



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

Weekly Report - Snowpack / Drought Monitor Update**Date: 3 March 2011****SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

Snow: SNOTEL Snow-Water Equivalent percent of normal values for 3 March 2011 shows several basins across the Pacific Northwest and Northern Rockies have improved by one-category during the past week (noted by blue circles). Red circles over the Colorado-New Mexico region reflect a one-category deterioration (Fig. 1). SNOTEL Snow-Water Equivalent percent of Normal peak map shows recovery across much of the West (we are about 82% through the snow accumulation season; ~100% for the Southwest). Parts of the Uinta, Wasatch, and Sierra are at peak values as of this week. Sites in central Arizona and southwest Utah have also met or exceeded their seasonal peak values (circles). Most SNOTEL sites over the Pacific Northwest have improved this past week but they need another week like last week to reach seasonal peak levels (we still have a month remaining before seasonal peaks are normally reached) (Fig. 1a). SNOTEL 7-day snow depth changes show significant gains over the Pacific Northwest, Sierra, northern Montana Rockies, southwest Utah, and Colorado (Fig. 1b).

Temperature: Average SNOTEL temperatures were below normal over all states except Colorado and New Mexico (Fig. 2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures over southeastern New Mexico ($>+10^{\circ}\text{F}$) and the greatest negative departures over northern Montana ($<-20^{\circ}\text{F}$). This is a very similar pattern to two weeks ago (Fig. 2a).

Precipitation: ACIS 7-day average precipitation amounts for the period ending 2 March shows the bulk of the heaviest precipitation confined to the Sierra and Central Cascades (Fig. 3). In terms of percent of normal, the precipitation pattern was quite complex across the West (Fig. 3a). The Pacific Northwest, parts of the Great Basin, and Colorado were easily the winners this week with abundant moisture (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, and the Northern and Central Rockies. One-category deterioration is noted by the red circle. The blue circle in Montana reflects a marginal one-category improvement (Fig. 3b).

Weekly Summary: Stormy weather returned to parts of the West in mid-February for the first time since late-December 2010. Some of the highest precipitation totals were observed in the Sierra Nevada and the coastal ranges of northern and central California. Beneficial precipitation also spread into parts of the Southwest.

West: Drought severity is increasing in the plains of eastern Colorado. The Standardized Precipitation Index for this region varies from -1 to -3, for various periods of 120 days to 12 months. Poor soil moisture conditions and increased wildfire threat are also apparent.

A new area of abnormally dry conditions is introduced in central Washington. Precipitation deficits are accumulating in what is normally the wet season. For the last 60 days, some locations have received less than 50 percent of their normal precipitation.

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Hydrological conditions in Wyoming have been improving of late due to recent snowfall in the mountains, resulting in removal of D0 in west central Wyoming. Abnormally dry conditions persist in the northwest and southwest.

Elsewhere in the West, no changes are made.

Author: [Laura Edwards, Western Regional Climate 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 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 and 4a).

SOIL MOISTURE

Soil moisture (Figs. 5) is estimated by a one-layer hydrological model ([Huang et al., 1996](#), [van den Dool et al., 2003](#)). The model takes observed precipitation and temperature and calculates soil moisture, evaporation and runoff. The potential evaporation is estimated from observed temperature.

http://www.cpc.ncep.noaa.gov/soilmst/index_jh.html

U.S. HISTORICAL STREAMFLOW

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>.

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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

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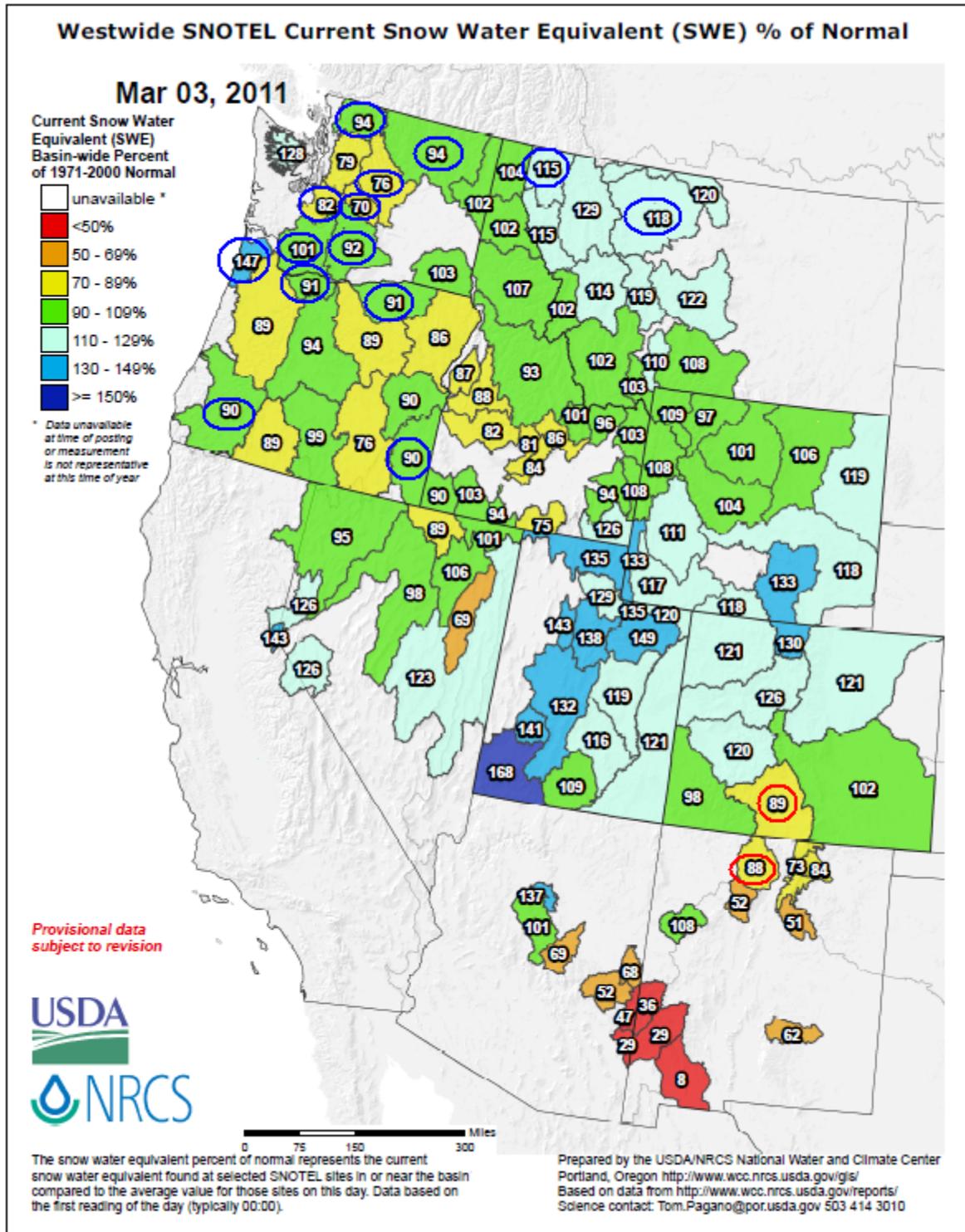


Fig. 1: SNOTEL Snow-Water Equivalent percent of normal values for 3 March 2011 shows several basins across the Pacific Northwest and Northern Rockies have improved by one category during the past week (noted by blue circles). Red circles over the Colorado-New Mexico region reflect one category deterioration.

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

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SNOTEL Current Snow Water Equivalent (SWE) Percent of Normal Peak Mar 03, 2011

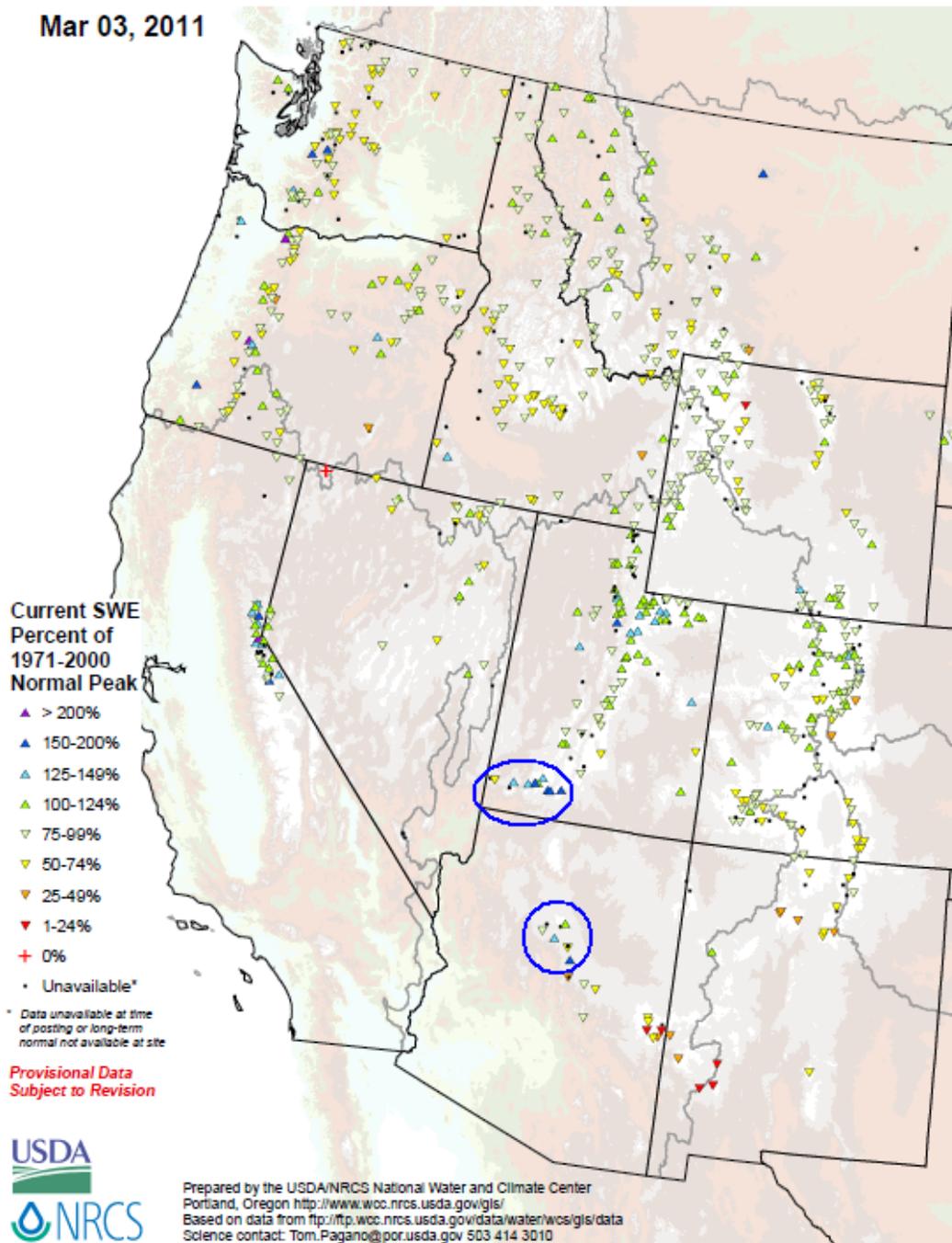


Fig. 1a: SNOTEL Snow-Water Equivalent percent of Normal peak shows recovery across much of the West (we are about 82% through the snow accumulation season; ~100% for the Southwest). Parts of the Uinta, Wasatch, and Sierra are at peak values as of this week. Sites in central Arizona and southwest Utah have also met or exceeded their seasonal peak values (circles). However, most SNOTEL sites over the Pacific Northwest have improved this past week but they need another week like last week to reach seasonal peak levels. Peaks are reached between 1 and 15 April.

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

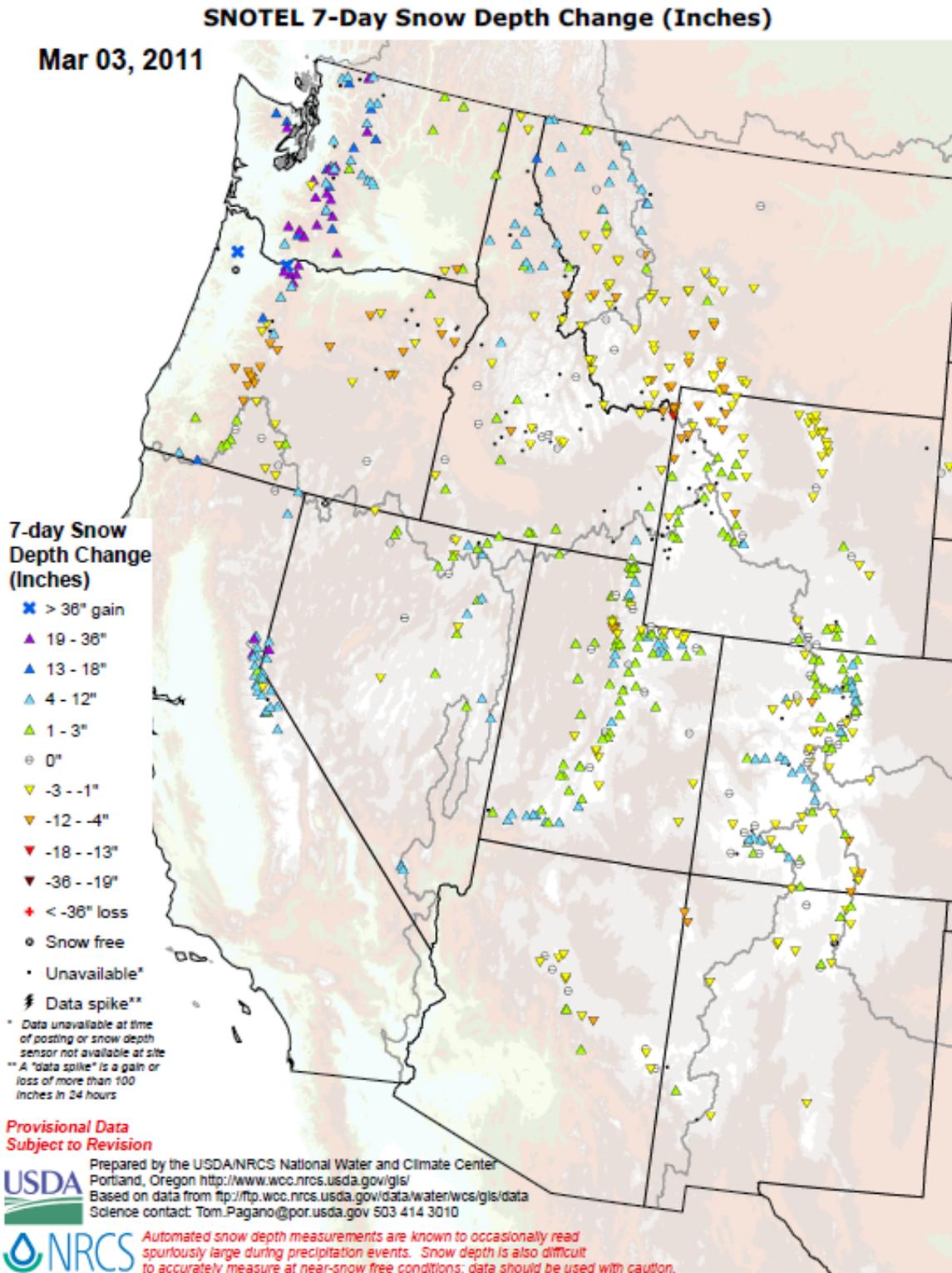


Fig. 1b: SNOTEL 7-day snow depth changes show significant gains over the Pacific Northwest, Sierra, northern Montana Rockies, southwest Utah, and Colorado.

Ref: http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_snowdepth_7ddelta.pdf

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SNOTEL (solid) 7-Day Average Temperature Anomaly (Degrees F) Mar 03, 2011

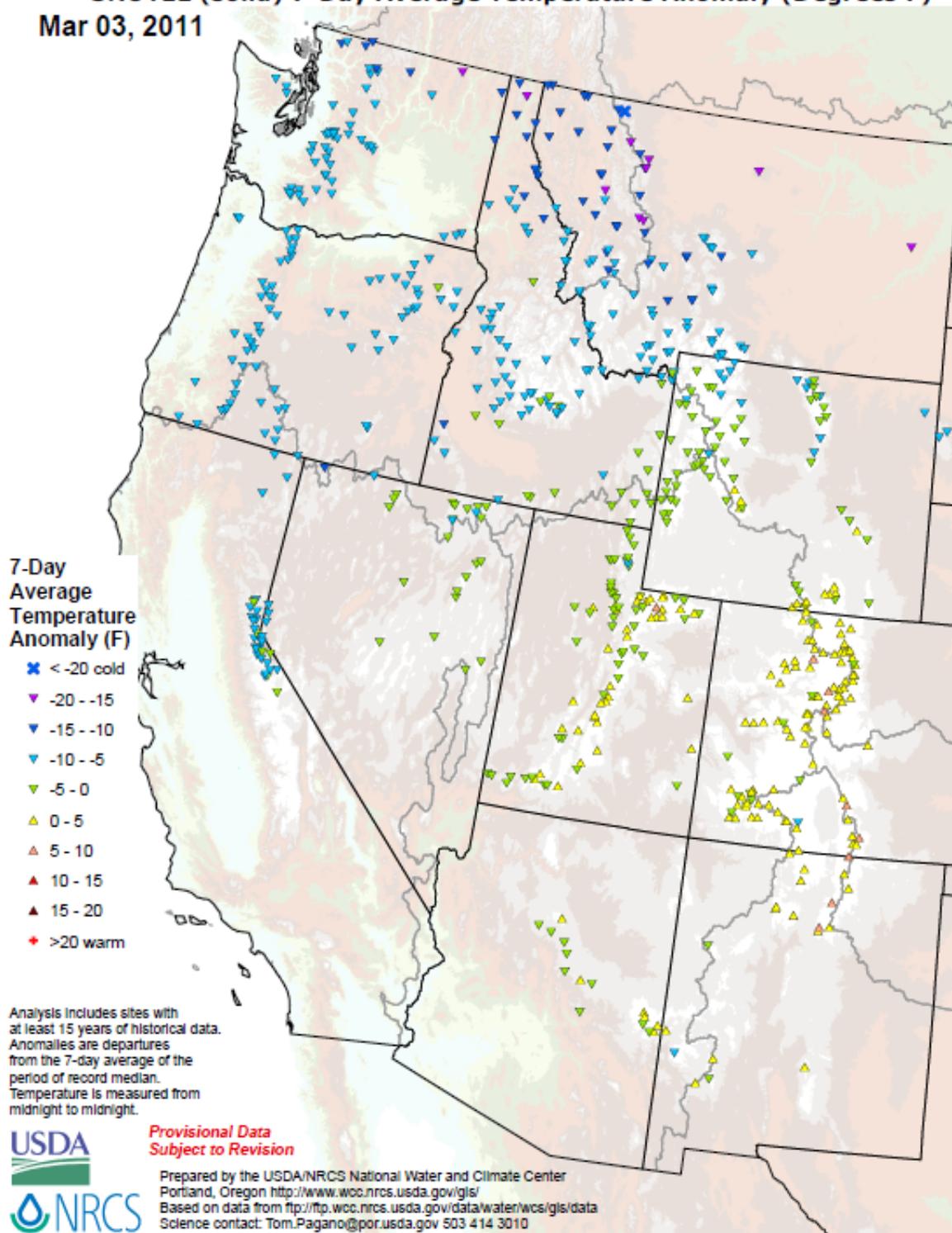
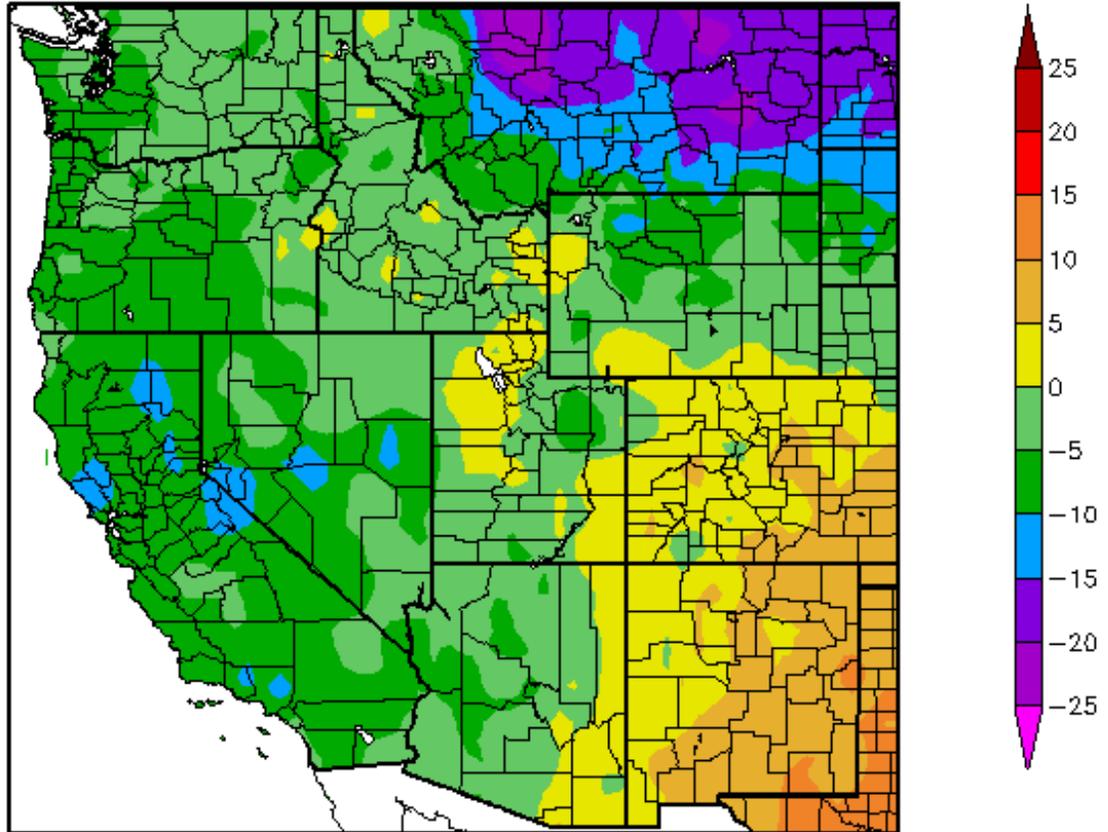


Fig. 2: Average SNOTEL temperatures were below normal over all states except Colorado and New Mexico. Ref: <http://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/WestwideTavg7dAnomaly.pdf>

Departure from Normal Temperature (F)
2/17/2011 – 2/23/2011



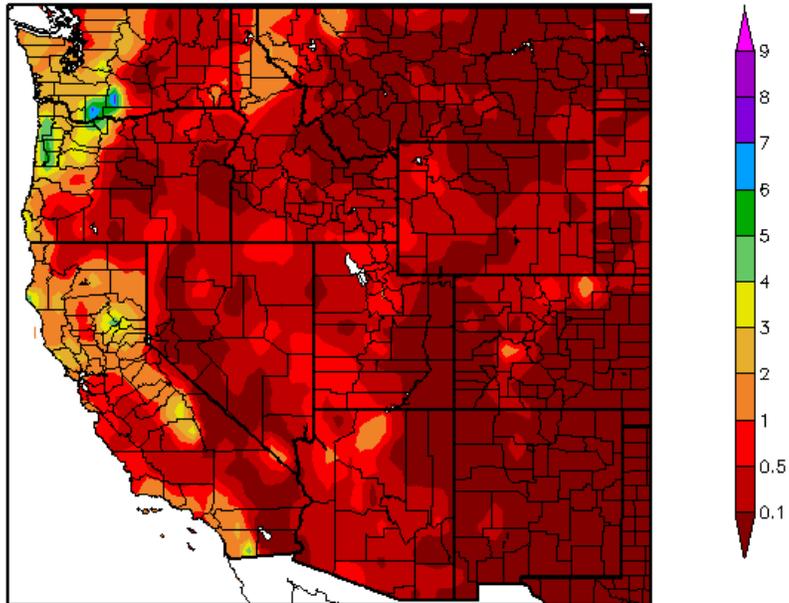
Generated 2/24/2011 at HPRCC using provisional data.

Regional Climate Centers

Fig. 2a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures over southeastern New Mexico ($>+10^{\circ}\text{F}$) and the greatest negative departures over northern Montana ($<-20^{\circ}\text{F}$). This is a very similar pattern to two weeks ago. Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=7d

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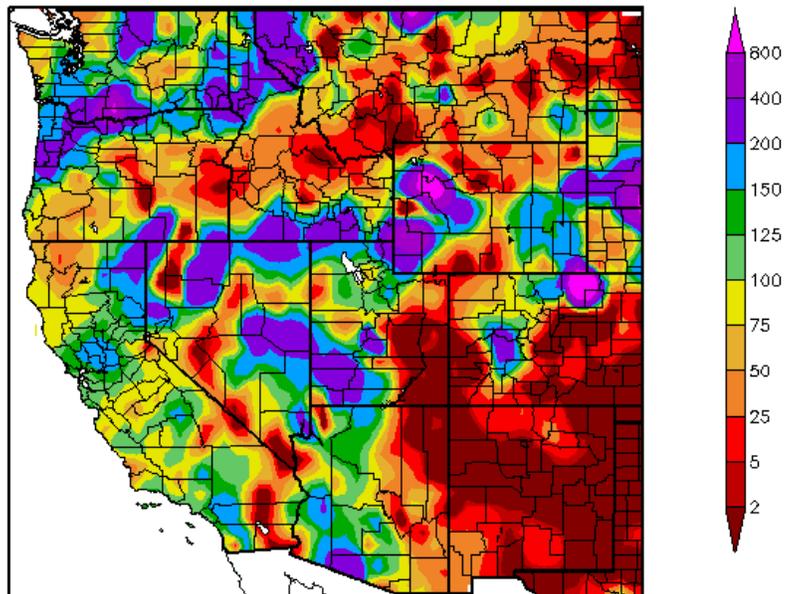
Precipitation (in)
2/24/2011 - 3/2/2011



Generated 3/3/2011 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
2/24/2011 - 3/2/2011



Generated 3/3/2011 at HPRCC using provisional data.

Regional Climate Centers

Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 2 March shows the bulk of the heaviest precipitation confined to the Sierra and Central Cascades (Fig. 3). In terms of percent of normal, the precipitation pattern was quite complex across the West (Fig. 3a). The Pacific Northwest, parts of the Great Basin and Colorado were easily the winners this week with abundant moisture. Ref: <http://www.hprcc.unl.edu/maps/current/>

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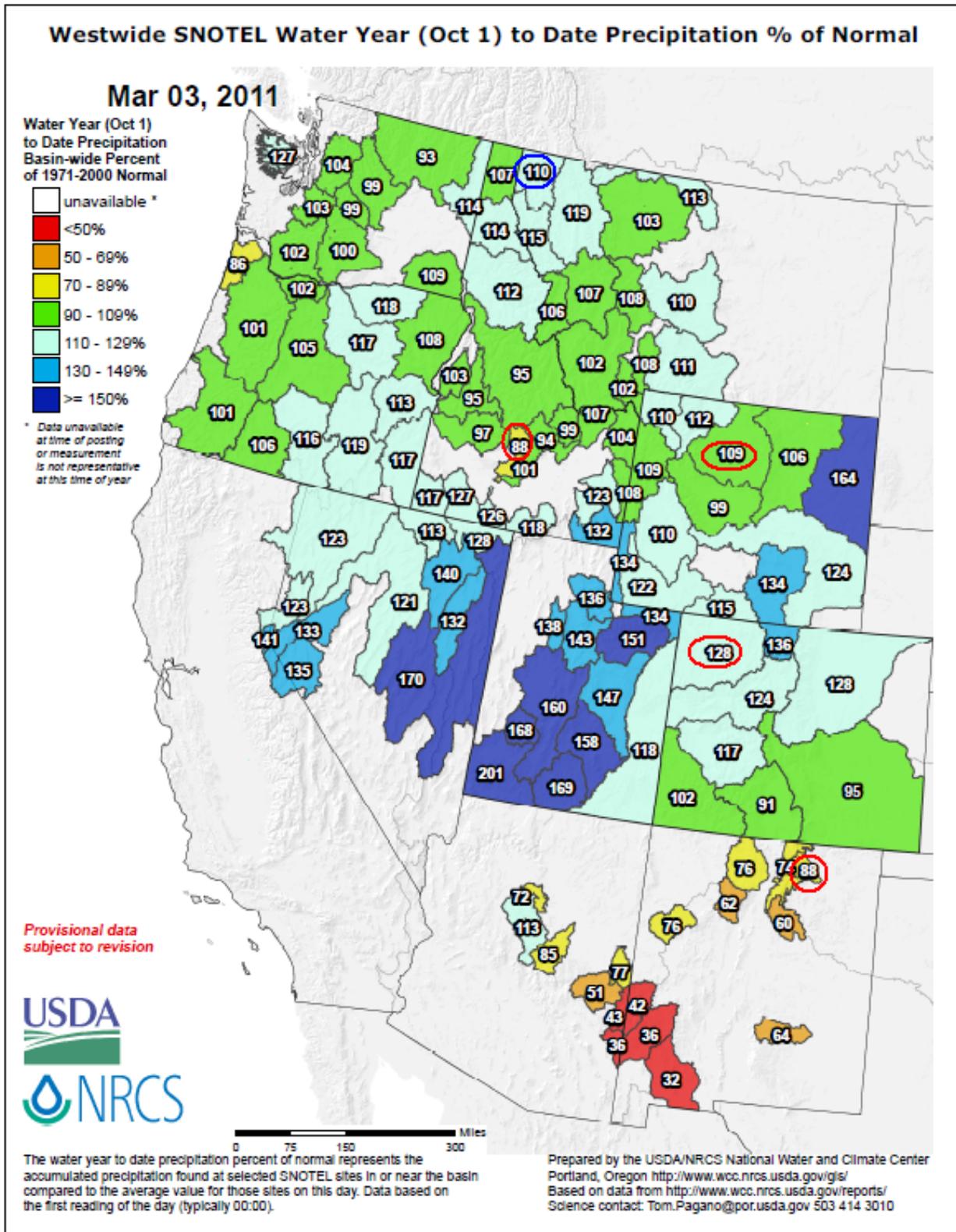


Fig 3b: For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin, and the Northern and Central Rockies. One-category deterioration is noted by the red circle. The blue circle in Montana reflects a marginal one-category improvement.

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

U.S. Drought Monitor

March 1, 2011
Valid 7 a.m. EST

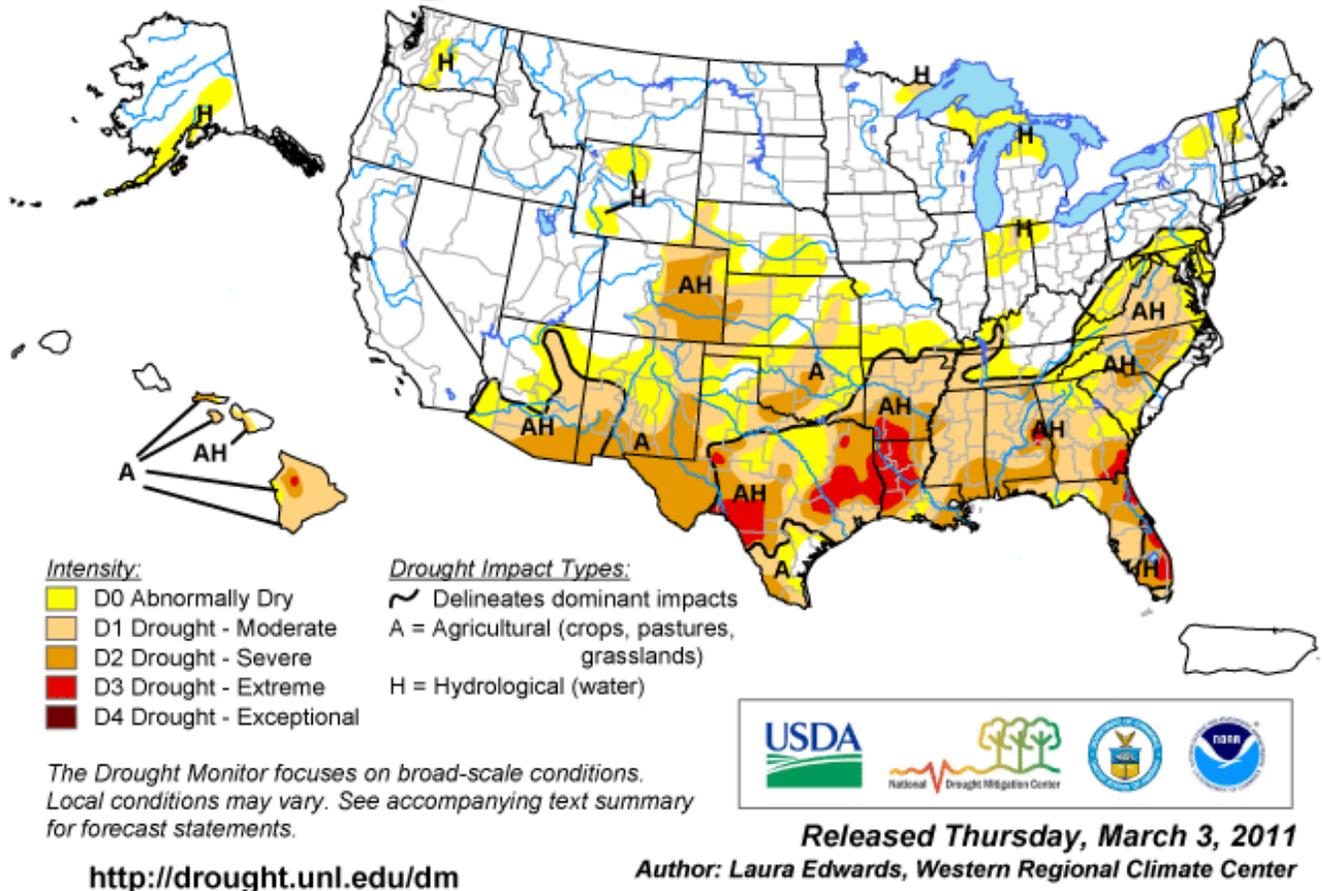


Fig. 4: Current Drought Monitor weekly summary. The severest D3 levels of drought are found on the Big Island of Hawaii and is scattered across Texas, Louisiana, Arkansas, Alabama, Georgia, and Florida. Ref: <http://www.drought.unl.edu/dm/monitor.html>

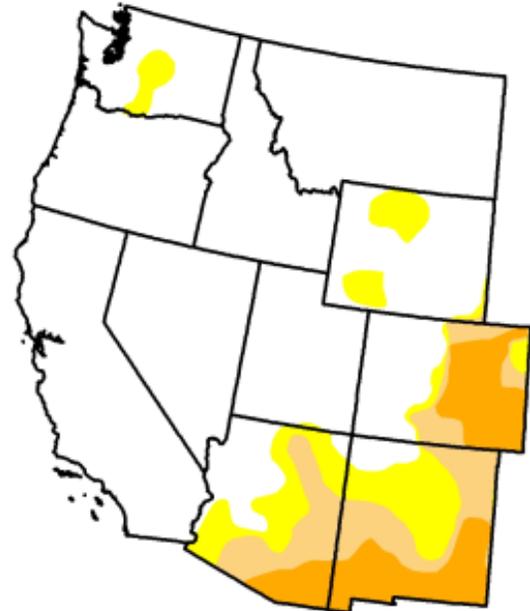
U.S. Drought Monitor

West

March 1, 2011
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	76.15	23.85	15.15	7.72	0.00	0.00
Last Week (02/22/2011 map)	76.19	23.81	15.02	5.41	0.00	0.00
3 Months Ago (11/30/2010 map)	72.76	27.24	5.82	0.87	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 (02/23/2010 map)	34.11	65.89	21.60	3.85	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.

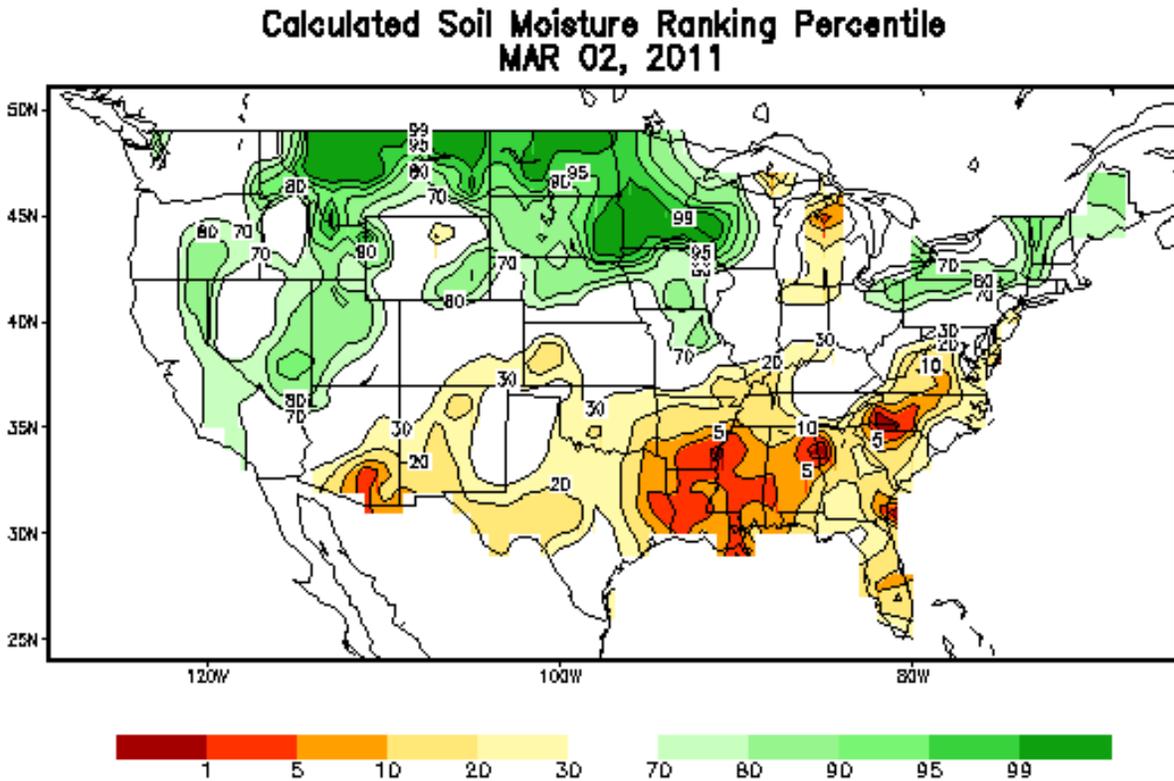
<http://drought.unl.edu/dm>



Released Thursday, March 3, 2011
L. Edwards, Western Regional Climate Center

Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. Regionally there was some deterioration in the D2-D4 categories during the past week. Ref: http://www.drought.unl.edu/dm/DM_west.htm

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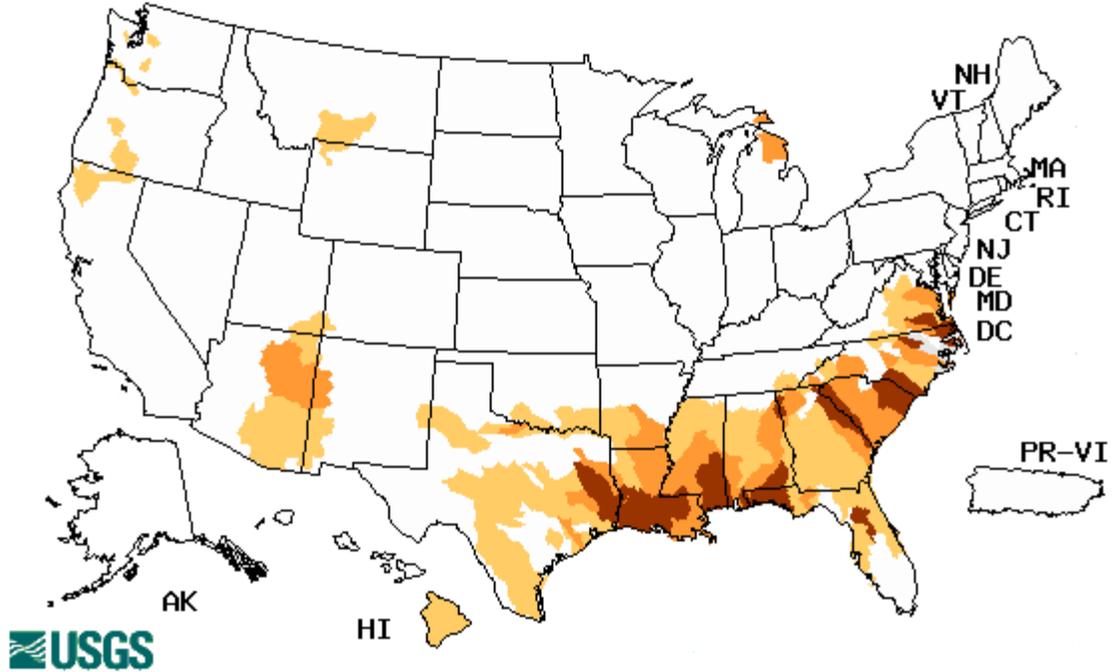


Figs. 5: Soil Moisture ranking in percentile as of 2 March (Fig. 5) shows wet conditions over much of the Central Northern Tier States with dryness over Arizona and much of the Lower Mississippi River Valley and into the Mid-Atlantic States.

Ref: http://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#

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Wednesday, March 02, 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 Arizona, the Gulf States, and the Mid-Atlantic States are reflecting La Niña conditions of dryness. Note: northern site gauges are less accurate as rivers and streams are probably frozen. Ref: <http://waterwatch.usgs.gov/?m=dryw&r>

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National Drought Summary -- March 1, 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/>.

Summary: A strong storm system passed through the central United States this week, bringing heavy rainfall from Missouri to Ohio, alleviating drought conditions in the Ohio River Valley. Drought intensified in parts of the southern states of Texas, Louisiana, Alabama and Florida.

Northeast and Mid-Atlantic: No changes are made in the drought depiction for this region. Lighter precipitation of less than an inch fell over the current D0 area in northern New York, Vermont and New Hampshire during this Drought Monitor period. Higher total rainfalls for the week were in Connecticut, Rhode Island and Massachusetts. Along the coastal states, rain primarily fell along the shores as snow dominated inland areas.

Southeast: Drought has been intensifying in this region as a typical La Nina pattern is settling in place. Areas with worsening conditions include southern Florida and much of Alabama. In Florida, D2 is expanded to include reflect significant rainfall deficits since October 1. For the last 90 days, a large portion of south Florida has received just 25 to 50 percent of normal precipitation. Fire danger is high for this time of year as well, as seen in some fire danger indices. Additionally, soil moisture is at or below 20 percent of capacity, with some exceptions in the Miami-Dade and surrounding areas where it is a bit higher. Hence, a hydrological impact label is given to this newly expanded D2 and D3 area. D1 now also covers the area from Tampa to Fort Myers along the Gulf coast.

In Alabama, substantial rainfall deficits are accruing quickly across the state. The hardest hit areas include Tallapoosa and Chambers counties, where extreme drought (D3) is re-introduced this week. The region of severe drought is expanded in southwestern Alabama, and similarly D2 conditions now exist over Jackson and DeKalb counties in the northeast. The previous area of D0 in central Alabama is downgraded to moderate drought in this week's depiction. Significant rainfall deficits over the last 30 to 90 days in addition to very low streamflow values were factors in these areas. Since December 1, many locations are reporting precipitation totals of 6 to 10 inches or more across the middle of the state.

South: Areas of Louisiana and Texas are shown this week to have more severe drought. Louisiana continues to experience severe rainfall shortages as compared to normal. A one-category deterioration was made in central Louisiana, and also in the southeast to expand the reach of severe and extreme drought areas. New Orleans is in its driest 6 month period on record, with just 11.72 inches of precipitation. In the central and western part of the state, deficits are mounting, with the last similar period occurring in 2004-05.

A number of climate data sources supported expansion of severe drought (D2) in southern Texas counties from Zapata to Hidalgo along the Mexican border. Worsening conditions in the

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Houston area and along the Gulf coast warranted degradation from D0 to moderate drought. Recent data show the last 6 months to be the 15th driest on record, about a 1 in 10 year event.

Midwest: Significant improvements in drought conditions are reflected on this week's map. A large area of one-category improvement in drought severity was made in the Ohio River Valley, from Missouri to the Ohio-Kentucky border. The core of precipitation fell fortuitously on the previous severe drought area in the 4-state region of Missouri, Arkansas, Kentucky and Tennessee. Rainfall totals for the week amounted to seven inches or more in the heart of this rain band, resulting in flooding across the area. US Geological Survey data show continued high streamflow in the area. The northern reaches of this band of precipitation improved drought in west central Indiana as well, with one-category improvements made there, resulting in removal of moderate drought (D1). Some local totals were greater than five inches. Illinois is now entirely drought-free on the map.

High Plains: An area of improvement is reflected in eastern Kansas as a result of the storm system that moved through the area last week. Local amounts ranged from 2 to 3 inches for the Drought Monitor period. A reduced drought area is now depicted on the map, with only abnormally dry conditions.

West: Drought severity is increasing in the plains of eastern Colorado. The Standardized Precipitation Index for this region varies from -1 to -3, for various periods of 120 days to 12 months. Poor soil moisture conditions and increased wildfire threat are also apparent.

A new area of abnormally dry conditions is introduced in central Washington. Precipitation deficits are accumulating in what is normally the wet season. For the last 60 days, some locations have received less than 50 percent of their normal precipitation.

Hydrological conditions in Wyoming have been improving of late due to recent snowfall in the mountains, resulting in removal of D0 in west central Wyoming. Abnormally dry conditions persist in the northwest and southwest.

Elsewhere in the West, no changes are made.

Hawaii, Alaska and Puerto Rico: In Hawaii, rainfall is benefitting primarily the western half of the state, leaving the Big Island in deteriorating conditions. Agricultural impacts are being reported to warrant expansion of moderate drought on the eastern half of the island, and D0 in the west. Some of these include the need to haul water for livestock and general water use for residents, and reduced yields of some crops. On the islands of Lanai and Maui, pasture conditions have improved and a one-category change was made to moderate drought status this week.

There were no changes made in Alaska or Puerto Rico.

Looking Ahead: In the early part of the next Drought Monitor period, widespread precipitation is forecast for northern California and the Pacific Northwest, and the Great Lakes states and south into the Mississippi and Ohio River Valleys. Precipitation amounts are not as considerable as those of last week in the Ohio River Valley, but could be enough to bring this region out of drought conditions. Temperatures in the West will initially be warm bringing high-elevation rain. The Great Lakes region could be particularly cold, resulting in snow or freezing rain.

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A frontal passage over Hawaii could bring some much-needed precipitation to the state, relieving some drought concerns for a short while.

In the six to ten day outlook, below normal temperatures are projected to dominate the northern states in the lower 48. Warmer than normal temperatures are likely to cover most of western and northern Alaska, and the Southeastern US, from Virginia to Florida. Above average precipitation is the current forecast for most of the northern states from northern California to Maine, with less rainfall in the desert Southwest and Florida. These conditions could exacerbate current severe drought in these areas.

Author: [Laura Edwards, Western Regional Climate 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 March 2, 2011