



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

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

**Date: 7 April 2011**

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** SNOTEL Snow-Water Equivalent percent of normal values for 7 April 2011 shows 1-Category gains (blue circles) over the northern-most tier states. Melt-out is nearing completion over much of the Southwest (1-Category loss with red circles) (Fig. 1). 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. Melt-out nearly completed over the Southwest (Fig.1a). SNOTEL 7-day snow depth changes show significant late season gains over the Cascades and Northern Rockies. Other more southern regions are showing rapid melt as would be expected this time of year (Fig. 1b).

**Temperature:** Average SNOTEL temperatures were mainly 5°F to 10°F above the long term average for this time of year across much of the West (Fig. 2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures across southern Arizona and New Mexico (>+10°F) and the greatest negative departures over northeast Montana (<-6°F) (Fig. 2a).

**Precipitation:** ACIS 7-day average precipitation amounts for the period ending 6 April shows the bulk of the heaviest precipitation confined to northwest Washington (Fig. 3). In terms of percent of normal, the precipitation was highest across the Great Basin and northern-most tier states. Elsewhere, little precipitation fell this week (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, most of Oregon, and parts of Northern and Central Rockies. One-category changes (±) are denoted by the blue and red circles, respectively (Fig. 3b).

The West: The heat is on in the Southwest after some unseasonably cooler weather recently, with readings some 6-10 degrees or more above normal last week. That and no precipitation made it feel like summer as Extreme Drought (D3) has now spread across much of southern New Mexico this week. D0-D1 have also pushed northward up into the Four Corners region as soil moisture and streamflow levels have fallen behind as of late. In northern Colorado, fires are a concern as well and there is a slight push north of D2 in and around the Ft. Collins region and to the east toward Sterling. Farther north, a favorable wet pattern leads to some trimming of the Abnormally Dry (D0) regions in both the southwest and northwest portions of the state. Author: Mark Svoboda, National Drought Mitigation Center

***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

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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. 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. 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://drought.gov>.

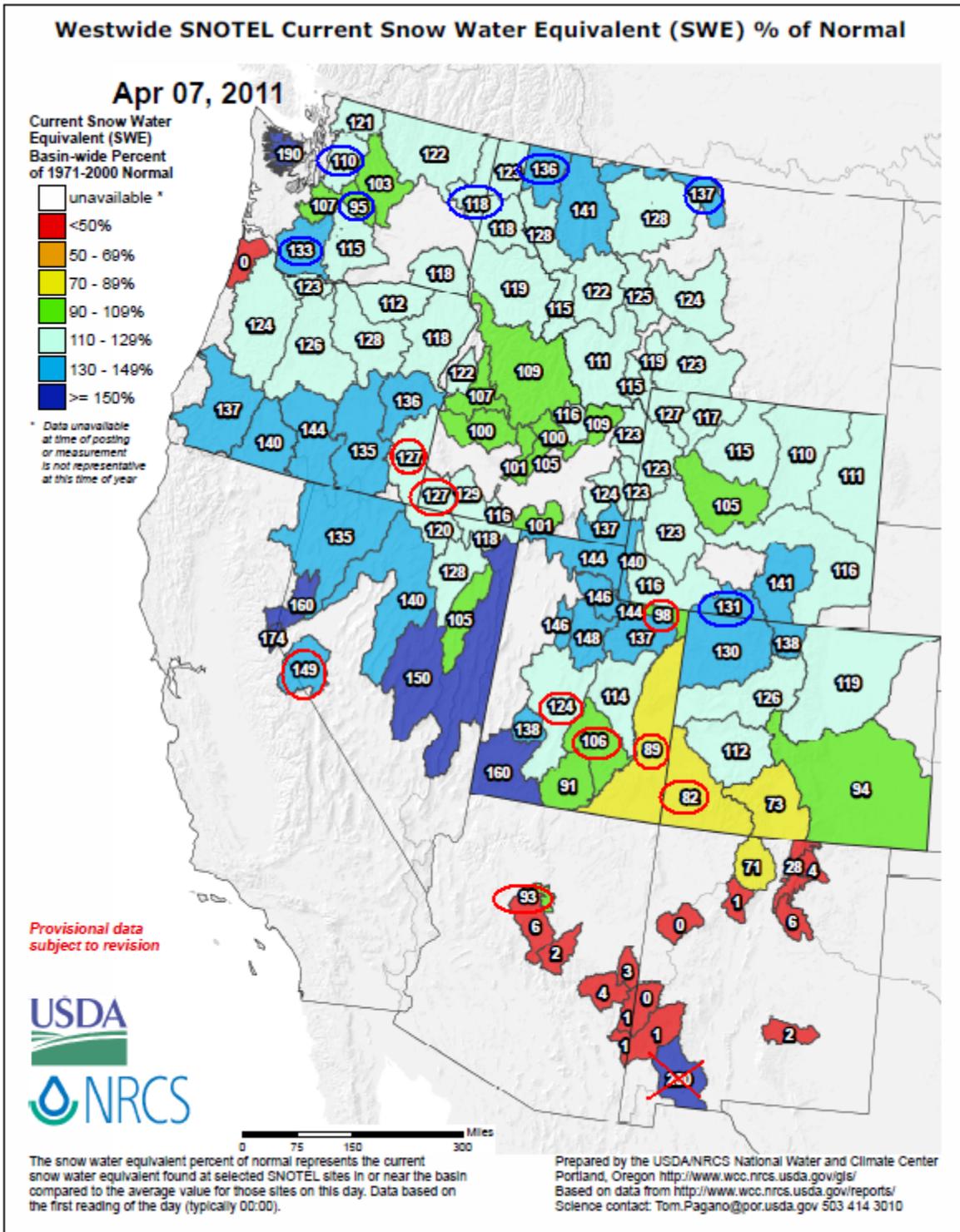
### FOR MORE INFORMATION

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

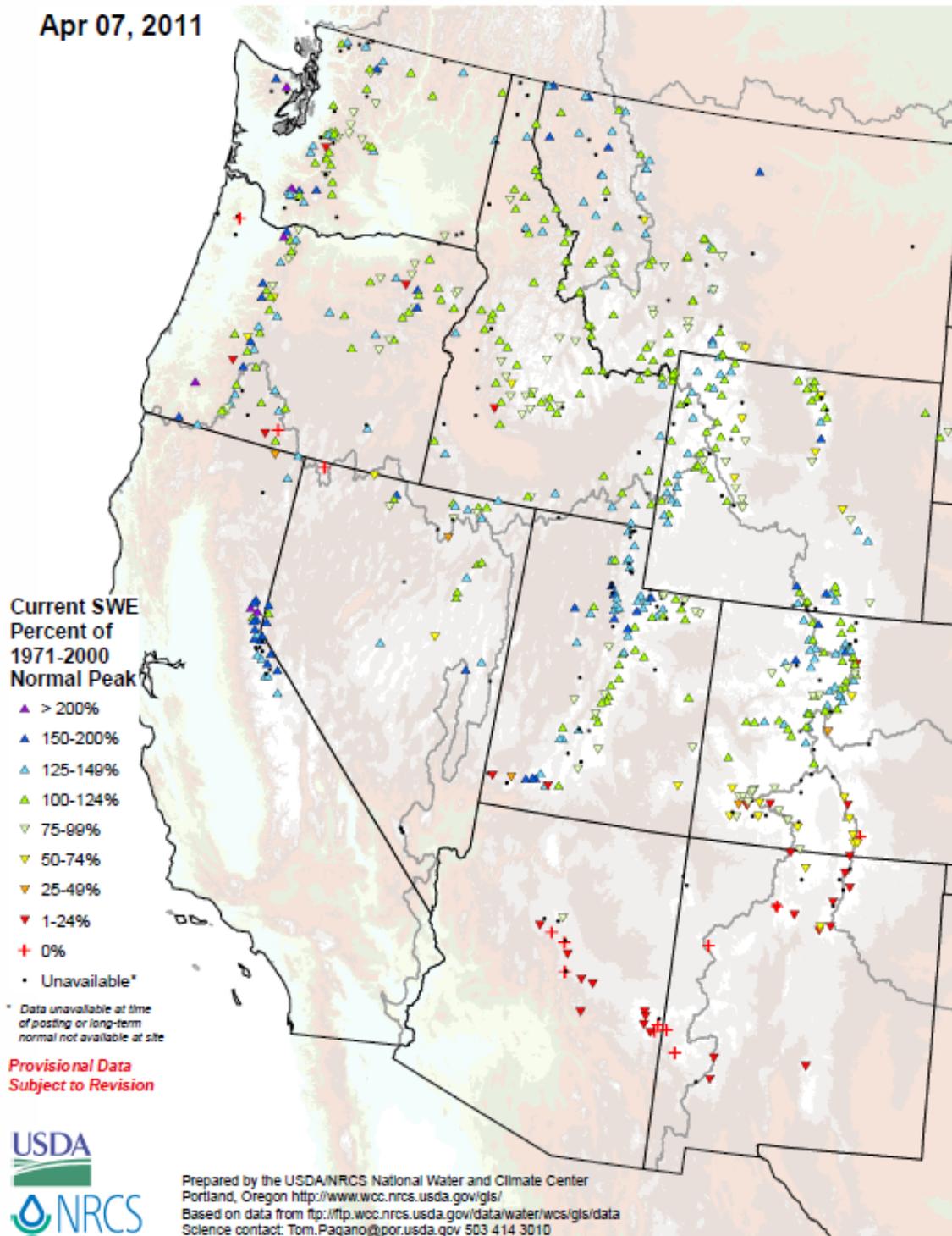


**Fig. 1: SNOTEL Snow-Water Equivalent percent of normal values for 7 April 2011 shows 1-Category gains (blue circles) over the northern-most Tier States. Melt-out is nearing completion over much of the Southwest (1-Category loss with red circles).**

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)

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SNOTEL Current Snow Water Equivalent (SWE) Percent of Normal Peak  
Apr 07, 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>

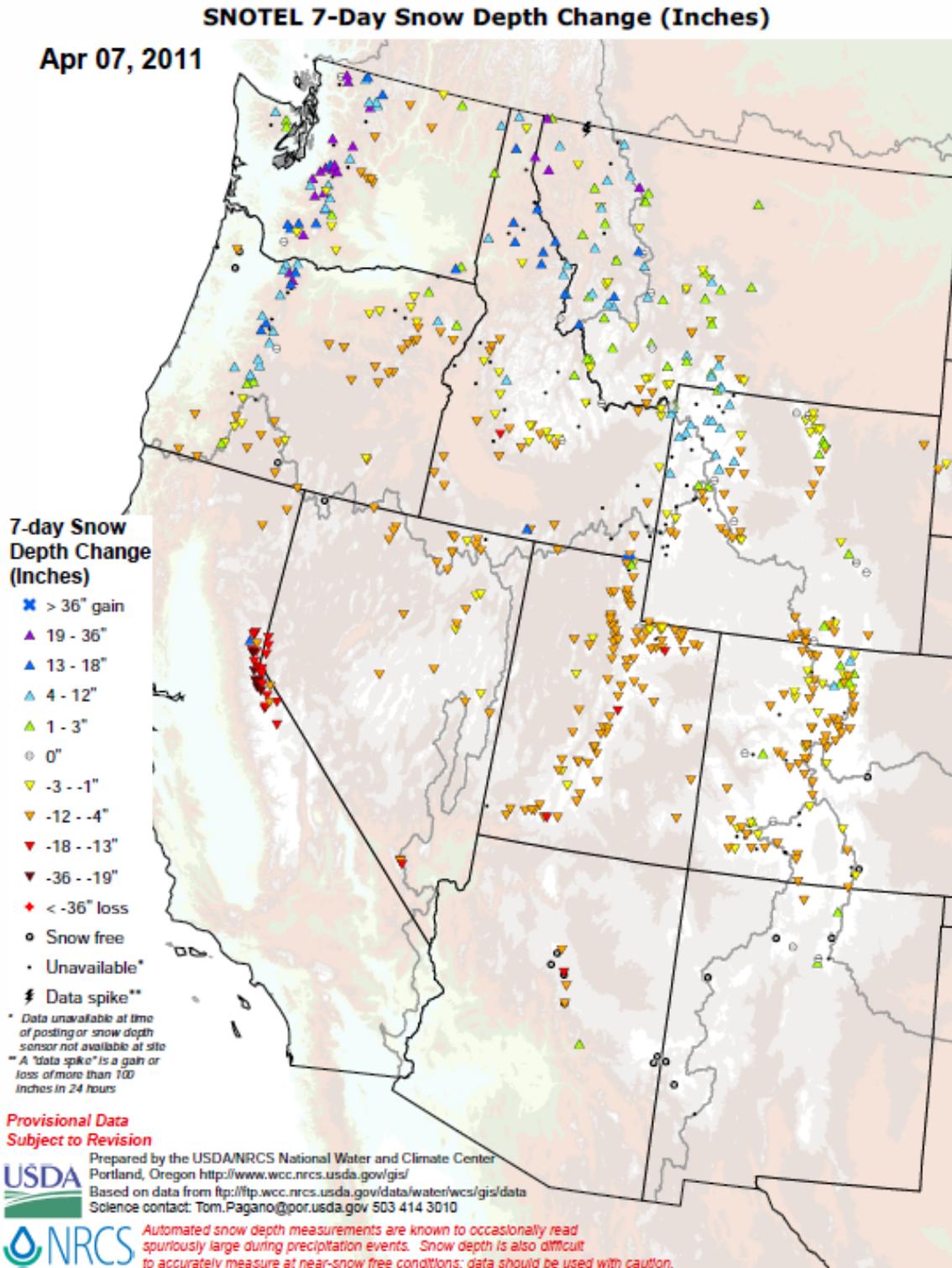
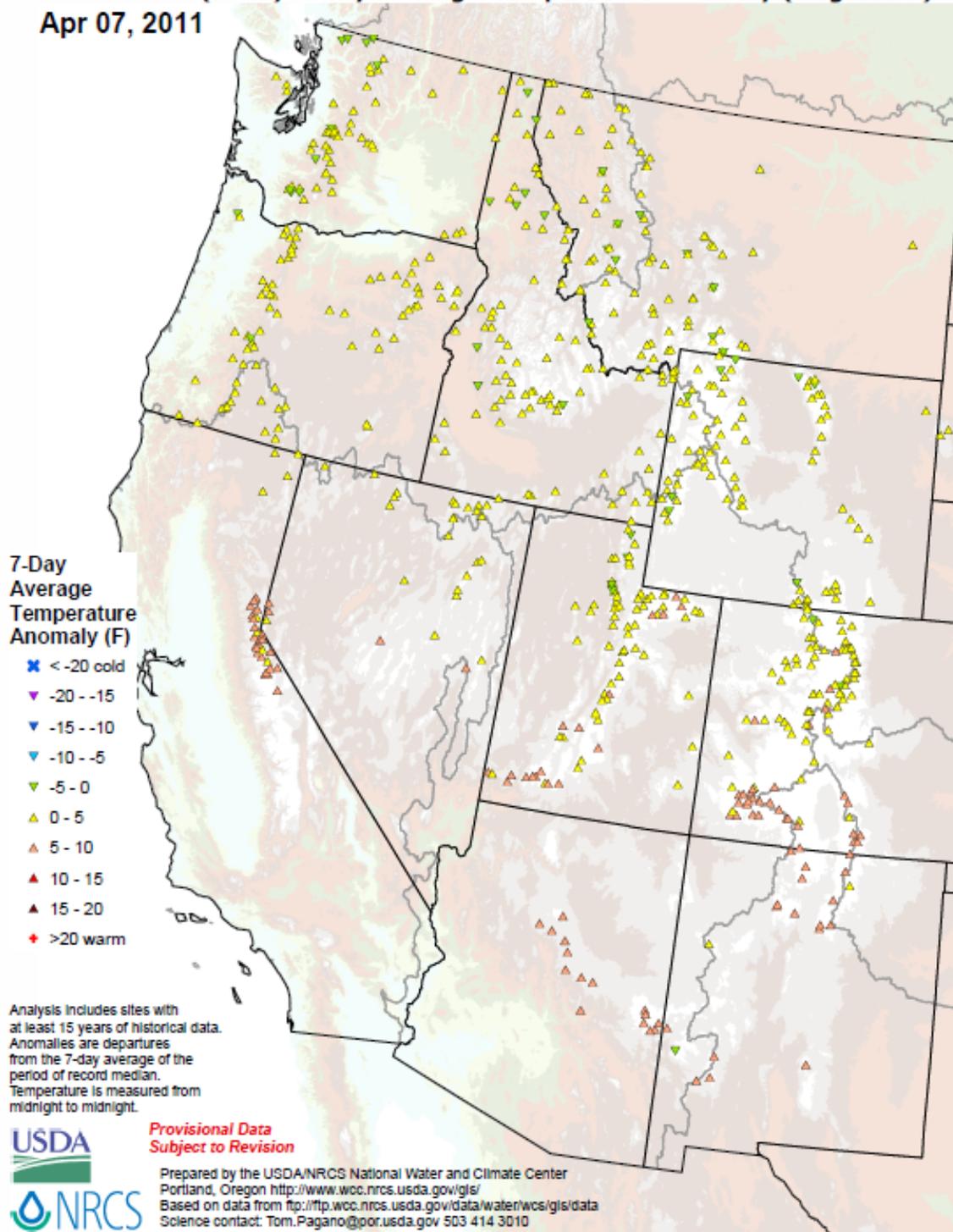


Fig. 1b: SNOTEL 7-day snow depth changes show significant late season gains over the Cascades and Northern Rockies. Other more southern regions are showing rapid melt as would be expected this time of year.

Ref: [http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west\\_snowdepth\\_7ddelta.pdf](http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_snowdepth_7ddelta.pdf)

# Weekly Snowpack and Drought Monitor Update Report

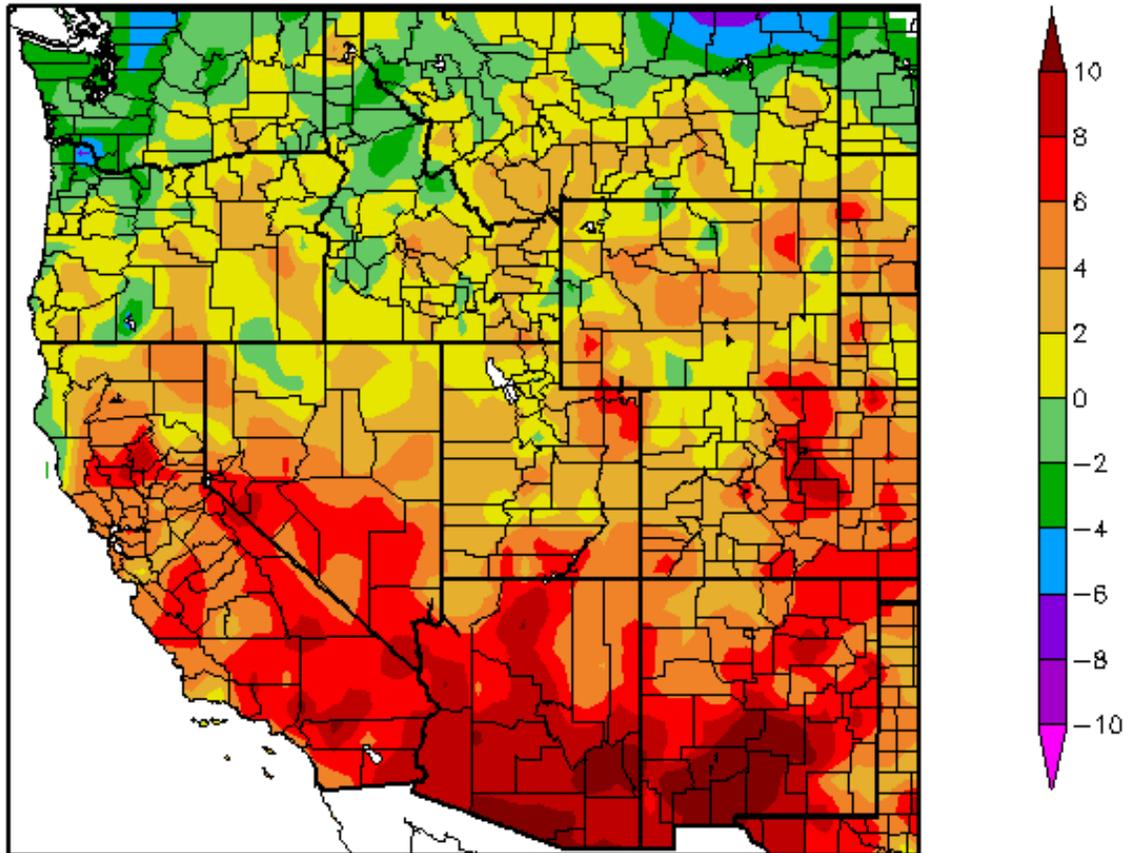
## SNOTEL (solid) 7-Day Average Temperature Anomaly (Degrees F) Apr 07, 2011



**Fig. 2: Average SNOTEL temperatures were mainly 5°F to 10°F above the long term average for this time of year across much of the West.**

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

Departure from Normal Temperature (F)  
3/31/2011 – 4/6/2011



Generated 4/7/2011 at HPRCC using provisional data.

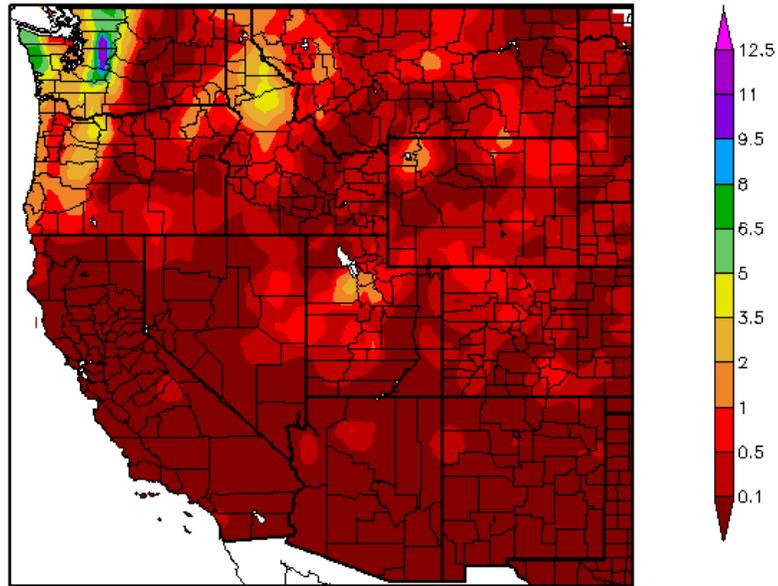
Regional Climate Centers

**Fig. 2a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures across southern Arizona and New Mexico (>+10°F) and the greatest negative departures over northeast Montana (<-6°F).**

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

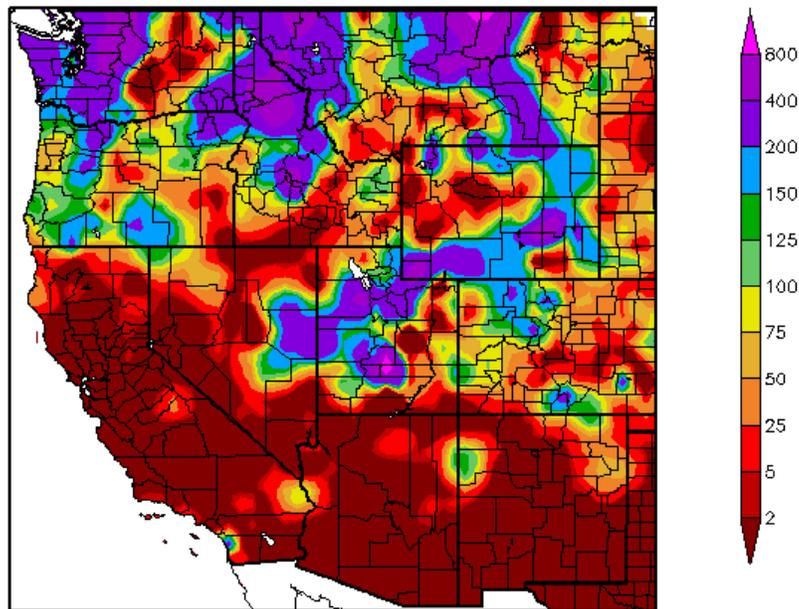
Precipitation (in)  
3/31/2011 - 4/6/2011



Generated 4/7/2011 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)  
3/31/2011 - 4/6/2011



Generated 4/7/2011 at HPRCC using provisional data.

Regional Climate Centers

**Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 6 April shows the bulk of the heaviest precipitation confined to northwest Washington (Fig. 3). In terms of percent of normal, the precipitation was highest across the Great Basin and northern-most tier states. Elsewhere, little precipitation fell this week (Fig 3a). Ref: <http://www.hprcc.unl.edu/maps/current/>**

Weekly Snowpack and Drought Monitor Update Report

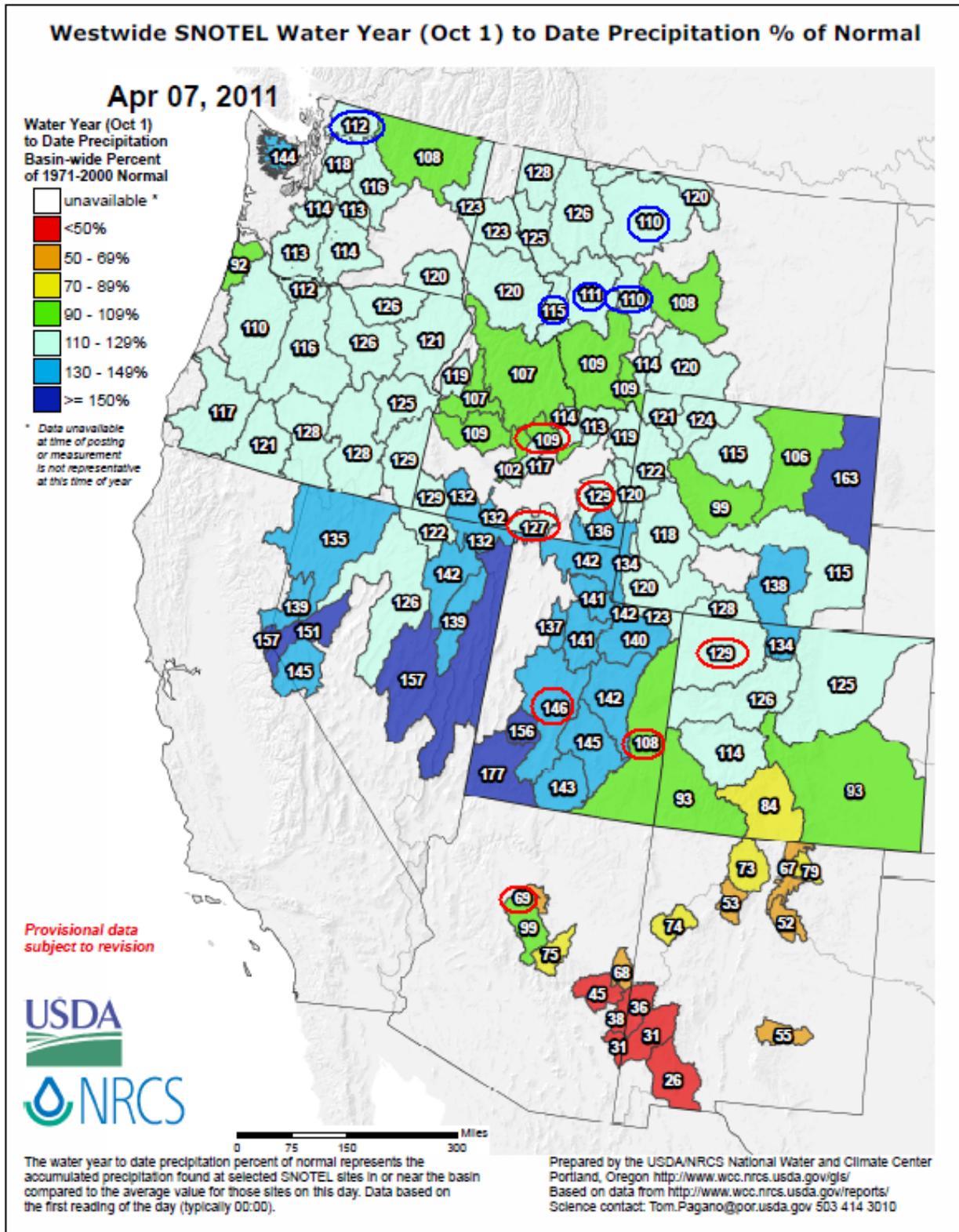


Fig 3b: For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, most of Oregon, and parts of Northern and Central Rockies. One-category changes ( $\pm$ ) are denoted by the blue and red circles.

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

# U.S. Drought Monitor

April 5, 2011  
Valid 8 a.m. EDT

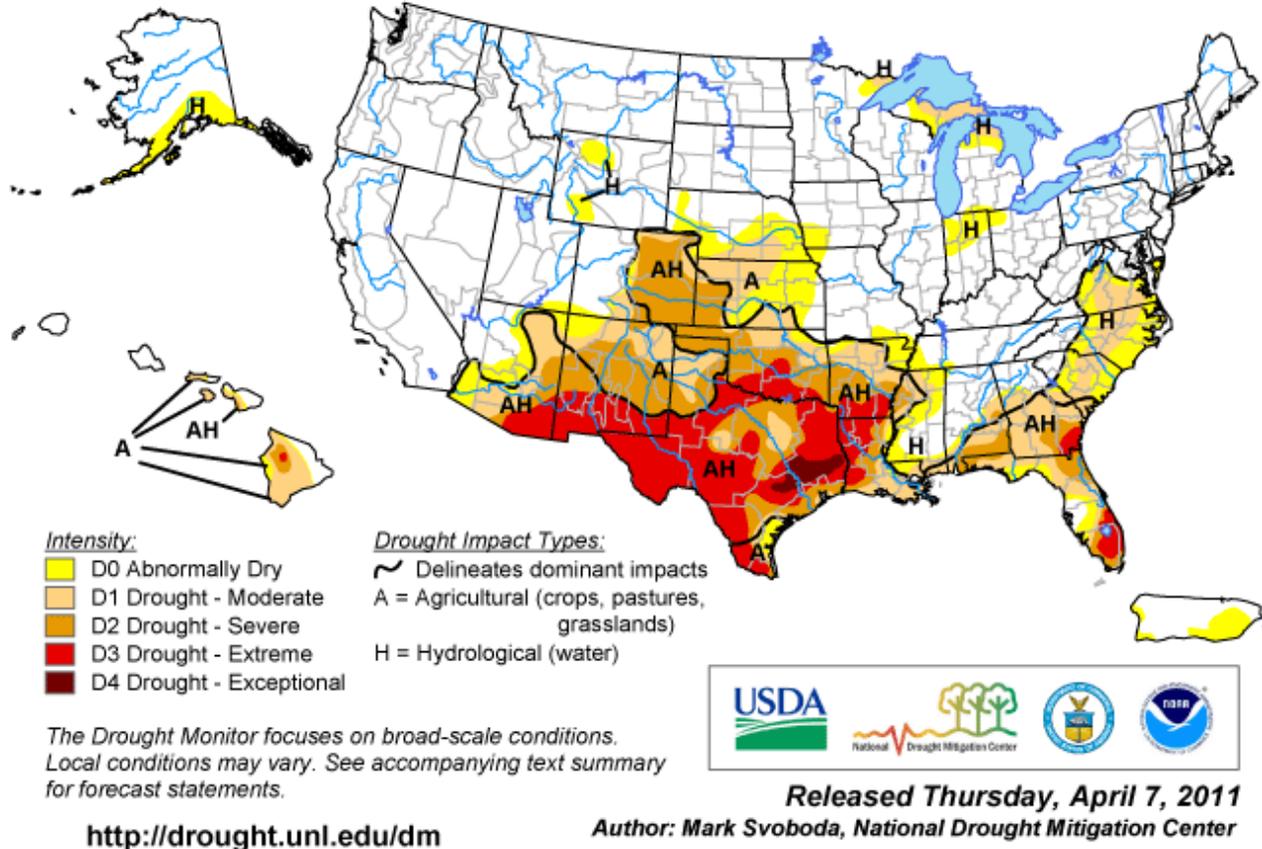


Fig. 4: Current Drought Monitor weekly summary. The exceptional D4 levels of drought are found over southeast Texas. Ref: <http://www.drought.unl.edu/dm/monitor.html>

# U.S. Drought Monitor

## West

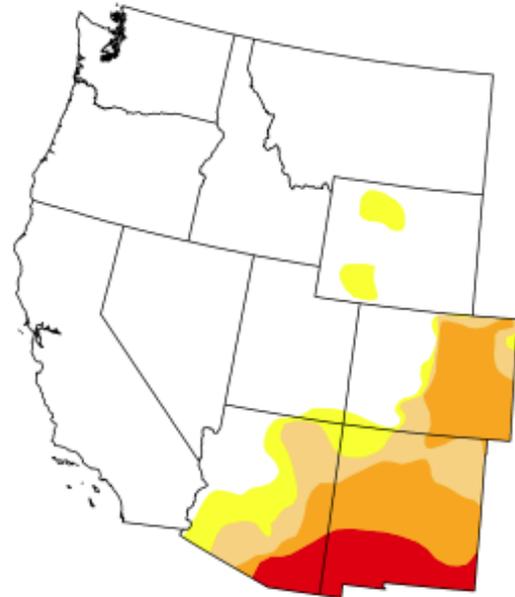
April 5, 2011  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	76.09	23.91	19.18	13.39	4.16	0.00
Last Week (03/29/2011 map)	76.08	23.92	18.56	13.12	2.12	0.00
3 Months Ago (01/04/2011 map)	74.72	25.28	11.69	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 (03/30/2010 map)	42.22	57.78	21.40	4.89	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.



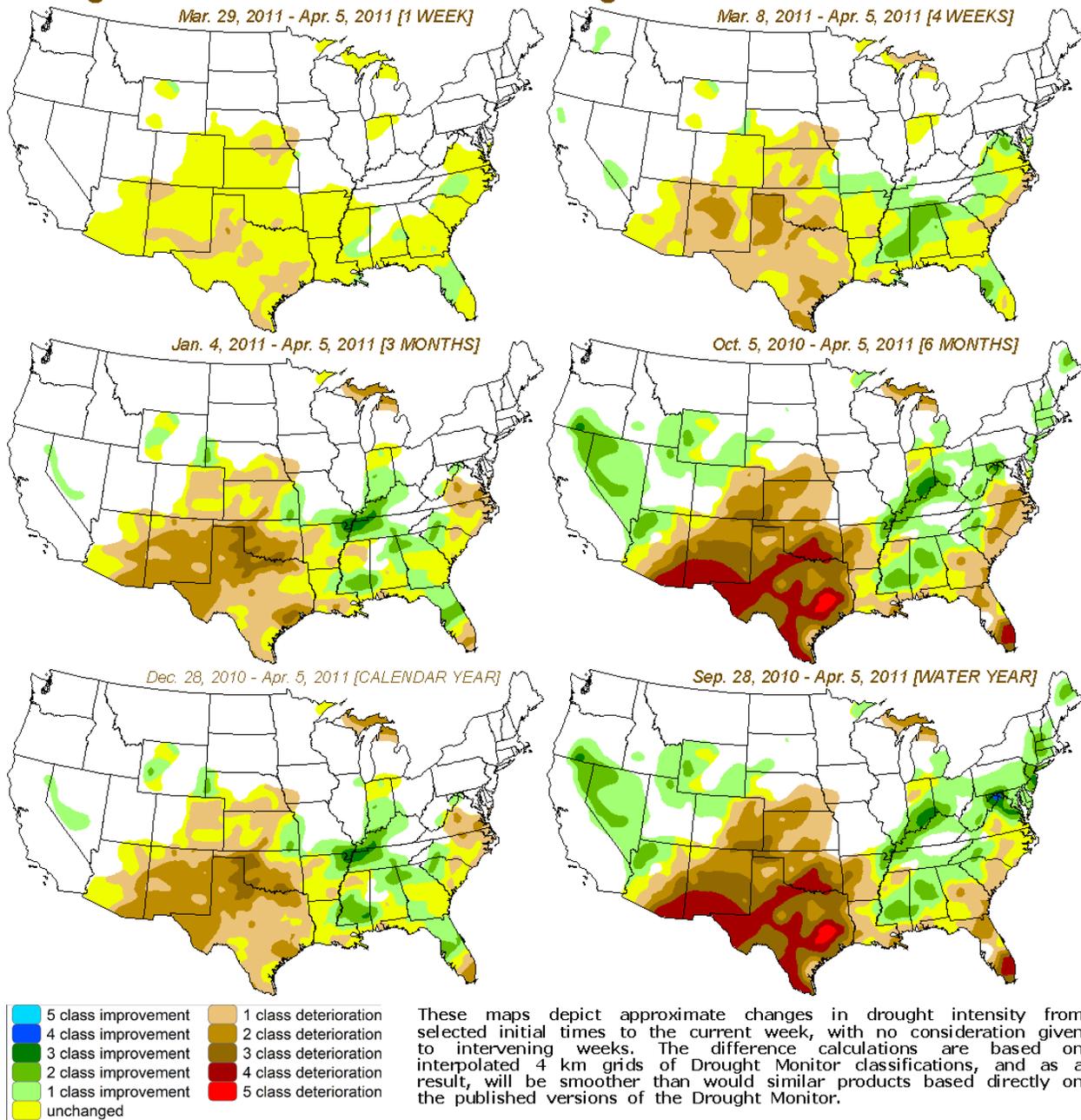
Released Thursday, April 7, 2011  
National Drought Mitigation Center,

<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.

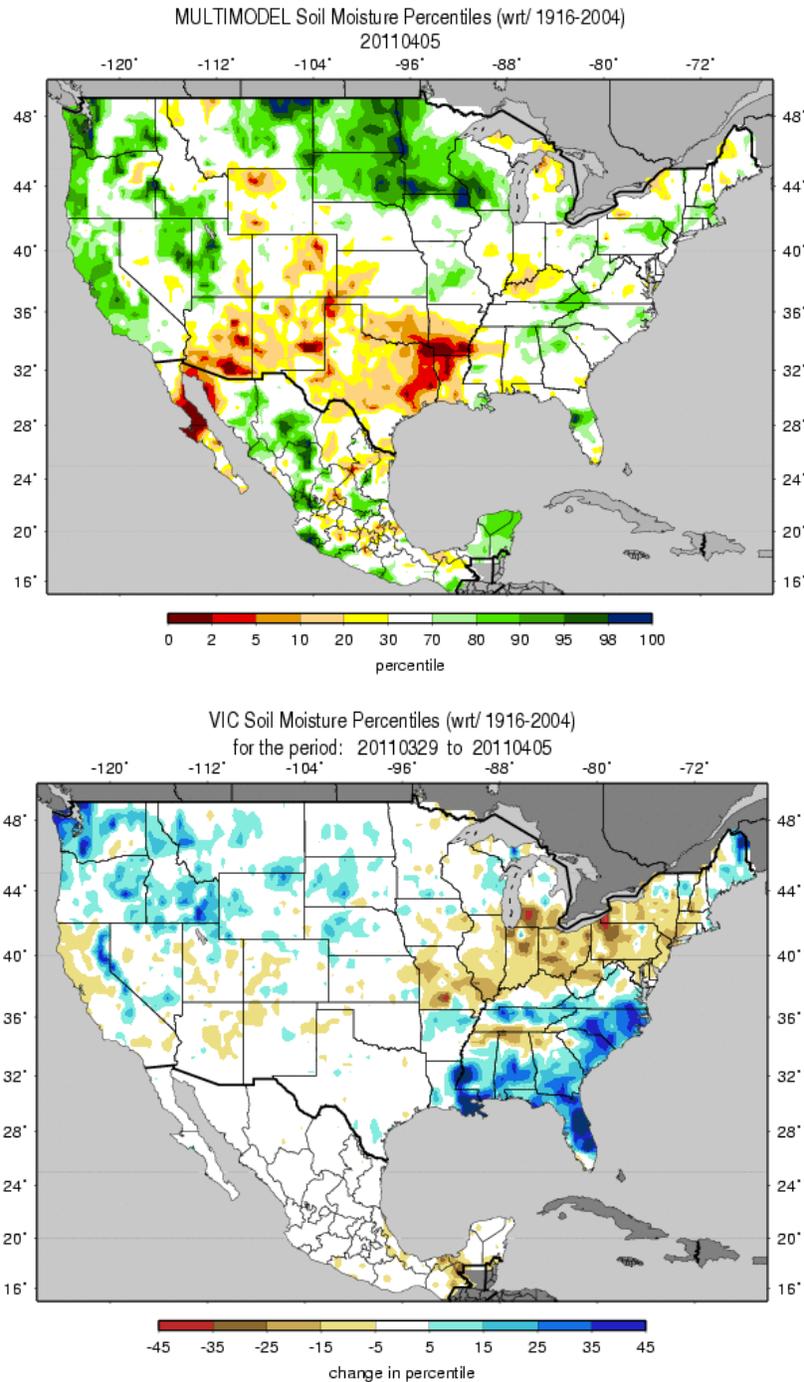
Ref: [http://www.drought.unl.edu/dm/DM\\_west.htm](http://www.drought.unl.edu/dm/DM_west.htm)

### Drought Monitor Classification Changes for Selected Time Periods



**Fig. 4b: Drought Monitor classification changes for various time periods. Note the developing drought over the south-central region of the country continues with minor improvements over the Southeast and Mid-Atlantic States.**

## Weekly Snowpack and Drought Monitor Update Report

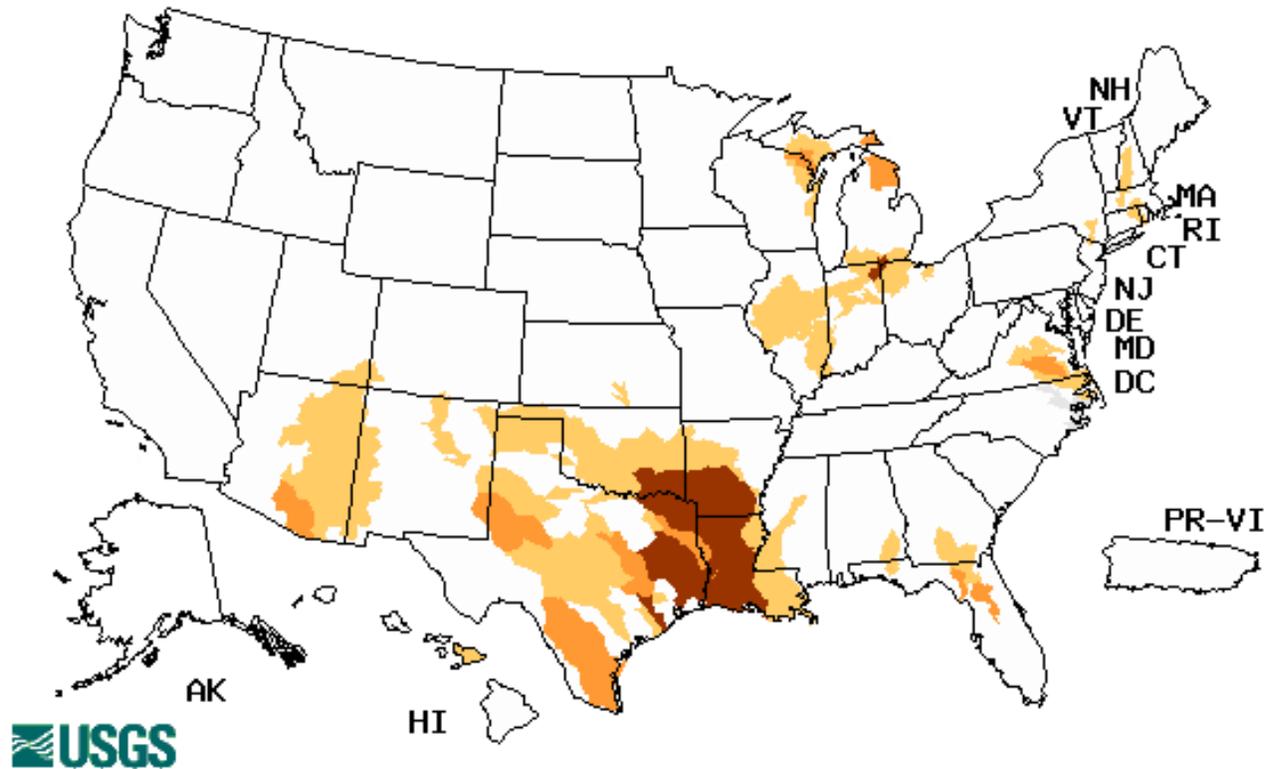


**Figs. 5a and 5b: Soil Moisture ranking in percentile as of 5 April (Fig. 5) shows moist conditions over much of the Northern Tier States and California with dryness over Arizona and much of the Lower Mississippi River (top). For the past week, the Pacific Northwest, Northeastern California, Northern Maine, and the southeastern have experienced significant increases while the Lower-Great Lakes and Ohio Valley are drying out.**

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

# Weekly Snowpack and Drought Monitor Update Report

Wednesday, April 06, 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. Portions of the eastern Texas, Louisiana, Arkansas, southeast Oklahoma, and the northeast corner of Indiana 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 5, 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/>.*

**Overview:** Last week proved to be cooler than normal in the East (with an exception being Florida, which was above normal) while much of the West was warmer than normal. It was dry across much of the West as well. The only drought-affected region seeing much in the way of precipitation was the Southeast. In general, this has led to more in the way of intensification rather than improvements as we turn our attention toward spring and all the planting activity and watering needs that will follow as nature's furnace turns over to the heat mode.

**Midwest:** Cooler weather and some scattered rains still dominated most of the region, and the drought depiction remains unchanged across northern Illinois and up into Michigan and the Upper Peninsula. The eastern half of the region is in better shape than the western reaches at this point and the better rains of last week (1 to 2 inches or more) fell across the southern portions of Illinois and Ohio. Longer-term Water Year deficits (Oct. 1 to date) leave some concern for deeper soil moisture reserves (even in the D-free areas of the region) unless spring rains can erase them altogether, thus the Abnormally Dry (D0 H) and Moderate (D1 H) designations.

**The Mid-Atlantic:** Generally modest (0.5 to 1.5 inches) rains and unseasonably cooler temperatures (4 to 8 degrees below normal) were widespread across the Mid-Atlantic, with the better amounts falling in the western highland country of the Carolinas and Virginia. This led to some minor reduction of Abnormally Dry to Moderate (D0-D1) along the western flank of the drought within the Carolinas. It also means there is no more Severe Drought (D2) within central North Carolina, based on reports from the N.C. Drought Monitoring Task Force this week. The area still bears watching going into the warm season because precipitation is 50-70% of normal since October 1 across most of the region.

**Southeast:** Last week brought widespread beneficial rains of 1 to 3 inches or more across a large portion of the region from Mississippi to Georgia and into central Florida. This led to more improvements in the drought depiction this week, with 1-category improvements noted in central Mississippi, northern and east-central Alabama, southern Georgia and northern and central Florida. Notably, Extreme Drought (D3) was removed from Alabama and northeast Florida. A large swath of improvement is also marked across central Florida where heavy rains (3 to 5 inches or more) continued the improvement trend seen here in recent weeks. Cooler temperatures accompanied the rains (lowering fire risk) across Mississippi, Alabama and Georgia while most of Florida experienced above-normal readings. In general, the region is seeing a trend of improvement over the past month in soil moisture (observed and modeled) and USGS streamflow levels from the north and west down to the south and east within the region.

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**Delta:** Last week's weather brought a mixed bag to the Delta region, with cooler temperatures to the north and above-normal temperatures in the southern/coastal reaches. Precipitation was a bit spottier as well with the heaviest rains falling over the Severe Drought (D2) parishes of southeastern Louisiana. This has led to a removal of the D2 there but most of western and northern Louisiana remains in the grips of a Severe (D2) to Extreme (D3) drought. Both year-to-date and water year-to-date (since October 1) precipitation totals are running in the 50-70% of normal range after a lackluster tropical storm season last year.

**Southern Plains:** This region was again marked by hot, windy conditions, which served to continue fanning several fires of late. Wheat conditions are generally dismal and significant precipitation will be needed to help pasture and rangeland recover along with reducing the risk of fire as we head into the hot season. The only improvement of note in the region was a slight trimming of the D3 in north-central Texas around the Dallas area where some good rains were reported. Elsewhere in Texas, the story is much worse as widespread advancement is noted in Severe (D2) and Extreme (D3) drought across the Texas Panhandle and western, southeastern, and deep southern counties along the Rio Grande and down to Brownsville.

To the north in Oklahoma, it is pretty much the same story, another verse, with blistering temperatures, fires, poor wheat conditions and not much relief on the horizon. Severe Drought (D2) remains over a good portion of the state, but this week leads to more in the way of Extreme Drought (D3) across the southern and southwestern counties of Oklahoma.

The first USDA soil moisture reports are out and they don't paint a pretty picture, with 86% of Oklahoma showing short or very short topsoil moisture conditions. Texas is reporting 90% short/very short as well. Other statistics provided by the National Weather Service (Austin/San Antonio WFO) show that Del Rio has reported only 0.31 inches of precipitation for October-March, the 2nd driest since 1906. Austin reported its 5th driest October-March since 1856 and San Antonio came in as the 12th driest October-March since 1871.

**Central Plains:** Much of the Central Plains saw a nice warm-up, but it was also predominantly dry. This recent, persistent dry pattern has led to more advancement of Abnormally Dry (D0) conditions across eastern Nebraska and northeastern Kansas leaking into southwestern Iowa and northwestern Missouri as well. Additionally, a lobe of Moderate Drought (D1) has now moved into central Nebraska from north central Kansas. Winter wheat conditions and sub-surface soil moisture recharge concerns lead the list heading into planting season in the next month or so.

**The West:** The heat is on in the Southwest after some unseasonably cooler weather recently, with readings some 6-10 degrees or more above normal last week. That and no precipitation made it feel like summer as Extreme Drought (D3) has now spread across much of southern New Mexico this week. D0-D1 have also pushed northward up into the Four Corners region as soil moisture and streamflow levels have fallen behind as of late. In northern Colorado, fires are a concern as well and there is a slight push north of D2 in and around the Ft. Collins region and to the east toward Sterling. Farther north, a favorable wet pattern leads to some trimming of the Abnormally Dry (D0) regions in both the southwest and northwest portions of the state.

**Hawaii, Alaska and Puerto Rico:** The only change of note this week is found on the Big Island of Hawaii, with a reduction of the D0 on the windward side after a series of beneficial rains. The rest of the islands remain unchanged this week.

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Alaska and Puerto Rico remain unchanged this week.

**Looking Ahead:** The next 5 days (through April 11) show a favorable pattern of precipitation across the Great Lakes, Midwest and Ohio Valley regions along with a more spotty chance of decent precipitation in the upper elevations across the West. The southern tier states from New Mexico across the Gulf Coast and Florida along with the Mid-Atlantic show a pretty dry outlook, though. Temperatures are expected to be well above normal (6 to 9 degrees) from the Rockies to the Atlantic while the opposite holds true across most of the West, with readings expected to be 6 to 9 degrees below normal.

The CPC 6-10 day forecast (April 12-16) is calling for cooler temperatures in Alaska and the west coast along with the Great Lakes and Northeast. The odds are enhanced for seeing a repeat of above-normal temperatures in the Four Corners region, southern Rockies, and southern Plains into the Mississippi Delta. Above-normal amounts of precipitation are more likely across the Pacific Northwest, Great Lakes and Florida with below-normal precipitation more likely in Alaska, the Southwest, central and southern Plains and the lower Mississippi Delta.

**Author:** [Mark Svoboda, National Drought Mitigation Center](#)

### 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 April 6, 2011