



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

Weekly Report - Snowpack / Drought Monitor Update **Date: January 18, 2007**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snowpack: During the past week, snow depths have decreased over the Pacific Northwest and Northern Rockies and increased over the remainder of the West. Depths decreased about a foot over the Cascades although up to half a foot of snow fell over the northern Willamette Valley (Portland area) on Wednesday. The Central Rockies experienced up to a foot increase in depths (Fig. 1). Snow depths for Wyoming show low snowpack for most of its mountain ranges (Fig. 1a). For the Water Year (since October 1, 2006), most locations across the West reveal below normal water content in the existing snowpack with the exception of the Cascades and Eastern Rockies from northern New Mexico to southern Wyoming where snow water-equivalent is above normal (Fig. 1b).

Temperature: During the past seven days, cold weather dominated the West. A hard freeze played havoc with California's citrus crops (<http://news.google.com/news?q=california+recent+freeze&hl=en&lr=&sa=X&oi=news&ct=title>) while the northern half of the West saw average temperatures between 10 to 20°F below normal (Fig. 2).

Precipitation: During this report period, above normal precipitation was confined to the Central and Southern Rockies and most of the mountain ranges in Utah (Fig. 3). Very dry weather continued over California and Arizona. For this Water Year, precipitation still remains above normal over the Cascades and Colorado Rockies but are slowly falling into deficits as the jet stream brings low pressure weather systems much further south than its climatic norms (Fig. 3a). The drought monitor maps (Fig 4 and Fig 4a) are starting to show drying over southern California and southwest Arizona (past four weeks). This is also being reflected with drier soil moisture conditions over the Southwest (Fig. 5).

WESTERN DROUGHT STATUS

The West and Rocky Mountains: For a change, much quieter (and drier) weather enveloped the Northwest as Arctic air spilled into the western half of the U.S. A stormy season since November has provided ample precipitation to the Northwest, with water year-to-date basin average precipitation and snow water content (SWC) at or above normal in the Cascades and northern Rockies. In general, basin values decrease farther to the south and east, except where two major December snow storms blanketed the Colorado Rockies and northern New Mexico. With Water Y-T-D basin precipitation between 117% and 150%, and Jan. 16 basin SWC between 102% and 191%, D0 was erased in these two areas.

In the Southwest, anticipated precipitation from the system that eventually hit the nation's midsection was disappointing, with only 0.1-0.4 inch falling on east-central Arizona and northern New Mexico, and little or no precipitation elsewhere. Since October 1, basin precipitation has averaged only half to two-thirds of normal, and Jan. 16 SWC was around half of normal, including the Sierra Nevada and major ranges in Nevada, Arizona, and southwestern New Mexico. Hydrologic concerns are currently negligible in California due to above-normal major

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve maintain and improve our natural resources and environment

Weekly Snowpack and Drought Monitor Update Report

reservoir capacity (at 119% of normal capacity on 12/31/06, or at 75% average capacity), thanks in part to a near-record wet 2004-05 rainy season. However, with a very dry 2005-06 rainy season, a poor 2006 summer monsoon, and this year's rainy season that has yet to get established, rain-fed pastures, ranges, streams, and wildlife have all suffered, along with an increased fire danger potential. As a result, where non-hydrological impacts prevailed (most of California), 'A' was designated. Farther east, where both short- and long-term impacts remained (most of Arizona), both 'A' and 'H' were used. In western New Mexico, where lingering long-term impacts remained but short-term moisture was adequate, only 'H' remained (Fig. 4).

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 (Fig. 4). Detailed drought maps and statistics for the West and Wyoming are shown in Fig. 4a.

SOIL MOISTURE

Soil moisture (Fig. 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. Reference: <http://www.cpc.ncep.noaa.gov/soilmst/img/curr.w.rank.daily.gif>.

OBSERVED FIRE DANGER CLASS

The National Interagency Coordination Center provides a variety of products that describe the current wildfire status for the U.S. - <http://www.nifc.gov/information.html>. The latest Observed Fire Danger Class is shown in Fig. 6.

U.S. HISTORICAL STREAMFLOW

This map, (Fig. 7) 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. Subregions 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.

http://water.usgs.gov/cgi-bin/waterwatch?state=us&map_type=dryw&web_type=map.

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/cqibin/bor.pl>. Additional information describing the products available from the Drought Monitor can be found at the following URL: <http://drought.unl.edu/dm/>

Weekly Snowpack and Drought Monitor Update Report

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/ DAVID THACKERAY
Director, Conservation Engineering Division

Weekly Snowpack and Drought Monitor Update Report

Jan 18, 2007

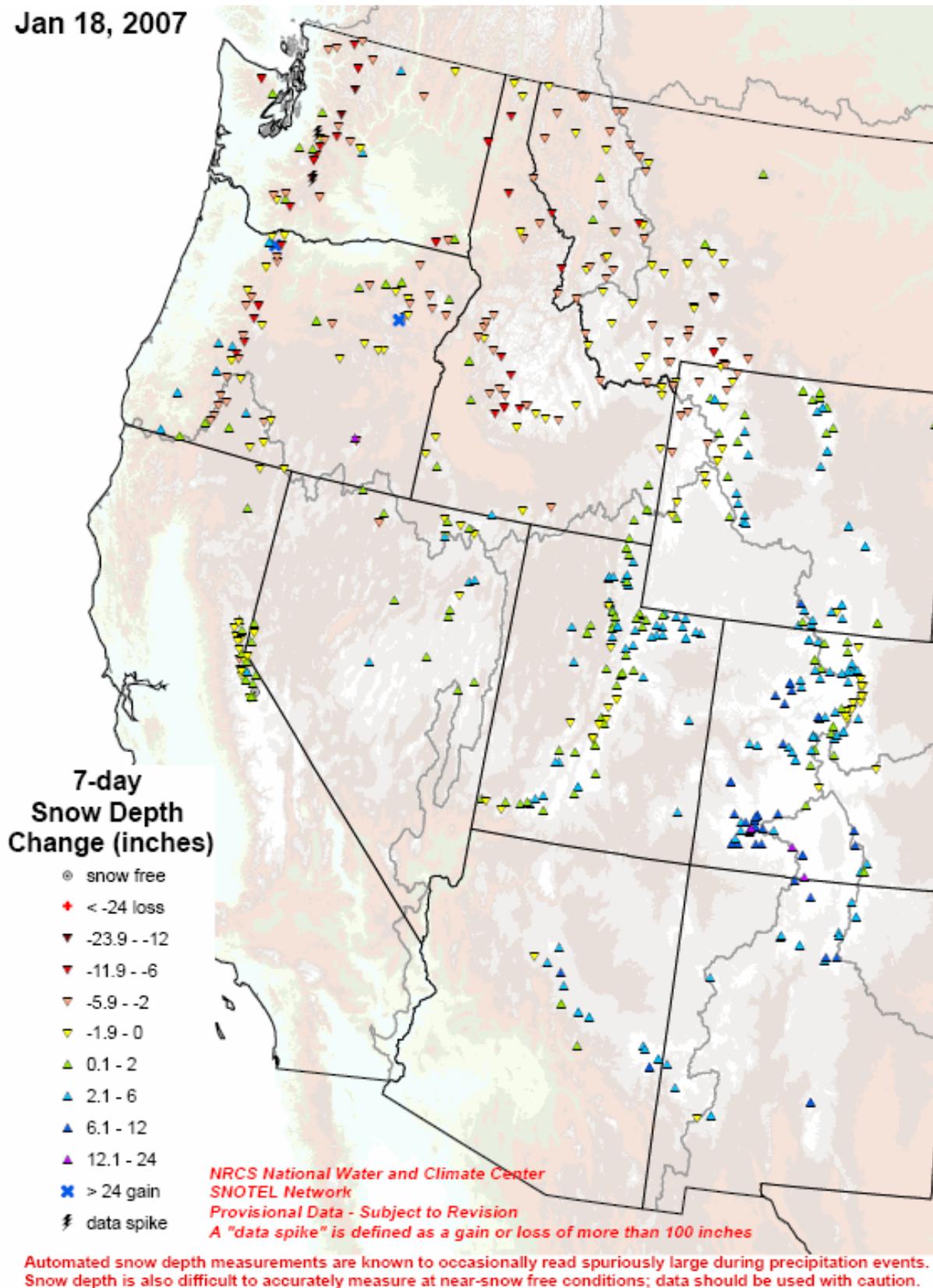


Fig. 1: Previous 7-day SNOTEL snow depth change.

Weekly Snowpack and Drought Monitor Update Report

Jan 18, 2007

Automated snow depth measurements are known to occasionally read spuriously large during precipitation events. Snow depth is also difficult to accurately measure at near-snow free conditions; data should be used with caution.

NRCS National Water and Climate Center
SNOTEL Network
Provisional Data - Subject to Revision

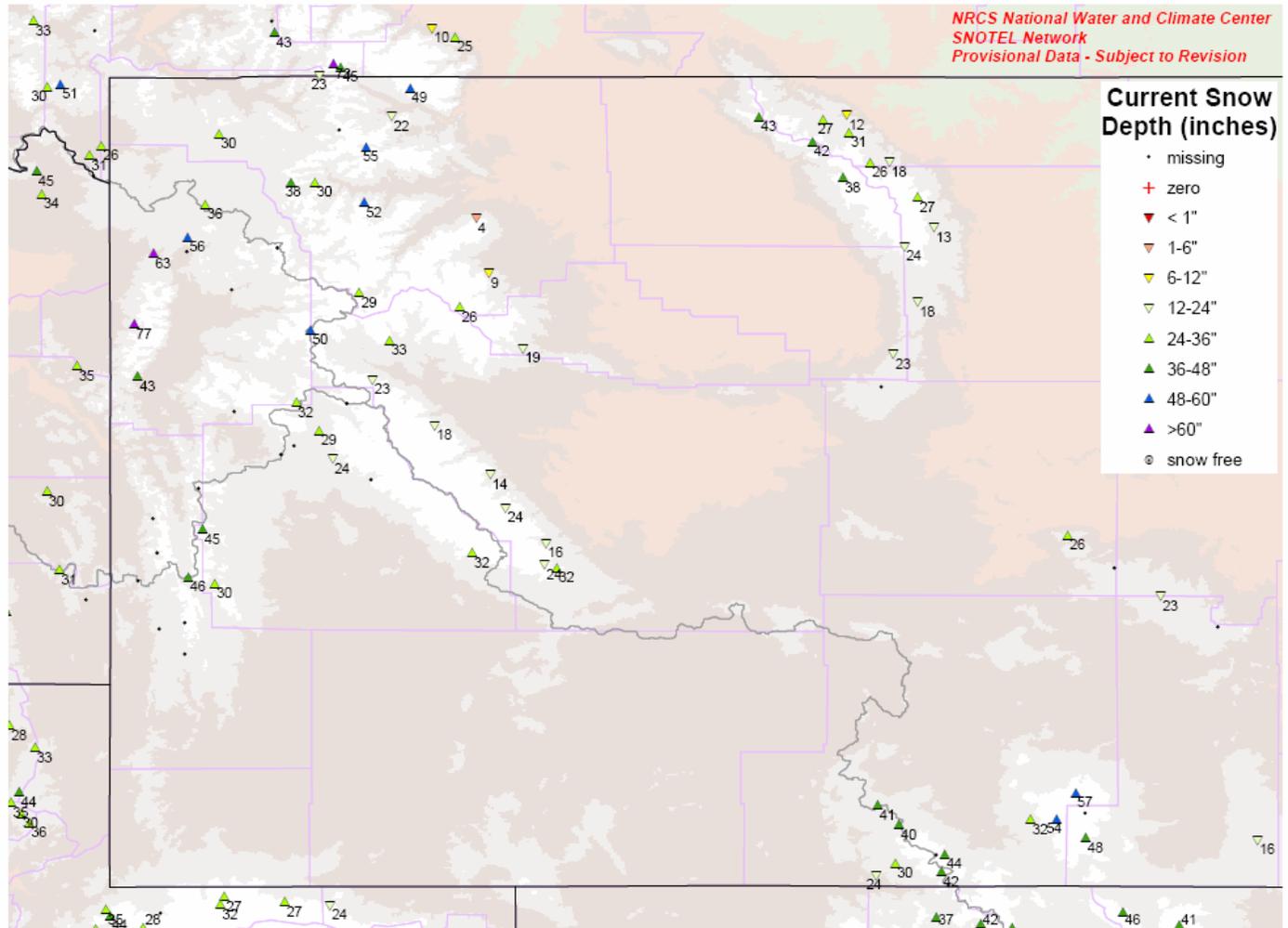


Fig. 1a. Current SNOTEL snow depths over Wyoming as of January 18, 2007.
<http://www.wcc.nrcs.usda.gov/gis/index.html>.

Weekly Snowpack and Drought Monitor Update Report

Jan 18, 2007

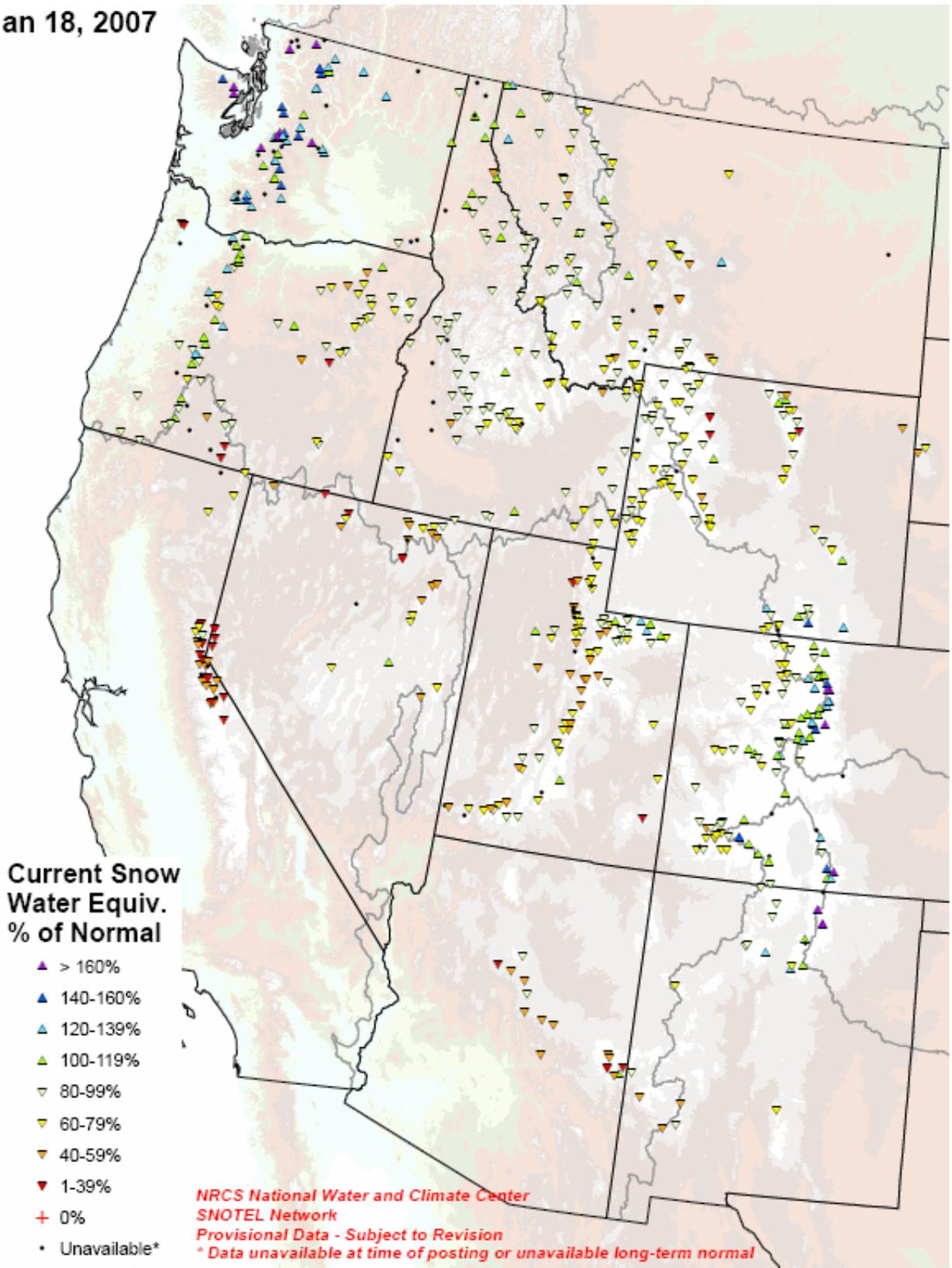


Fig. 1b. SNOTEL station water year (since October 1) snow water-equivalent as a percent of normal.

Jan 18, 2007

**7-day Avg
Temperature
Anomaly (F)**

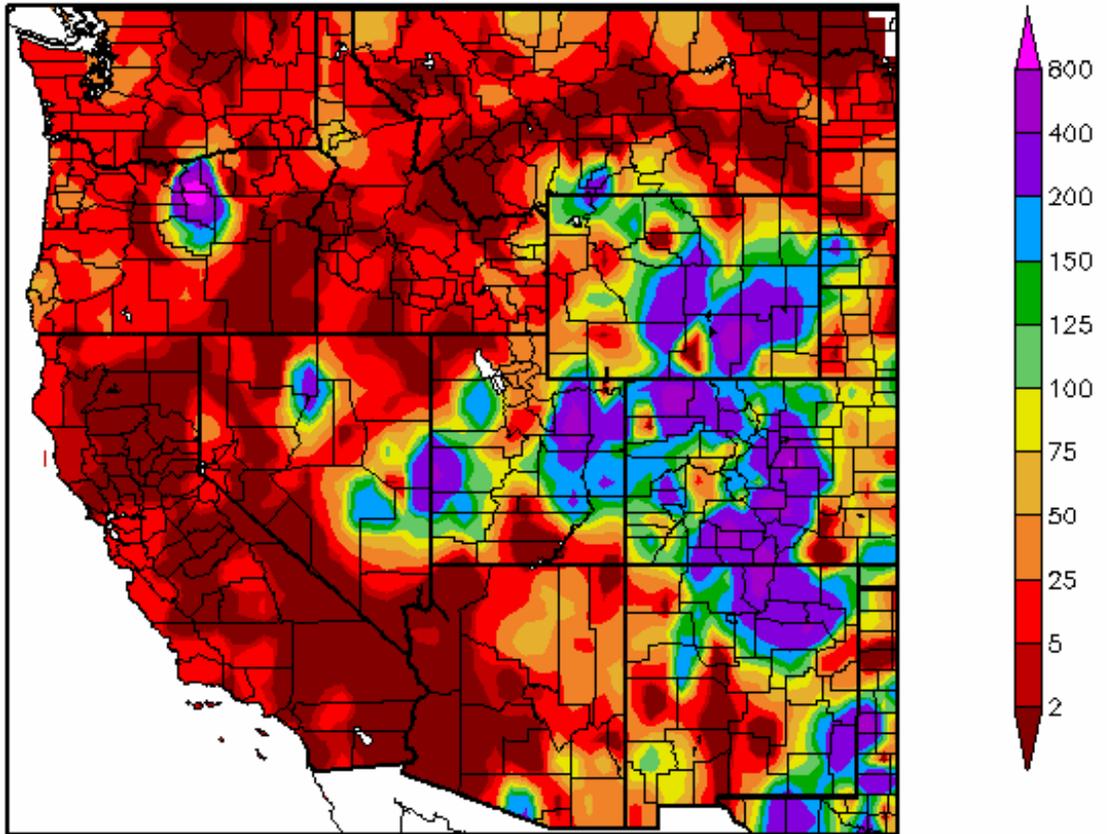
- ✕ < -20 cold
- ▼ -20 -- -15
- ▼ -15 -- -10
- ▼ -10 -- -5
- ▼ -5 - 0
- ▲ 0 - 5
- ▲ 5 - 10
- ▲ 10 - 15
- ▲ 15 - 20
- ◆ >20 warm

*NRCS National Water and Climate Center
SNOTEL Network (Sites with 15 or more years of record)
Anomaly with respect to 7 day average period of record median
Provisional Data - Subject to Revision*

Fig. 2: SNOTEL 7-day average temperature anomaly.

Weekly Snowpack and Drought Monitor Update Report

Percent of Normal Precipitation (%)
1/11/2007 – 1/17/2007



Generated 1/18/2007 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig 3. ACIS percent of normal precipitation for the past week over the Western US.

Weekly Snowpack and Drought Monitor Update Report

Jan 18, 2007

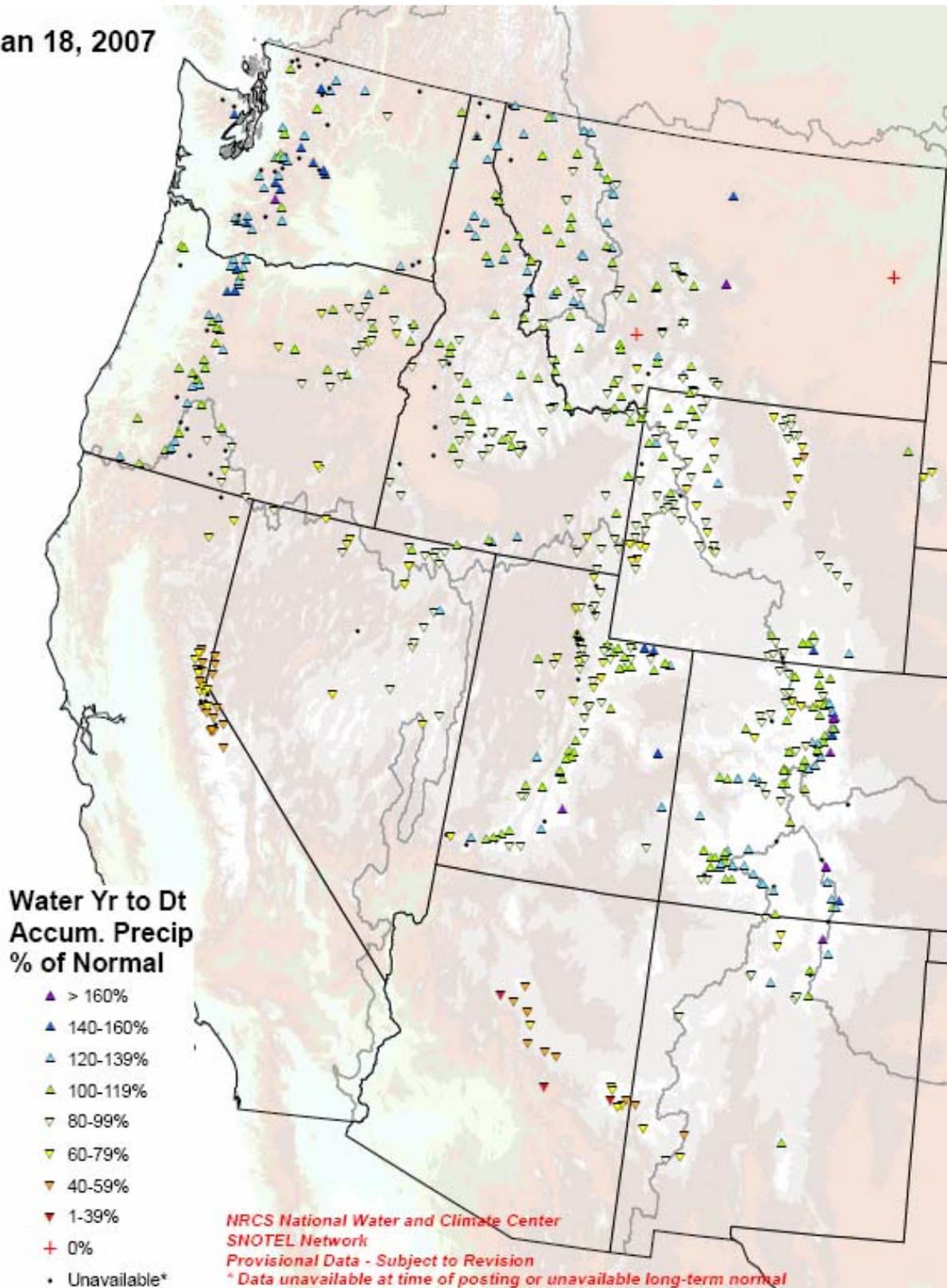


Fig. 3a. SNOTEL station water year (since October 1) precipitation as a percent of normal.

U.S. Drought Monitor

January 16, 2007
Valid 7 a.m. EST

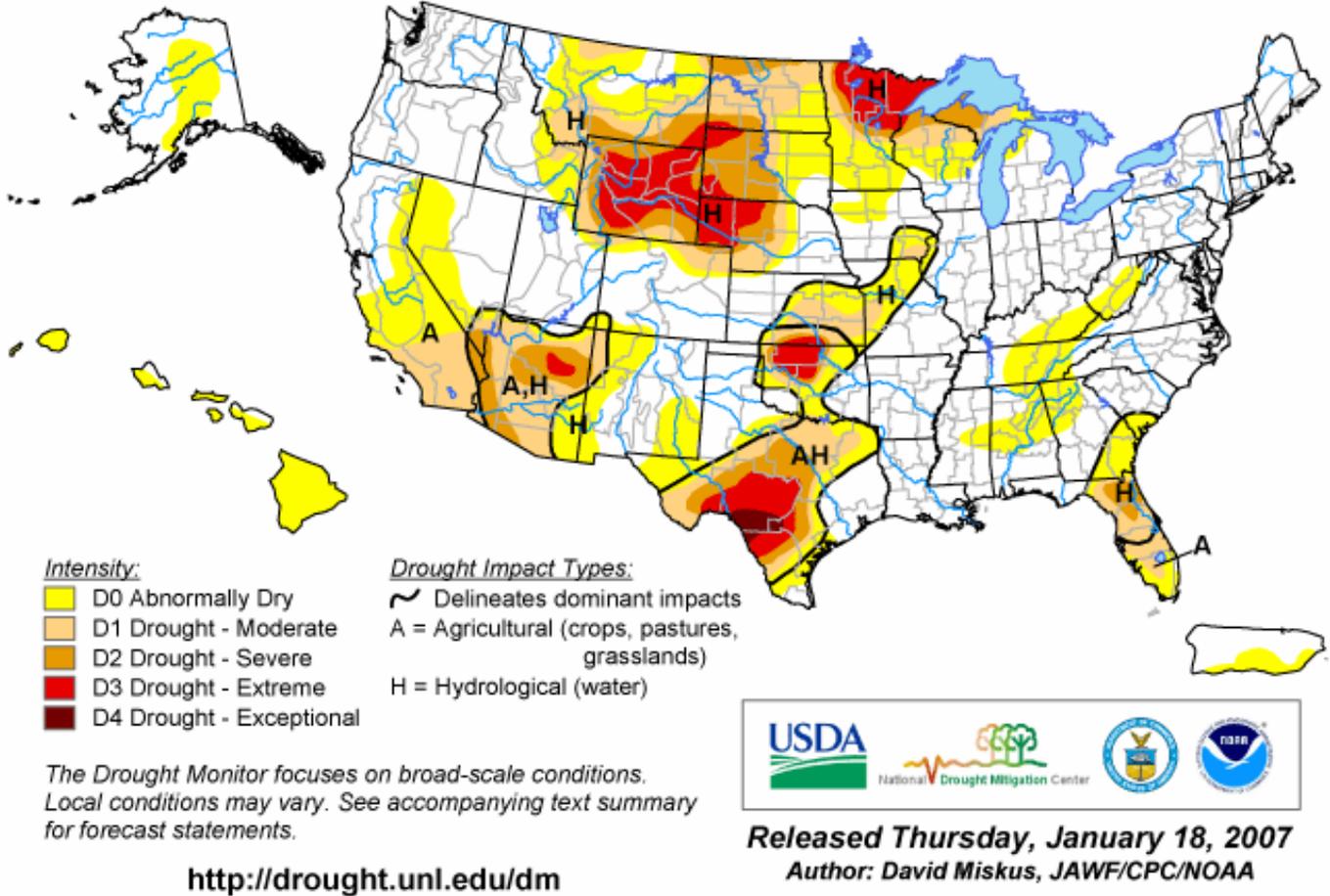


Fig. 4. Current Drought Monitor – Source: National Drought Mitigation Center (NDMC)

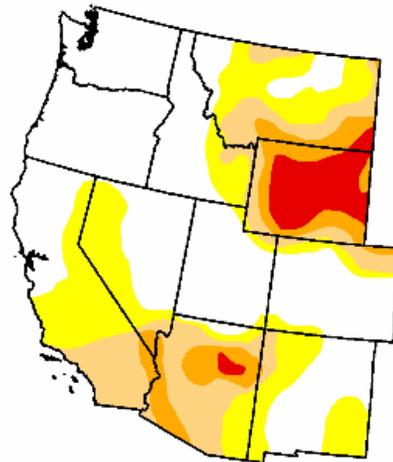
Weekly Snowpack and Drought Monitor Update Report

U.S. Drought Monitor

West

January 16, 2007
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	50.6	49.4	26.8	12.5	5.0	0.0
Last Week (01/09/2007 map)	49.1	50.9	26.8	12.5	5.0	0.0
3 Months Ago (10/24/2006 map)	47.9	52.1	30.2	15.2	4.8	0.0
Start of Calendar Year (01/02/2007 map)	51.2	48.8	25.8	9.4	4.0	0.0
Start of Water Year (10/03/2006 map)	43.5	56.5	33.5	16.9	5.2	0.0
One Year Ago (01/17/2006 map)	61.2	38.8	18.6	2.2	0.0	0.0



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, January 18, 2007
Author: David Miskus, JAWF/CPC/NOAA

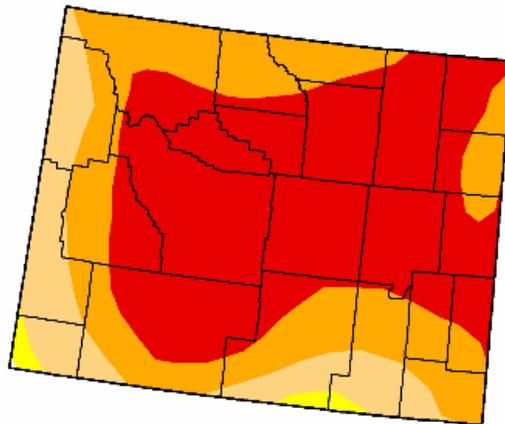
<http://drought.unl.edu/dm>

U.S. Drought Monitor

Wyoming

January 16, 2007
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.0	100.0	98.7	84.9	54.1	0.0
Last Week (01/09/2007 map)	0.0	100.0	98.7	84.9	54.1	0.0
3 Months Ago (10/24/2006 map)	0.3	99.7	95.7	69.0	50.1	0.0
Start of Calendar Year (01/02/2007 map)	1.6	98.4	92.1	71.5	40.9	0.0
Start of Water Year (10/03/2006 map)	0.3	99.7	97.2	69.0	50.0	0.0
One Year Ago (01/17/2006 map)	19.2	80.8	43.0	0.0	0.0	0.0



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, January 18, 2007
Author: David Miskus, JAWF/CPC/NOAA

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

Fig. 4a. The Western and Wyoming Drought Monitor maps for this week and statistics over the past year.

Weekly Snowpack and Drought Monitor Update Report

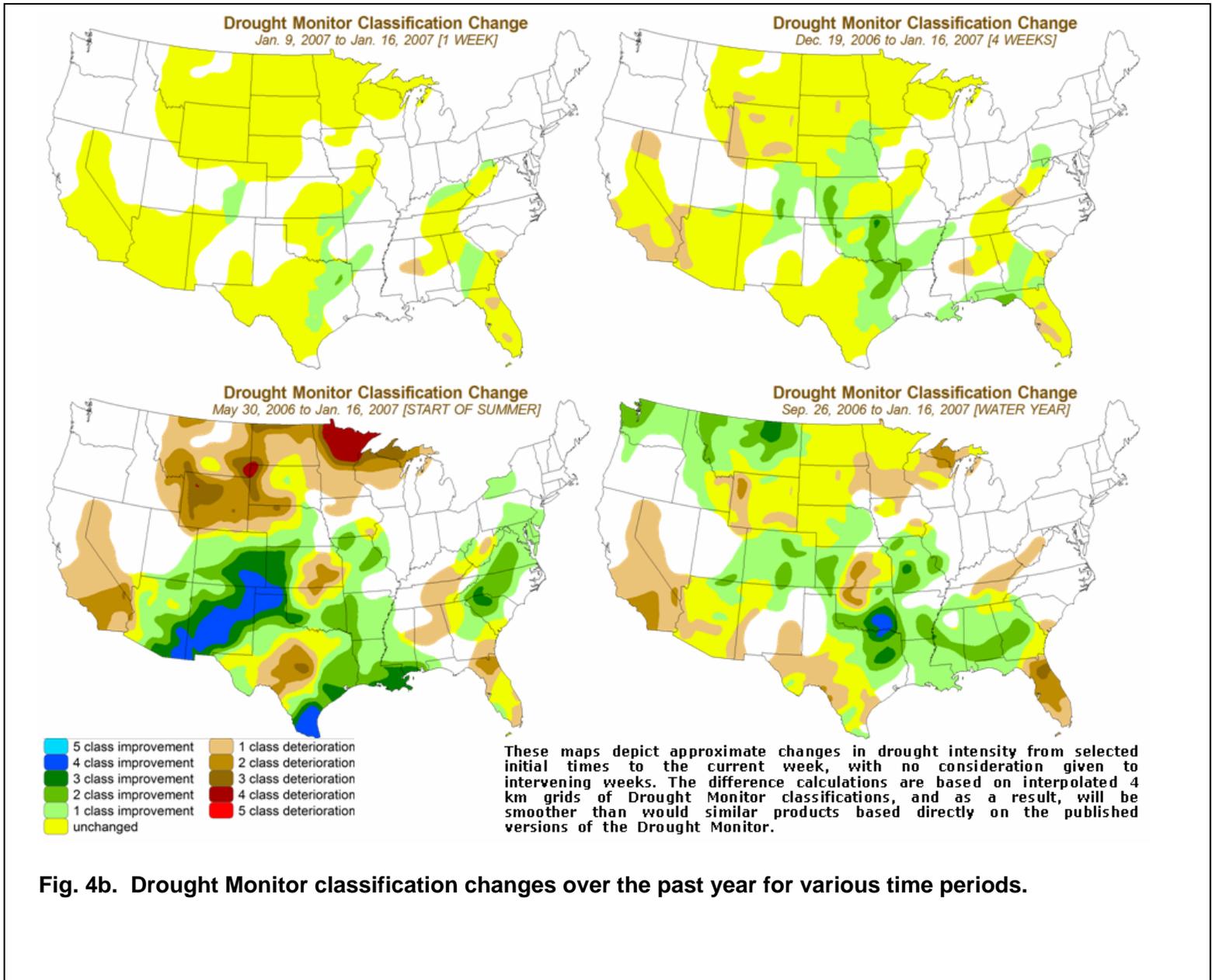


Fig. 4b. Drought Monitor classification changes over the past year for various time periods.

Weekly Snowpack and Drought Monitor Update Report

Calculated Soil Moisture Ranking Percentile
JAN 17, 2007

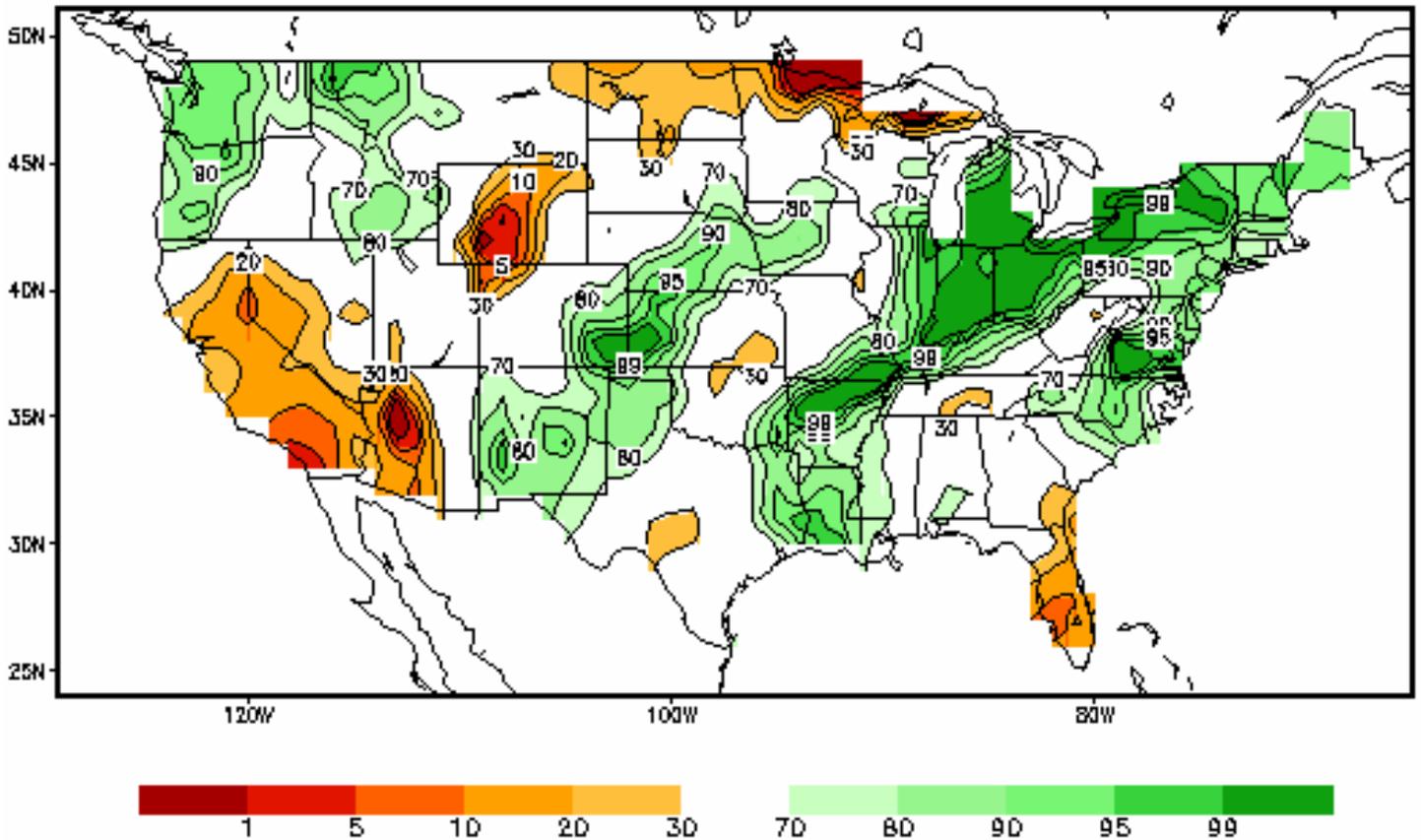


Fig. 5: Soil Moisture Ranking Percentile based on 1932-2000 climatology. Caution: Soils tend to freeze this time of year resulting in potentially erroneous sensor readings. Source NOAA-CPC

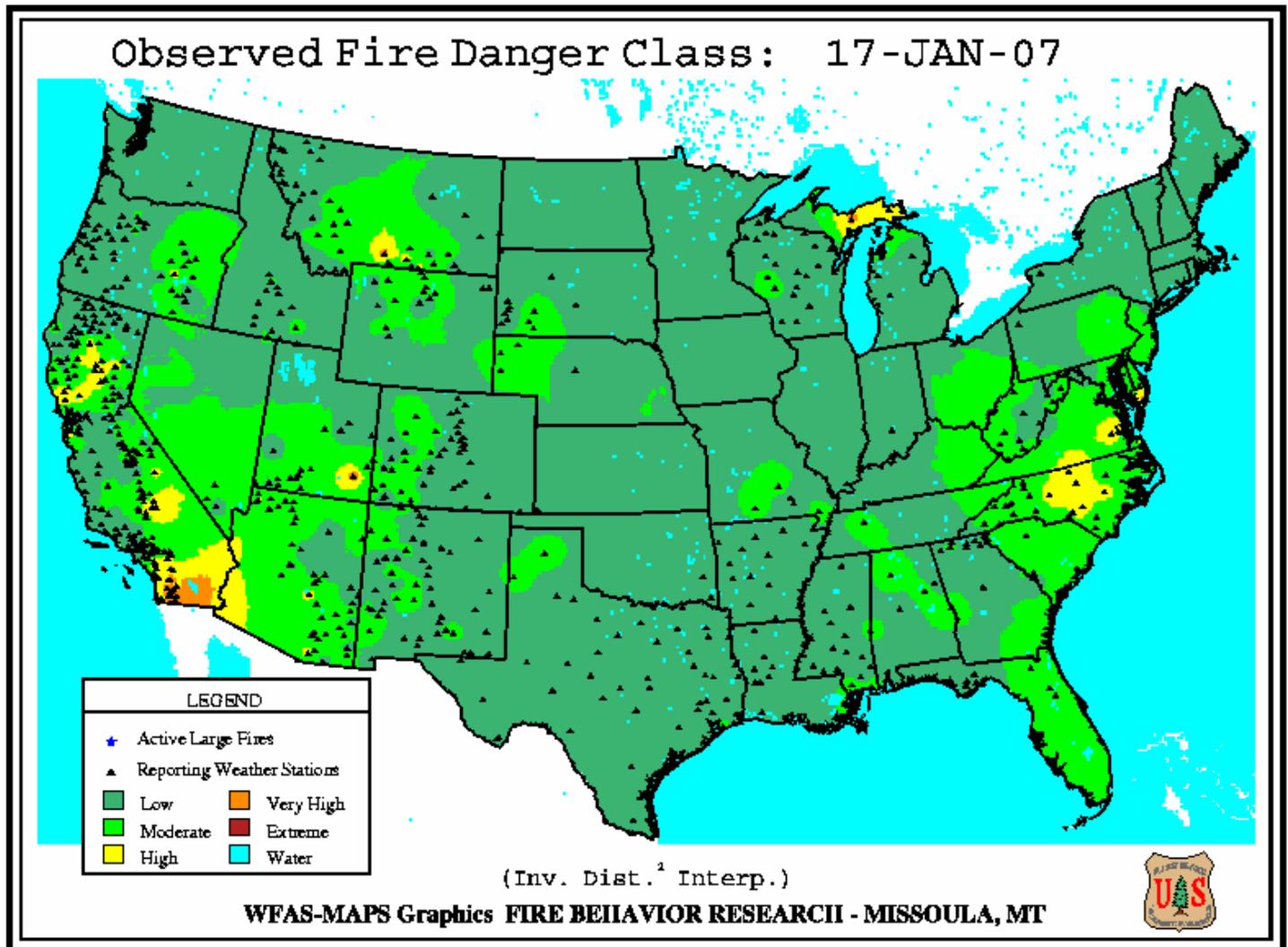
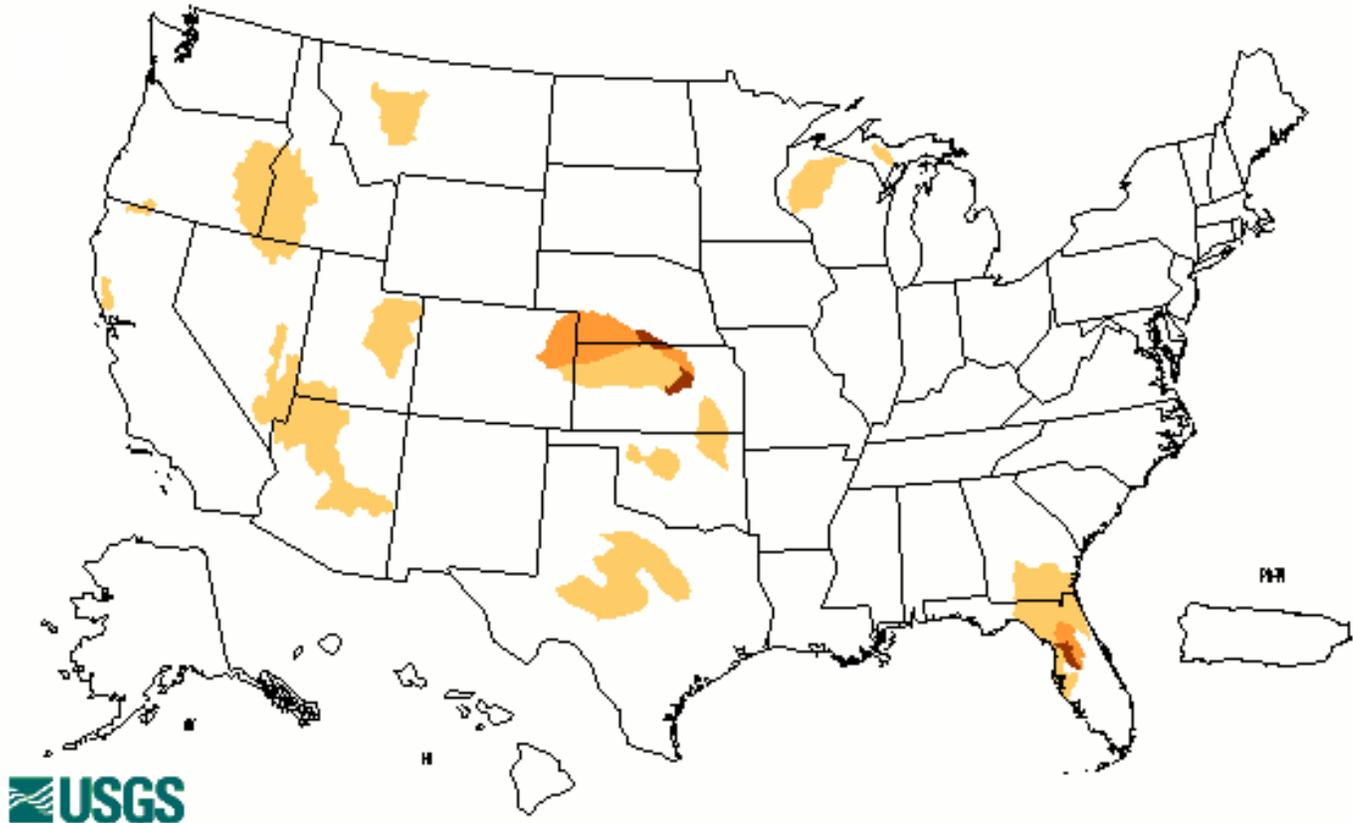


Fig. 6. Observed Fire Danger Class. Note continued increase risk of fire over southern California. Source: Forest Service *Fire Behavior Research – Missoula, MT*

Weekly Snowpack and Drought Monitor Update Report

Wednesday, January 17, 2007



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. 7. Map of below normal 7-day average streamflow compared to historical stream flow for the day of the year. **Caution:** Flows tend to freeze this time of year resulting in potentially erroneous gauge readings. Source: USGS

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary -- January 16, 2007

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/>.

While the moderate El Niño event continued in the equatorial Pacific Ocean, some expected cold-season anomalies in the contiguous United States had not yet occurred. In most of Florida, an expected El Niño-influenced wet and cool winter hadn't materialized yet; instead, the southern two-thirds of Florida have experienced subnormal rainfall and above-normal temperatures. In the Southwest, although the ENSO 'wet and cool' signal is not as strong in this region, an extremely disappointing rainy season continued in southern California and Arizona. This was punctuated with a severe cold snap (readings below 28°F for an extended time) in California during January 12-16, causing extensive agricultural losses to vulnerable citrus, other fruits, and vegetable crops. In contrast, a slow-moving cold front with several waves of low pressure was the focal point for moderate to heavy precipitation across the nation's midsection, including snow, sleet, and devastating heavy freezing rain in the south-central Plains and lower Missouri Valley. To the east in the milder air, heavy rain fell from eastern Texas northeastward into the eastern Great Lakes region.

The Plains and Midwest: While Arctic air (readings below 0°F, including -30°F in North Dakota) replaced unseasonably mild conditions in the northern Plains and upper Midwest, little or no precipitation accompanied the plunging thermometer. This maintained a thin to spotty or non-existent snow cover in parts of the Dakotas, Minnesota, and northwestern Wisconsin, and drought conditions remained status-quo. Farther south, however, several waves of low pressure formed along the slow-moving cold front, dropping a widespread swath of 2-6 inches of rain (locally up to 8.6 inches) from eastern Texas northeastward into western Pennsylvania, with much of Arkansas receiving over 4 inches. In the colder air, although the moisture was needed in eastern Oklahoma, falling in the form of freezing rain was not (ice accumulations of 1 to 3 inches, locally up to 5), causing numerous large trees and power lines to topple that cut power to over 122,000 customers on Sunday. As a result, conditions improved by one category in the eastern portion of last week's drought area, namely eastern Texas, eastern Oklahoma, southeastern Kansas, and southwestern Missouri.

The South and Appalachians: As the cold front finally gained pace and advanced eastward toward the end of the period, it finally dropped temperatures to more winter-like levels in the eastern third of the nation, but brought little or no precipitation to the mid-Atlantic and Southeast. Before the front dried out, however, it dropped 2-3 inches of rain on the northern part of the D0 area, alleviating abnormal dryness in northern Kentucky and western West Virginia. Farther south, totals of 0.1 to 0.5 inches maintained deficiencies more pronounced at 60- and 90-day periods. In Georgia, a reassessment of blends and products called for removal of most D0(H), except in the northwestern and southeastern sections of the state. Meanwhile, Florida was still waiting for increasing winter rainfall once (and if) an enhanced subtropical jet stream (courtesy of El Niño) becomes established. Instead, another dry and warm week increased short-term deficits in the south, while lingering long-term departures in north-central Florida dropped several USGS river flow gauge readings into the lower 10th percentile for the 7-day, 14-day, and 28-day periods ending January 16. Accordingly, northern Florida was labeled

Weekly Snowpack and Drought Monitor Update Report

'H' for hydrological impacts (low rivers), while southern Florida was labeled 'A' for short-term dryness and increased fire danger (KBDI over 600) as hydrological impacts were negligible around Lake Okeechobee. January is normally the month with the least hydrologic impact due to lower temperatures, lower demand, and lower evaporation, but continued dryness into February could become a concern for Lake Okeechobee.

The West and Rocky Mountains: For a change, much quieter (and drier) weather enveloped the Northwest as Arctic air spilled into the western half of the U.S. A stormy season since November has provided ample precipitation to the Northwest, with water year-to-date basin average precipitation and snow water content (SWC) at or above normal in the Cascades and northern Rockies. In general, basin values decrease farther to the south and east, except where two major December snow storms blanketed the Colorado Rockies and northern New Mexico. With Water Y-T-D basin precipitation between 117% and 150%, and Jan. 16 basin SWC between 102% and 191%, D0 was erased in these two areas.

In the Southwest, anticipated precipitation from the system that eventually hit the nation's midsection was disappointing, with only 0.1-0.4 inches falling on east-central Arizona and northern New Mexico, and little or no precipitation elsewhere. Since October 1, basin precipitation has averaged only half to two-thirds of normal, and Jan. 16 SWC was around half of normal, including the Sierra Nevada and major ranges in Nevada, Arizona, and southwestern New Mexico. Hydrologic concerns are currently negligible in California due to above-normal major reservoir capacity (at 119% of normal capacity on 12/31/06, or at 75% average capacity), thanks in part to a near-record wet 2004-05 rainy season. However, with a very dry 2005-06 rainy season, a poor 2006 summer monsoon, and this year's rainy season that has yet to get established, rain-fed pastures, ranges, streams, and wildlife have all suffered, along with an increased fire danger potential. As a result, where non-hydrological impacts prevailed (most of California), 'A' was designated. Farther east, where both short- and long-term impacts remained (most of Arizona), both 'A' and 'H' were used. In western New Mexico, where lingering long-term impacts remained but short-term moisture was adequate, only 'H' remained.

Hawaii, Alaska, and Puerto Rico: Another stormy week along the south-central Alaskan Coast dropped 3-6 inches of precipitation on the Kenai Peninsula, and around Cordoba, Valdez, and Yakutat, eliminating abnormal dryness in this area. Farther west, although outside the D0 area, a historic snow storm unfolded in parts of western Alaska, where Nome (10.5 inches on January 9) had its snowiest January day on record (previously, 10.1 inches on 1/22/99). The following day was Nome's third-snowiest January day with a 9.7-inch total. Nearby Kotzebue received 21.4 inches of snow on January 10-11.

In Hawaii, after a very dry December (an expected El Niño impact), leeward showers increased early in the week, then somewhat tapered off. Some of the heaviest rain fell on January 8-9, when 24-hour Big Island totals reached 5.15 inches at Kapapala Ranch and 3.67 inches in Glenwood. Hilo also received 5.58 inches January 7-9. On Kauai, 10.43 inches fell at Mt. Waialeale during January 10-12, but other Kauai sites generally measured under an inch. Overall, the showers were enough to prevent further deterioration, but not enough for improvement. In Puerto Rico, heavier showers (more than 2 inches) occurred in west-central and eastern parts while southern sections were drier (0.1-0.4 inches), maintaining D0.

Looking ahead: During the next 5 days (January 18-22), subnormal temperatures will persist over the much of the nation as cold air continues to pour out of Canada. This will be especially true over the southern High Plains where temperatures will average 20-25°F below normal through the weekend. Another weekend snow and icing event is possible over the southern Rockies and south-central Plains as a weak storm system tracks out of the Southwest and

Weekly Snowpack and Drought Monitor Update Report

heads east-northeast. This should bring more rain to the Delta, with parts of the Southeast receiving light to moderate rain. Unfortunately, Florida is expected to remain dry. Farther north, light snow may fall on southern sections of the Midwest and mid-Atlantic. Rather tranquil conditions will continue in the Northwest.

The NWS 6-10 day outlook (January 23-27) calls for below-normal temperatures over the eastern third of the U.S. and southern Texas. The rest of the nation will begin to moderate as a ridge builds from the West Coast eastward into the northern and central Plains. A drier weather pattern will envelop much of the nation, with only the extreme southern U.S., Great Lakes region, and New England expecting near-normal precipitation for the period.

Author: [David Miskus, Joint Agricultural Weather Facility, CPC/NCEP/NWS/NOAA](#)

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 17, 2007