



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

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

**Date: 20 January 2011**

## **SNOTEL SNOWPACK AND PRECIPITATION SUMMARY**

**Snow:** SNOTEL Snow-Water Equivalent percent of normal values for 20 January 2011 shows the highest river basin values have fallen between 10 to 20 percent since last week. The Northern Rockies have seen a one category improvement during the past 7 days while the Northern Cascades have seen some basins deteriorated by one category (Fig. 1). SNOTEL Snow-Water Equivalent percent of Normal peak shows that earlier surpluses in Figure 1 don't necessarily translate to adequate snowpack in late winter. Basins with less than 50% of peak will have difficulty reaching average peak conditions by early spring (Fig. 1a). SNOTEL 7-day snow depth changes show considerably gains in accumulation across much of the Northern and Central Rockies but down significantly across the Cascades, Sierra, and Wasatch Ranges (Fig. 1b).

**Temperature:** SNOTEL 7-day average temperature departure from normal map shows temperatures were uniformly warmer than normal over the West (Fig 2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures over southwest Montana (>+15°F) and the greatest negative departures over portions of north-central Montana (<-15°F); a remarkable temperature gradient. (Fig. 2a)

**Precipitation:** ACIS 7-day average precipitation amounts for the period ending 19 January shows the bulk of the heaviest precipitation confined to the Olympic and Cascades Mountains (mostly falling as rain) (Fig. 3). In terms of percent of normal, the precipitation pattern was extremely wet over parts of the Northern Tier States and Colorado Rockies (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. A rather wet week was the rule over the Cascades and Northern Rockies resulting in a one category improvement (Fig. 3b).

**The West:** No changes were made in the western United States this week. Above-normal snow pack over most of the region is ongoing. In Wyoming, the upper elevation snow amounts are good, but the lower elevations remain dry in the D0 region. Author: Brian Fuchs, 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 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

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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 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](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](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

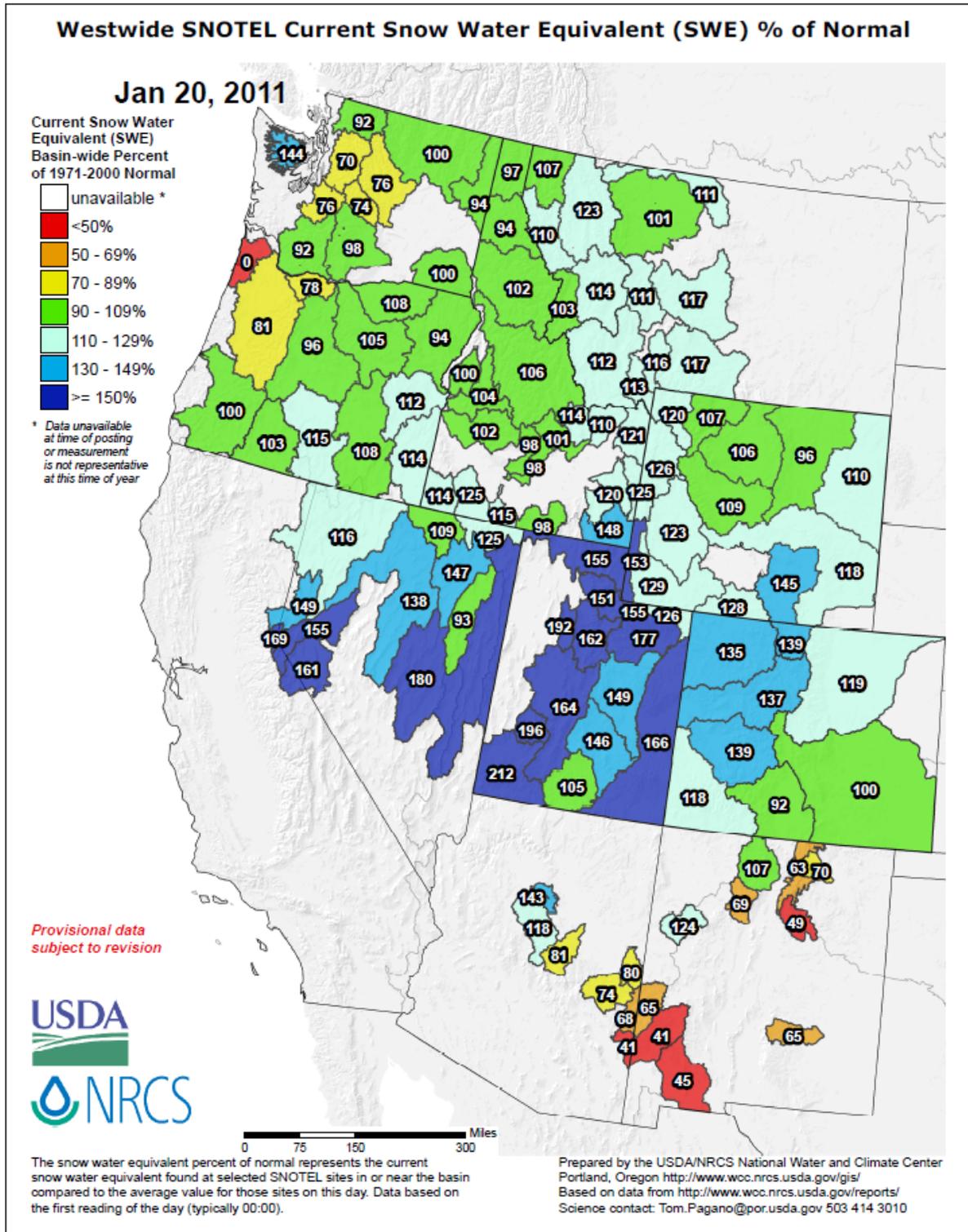
The National Water and Climate Center Homepage provide the latest available snowpack and water supply information. Please visit us at <http://www.wcc.nrcs.usda.gov>. This document is available from the following location on the NWCC homepage - <http://www.wcc.nrcs.usda.gov/water/drought/wdr.pl>

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

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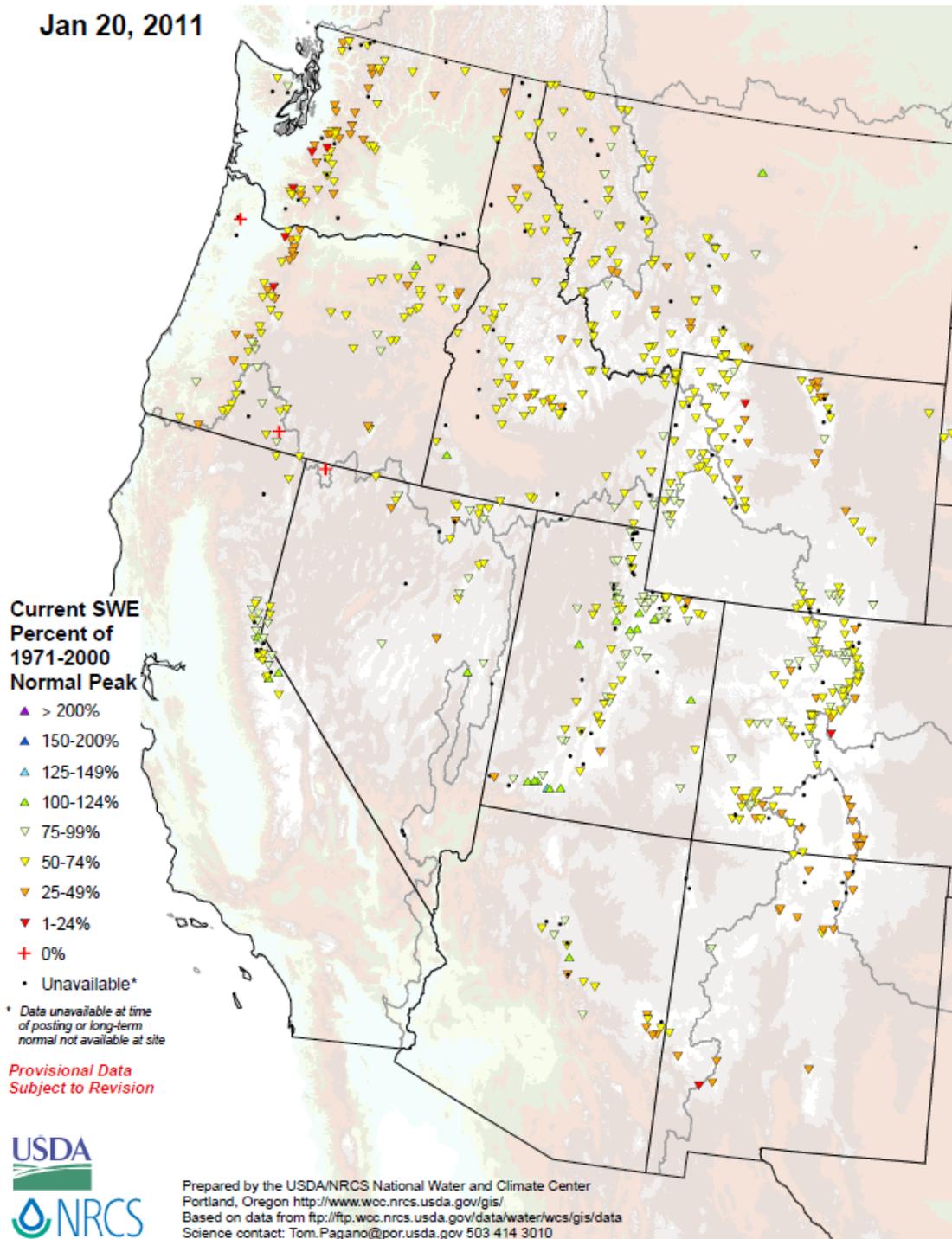


**Fig. 1: SNOTEL Snow-Water Equivalent percent of normal values for 20 January 2011 shows the highest river basin values have fallen between 10 to 20 percent since last week. The Northern Rockies have seen a one category improvement during the past 7 days while the Northern Cascades have seen some basins deteriorated by one category.**

Ref: [ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west\\_swepctnormal\\_upate.pdf](ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_swepctnormal_upate.pdf)

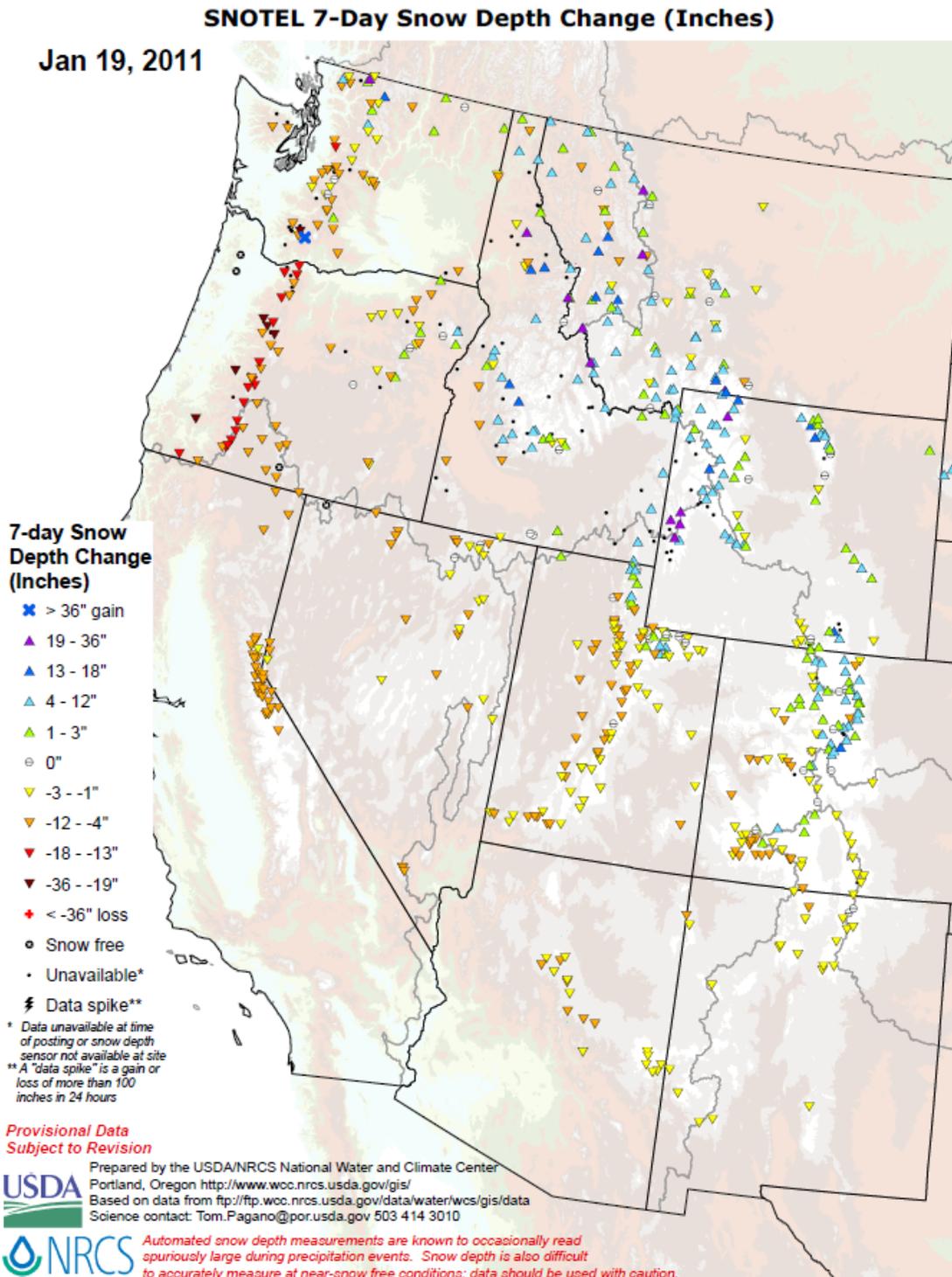
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### SNOTEL Current Snow Water Equivalent (SWE) Percent of Normal Peak Jan 20, 2011



**Fig. 1a: SNOTEL Snow-Water Equivalent percent of Normal peak shows that earlier surpluses in Figure 1 don't necessarily translate to adequate snowpack in late winter. Basins with less than 50% of peak will have difficulty reaching average peak conditions by early spring. Most SNOTEL sites will need much more snow this season in order to finish with near normal SWE. Ref:**

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



**Fig. 1b: SNOTEL 7-day snow depth changes show considerably gains in accumulation across much of the Northern and Central Rockies but down significantly across the Cascades, Sierra, and Wasatch Ranges.**

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) Jan 19, 2011

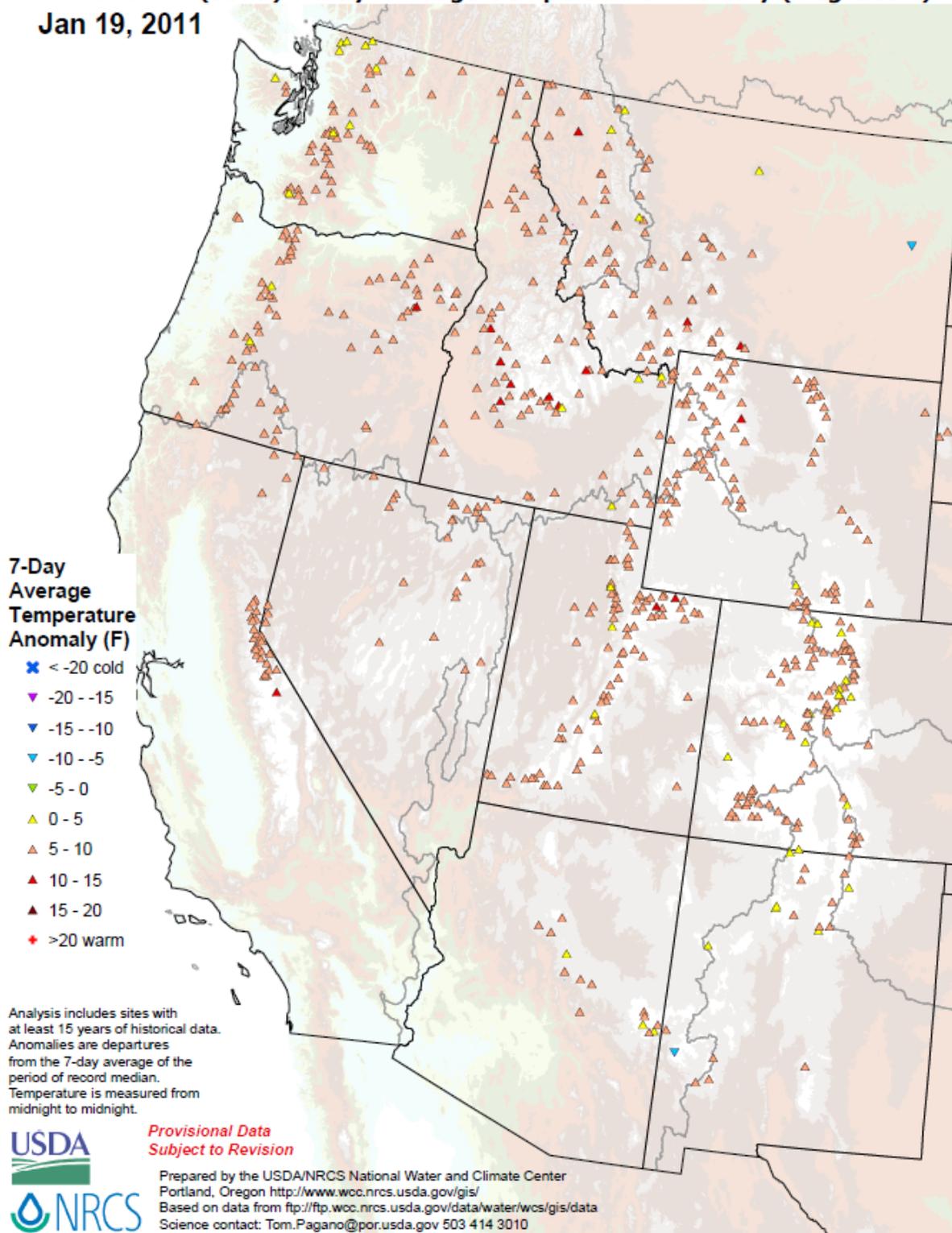
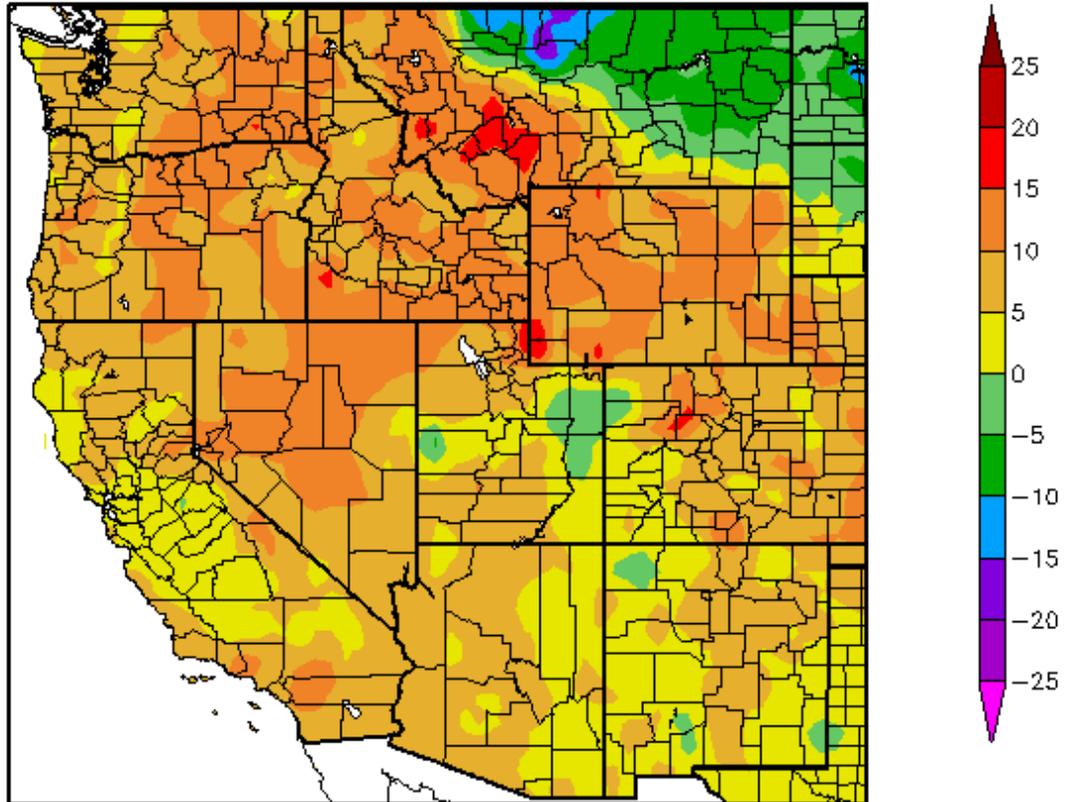


Fig. 2: SNOTEL 7-day average temperature departure from normal map shows temperatures were uniformly warmer than normal over the West.

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

Departure from Normal Temperature (F)  
1/13/2011 – 1/19/2011



Generated 1/20/2011 at HPRCC using provisional data.

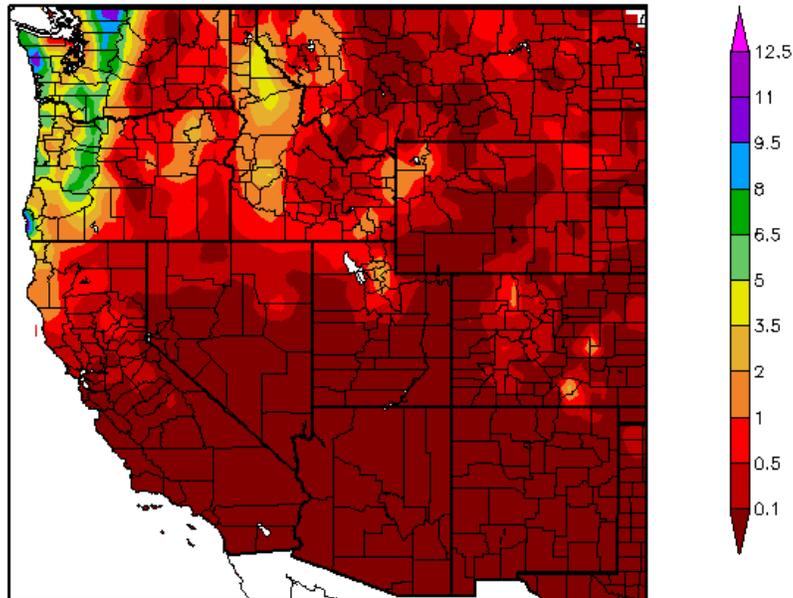
Regional Climate Centers

**Fig. 2a: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures over southwest Montana (>+15°F) and the greatest negative departures over portions of north-central Montana (<-15°F); a remarkable temperature gradient.**

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

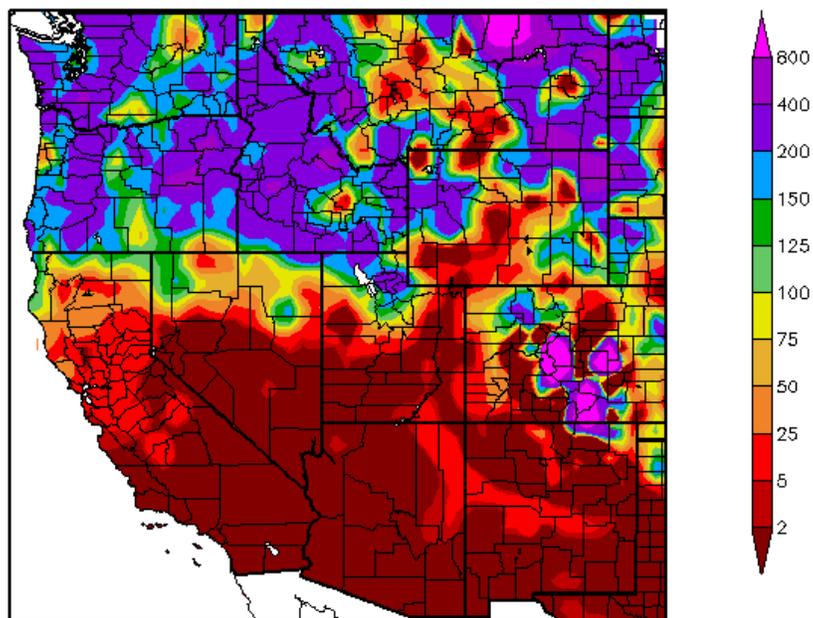
Precipitation (in)  
1/13/2011 - 1/19/2011



Generated 1/20/2011 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)  
1/13/2011 - 1/19/2011

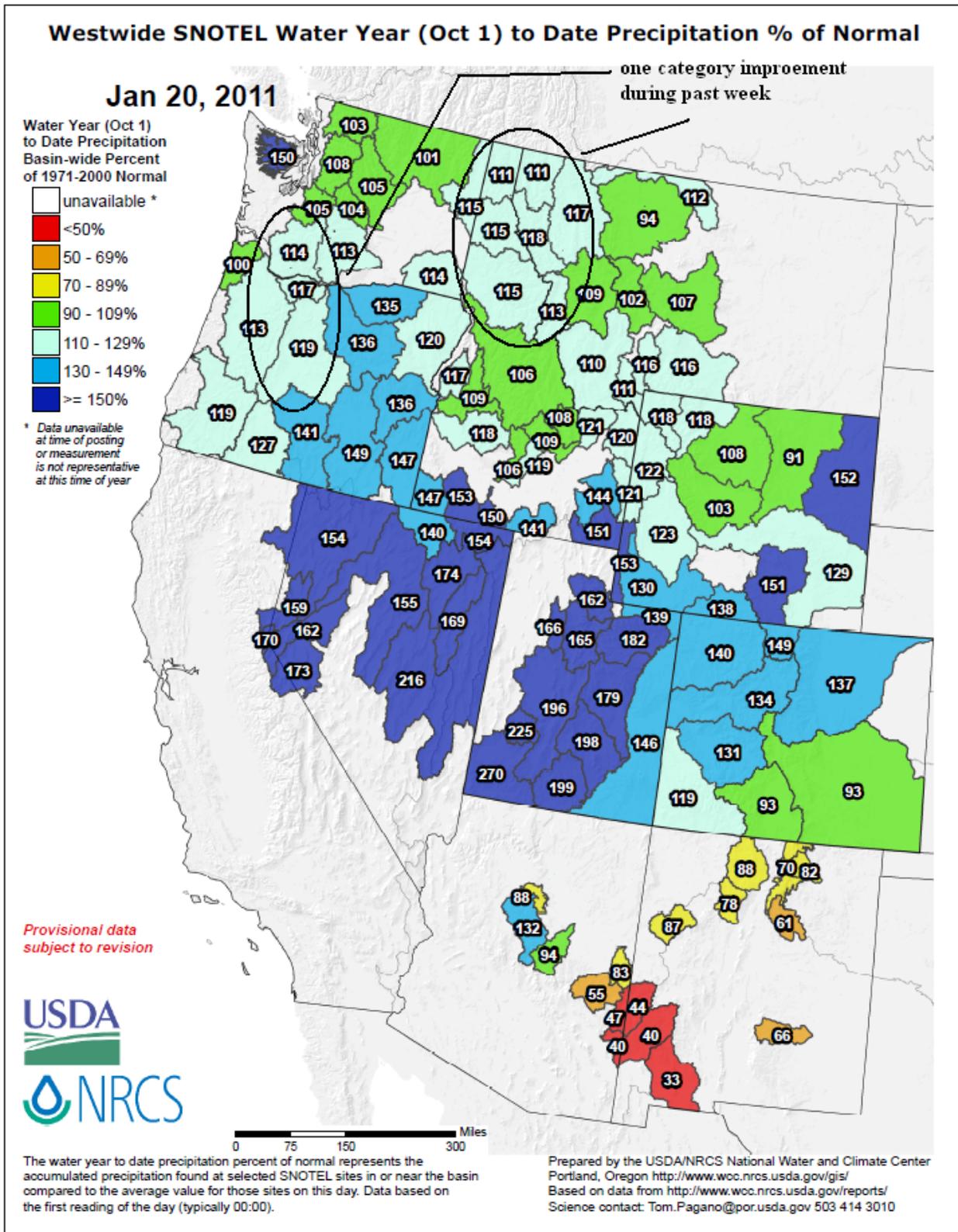


Generated 1/20/2011 at HPRCC using provisional data.

Regional Climate Centers

**Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 19 January shows the bulk of the heaviest precipitation confined to the Olympic and Cascades Mountains (mostly falling as rain) (Fig. 3). In terms of percent of normal, the precipitation pattern was extremely wet over parts of the Northern Tier States and Colorado Rockies (Fig. 3a). 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. A rather wet week was the rule over the Cascades and Northern Rockies resulting in a one category improvement.**

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

# U.S. Drought Monitor

January 18, 2011  
Valid 7 a.m. EST

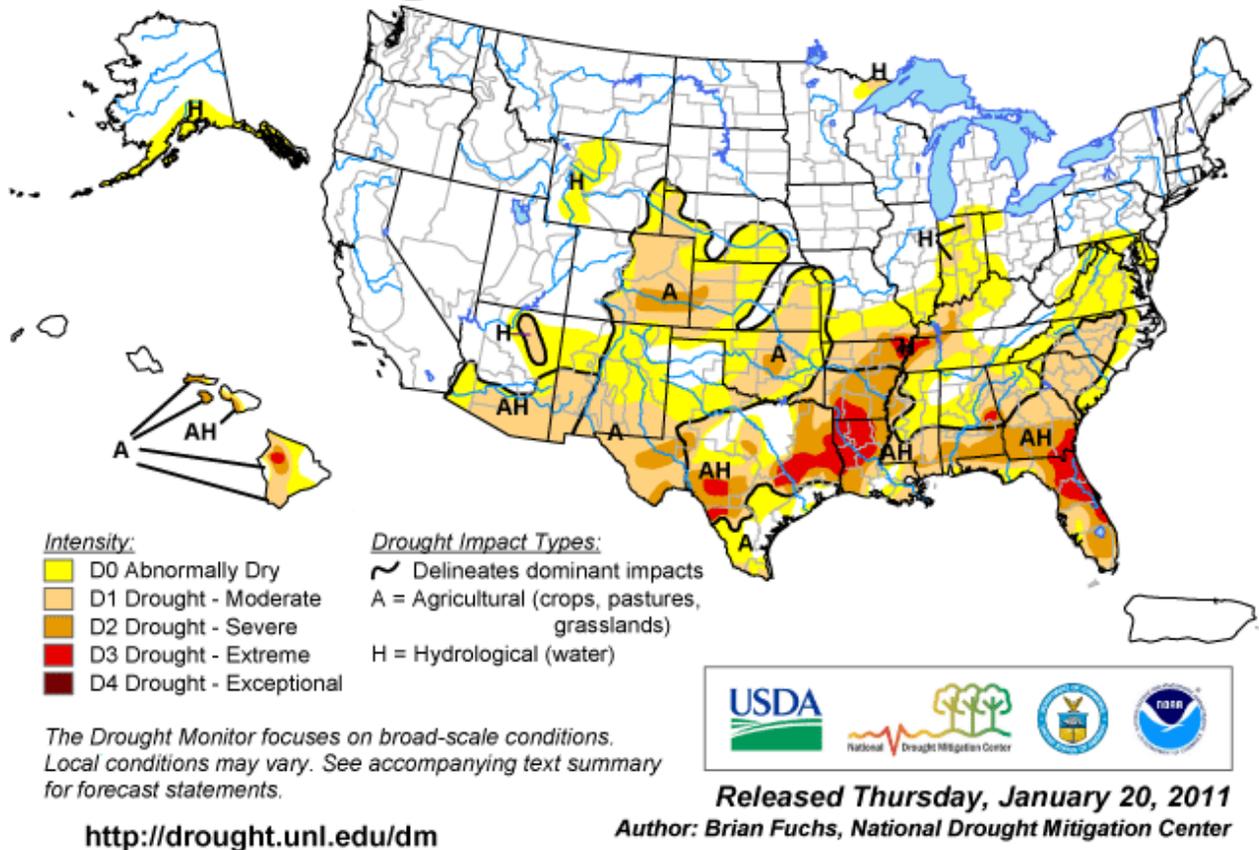


Fig. 4: Current Drought Monitor weekly summary. The severest D3 levels of drought dominate Hawaii, and is scattered across Texas to Florida.

Ref: <http://www.drought.unl.edu/dm/monitor.html>

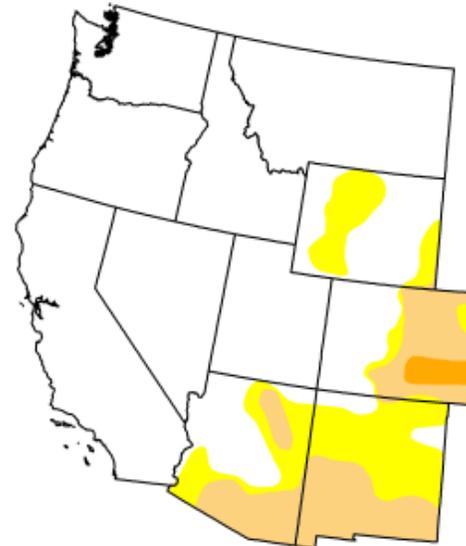
# U.S. Drought Monitor

## West

January 18, 2011  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	76.96	23.04	11.88	0.89	0.00	0.00
Last Week (01/11/2011 map)	76.92	23.08	11.88	0.89	0.00	0.00
3 Months Ago (10/19/2010 map)	62.30	37.70	6.01	0.56	0.00	0.00
Start of Calendar Year (12/29/2010 map)	73.26	26.74	11.98	0.89	0.00	0.00
Start of Water Year (09/29/2010 map)	62.50	37.50	8.14	0.56	0.00	0.00
One Year Ago (01/12/2010 map)	31.89	68.11	31.96	14.68	0.92	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>

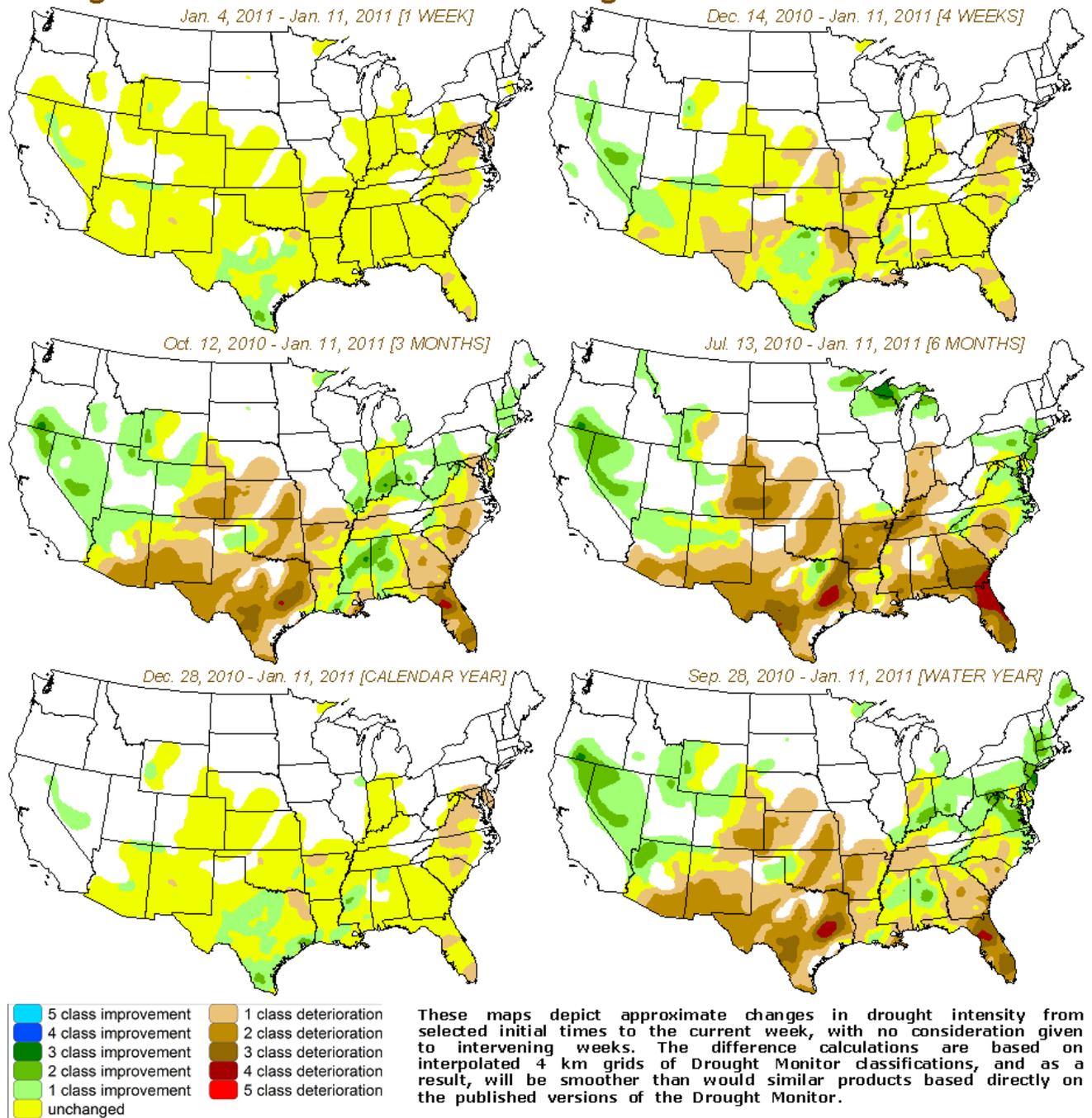


Released Thursday, January 20, 2011  
B. Fuchs, National Drought Mitigation Center

**Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. Regionally there was no 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

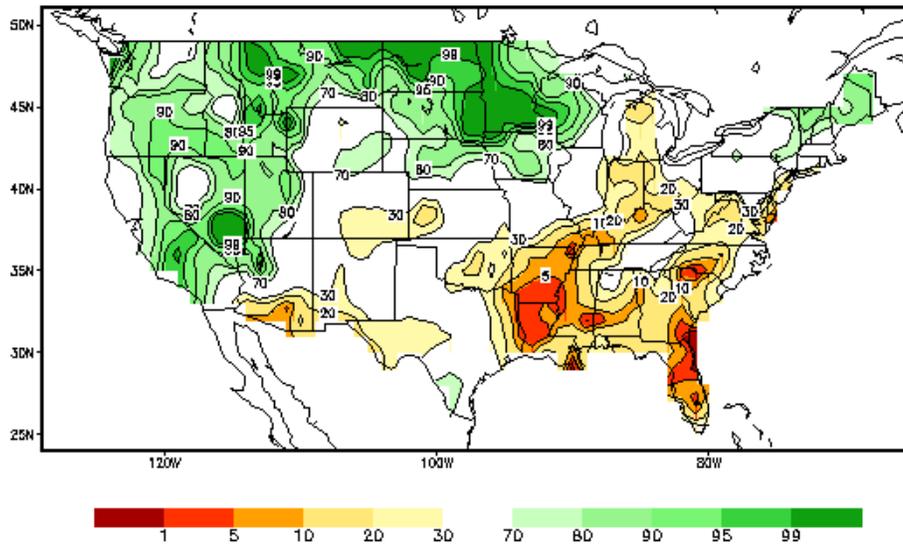


**Fig. 4b: Drought Monitor Classification Changes for Selected Time Periods. Note: This figure is one week old.**

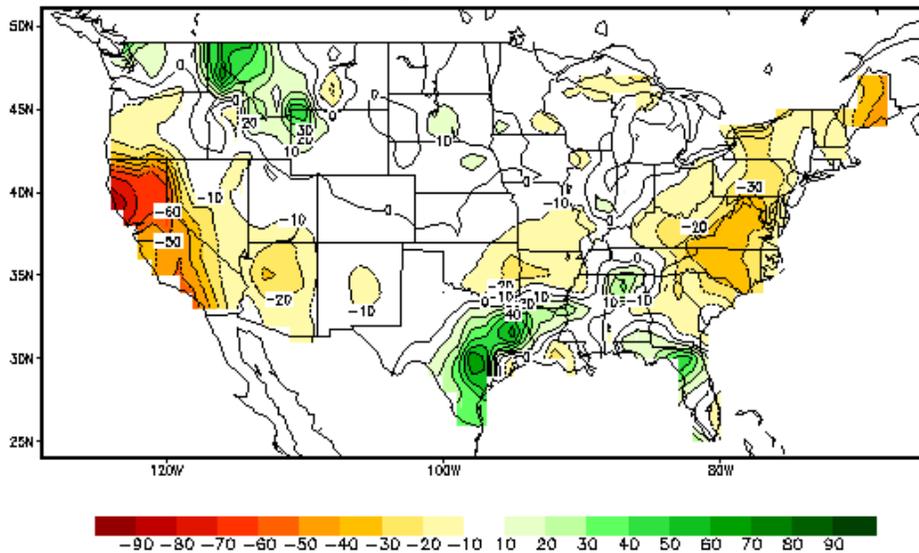
Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/dm-change-6maps.png>

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### Calculated Soil Moisture Ranking Percentile JAN 19, 2011



### Calculated Soil Moisture Anomaly Change JAN 19, 2011 from DEC.31

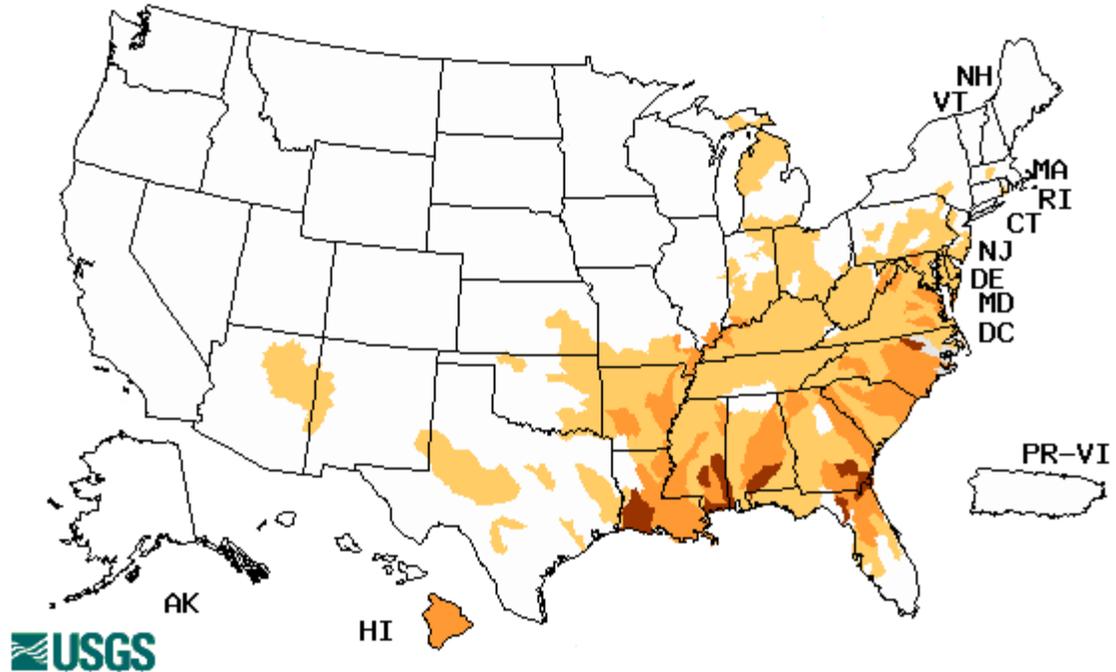


**Figs. 5a and 5b: Soil Moisture ranking in percentile as of 19 January (Fig. 5a) shows wet conditions over the Western and Northern areas of the West. Since the end of December, much of the California is drying out. The Montana Rockies have seen some improvement (Fig. 5b).**

Ref: [http://www.cpc.ncep.noaa.gov/products/Soilmst\\_Monitoring/US/Soilmst/Soilmst.shtml#](http://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#)

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Hednesday, January 19, 2011



Choose a data retrieval option and select a state on the map

State DroughtWatch,  State map

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. Clearly, portions of the Gulf States and Southeastern Tier States are reflecting La Niña conditions of dryness. Note: northern site gauges are less accurate as rivers and streams freeze. Ref: <http://waterwatch.usgs.gov/?m=dryw&r>

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### National Drought Summary -- January 18, 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/>.*

**The Northeast and Mid Atlantic:** Most of the region ended the week with below-normal precipitation, continuing the pattern observed for most of the winter. Coastal regions were impacted by a storm delivering several inches of snow. D0 expanded this week in Virginia as the Mid Atlantic remains dry.

**Southeast:** Precipitation was minimal over most of the region, with Florida being the anomaly. Several stations reported well over an inch of rain, with close to 3 inches in the Tampa Bay area. Tarpon Springs, Florida, recorded 2.86 inches for the week. This allowed the drought status in Florida to remain unchanged this week. D0 and D1 conditions expanded in North Carolina. Low inflows into reservoirs as well as low streamflows, for this time of year, throughout the region are being observed. D0 was also expanded in western North Carolina, extreme western South Carolina and northeast Georgia as dry conditions continue in the region.

**Southern Plains and Gulf Coast:** Widespread rain through east Texas allowed for continued improvements to the drought status. Categorical improvements were made in most areas as the rains continued to improve upon the dryness in the region. In south Texas, precipitation over the last two weeks has allowed for more improvements, with just a few small pockets of D1 remaining. West Texas remains dry even for the dry season. D2 was introduced this week as the short-term dryness continues to worsen. In Alabama, the drought-free pocket in the central portion of the state was filled in with D0 and D1 expanded to the north out of southern Alabama. In Arkansas, D2 was expanded in the north-central part of the state.

**Midwest:** Dryness continued in southern Missouri and southern Illinois. D1 was expanded out of Arkansas and into southern Missouri while D0 was pushed farther north to include all of southern Missouri. D0 was expanded to include the southern reaches of Illinois.

**The West:** No changes were made in the western United States this week. Above-normal snow pack over most of the region is ongoing. In Wyoming, the upper elevation snow amounts are good, but the lower elevations remain dry in the D0 region.

**Hawaii, Alaska and Puerto Rico:** No changes for Alaska, Hawaii or Puerto Rico this week. In Hawaii, even with the return of moisture, many of the Islands are not showing immediate improvements to drought conditions as the long-term drought has definitely impacted many, especially agricultural and water supply interests.

**Looking Ahead:** Over the next 5 days (January 19-23), cold air will entrench the United States east of the Rocky Mountains. Temperature departures of 12-15 degrees Fahrenheit below normal will be common through the Great Lakes and Upper Midwest regions. Temperatures will

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be above normal over the western United States, especially California, with departures 6-9 degrees Fahrenheit above normal. Precipitation chances will be widespread, especially over the Plains and the northern tier of the country. The greatest precipitation amounts are expected over east Texas, Florida and the Pacific Northwest.

The CPC 6-10 day forecast (January 24-28) has temperatures remaining below normal over the United States for most locations east of the Rocky Mountains. Temperatures are projected to stay above normal for southern Alaska, the western United States, and the northern Rocky Mountains. Dry conditions are expected over the Midwest, Pacific Northwest, and Great Basin. The best chances for above-normal precipitation can be expected over the Gulf Coast and along the eastern seaboard as well as southern Alaska.

**Author:** [Brian Fuchs, 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 January 19, 2011