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

Weekly Report - Snowpack / Drought Monitor Update **Date: 27 January 2011**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: SNOTEL Snow-Water Equivalent percent of normal values for 27 January 2011 shows many basins in the Cascades, Sierra, Great Basin, and Southwest Ranges have deteriorated by one category during the past week (noted by red circles) (Fig. 1). SNOTEL Snow-Water Equivalent percent of Normal peak shows that surpluses in Figure 1 aren't heading to average snowpack in late winter if the current drying trend continues. Most basins have less than 50% of peak at this point (we are now more than half way through the snow accumulation season). These SNOTEL sites will need much more snow this season in order to finish with near normal SWE (Fig. 1a). SNOTEL 7-day snow depth changes show gains in accumulation across the Northern Wasatch and Uinta Ranges in Utah and the Northern and Central Rockies. Elsewhere, decreases rule (Fig. 1b).

Temperature: The SNOTEL 7-day average temperature departure from normal map is unavailable this week. ACIS 7-day average temperature anomalies show that the greatest positive temperature departures over north-central Montana (>+15°F) and the greatest negative departures over portions of Colorado Rockies (<-6°F). (Fig. 2a)

Precipitation: ACIS 7-day average precipitation amounts for the period ending 26 January shows the bulk of the heaviest precipitation confined to the Olympic and Northern 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 Rockies and Western High Plains (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 dry week was the rule over much of the West which resulted in one category deterioration as noted by the red circles (blue circles are one category improvements over eastern Montana and north-central Wyoming) (Fig. 3b).

The West: Above-normal precipitation occurred across parts of the Pacific Northwest and northern Rockies this week, but the rest of the West was unusually dry. Temperatures averaged above-normal in most areas, with continued melting of the winter snowpack. With the exception of the coastal Northwest and southern portions of the Southwest, mountain snow water content continued near to above normal. Snowfall from this week's systems improved mountain snowpack to above normal in all of Wyoming's basins, but D0H was kept in place to reflect long-term precipitation deficits in the lower valleys. D0 and D1 expanded in eastern New Mexico and an area of D2 was added to southeast Arizona and southwest New Mexico to reflect growing precipitation deficits**.** Author: Richard Heim, NOAA/NESDIS/National Climatic Data 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. 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

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.

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

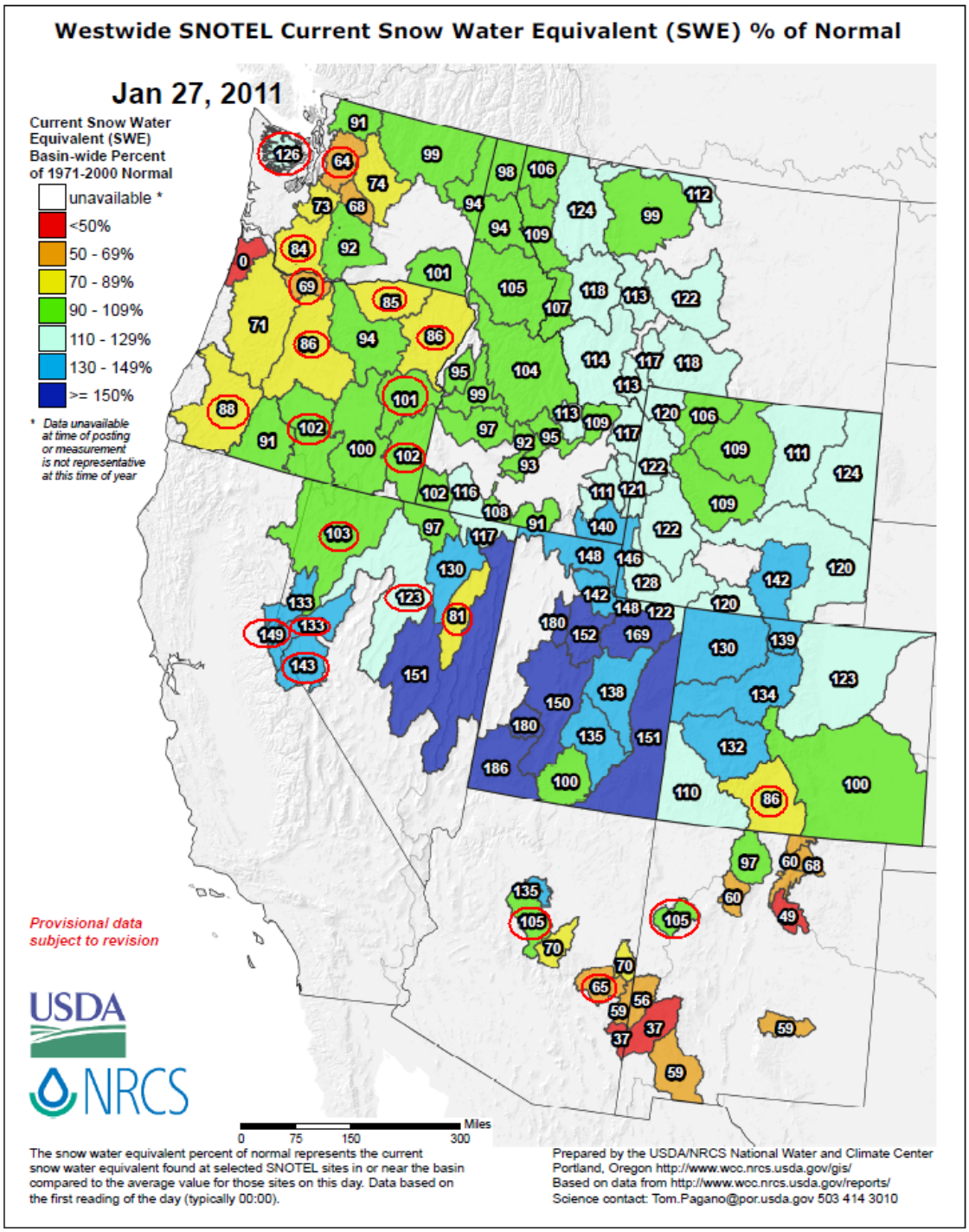


Fig. 1: SNOTEL Snow-Water Equivalent percent of normal values for 27 January 2011 shows many basins in the Cascades, Sierra, Great Basin, and Southwest Ranges have deteriorated by one category during the past week (noted by red circles).

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

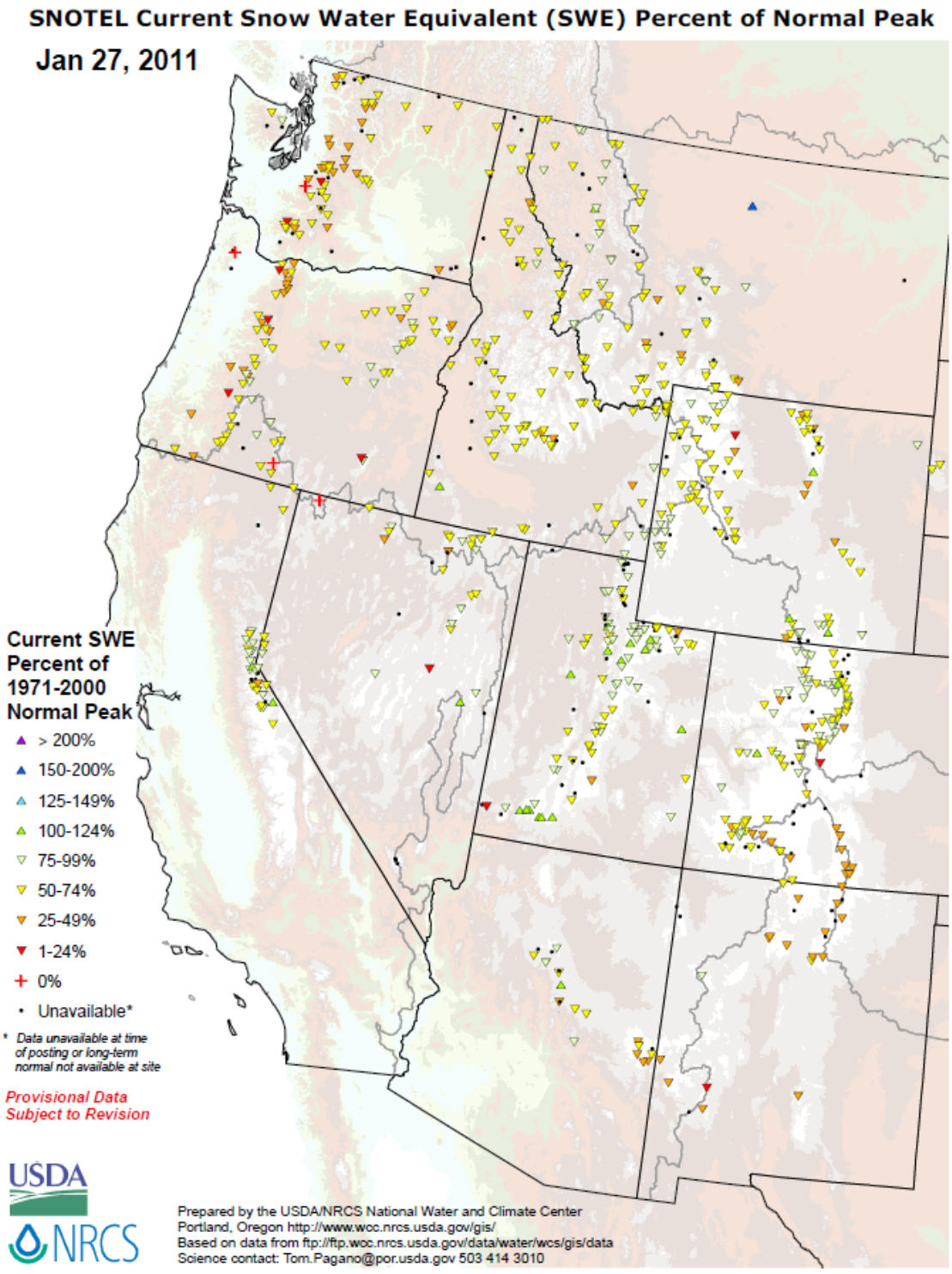


Fig. 1a: SNOTEL Snow-Water Equivalent percent of Normal peak shows that surpluses in Figure 1 aren't heading to average snowpack in late winter if the current drying trend continues. Most basins have less than 50% of peak at this point (we are now more than half way through the snow accumulation season). 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

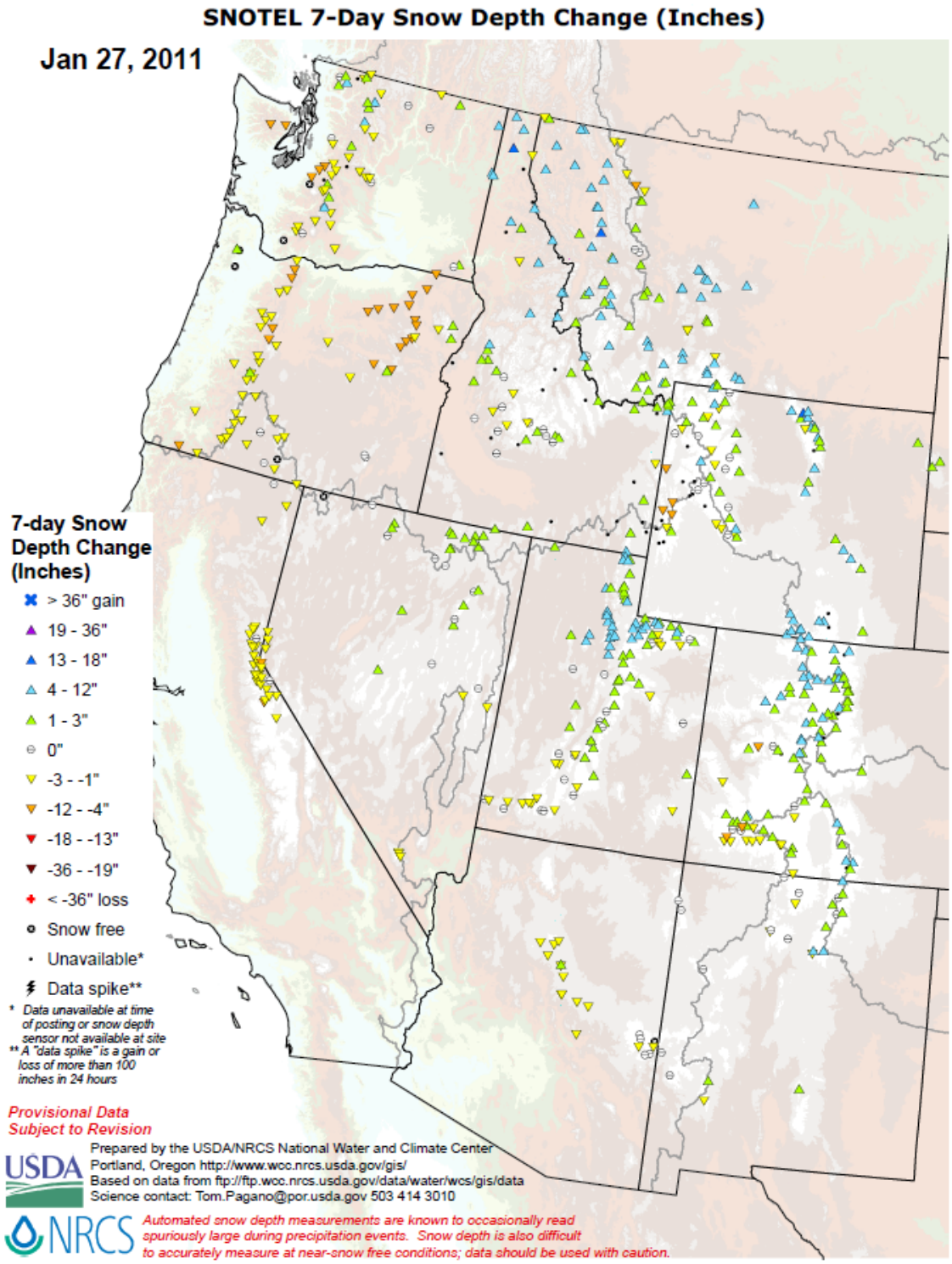


Fig. 1b: SNOTEL 7-day snow depth changes show gains in accumulation across the Northern Wasatch and Uinta Ranges in Utah and the Northern and Central Rockies. Elsewhere, decreases are noted.

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

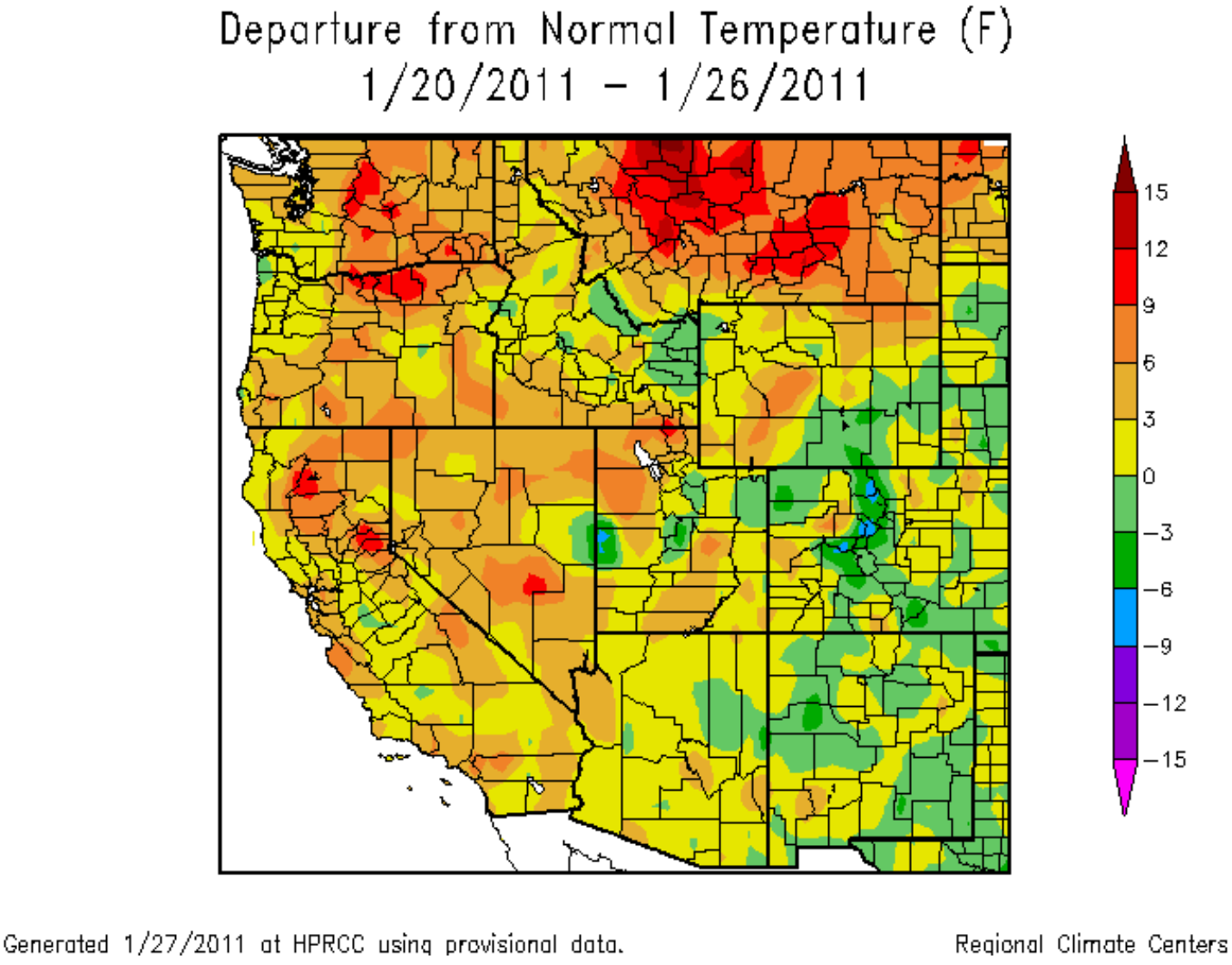
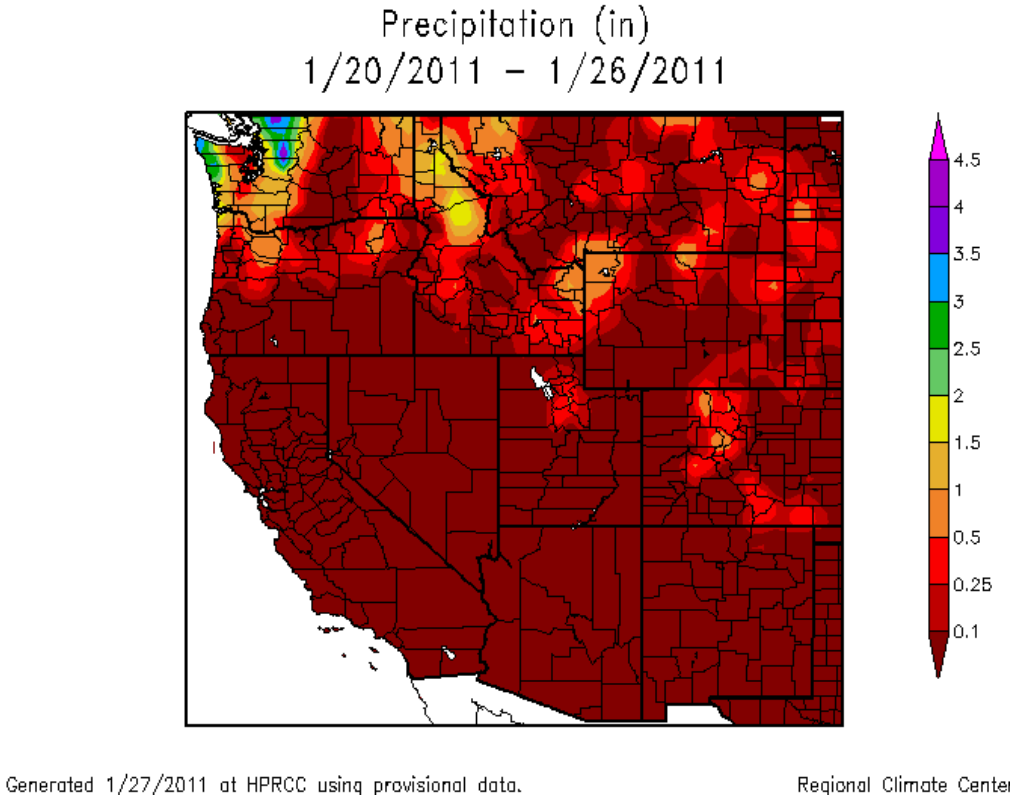


Fig. 2: ACIS 7-day average temperature anomalies show that the greatest positive temperature departures over north-central Montana (>+15°F) and the greatest negative departures over portions of Colorado Rockies (<-6°F).

Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_daterange&daterange=7d



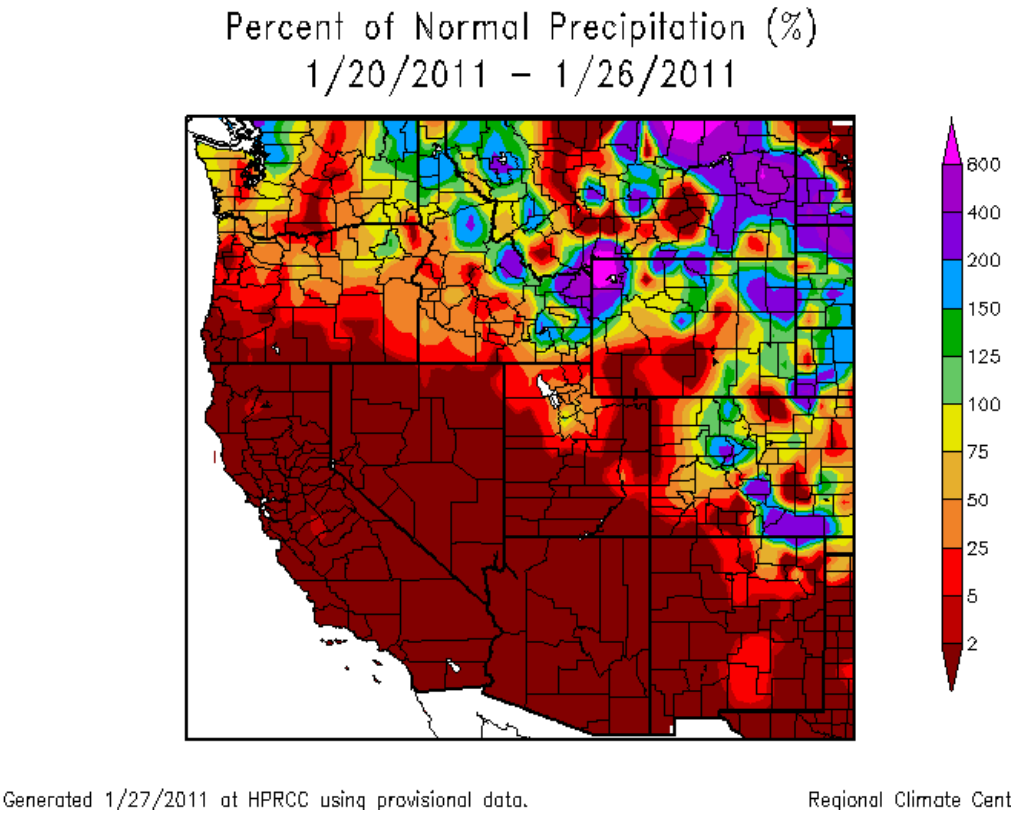


Fig. 3 and 3a: ACIS 7-day average precipitation amounts for the period ending 26 January shows the bulk of the heaviest precipitation confined to the Olympic and Northern Cascades Mountains (mostly falling as rain) (Fig. 3). In terms of percent of normal, the precipitation pattern was extremely wet over parts of the Northern Rockies and Western High Plains (Fig. 3a). Ref: http://www.hprcc.unl.edu/maps/current/

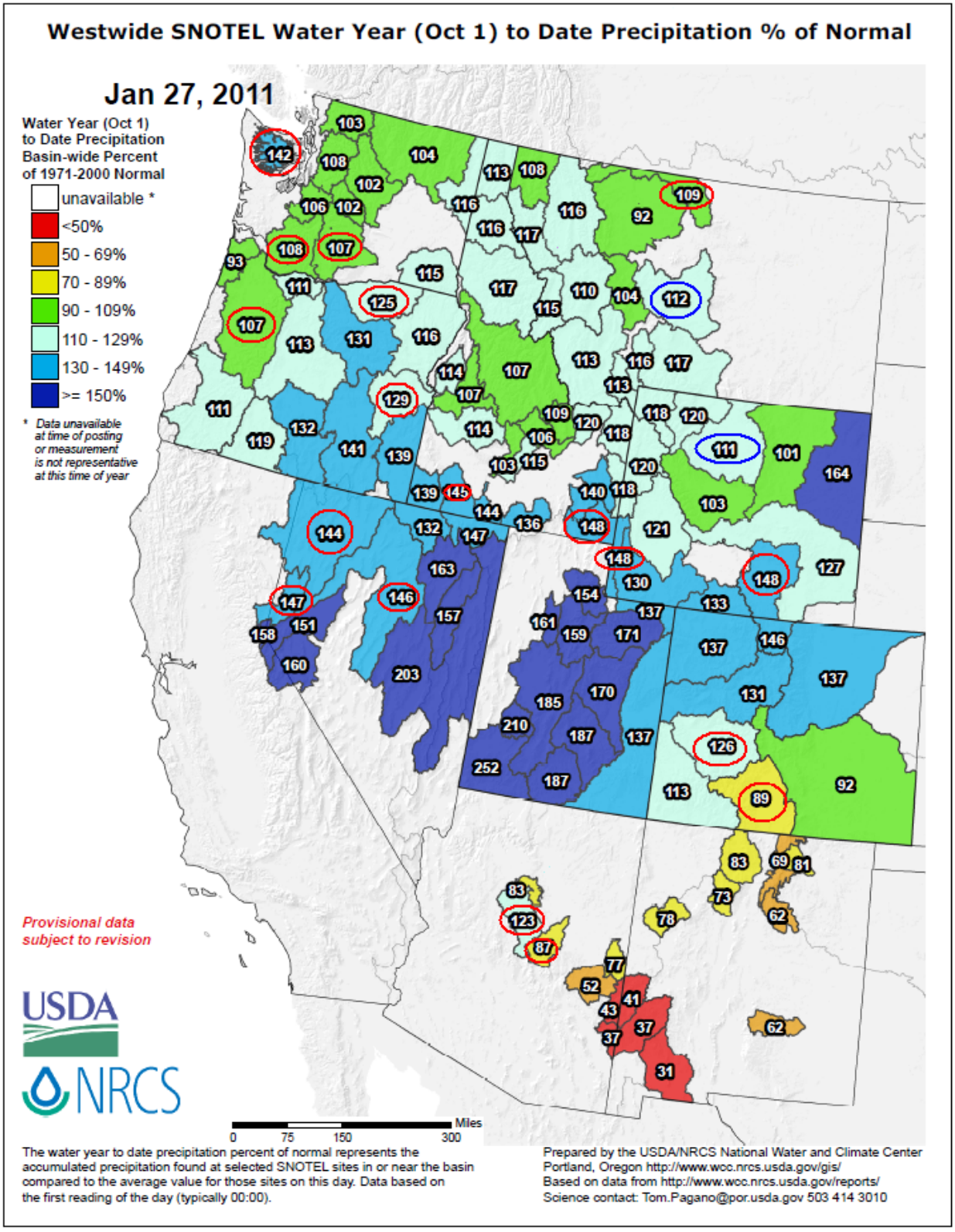


Fig 3b: For the 2011 Water-Year that began on 1 October 2010, the greatest deficits are found over the extreme southern reaches of the Southwest. Areas with the highest values are found over the Great Basin. A rather dry week was the rule over much of the West which resulted in one category deterioration as noted by the red circles (blue circles are one category improvements).
Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_wytdprecpctnormal_update.pdf

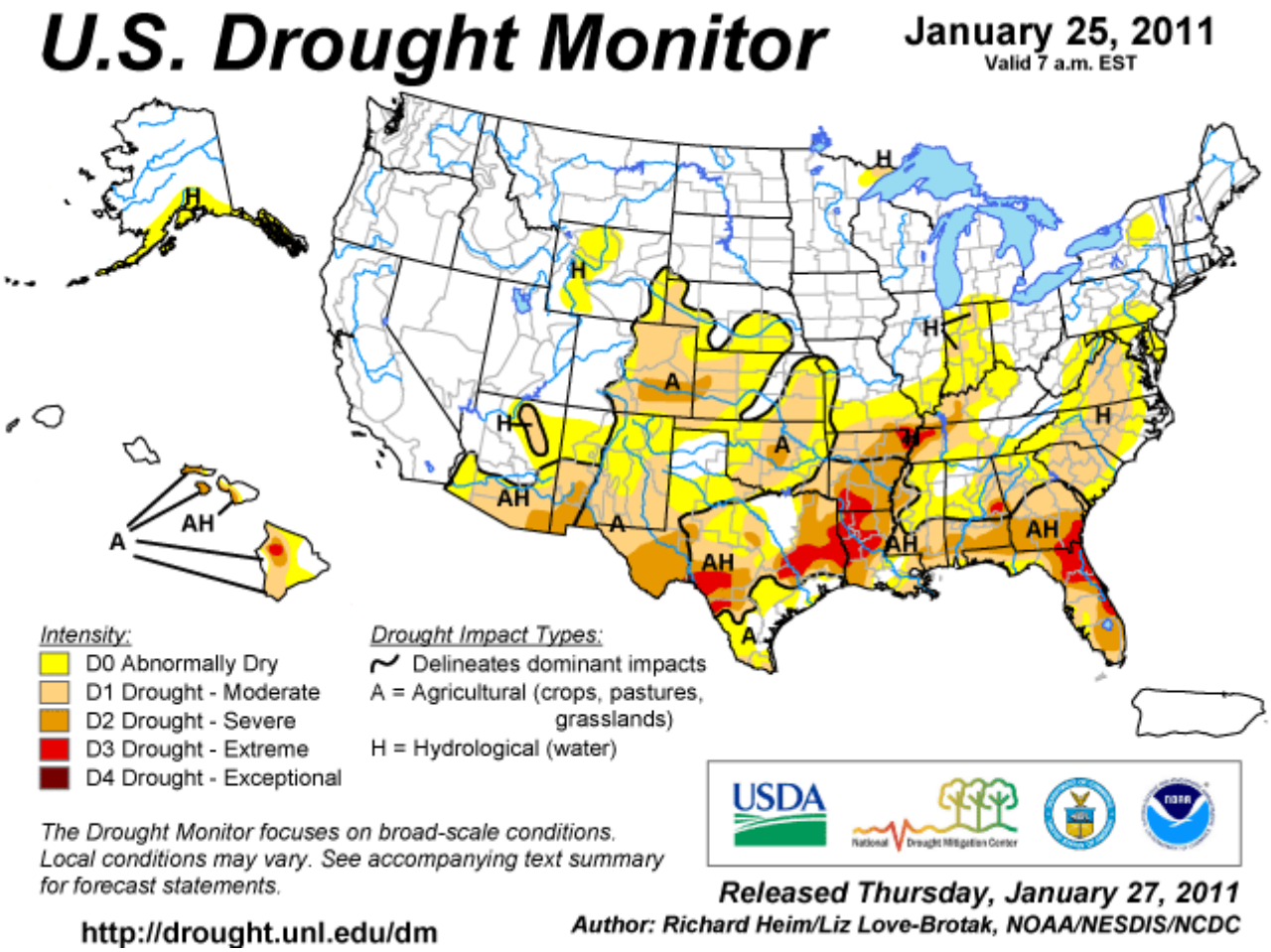


Fig. 4: Current Drought Monitor weekly summary. The severest D3 levels of drought dominate the Big Island of Hawaii and is scattered across Texas to Florida.
Ref: http://www.drought.unl.edu/dm/monitor.html

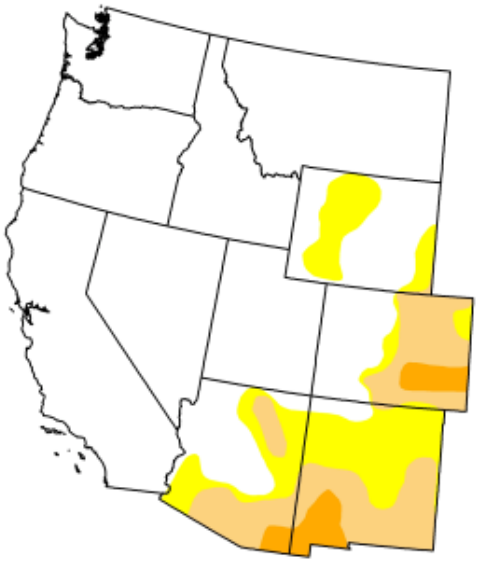
U.S. Drought Monitor

West

January 25, 2011
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	76.62	23.38	12.70	2.44	0.00	0.00
Last Week (01/18/2011 map)	76.96	23.04	11.88	0.89	0.00	0.00
3 Months Ago (10/26/2010 map)	69.02	30.98	5.39	0.19	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 (01/19/2010 map)	32.47	67.53	31.79	13.64	0.92	0.00



Intensity:

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

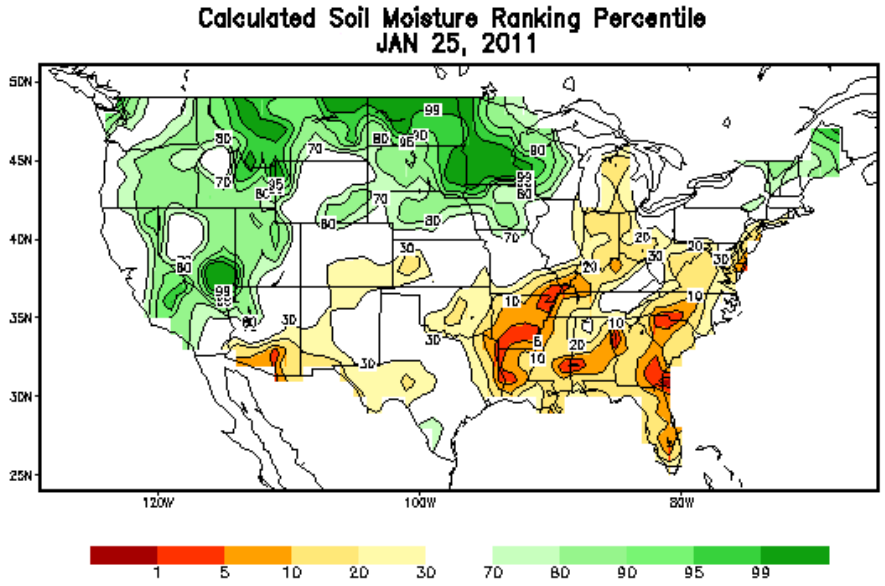
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

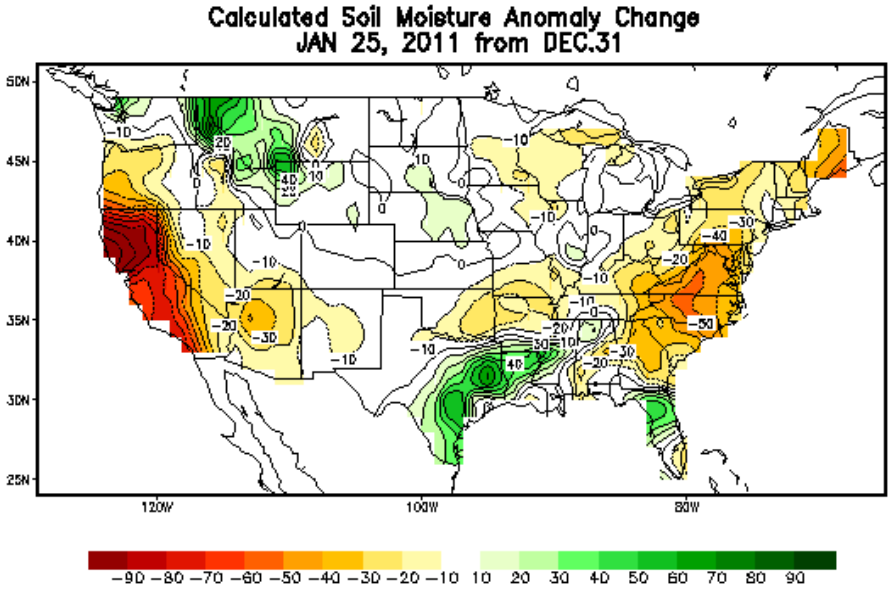
http://drought.unl.edu/dm

USDA National Drought Mitigation Center

Released Thursday, January 27, 2011
R. Heim/L. Love-Brotak, NOAA/NESDIS/NCDC

Fig. 4a: **Drought Monitor for the Western States with statistics over various time periods. Regionally there was some deterioration over the southern reaches of Southwest during the past week.** Ref: http://www.drought.unl.edu/dm/DM_west.htm





Figs. 5a and 5b: Soil Moisture ranking in percentile as of 25 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#

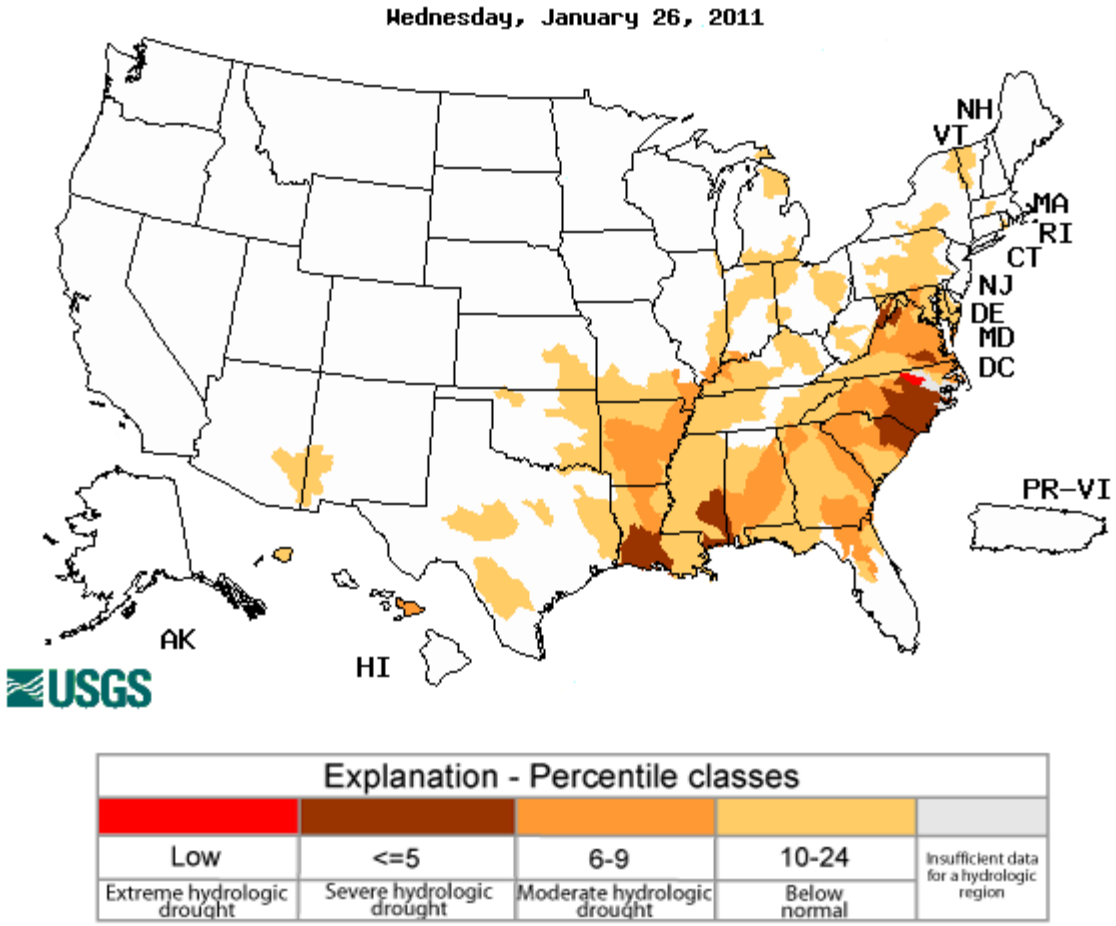


Fig. 6: Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Portions of the Gulf States and Southeastern Tier States are reflecting La Niña conditions of dryness. Note: northern site gauges are less accurate as rivers and streams freeze. Ref: http://waterwatch.usgs.gov/?m=dryw&r

National Drought Summary -- January 25, 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 series of weather systems in the westerly flow moved across the country during this U.S. Drought Monitor (USDM) week. In the West, the systems moved across the Pacific Northwest, leaving the Southwest dry. Cyclonic storm systems energized over the central third of the country and moved east, trailing cold fronts in their wake. Several of these systems followed a track along the Gulf Coast and up the Atlantic Seaboard. The combination of moisture and cold Canadian air resulted in widespread snowfall. Snow has a lower moisture content than rain, so it takes more snow (on average, about ten times as much) to equal the same amount of precipitation (melt water equivalent) that would fall as rain. These winter storm systems brought above-normal snowfall but below-normal rain to many drought areas, giving the impression of wet conditions when, in fact, total precipitation was below normal.

The Northeast and Mid-Atlantic: Above-normal precipitation fell over parts of the Northeast that were drought-free, but the rest of the Northeast and Mid-Atlantic had below-normal precipitation this USDM week. Long-term deficits continued to mount, with parts of Virginia falling 3 inches or more behind normal for the last 30 days and parts of Pennsylvania to Virginia more than 4 inches behind for the last 60 days. Streamflow levels were significantly below normal (in the bottom ten percentile) across much of the Gulf Coast states to southern Pennsylvania, with record low levels observed at many North Carolina and Virginia streams. Soil moisture models indicated continued drying potential, but the cold temperatures have minimized agricultural impacts. The abnormally dry (D0) area was expanded further into West Virginia and Pennsylvania and moderate drought with hydrological impacts (D1H) was extended into central Virginia. An area of D0 was introduced into northern New York, around the Adirondacks, where 90-day precipitation deficits approached 6 to 9 inches in places.

Southeast and Gulf Coast: Above-normal rainfall over southeast Texas to western Mississippi, and much of central Florida, benefited the drought areas, but the week was drier than normal across the rest of the region, especially northern Alabama to the Carolinas. Widespread 1-2 inch rains fell over Louisiana on the last day of the week, resulting in pullback of D1, severe drought (D2), and extreme drought (D3) where the heaviest rain fell and long-term deficits were smallest. In central Florida, D2 and D3 were pulled back where 1-2 inches of rain was measured. The AH impacts boundary was pulled back to the Georgia-South Carolina state line, leaving H impacts over the Carolinas. Long-term precipitation deficits resulted in low groundwater and stream levels and reduced inflows into reservoirs, with some streams in North Carolina reaching record low levels for the day, week, and month, but the cold weather minimized agricultural and other impacts there.

Great Plains and Midwest: Widespread above-normal precipitation occurred from the northern High Plains to the central Plains and over southeast Texas, and precipitation was locally above

normal in a few other places. But generally the week was drier than normal across the rest of the Plains and the Midwest. It has been especially dry in west Texas where many stations reported less than 25% of normal precipitation for the last 90 days. Del Rio received only 0.12 inch of precipitation for October 1-January 25, which was the third driest such period on record in the last 105 years. Lake levels continued to drop, with January 25 reports ranging from 58% of capacity at Oak Creek Reservoir to 3% at E.V. Spence Reservoir. The January 24 U.S. Department of Agriculture (USDA) Crop Report indicated that, statewide, 49% of wheat, 48% of oats, and 51% of the range and pasture land in Texas was in very poor to poor condition. The USDA report stated that topsoil was very short to short (very dry to dry) in 100% of the Trans-Pecos district, 90% of the Southern Low Plains district, 88% of the Edwards Plateau district, and 80% of the Cross Timbers district. The Farm Service Agency reported significant crop loss in several western Texas counties, with up to 70% loss of wheat for grazing in Shackelford County. Based on these data, D2 was expanded in the Trans Pecos, D1-D3 expanded in the Edwards Plateau, and D0 expanded in the Edwards Plateau and southern Low Rolling Hills climate divisions.

The West: Above-normal precipitation occurred across parts of the Pacific Northwest and northern Rockies this week, but the rest of the West was unusually dry. Temperatures averaged above-normal in most areas, with continued melting of the winter snowpack. With the exception of the coastal Northwest and southern portions of the Southwest, mountain snow water content continued near to above normal. Snowfall from this week's systems improved mountain snowpack to above normal in all of Wyoming's basins, but D0H was kept in place to reflect long-term precipitation deficits in the lower valleys. D0 and D1 expanded in eastern New Mexico and an area of D2 was added to southeast Arizona and southwest New Mexico to reflect growing precipitation deficits.

Hawaii, Alaska and Puerto Rico: Like last week, 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. Above-normal precipitation fell over southern Alaska this week, but the D0H area was kept in place to reflect longer-term deficits.

Looking Ahead: Winter weather systems will move across the northern, central, and eastern United States during the next 5 days (January 26-30), bringing rain and/or snow to the Pacific Northwest, western Gulf of Mexico Coast, and Mid-Atlantic to Northeast. The systems will bring warmer-than-normal temperatures ahead of them and cooler-than-normal temperatures behind them, with very cold air masses forecasted to move into the central U.S. by February 3. During the first week of February, a strong upper-level ridge will become entrenched over the West with an upper trough holding sway in the East. Below-normal temperatures are expected February 1-9 from the southern Plains to Northeast while above-normal temperatures should dominate from Alaska to the Northwest. This circulation pattern will bring drier-than-normal weather to western Alaska and much of the West, central Plains, and Midwest, while the weather is expected to be wetter-than-normal along the Gulf of Mexico Coast, Atlantic Seaboard, northern Plains to western Great Lakes, and southern Alaska.

Author: Richard Heim, NOAA/NESDIS/National Climatic Data 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 26, 2011