping to boost 7-day average streamflows. Lighter showers (less than 0.50 inch) also developed in Utah and north-central Colorado. At week's end, a slow-moving Pacific storm was generating showers from southern California into southern portions of the Four Corners Region. Temperatures averaged up to 7 degrees F above normal, with 90-degree heat preceding the storm's arrival in central and southern California. Given the ongoing La Nina (and the associated dry correlation in the western U.S.), close attention will need to be given to the evolution of the Western wet season over the next several months.

## Weekly Snowpack and Drought Monitor Update Report

**Hawaii, Alaska and Puerto Rico:** In Hawaii, mostly dry conditions maintained Exceptional Drought (D4) on Maui and the Big Island. In Alaska, cool, mostly dry weather prevailed over the Abnormally Dry (D0) areas, while rain was reported in the southeastern portions of the state. In Puerto Rico, locally heavy rain (greater than 6 inches) fell across the western half of the island, while lower streamflows and short-term dryness was noted on the eastern third of the island.

**Looking Ahead:** Increasingly stormy weather is anticipated across much of the nation. A disturbance in the Four Corners region will move slowly northeast into the Corn Belt, generating beneficial showers from southern portions of the Rockies and Plains into the Upper Midwest. A trailing cold front may touch off some much-needed shower activity in the Delta over the weekend. Meanwhile, a second, more potent Pacific storm will bring rain and mountain snow to the northwestern quarter of the nation over the weekend, with precipitation from this system reaching the northern Plains early next week. Despite the stormy weather pattern, mostly dry conditions will prevail over the Southeast, although there are some preliminary indications that beneficial rainfall will arrive next week.

The CPC 6-10 day forecast (October 26-30) calls for near- to above-normal precipitation across much of the U.S., with drier-than-normal conditions confined to eastern Alaska and from eastern portions of Oklahoma and Texas into the Delta. Near- to above-normal temperatures are expected nation-wide, except for California and Nevada, where cooler-than-normal weather is anticipated.

**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 October 20, 2010