



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

Weekly Report - Snowpack / Drought Monitor Update

Date: 1 July 2010

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: SNOTEL 7-day average temperature departures from normal map reveal warmer than average temperatures over all but the Northern Cascades and New Mexico-southeast Arizona (Fig. 1). ACIS 7-day average temperature anomalies show that the greatest positive temperature departure was over south-central California ($>+10^{\circ}\text{F}$) and the greatest negative departure occurred over southeastern New Mexico ($<-4\text{F}$). The 7-day temperature pattern this week is almost the exact opposite to last week's when cooler than average conditions prevailed across the West (Fig. 2a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 30 June shows the bulk of the heaviest precipitation falling over central Oregon to Montana and especially over New Mexico (Fig. 2). In terms of percent of normal, much of these same regions had two to four times the normal precipitation this week. California's anomaly indicates that very light precipitation fell when normally none occurs this time of year (Fig. 2b).

WESTERN DROUGHT STATUS

The West: Little precipitation fell from the Rockies westward, generally keeping any dryness and drought intact, to some small-scale expansion of abnormal dryness was noted in southwestern Colorado and central Arizona. Farther north, a re-assessment of conditions led to a significant reduction in the extent of abnormal dryness and moderate drought in western Montana and northern Idaho, with drought eliminated completely in areas north and west of southeastern Idaho. In these areas, record or near-record June precipitation brought water-year totals to near or above normal levels. Author: Rich Tinker, CPC/NCEP/NWS/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 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/>.

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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.

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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SNOTEL (solid) 7-Day Average Temperature Anomaly (Degrees F) Jul 01, 2010

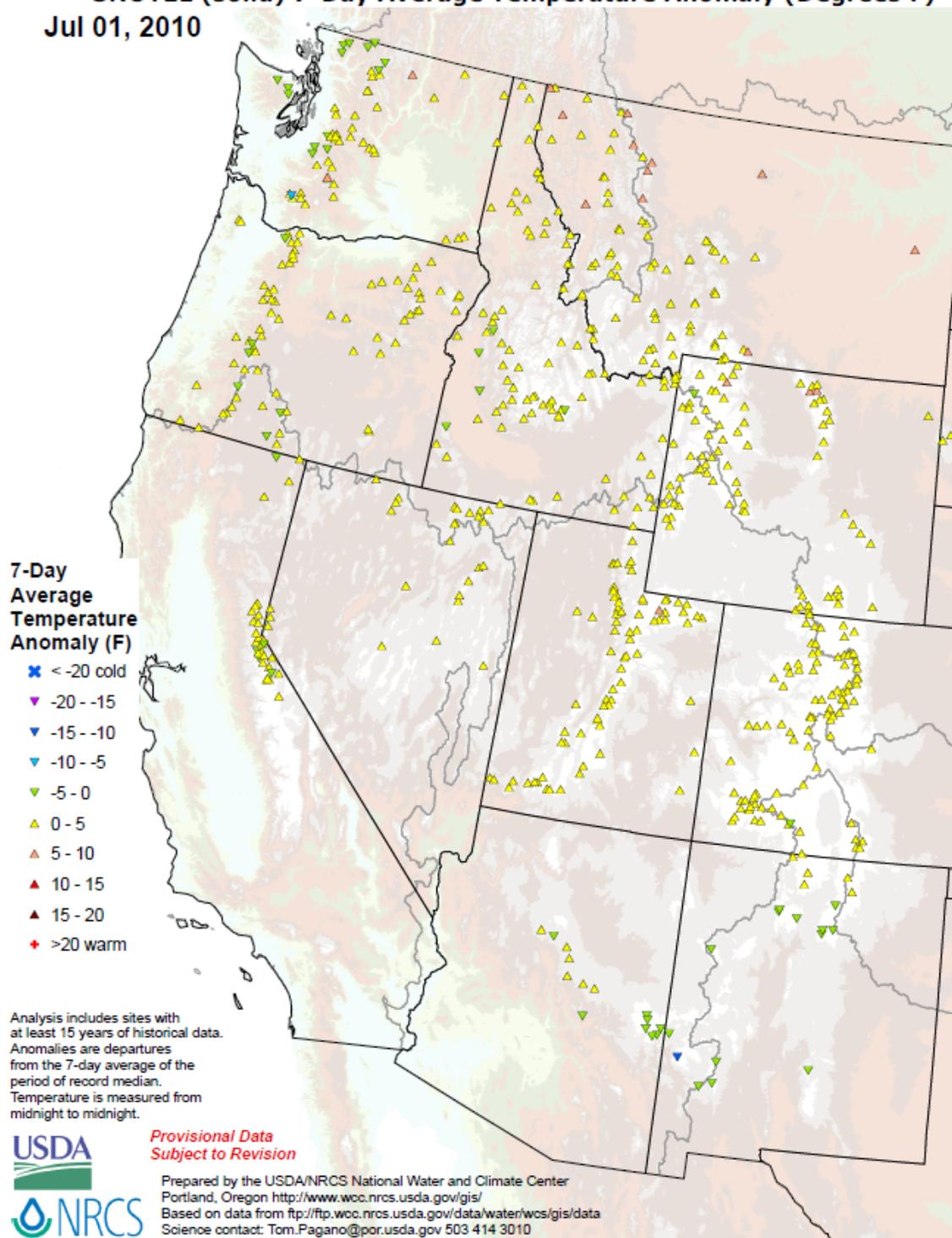
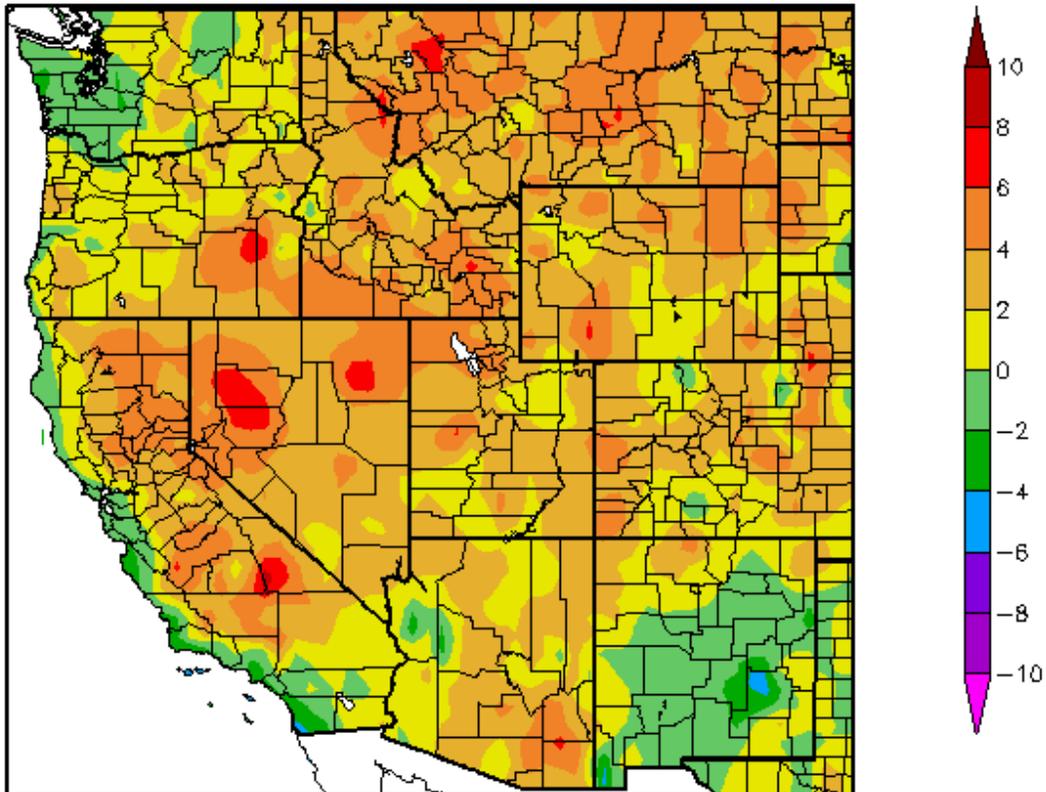


Fig. 1: SNOTEL 7-day average temperature departures from normal map reveal warmer than average temperatures over all but the Northern Cascades and New Mexico-southeast Arizona.

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

Departure from Normal Temperature (F)
6/24/2010 – 6/30/2010



Generated 7/1/2010 at HPRCC using provisional data.

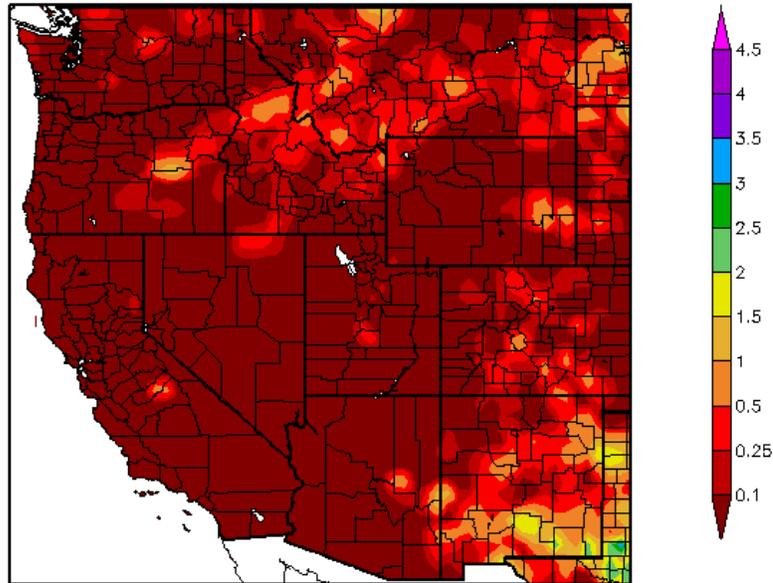
NOAA Regional Climate Centers

Fig. 1a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departure was over south-central California ($>+10^{\circ}\text{F}$) and the greatest negative departure occurred over southeastern New Mexico ($<-4\text{F}$). The 7-day temperature pattern this week is almost the exact opposite to last week's when cooler than average conditions prevailed across the West.

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

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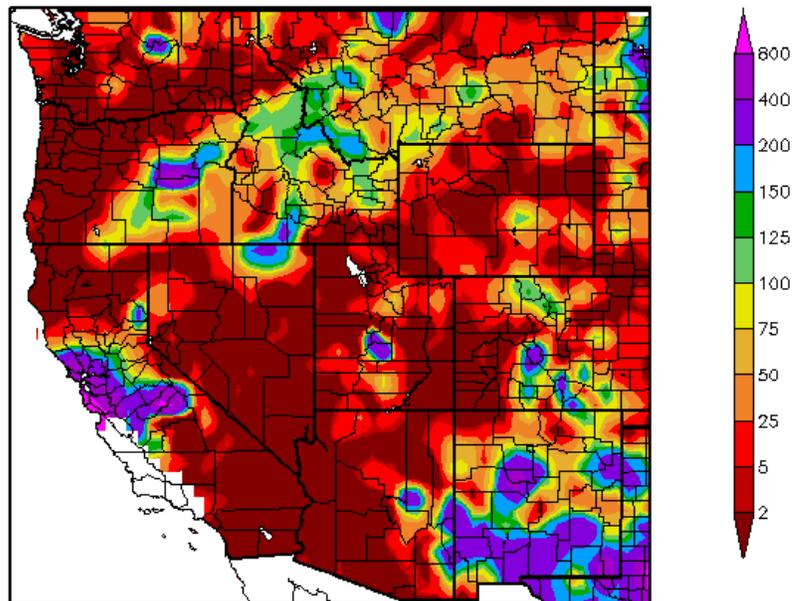
Precipitation (in)
6/24/2010 – 6/30/2010



Generated 7/1/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
6/24/2010 – 6/30/2010



Generated 7/1/2010 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2 and 2a: ACIS 7-day average precipitation amounts for the period ending 30 June shows the bulk of the heaviest precipitation falling over central Oregon to Montana and especially over New Mexico (Fig. 2). In terms of percent of normal, much of these same regions had two to four times the normal precipitation this week. California's anomaly indicates that light precipitation fell when normally none occurs this time of year (Fig. 2a).

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

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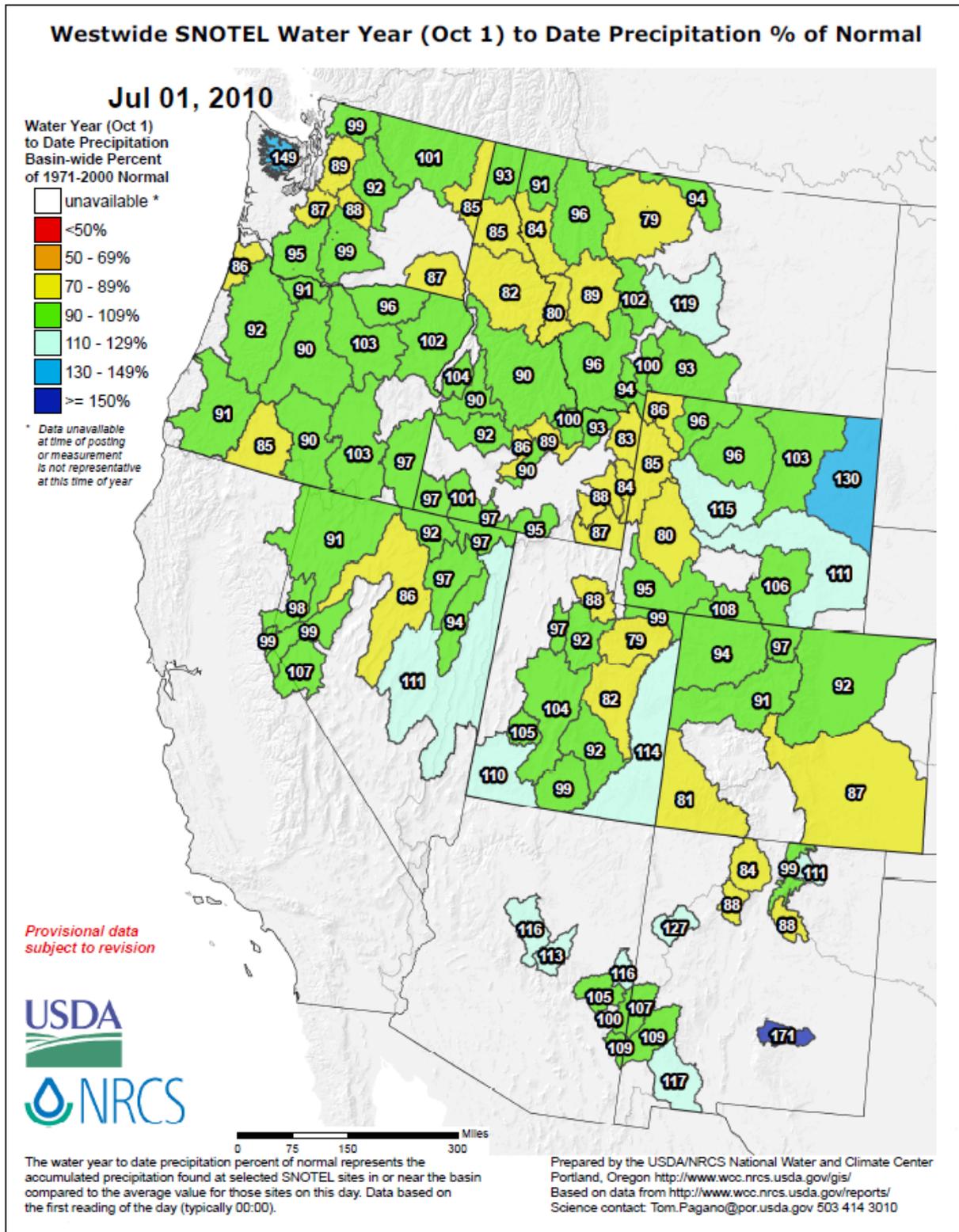
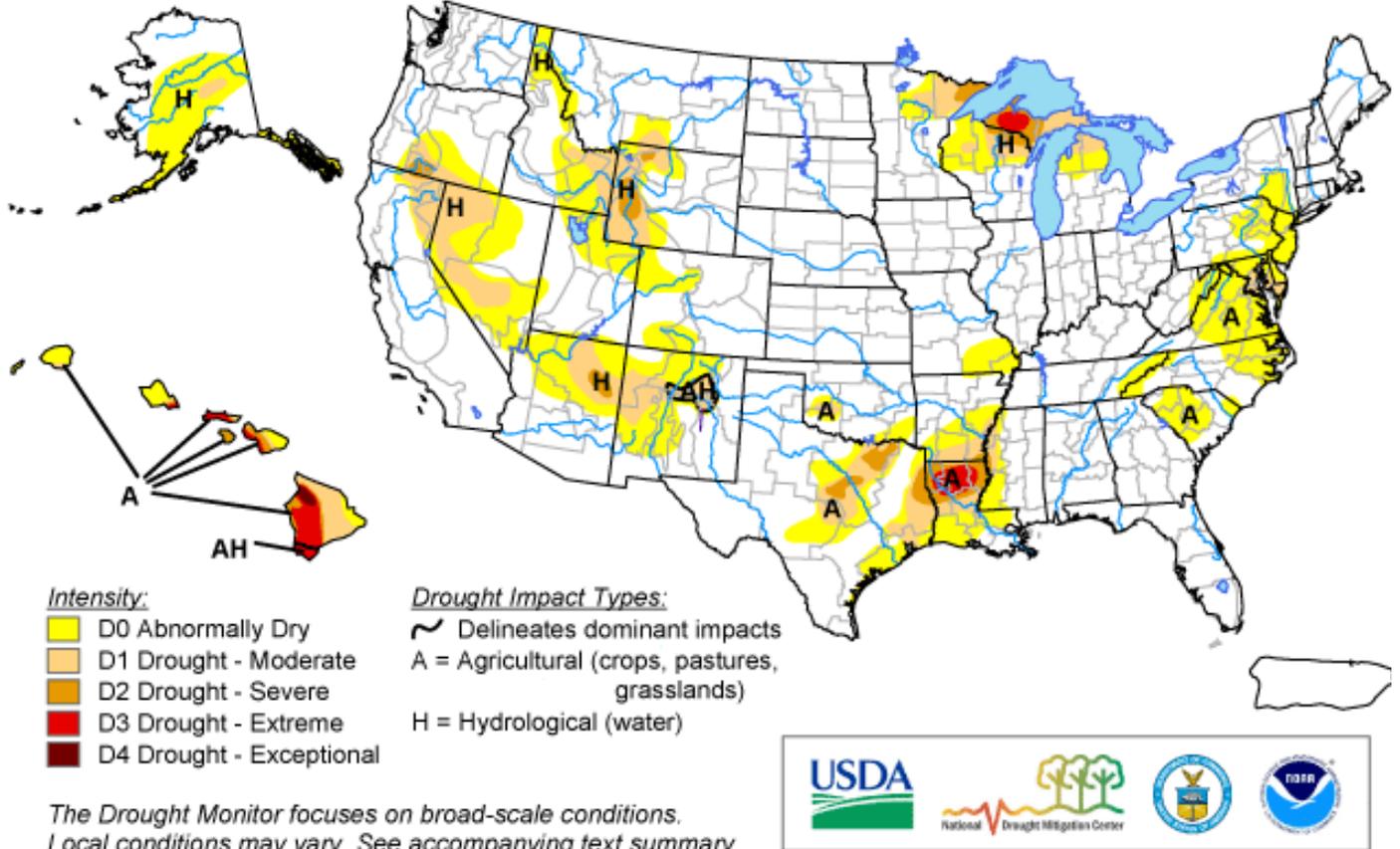


Fig 2b: For the 2010 Water-Year that began on 1 October 2009, Arizona, southern New Mexico, eastern Nevada, southeast & southwest Utah, the Olympic Range (WA), central Montana, and central-eastern Wyoming have the largest surpluses while much of northern Idaho, Upper Snake River, Northern Wasatch (UT), and southern Colorado have the greatest deficits.

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

U.S. Drought Monitor

June 29, 2010
Valid 8 a.m. EDT



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



Released Thursday, July 1, 2010
Author: Rich Tinker, NOAA/NWS/NCEP/CPC

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

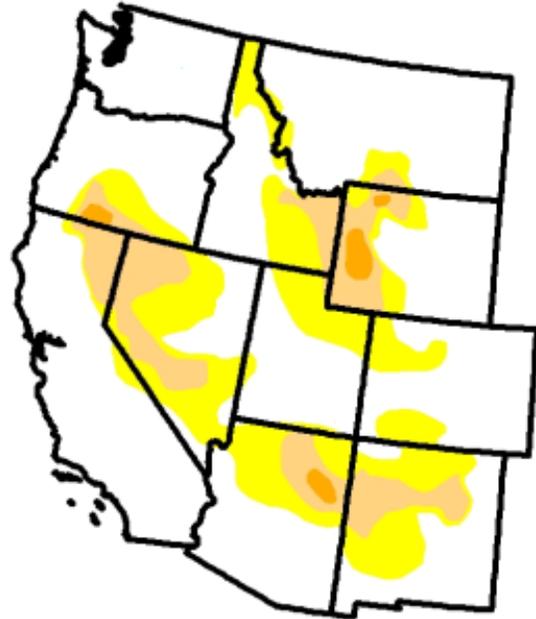
U.S. Drought Monitor

West

June 29, 2010
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	68.6	31.4	11.1	1.0	0.0	0.0
Last Week (06/22/2010 map)	66.5	33.5	11.9	1.0	0.0	0.0
3 Months Ago (04/06/2010 map)	43.5	56.5	20.6	4.9	0.0	0.0
Start of Calendar Year (01/05/2010 map)	40.1	59.9	30.6	9.9	0.5	0.0
Start of Water Year (10/06/2009 map)	42.1	57.9	25.4	8.5	0.0	0.0
One Year Ago (06/30/2009 map)	55.1	44.9	17.9	7.1	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



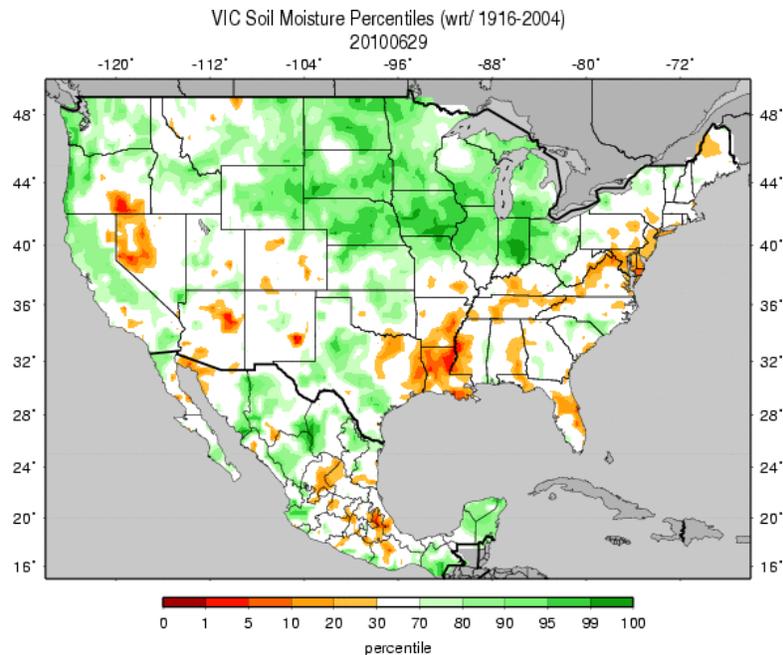
Released Thursday, July 1, 2010
Author: R. Tinker, CPC/NOAA

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

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

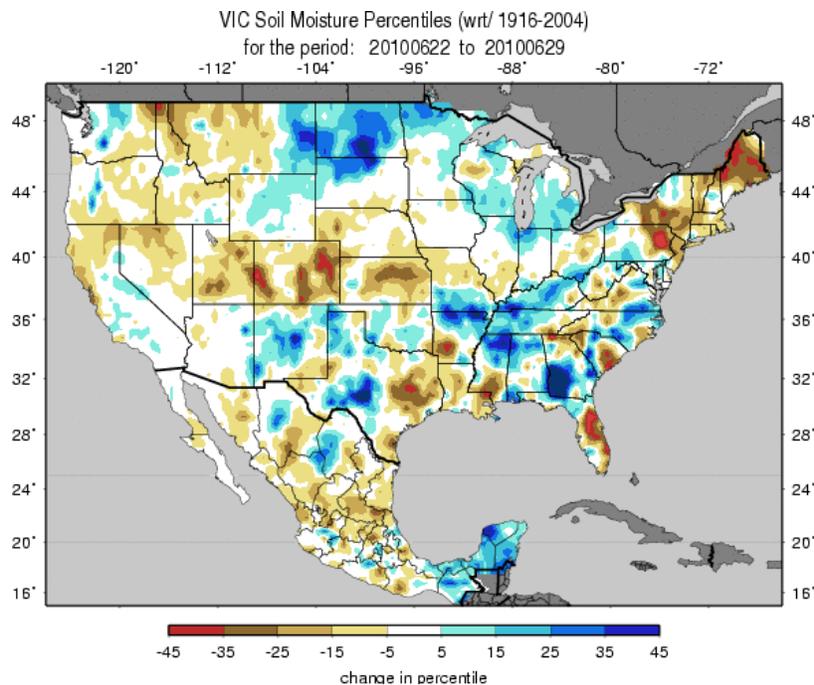
Ref: http://www.drought.unl.edu/dm/DM_west.htm

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Figs. 4a: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 29 June. Excessive moisture dominates over the High Plains, Ohio Valley, and coastal Oregon and Washington. Dry soils continue over the Lower Mississippi River Valley this week.

Ref: http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.gif

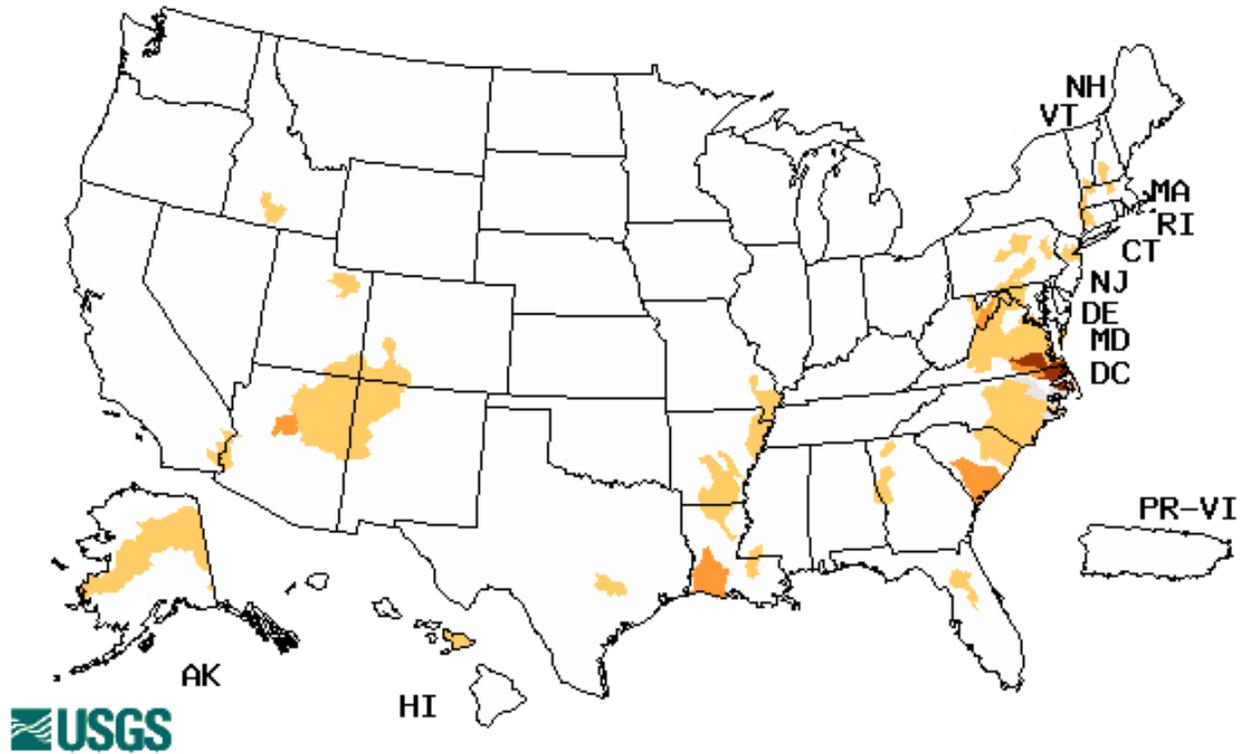


Figs. 4b: Soil Moisture change in percentile based on 1916-2004 climatology for the week shows intensifying drying over parts of the Southeast and New England. Saturated soils are noted over the Northern High Plains, western Texas, and southern Georgia.

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

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Wednesday, June 30, 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, coastal South Carolina, and southwest Louisiana are showing the largest stream flow deficits.

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

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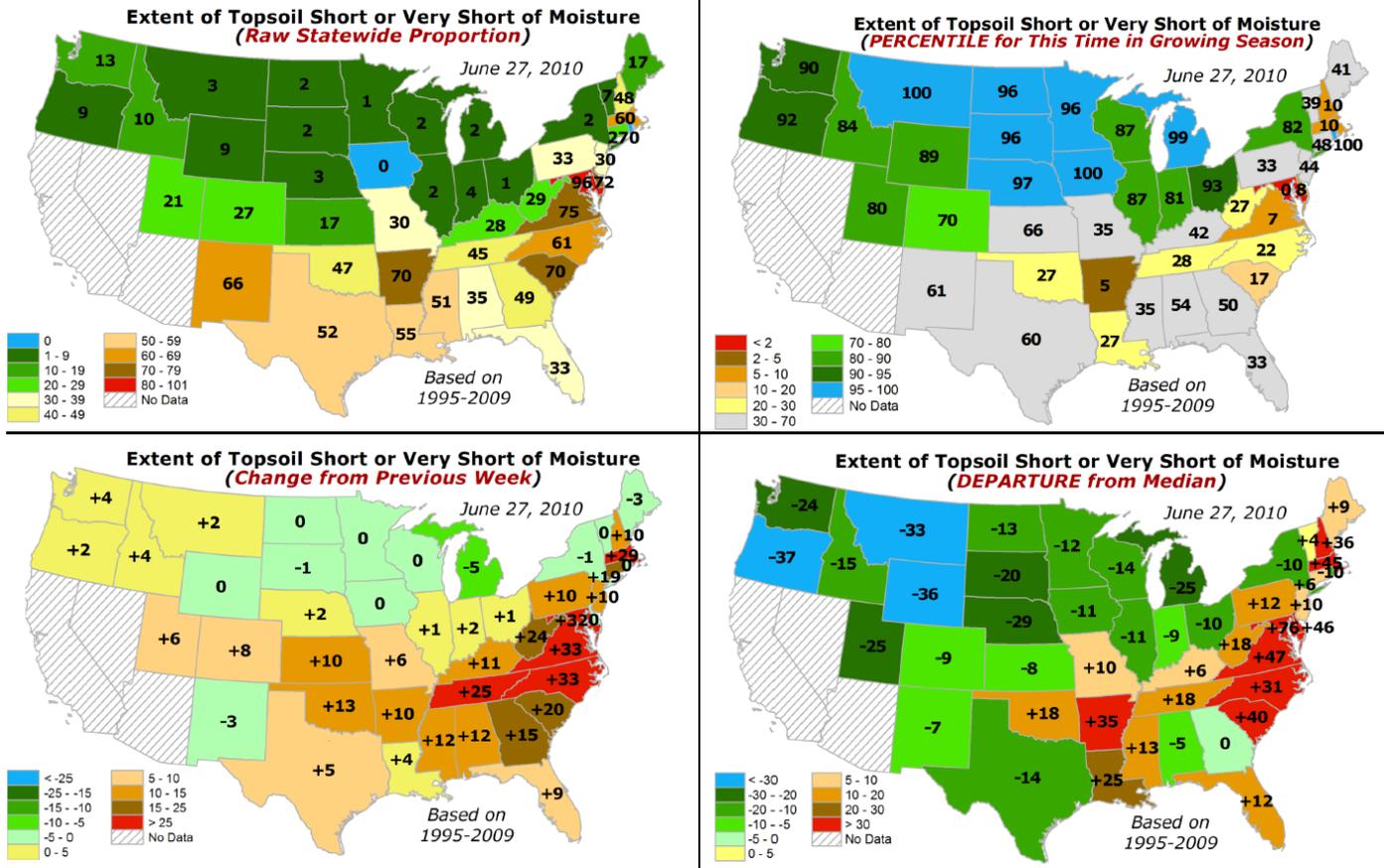


Fig. 6: Maps of Top Soil deficits in terms of percentiles. Note that the driest conditions are over New Mexico (66) upper left panel reflects a 3 percentile improvement this week (lower left panel). Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/topsoil-statewide-statistics.pdf>

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National Drought Summary -- June 29, 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/>.

Heavy rains, exceeding 5 inches in some areas, brought substantial improvement to parts of the Great Lakes region entrenched in a protracted drought. Farther south and east, relentless heat from the south-central Plains northeastward through the central and southern Atlantic Seaboard during June allowed dryness and drought to expand and intensify despite locally moderate to heavy rainfall. Little or no precipitation fell from the Rockies to the West Coast, allowing abnormal dryness to expand in a few small areas; however, D0 and D1 conditions were reduced in parts of the northern Rockies and Intermountain West following a re-assessment of conditions. Meanwhile, heavy rains and some flooding led to the withdrawal of D0 in parts of southeastern Alaska, but increasing moisture deficits prompted D0 expansion in the southwest portion of the state.

The Atlantic Seaboard: Despite scattered moderate rainfall, a hot and generally dry week allowed for rapid drying in many areas, and thus D0A was expanded to cover broader sections of the Carolinas and a large area across the mid-Atlantic and lower Northeast. In addition, moderate drought was introduced in much of central and southern Maryland and some adjacent locales. Temperatures from the Carolinas to southern New York averaged at least 2 degrees F above normal for the last 30 days, with departures reaching +6 degrees F in parts of northeastern North Carolina and the central mid-Atlantic. Precipitation totals in many of these areas were at least an inch below normal during the same period, with departures of -2 to nearly -4 inches observed in a few regions, the largest centered over north-central Maryland. Since late March, rainfall totaled 4 to 7 inches below normal across extreme southern Delaware, the southern tier of Maryland, and portions of central Maryland where moderate drought was introduced this week. Topsoil is short or very short of moisture in 75 to 96 percent of South Carolina, Virginia, Maryland, and Delaware, with 41 percent of pasture lands in poor or very poor condition through the latter two states, according to the National Agricultural Statistics Service.

The Great Lakes Region: Widespread moderate to heavy rain, with totals exceeding 5 inches in part of north-central Wisconsin, brought broad-scale improvement to many areas that have been entrenched in long-term drought and eliminated surface moisture concerns, at least for the time being. Most of this region has received near- to above-normal totals over the course of the past 3 to 5 months, except in portions of the western Upper Peninsula of Michigan where an area of extreme drought persists. Drought Monitor classifications were improved by more than one category in some sections of north-central and northwestern Wisconsin where 6-month precipitation totals have climbed to near normal levels. It should be noted, however, that dryness dates back multiple years in portions of the northern Great Lakes region, likely making complete relief a slow and arduous process there.

The South-Central States: Widespread moderate rains eliminated abnormally dry conditions over a large swath of central and western Texas and in portions of northwestern Tennessee and northeastern Arkansas. In stark contrast, heat and evaporation offset localized heavy rains in most other areas, allowing dryness and drought to persist or worsen. Most notably, dryness dating back at least 6 months and temperatures averaging at least a couple of degrees above normal during June prompted the introduction of extreme drought (D3) across a large part of northern Louisiana. Precipitation this year is

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12 to locally 16 inches below normal throughout the new D3 area, with some locations reporting less than half of normal precipitation during this period.

In other parts of the south-central states, D0 to D2 conditions improved in a few small areas where heavy rainfall was relatively widespread, but dryness either persisted or intensified in most areas. Some patches of severe drought were introduced across central and northeastern Texas where rainfall totals over the last 2 months were 5 to 7 inches below normal.

The West: Little precipitation fell from the Rockies westward, generally keeping any dryness and drought intact, to some small-scale expansion of abnormal dryness was noted in southwestern Colorado and central Arizona. Farther north, a re-assessment of conditions led to a significant reduction in the extent of abnormal dryness and moderate drought in western Montana and northern Idaho, with drought eliminated completely in areas north and west of southeastern Idaho. In these areas, record or near-record June precipitation brought water-year totals to near or above normal levels.

Alaska: Heavy rains of 1 to 4 inches wiped out abnormally dry conditions across interior southeastern Alaska, with flood warnings and advisories issued for the Upper Tanana Valley, the Delta and Tanana Flats, the Eastern Alaskan Range, and the Copper River Basin. In addition, several inches of rain fell on and near Juneau, eliminating D0 in the northeastern Alaskan Panhandle. A few inches of rain fell on most other parts of the Alaskan Panhandle, but D0 was retained because 90-day totals remained 5 to locally 16 inches below normal. In contrast, D0 was expanded into the upper Aleutians where only 70 to 80 percent of normal precipitation (4 to 9 inches less than normal) has fallen over the past 12 months.

Hawaii: Generally light rainfall kept dryness and drought conditions unchanged from last week, including the exceptional drought (D4) covering part of the northeastern Big Island, currently the only drought identified as exceptional anywhere in the nation.

Looking Ahead: Moisture fueled at least partially by Hurricane Alex will dump heavy rain along most of the Gulf Coast during the first five days of July 2010. At least 2 inches should fall on the southern half of Louisiana and a large part of southern and southeastern Texas, with totals of 4 to 8 inches possible in Texas south and west of Galveston. More modest amounts of 0.5 to 2.0 inches are expected over the rest of Texas and Louisiana, southwestern Oklahoma, most of the dry areas across the Great Lakes region, and the southeastern Carolinas. Meanwhile, little or no rain is anticipated in most areas south and west of Montana, and from most of North Carolina northward through central New York.

The ensuing 5 days (July 6 – 10, 2010) feature enhanced chances for above-normal precipitation in the Alaskan Panhandle and in a broad swath from the Gulf Coast and Texas northeastward through central and eastern sections of the Great Lakes region. Meanwhile, below-median precipitation is favored across northern sections of the Rockies, Intermountain West, and West Coast. Neither abnormally heavy nor abnormally light precipitation is favored in any other current areas or dryness and drought.

Author: [Rich Tinker, CPC/NCEP/NWS/NOAA](#)

Dryness Categories

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

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Drought Intensity Categories

D1 ... Moderate Drought

D2 ... Severe Drought

D3 ... Extreme Drought

D4 ... Exceptional Drought

Drought or Dryness Types

A ... Agricultural

H ... Hydrological

Updated June 30, 2010