



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

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

**Date: 21 April 2011**

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** SNOTEL Snow-Water Equivalent percent of normal values for 21 April 2011 shows 1-Category gains (blue circles) over much of the northern Tier States including the Great Basin. Melt-out is nearing completion over much of the Southwest (1-Category loss with red circle) (Fig. 1). SNOTEL Snow-Water Equivalent percent of Normal peak shows continued gains across the West (excluding the Southwest). Most of the West has met or exceeded the long-term climatologically average snowpack this Water Year. Melt-out nearly completed over the Southwest (Fig.1a).

**Temperature:** ACIS 7-day average temperature anomalies show that the greatest positive temperature departures across south-central New Mexico and western Nevada ( $>+6^{\circ}\text{F}$ ) and the greatest negative departures over northern Montana ( $<-9^{\circ}\text{F}$ ). This pattern is typical of a classical La Niña (Fig. 2).

**Precipitation:** ACIS 7-day average precipitation amounts for the period ending 20 April shows the bulk of the heaviest precipitation confined to Cascades and northwest California (Fig. 3). In terms of percent of normal, the precipitation was highest over the northern half of the West (classic La Niña) (Fig 3a). For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, Oregon, Washington, and parts of Northern and Central Rockies. One-category positive changes are denoted by the blue circles. Red circles reflect a one-category decrease (Fig. 3b).

**The West:** The West generally continues to benefit from above normal snowpack and beneficial precipitation, with the exception of the Southwest. In Wyoming, the northern area of Abnormal Dryness (D0) was eliminated. The southern area of Abnormal Dryness was repositioned to align more closely with the indicators for this week. In Colorado, Severe Drought (D2) expanded westward in the south-central part of the state. An area of Extreme Drought (D3) was introduced in the southeast part of the state, coinciding with deteriorating conditions in the Oklahoma Panhandle, northern Texas, and southwest Kansas. New Mexico saw a slight expansion of Extreme Drought (D3) along the Texas border. Author: Michael Brewer, 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

## Weekly Snowpack and Drought Monitor Update Report

developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 4, 4a and 4b).

### SOIL MOISTURE

Soil moisture (Figs. 5a and 5b), 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. 7) 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.

### 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>.

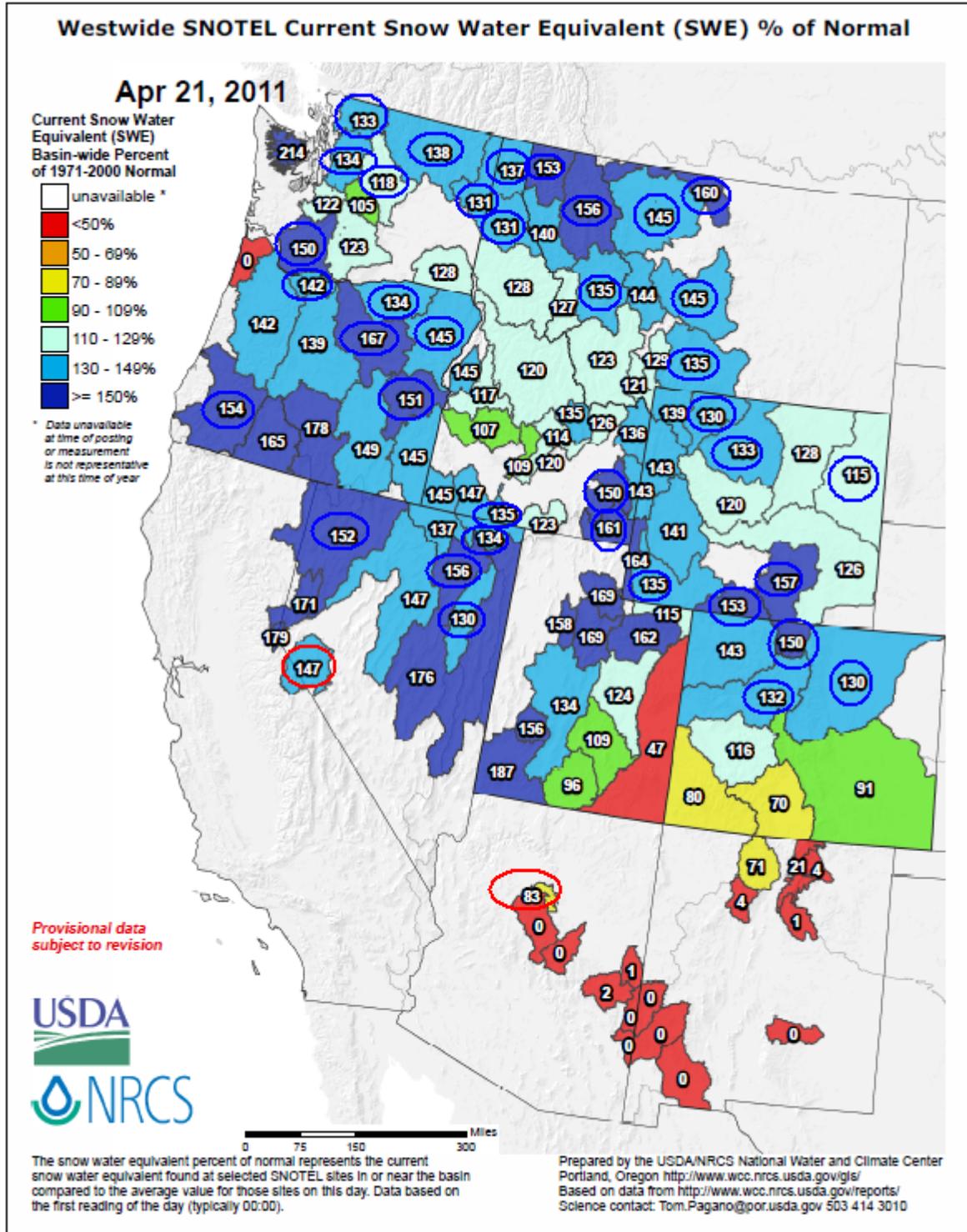
### FOR MORE INFORMATION

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

## Weekly Snowpack and Drought Monitor Update Report

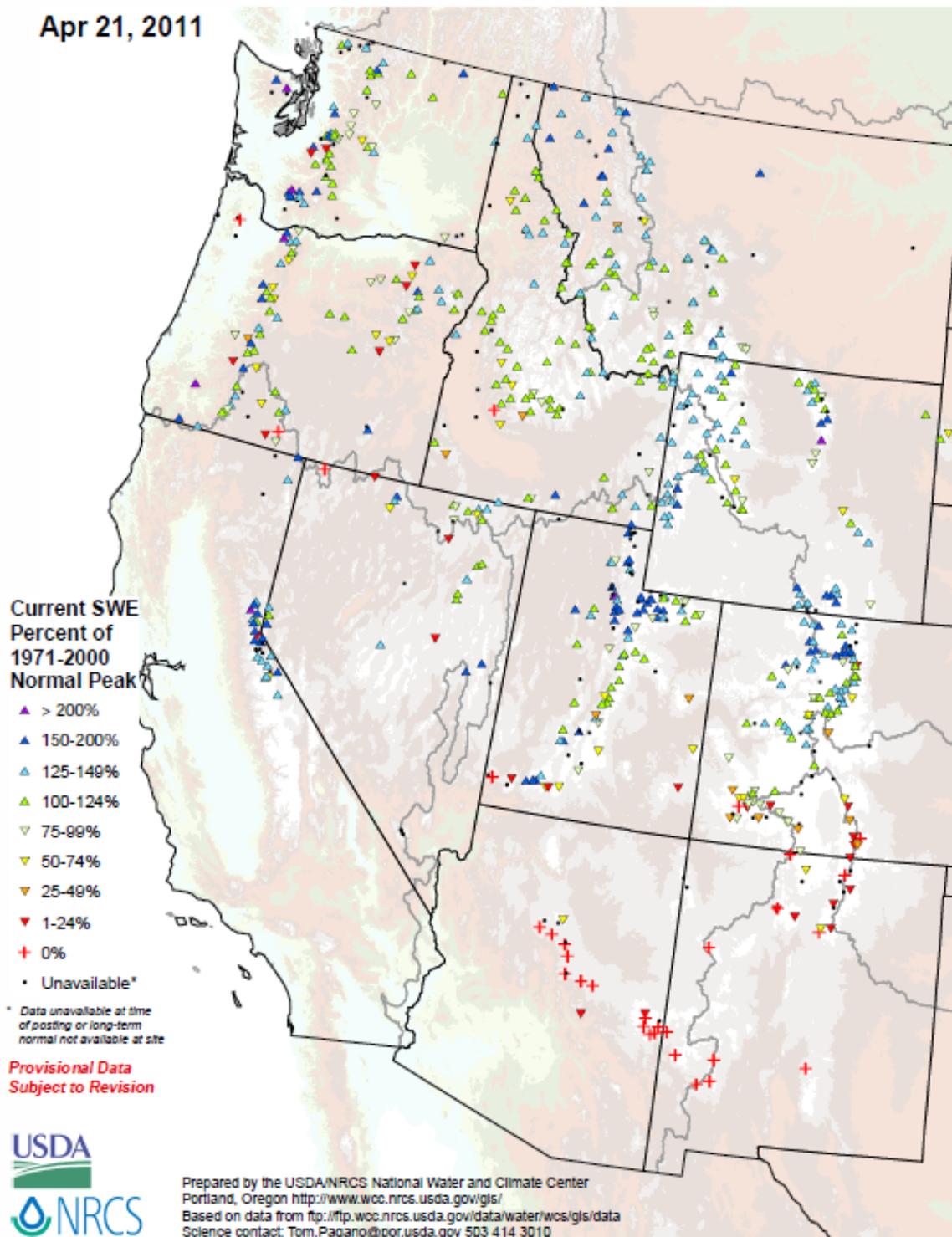


**Fig. 1: SNOTEL Snow-Water Equivalent percent of normal values for 21 April 2011 shows 1-Category gains (blue circles) over much of the northern Tier States including the Great Basin. Melt-out is nearing completion over much of the Southwest (1-Category loss with red circle).**

Ref: [http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west\\_sweptctnormal\\_update.pdf](http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_sweptctnormal_update.pdf)

## Weekly Snowpack and Drought Monitor Update Report

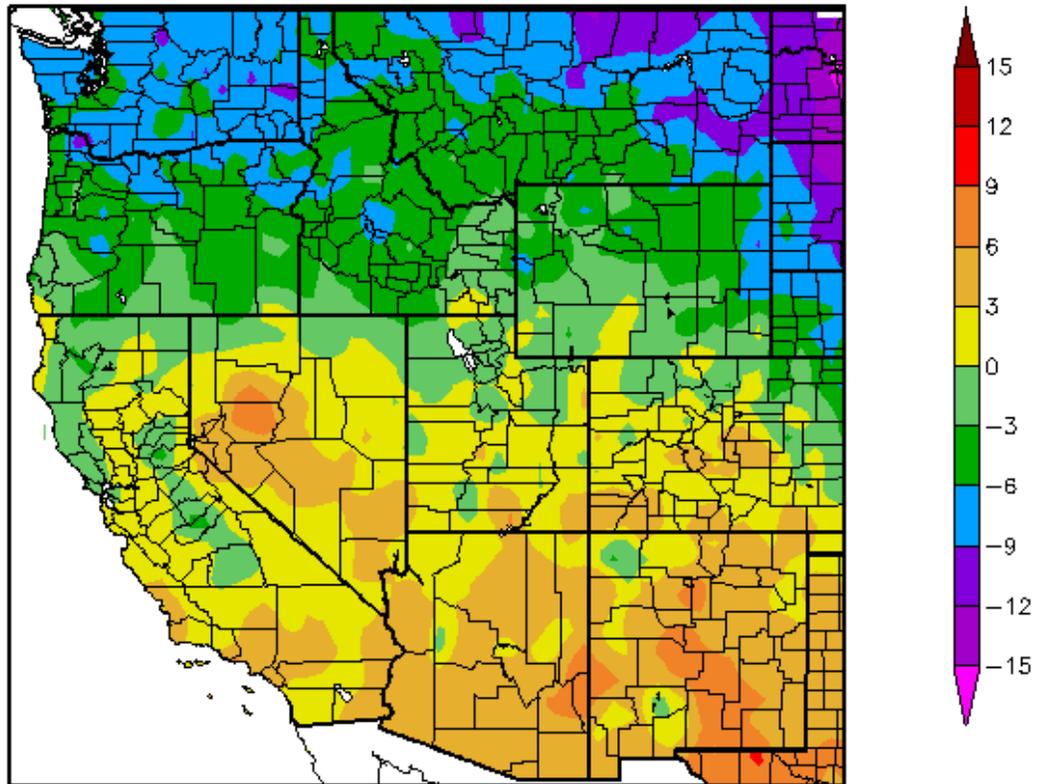
### SNOTEL Current Snow Water Equivalent (SWE) Percent of Normal Peak Apr 21, 2011



**Fig. 1a: SNOTEL Snow-Water Equivalent percent of Normal peak shows continued gains across the West (excluding the Southwest). Most of the West is meeting or exceeding the long-term climatologically average snowpack with melt-out nearly completed over the Southwest.**

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

Departure from Normal Temperature (F)  
4/14/2011 - 4/20/2011



Generated 4/21/2011 at HPRCC using provisional data.

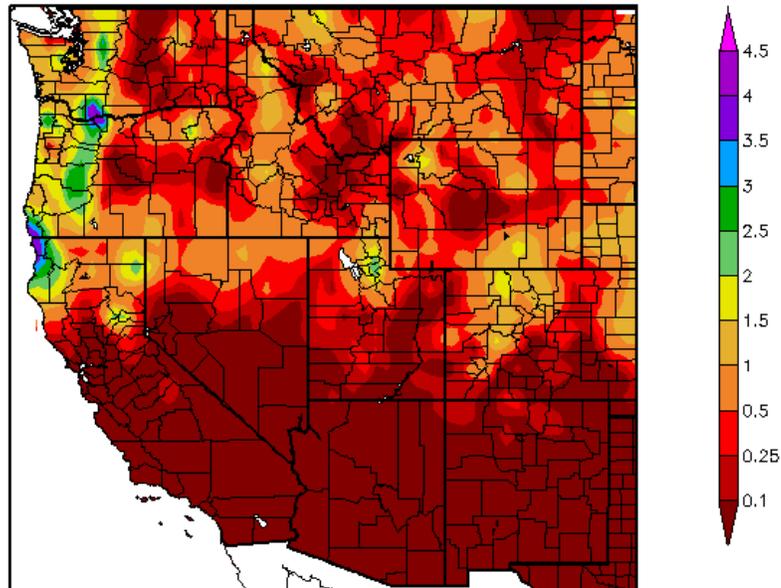
Regional Climate Centers

**Fig. 2: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures across south-central New Mexico and western Nevada (>+6°F) and the greatest negative departures over northern Montana (<-9°F). This pattern is typical of a classical La Niña.**

Ref: [http://www.hprcc.unl.edu/maps/current/index.php?action=update\\_daterange&daterange=7d](http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=7d)

## Weekly Snowpack and Drought Monitor Update Report

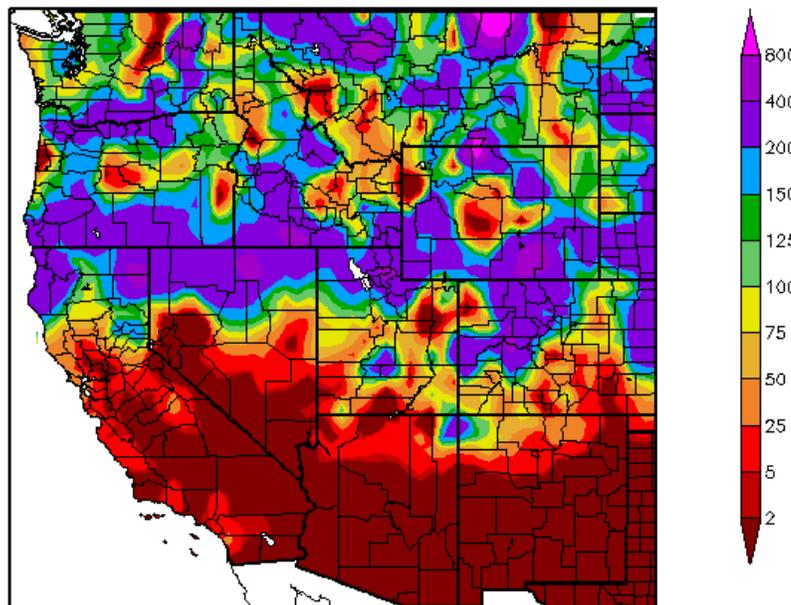
Precipitation (in)  
4/14/2011 - 4/20/2011



Generated 4/21/2011 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)  
4/14/2011 - 4/20/2011

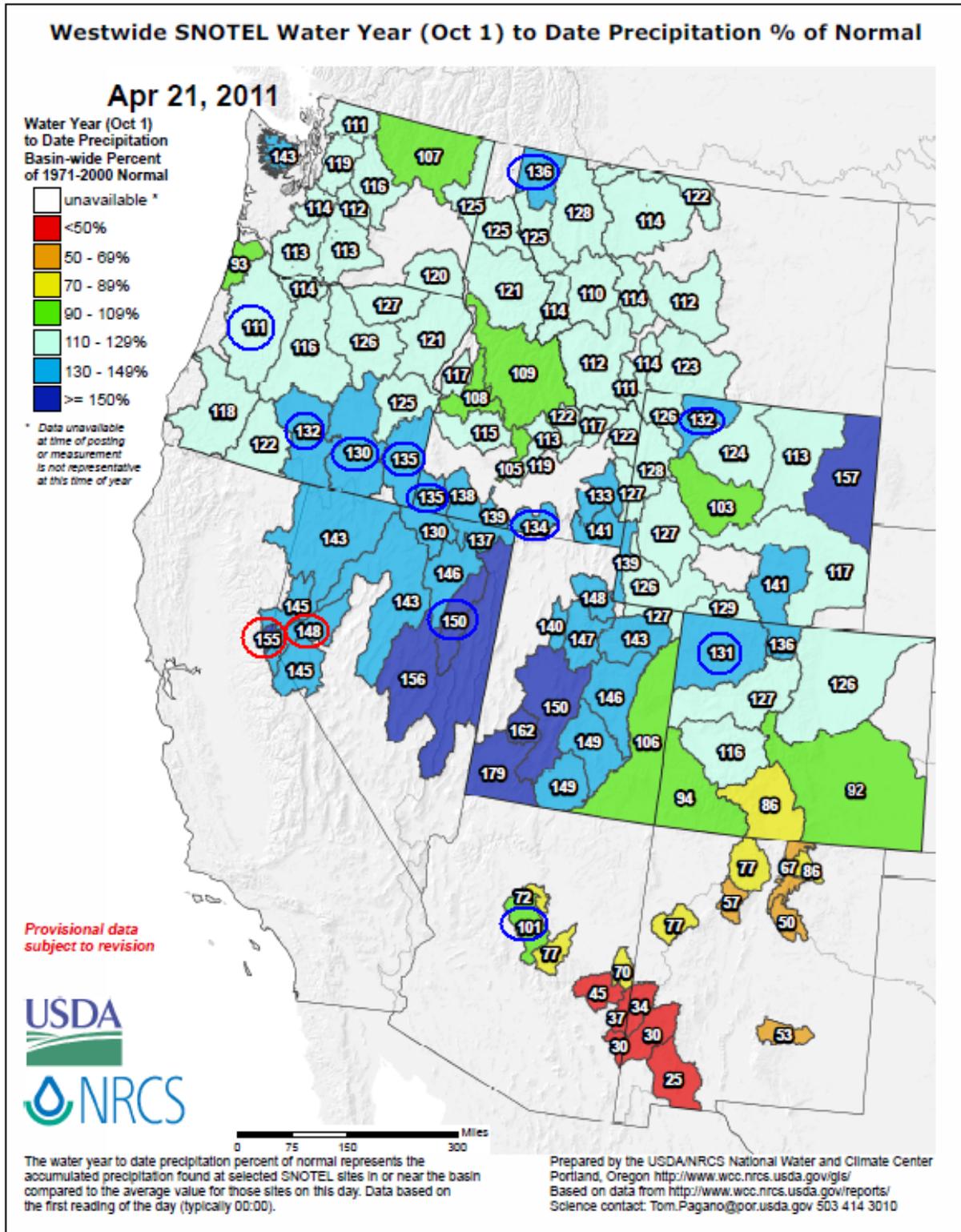


Generated 4/21/2011 at HPRCC using provisional data.

Regional Climate Centers

**Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 20 April shows the bulk of the heaviest precipitation confined to Cascades and northwest California (Fig. 3). In terms of percent of normal, the precipitation was highest over the northern half of the West (classic La Niña) (Fig 3a). Ref: <http://www.hprcc.unl.edu/maps/current/>**

## Weekly Snowpack and Drought Monitor Update Report



**Fig 3b:** For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, Oregon, Washington, and parts of Northern and Central Rockies. One-category positive changes are denoted by the blue circles. Red circles reflect a one-category decrease.

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

# U.S. Drought Monitor

April 19, 2011  
Valid 8 a.m. EDT

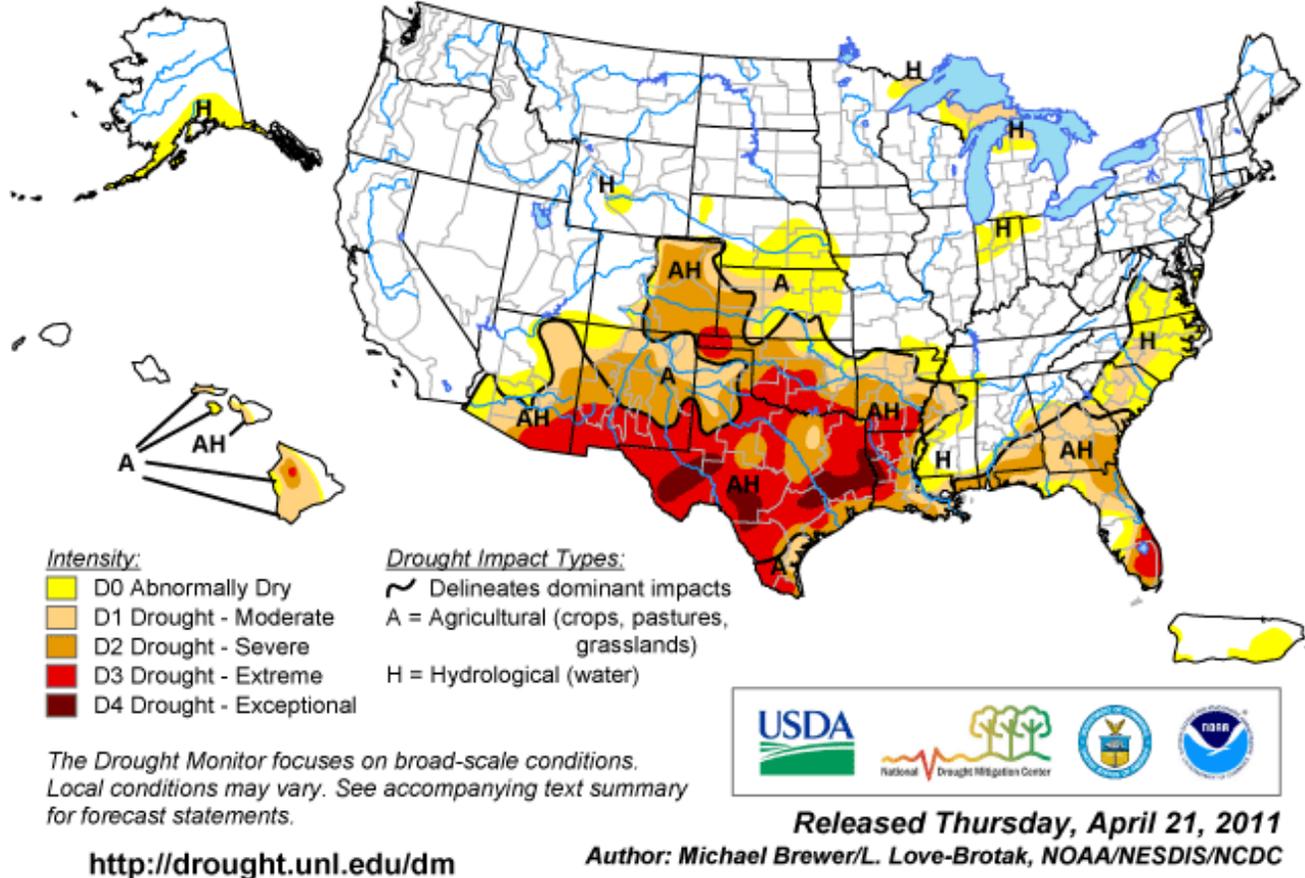


Fig. 4: Current Drought Monitor weekly summary. The exceptional D4 levels of drought are found over western and eastern Texas. Ref: <http://www.drought.unl.edu/dm/monitor.html>

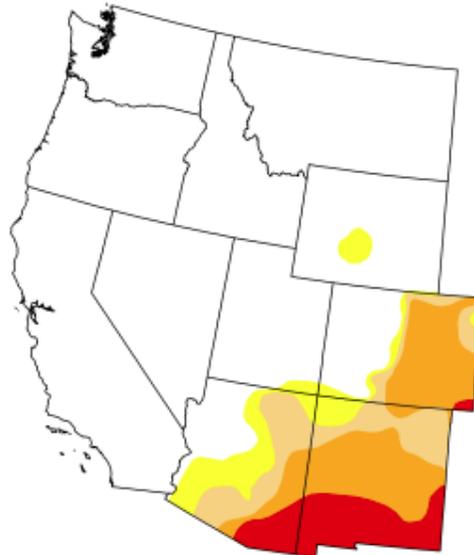
# U.S. Drought Monitor

## West

April 19, 2011  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	76.60	23.40	19.17	13.55	4.57	0.00
Last Week (04/12/2011 map)	75.98	24.02	19.17	13.34	4.15	0.00
3 Months Ago (01/18/2011 map)	76.96	23.04	11.88	0.89	0.00	0.00
Start of Calendar Year (12/28/2010 map)	73.26	26.74	11.98	0.89	0.00	0.00
Start of Water Year (09/28/2010 map)	62.50	37.50	8.14	0.56	0.00	0.00
One Year Ago (04/13/2010 map)	42.23	57.77	20.03	4.48	0.00	0.00



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, April 21, 2011  
Michael Brewer, National Climatic Data Center, NOAA

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

**Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. Regionally there was little change during the past week.**

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

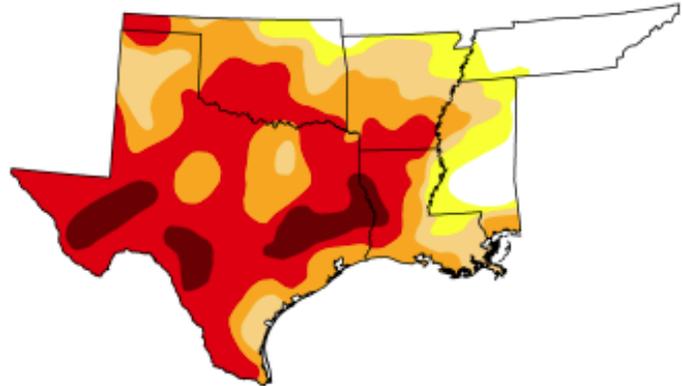
# U.S. Drought Monitor

## South

April 19, 2011  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	10.72	89.28	80.97	67.61	44.34	8.15
Last Week (04/12/2011 map)	10.71	89.29	79.93	64.18	39.67	5.35
3 Months Ago (01/18/2011 map)	15.38	84.62	58.49	27.99	8.45	0.00
Start of Calendar Year (12/28/2010 map)	8.86	91.14	67.65	35.21	10.17	0.00
Start of Water Year (09/28/2010 map)	54.23	45.77	20.04	6.79	0.83	0.00
One Year Ago (04/13/2010 map)	82.53	17.47	0.00	0.00	0.00	0.00



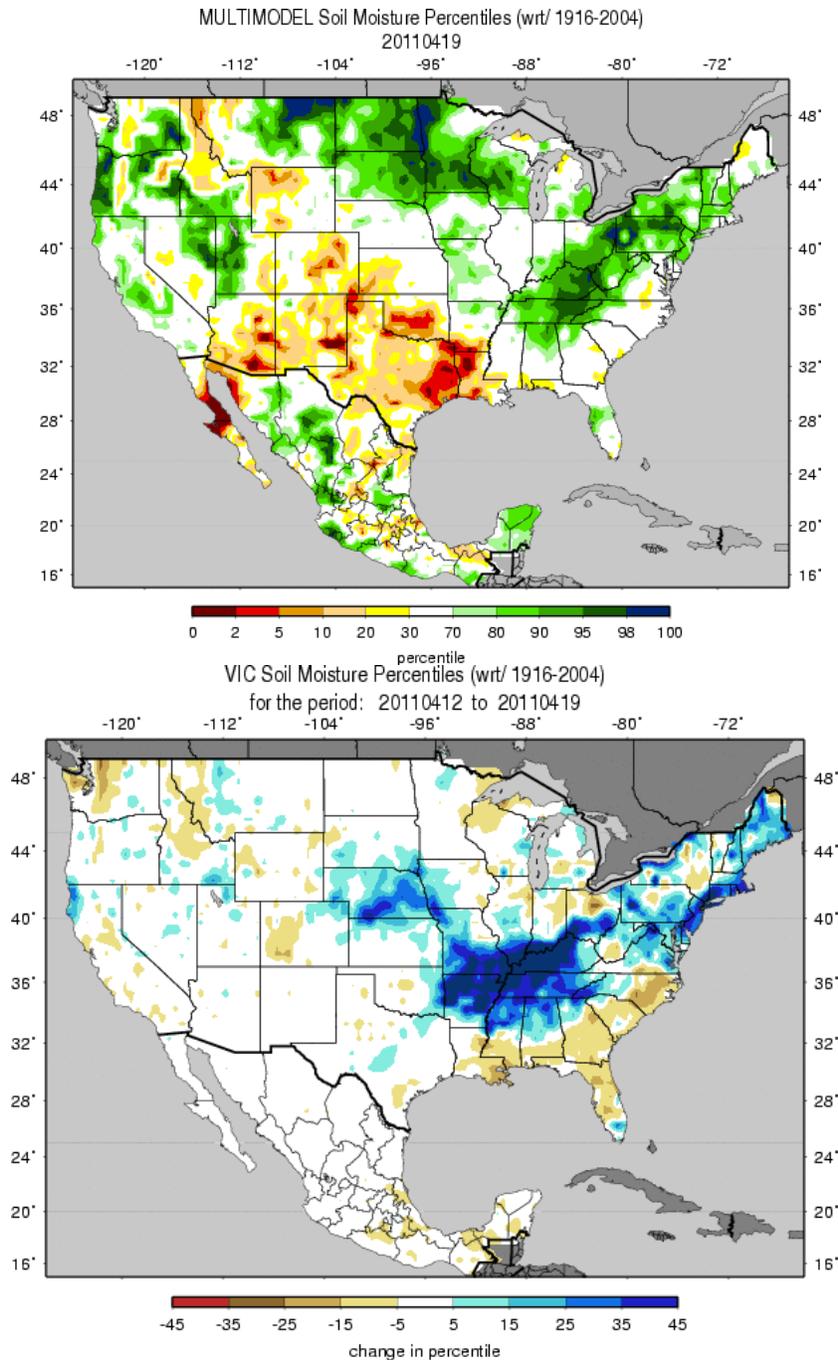
**Intensity:**

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

**Fig. 4b: Drought Monitor for the South-Central States with statistics over various time periods. This region has shown significant increases the D3-D4 categories over the past few weeks.**

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

## Weekly Snowpack and Drought Monitor Update Report



**Figs. 5a and 5b: Soil Moisture ranking in percentile as of 19 April (top) shows moist conditions over much of the Northern Tier States, Great Basin, and the Appalachians with dryness over Arizona and across much of the Lower Mississippi River (top). For the past week, the Tennessee River Valley to New England has experienced significant increases in soil moisture while the Southeast dried out. Readings over the Northwest are suspect due to potential frozen ground.**

[http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.multimodel.sm\\_gnt.gif](http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.multimodel.sm_gnt.gif)  
[http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm\\_gnt.1wk.gif](http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_gnt.1wk.gif)

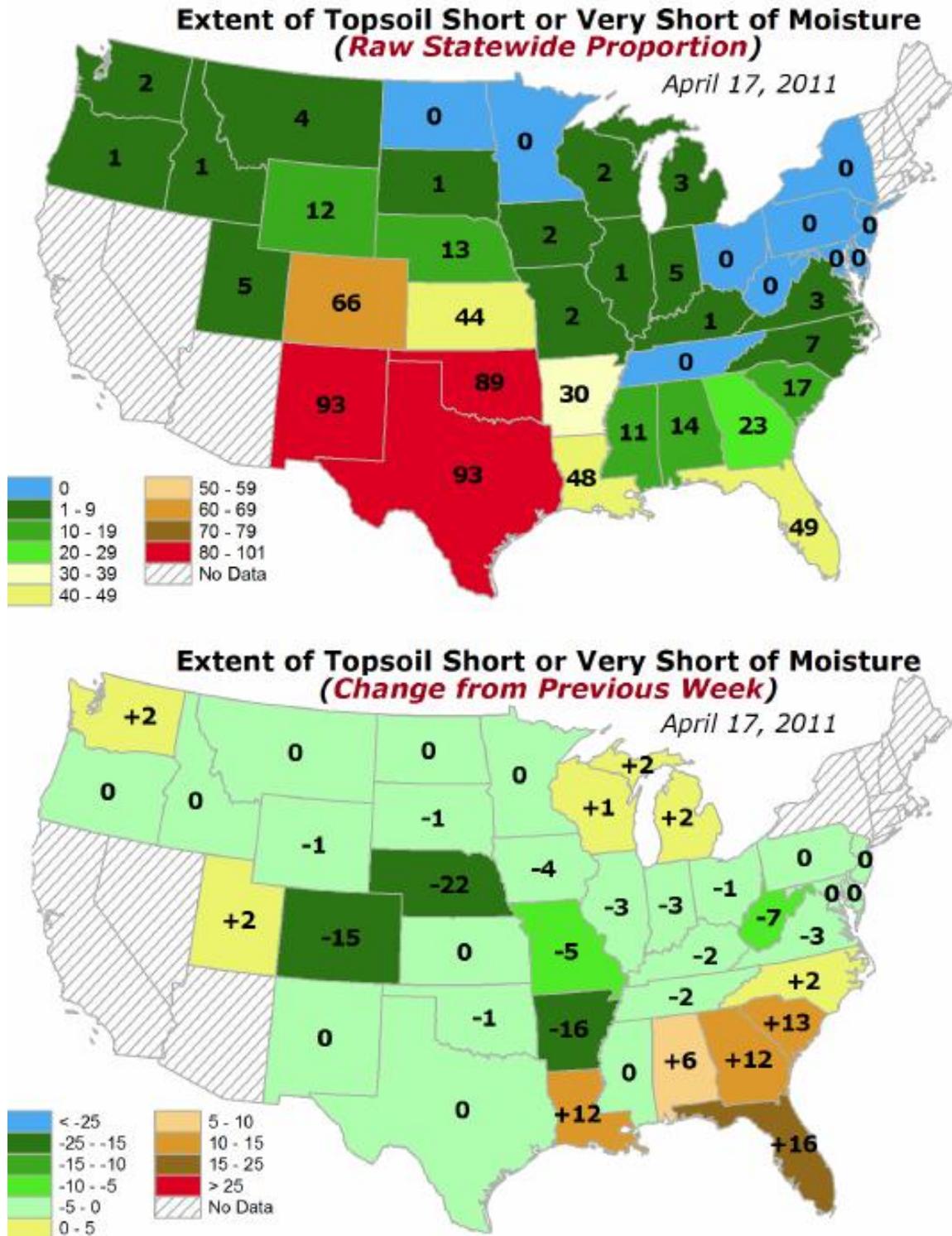
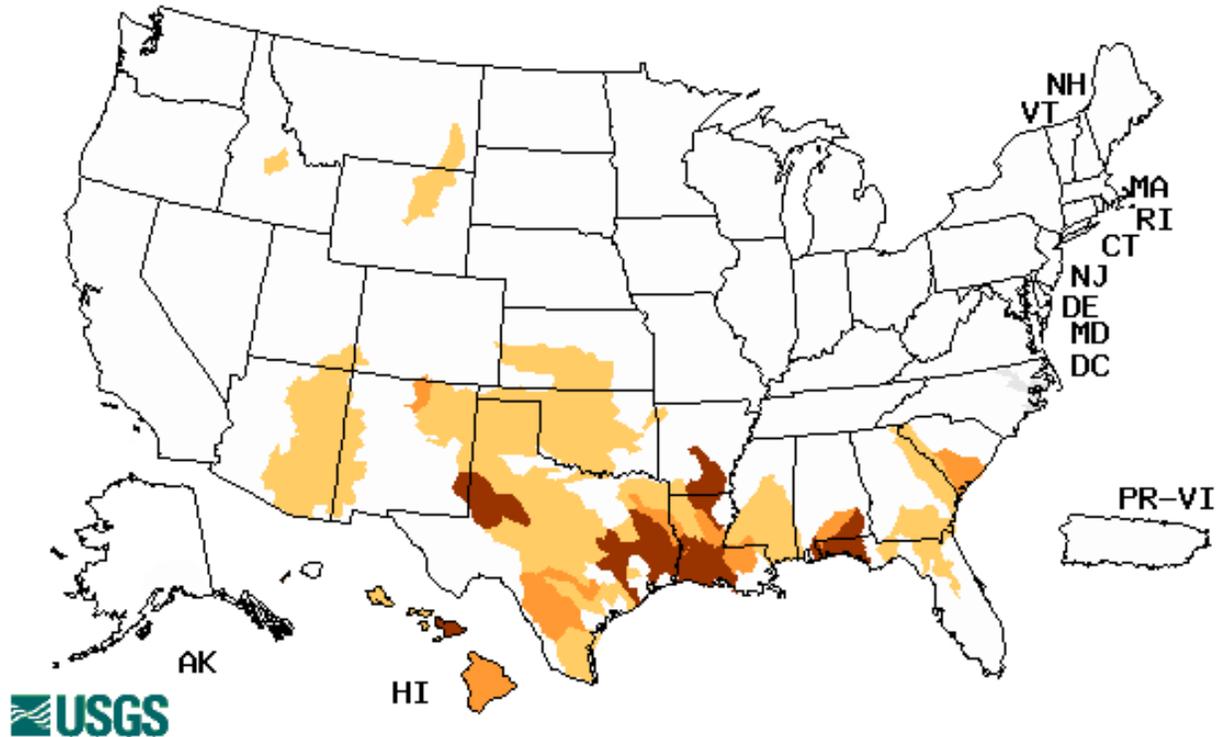


Fig. 6: Top soil moisture shows severe dryness over the South-Central States and surplus moisture over the Northern Tier States. The greatest improvements last week occurred over Colorado and Nebraska.

# Weekly Snowpack and Drought Monitor Update Report

Wednesday, April 20, 2011



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. 7:** Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Portions of the eastern Texas, Louisiana, Arkansas, and the Panhandle of Florida, are indicating severe conditions. Note: northern-most gauges are less accurate as rivers and streams are probably frozen.

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

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary -- April 19, 2011

*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/>.*

A severe storm ripped through the Southeast this week. In its wake, at least 45 people were killed across Alabama, Arkansas, Mississippi, North Carolina, Oklahoma, and Virginia, including over 20 in North Carolina alone. Preliminary reports indicate that there were 230 tornadoes in the region which affected the above states as well as Georgia, Illinois, Kansas, Kentucky, Louisiana, Maryland, Mississippi, Missouri, South Carolina, and Texas. As an example of the storm's intensity, North Carolina, which normally experiences 19 tornadoes a year, saw 90 tornadoes in this outbreak, according to preliminary reports. This system also dumped rain up the East Coast and into New England.

**The Southeast:** The devastating severe storms that hammered the region largely dumped rain in areas that were unaffected by drought. In central Kentucky, an estimated seven plus inches of rain fell in an already wet area leading to more concern over flooding than drought. The same was true throughout northern Alabama and Georgia where just clipped areas of Abnormal Dryness (D0) and Moderate Drought (D1), leading to slight alleviation along their northern extent. In southeast Georgia, the accumulated precipitation did alleviate Extreme Drought (D3) conditions.

**The Northeast and Mid-Atlantic:** Ample rains fell again this week throughout the Mid-Atlantic and Northeast. The severe storm that impacted the South made its way northeastward with somewhat less intensity. The rains led to a decrease in Abnormal Dryness (D0) in Virginia, Moderate Drought (D1) was eradicated in Virginia and greatly reduced in northern North Carolina.

**The South:** Severe weather impacted select areas of the South. Heavy rain accompanied tornadoes in some areas. In Oklahoma and Texas, there was a slight alleviation of Extreme (D3) and Severe (D2) drought conditions in the south-central to southeast Oklahoma – northeast Texas area. Over much of the remaining region, however, drought conditions maintained or intensified. The Oklahoma panhandle and nearby locations in northern Texas, southeast Colorado, and southwest Kansas saw the introduction of Extreme Drought (D3). Further, conditions along the Texas Gulf Coast and into the Louisiana Gulf Coast intensified with one category degradation over select areas. In north-central Texas, while conditions did not change appreciably, strong impacts are being felt. High temperatures combined with no precipitation and high winds have led to widespread wildfires. Unless precipitation comes in to the area soon, conditions are likely to become exceptional. Conditions in south-central and southwest Texas saw drought intensify as well. Another area of Exceptional Drought (D4) was introduced in that area.

## Weekly Snowpack and Drought Monitor Update Report

**The Plains and Midwest:** Heavy rains which fell across Nebraska this week alleviated Abnormal Dryness (D0) and Moderate Drought (D1) conditions throughout the central part of the state and part of the Panhandle. Moderate Drought (D1) in the south-central part of the state was pulled southward into Kansas. Eastern Nebraska and Iowa saw alleviation of Abnormal Dryness (D0).

**The West:** The West generally continues to benefit from above normal snowpack and beneficial precipitation, with the exception of the Southwest. In Wyoming, the northern area of Abnormal Dryness (D0) was eliminated. The southern area of Abnormal Dryness was repositioned to align more closely with the indicators for this week. In Colorado, Severe Drought (D2) expanded westward in the south-central part of the state. An area of Extreme Drought (D3) was introduced in the southeast part of the state, coinciding with deteriorating conditions in the Oklahoma Panhandle, northern Texas, and southwest Kansas. New Mexico saw a slight expansion of Extreme Drought (D3) along the Texas border.

**Hawaii, Alaska and Puerto Rico:** Drought conditions remained unchanged across Alaska and Puerto Rico this week. In Hawaii, conditions of Extreme Drought (D3) were alleviated on Kauai. Conditions in southeastern Puerto Rico improved slightly with rains that fell from the April 13-16 but some Abnormal Dryness (D0) still remains at timescales longer than a month.

**Looking Ahead:** During the April 21-25, 2011 time period, there is an enhanced probability of precipitation in the northern Plains, the Upper Midwest, and into the Great Lakes and Ohio Valley. Later in the period, this precipitation is expected to move into the Northeast. A second area of elevated precipitation potential is expected along the Pacific Northwest coast late in this period. Temperatures are generally forecast to be normal to below normal throughout most of the northern tier of the country for this entire period and in the Southwest late in the period. Above normal temperatures are generally expected in the southern tier of the country.

For the ensuing 5 days (April 26 – 30, 2011), the odds favor cooler-than-normal conditions for much of the western part of the country roughly from the Upper Midwest down through the Plains to northern Texas and over to the Pacific Coast, with the exception of southern California. Warmer-than-normal conditions are expected across the eastern U.S. from the Great Lakes to the Gulf Coast and over to the Atlantic Coast and along Southern California. The odds of above-normal precipitation are greatest from the Upper Midwest, through the Ohio Valley, and into the South and Southeast. A second area of above-normal precipitation is forecasted for the Northwest. Odds favor below-normal precipitation in the Southwest through southwestern Texas. In Alaska, the odds favor normal to below-normal temperatures across the state. The southeastern part of the state should expect above-normal precipitation while the northwestern part of the state should expect below-normal precipitation.

**Author:** [Michael Brewer, 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

## Weekly Snowpack and Drought Monitor Update Report

D3 ... Extreme Drought  
D4 ... Exceptional Drought

### **Drought or Dryness Types**

A ... Agricultural  
H ... Hydrological

Updated April 20, 2011