



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

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**Weekly Report - Snowpack / Drought Monitor Update** Date: **30 September 2011**  
(End of 2011 Water-Year)

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Temperature:** [SNOTEL](#) and ACIS 7-day temperature anomaly shows temperatures below normal over the Cascades and above normal elsewhere across the West (Fig. 1). [ACIS](#) 7-day average temperature anomalies show the greatest positive temperature departures over eastern central Montana ( $>+12^{\circ}\text{F}$ ) and the greatest negative departures along the southern California coast and west-central New Mexico ( $<-2^{\circ}\text{F}$ ) (Fig. 1a). For the 2011 Water Year, average temperature anomalies show the greatest positive temperature departures over south-central New Mexico ( $>+4^{\circ}\text{F}$ ) and the greatest negative departures over north-central Montana ( $<-5^{\circ}\text{F}$ ) (Fig. 1a-1).

**Precipitation:** Last week, [ACIS](#) 7 day reports showed very wet conditions over extreme northwest Washington (Fig. 2). During the past 12 months, ACIS data showed the driest region occurred over the Southwest, near normal conditions were experienced over coastal California, the Pacific Northwest, and Northern Rockies, and abundant moisture occurred from southern California, the Great Basin, parts of the Central Rockies, and the eastern half of Montana (Fig. 2a). For the end of the [2011 Water-Year](#) that began on 1 October 2010, the greatest SNOTEL deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, Cascades, Sierra, and parts of Northern and Central Rockies (Fig. 2b).

**National Summary:** A number of rain events moved across the country again this Drought Monitor week. While the West remained mostly dry, areas of the Midwest, Southeast, and Northeast saw areas of much above normal precipitation.

**The West:** The West was generally dry this week with the exception of the extreme Northwest and isolated thunderstorm activity across the region. Drought conditions remain unchanged this week. 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**

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 through 3d).

## Weekly Snowpack and Drought Monitor Update Report

### Soil Moisture

Soil moisture (Figs. 4a and 4b), is simulated by the [VIC macroscale hydrologic model](#). The detailed, physically-based VIC model is driven by observed daily precipitation and temperature maxima and minima from approximately 2130 stations, selected for reporting reliably in real-time and for having records of longer than 45 years (and various other criteria). Another good resource can be found at: <http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>.

### Soil Climate Analysis Network (SCAN)

Figure 5 provides supplemental data on soil conditions (moisture and temperatures at various depths from 2 inches to 80 inches). For more information about SCAN see ([brochure](#)).

### U.S. Historical Streamflow

This map, (Fig. 6) shows the 7-day average streamflow conditions in hydrologic units of the United States and Puerto Rico for the day of year. The colors represent 7-day average streamflow percentiles based on historical streamflow for the day of the year. Thus, the map shows conditions adjusted for this time of the year. Only stations having at least 30 years of record are used. Sub-regions shaded gray indicate that insufficient data were available to compute a reliable 7-day average streamflow value. During winter months, this situation frequently arises due to ice effects. The data used to produce this map are provisional and have not been reviewed or edited. They may be subject to significant change.

### **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://www.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>. Reports from 2007 are available on-line while ones from 2001-2006 can be acquired upon request.

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

/s/

Douglas Lawrence  
Deputy Chief, Soil Survey and Resource Assessment

# Weekly Snowpack and Drought Monitor Update Report

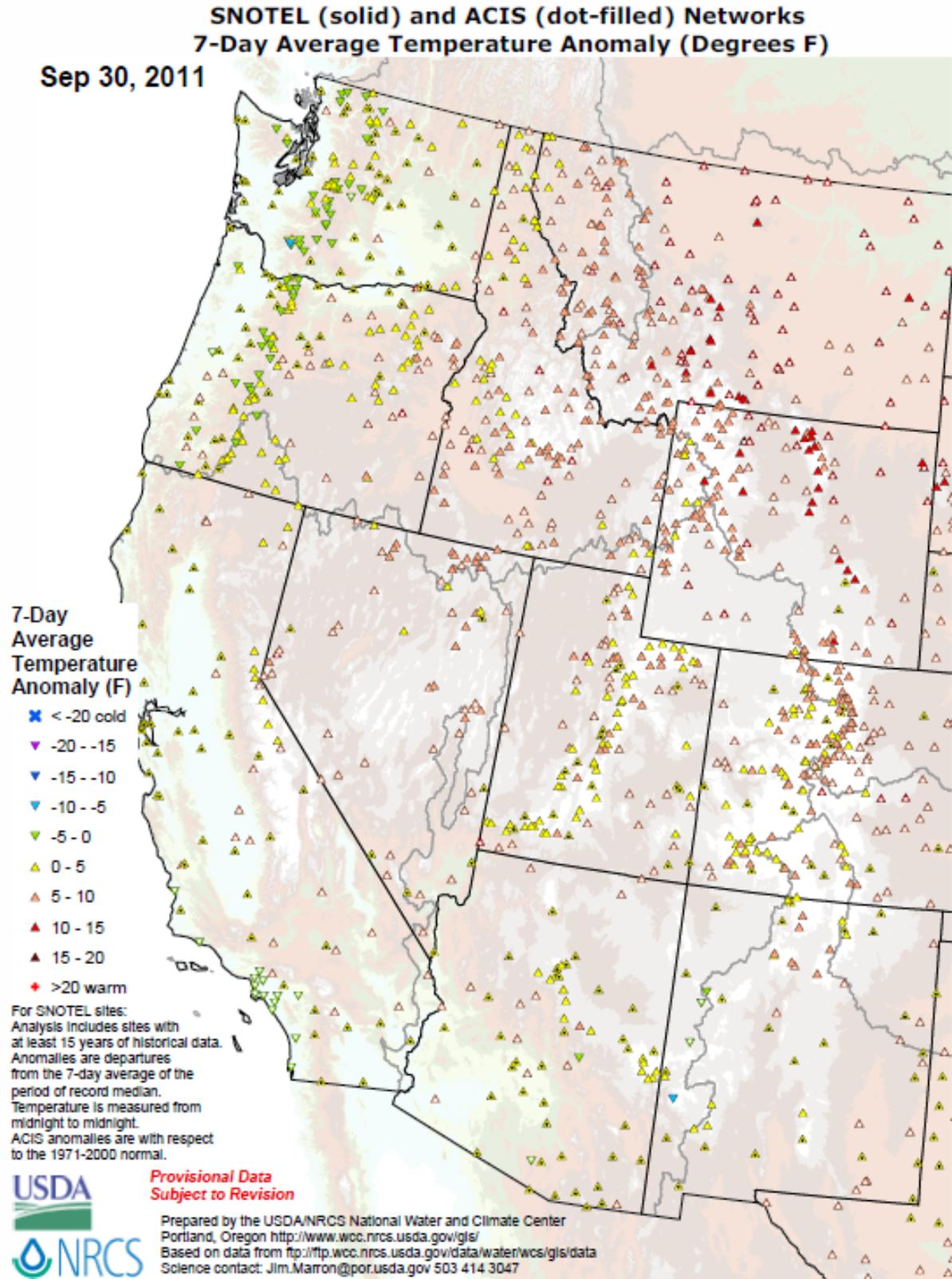
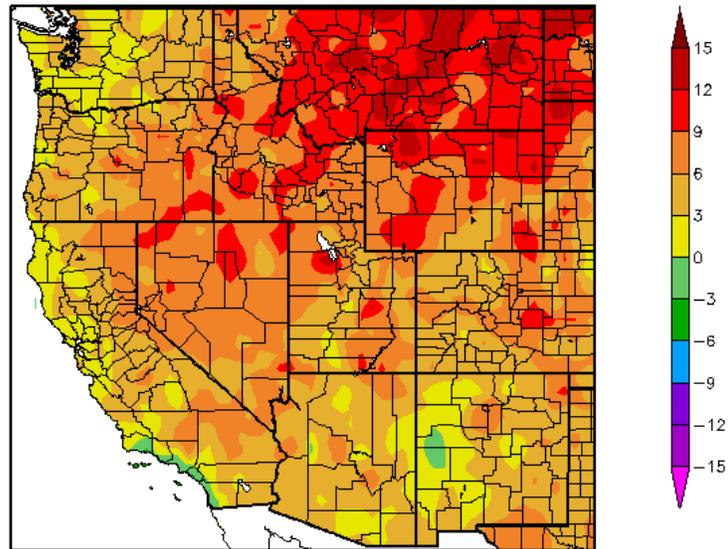


Fig. 1: **SNOTEL** and ACIS 7-day temperature anomaly shows temperatures below normal over the Cascades and above normal elsewhere across the West.

## Weekly Snowpack and Drought Monitor Update Report

Departure from Normal Temperature (F)  
9/23/2011 – 9/29/2011

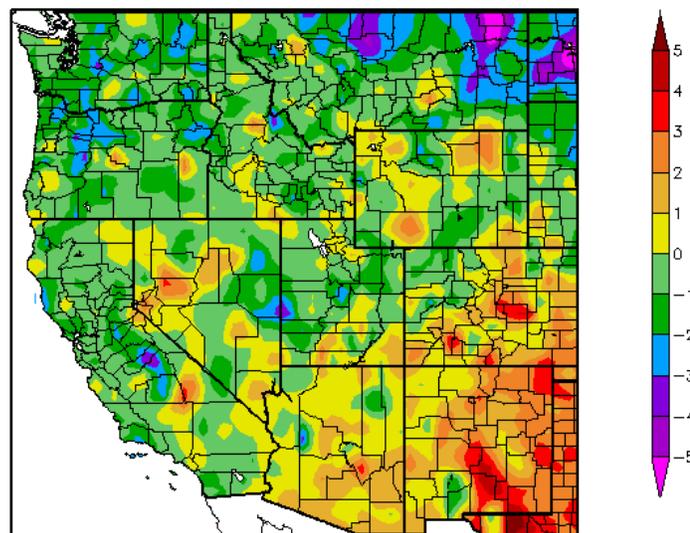


Generated 9/30/2011 at HPRCC using provisional data.

Regional Climate Centers

**Fig. 1a: ACIS 7-day average temperature anomalies show the greatest positive temperature departures over eastern central Montana ( $>+12^{\circ}\text{F}$ ) and the greatest negative departures along the southern California coast and west-central New Mexico ( $<-2^{\circ}\text{F}$ ).**

Departure from Normal Temperature (F)  
10/1/2010 – 9/29/2011



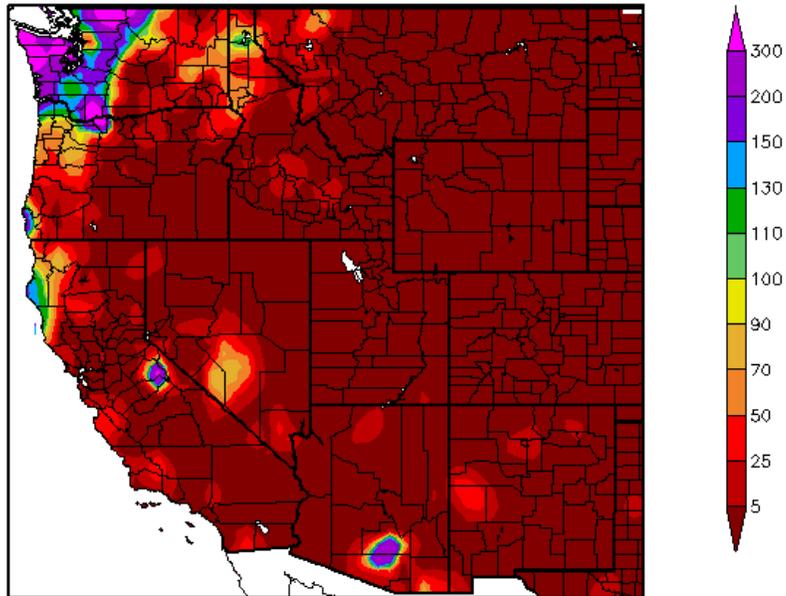
Generated 9/30/2011 at HPRCC using provisional data.

Regional Climate Centers

**Fig. 1a-1: ACIS 2011 Water Year average temperature anomalies show the greatest positive temperature departures over south-central New Mexico ( $>+4^{\circ}\text{F}$ ) and the greatest negative departures over north-central Montana ( $<-5^{\circ}\text{F}$ ).**

## Weekly Snowpack and Drought Monitor Update Report

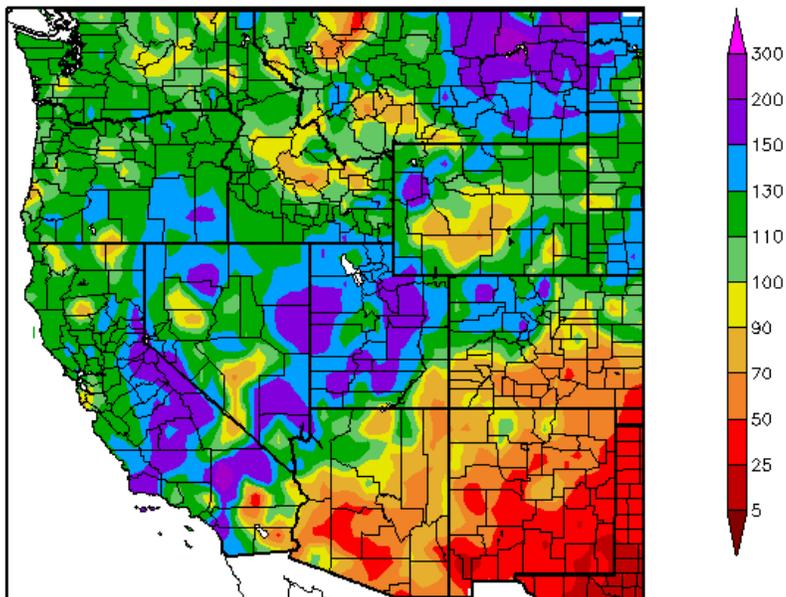
Percent of Normal Precipitation (%)  
9/23/2011 – 9/29/2011



Generated 9/30/2011 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)  
10/1/2010 – 9/29/2011



Generated 9/30/2011 at HPRCC using provisional data.

Regional Climate Centers

**Fig. 2 and 2a: [ACIS](#) 7-day and 2011 Water Year precipitation percent of normal values respectively. Last week was very wet over extreme northwest Washington. As for past 12 months, the driest region occurred over the Southwest, near normal conditions were experienced over coastal California, the Pacific Northwest, and Northern Rockies, and abundant moisture occurred from southern California, the Great Basin, parts of the Central Rockies, and the eastern half of Montana.**

# Weekly Snowpack and Drought Monitor Update Report

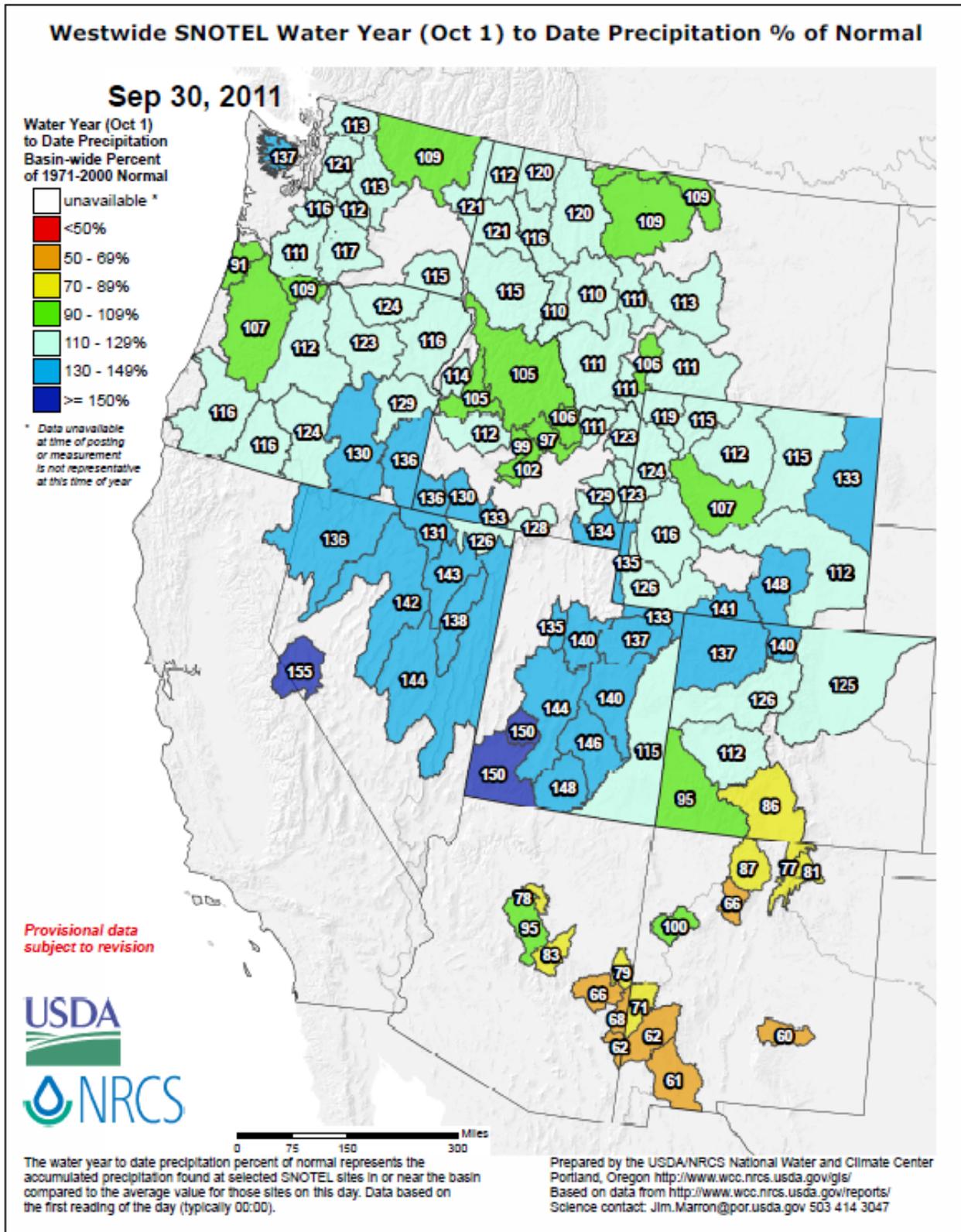


Fig 2b: For the end of the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, Cascades, Sierra, and parts of Northern and Central Rockies.

# U.S. Drought Monitor

September 27, 2011  
Valid 8 a.m. EDT

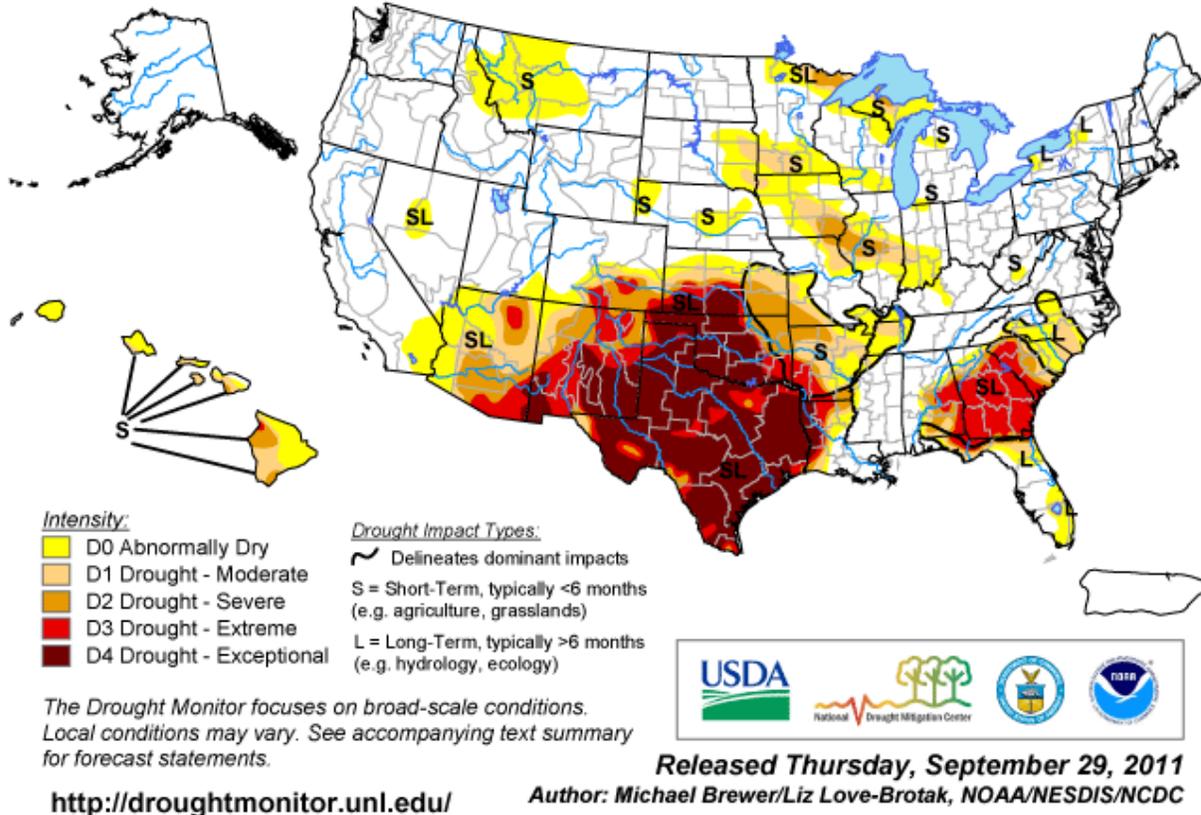


Fig. 3: Current **Drought Monitor** weekly summary. The exceptional D4 levels of drought are found over extreme southeast Arizona, New Mexico, Texas, Oklahoma, and western Louisiana.

## Headline Agriculture News

Sept 20, [Houston, Texas](#). A farmer in the Houston area had to purchase relatively expensive pumpkins from north Texas because it was too dry to grow his own crop. The pumpkins grown in northern Texas were smaller than usual, due to drought.

Sept 19, [Kansas](#). Alfalfa supplies were low in Kansas, driving up prices to twice that of a year ago, leading alfalfa producers to keep the alfalfa hay for their own livestock rather than selling it to out of state buyers.

Sept 21, [Texas](#). The return of La Niña means a likely continuation of the drought that has caused billions of dollars in damage to the South. Quotes from Brian F.

Sept 17, [US](#). The National Cattlemen's Beef Association and others are pushing for an ethanol waiver during years when corn production is below some threshold.

Sept 20, [Texas](#). Of the Texas ranchers who responded to a survey from the Texas and Southwestern Cattle Raisers Association, 8 percent revealed that they will not have cattle in 2012. Just 872 ranchers of the 8,995 ranchers invited to participate answered the survey.

Sept 21, [Houston, Texas](#). The executive director of Trees for Houston has a dire view of the ongoing drought's impact on trees and estimated that up to 10 percent or 66 million of the 660 million trees in Harris County could die from lack of water in two years' time. Air quality will likely suffer if so many

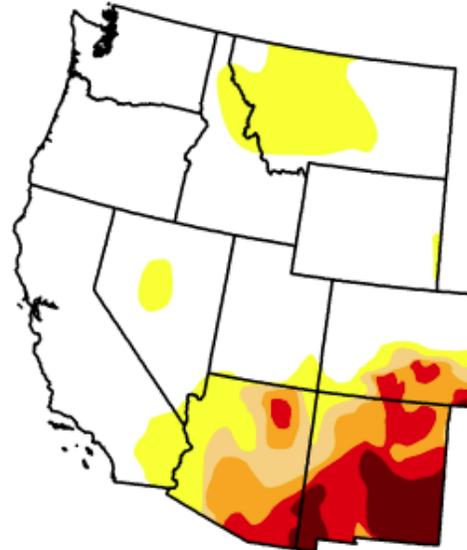
# U.S. Drought Monitor

## West

September 27, 2011  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	66.72	33.28	19.04	14.99	9.30	3.81
Last Week (09/20/2011 map)	73.65	26.35	19.04	14.99	9.30	3.81
3 Months Ago (06/28/2011 map)	73.59	26.41	19.31	16.01	11.35	5.65
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 (09/21/2010 map)	69.90	30.10	6.92	0.56	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.

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



Released Thursday, September 29, 2011  
Michael Brewer, National Climatic Data Center, NOAA

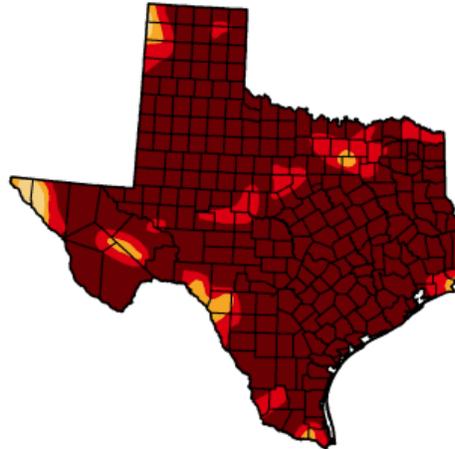
Fig. 3a: Drought Monitor for the [Western States](#) with statistics over various time periods. Regionally there was no change in drought condition this week.

Weekly Snowpack and Drought Monitor Update Report

**U.S. Drought Monitor**  
Texas

September 27, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	99.16	96.65	85.75
Last Week (09/20/2011 map)	0.00	100.00	100.00	99.03	96.10	85.43
3 Months Ago (06/28/2011 map)	2.68	97.32	95.71	94.52	90.62	72.32
Start of Calendar Year (12/28/2010 map)	7.89	92.11	69.43	37.46	9.59	0.00
Start of Water Year (09/28/2010 map)	75.57	24.43	2.43	0.99	0.00	0.00
One Year Ago (09/21/2010 map)	77.29	22.71	3.34	0.97	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.

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



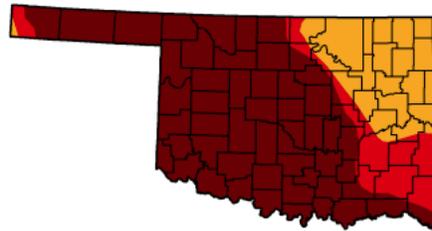
Released Thursday, September 29, 2011  
Michael Brewer, National Climatic Data Center, NOAA

Fig. 3b(1): Currently, ~86% of [Texas](#) is experiencing “Exceptional” D4 drought. Over 96% of the state is in D3 and D4 drought! No significant change this week.

**U.S. Drought Monitor**  
Oklahoma

September 27, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	100.00	78.97	66.42
Last Week (09/20/2011 map)	0.00	100.00	100.00	100.00	90.00	66.42
3 Months Ago (06/28/2011 map)	0.13	99.87	75.59	55.96	41.22	32.55
Start of Calendar Year (12/28/2010 map)	13.82	86.18	47.90	1.50	0.00	0.00
Start of Water Year (09/28/2010 map)	66.28	33.72	4.21	0.00	0.00	0.00
One Year Ago (09/21/2010 map)	58.82	41.18	4.21	0.00	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.

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



Released Thursday, September 29, 2011  
Michael Brewer, National Climatic Data Center, NOAA

Fig. 3b(2) Currently, 66% of [Oklahoma](#) is experiencing “Exceptional” D4 drought. Over 79% of the state is in D3 and D4 drought! There was some improvement in D3 areas this week.

Weekly Snowpack and Drought Monitor Update Report

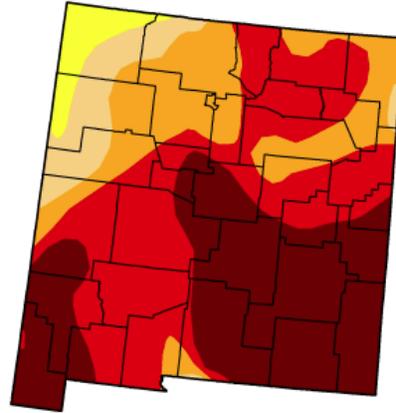
**U.S. Drought Monitor**  
New Mexico

September 27, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	96.40	88.99	69.61	35.13
Last Week (09/20/2011 map)	0.00	100.00	96.40	88.99	69.61	35.13
3 Months Ago (06/28/2011 map)	0.00	100.00	100.00	93.96	79.34	49.09
Start of Calendar Year (12/28/2010 map)	6.16	93.84	40.40	0.00	0.00	0.00
Start of Water Year (09/28/2010 map)	76.66	23.34	0.00	0.00	0.00	0.00
One Year Ago (09/21/2010 map)	79.95	20.05	0.00	0.00	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.

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



Released Thursday, September 29, 2011  
Michael Brewer, National Climatic Data Center, NOAA

Fig. 3b(3): Currently, 35% of **New Mexico** is experiencing “Exceptional” D4 drought. Over ~70% of the state is in D3 and D4 drought. This represents no change this week.

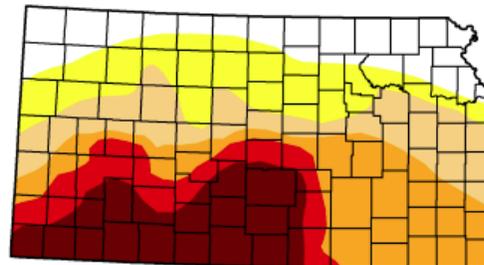
**U.S. Drought Monitor**  
Kansas

September 20, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	16.39	83.61	64.95	47.87	27.24	17.63
Last Week (09/13/2011 map)	19.89	80.11	63.29	49.90	32.26	17.63
3 Months Ago (06/21/2011 map)	27.96	72.04	50.70	33.48	13.75	1.95
Start of Calendar Year (12/28/2010 map)	17.82	82.18	43.85	3.48	0.00	0.00
Start of Water Year (09/28/2010 map)	83.23	16.77	0.00	0.00	0.00	0.00
One Year Ago (09/14/2010 map)	97.58	2.42	0.00	0.00	0.00	0.00

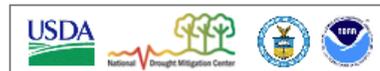
Intensity:

- 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.

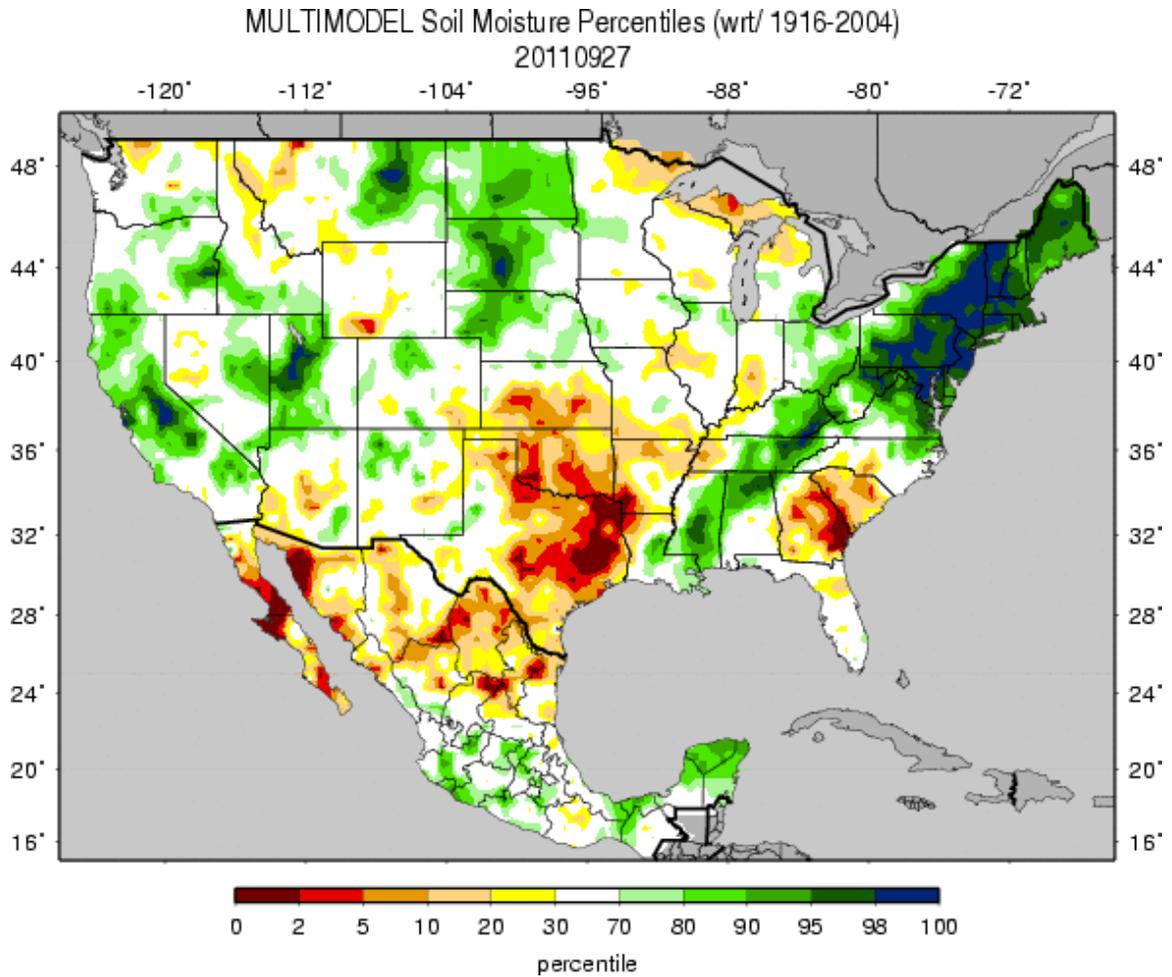
<http://drought.unl.edu/dm>



Released Thursday, September 22, 2011  
Michael Brewer, National Climatic Data Center/NOAA

Fig. 3b(4): Currently, 17% of **Kansas** is experiencing “Exceptional” D4 drought. 27% of the state is in D3 and D4 drought. Slight improvement in D3 noted this week.

## Weekly Snowpack and Drought Monitor Update Report



**Figs. 4a and 4b: Soil Moisture ranking in percentile as of 27 September shows accumulated moist conditions over of New England due to Tropical Storm Irene and Tropical Depression Lee. Driest still dominates over the Southern plains and Georgia.**

# Weekly Snowpack and Drought Monitor Update Report

## Soil Climate Analysis Network (SCAN)

Station (2091) MONTH=2011-08-31 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision Fri Sep 30 08:15:01 PDT 2011

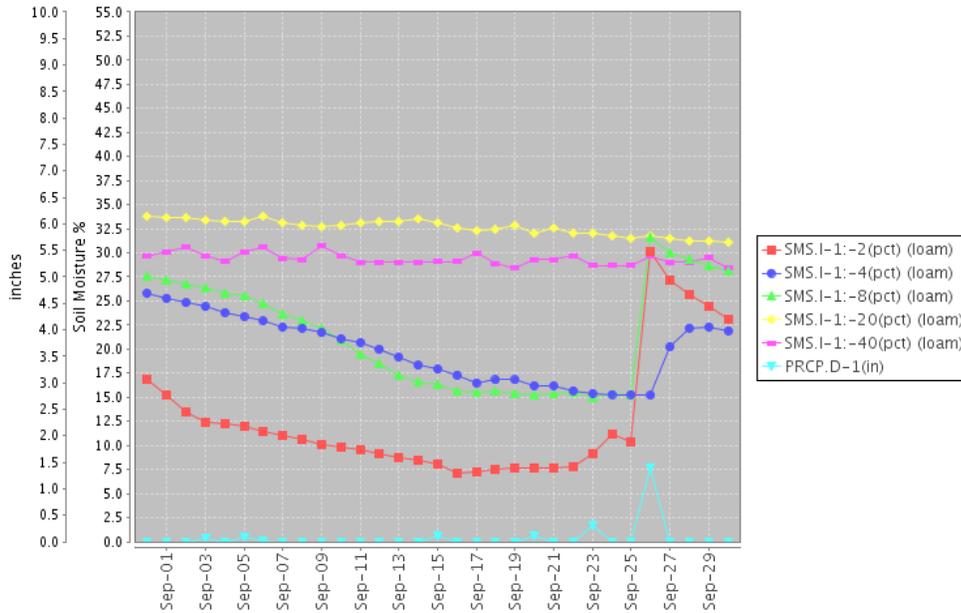


Fig. 5a: This NRCS resource shows a site in [eastern Arkansas](#) with moistening soil as a result of heavy rains on 26 September.

Station (2037) MONTH=2011-08-31 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision Fri Sep 30 08:17:28 PDT 2011

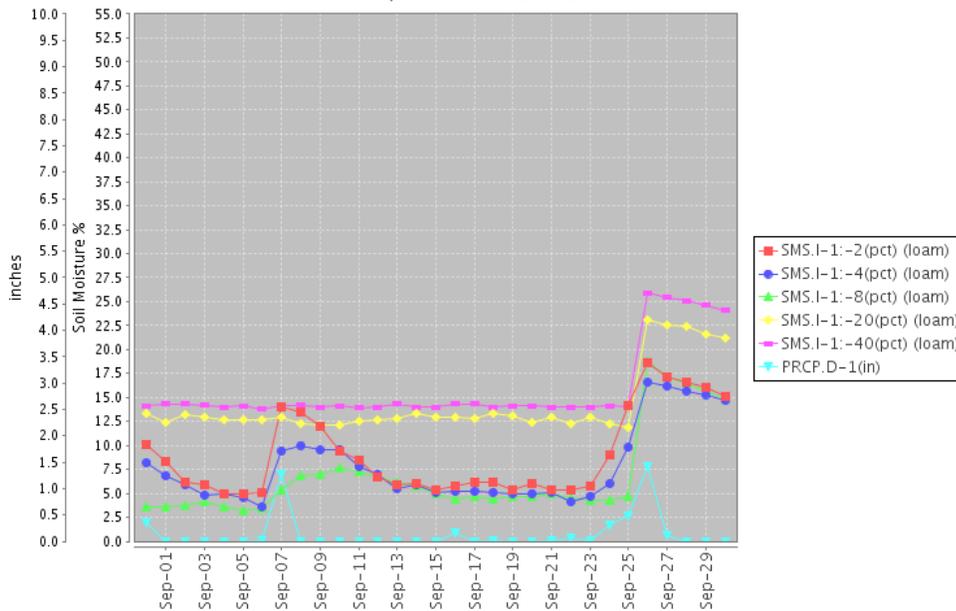


Fig. 5b: This SCAN station is located in the [eastern South Carolina](#) also shows a nice spike in moisture due to recent rains (see discussion on the next page).



## Weekly Snowpack and Drought Monitor Update Report

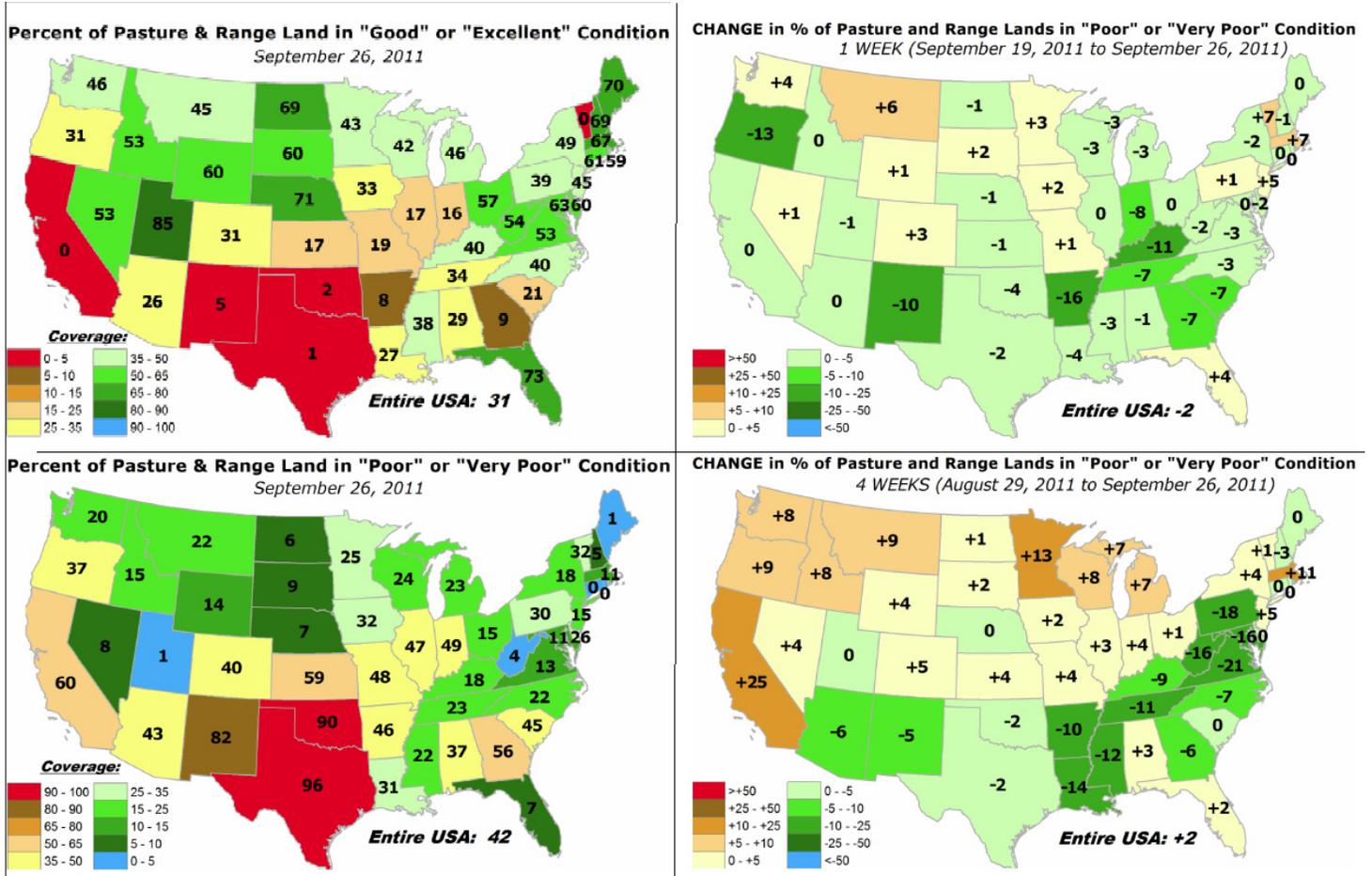
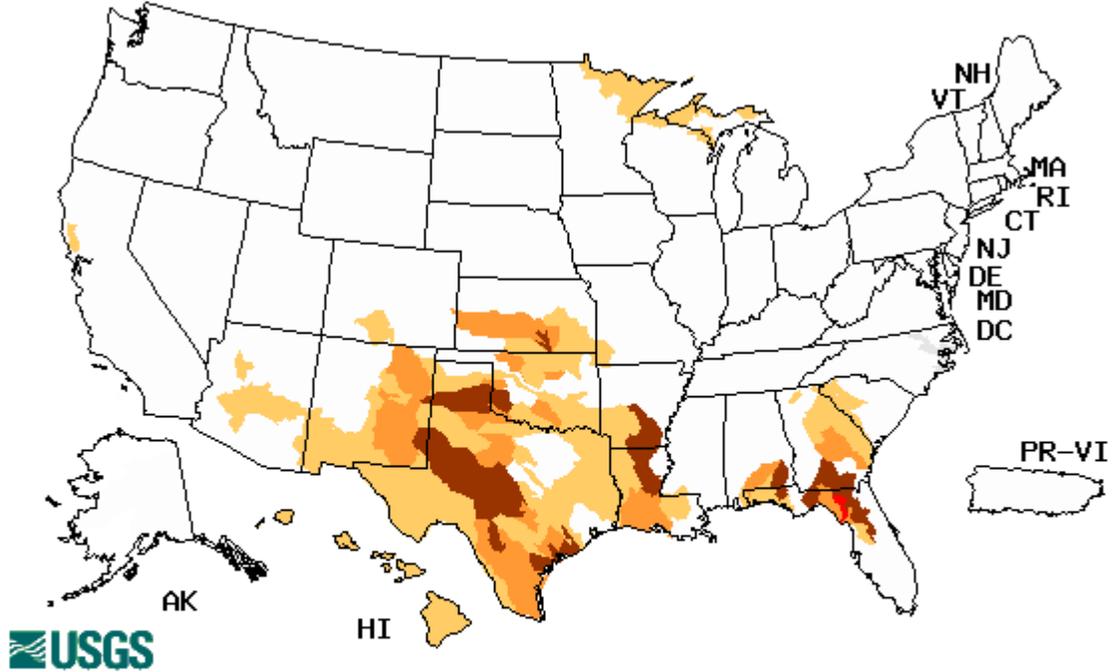


Fig. 5d: Status of [pasture and range land](#) and changes during the last week and month. Note that Montana has deteriorated the most under much warmer than normal conditions during this past week (upper right panel). Oregon and New Mexico experience the best improvements.

# Weekly Snowpack and Drought Monitor Update Report

Thursday, September 29, 2011

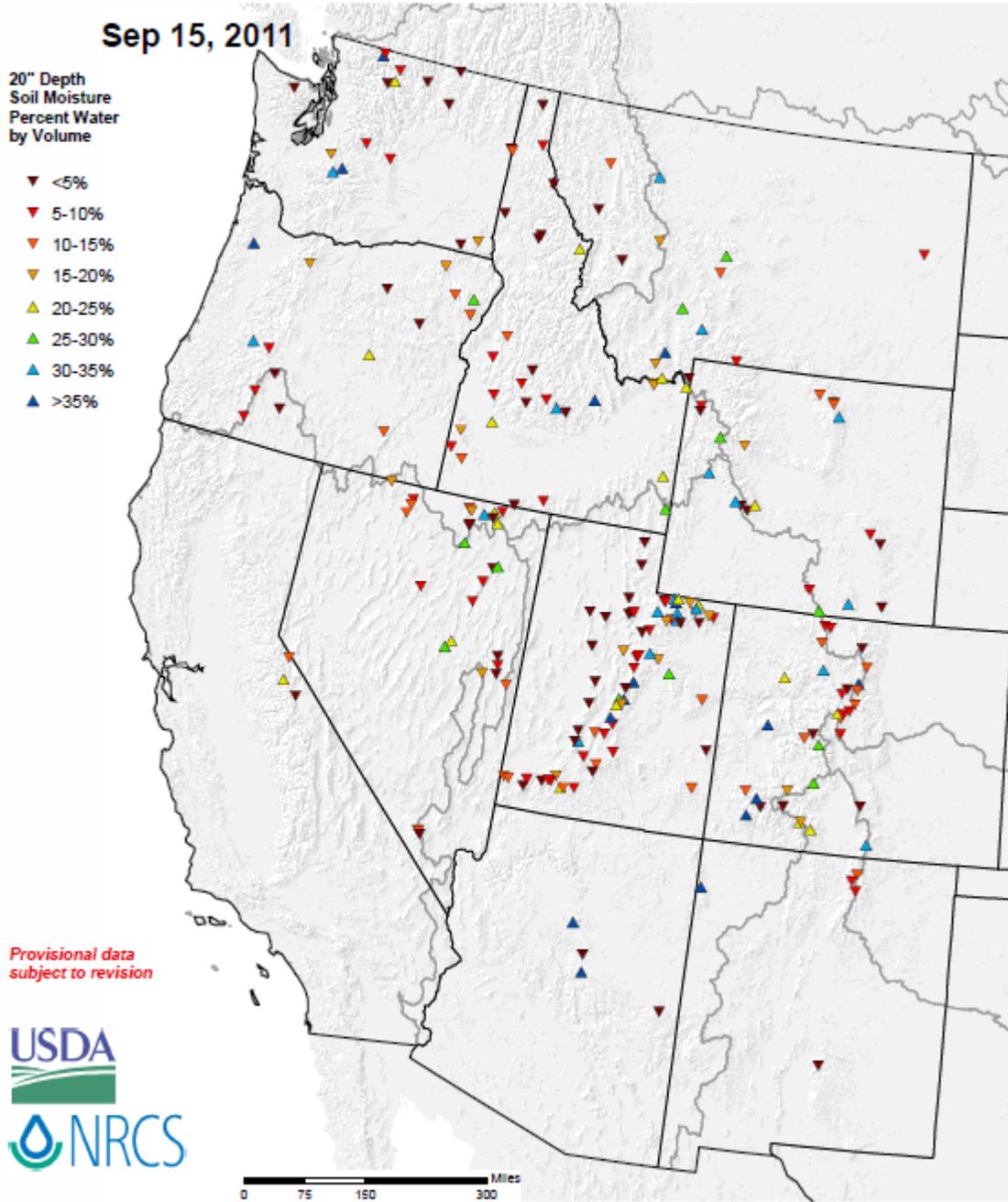


Explanation - Percentile classes				
Low	≤5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

Fig. 6: Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Extreme conditions exist over parts of northern Florida.

# Weekly Snowpack and Drought Monitor Update Report

## Westwide SNOTEL Current 20" Depth Soil Moisture % Water by Volume



Data based on the first reading of the day (typically 00:00).

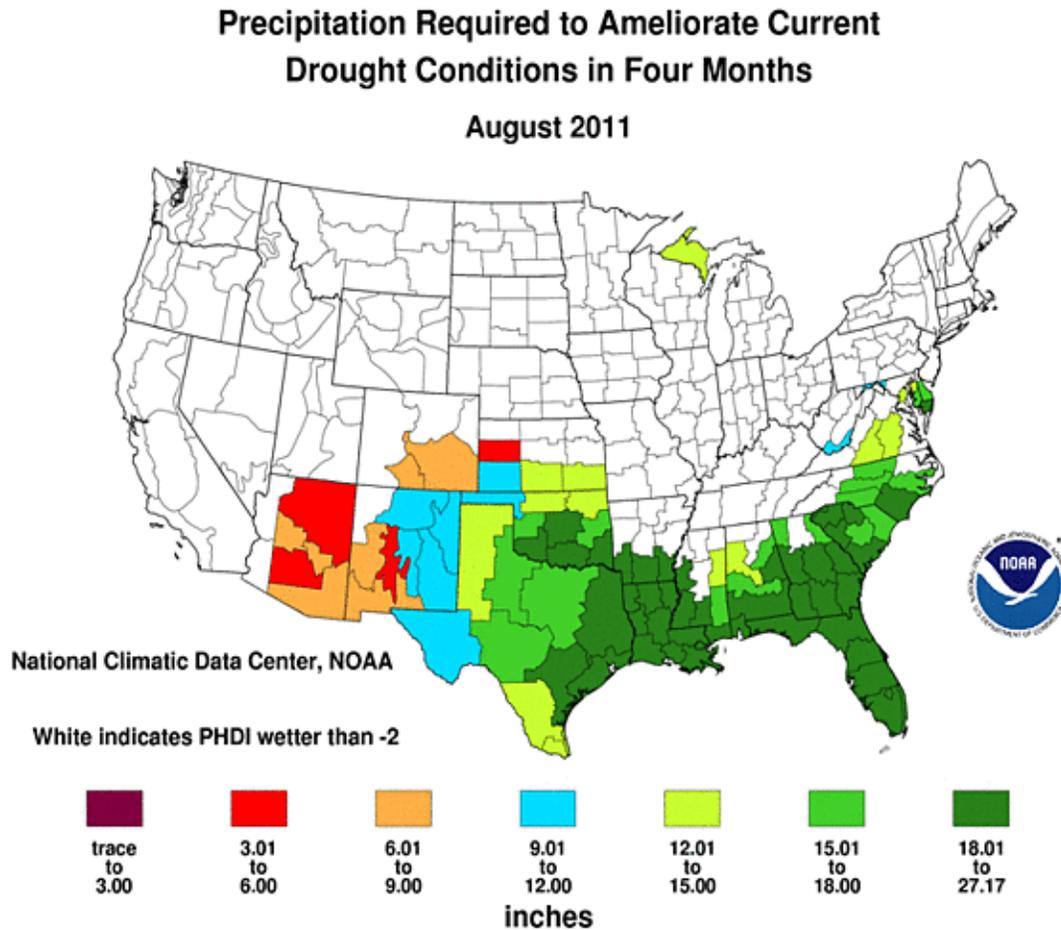
Prepared by the USDA/NRCS National Water and Climate Center  
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>  
Science contact: Jim.Marron@por.usda.gov 503 414 3047

Fig. 7: SNOTEL Soil Moisture at a depth of 20" reveals many sites have below average moisture. These values are typical during this time of year.

## Weekly Snowpack and Drought Monitor Update Report

### [Special Report](#) – **The impact of the Southern Tier States Drought**

What it would take to end the current drought by the end of the year.

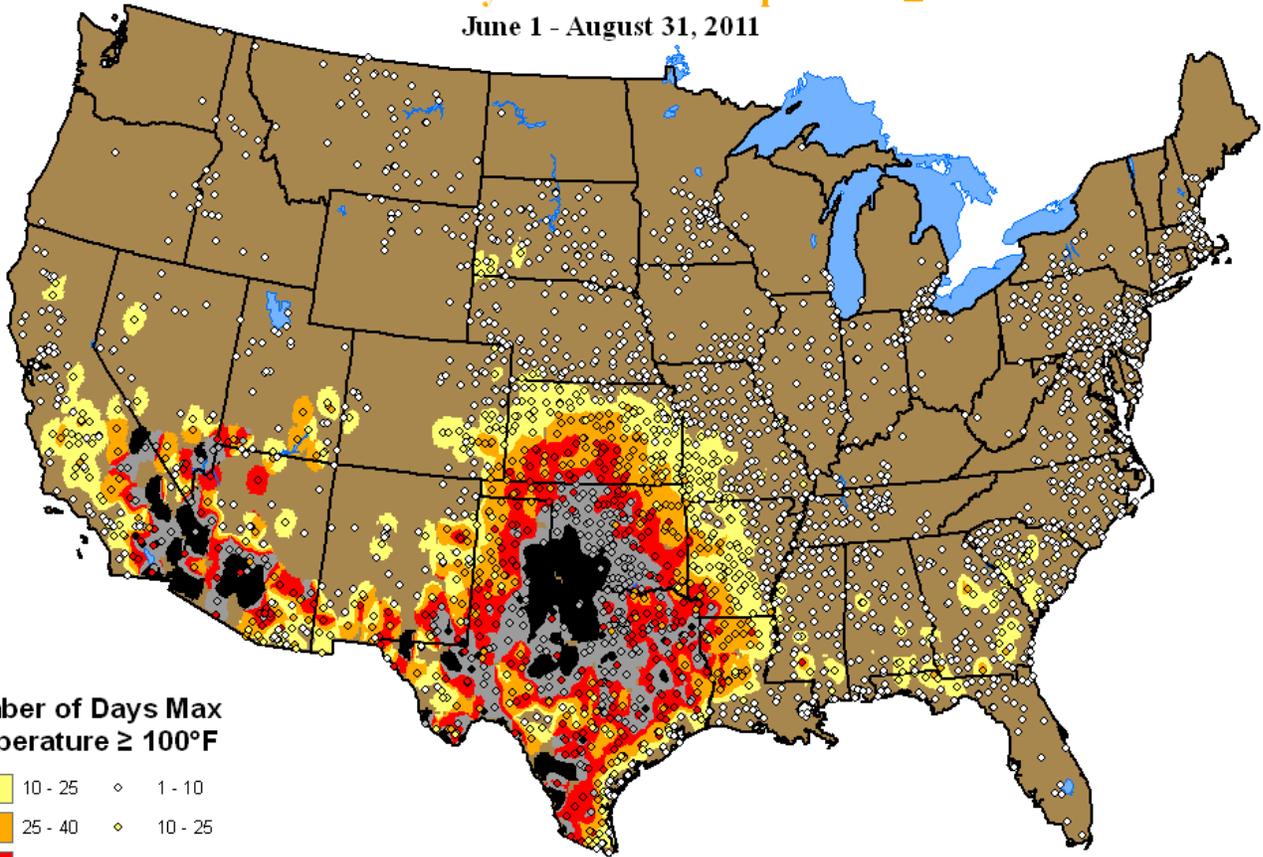


**Fig. 8: The severity of the drought over the Southern Tier States is so great that it would take nearly 1 to 2 feet of rainfall to occur over the remainder of 2011 to end the drought.**

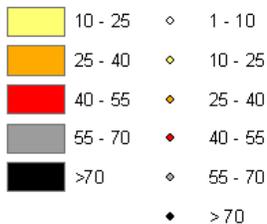
## Persistent Heat Engulfs Nation - Summer 2011

Number of Days Maximum Temperature  $\geq 100^{\circ}\text{F}$

June 1 - August 31, 2011



Number of Days Max  
Temperature  $\geq 100^{\circ}\text{F}$



Total number of stations: 2731 (only includes 60 or more non-missing days).

Leader: Laredo AP TX 90 out of 92 possible days.

Preliminary data: full quality assurance not yet applied.

Updated: September 27, 2011



NOAA's  
National Climatic Data Center

Ref: <http://www1.ncdc.noaa.gov/pub/data/cmb/extremes/summer-2011-days-over-100.png>

(Courtesy: Derek "Deke" Arndt, Chief, Climate Monitoring Branch, NOAA's National Climatic Data Center)

## Weekly Snowpack and Drought Monitor Update Report

### National Drought Summary -- September 27, 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 number of rain events moved across the country again this Drought Monitor week. While the West remained mostly dry, areas of the Midwest, Southeast, and Northeast saw areas of much above normal precipitation.

**The Southeast:** Large areas of rain moved through the Southeast this week with some areas seeing rain almost every day. The most intense precipitation fell from September 22-24 and spread from Alabama and Georgia, across much of the Carolinas and into the Mid-Atlantic. This rain improved areas of Abnormal Dryness (D0) and Moderate Drought (D1) in northern Alabama, as well as widespread improvement in Abnormal Dryness (D0), Moderate Drought (D1), and to a lesser extent Severe Drought (D2) across the Carolinas. Southern Virginia saw an improvement in Moderate Drought (D1). Conditions continued to improve in Kentucky with this week's rainfall reflected in reductions in Abnormal Dryness (D0) and Moderate Drought (D1).

**The Northeast and Mid-Atlantic:** Adequate rains fell this week the Mid-Atlantic and Northeast. No changes were made in the drought status in this area.

**The South:** Oklahoma was the lucky recipient of multiple rain events this week, something that has not happened in quite a while. While these events did lead to minor improvement in Extreme Drought (D3) in eastern Oklahoma, the precipitation deficits remain large and the impacts wide-spread. No improvement was made in the rest of the state. This same series of storms also moved through Arkansas and southern Missouri. While it did improve short and long-term precipitation deficits some, impacts, especially to agriculture, are still extreme. Despite the rain, recent impact information led to the elimination of improvements made last week in this area. Conditions in Kansas degraded slightly in the central part of the state with a slight expansion of Abnormal Dryness (D0), Moderate (D1) and Severe (D2) Drought. In Texas, mounting dryness in the south, around Brownsville and Beaumont, led to slight degradation of drought conditions. In Texas, 96% of the Pasture and Range land is considered to be in Poor or Very Poor condition, a slight change from last week's 98%. In Oklahoma, the total is 90% (94% last week).

**The Plains and Midwest:** Conditions in the Northern Plains deteriorated some this week while in the Midwest, conditions improved slightly. Minnesota saw expansion of Abnormal Dryness (D0) in the southern part of the state. Additional beneficial precipitation this week led to wide improvement in Abnormal Dryness (D0), Moderate (D1) and Severe (D2) Drought across Illinois and Indiana.

## Weekly Snowpack and Drought Monitor Update Report

**The West:** The West was generally dry this week with the exception of the extreme Northwest and isolated thunderstorm activity across the region. Drought conditions remain unchanged this week.

**Hawaii, Alaska and Puerto Rico:** Drought conditions remained unchanged in Alaska and Puerto Rico this week. In Hawaii, mounting agricultural impacts led to the introduction of Extreme Drought (D3) in the northwest of the Big Island and the introduction of Moderate Drought (D1) in western Oahu.

**Looking Ahead:** During the September 28 – October 3, 2011 time period, there is an enhanced probability of precipitation limited to the Northeast, the Northwest, and the extreme Southwest, early in the period. Later, the above-normal probability of precipitation encompasses most of the West and is eliminated in the Northeast. Below normal temperatures are expected in the eastern part of the country early in the period. Later, the chances shift to near-normal. In the West and central part of the country, temperatures are expected to be above normal throughout the period.

For the ensuing 5 days (October 4 – October 8, 2011), the odds favor cooler-than-normal conditions over much of the Southeast and along the West Coast. Warmer-than-normal to normal conditions are expected across the West, through the Plains and into the Mid-Atlantic and Northeast. The odds of above-normal precipitation are limited to the West and primarily in the Northwest. Normal to below-normal precipitation is expected across the Southwest, through the center of the country and along the East Coast. In Alaska, the odds favor above normal precipitation across the southern part of the state. Below-normal temperatures are expected in the same part in the southern part of the state. The northern part of the state is expecting above-normal temperatures.

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### 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 28, 2011*