



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

Weekly Report - Snowpack / Drought Monitor Update

Date: 23 September 2010

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: SNOTEL 7-day average temperature departure from normal map shows temperatures coolest over the Northern Rockies and warmest over the Central Rockies and mountains over Utah (Fig. 1). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over parts northeast New Mexico and central Colorado ($>+10^{\circ}\text{F}$) and the greatest negative departures occurred over much of Montana ($<-8^{\circ}\text{F}$) (Fig. 1a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 22 September shows the bulk of the heaviest precipitation confined to the Pacific Northwest and northern Montana. Remnants of a tropical storm from the Gulf of California moved over parts of Arizona and New Mexico and caused considerable rainfall (Fig. 2). In terms of percent of normal, unusually heavy precipitation for this time of year fell over the regions described above (Fig. 2a). This is a particularly dry time of year so any precipitation that occurs is guaranteed to be considered well above the long-term average. For the 2010 Water-Year that began on 1 October 2009, Arizona, southern New Mexico, central Montana, the Olympics (WA), and eastern Wyoming have the largest surpluses while much of northern Idaho, Upper Snake River, Northern Wasatch (UT), central Nevada, and southern Oregon have the greatest deficits. By this late period in the Water Year, significant changes to the overall percentages on week to week bases become very unusual (Fig. 2b).

WESTERN DROUGHT STATUS

West: A large area of 1+ inches of precipitation fell along the Pacific Northwest coast and northern Rockies, with heavier amounts in the coastal mountains. But this precipitation mostly missed the drought areas of the Far West. Most of the rest of the West received little if any precipitation. Aside from the changes made in Colorado and Wyoming, no changes were made to the USDM depiction in the West. *Comment: Yesterday's rains over the Southwest were not addressed in this week's Drought Monitor.* Author: Richard Heim, NOAA/NESDIS/NCDC.

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

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developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 3 and 3a).

SOIL MOISTURE (unavailable this week)

Soil moisture is simulated by the [VIC macroscale hydrologic model](#). The detailed, physically-based VIC model is driven by observed daily precipitation and temperature maxima and minima from approximately 2130 stations, selected for reporting reliably in real-time and for having records of longer than 45 years (and various other criteria). Another good resource can be found at: <http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>.

U.S. HISTORICAL STREAMFLOW

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

This map, (Fig. 5) shows the 7-day average streamflow conditions in hydrologic units of the United States and Puerto Rico for the day of year. The colors represent 7-day average streamflow percentiles based on historical streamflow for the day of the year. Thus, the map shows conditions adjusted for this time of the year. Only stations having at least 30 years of record are used. Sub-regions shaded gray indicate that insufficient data were available to compute a reliable 7-day average streamflow value. During winter months, this situation frequently arises due to ice effects. The data used to produce this map are provisional and have not been reviewed or edited. They may be subject to significant change.

RANGELAND CONDITIONS

The maps in Figure 6 show the general (inferred) soil conditions by state over the past one and four weeks.

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/> 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

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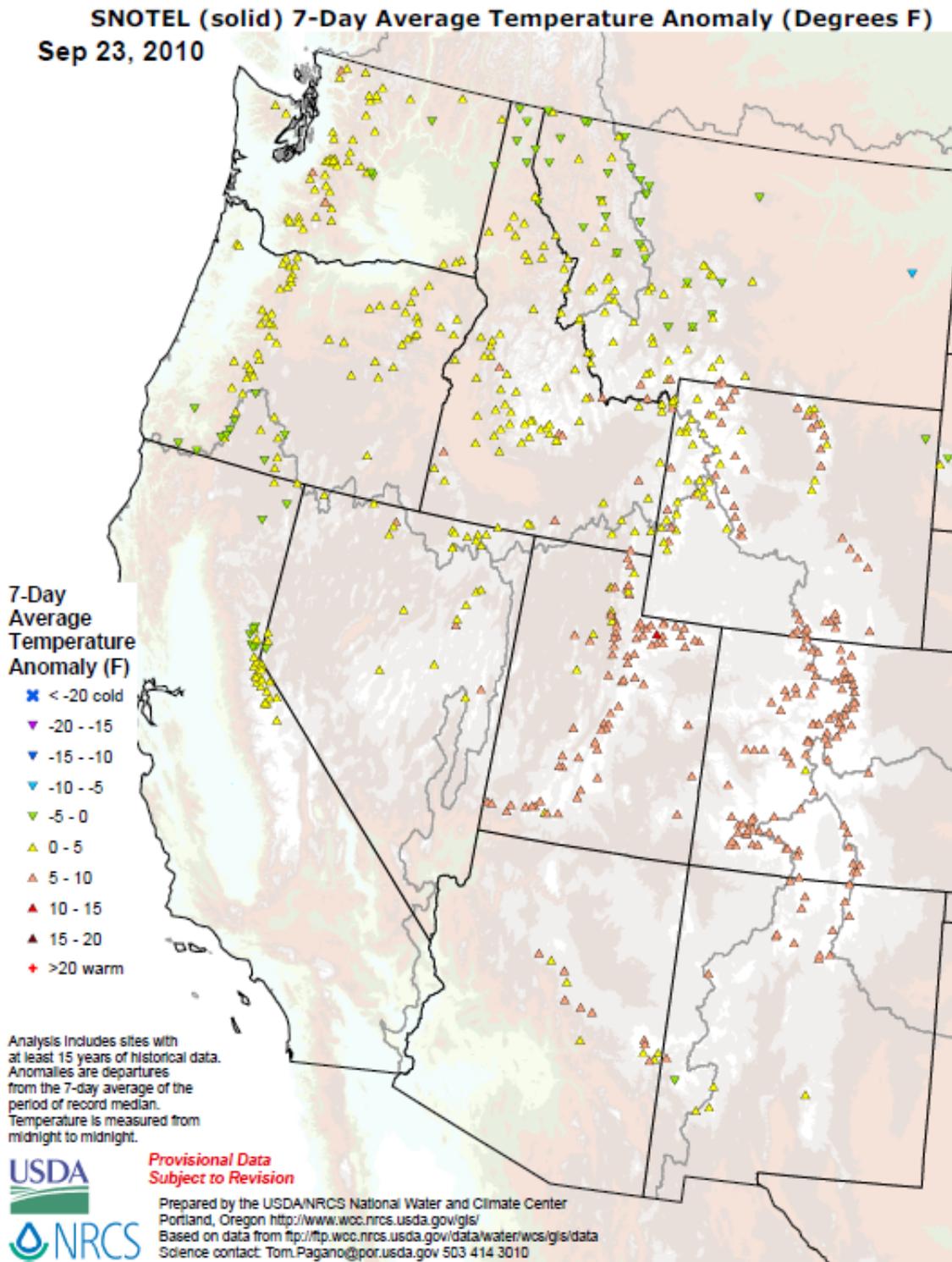
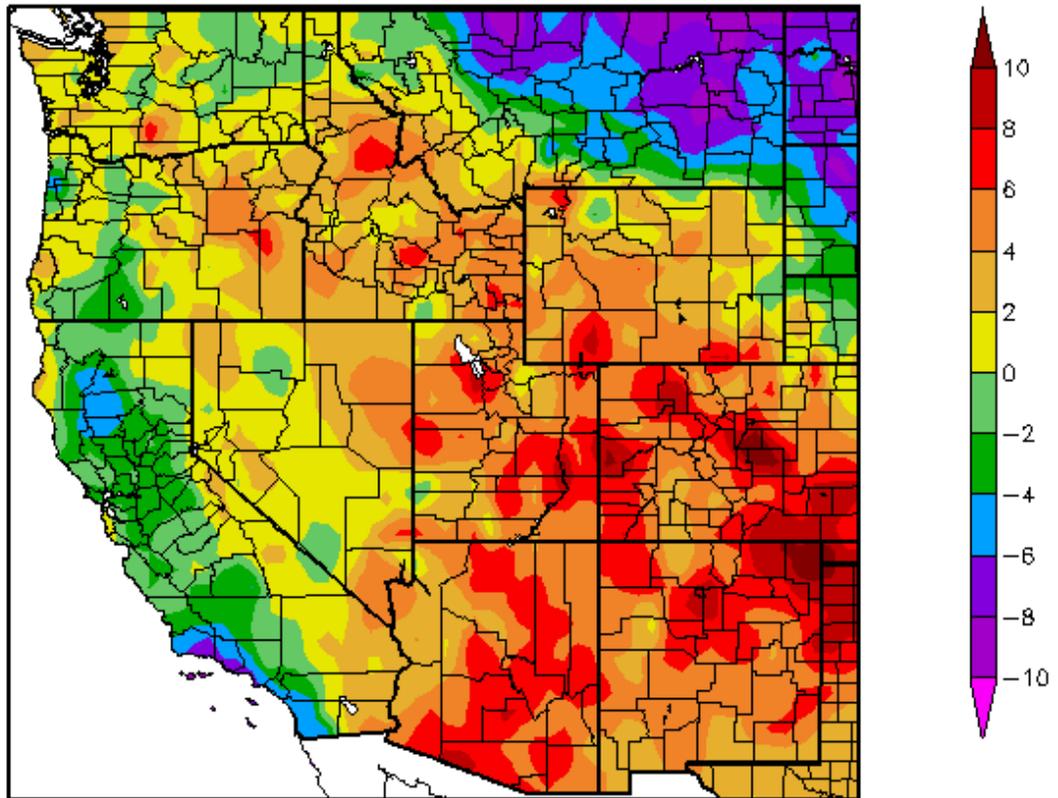


Fig. 1: SNOTEL 7-day average temperature departure from normal map shows temperatures coolest over the Northern Rockies and warmest over the Central Rockies and mountains over Utah.

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

Departure from Normal Temperature (F)
9/16/2010 – 9/22/2010



Generated 9/23/2010 at HPRCC using provisional data.

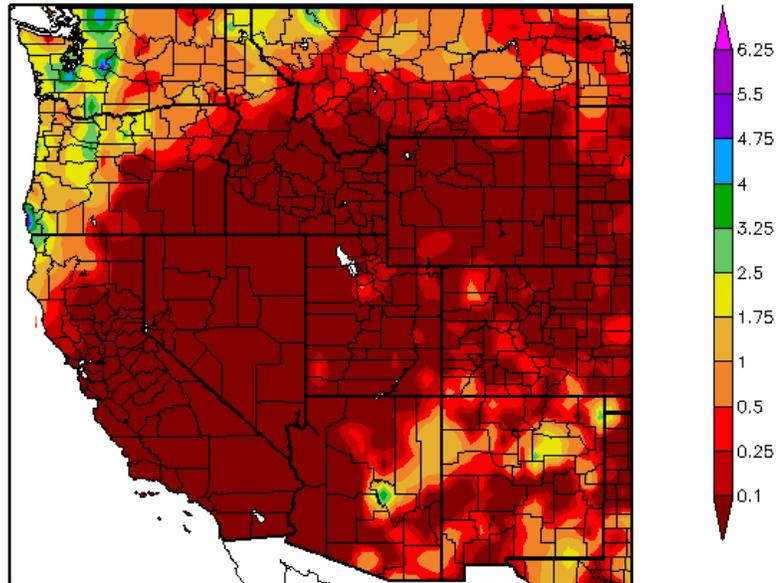
Regional Climate Centers

Fig. 1a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over parts northeast New Mexico and central Colorado (>+10°F) and the greatest negative departures occurred over much of Montana (<-8°F).

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

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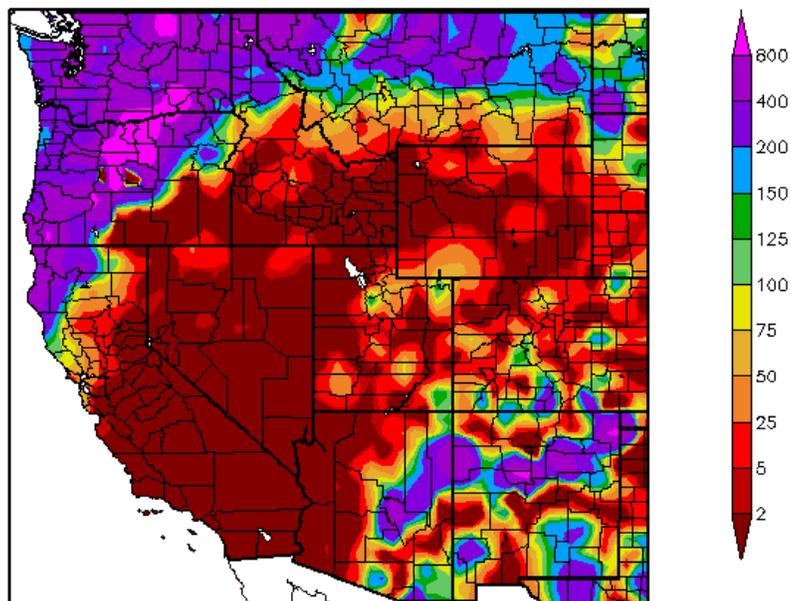
Precipitation (in)
9/16/2010 - 9/22/2010



Generated 9/23/2010 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
9/16/2010 - 9/22/2010



Generated 9/23/2010 at HPRCC using provisional data.

Regional Climate Centers

Fig. 2 and 2a: ACIS 7-day average precipitation amounts for the period ending 22 September shows the bulk of the heaviest precipitation confined to the Pacific Northwest and northern Montana. Remnants of a tropical storm from the Gulf of California moved over parts of Arizona and New Mexico and caused considerable rainfall (Fig. 2). In terms of percent of normal, unusually heavy precipitation for this time of year fell over the regions described above (Fig. 2a). Ref: <http://www.hprcc.unl.edu/maps/current/>

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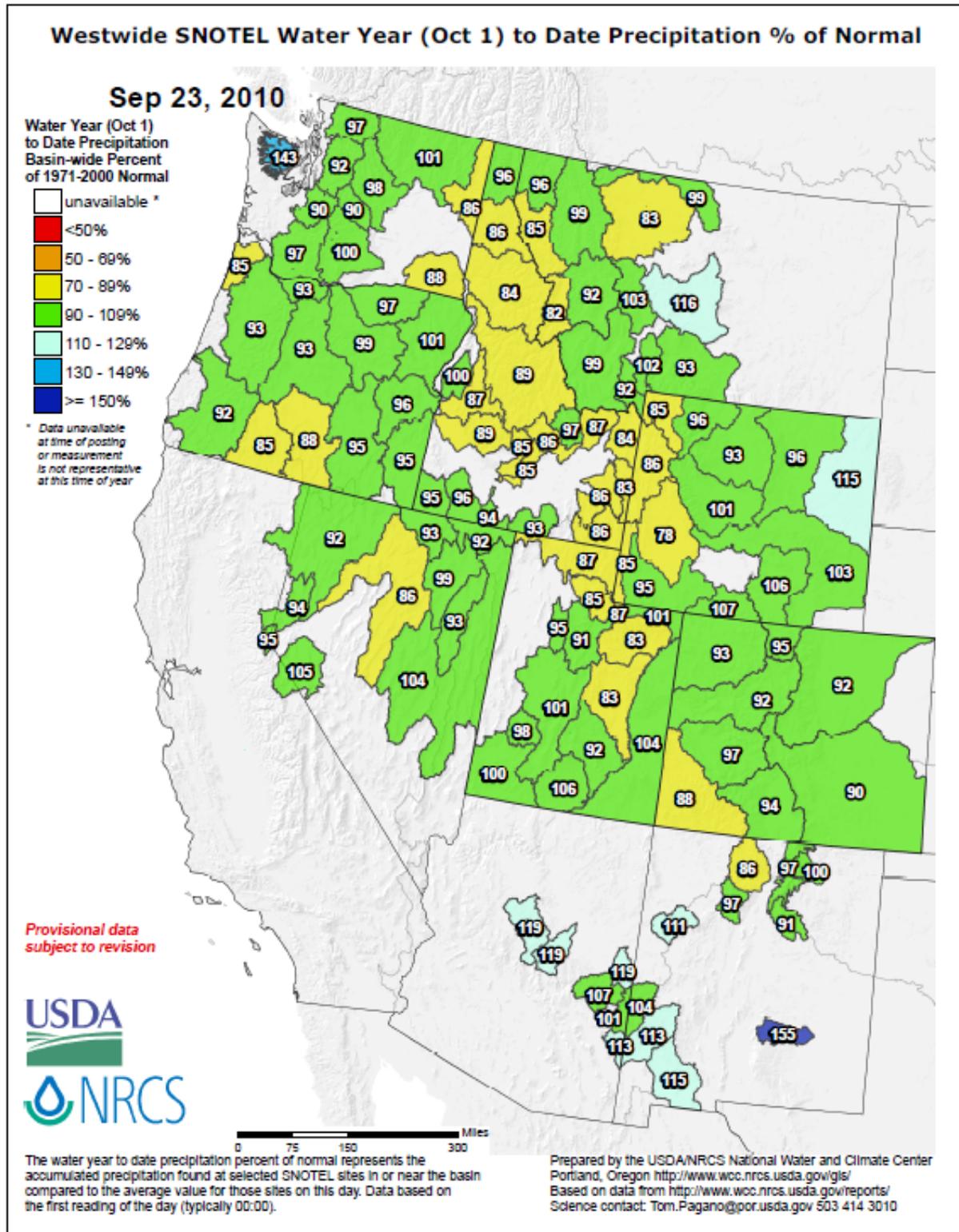


Fig 2b: For the 2010 Water-Year that began on 1 October 2009, Arizona, southern New Mexico, central Montana, the Olympics (WA), and eastern Wyoming have the largest surpluses while much of northern Idaho, Upper Snake River, Northern Wasatch (UT), central Nevada, and southern Oregon have the greatest deficits. By this late period in the Water Year, significant changes to the overall percentages on week to week bases become very unusual.

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

U.S. Drought Monitor

September 21, 2010
Valid 8 a.m. EDT

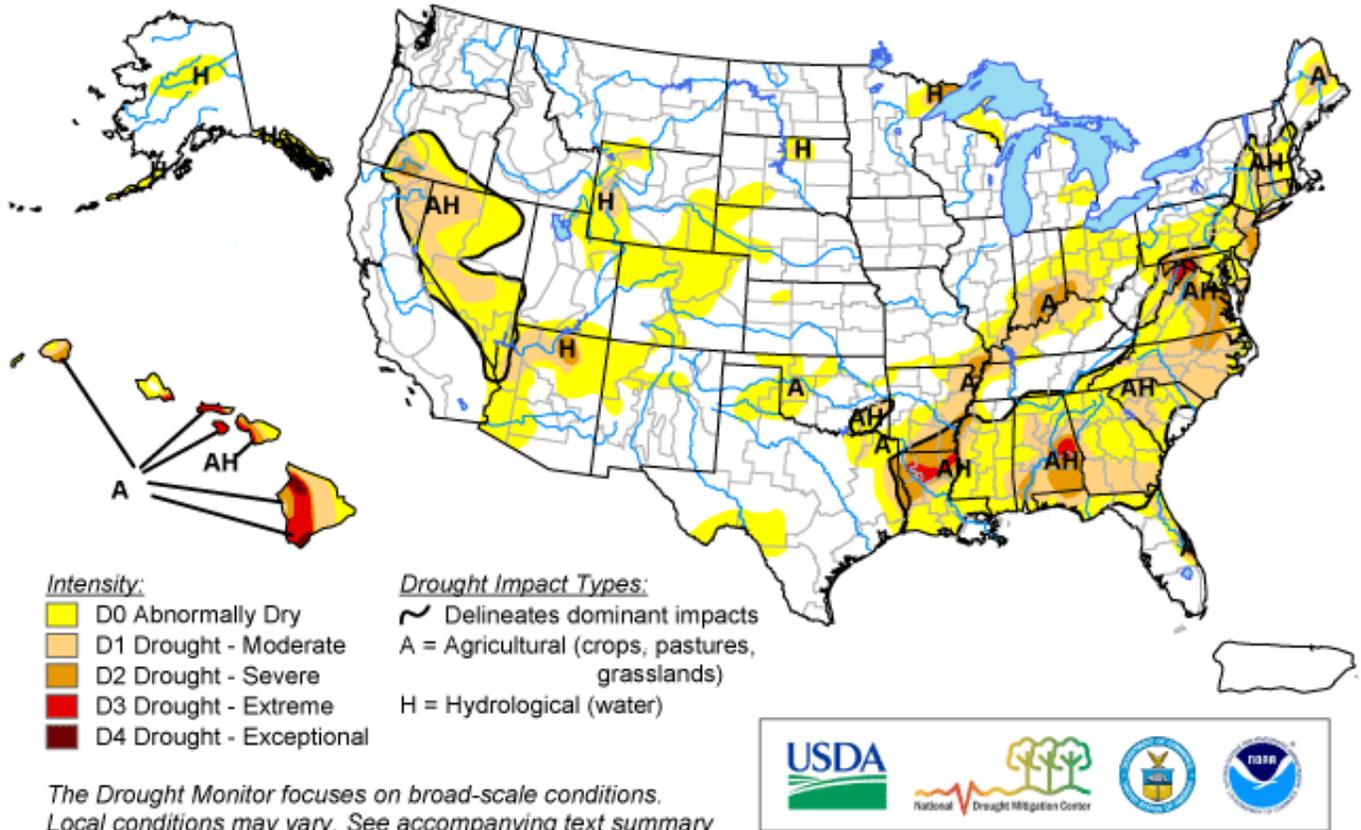


Fig. 3: Current Drought Monitor weekly summary. Hawaii is only state that has a D4 drought level. D3 levels dominate northern Louisiana, southeast Alabama, and the Washington DC area. Ref: <http://www.drought.unl.edu/dm/monitor.html>

U.S. Drought Monitor

West

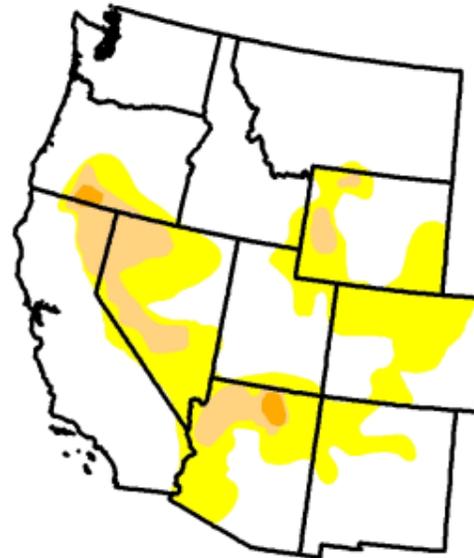
September 21, 2010
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	69.9	30.1	6.9	0.6	0.0	0.0
Last Week (09/14/2010 map)	72.8	27.2	6.9	0.6	0.0	0.0
3 Months Ago (06/29/2010 map)	68.6	31.4	11.1	1.0	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 (09/22/2009 map)	52.8	47.2	22.4	7.5	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>

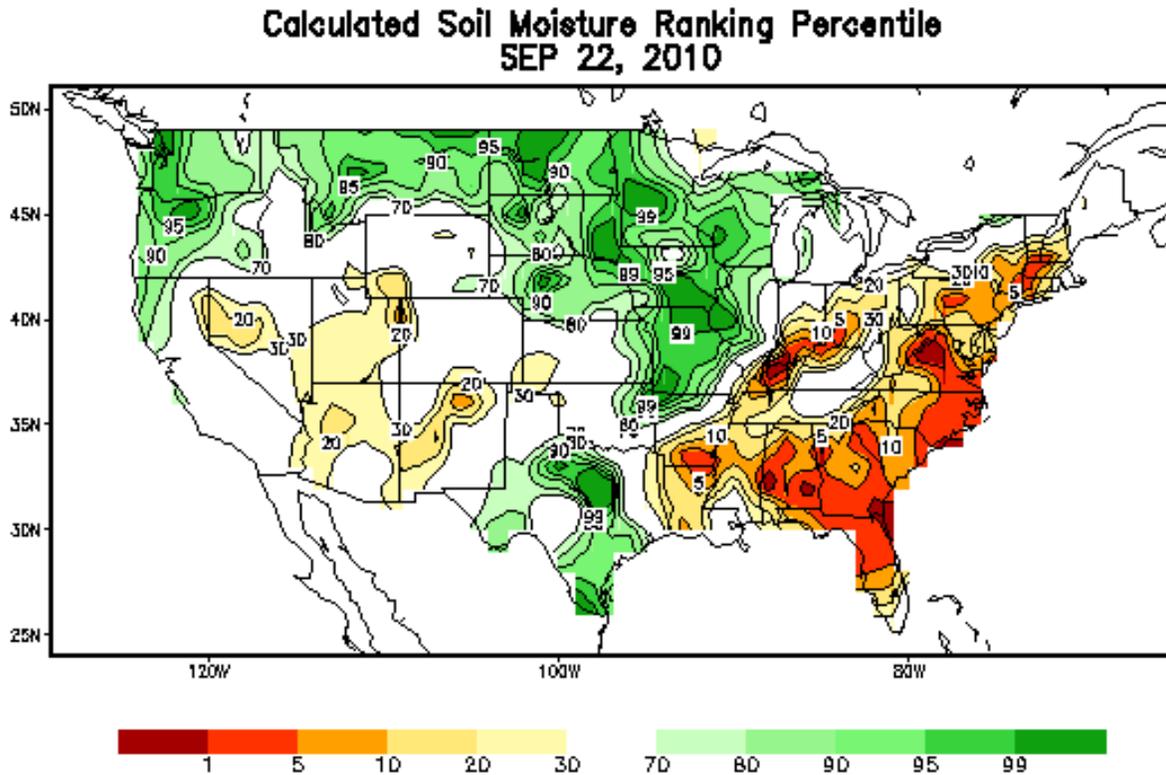


Released Thursday, September 23, 2010
Author: Richard Heim, NCDC/NOAA

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

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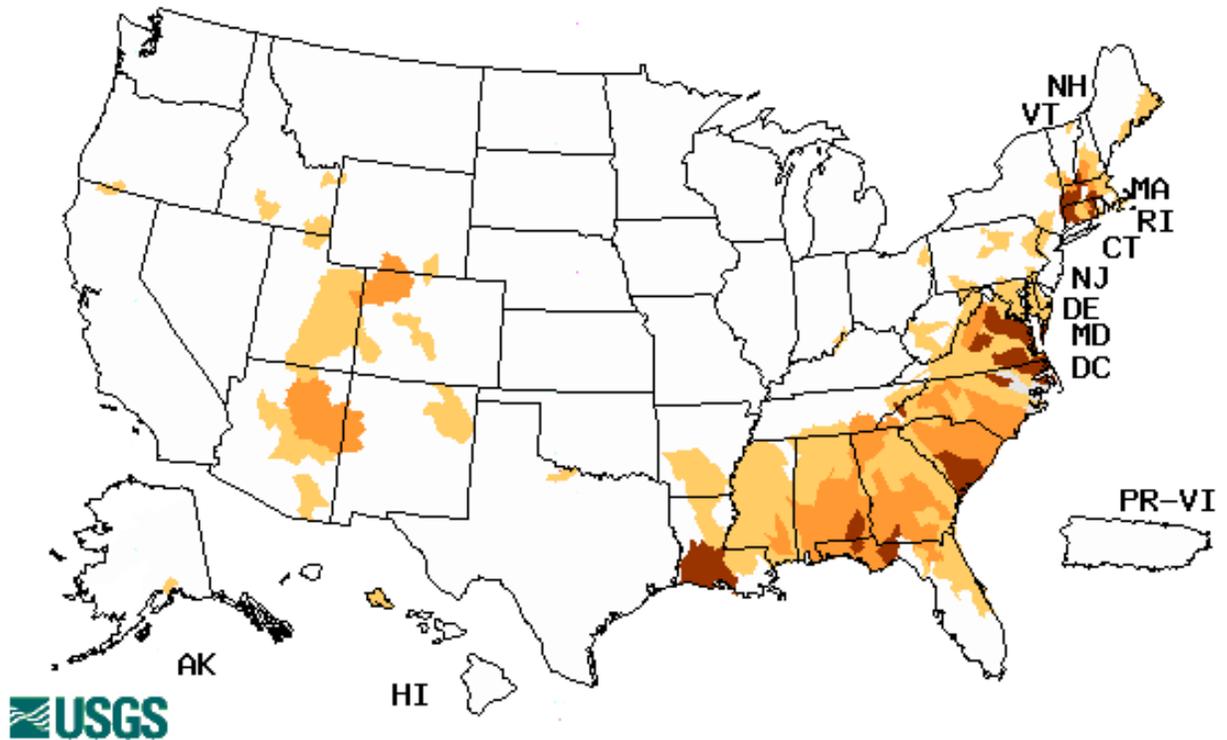


Figs. 4: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 22 September. Excessive dryness dominates over the eastern third of the nation. Wet soils are scattered across the Upper Great Basin and much of the Northern Tier States of the West. Note: The University of Washington graphs normally used in this spot are unavailable this week.

Ref: http://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/Figures/daily/curr.w.rank.daily.gif

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Hednesday, September 22, 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. Dryness is increasing over the East Coast States. The Gulf Coast area from Louisiana eastward and parts of Eastern Seaboard have the largest stream flow deficits in the U.S. this week. Ref: <http://waterwatch.usgs.gov/?m=dryw&r>

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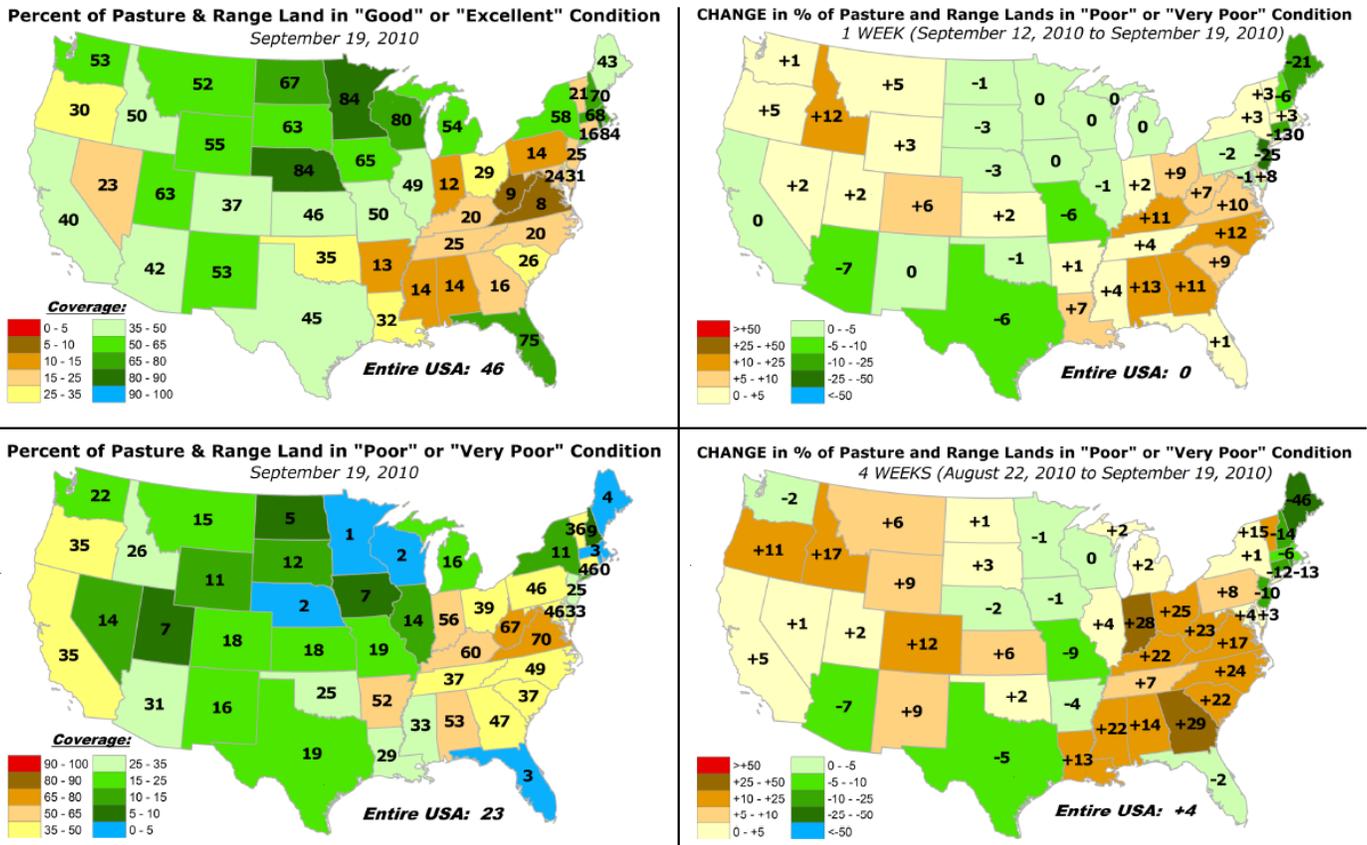


Fig. 6: These maps show the overall pasture and rangeland conditions by state. Note that Nevada has the least amount of good or excellent condition (upper left panel) in the West and during the previous week (upper right panel); conditions improved the most in Arizona and the worst in Idaho.

Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/pasture-range-statewide-conditions.pdf>

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National Drought Summary -- September 21, 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 Bermuda High dominated the weather across the southern tier states this U.S. Drought Monitor (USDM) week, while fronts and low pressure systems brought areas of rain to the northern half of the contiguous United States. A few of the showers gave relief to some of the drought areas, but dry weather dominated most of them, with hot temperatures roasting the South for another week. Stream levels continued to drop in the East and South. The dry conditions have allowed crop harvesting to proceed apace in some areas, but in many states crops still in the ground were suffering. The hot temperatures and lack of rain have baked the soil, making harvesting of some crops (especially peanuts) difficult and hampering planting of fall crops.

East and South: Persistently low to record low stream levels and continued crop impacts resulted in the addition of a large area of AH impacts from southern New England to Louisiana. Impacts included the following: North Carolina reservoirs were approaching levels low enough to trigger responsive measures. U.S. Department of Agriculture (USDA) reports described “arid, desert-like conditions observed during the first half of the week” in South Carolina, referring to low humidity and hot afternoon temperatures. In Georgia, daily high temperatures averaged in the upper 80s to lower 90s, with highs reaching 90 to 100 degrees F in Montgomery and Headland, Alabama. Several southeast Alabama counties have not seen rain in at least six weeks, severely impacting crop conditions and livestock. The weather station at Mobile has not received any measurable precipitation for September through the 21st. They have never gone so deep into September without measurable precipitation, based on records going back to 1871. Oak trees (20 to 30 years old) were beginning to die, cattle were being impacted by poor nutrition from the ravaged pasture conditions, and the peanut crop in southern Alabama and the Florida panhandle was at risk of being wiped out.

According to September 19 USDA reports, topsoil was “short or very short” of moisture (dry or very dry) over a large percentage of the Northeast to South. Eighty percent or more of the topsoil was dry or very dry in Mississippi (80%), Alabama (89%), Georgia (84%), South Carolina (88%), Virginia (90%), West Virginia (86%), and Maryland (83%), with the value at 73% for Connecticut. Nearly half or more of the pastures and rangeland were in poor or very poor condition in North Carolina (49%), Alabama (53%), West Virginia (67%), and Virginia (70%). The percentage of crops in poor to very poor condition ranged from 20% (Alabama) to 62% (Virginia) for corn, 24% (South Carolina) to 56% (West Virginia) for soybeans, from 20% (Georgia and North Carolina) to 71% (Virginia) for peanuts, and from 19% (South Carolina) to 46% (Virginia) for cotton. In West Virginia, 78% of the apple crop was rated in poor to very poor condition, and 42% of Louisiana’s vegetable crop was in poor to very poor condition.

A few stations in the southern Appalachians and the Northeast received half an inch to an inch or more of rain this week. The drought depiction remained unchanged for these areas. Several

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inches of rain fell in the drought-free area along the Texas coast. But most of the East and South remained dry. Changes to the USDM depiction in the East and South include: expansion of D0 (abnormally dry) and D1 (moderate drought) conditions in New England, Virginia, the Carolinas, Alabama, Florida, and Louisiana. D0 expanded in Maryland, Georgia and Mississippi, and spread further into southeast Texas and southern Tennessee. D2 (severe drought) expanded in North Carolina and Alabama, and a spot of D2 was added to the central east coast of Florida. An oval of D3 (extreme drought) was added in eastern Alabama. An A impact indicator was added to the D1 in Maine to reflect soil moisture impacts (33% of the topsoil in Maine was rated short or very short).

Ohio Valley and Great Lakes: One to three inches of rain fell over the drought area of the Michigan Upper Peninsula, resulting in improved streamflow and the elimination of the D1 area and shrinkage of the D0 there. The H impacts indicator for the western Great Lakes drought area was moved from the U.P. to the Arrowhead of Minnesota, where D0-D2 remained.

Half an inch to an inch of rain fell over the eastern half of Ohio, but otherwise the Ohio Valley was mostly dry this week. Soils continued to dry out and crops suffered. USDA reports indicated that topsoil conditions ranged from 31% short or very short in Illinois to over 75% short or very short in Ohio (79%), Kentucky (83%), and Indiana (84%). Pastures and rangeland were in poor to very poor condition in Ohio (39%), Indiana (56%), and Kentucky (60%), and 33% of Kentucky's soybean crop was rated poor to very poor. Field fires have been reported in the driest portions of southern Indiana. The Office of the State Climatologist and the Kentucky Energy and Environment Cabinet, in coordination with the Kentucky Drought Mitigation Team, issued a Level I Drought Declaration for five drought management areas in western and central Kentucky. These five areas are in addition to the three currently under the Level 1 declaration.

Changes to the USDM depiction in the Ohio Valley include: expansion of the D0 in Illinois, Kentucky, and Tennessee; expansion of D1 in those three states and Indiana; and introduction of D2 in southern Indiana and southwest Ohio.

Great Plains and West: The ovals of D0 in North Dakota were eliminated due to sufficient soil moisture and wet fields, and the D0 and D1 in northern South Dakota shrank under 1+ inches of rain. But an H impact label was added to the D1 to reflect lingering long-term deficits. D0 expanded in southwestern South Dakota, western Nebraska, southeastern Wyoming, and northwestern and northeastern to central Colorado where persistently dry conditions lowered the Standardized Precipitation Index to significantly negative values for the last 30 to 90 days. September 19 USDA reports indicated 80% of Colorado's topsoil and 40% of Nebraska's topsoil was short to very short.

In eastern Oklahoma and adjoining Arkansas, 1+ inches of rain at the beginning of the USDM week prompted the pullback of D0 and D1. An oval of AH was added to reflect decreasing lake levels, with Lake Wister down 10% and Hugo Lake down 26%. Spotty 1+ inch rains punctuated a dry week in western Oklahoma, resulting in a reconfiguration of the D0 there. But the below-normal rainfall coupled with high temperatures causing high evaporation severely dried soils, prompting the introduction of D1 in western Oklahoma.

Further west, a large area of 1+ inches of precipitation fell along the Pacific Northwest coast and northern Rockies, with heavier amounts in the coastal mountains. But this precipitation mostly missed the drought areas of the Far West. Most of the rest of the West received little if any

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precipitation. Aside from the changes made in Colorado and Wyoming, no changes were made to the USDM depiction in the West.

Hawaii, Alaska, and Puerto Rico: In Hawaii, rancher reports from the island of Kauai indicate continuing degradation of pasture conditions. Some areas in the southeast portion of the island cannot support cattle. Many reports indicate pastures as being in the worst condition in many years. Seventy percent of the Big Island's national parks were "profoundly dry". The Molokai Irrigation System water level continued to decline. Phase III mandatory conservation measures continued in effect in Maui and Honolulu counties, with measures that include a mandatory 30 percent conservation in usage from all non homestead users. Livestock and pasture conditions on leeward and lower elevation areas continued to be poor. On Kauai, D1 and D2 expanded and an area of D3 was added on the southeast corner. AH impacts were added to island of Maui to reflect persistent widespread below-normal streamflow, although many areas in the state use ground water which is more resilient to shortages. In Alaska, stream levels were persistently low and precipitation was below normal at stations in the panhandle, so D0 was re-introduced in the Alexander Archipelago. Puerto Rico remained drought-free.

Looking Ahead: Early in the period for the next 7 days, moisture from Tropical Depression Georgette will become entrained in the circulation over the Southwest, eventually migrating into the northern Plains with a frontal/low pressure system. The low will drag a front across the South, followed by a slow-moving low pressure trough in the upper atmosphere, bringing a chance of showers for several days later in the period. An inch or more of precipitation is forecast for September 22-26 for parts of the Southwest, southern Plains, and Florida, and the drought areas of Mississippi and Alabama to Kentucky. A large area from the central Plains to Great Lakes can expect an inch or more of moisture, with 3 inches or more progged for the Upper Mississippi Valley. Temperatures are forecast to be warmer than normal for most of the country, but cooler than normal in the central third.

A shift in the weather pattern will occur by the second week of the forecast period. Above-normal precipitation is expected for the eastern third of the country and southern Alaska for September 28-October 6, with below-normal precipitation across much of the central and western portions of the contiguous U.S. and northern Alaska. The outlook calls for warmer-than-normal temperatures for the western half of the country and the Northeast, with below-normal temperatures across the southeastern third from the southern Plains to Ohio Valley, and much of Alaska.

Author: [Richard Heim, NOAA/NESDIS/NCDC](#)

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 September 22, 2010