



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

Weekly Report - Snowpack / Drought Monitor Update **Date: 30 October, 2008**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: During the past three days, snowfall accumulations were mostly down from the 9-12 Oct major winter storm that hit Wyoming (fig. 1). Snow-water equivalent percent to date shows well below normal values over much of the West with a few exceptions over the Northern Rockies (Fig. 1a).

Temperature: SNOTEL and ACIS-day station average temperature anomalies were significantly above normal over much of the West during the past week (Fig. 2). Specifically, the greatest positive temperature departures occurred over California (>+10F) and the greatest negative departures occurred over the Eastern Plains of Colorado and New Mexico (<-6F) (Fig. 2a).

Precipitation: Preliminary precipitation totals for the 7-day period ending 29 October shows very little precipitation falling over the West (Fig. 3).

Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the new 2009 Water Year that began on October 1, 2008 shows below normal totals across the West with pockets of above normal amounts in southwest Montana, central Wyoming and eastern Arizona (Fig. 3a). For precipitation totals, departures, and percent of normal for several time periods see: <http://water.weather.gov/> and <http://cig.mesonet.org/~derek/public/droughtmonitoring/>.

WESTERN DROUGHT STATUS

The West: After a quick commencement to the 2008-09 wet season (starting October 1) in the Far West (1 to 4 inches of precipitation during October 4-5 from central California northward), Pacific storm systems have been mostly absent, and the few that occurred were weak and shifted well north. This week was no different as dry and mild weather enveloped the Southwest while dry and cool conditions affected the Northwest. As a result, the slow (dry) start in the Northwest has accumulated 60-day deficits of 3 to 6 inches in parts of western Washington and Oregon, while less than 50% of normal precipitation has fallen on interior sections. October 28 USGS stream flows have dropped below the 25th percentile at many sites, while 47% and 60% of pastures and ranges in Oregon and Washington were rated poor or very poor, according to NASS/USDA. As a result, D0 was expanded westward from central Washington and Oregon to the Cascades.

In addition, although it is still early in the wet season, particular interest will be focused on precipitation and temperatures during the 2008-09 wet season in California. California's reservoir storage slipped below the long-term average during the Spring of 2007 following the miserably dry 2006-07 wet season, and further declined thanks to the record dry Spring of Water Year 2007-08. As of October 1, the storage figure for the state's 151 intrastate reservoirs stood at 70% of average, and 95% of the pastures and ranges were rated very poor or poor. USGS stream flows continue to hover near record low levels, particularly in northern California. Author: David Miskus, Joint Agricultural Weather Facility, CPC/NCEP/NWS/NOAA.

Weekly Snowpack and Drought Monitor Update Report

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, 4a, 4b, and 4c).

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).

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://activefiremaps.fs.fed.us/lq_fire2.php. The latest Observed Fire Danger Class is shown in Figs. 6 shows the current active wildfires across the West - <http://geomac.usgs.gov/>.

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. 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.

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/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/>

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/ NOLLER HERBERT
Director, Conservation Engineering Division

10/30/2008

Page 2 of 19

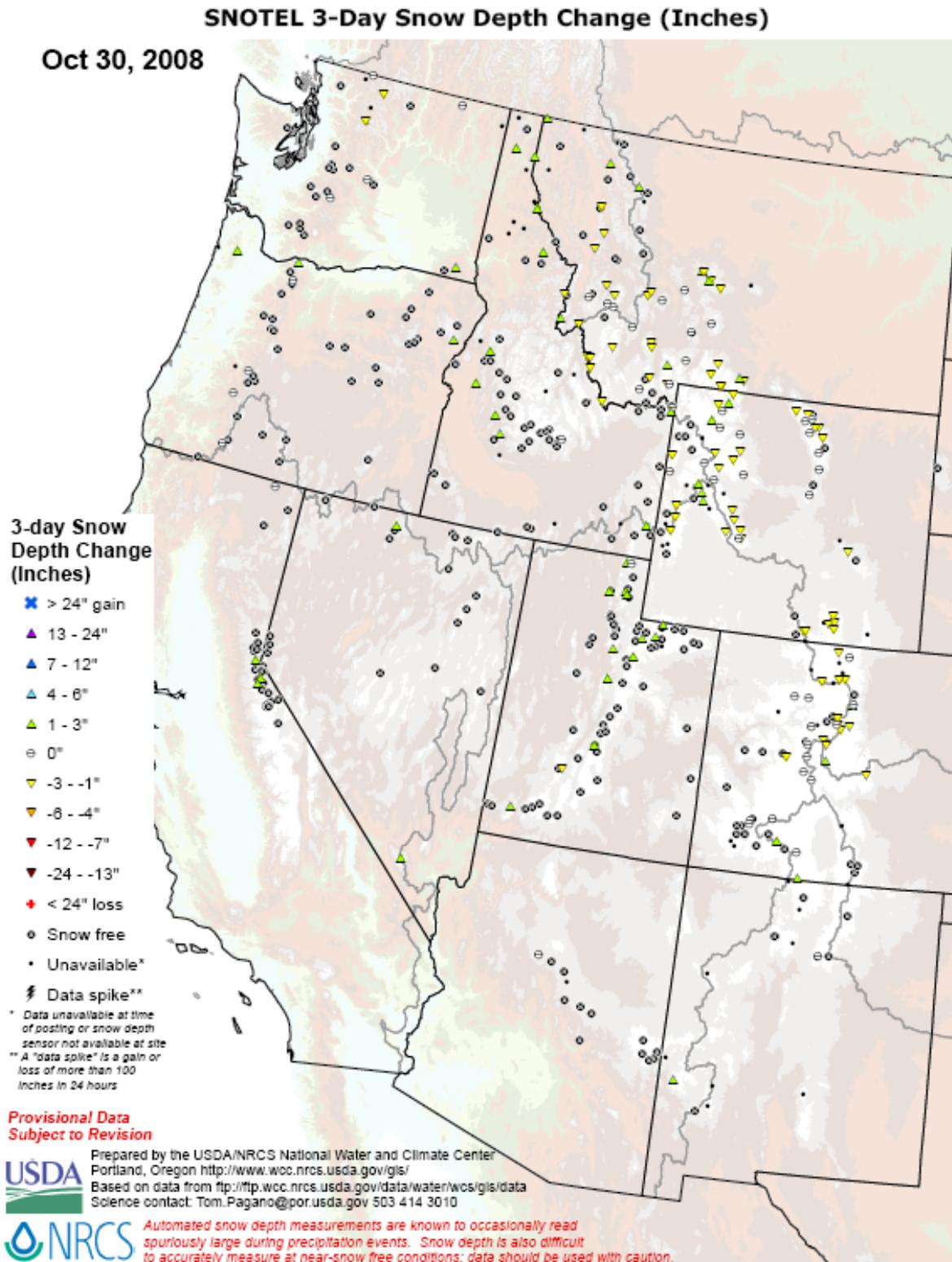


Fig. 1. During the three days, snowfall accumulations were mostly down from the 9-12 Oct major winter storm over Wyoming:
http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=riw&storyid=18588&source=2 and
http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=riw&storyid=18617&source=2
 Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_snowdepth_3ddelta.pdf

Weekly Snowpack and Drought Monitor Update Report

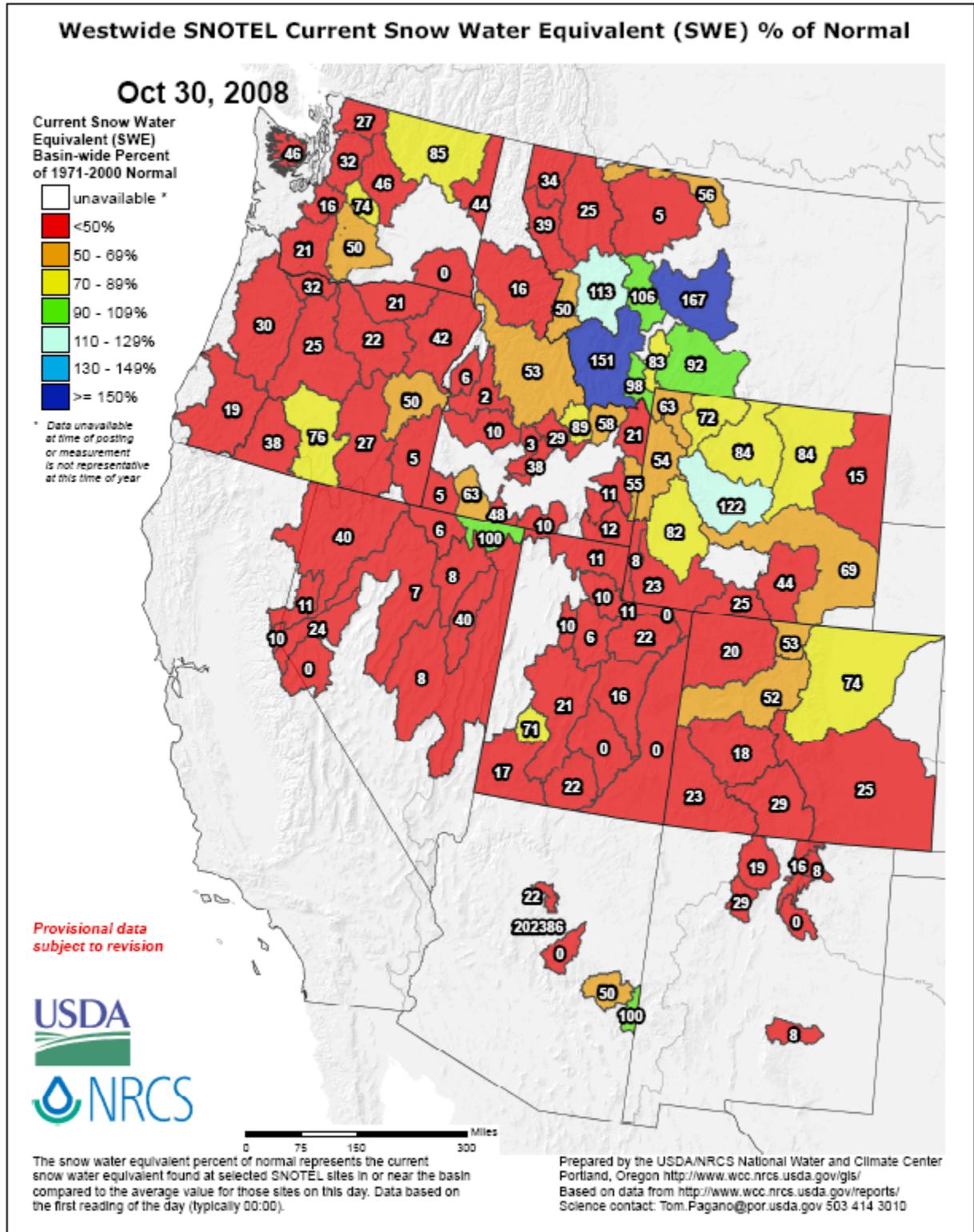


Fig. 1a. Snow-water equivalent percent to date shows well below normal values over much of the West with a few exceptions over the Northern Rockies.

Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_swepctnormal_update.pdf

Weekly Snowpack and Drought Monitor Update Report

SNOTEL (solid) and ACIS (dot-filled) Networks
7-Day Average Temperature Anomaly (Degrees F)

Oct 30, 2008

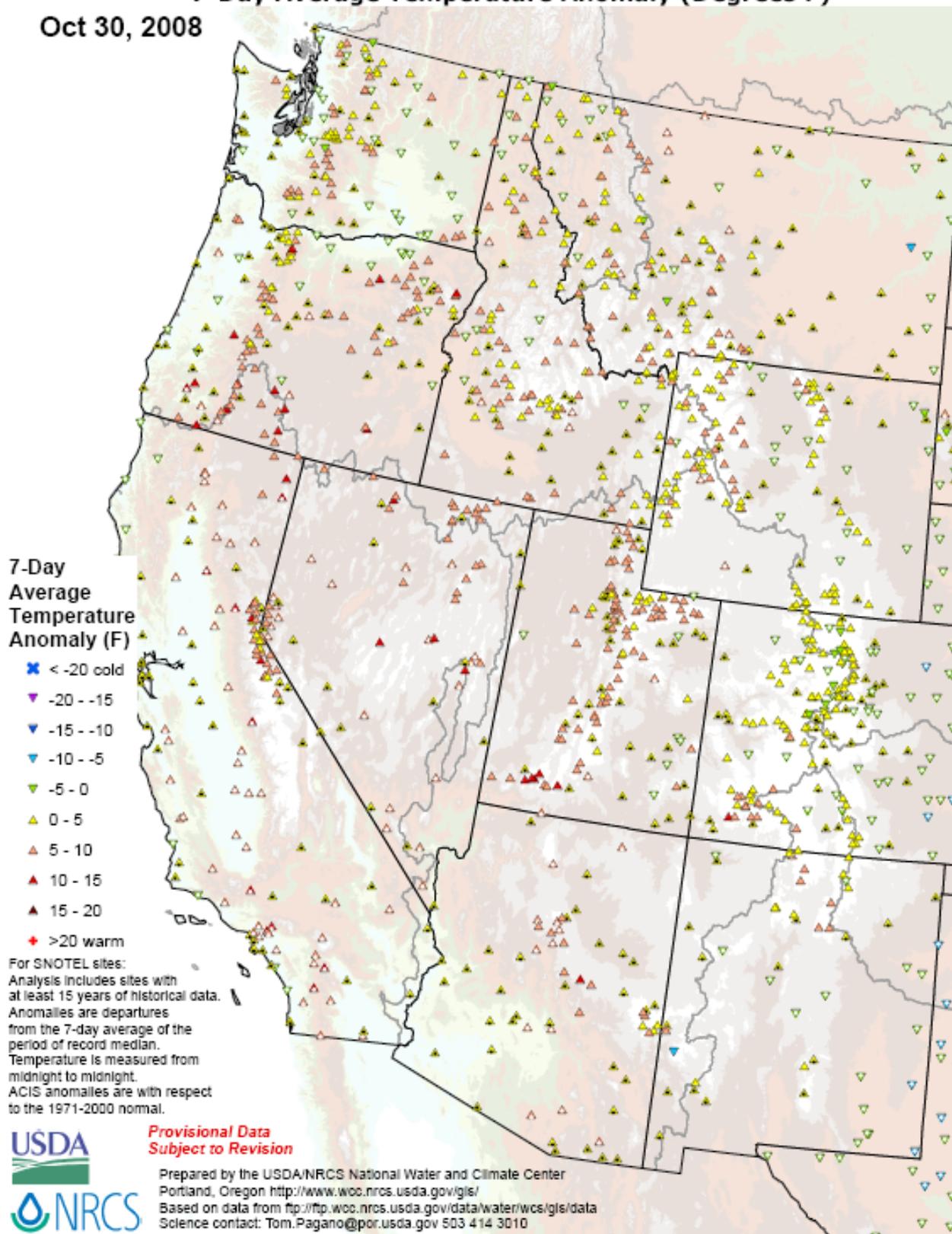
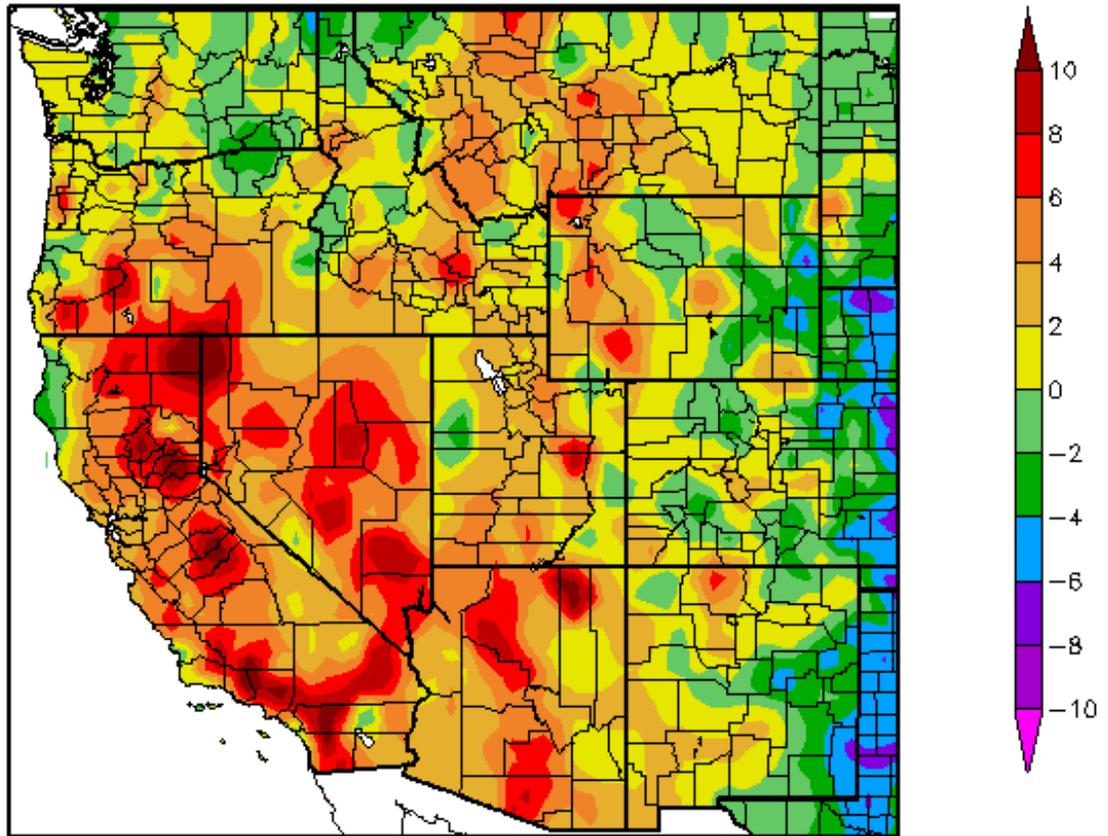


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were significantly above normal over much of the West during the past week.

Ref: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavg7dAnomalyAcis.pdf>

Departure from Normal Temperature (F)
10/23/2008 – 10/29/2008



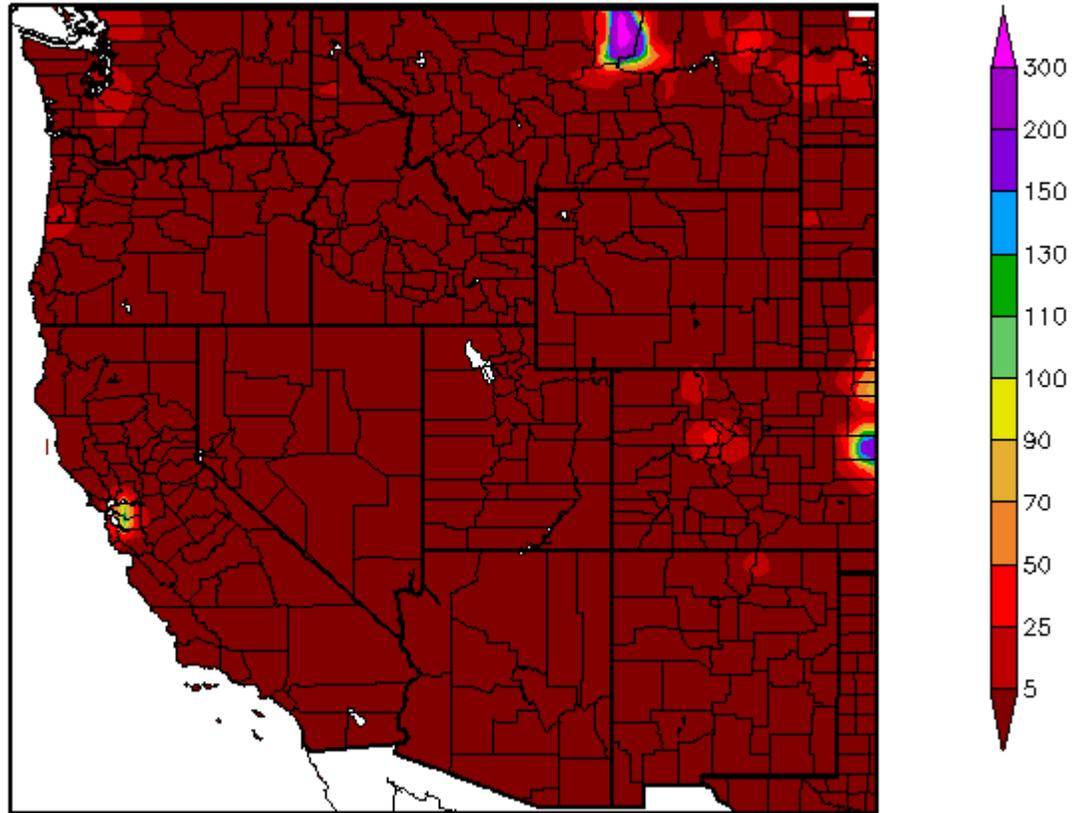
Generated 10/30/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over California (>+10F) and greatest negative departures occurred over the Eastern Plains of Colorado and New Mexico (<-6F).

Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_product&product=TDdept

Percent of Normal Precipitation (%)
10/23/2008 – 10/29/2008



Generated 10/30/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the 7-day period ending 29 October shows very little precipitation falling over the West.

Ref: http://www.hprcc.unl.edu/maps/index.php?action=update_product&product=PNorm

Weekly Snowpack and Drought Monitor Update Report

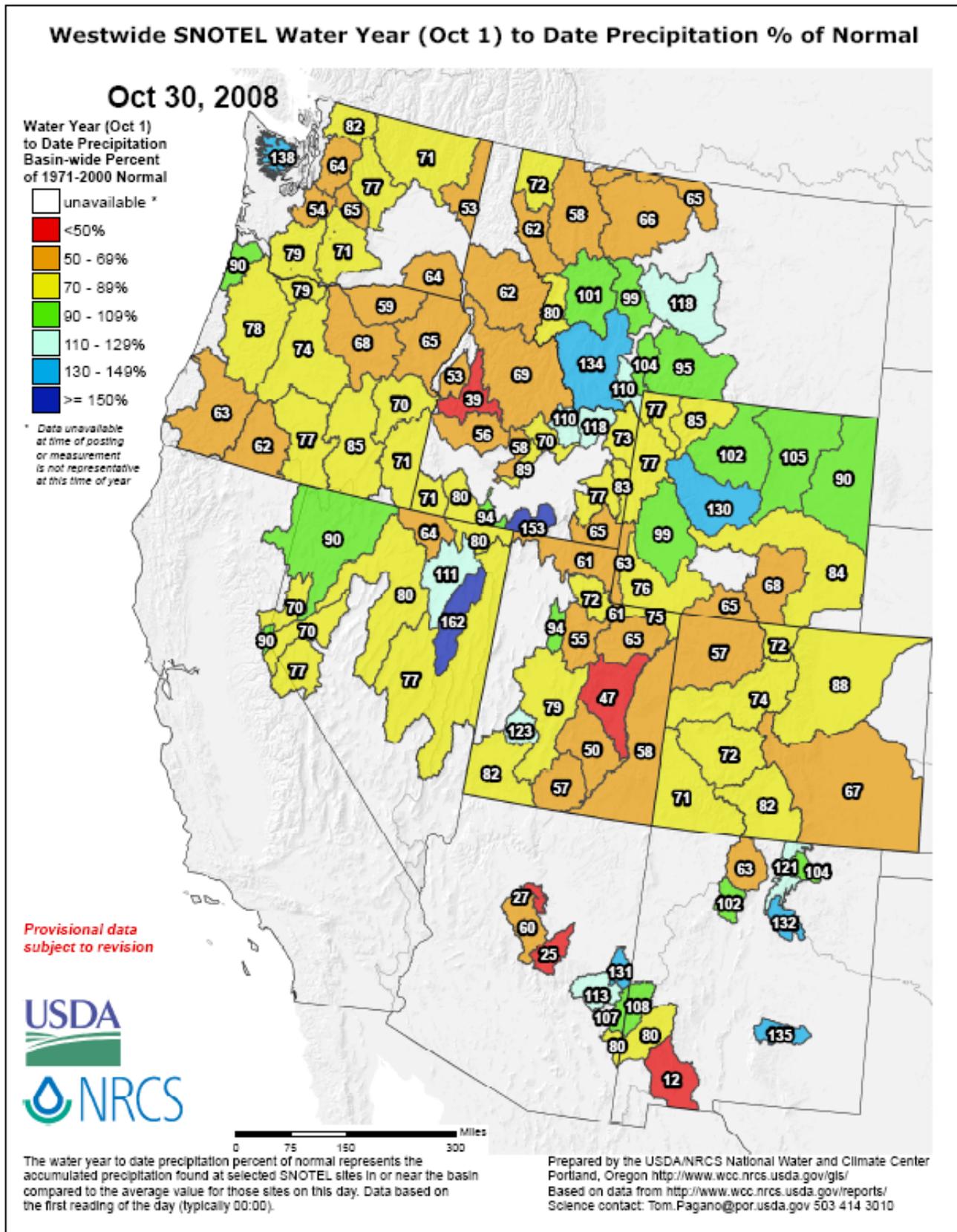


Fig 3a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the new 2009 Water Year that began on October 1, 2008 shows below normal totals across the West with pockets of above normal amounts in southwest Montana, central Wyoming and eastern Arizona.

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

SNOTEL Current Snow Water Equivalent (SWE) Percent of Normal
Oct 30, 2008

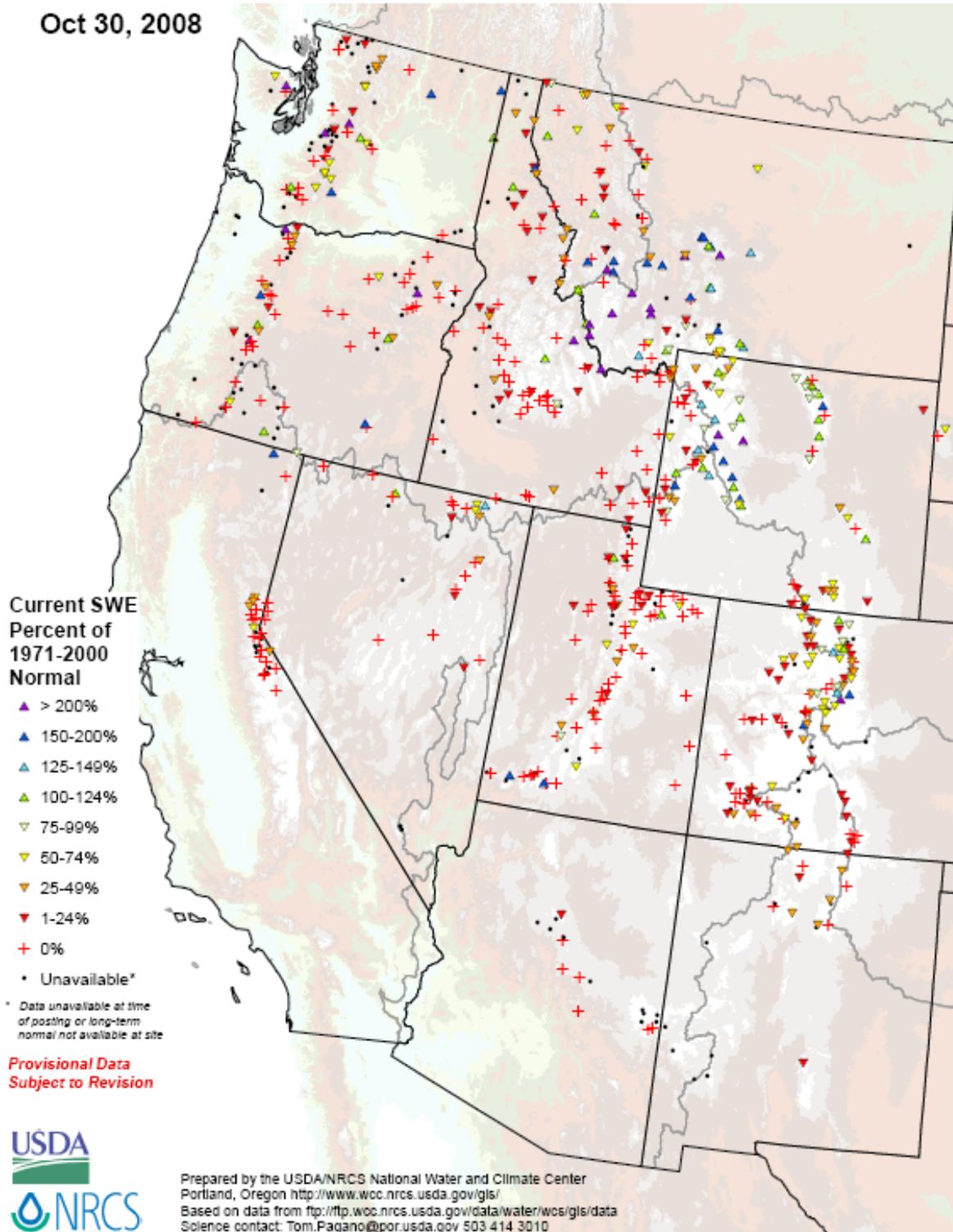


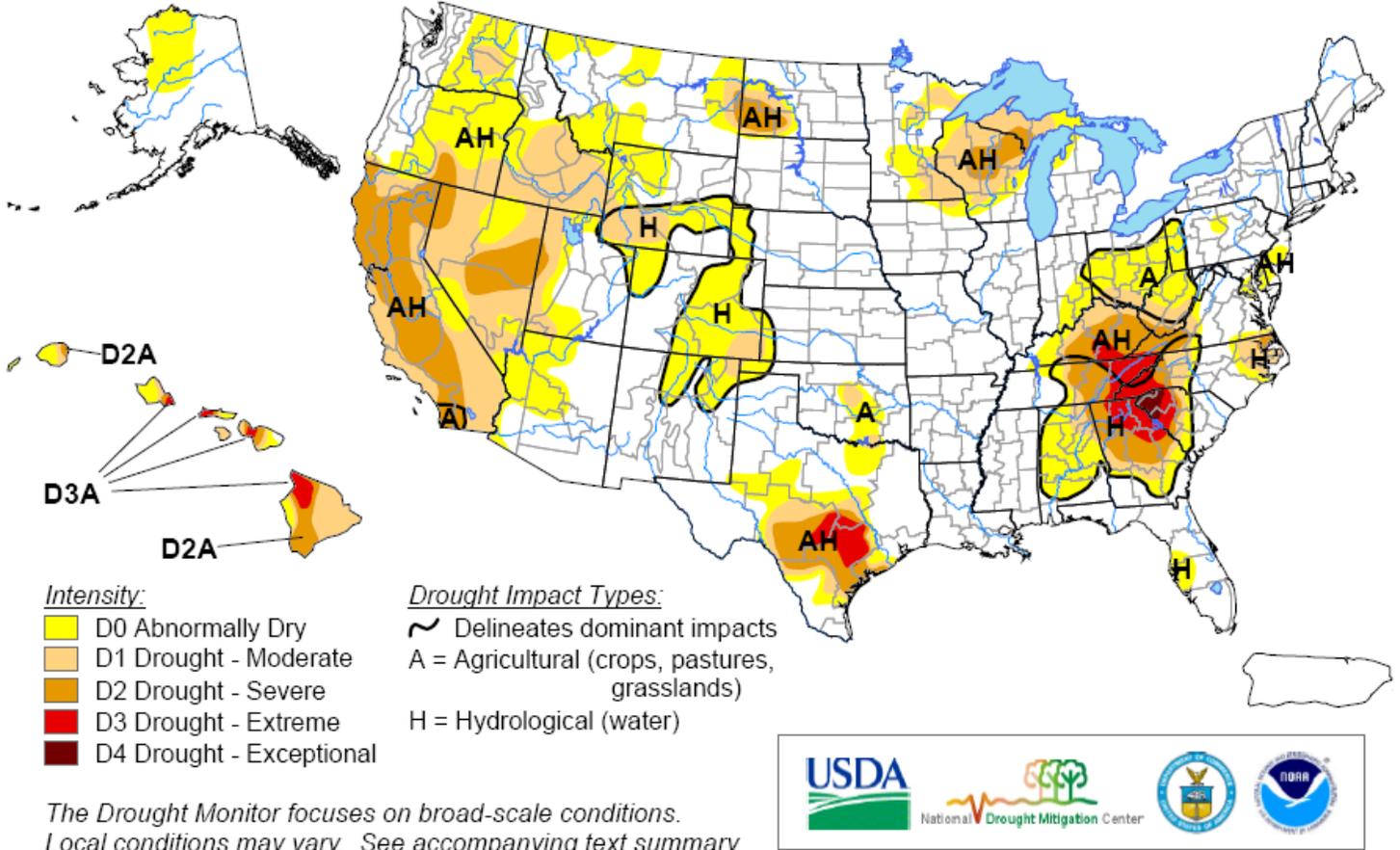
Fig. 3b. Individual SNOTEL station shows (as of today) snow water-equivalent as a percent of normal with only a small portion of the Northern Rockies experiencing above normal values thus far in this early Water Year.

Ref: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideSWEPercent.pdf>

U.S. Drought Monitor

October 28, 2008

Valid 8 a.m. EDT



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, October 30, 2008

Author: David Miskus, JAWF/CPC/NOAA

Fig. 4. Current Drought Monitor weekly summary.

Ref: National Drought Mitigation Center (NDMC) - <http://www.drought.unl.edu/dm/monitor.html>

U.S. Drought Monitor

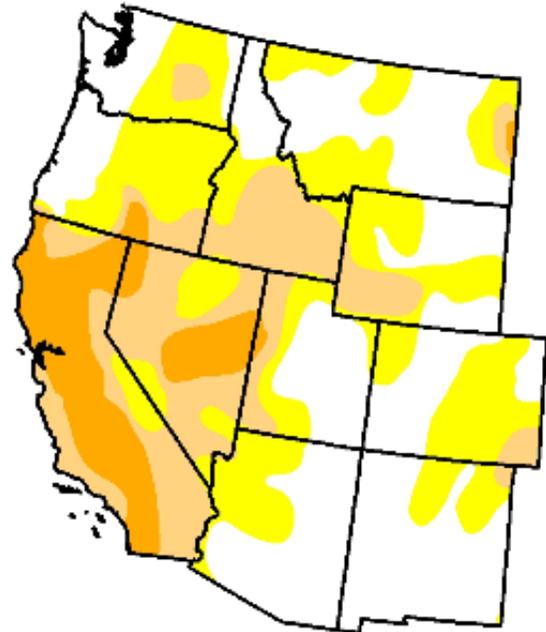
West

October 28, 2008

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	39.9	60.1	30.0	10.4	0.0	0.0
Last Week (10/21/2008 map)	40.5	59.5	30.0	10.4	0.0	0.0
3 Months Ago (08/05/2008 map)	32.2	67.8	31.9	10.5	0.8	0.1
Start of Calendar Year (01/01/2008 map)	26.3	73.7	54.7	33.1	2.7	0.0
Start of Water Year (10/07/2008 map)	41.3	58.7	28.6	10.4	0.1	0.0
One Year Ago (10/30/2007 map)	28.4	71.6	57.4	41.5	10.0	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

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



Released Thursday, October 30, 2008

Author: David Miskus, JAWF/CPC/NOAA

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Note no significant change since last week. Ref: http://www.drought.unl.edu/dm/DM_west.htm

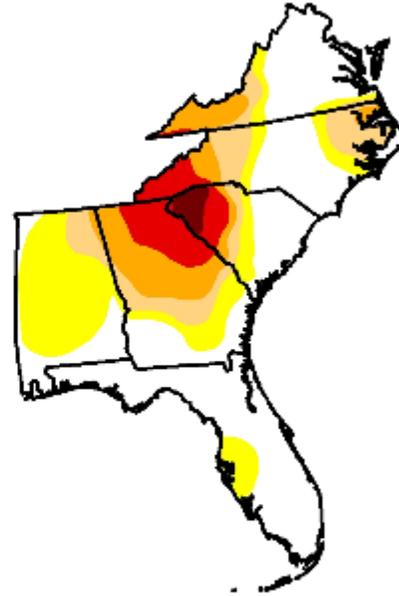
U.S. Drought Monitor

Southeast

October 28, 2008
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	48.8	51.2	30.0	19.1	8.8	1.3
Last Week (10/21/2008 map)	35.4	64.6	35.5	22.5	9.6	1.3
3 Months Ago (08/05/2008 map)	23.0	77.0	57.0	35.0	13.8	6.3
Start of Calendar Year (01/01/2008 map)	9.6	90.4	74.3	58.5	41.0	22.0
Start of Water Year (10/07/2008 map)	35.2	64.8	41.8	20.8	9.4	1.9
One Year Ago (10/30/2007 map)	14.8	85.2	66.7	46.3	31.3	18.5



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, October 30, 2008
Author: David Miskus, JAWF/CPC/NOAA

Fig. 4b: Drought Monitor for the Southeastern shows some improvement since last week. A small area of D4 continues over NW South Carolina. Ref: http://www.drought.unl.edu/dm/DM_southeast.htm

Drought Monitor Classification Changes for Selected Time Periods

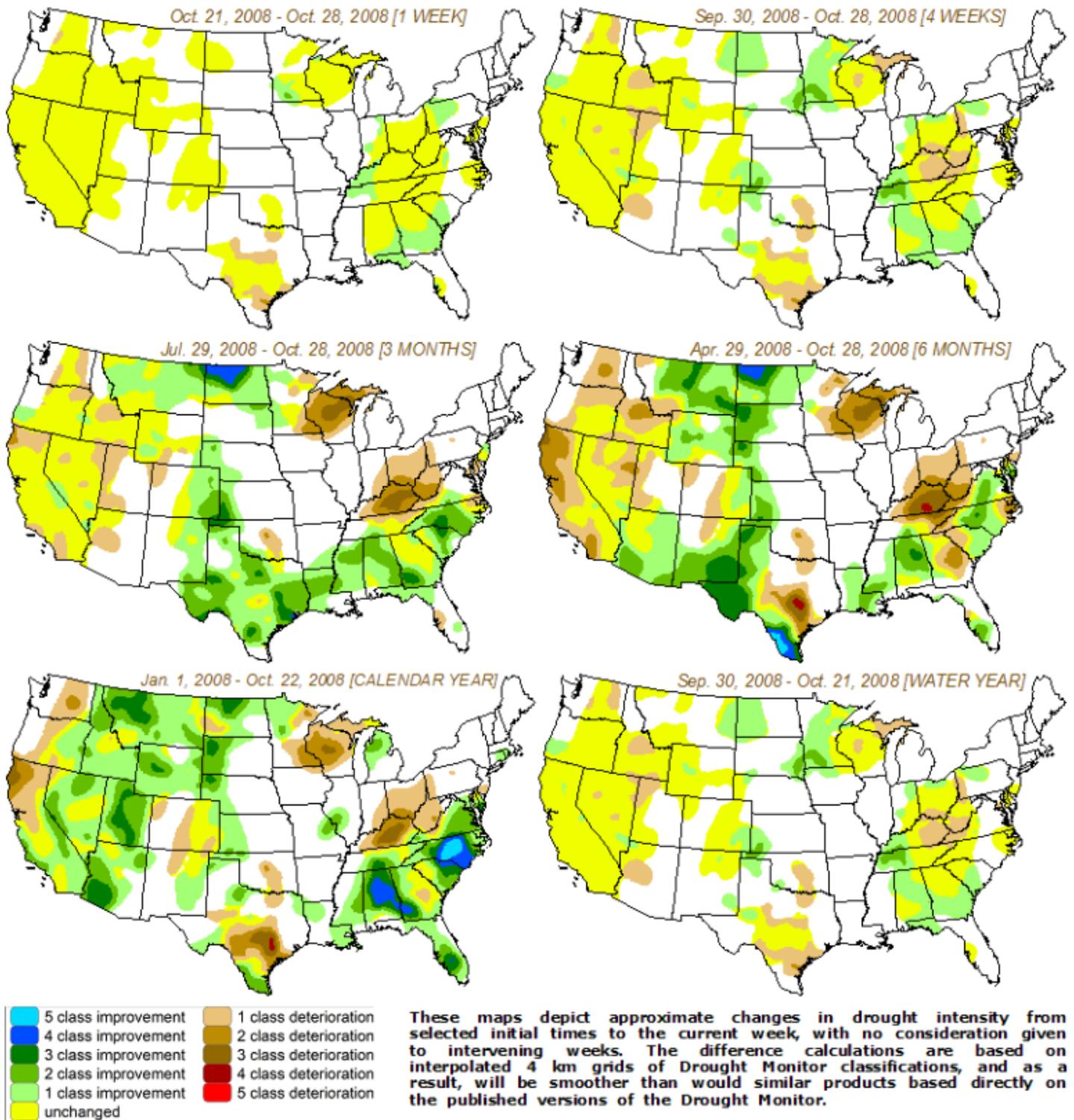
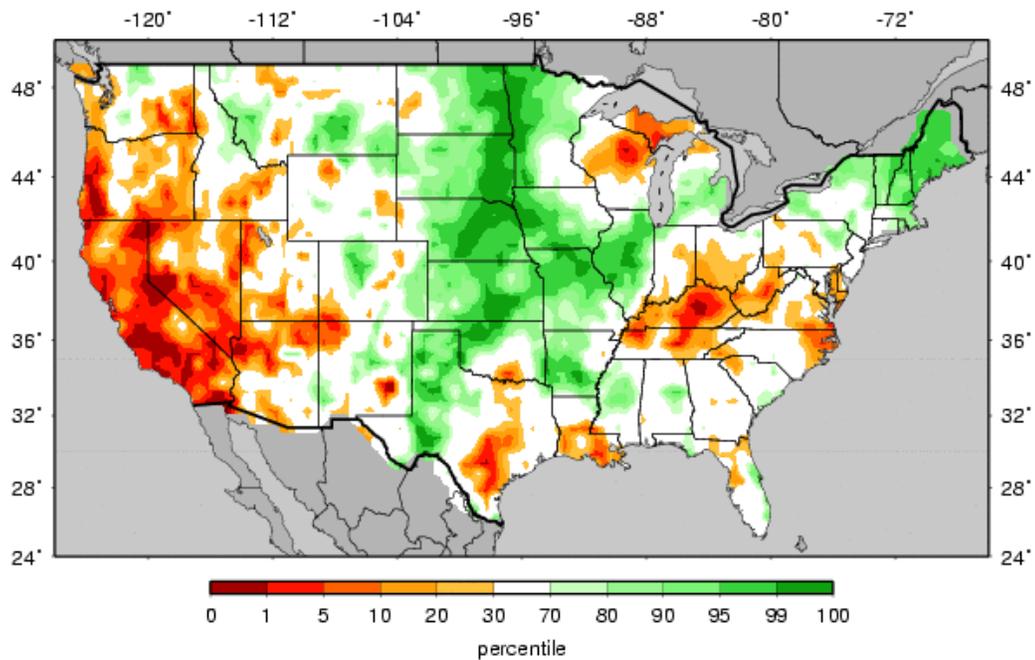


Fig. 4c: Drought Monitor Classification Changes for Selected Time Periods.

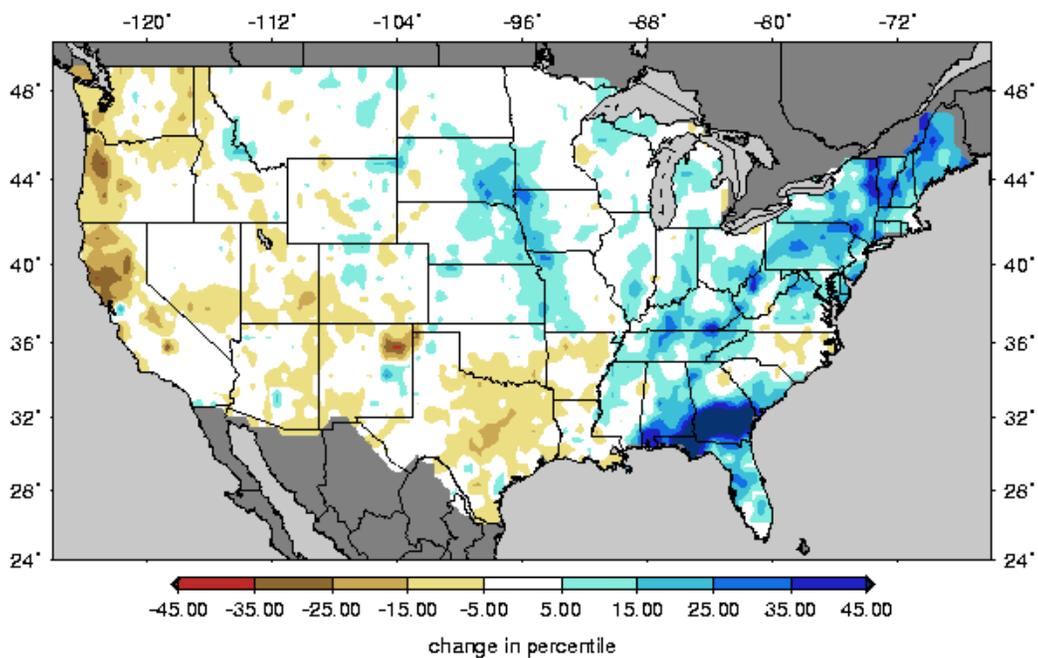
Ref: <http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/dm-change-4maps.png>

Weekly Snowpack and Drought Monitor Update Report

MULTIMODEL Soil Moisture Percentiles (wrt/ 1920-2003)
20081028



Change in Soil Moisture Percentiles (wrt/ 1915-2003)
for the week 20081021 to 20081028



Figs. 5a & 5b: Soil Moisture Ranking and change in percentile based on 1915-2003 climatology for this past week. The driest conditions persist over Kentucky, Tennessee, northern Wisconsin, California, and Oregon while the wettest conditions are occurring over the Central Plains, and much of northern New England (Fig. 5a). Last week saw a significant decrease in moisture over northern California and western Oregon while increases are noted over much of the Eastern States (Fig 5b).

Ref: http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.multimodel.sm_qnt.gif
http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.vic.sm_qnt.1wk.gif

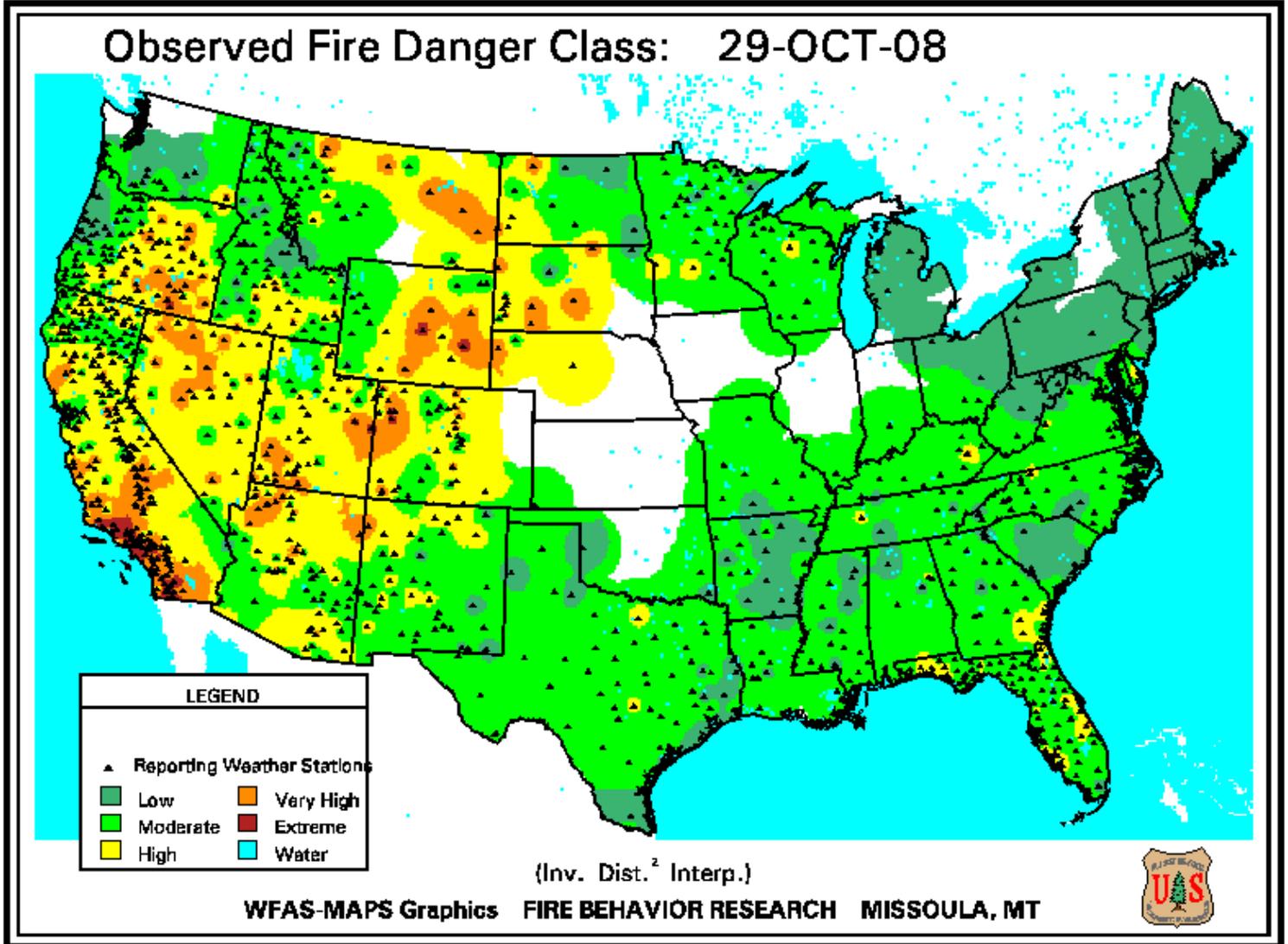
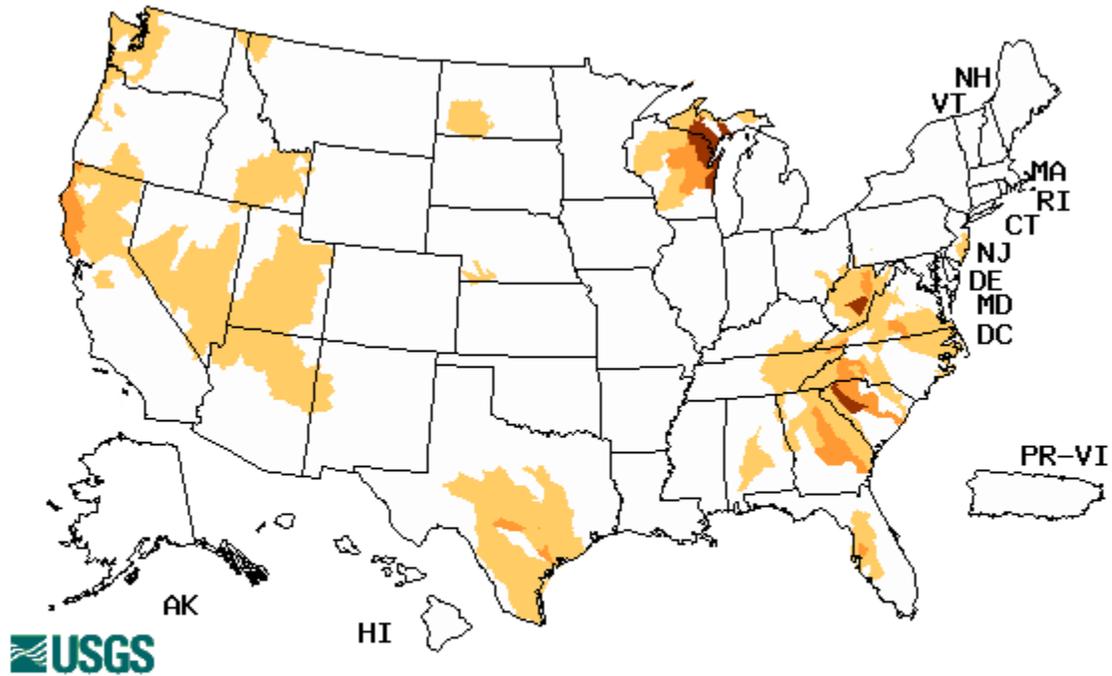


Fig. 6. Observed Fire Danger Class. Note high fire threat persists over southern California while worsening conditions have developed over much of the Rockies since last week. Source: Forest Service Fire Behavior Research – Missoula, MT. Ref: http://www.fs.fed.us/land/wfas/fd_class.gif

Weekly Snowpack and Drought Monitor Update Report

Wednesday, October 29, 2008



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 streamflow for the day of year. Note persistent low flows over the Central Appalachian Mountains, Southeastern States, and Wisconsin-Upper Peninsula of Michigan. Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary – October 28, 2008

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/>.

Weather Summary: A vigorous upper-air low slowly tracked northeastward from the central Plains into the Northeast, bringing widespread rainfall to much of the eastern half of the Nation. Over 2 inches of precipitation fell on the middle and lower Missouri Valleys, along the eastern Gulf and southern Atlantic Coasts, and in the Northeast. In contrast, high pressure kept the West and Rockies dry, while rain bypassed the southern Plains. Subnormal temperatures were the norm throughout most of the lower 48 States, except for unseasonable warmth in the Southwest.

The Southeast, Tennessee and Ohio Valleys, and mid-Atlantic Coast: In the Midwest, rain from the weakening upper-air low and associated cold front dropped 0.5 to 1.5 inches of rain on the Ohio and Tennessee Valleys. Scattered, heavy showers (more than 2 inches) also occurred in northern Mississippi and west-central Tennessee, and at a few locations in the southern Appalachians and Virginia Piedmont. Meanwhile, a wave of low pressure developed along the southern section of the cold front in the Southeast, becoming the focal point for heavy rains (2 to 4 inches, locally to 8 inches near Charleston, SC) along the eastern Gulf and southern Atlantic Coasts. Later in the weekend, a strong upper-air low formed off the mid-Atlantic Coast along the northern extent of the cold front and moved northward, dumping widespread heavy precipitation (including high-elevation snows) on much of the Northeast.

Where the rains exceeded 2 inches, a one category improvement was made to some D0 and D1 areas, including southern Alabama, the Florida Panhandle, southern Georgia, and eastern South Carolina. Some reduction of drought (mostly D0, some D1) was also made along the western and northern edge of the core Southeast drought region where 1.5 to 2.5 inches fell (western Tennessee, western Kentucky, central Indiana, northern Ohio), but the main D2-D4 region remained intact. Rainfall was generally too spotty and light (less than an inch) to provide much relief from the long-term drought, and the USGS stream flow values (1-, 7-, 14-, and 28-days) remained at or near record low flows as of October 28. In southwestern Virginia and northwestern North Carolina, however, 1 to 3 inches fell, and minor improvements were made there. In contrast, D1 extended northward into southeastern West Virginia (Pocahontas County) as less than 0.5 inches was measured. In addition, the D0(A) region in the eastern Ohio Valley and mid-Atlantic was pared away, especially in central Pennsylvania and central New Jersey where 1.5 to 2.5 inches of precipitation fell. The rainfall was enough to prevent a developing area of D0 in the mid-Atlantic, but not enough to relieve existing drought in the remainder of the Delmarva Peninsula and eastern North Carolina. Finally, continued showers warranted the removal of the small D1(A) area near Tampa, FL area, but since USGS stream flows remained in the lower 10th percentile, D0(H) was maintained in west-central Florida.

Great Lakes Region and upper Midwest: As the slow-moving upper-air low tracked eastward away from the central Great Plains, light to moderate precipitation fell on much of the Midwest and Great Lakes region Thursday into Friday. Most of the D0-D2 drought area in the upper Midwest generally received less than an inch of precipitation, including the core D2 region in north-central Wisconsin that measured under 0.5 inches. Even with the recent rain, less than 70% of normal precipitation has fallen during the past 90-days from southeastern Minnesota northeastward into the Upper Peninsula of Michigan, creating shortages of 4 to 8 inches. In this

Weekly Snowpack and Drought Monitor Update Report

area, USGS stream flows remained in the lower 10th percentile, with a few sites at record low levels, for 1-, 7-, 14-, and 28-days ending October 28. Accordingly, status-quo was applied to this region. In contrast, 1 to 2.5 inches of rain fell on southwestern Minnesota, alleviating D0 and improving D1 by a category.

The Plains: Early in the week, a slow-moving, upper-air low produced a widespread swath of 1 to 4 inches of precipitation from northern Oklahoma and southwestern Missouri northward into western Minnesota and eastern South Dakota, including light snow in parts of Nebraska and Kansas. Unfortunately, the bulk of the heavy precipitation missed most of the Plains drought areas, except in eastern South Dakota and far western Kansas where D0 was erased. Elsewhere, subnormal temperatures, light precipitation (0.1 to 0.5 inches), and little to no evapotranspiration maintained conditions in the northern and central High Plains.

In contrast, another week of dry and windy, albeit cool, weather further deteriorated moisture conditions in the southern Great Plains, especially in south-central Oklahoma, northern and south-central Texas. With October normally the second wettest month of the year in much of Texas, decent rains have fallen on the Panhandle and eastern sections, but have largely missed many areas in-between, particularly south-central sections. During the past 90- and 180-days, deficiencies of 4 to 8 and 8 to 16 inches, respectively, have accumulated between Austin and Corpus Christi. Since the start of the year, Austin/Bergstrom, San Antonio, and Victoria have deficits of 13.31, 14.54, and 14.37 inches, respectively, or around half of normal precipitation. Around Sweetwater, TX region, county extension agents reported adverse growing conditions to emerged small grains or delayed planting of small grains due to dryness caused by light, spotty September and October rains. Accordingly, D3 was extended northward into Burnet and Williamson counties, and D2 reached southeastward to the Gulf Coast and increased to the west of San Antonio. D1 now covered most of Texas climate division (cd) 6 and pushed into southern cd 3, while D0 developed in the Dallas-Ft. Worth and slightly expanded outward in south-central Texas drought area.

The West: After a quick commencement to the 2008-09 wet season (starting October 1) in the Far West (1 to 4 inches of precipitation during October 4-5 from central California northward), Pacific storm systems have been mostly absent, and the few that occurred were weak and shifted well north. This week was no different as dry and mild weather enveloped the Southwest while dry and cool conditions affected the Northwest. As a result, the slow (dry) start in the Northwest has accumulated 60-day deficits of 3 to 6 inches in parts of western Washington and Oregon, while less than 50% of normal precipitation has fallen on interior sections. October 28 USGS stream flows have dropped below the 25th percentile at many sites, while 47% and 60% of pastures and ranges in Oregon and Washington were rated poor or very poor, according to NASS/USDA. As a result, D0 was expanded westward from central Washington and Oregon to the Cascades.

In addition, although it is still early in the wet season, particular interest will be focused on precipitation and temperatures during the 2008-09 wet season in California. California's reservoir storage slipped below the long-term average during the Spring of 2007 following the miserably dry 2006-07 wet season, and further declined thanks to the record dry Spring of Water Year 2007-08. As of October 1, the storage figure for the state's 151 intrastate reservoirs stood at 70% of average, and 95% of the pastures and ranges were rated very poor or poor. USGS stream flows continue to hover near record low levels, particularly in northern California.

Alaska and Hawaii: In Alaska, a storm system brought between 0.3 to 0.6 inches of precipitation (liquid equivalent) to northwestern Alaska, easing D0 conditions along the coast. Further inland, however, little or no precipitation fell, maintaining abnormal dryness there.

In Hawaii, showers fell on the westernmost islands of Kauai and Oahu, especially on Oahu during the weekend, but the totals (0.5 to 3 inches, with up to 5.38 inches at Oahu Forest NWR)

Weekly Snowpack and Drought Monitor Update Report

were not enough to bring reservoirs and groundwater levels back to where they needed to be, keeping conditions status-quo.

Looking Ahead: During the next 5 days (October 30-November 3), an upper-air low over New England will weaken as high pressure builds in, bringing more seasonable temperatures and drier conditions to the Northeast over the next few days. Mostly dry conditions will prevail across the rest of the U.S., with unseasonable warmth in the West, gradually spreading eastward into the Plains. A cold front will sweep across the upper Midwest and Great Lakes region this weekend, bringing light precipitation and dropping temperatures after a brief warm-up on Thursday. Finally, a strong system approaching the West Coast will bring heavy precipitation (more than 4 inches) and cooler air to the Pacific Northwest and the northern half of California over the weekend, then slowly move into the Great Basin and northern Rockies next week. Unfortunately, the Southwest will remain mostly dry.

The CPC 6-10 day forecast (November 4-8) calls for subnormal temperatures in the western third of the Nation and unseasonable warmth in the northeastern quarter of the U.S. Unsettled, wet weather is expected in the western two-thirds of the country (except for near-normal precipitation in the Southwest), while subnormal precipitation is forecast for the Northeast and coastal mid-Atlantic. Alaska is expected to be cold and dry.

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 29 October 2008