



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

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**Weekly Report - Snowpack / Drought Monitor Update**      **Date: 2 October, 2008**

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Temperature:** SNOTEL and ACIS-day station average temperature anomalies were highest (positive departures) over California and Utah and lowest (negative departures) over the Pacific Northwest and Northern Rockies (Fig. 1). Specifically, the greatest positive temperature departures occurred over Utah (>+8F) and the greatest negative departures occurred over Southern New Mexico (<-2F) (Fig. 1a). For the 2008 Water Year (October 1, 2007 – September 30, 2008), temperatures were generally below normal over the Pacific NW, Intermountain West, Great Basin and Central Rockies and above normal over the Southwest and much of California (Fig 1b).

**Precipitation:** Preliminary precipitation totals for the 7-day period ending 1 October shows scattered areas of heavy precipitation over portions of Nevada, Arizona, and Colorado while dry conditions prevail over much of the remainder of the West (Fig. 2).

SNOTEL seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2008 Water Year that began on October 1, 2007 (Fig 2a) shows above normal totals over northeastern Wyoming, parts of the Snake and Columbia River Basins in Washington and Idaho, and over parts of Arizona, New Mexico and Colorado. Parts of Nevada, southwest Utah, and Idaho are experiencing significant shortfalls. For lower elevations, precipitation was generally below normal over much of the West excluding scattered regions over the Rockies, southern Arizona and New Mexico (Fig 2b). For precipitation totals, departures, and percent of normal for several time periods see: <http://water.weather.gov/>.

## **WESTERN DROUGHT STATUS**

**The West:** There were a few areas that received rainfall amounts of a few tenths, with an inch or more falling in northwest Washington. But generally the week was dry. No change was made to the depiction in the West. (Author: Richard Heim, National Climatic Data 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, 3b, and 3c).

## 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).

### OBSERVED FIRE DANGER CLASS

The National Interagency Coordination Center provides a variety of products that describe the current wildfire status for the U.S. - [http://activefiremaps.fs.fed.us/lq\\_fire2.php](http://activefiremaps.fs.fed.us/lq_fire2.php). The latest Observed Fire Danger Class is shown in Figs. 5 shows the current active wildfires across the West - <http://geomac.usgs.gov/>.

### U.S. HISTORICAL STREAMFLOW

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.  
[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).

### 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/cgibin/bor.pl>. Additional information describing the products available from the Drought Monitor can be found at the following URL: <http://drought.unl.edu/dm/>

### 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>

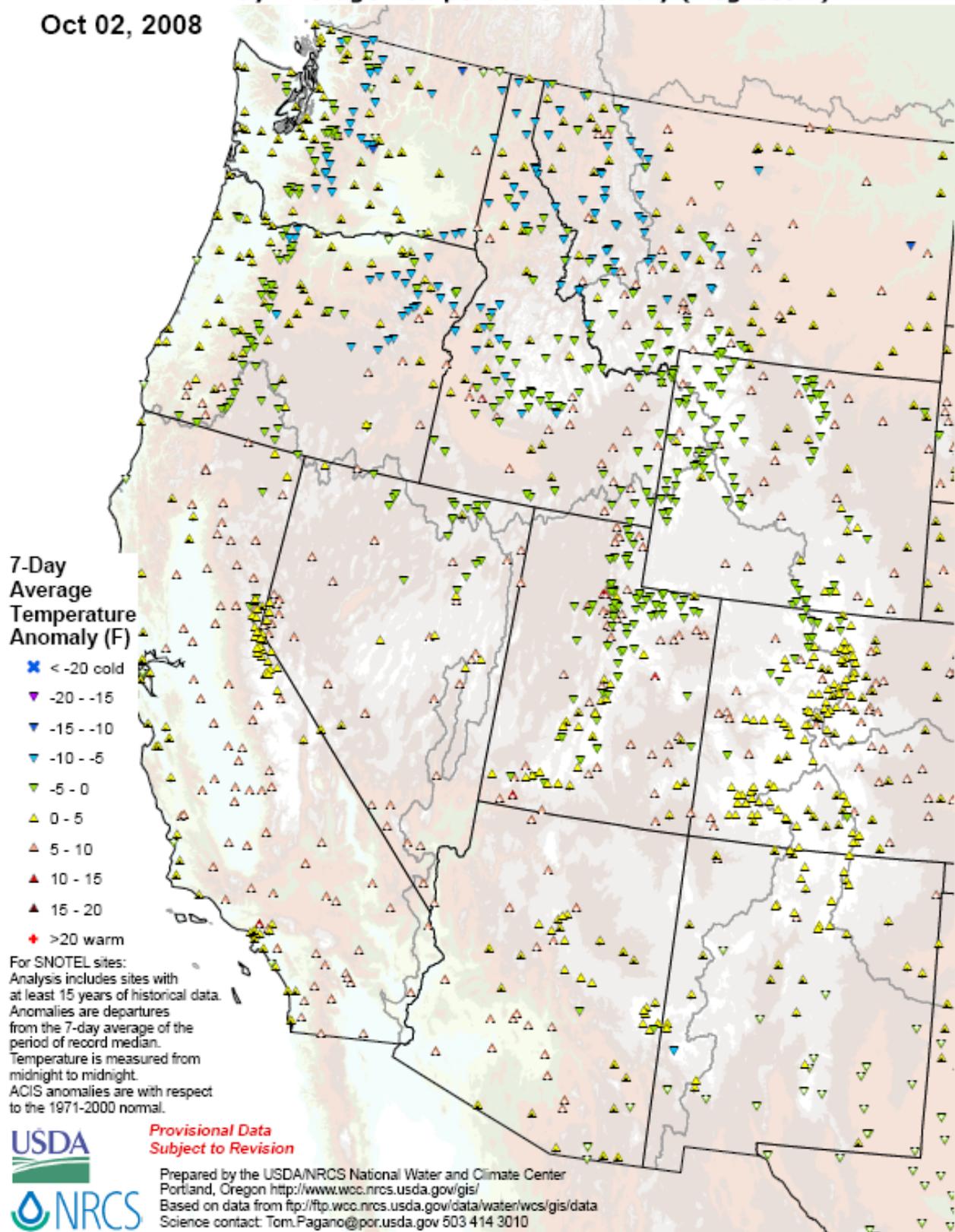
This report uses data and products provided by the Interagency Drought Monitor Consortium members and the National Interagency Fire Center.

/s/ NOLLER HERBERT  
Director, Conservation Engineering Division

# Weekly Snowpack and Drought Monitor Update Report

## SNOTEL (solid) and ACIS (dot-filled) Networks 7-Day Average Temperature Anomaly (Degrees F)

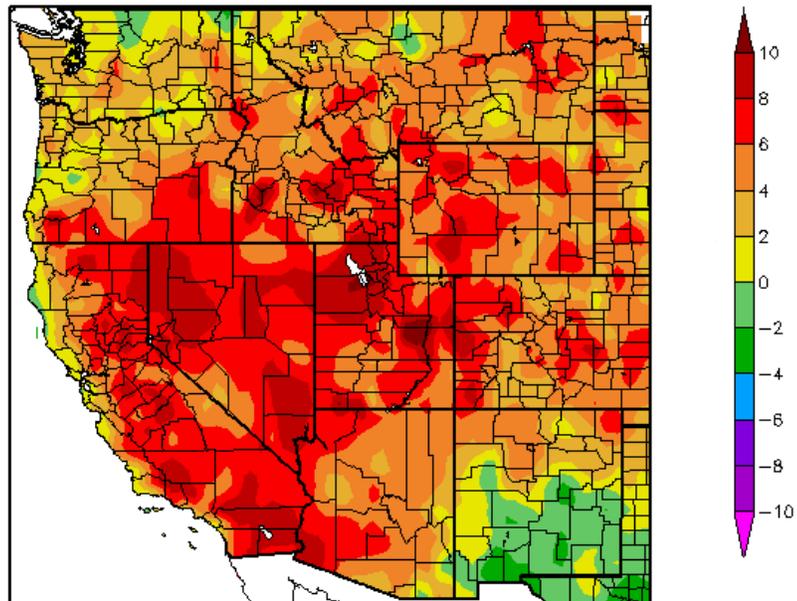
Oct 02, 2008



**Fig. 1. SNOTEL and ACIS-day station average temperature anomalies were highest (positive departures) over California and Utah and lowest (negative departures) over the Pacific Northwest and Northern Rockies. Ref: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavq7dAnomalyAcis.pdf>**

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Departure from Normal Temperature (F)  
9/25/2008 – 10/1/2008

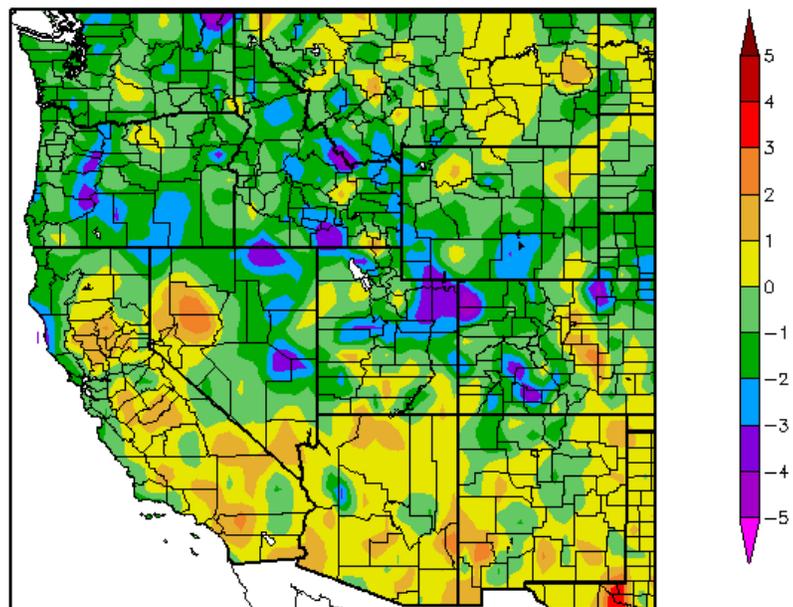


Generated 10/2/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 1a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over Utah (>+8F) and greatest negative departures occurred over Southern New Mexico (<-2F).**  
Ref: [http://www.hprcc.unl.edu/maps/current/index.php?action=update\\_product&product=TDept](http://www.hprcc.unl.edu/maps/current/index.php?action=update_product&product=TDept)

Departure from Normal Temperature (F)  
10/1/2007 – 9/30/2008

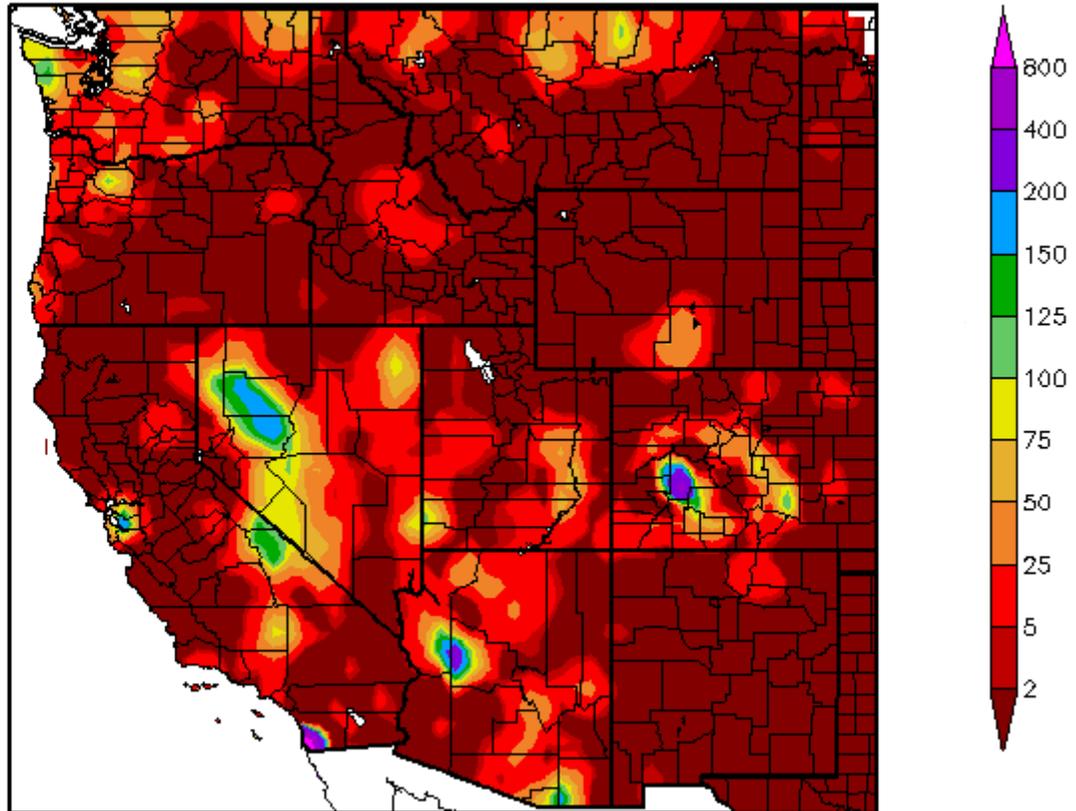


Generated 10/1/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig 1b. ACIS temperature departures of the 2008 Water Year over the Western States.**

Percent of Normal Precipitation (%)  
9/25/2008 – 10/1/2008



Generated 10/2/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 2. ACIS 7-day average precipitation anomaly: Preliminary precipitation totals for the 7-day period ending 1 October shows scattered areas of heavy precipitation over portions of Nevada, Arizona, and Colorado while dry conditions prevail over much of the remainder of the West.**

Ref: [http://www.hprcc.unl.edu/maps/index.php?action=update\\_product&product=PNorm](http://www.hprcc.unl.edu/maps/index.php?action=update_product&product=PNorm)

Weekly Snowpack and Drought Monitor Update Report

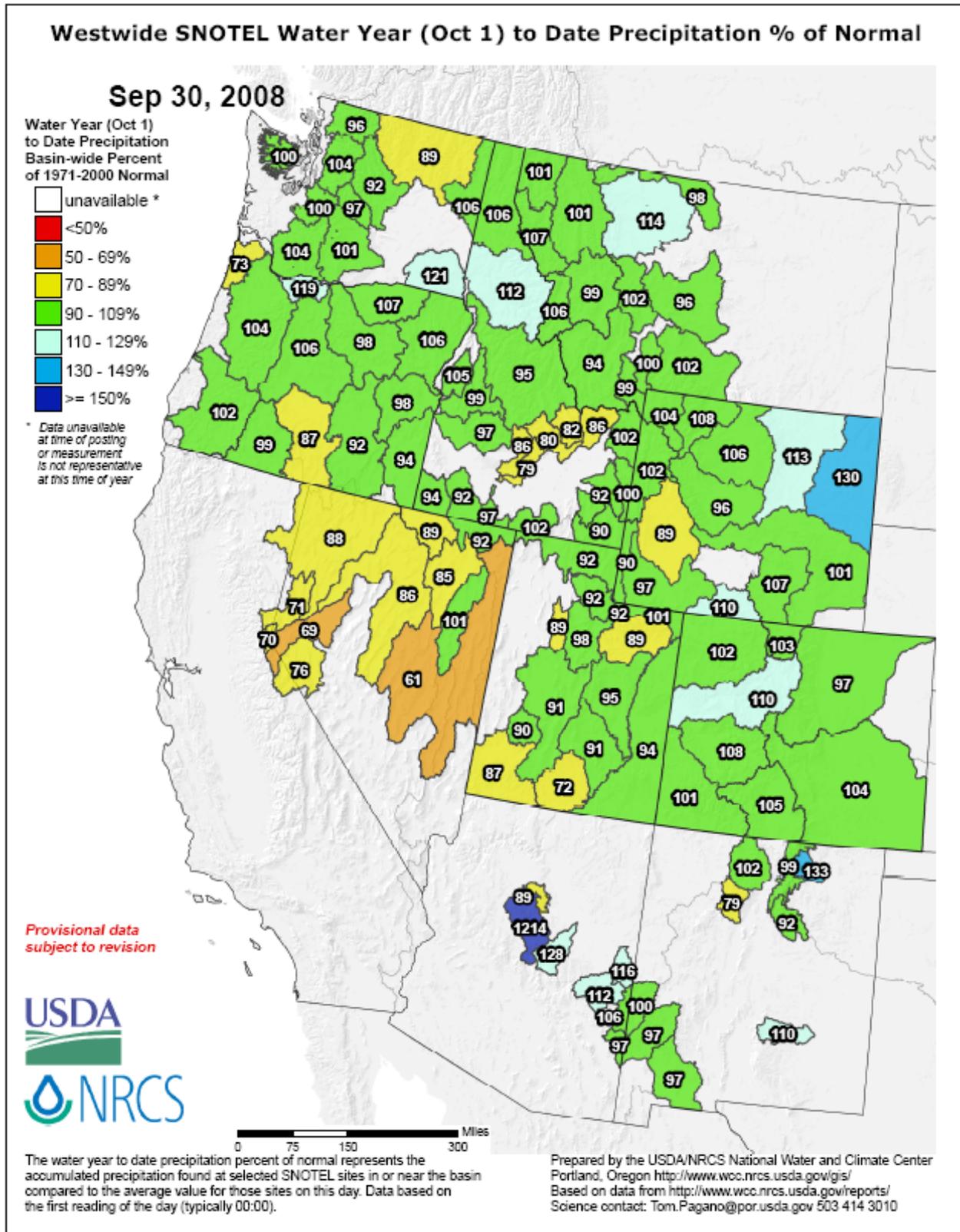
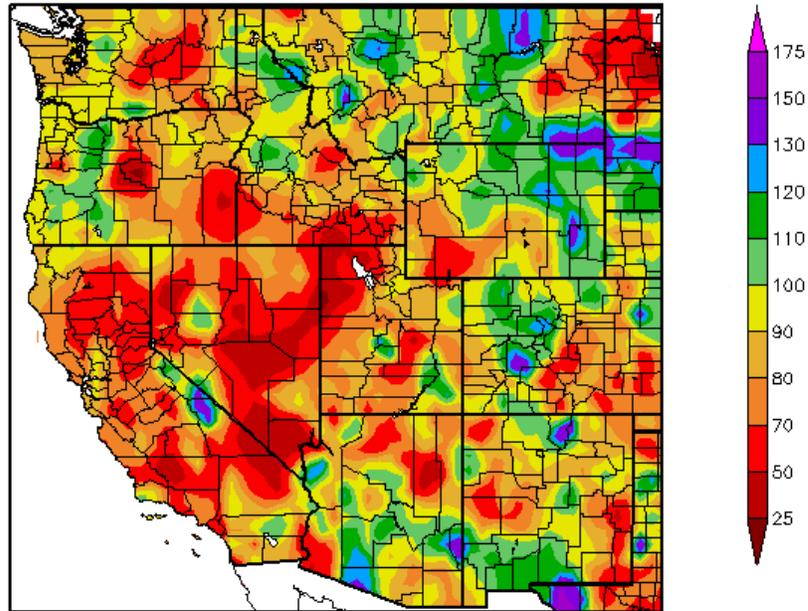


Fig 2a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2008 Water Year that began on October 1, 2007 shows above normal totals over northeastern Wyoming, parts of the Snake and Columbia River Basins in Washington and Idaho, and over parts of Arizona, New Mexico and Colorado. Parts of Nevada, southwest Utah, and Idaho are experiencing significant shortfalls.

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)

# Weekly Snowpack and Drought Monitor Update Report

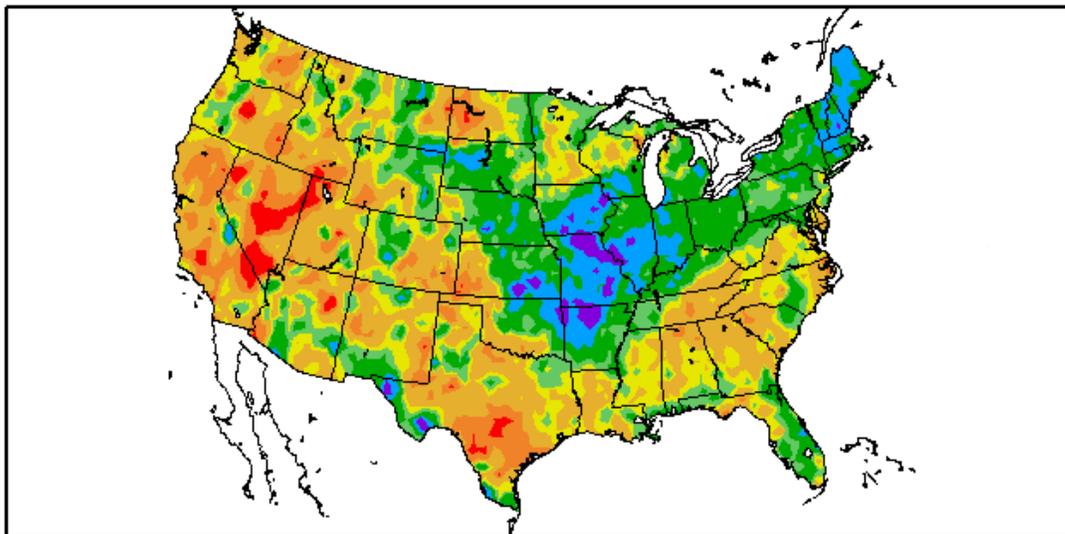
Percent of Normal Precipitation (%)  
10/1/2007 - 9/30/2008



Generated 10/1/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)  
10/1/2007 - 9/30/2008



Generated 10/1/2008 at HPRCC using provisional data.

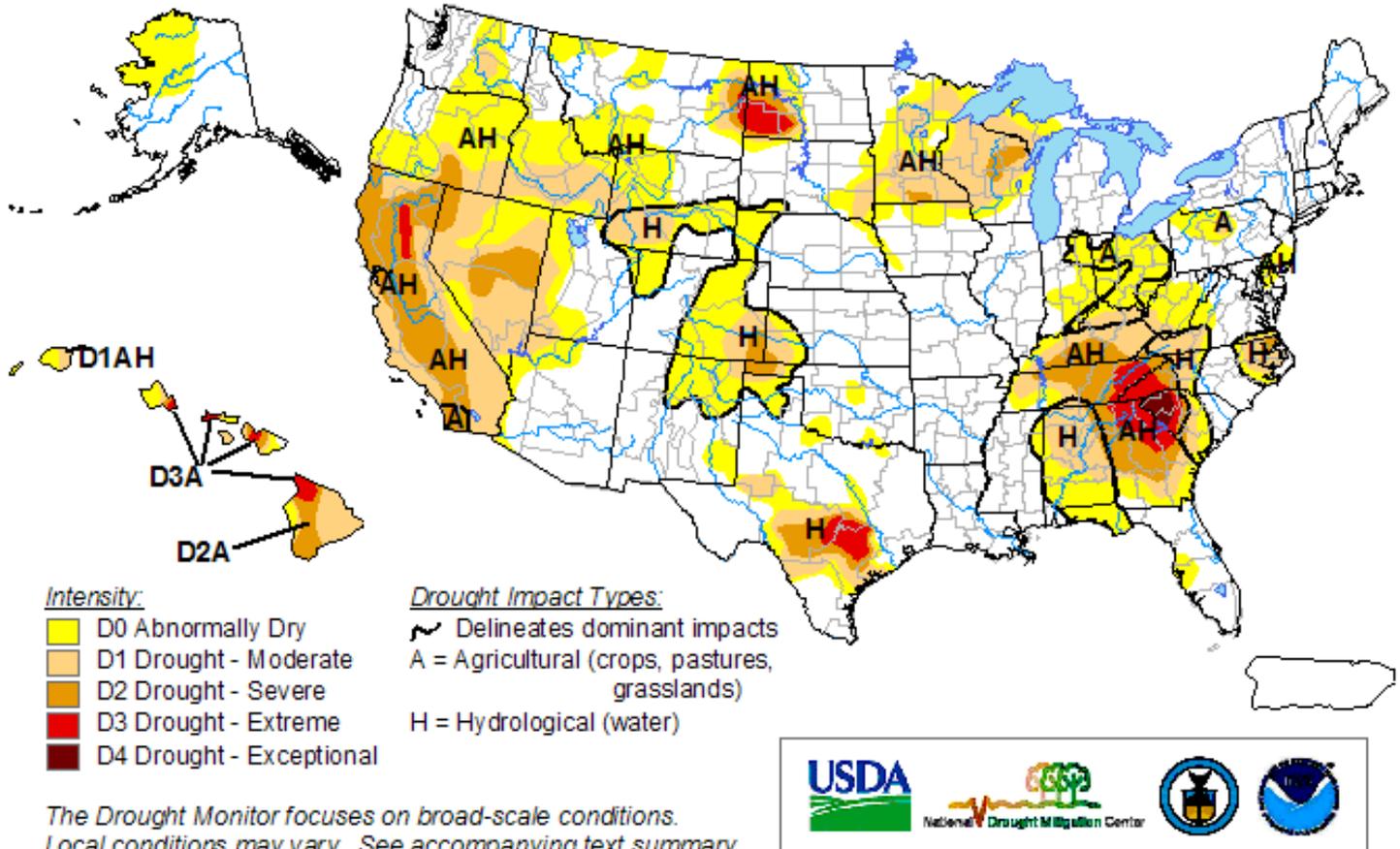
NOAA Regional Climate Centers

**Fig 2b. ACIS Percent of normal (1971-2000) precipitation for the 2008 Water Year.**

# U.S. Drought Monitor

September 30, 2008

Valid 8 a.m. EDT



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

Released Thursday, October 2, 2008

Authors: Richard Heim/Liz Love-Brotak NOAA/NESDIS/NCDC

Fig. 3. Current Drought Monitor weekly summary.

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

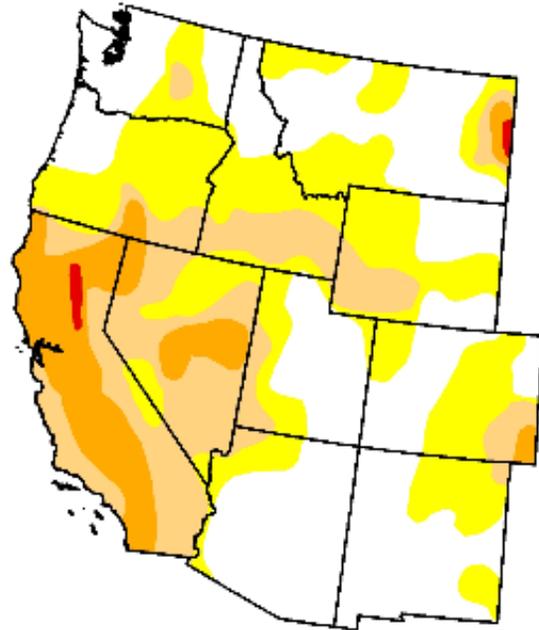
# U.S. Drought Monitor

## West

September 30, 2008  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	40.5	59.5	29.2	10.4	0.4	0.0
Last Week (09/23/2008 map)	40.5	59.5	29.2	10.4	0.4	0.0
3 Months Ago (07/08/2008 map)	39.9	60.1	34.5	9.0	1.7	0.1
Start of Calendar Year (01/01/2008 map)	26.3	73.7	54.7	33.1	2.7	0.0
Start of Water Year (10/02/2007 map)	22.0	78.0	62.3	44.7	12.4	0.0
One Year Ago (10/02/2007 map)	22.0	78.0	62.3	44.7	12.4	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 2, 2008**

Author: R. Heim/L. Love-Brotak, NOAA/NESDIS/NCDC

**Fig. 3a. Drought Monitor for the Western States with statistics over various time periods. Note no change since last week. Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)**

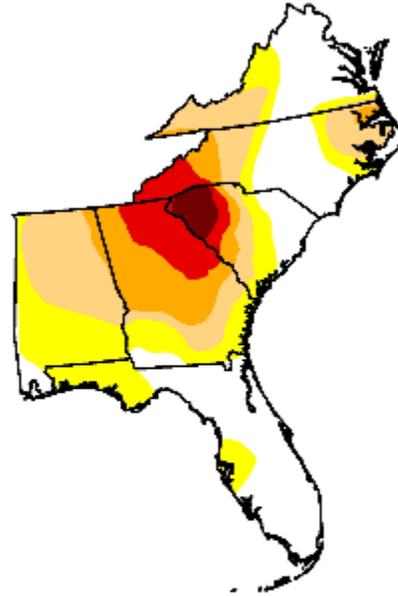
# U.S. Drought Monitor

## Southeast

September 30, 2008  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	35.2	64.8	41.8	20.8	9.4	1.9
Last Week (09/23/2008 map)	44.3	55.7	34.0	16.8	6.8	1.9
3 Months Ago (07/08/2008 map)	15.8	84.2	56.7	31.9	12.1	2.8
Start of Calendar Year (01/01/2008 map)	9.6	90.4	74.3	58.5	41.0	22.0
Start of Water Year (10/02/2007 map)	10.1	89.9	77.9	63.8	45.2	24.0
One Year Ago (10/02/2007 map)	10.1	89.9	77.9	63.8	45.2	24.0



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 2, 2008**

Author: R. Heim/L. Love-Brotak, NOAA/NESDIS/NCDC

**Fig. 3b: Drought Monitor for the Southeastern shows slight deterioration change since last week. A small area of D4 continues over NW South Carolina.** Ref: [http://www.drought.unl.edu/dm/DM\\_southeast.htm](http://www.drought.unl.edu/dm/DM_southeast.htm)

### Drought Monitor Classification Changes for Selected Time Periods

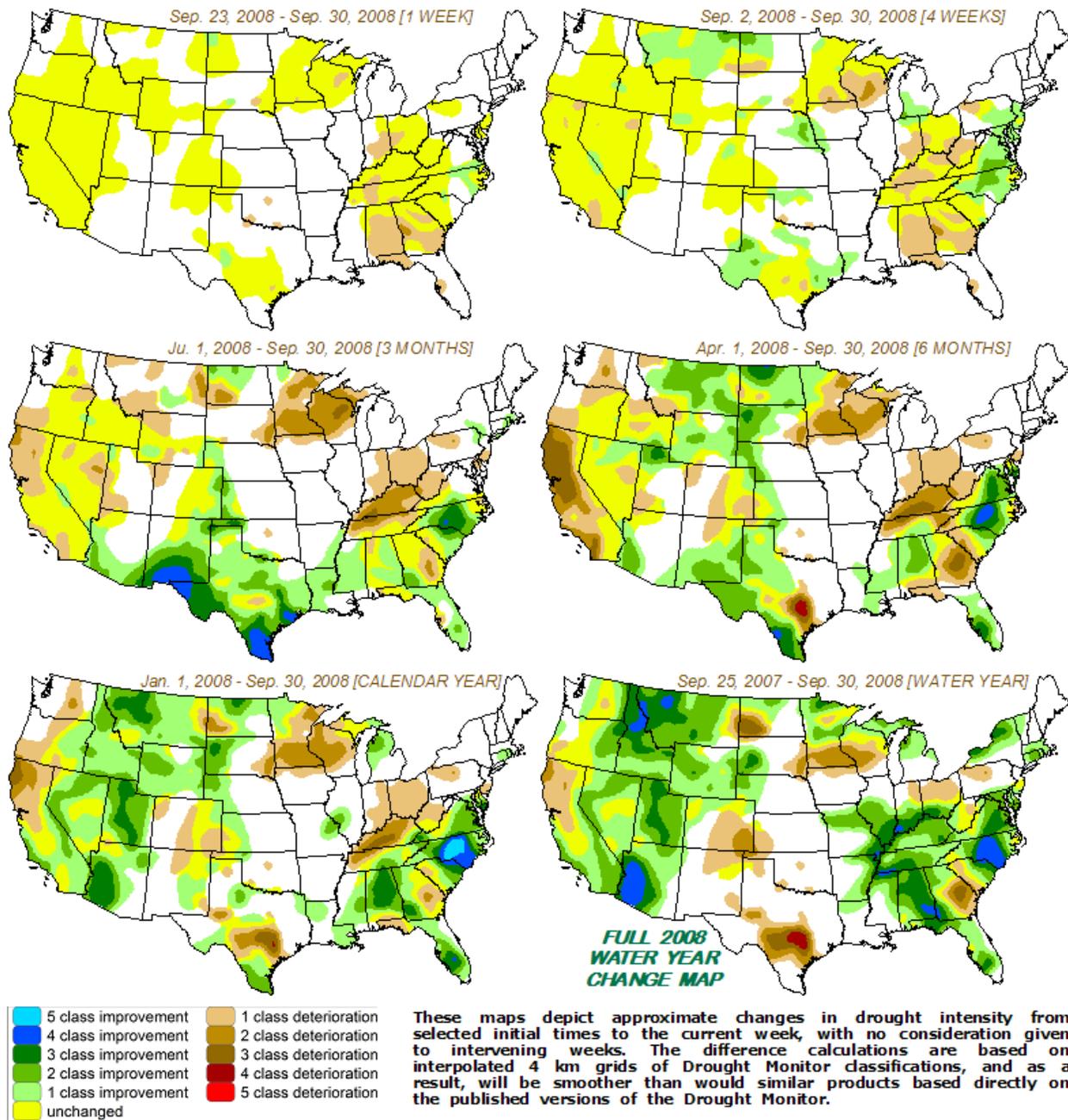
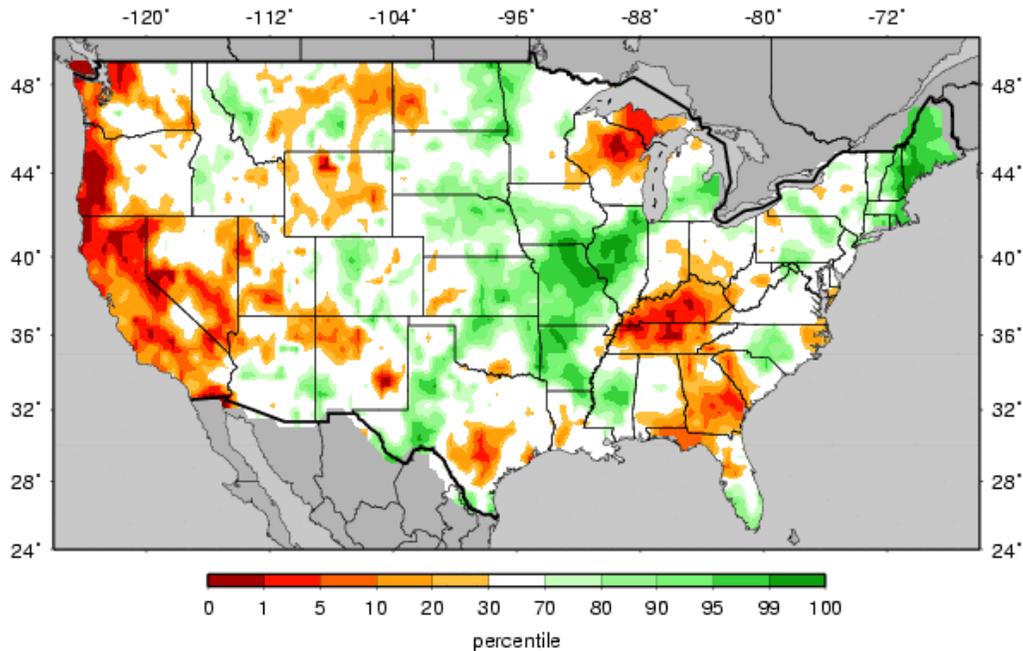


Fig. 3c: Drought Monitor Classification Changes for Selected Time Periods.

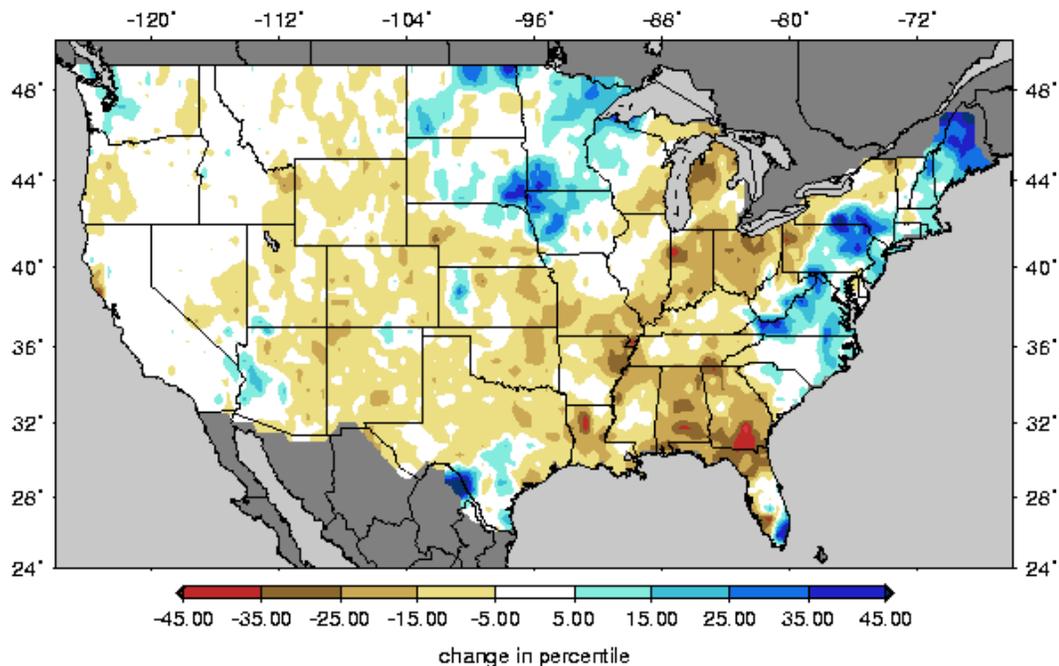
Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/dm-change-4maps.png>

## Weekly Snowpack and Drought Monitor Update Report

MULTIMODEL Soil Moisture Percentiles (wrt/ 1920-2003)  
20080930



Change in Soil Moisture Percentiles (wrt/ 1915-2003)  
for the week 20080923 to 20080930



**Figs. 4a & 4b: Soil Moisture Ranking and change in percentile based on 1915-2003 climatology for this past week. The driest conditions persist over California and part of Oregon, Washington, Nevada, Wisconsin, Kentucky, Tennessee, and Georgia while the wettest in soil moisture is occurring over the middle Mississippi River Valley (Fig. 5). Last week saw a significant decrease in moisture from Michigan to Florida while increases are noted over the Mid-Atlantic, Maine and parts of Iowa, Minnesota and South Dakota (Fig 4b).**

Ref: [http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.multimodel.sm\\_qnt.gif](http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.multimodel.sm_qnt.gif)  
[http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.vic.sm\\_qnt.1wk.gif](http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.vic.sm_qnt.1wk.gif)

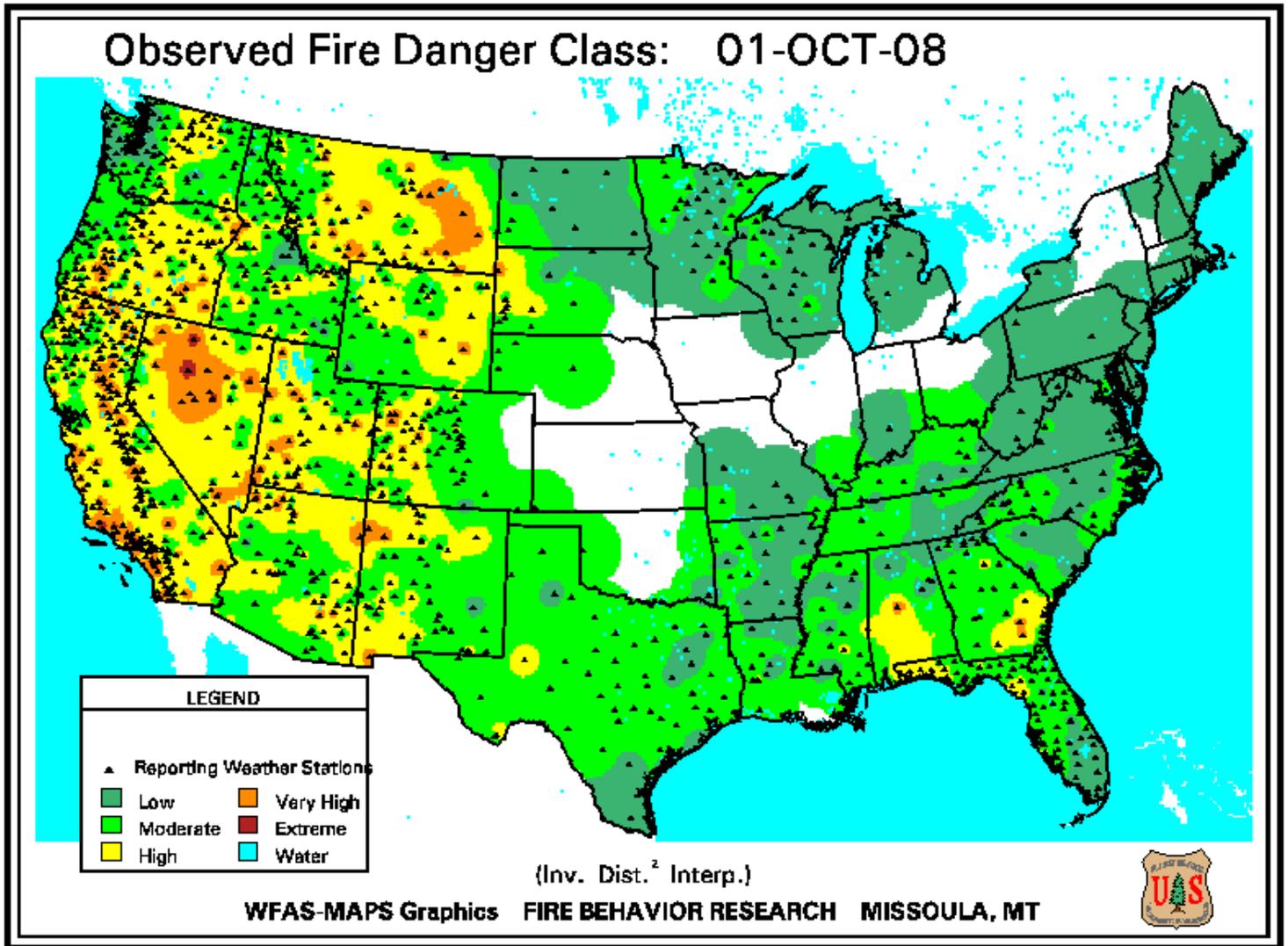
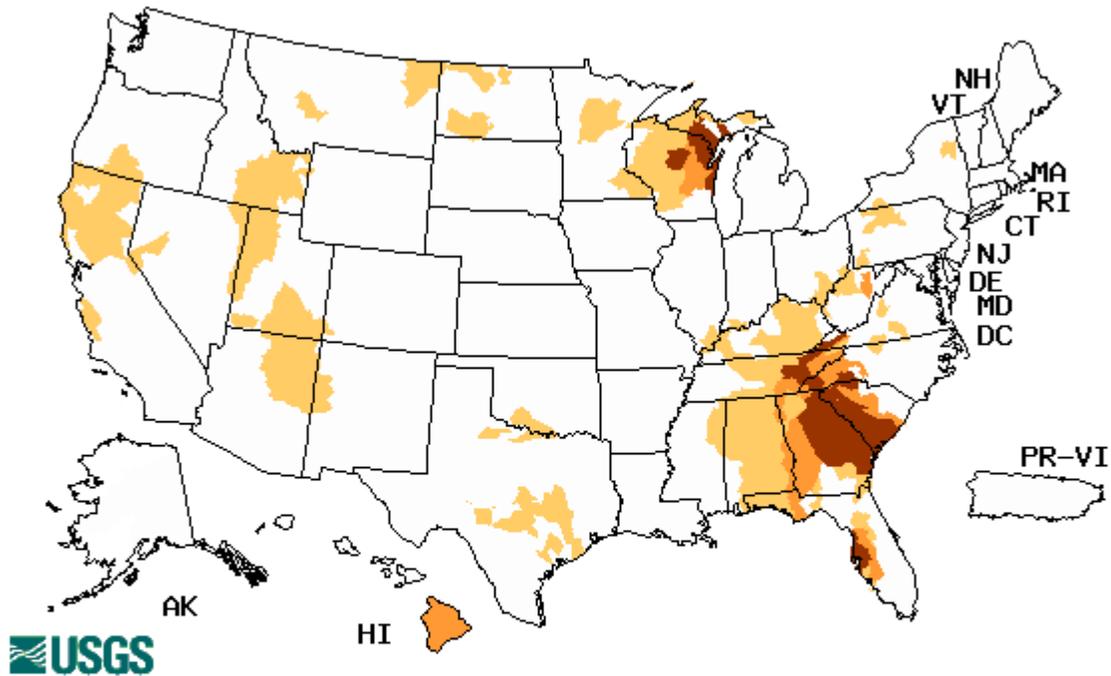


Fig. 5. Observed Fire Danger Class. Note marked improvement in fire threat over much of the West since last week. Source: Forest Service Fire Behavior Research – Missoula, MT.

Ref: [http://www.fs.fed.us/land/wfas/fd\\_class.gif](http://www.fs.fed.us/land/wfas/fd_class.gif)

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Wednesday, October 01, 2008



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. 6. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Note persistent low flows over the Southeast and Wisconsin-Upper Peninsula of Michigan.

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

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary – September 30, 2008

*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/>.

During this U.S. Drought Monitor (USDM) week, an upper-level disturbance brought beneficial rains to parts of the Southeast, then moved up the East Coast as a nor'easter. A series of weak cold fronts moved across the Pacific Northwest states then into the northern Plains, Upper Midwest and East Coast. Hurricane Kyle brought rain to parts of New England by the end of the week, and showers moistened southern Florida and extreme southern Texas. Otherwise, dry high pressure dominated the country.

**The Great Lakes and Upper Midwest:** Frontal rains of 1-2 inches with locally heavier amounts fell from northeastern Kansas to western Lake Superior. As a result, the spot of D2 in northern Minnesota was removed. But rainfall was considerably less in central to southern Wisconsin. D2 was added to east central Wisconsin to reflect significant 60-90 day rainfall deficits, dry soil moisture, and continued low streamflow. The heavier rains missed Fairbault and Martin counties in south central Minnesota, where D2 was added over the areas with the greatest 60-90 day precipitation deficits. D1 was expanded slightly in the adjacent north central Iowa counties.

Scattered frontal showers dropped a few tenths of an inch of moisture over southern Indiana, but this was not enough to compensate for deficits which have built up over the last 60-90 days, so D0 expanded across southwest Ohio and much of southern Indiana. The fronts fell apart as they moved across the lower Ohio and Tennessee valleys. D2, D1, and D0 expanded across western Kentucky and central and western Tennessee where pasture and range land in poor to very poor condition increased over 10% this week, to 77% in Kentucky and 47% in Tennessee. D1 expanded to cover the Guyandotte River counties in West Virginia.

**The Southeast and East Coast:** Widespread 2+-inch rains fell across the East Coast from the Carolinas to Maine, with locally heavier amounts greater than 5 inches in places. Improvement was made to the USDM depiction where streams responded to the heavy rains, including retreat of the D0 and D1 in the central Carolinas and south central Virginia. Lesser rainfall amounts were measured in northeast North Carolina, but the amounts were enough to shrink the D0-D1-D2 there and in extreme southeast Virginia. No change was made to the D2 areas of western North Carolina, where 3+ inches of rain fell, because hydrologic conditions failed to improve significantly (streamflows continued very low). The heaviest rains largely missed the D0 from the Chesapeake to southern New Jersey and the D0-D1 in central to northwest Pennsylvania. These areas were trimmed along the edges where 2+ inches of rain fell, but otherwise subsoil moisture remained deficient.

Areas south and west of the Carolinas were left high and dry this week. All of the Dx categories expanded in Georgia and Alabama, with D0 creeping into the Florida panhandle. Streamflow, soil moisture, and pasture and range land conditions continued to deteriorate in these areas. Augusta, Georgia recorded only 0.95 inch of rain (2.64 inches below normal) during September, Savannah, Georgia had only 1.42 inches (3.66 inches below normal), and Asheville, North Carolina only 1.70 inches (2.02 inches below normal). In Alabama, September 2008 was the third driest September for Tuscaloosa (which had 0.60 inch of rain), sixth driest for Birmingham (0.40 inch), and eighth driest for Anniston (0.81 inch). D0 was added to the Tampa Bay area of

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Florida where streams were low and deficits were accumulating in rainfall and soil moisture. The Tampa weather station has received only 7.13 inches of rain during August and September, a departure of -7.01 inches (or 50% of normal), and the Tampa Bay area has an 8-12 inch deficit over the past three months.

**The Great Plains:** While only a few tenths of an inch of rain fell across northwest North Dakota this week, D1 and D2 were pulled back to reflect improving hydrologic conditions. However, D1 expanded in Mercer county and D2 expanded in Bowman county in southwest North Dakota. D0 was trimmed in southwest South Dakota to reflect improving hydrologic conditions. In southeast South Dakota, D0 expanded to reflect deteriorating soil moisture conditions, but nearby D0-D1 was shaved under beneficial rains in Bon Homme County.

Very little rainfall was reported in southwestern, central, and south central Oklahoma over the past 30 days. Based on localized soil moisture deficits, D0 was introduced into several parts of the state, specifically central Oklahoma and along the Red River where soil moisture conditions were driest. Meanwhile, the Oklahoma panhandle returned to the dry conditions it had experienced earlier this year, continuing drought designations there.

In west Texas, the spot of D2 along the confluence of the High Plains, Edwards Plateau, and Trans Pecos regions was removed, and D1 and D0 trimmed back to reflect improving hydrologic conditions. The last 2 weeks here have had no rain, but prior to that it has been wet. Soil moisture conditions and precipitation for the last 30 to 90 days were wetter than normal, so improvement was shown. To the southeast, the D3 oval in south central Texas expanded, as did D2 and D0 on its southern boundary. September 2008 tied with 1931 as the third driest September since 1856 at the Austin City climate location, and September 2008 was the eighth driest since 1906 at Del Rio and ninth driest since 1871 at San Antonio. The Austin City climate station recorded only 0.02 inch of rain this month. The year-to-date ranked as the seventh driest January-September at Austin and fourteenth driest at San Antonio.

**The West:** There were a few areas that received rainfall amounts of a few tenths, with an inch or more falling in northwest Washington. But generally the week was dry. No change was made to the depiction in the West.

**Alaska, Hawaii, and Puerto Rico:** The week was cooler and drier than normal across most of Alaska and drier than normal across eastern and north central Puerto Rico and most of the Hawaiian Islands. No change was made to the D0 in Alaska. Only a few stations in the northern Hawaiian Islands were wetter than normal, and streams averaged slightly to much below normal across most of the islands. No change was made to the USDM depiction in Hawaii this week. With heavy rains last week, the month ended wetter than normal along the southern coastal areas of Puerto Rico with near normal rainfall in the northern interior regions. Streams were above normal across the island.

**Looking Ahead:** During the next 6 days (October 1-6), a strong low pressure system and Pacific front will move into the western U.S., bringing cooler temperatures and rain, with possibly snow to the higher elevations. An inch or more of moisture could be measured in some places. The system will bring rain to the Plains near the end of the period. In the meantime, an upper-level low over eastern Canada will bring continued showery weather to the Great Lakes and Northeast. This low will move off the continent later in the period, leaving dry high pressure to dominate much of the eastern U.S. Southern Florida could receive up to an inch of rain during the period from scattered showers and thunderstorms.

The outlook for October 7-15 calls for wet weather in southern Florida, along the storm track in the northern tier states from the Pacific Northwest to the western Great Lakes, and in the Great Plains, with dry weather from the southern Appalachians to the Northeast. Alaska is expected to

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be wet in the southeast and drier in the west. Warmer-than-normal temperatures are forecast for the eastern half of the country, with below-normal temperatures expected in the West and across much of Alaska.

Author: Richard Heim, National Climatic Data 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 1 October 2008