



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

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## Weekly Report - Snowpack / Drought Monitor Update

Date: 16 July 2010

### SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

**Temperature:** SNOTEL 7-day average temperature departures from normal map reveals cooler than average readings over most of the West. The Southern Rockies had slightly warmer than average temperatures (Fig. 1). However, the ACIS map for the same time period reflects warmer than average temperatures from Arizona to Oregon in Fig. 1a. ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over areas of the Western Great Basin, northern California, and southern Arizona ( $+6^{\circ}\text{F}$ ) and the greatest negative departure occurred over northwestern Oregon and southeastern Wyoming ( $-4\text{F}$ ) (Fig. 1a).

**Precipitation:** ACIS 7-day average precipitation amounts for the period ending 15 July shows the bulk of the heaviest precipitation falling over southern New Mexico (Fig. 2). In terms of percent of normal, scattered thunderstorms throughout all but the Pacific Northwest resulted in two to four times the normal precipitation this week (Fig. 2a). This weather pattern is typical for this time of year. For the 2010 Water-Year that began on 1 October 2009, Arizona, southern New Mexico, eastern Nevada, southeast & southwest Utah, the Olympic Range (WA), central Montana, and central-eastern Wyoming have the largest surpluses while much of northern Idaho, Upper Snake River, Northern Wasatch (UT), and southern Colorado have the greatest deficits. The Olympic Range in Washington and South-Central Mountains in New Mexico have increased significantly this week (Fig. 2b).

### WESTERN DROUGHT STATUS

**The West:** Little to no rain fell over the Pacific Northwest during the past week, with light shower activity (0.1 to 0.5 inch) being reported over portions of the northern and central Rockies. No changes have been made to the regional drought depiction this week. At this time, the only remaining areas of drought north of the southern Rockies and east of the Great Basin are D1 areas in western Wyoming, where longer-term deficits remain substantial and recent relief has been less robust.

Light to moderate showers (up to an inch) fell over central and southeastern Arizona, with a few spotty locations receiving between 1.5 and 2.5 inches of precipitation. Monsoonal showers and thunderstorms are gradually increasing in coverage across both Arizona and New Mexico. About a dozen sites in New Mexico, mostly in the southern part of the state, reported rainfall amounts in excess of 2 inches. Little if any rain was observed over the dryness and drought areas of Nevada. Author: Anthony Artusa, NOAA/NWS/NCEP/CPC.

***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

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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.

Figure 6 contains top soil moisture percentiles and weekly changes:

<http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/topsoil-statewide-statistics.pdf>.

### STATE ACTIVITIES

State government drought activities can be tracked at the following URL:

<http://drought.unl.edu/mitigate/mitigate.htm>. NRCS SS/WSF State Office personnel are participating in state drought committee meetings and providing the committees and media with appropriate SS/WSF information - <http://www.wcc.nrcs.usda.gov/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>.

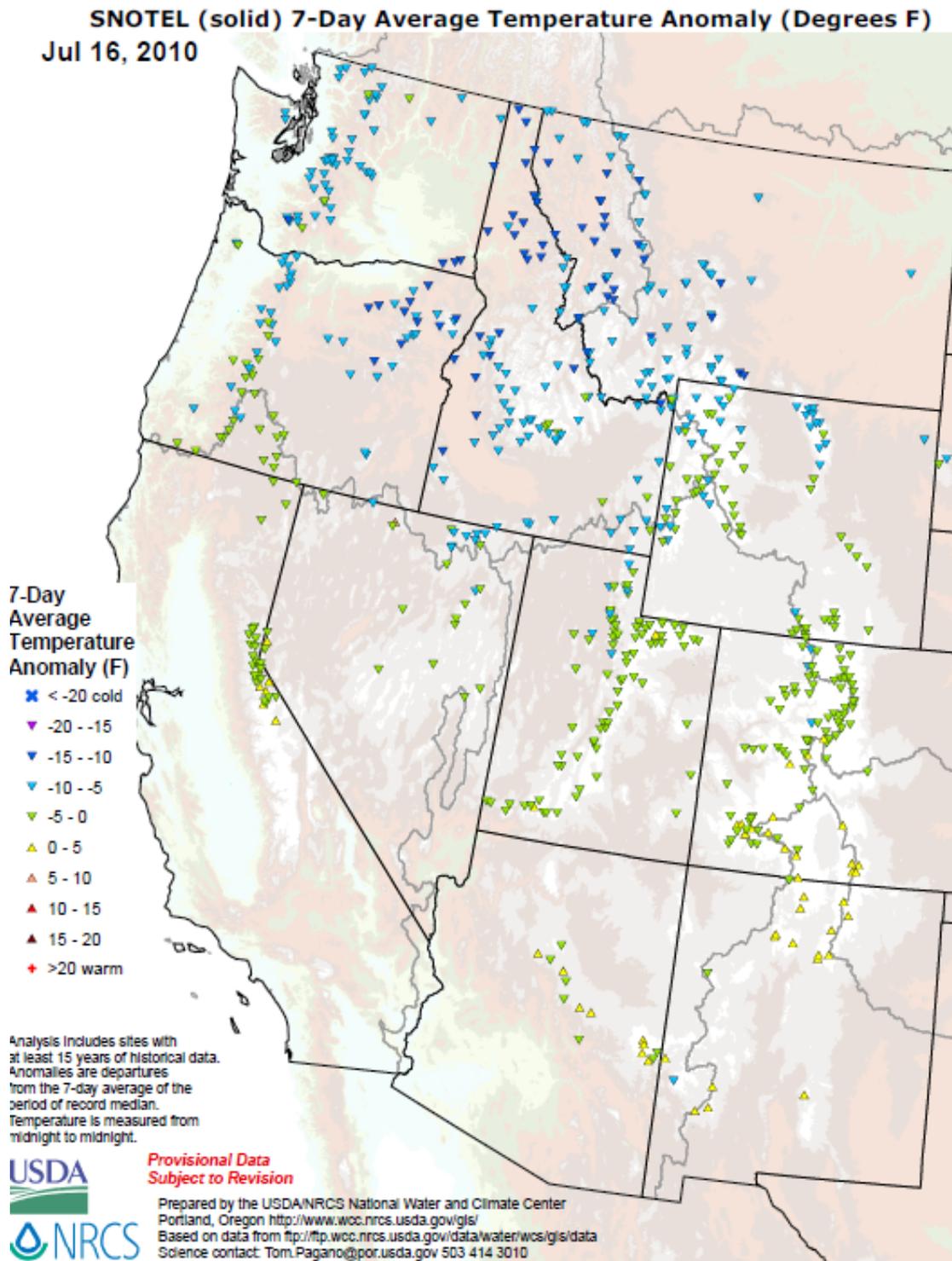
### FOR MORE INFORMATION

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/ NOLLER HERBERT  
Director, Conservation Engineering Division

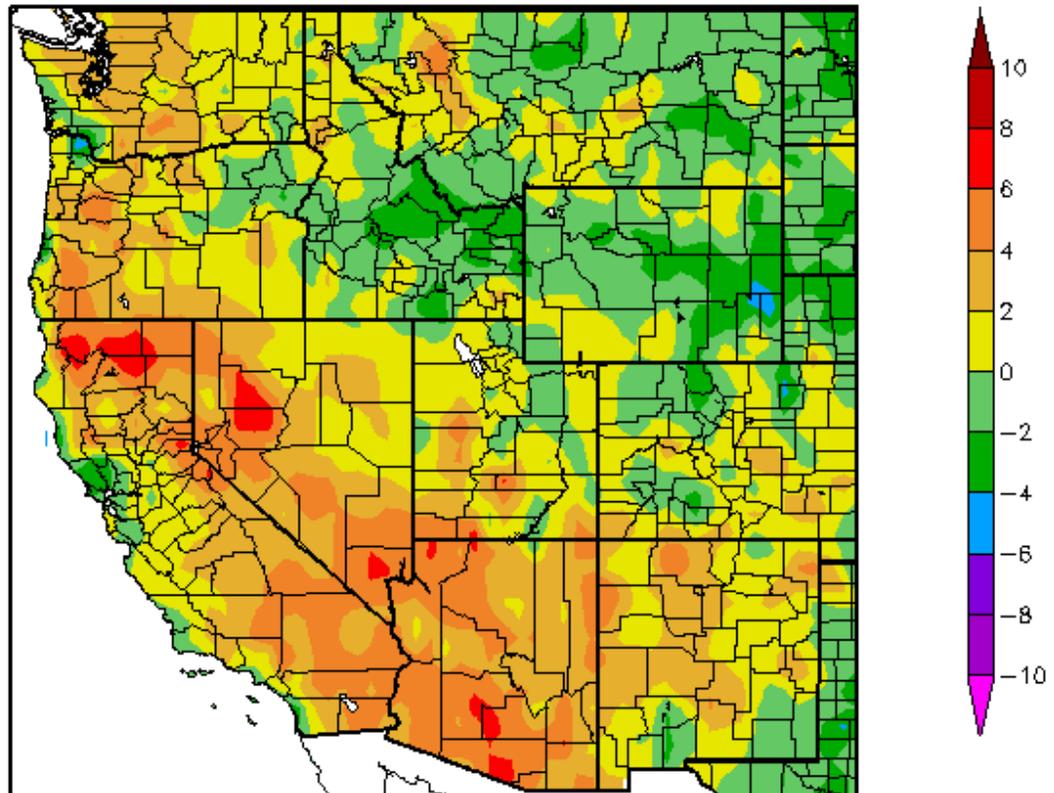
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**Fig. 1: SNOTEL 7-day average temperature departures from normal map reveals cooler than average readings over most of the West. The Southern Rockies had slightly warmer than average temperatures. However, the ACIS map for the same time period reflects warmer than average temperatures from Arizona to Oregon in Fig. 2 below.**

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

Departure from Normal Temperature (F)  
7/9/2010 – 7/15/2010



Generated 7/16/2010 at HPRCC using provisional data.

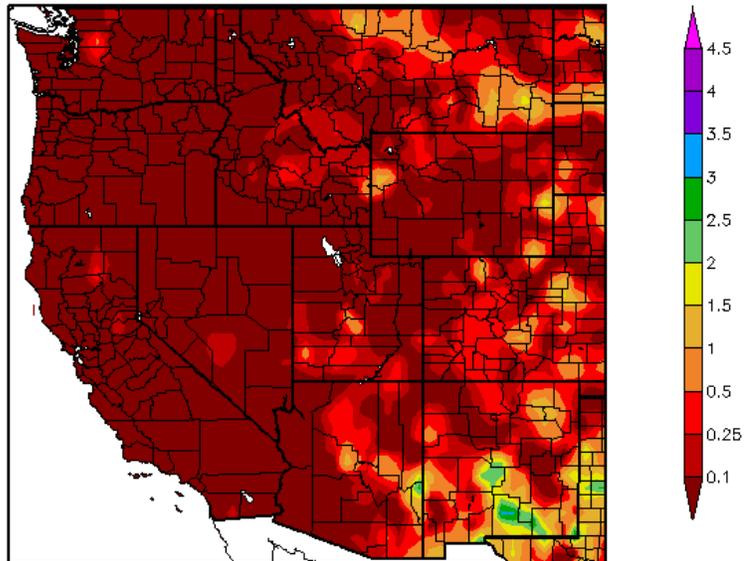
NOAA Regional Climate Centers

**Fig. 1a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures were over areas of the Western Great Basin, northern California, and southern Arizona (>+6°F) and the greatest negative departure occurred over northwestern Oregon and southeastern Wyoming (<-4F).**

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)

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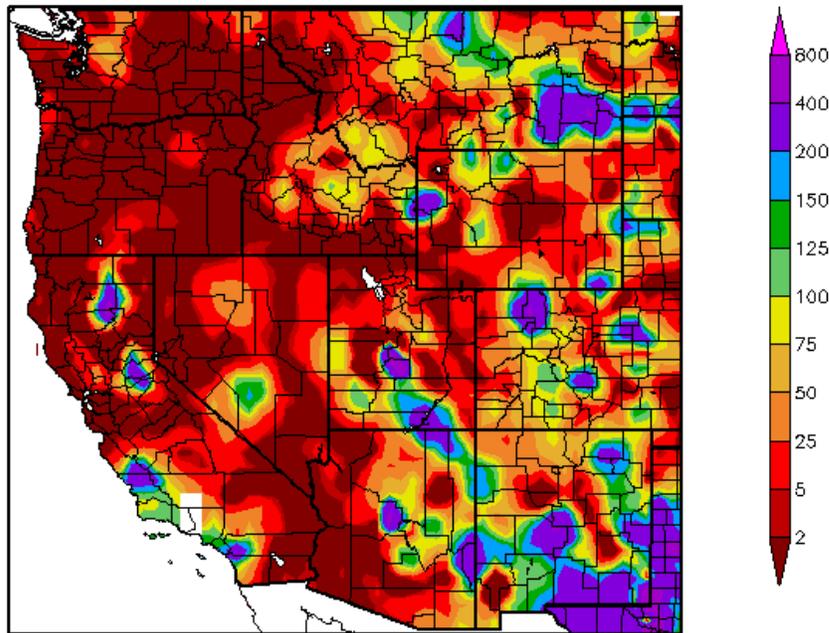
Precipitation (in)  
7/9/2010 - 7/15/2010



Generated 7/16/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)  
7/9/2010 - 7/15/2010

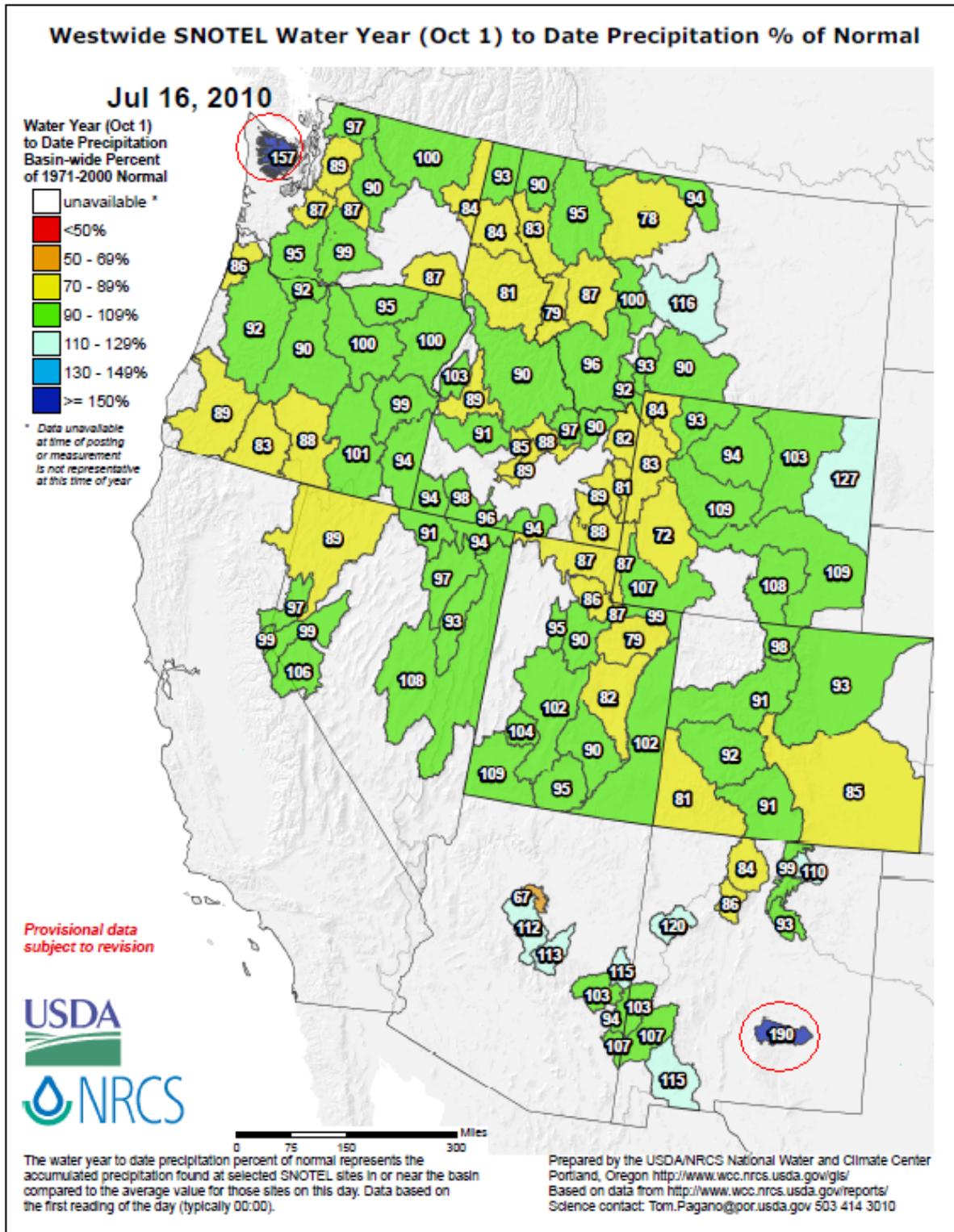


Generated 7/16/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

**Fig. 2 and 2a:** ACIS 7-day average precipitation amounts for the period ending 15 July shows the bulk of the heaviest precipitation falling over southern New Mexico (Fig. 2). In terms of percent of normal, scattered thunderstorms throughout all but the Pacific Northwest resulted in two to four times the normal precipitation this week (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, eastern Nevada, southeast & southwest Utah, the Olympic Range (WA), central Montana, and central-eastern Wyoming have the largest surpluses while much of northern Idaho, Upper Snake River, Northern Wasatch (UT), and southern Colorado have the greatest deficits. Circled areas in red have increased significantly this week.

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

# U.S. Drought Monitor

July 13, 2010  
Valid 8 a.m. EDT

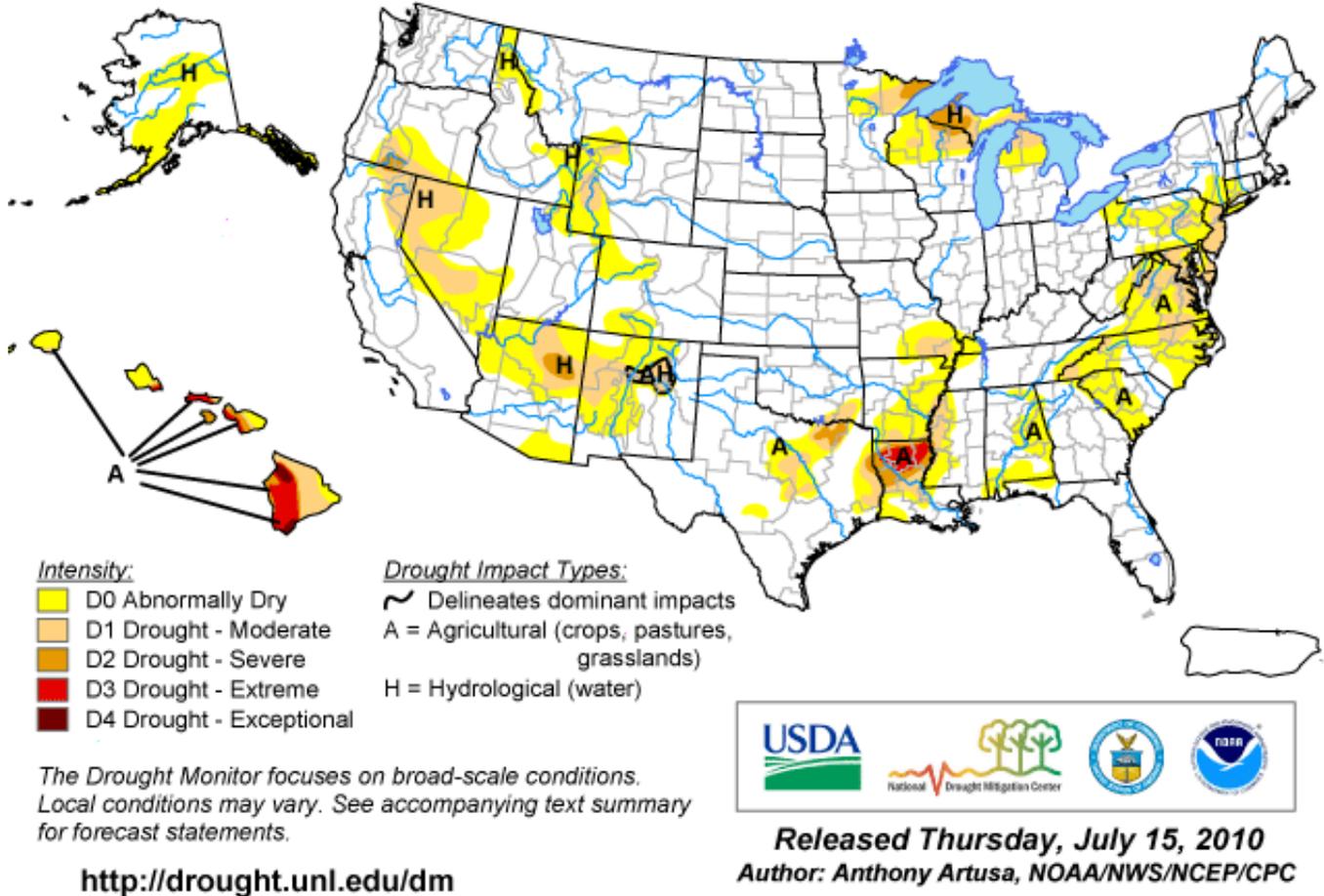


Fig. 3: Current Drought Monitor weekly summary. Hawaii is only state that has a D4 drought level. D3 levels dominate northern Louisiana. Ref: National Drought Mitigation Center (NDMC) - <http://www.drought.unl.edu/dm/monitor.html>

# U.S. Drought Monitor West

July 13, 2010  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

|   | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4  |
|---|------|-------|-------|-------|-------|-----|
| Current                                       | 71.3 | 28.7  | 8.4   | 0.6   | 0.0   | 0.0 |
| Last Week<br>(07/06/2010 map)                 | 71.3 | 28.7  | 8.4   | 0.6   | 0.0   | 0.0 |
| 3 Months Ago<br>(04/20/2010 map)              | 44.9 | 55.1  | 19.7  | 4.9   | 0.0   | 0.0 |
| Start of<br>Calendar Year<br>(01/05/2010 map) | 40.1 | 59.9  | 30.6  | 9.9   | 0.5   | 0.0 |
| Start of<br>Water Year<br>(10/06/2009 map)    | 42.1 | 57.9  | 25.4  | 8.5   | 0.0   | 0.0 |
| One Year Ago<br>(07/14/2009 map)              | 55.1 | 44.9  | 19.0  | 7.7   | 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*



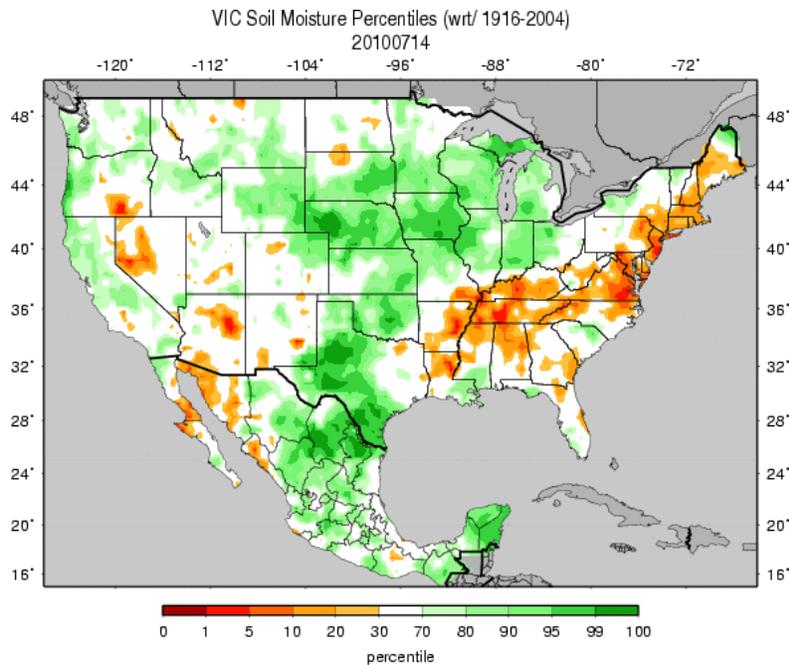
**Released Thursday, July 15, 2010**  
Author: A. Artusa, CPC/NOAA

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

**Fig. 3a: Drought Monitor for the Western States with statistics over various time periods. Regionally there were no changes since last week.**

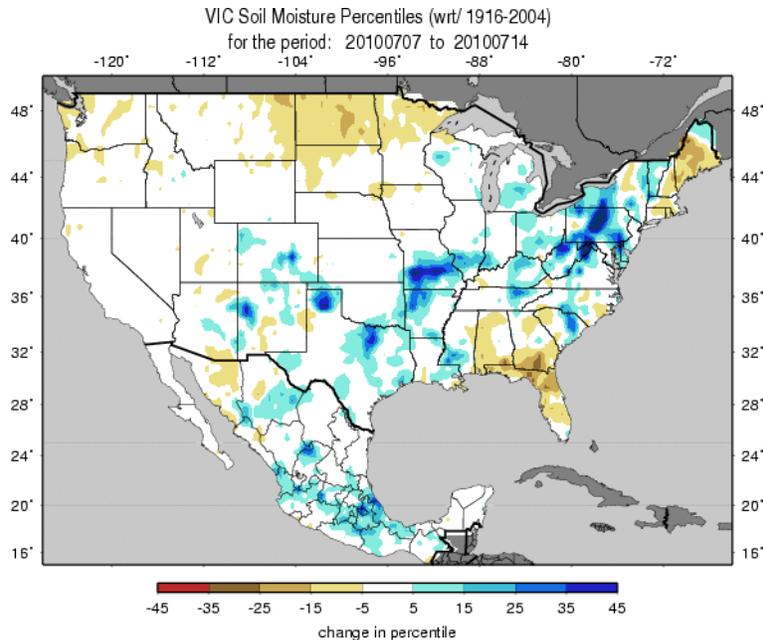
Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)

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**Figs. 4a:** Soil Moisture ranking in percentile based on 1916-2004 climatology as of 14 July. Excessive moisture dominates over the High Plains. Dry soils continue over the Lower Mississippi River Valley and the Northeast.

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

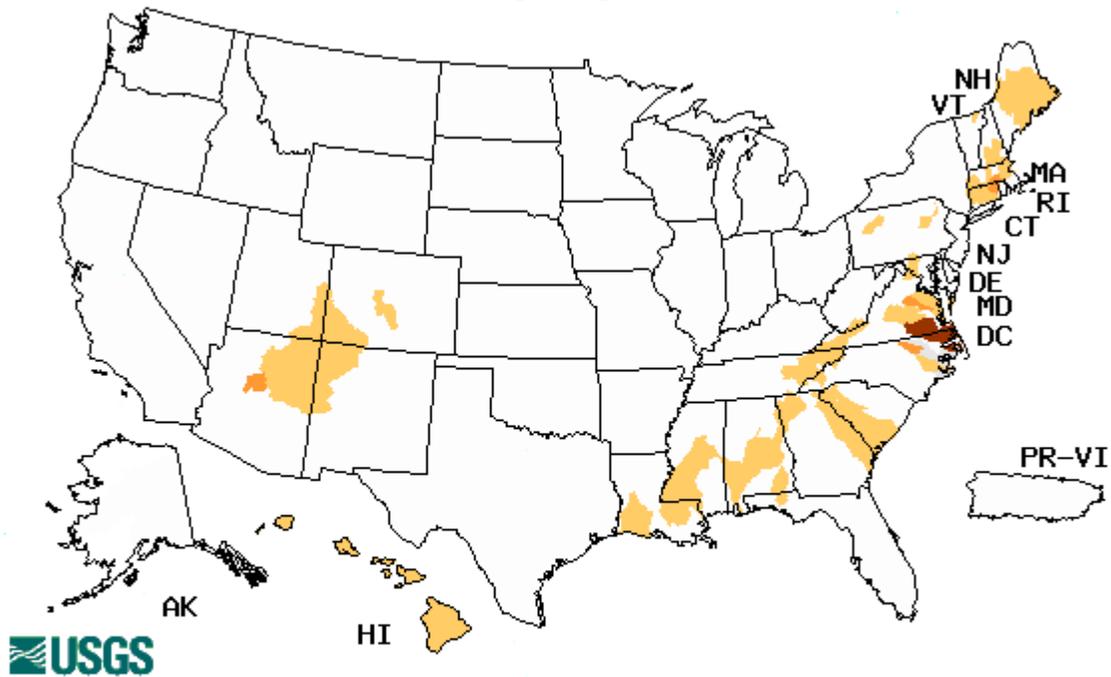


**Figs. 4b:** Soil Moisture change in percentile based on 1916-2004 climatology for the week shows some moistening over West Virginia to New York and Missouri and some drying over the Southeast and North Dakota.

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)

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Thursday, July 15, 2010

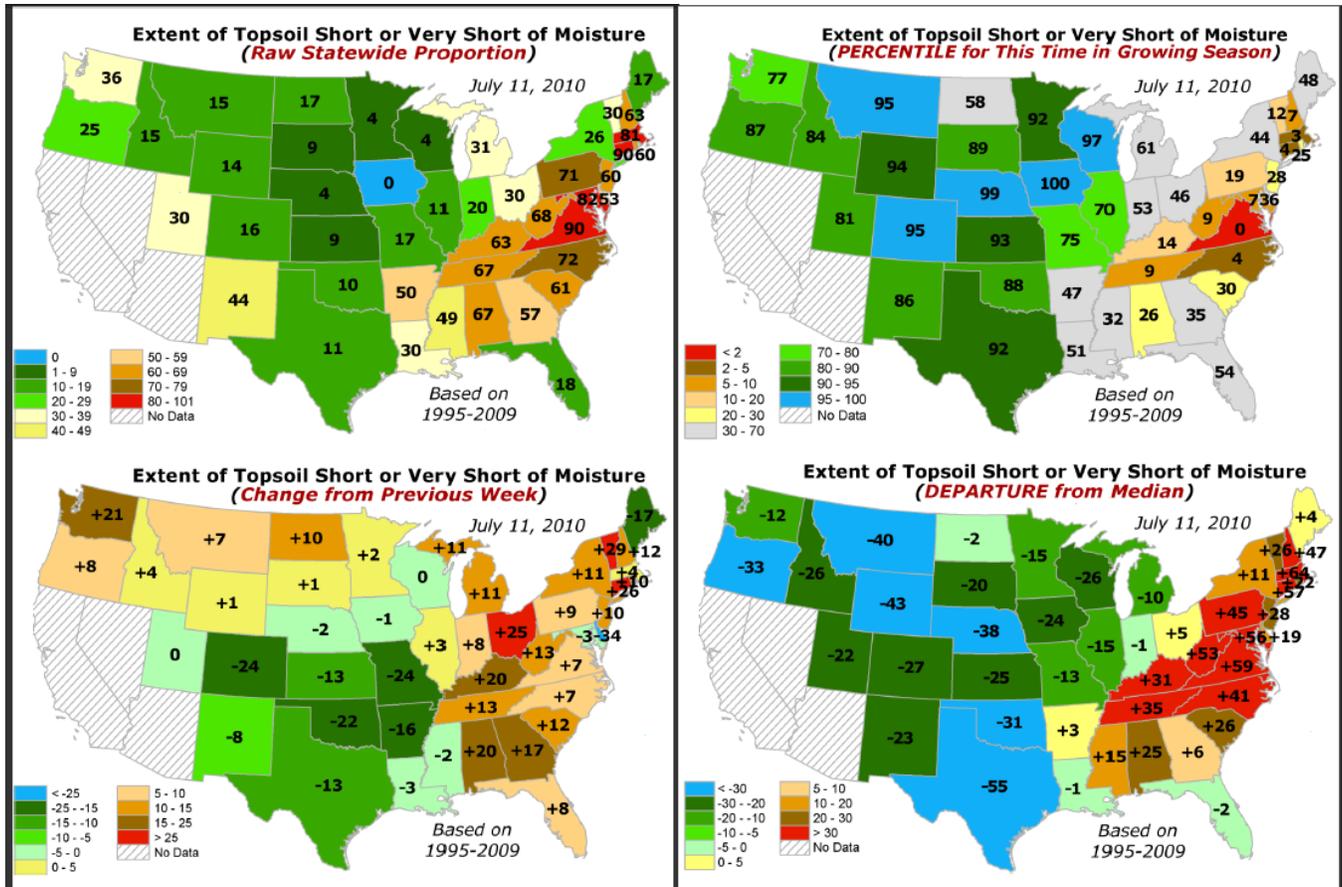


| Explanation - Percentile classes |                           |                             |              |   |
|----------------------------------|---------------------------|-----------------------------|--------------|---|
| Low                              | ≤5                        | 6-9                         | 10-24        | Insufficient data for a hydrologic region |
| Extreme hydrologic drought       | Severe hydrologic drought | Moderate hydrologic drought | Below normal |   |

**Fig. 5:** Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Very few regions are showing below normal flows. The Mid-Atlantic has the largest stream flow deficits. Improvement occurred over New York and vicinity this week.

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

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**Fig. 6: Maps of Top Soil deficits in terms of percentiles. Note that the driest conditions are over New Mexico (44) upper left panel reflects an 8 percentile improvement this week (lower left panel). Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/topsoil-statewide-statistics.pdf>**

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### National Drought Summary -- July 13, 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 Atlantic Seaboard:** Very warm, humid weather continued across the East Coast states this week, though not quite as hot or dry as during the previous week. Temperatures ranged from 8 to 12 degrees F above normal throughout the Northeast, and 4 to 8 degrees F above normal throughout the mid-Atlantic region. Weak weather disturbances moved across the region, bringing greater coverage of showers and thunderstorms, though many areas still received little or no rainfall. Heavy rain (2 or more inches) fell across western counties in New Jersey, but much of the state continued to miss out on the heavier precipitation, prompting a 1-category degradation, from D0 to D1 drought conditions. In addition, D0 dryness was expanded from southeastern New York and Long Island into western Connecticut, where negative rainfall departures of 4 to 6 inches have occurred over the past 60 days. Farther south, moderate to heavy rains (1.5 to 4 inches) fell over northern portions of the Chesapeake Bay shoreline, prompting a 1-category improvement, while the lower Delmarva Peninsula missed out on the heavier rains, contributing to a southward expansion of D1 conditions. The rain that fell within the past 1-2 days is not taken into account by CPC's 3-month or 6-month SPI tools, nor the NLDAS Top 1-meter and total column soil moisture tools, which support a significantly drier depiction. In the eastern Panhandle of West Virginia and adjacent north-central Maryland, little rain and pervasive dryness warranted a 1-category degradation of drought, from D0 to D1 conditions. At Shenandoah Junction, WV, which is located near Harper's Ferry, only 1.07 inches of rain has been observed since June 14th. This one month period includes a string of 22 consecutive days without measurable rain.

Little rainfall and very warm temperatures resulted in an expansion of D0 dryness across southeastern portions of North Carolina, and southern and western portions of South Carolina. In terms of soil moisture for the North Carolina coastal region, the percentage of soil moisture rated short increased from 37 percent last week to 51 percent this week. Crop reports still indicate concerns of stress, particularly the corn crop. In South Carolina, soil moisture levels also regressed, with 41 percent rated short. The dry weather and increased evaporation rates have had a substantial impact on both agriculture and wildfire activity.

**The Great Lakes Region:** Recent heavy rains over central Upper Michigan contributed to one and two category improvements in the area. The town of Munising, in Alger County, has received 3.93 inches of rain so far in July, and 8.32 inches of rain in June. Just west of Marquette, MI, 8.93 inches of rain has fallen since June 1st, which is the second highest rainfall on record for that time period, with records dating back to 1961. This area continues to receive well above normal rain this month, and is only a third of an inch shy of normal rainfall for July. The Keweenaw Peninsula has been missing out on much of the rain this month, justifying the maintenance of D2 drought conditions. This is also consistent with lingering low water levels at reservoirs in western Upper Michigan.

**The South-Central States:** During the past week, heavy rain (2 inches or more) fell across much of eastern and southern Oklahoma, northern-, central-, and southeastern Texas, northern Arkansas, and portions of Louisiana. Even with this beneficial rainfall, it is unclear as to what significant improvements

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can be made in the drought depiction at this time, and a reassessment of conditions will be made next week for possible modifications.

**The West:** Little to no rain fell over the Pacific Northwest during the past week, with light shower activity (0.1 to 0.5 inch) being reported over portions of the northern and central Rockies. No changes have been made to the regional drought depiction this week. At this time, the only remaining areas of drought north of the southern Rockies and east of the Great Basin are D1 areas in western Wyoming, where longer-term deficits remain substantial and recent relief has been less robust.

Light to moderate showers (up to an inch) fell over central and southeastern Arizona, with a few spotty locations receiving between 1.5 and 2.5 inches of precipitation. Monsoonal showers and thunderstorms are gradually increasing in coverage across both Arizona and New Mexico. About a dozen sites in New Mexico, mostly in the southern part of the state, reported rainfall amounts in excess of 2 inches. Little if any rain was observed over the dryness and drought areas of Nevada.

**Alaska:** South-central and southeastern parts of mainland Alaska received over 2 inches of rain during the past week. Unfortunately, these heavier rains mostly missed the areas of D0 dryness over the southwestern and central Interior sections of the state. A few locations in the Panhandle received 1 to 2 inches of precipitation, while others received much less. Even the higher amounts of rain result in only a modest reduction in 90-day shortfalls to this climatologically wet region, thus D0 conditions remained unchanged.

**Hawaii:** Once again, only light rainfall (up to three-quarters of an inch) was recorded across most of the state last week, with an isolated report of 2 inches observed over Oahu. Dryness and drought remained unchanged through most of the state. The only areas of exceptional drought (D4) affecting any part of the United States exist in part of northwestern and southwestern Hawaii Island.

**Looking Ahead:** During the next 5 days (July 15-19), 2 inches of rain is forecast across the long-term drought area encompassing northeastern Minnesota, north-central Wisconsin, and western Upper Michigan. Somewhat less precipitation (1 to 1.5 inches) is expected in eastern Upper Michigan and northern Lower Michigan, as well as over southeastern New York including Long Island, Connecticut and New Jersey. The mid-Atlantic region should receive up to 0.5 inch of rain, while farther south, 2 to 3 inches of rain is forecast for portions of the Southeast. Little relief is predicted across Texas and southeastern Oklahoma during the next 5 days, with rainfall amounts generally ranging between 0.10 and 0.25 inch. Up to an inch of rain is anticipated across the drought area in the lower Mississippi Valley. In the Southwest, 0.25 to 0.50 inch of rain associated with monsoonal showers and thunderstorms is expected over Arizona and New Mexico, with locally heavier amounts possible.

For the ensuing 5 days (July 20-24), the odds favor above-median rainfall across the Upper Great Lakes region, and below-median rainfall over southeastern New York, southern New England, New Jersey, the southern Plains, and southwestern and south-central portions of Alaska.

**Author:** [Anthony Artusa, NOAA/NWS/NCEP/CPC](#)

### Dryness Categories

D0 ... Abnormally Dry ... used for areas showing dryness but not yet in drought, or for areas recovering from drought.

### Drought Intensity Categories

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

### **Drought or Dryness Types**

A ... Agricultural  
H ... Hydrological

Updated July 14, 2010