United States Department of Agriculture

NRCS

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

Weekly Report - Snowpack / Drought Monitor Update Date: April 26, 2007

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snowpack: For the 2007 Water Year, snow water-equivalent (SWE) is still above average over isolated portions of the Northern Cascades (WA) and Colorado Front Range (Fig. 1). Elsewhere, the mountain snowpack season is quickly coming to a close. For the week, SWE did rebound a bit over most of the West excluding the Central and Northern Cascades (Fig. 1a). Snow depths increased across the Central Rockies (CO, WY) but elsewhere were generally down a foot (Fig. 1b).

Temperature: During the past seven days, temperatures ranged within 5°F of normal across the West (Fig. 2). During the past 24 hours, cooler than normal temperatures dominated the Pacific Northwest while warmer than normal temperatures occurred along the eastern slope of the Rockies (Fig. 2a). High pressure will continue to build during the next few days and will result in much above normal temperatures over the Rockies and Intermountain West.

Precipitation: During this report period, a pair of vigorous Pacific storm systems brought beneficial precipitation and cool weather to many parts of the West, including much of California, the Sierra Nevada, and the north-central Rockies and High Plains. Precipitation (rain and SWE) greater than an inch occurred over the West Coast, much of Idaho, and the Northern Rockies (MT, WY, CO) (Fig. 3). For the Water Year, precipitation has been near normal over the Cascades, above normal over portions of the Northern Rockies (MT), Central and South Rockies (CO, NM). Elsewhere, large deficits persist, especially over southern California and western Arizona (Fig. 3a).

WESTERN DROUGHT STATUS

The West: Once again, unusual weather occurred across the West, but this time it was welcome and beneficial. With an upper-air trough of low pressure locked over the West, a pair of strong Pacific storm systems slowly traversed the West, dropping unseasonably heavy precipitation along the Pacific Coast (including southern California), on the Sierra Nevada, southern Cascades, north-central Rockies, and Utah's Wasatch Range. In addition, much cooler conditions enveloped the West, with temperatures averaging 3 to 10°F below normal, slowing snowmelt in the mountains. With 2 to 3 inches of precipitation in northwestern California and Sierra Nevada, D0(A) and D1(A) were edged eastward to reflect short-term moisture improvement. NASS/USDA reported that the recent rains in California improved ranges where grasses were still viable. In addition, much of Idaho, Montana, northern Wyoming, and northern Nevada measured over an inch of precipitation. The storms increased both the season-to-date (STD) average basin precipitation percentage and the April 23 snow water content (SWC) percent of normal as compared to the April 17 values, in some cases by 5-10 points or more. For example, STD average basin percent of normal precipitation increased by at least 5 percentage points in northern and eastern Nevada and southern Idaho, bringing values close to normal, and some improvement was made. The April 23 average basin SWC increased by at least 10 points in southern Oregon, southern Idaho, and parts of Nevada, but values were still below to much below normal. Similarly, average basin STD percent of normal precipitation and SWC increased a few points across much of Idaho and western Montana, but

values still remained below normal, thus maintaining status quo. Even in parched southern California, the heaviest rain of the season arrived on April 20, with downtown Los Angeles netting 0.50 inches, its wettest day since May 22, 2006. Despite the recent rain, Los Angeles remained on course for its driest water year on record (3.17 inches during July 1-April 24; the old record is 4.42 inches during 2001-02). Unfortunately, little or no precipitation fell on southeastern California, southern Nevada, and most of Arizona and New Mexico. Although the desert Southwest relies on the Colorado River for water supplies, it has been an exceptionally dry water year. For example, Imperial, CA, and Yuma, AZ, have only measured 0.05 and 0.26 inches of rain, or 3% and 6% of normal, respectively, since October 1, 2006 (Figs. 4 and 4a).

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, and 4a).

SOIL MOISTURE
Soil moisture (Fig. 5), 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://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. 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/ DANIEL MEYER
Acting Director, Conservation Engineering Division

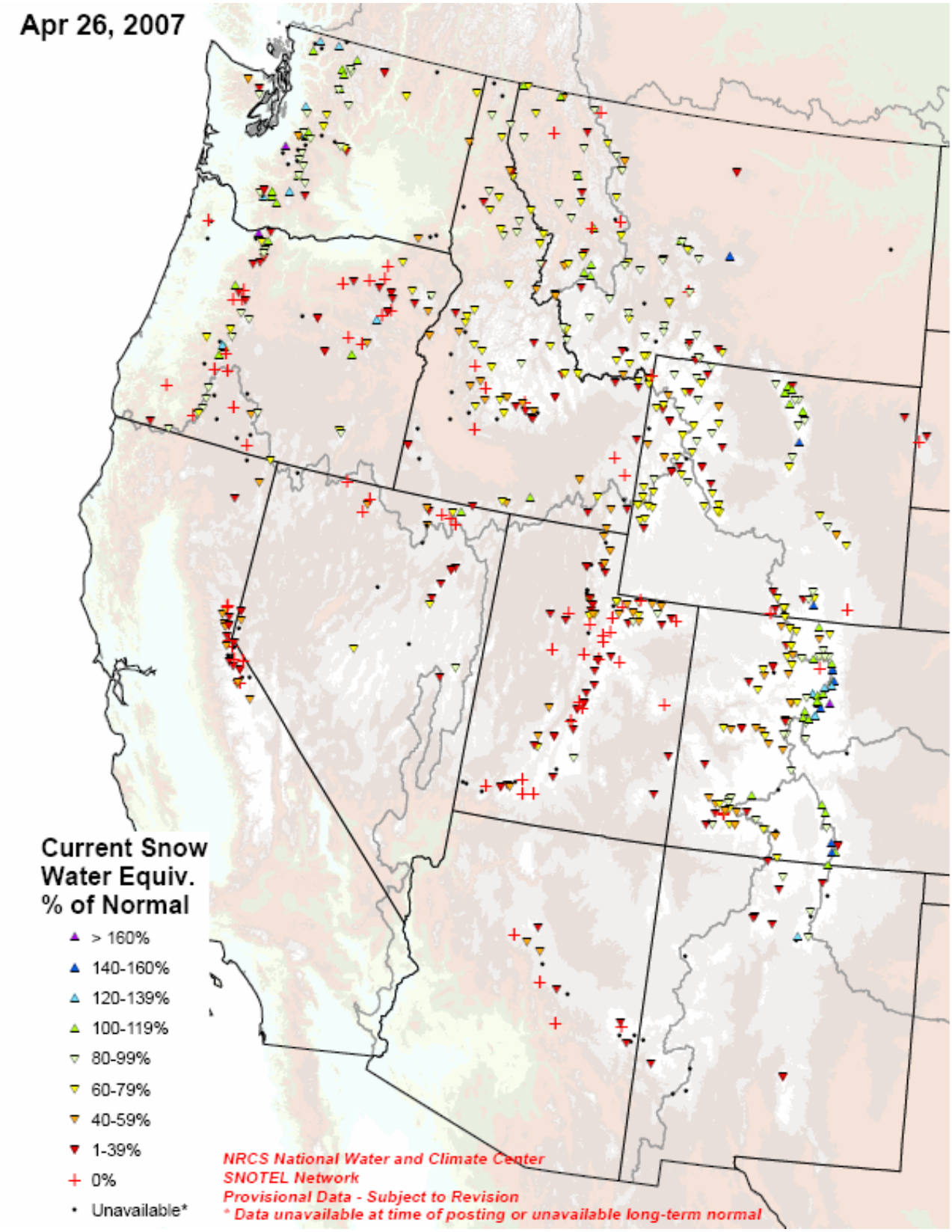


Fig. 1: Snow Water-Equivalent as a percent of normal for Water Year 2007.
Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideSWEPercent.pdf

Weekly SWE Change

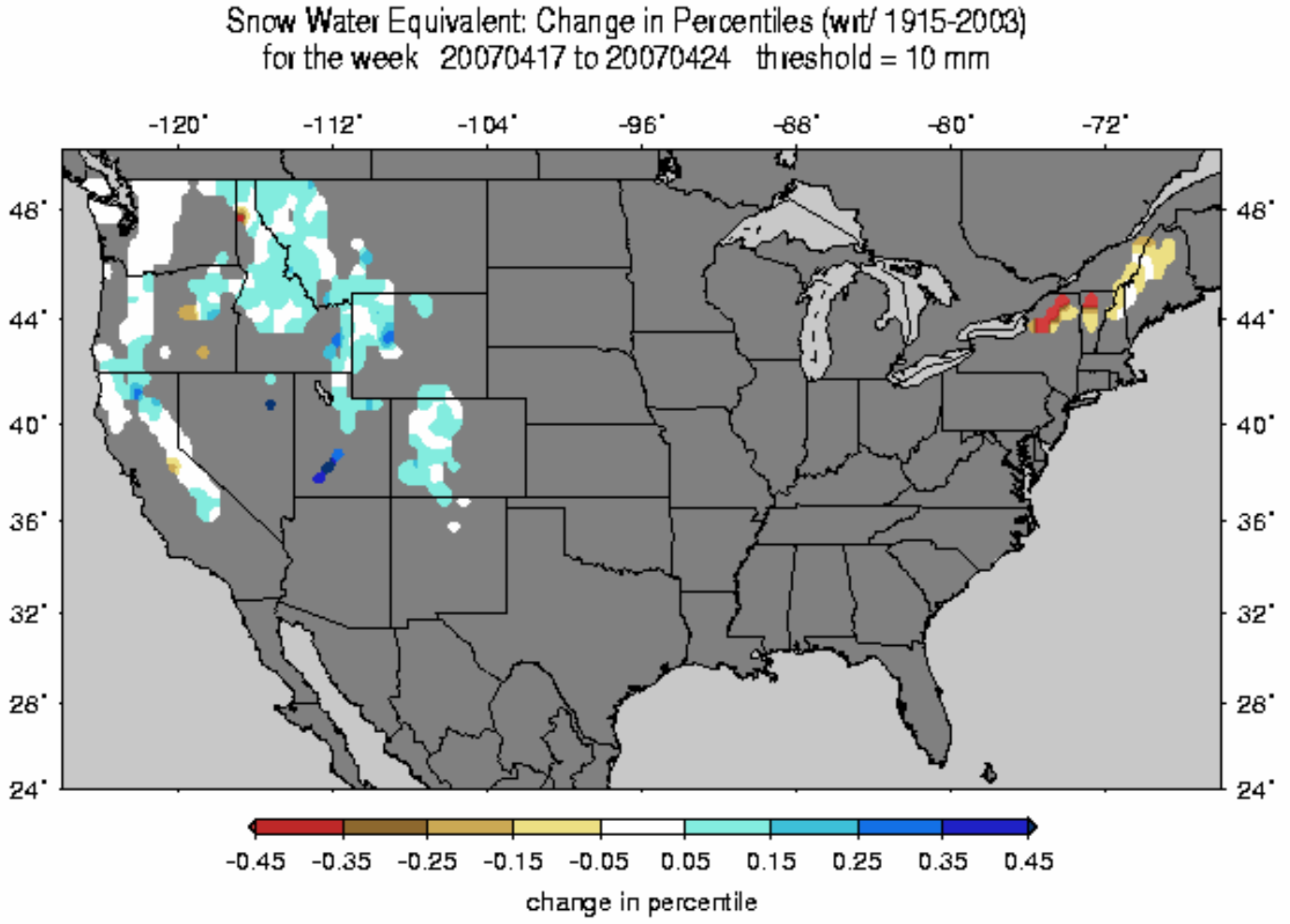


Fig. 1a. Snow Water-Equivalent changes as a percent during the period 17 to 24 April 2007 based on 1915-2003 climatology. Note the slight enhanced SWE overmuch of the West.
Ref: http://www.hydro.washington.edu/forecast/monitor/index.shtml

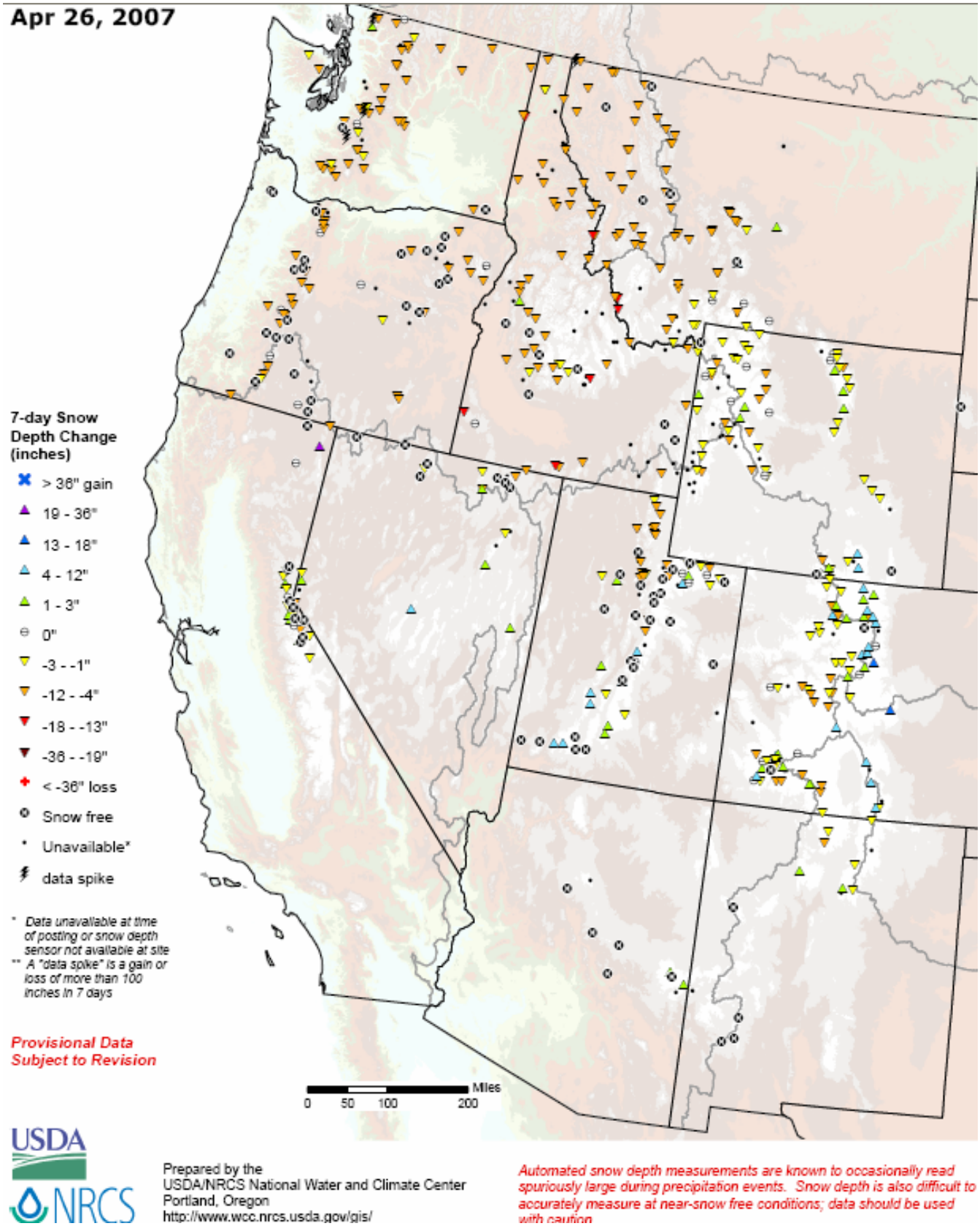


Fig. 1b. SNOTEL 7-day snow depth change reflects recent Northern Rockies spring snowstorm.
Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavg7dAnomaly.pdf

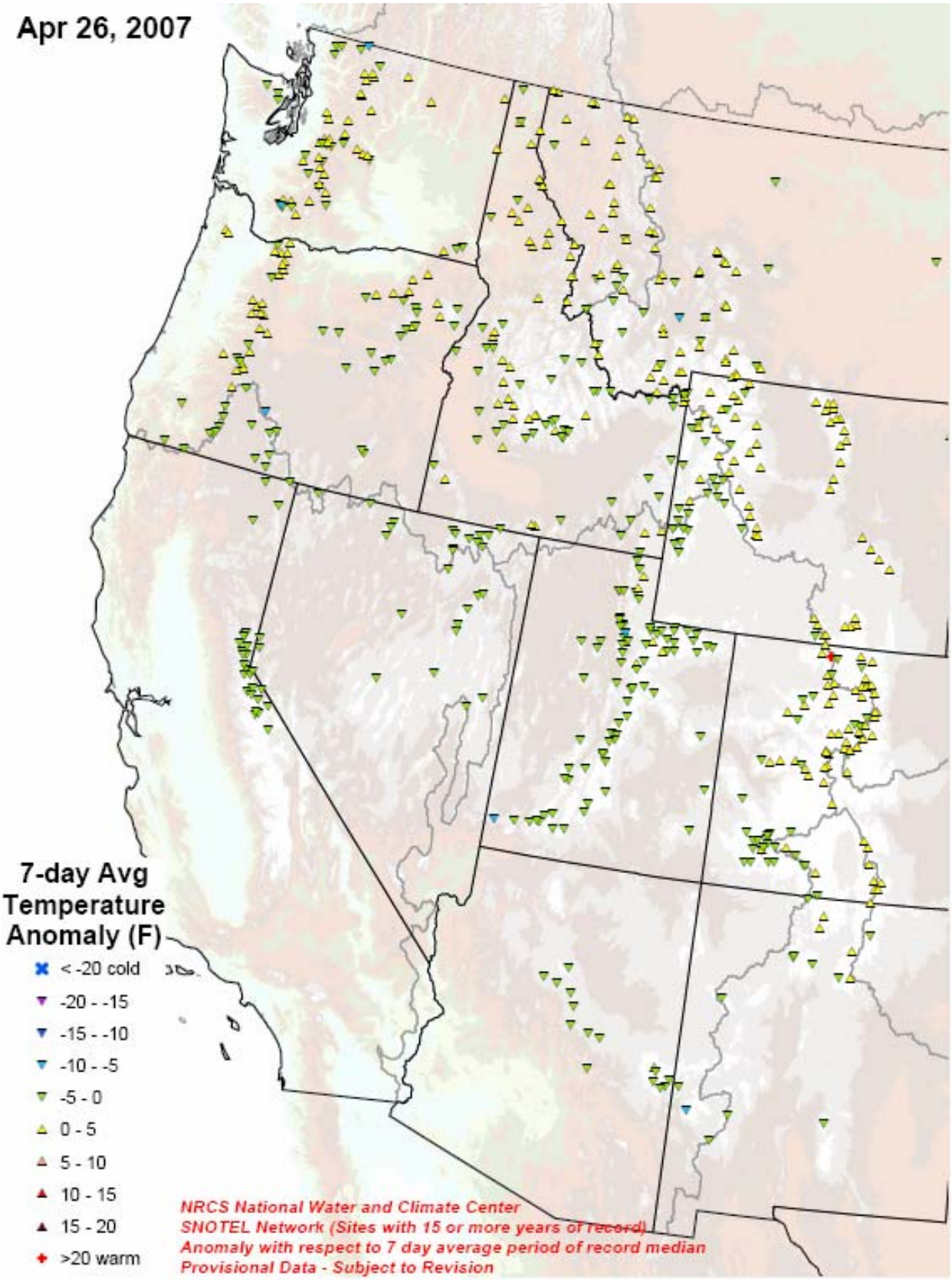


Fig. 2. SNOTEL 7-day average temperature anomaly.
Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavg7dAnomaly.pdf

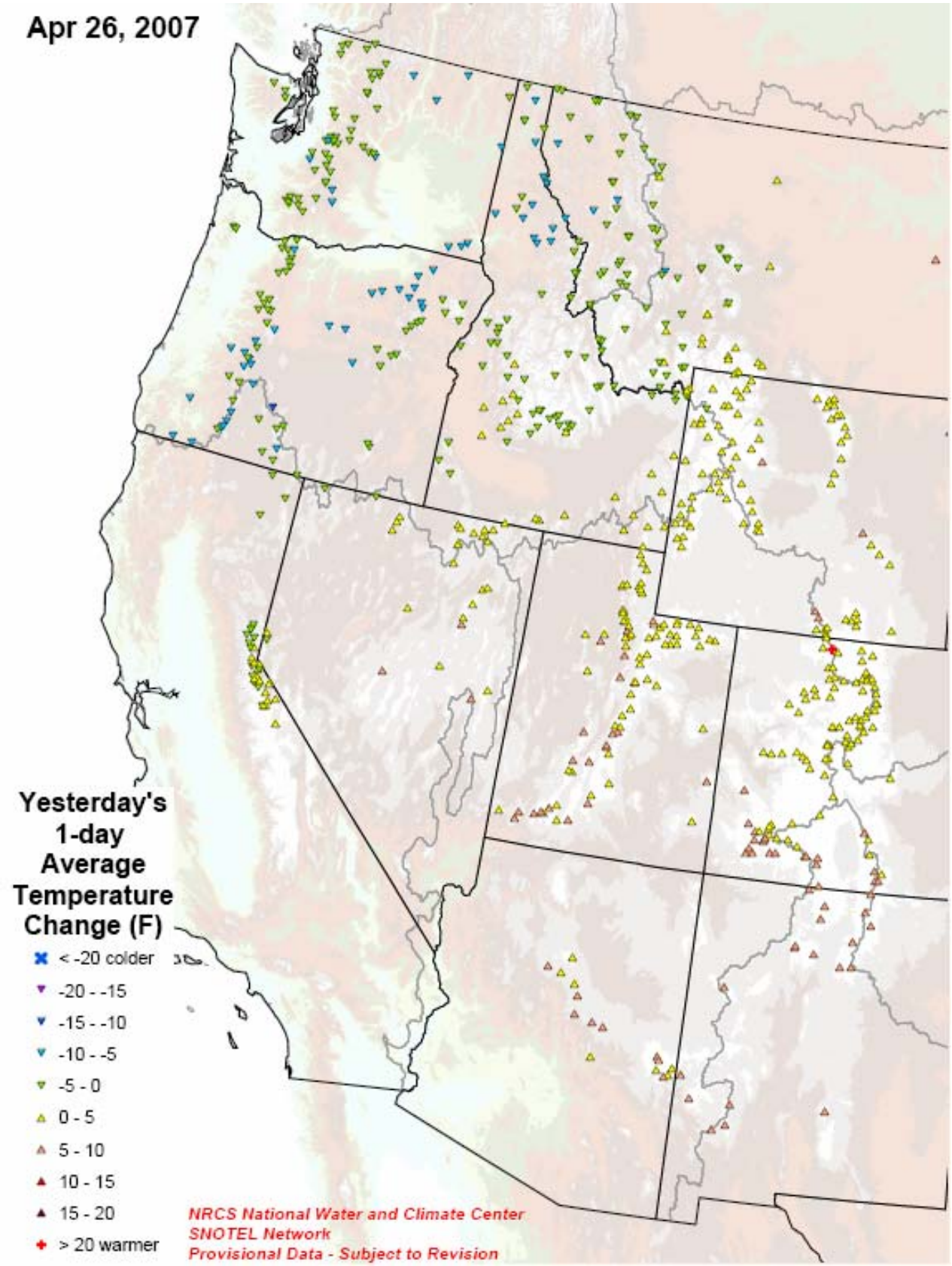


Fig. 2a. SNOTEL average temperature change from 25 to 26 April 2007.

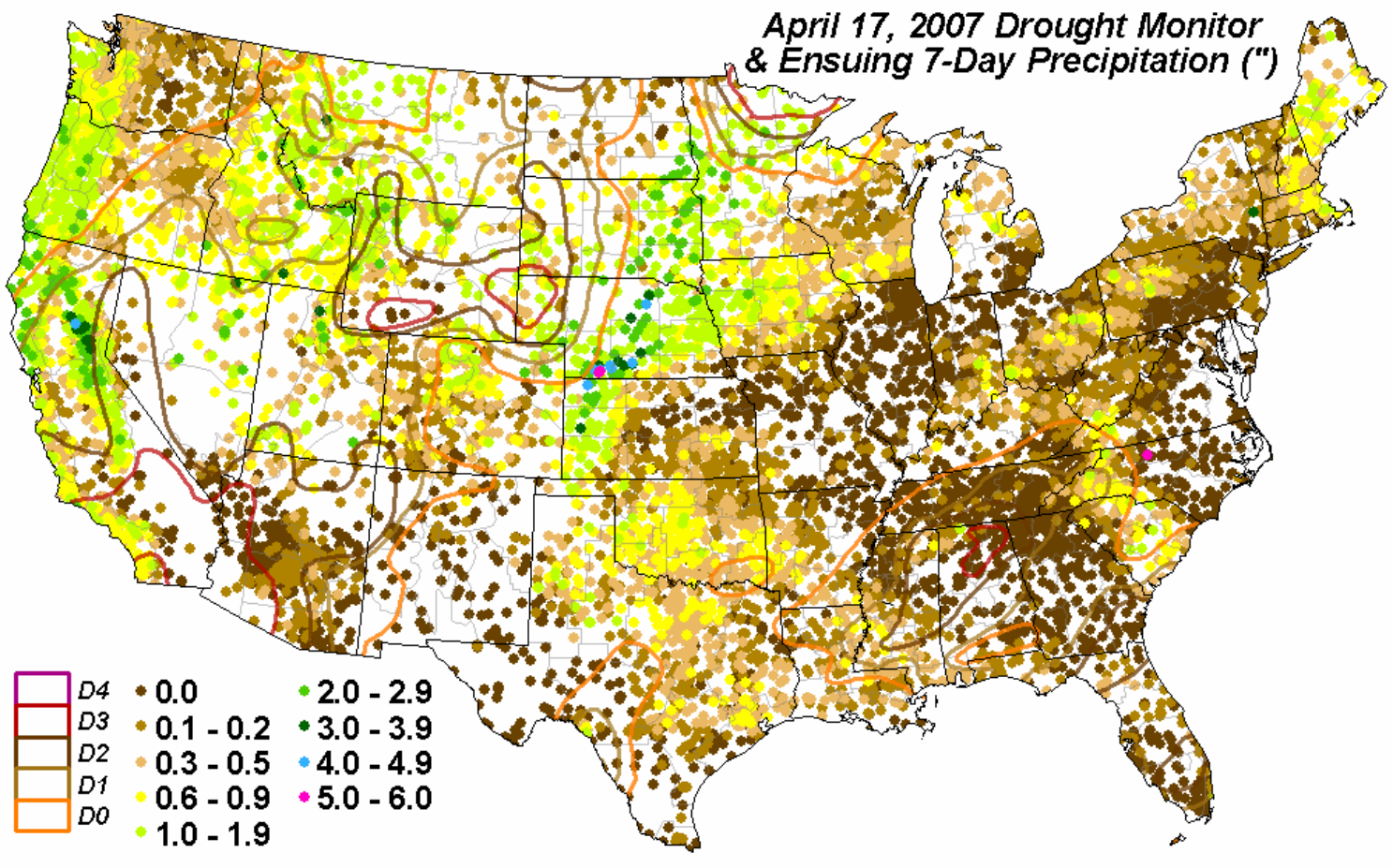


Fig. 3. Preliminary precipitation totals as a percent of normal for the 7-day period ending 24 April 2007.
Ref: http://www.cpc.ncep.noaa.gov/products/predictions/experimental/edb/usdm-precip-overlay.gif

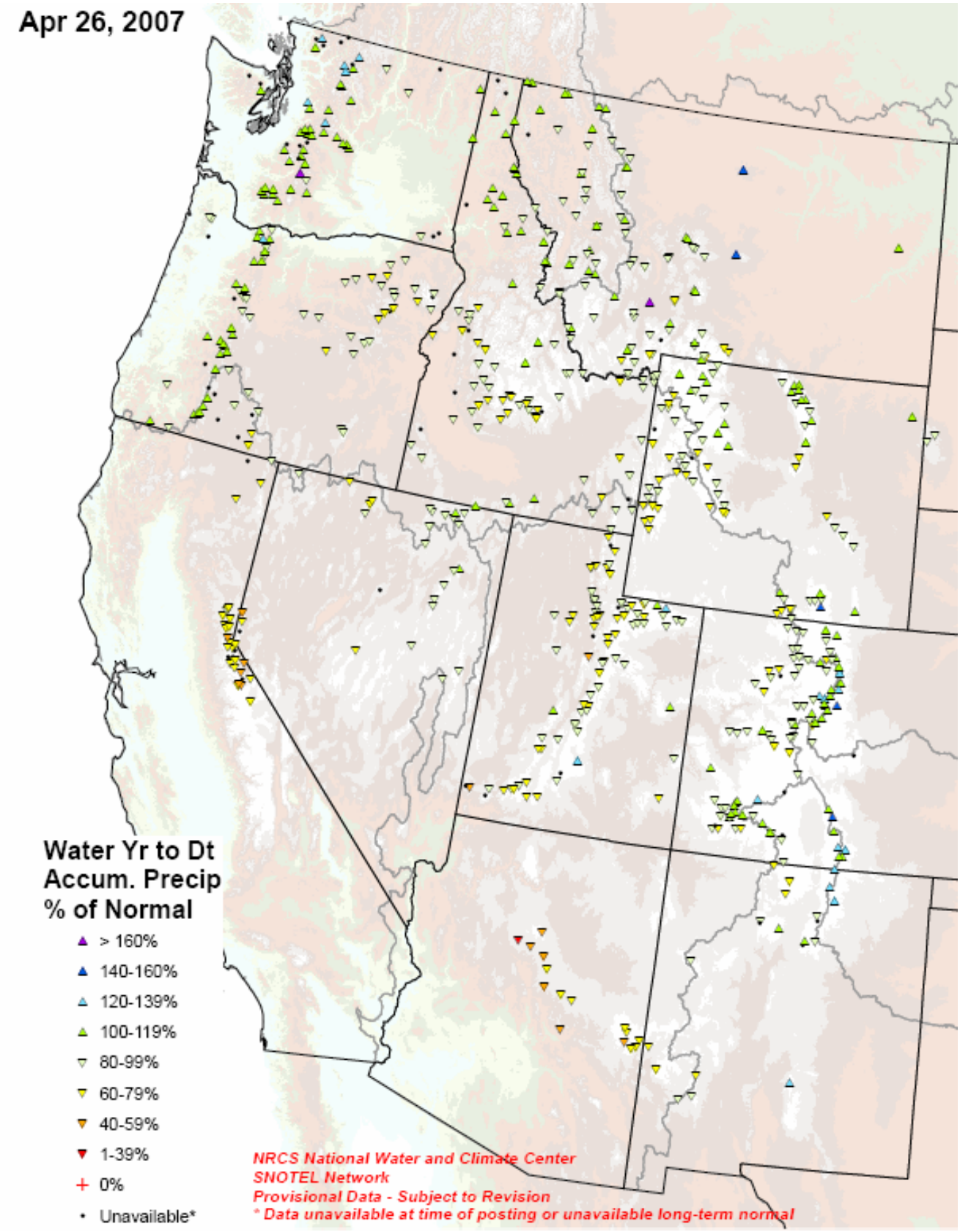


Fig. 3a. SNOTEL station water year (since October 1) precipitation as a percent of normal.
Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideWYTDPrecipPercent.pdf

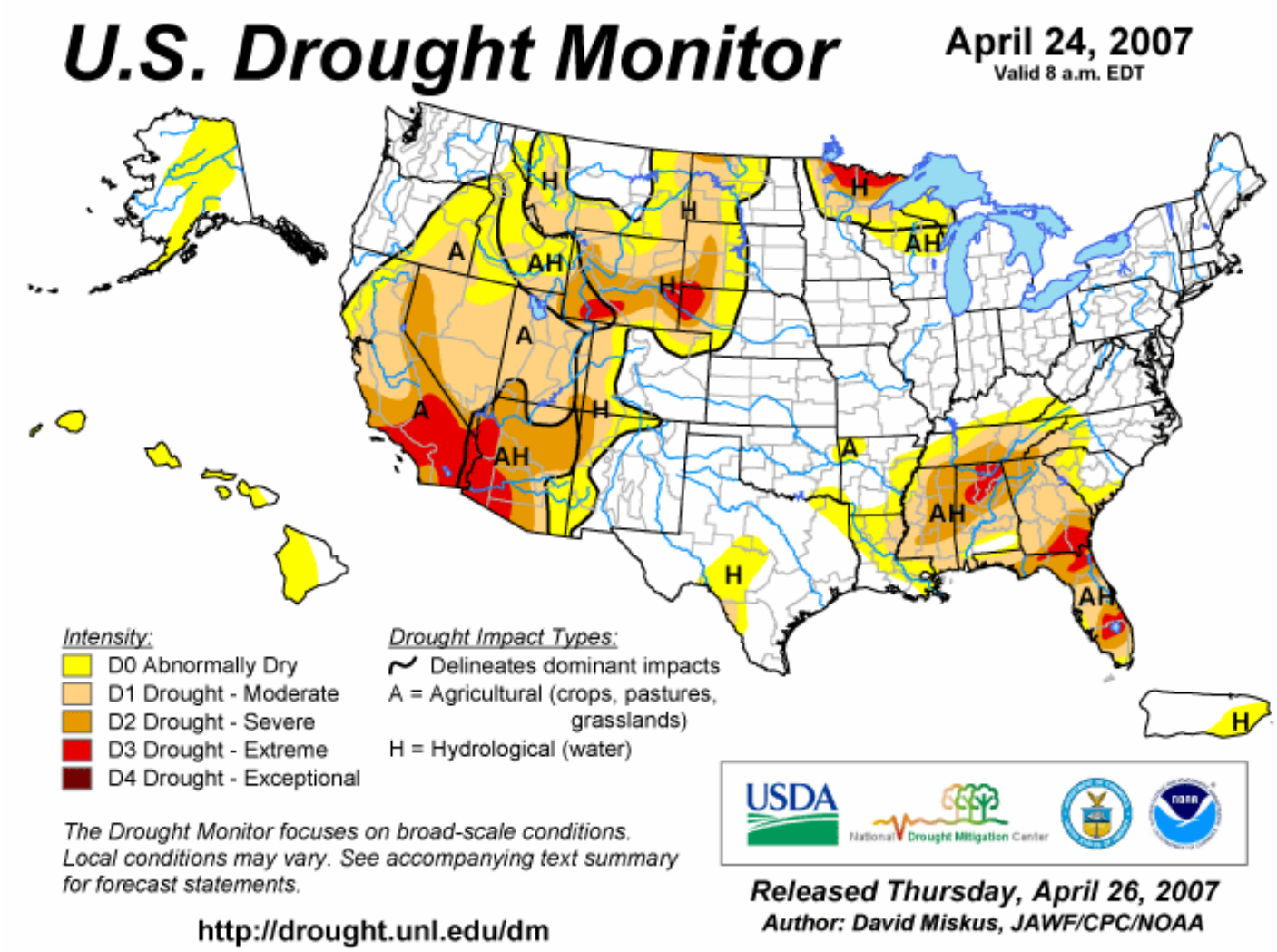


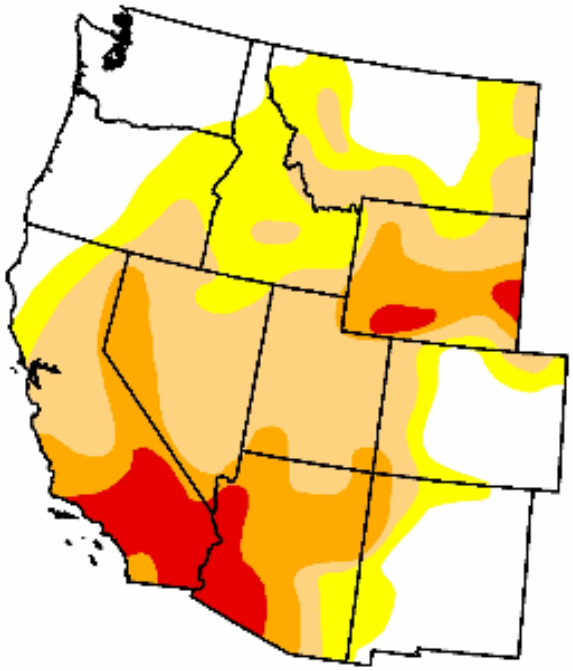
Fig. 4. Current Drought Monitor weekly summary.
Ref: ***National Drought Mitigation Center (NDMC) -*** **http://www.drought.unl.edu/dm/monitor.html**

U.S. Drought Monitor
West

April 24, 2007
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	28.5	71.5	51.5	22.1	6.8	0.0
Last Week (04/17/2007 map)	25.5	74.5	54.7	23.4	6.9	0.0
3 Months Ago (01/30/2007 map)	45.1	54.9	32.6	16.4	5.0	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 (04/25/2006 map)	62.8	37.2	27.4	17.6	5.8	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

USDA National Drought Mitigation Center

Released Thursday, April 26, 2007
Author: David Miskus, JAWF/CPC/NOAA

Fig 4a. Drought Monitor for the Western States with statistics over various time periods.
Ref: *http://www.drought.unl.edu/dm/DM_west.htm*

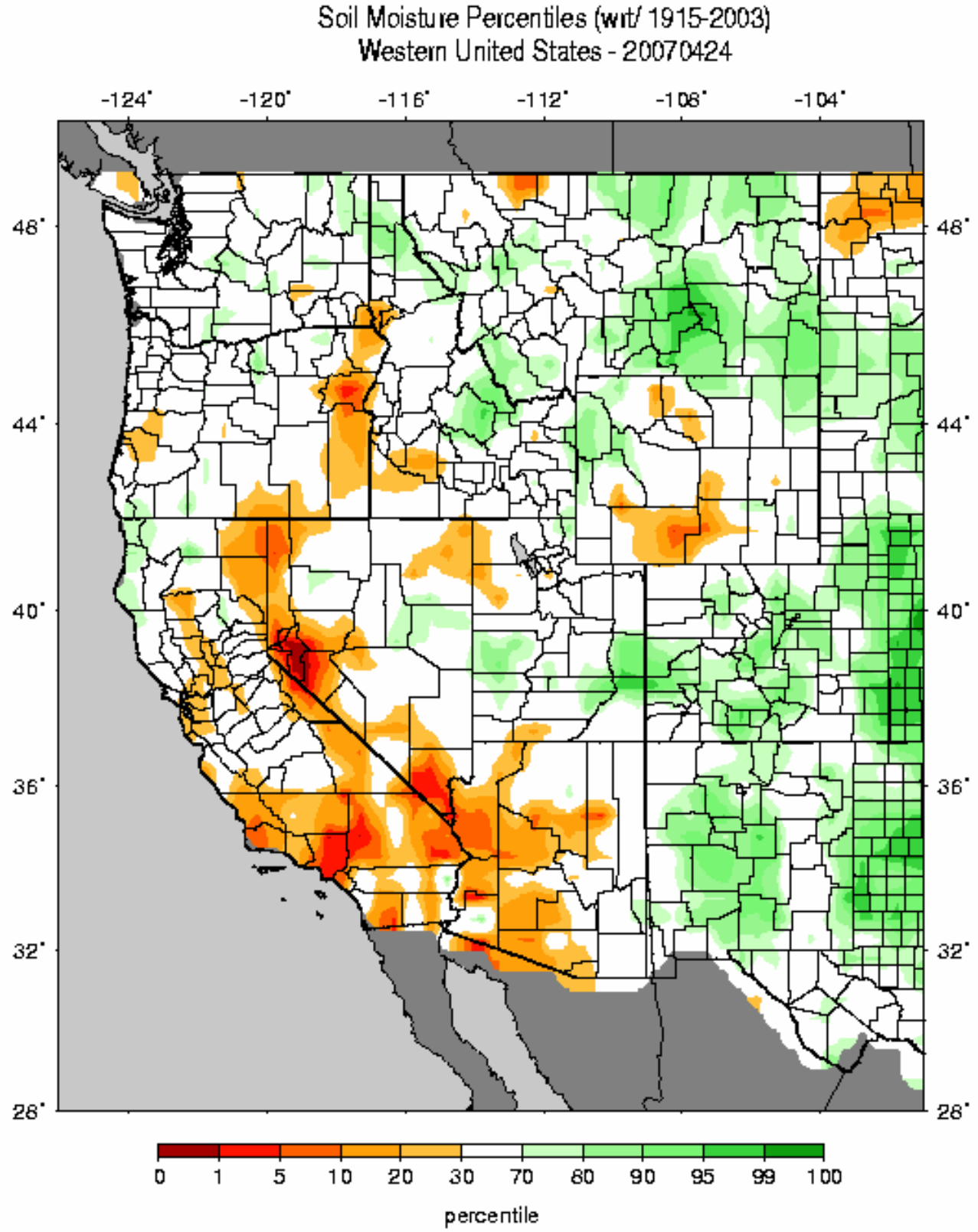


Fig. 5: Soil Moisture Ranking Percentile based on 1915-2003 climatology. (source: Univ. of Washington). **Ref:** http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.sm_gnt.gif

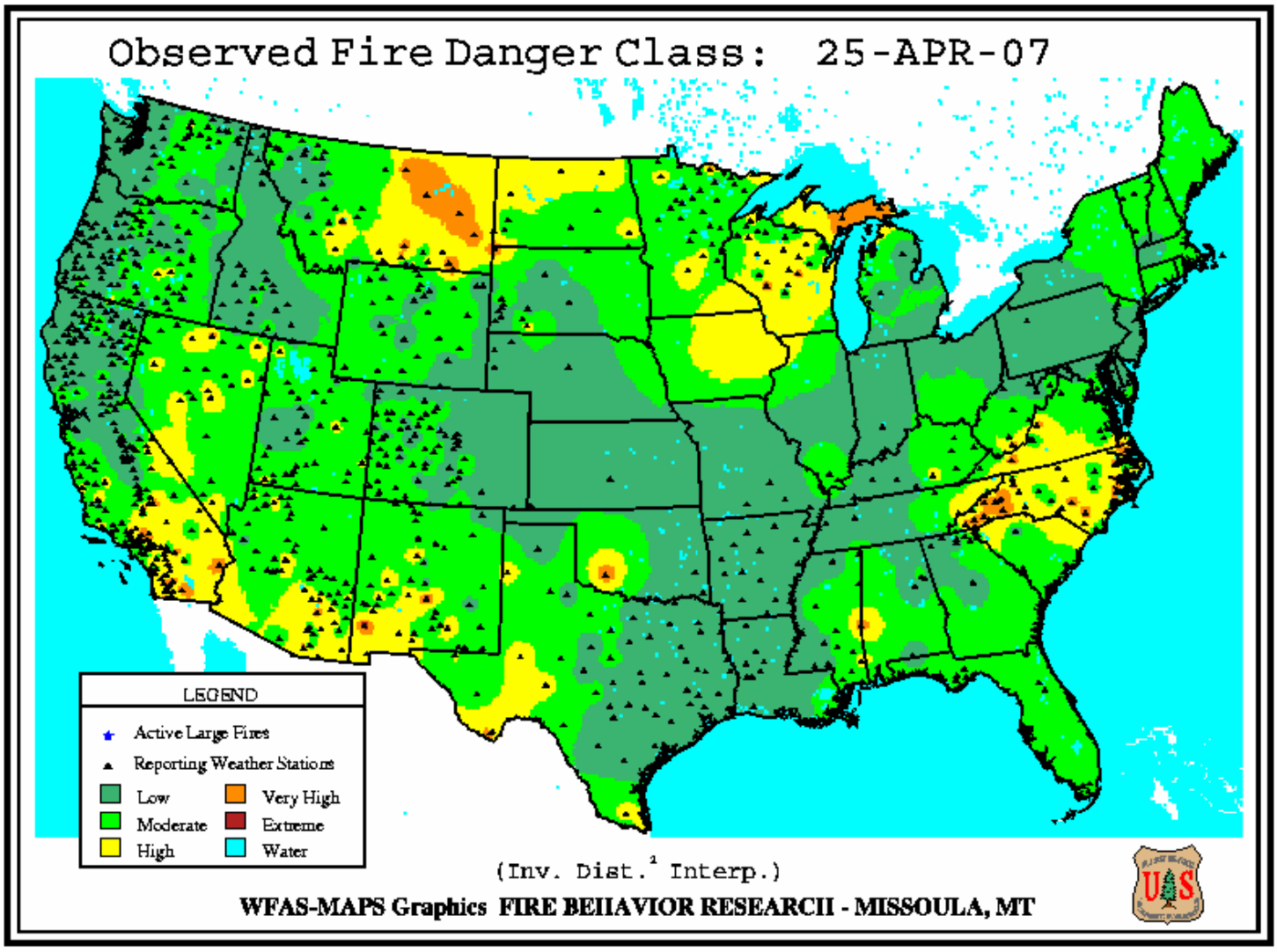


Fig. 6. Observed Fire Danger Class. Source: Forest Service Fire Behavior Research – Missoula, MT Note marked improvement since last week. Ref: ***http://www.fs.fed.us/land/wfas/fd_class.gif***

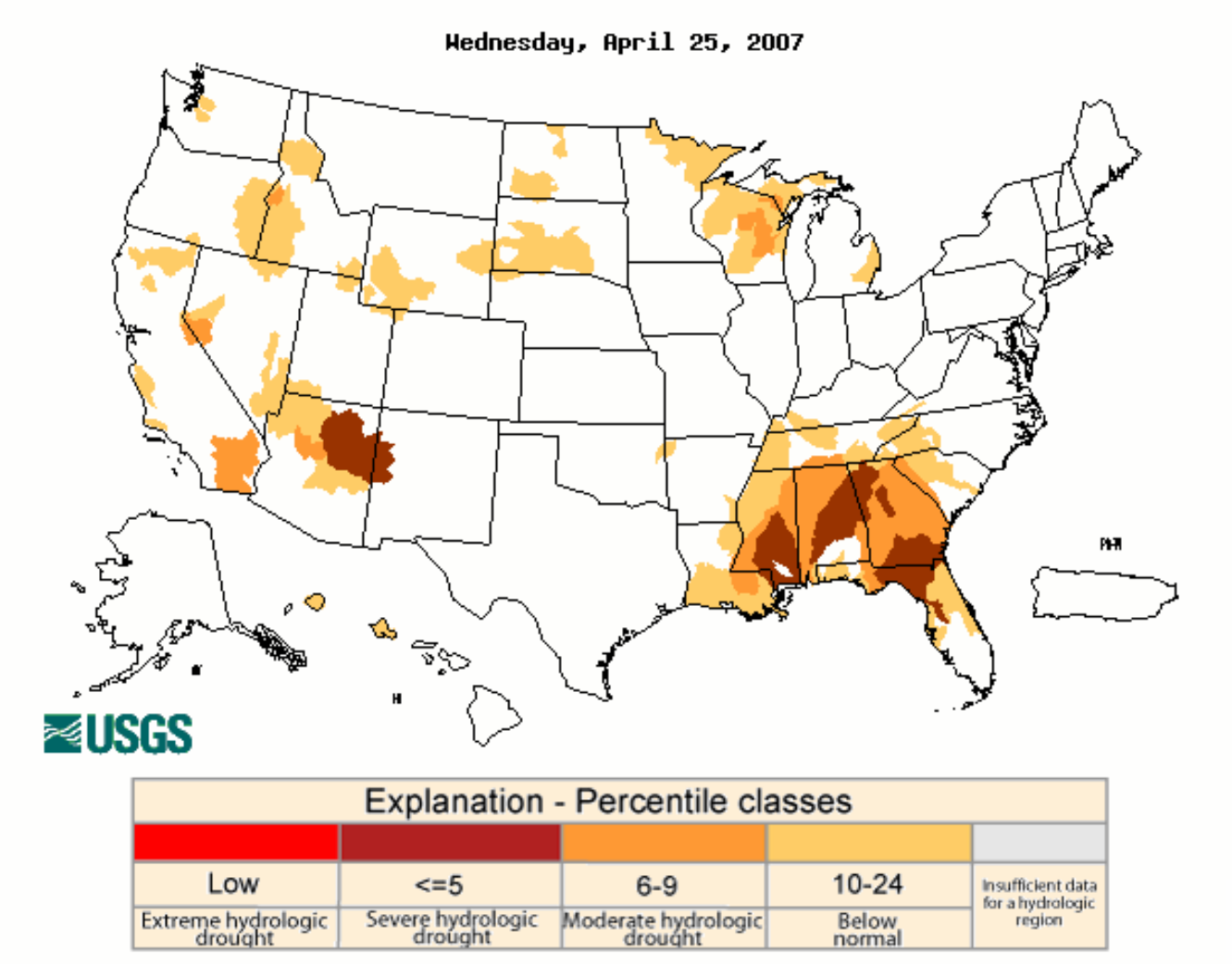


Fig. 7. Map of below normal 7-day average streamflow compared to historical stream flow for the day of the year. **Ref: USGS** http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us

National Drought Summary -- April 24, 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/.

A pair of vigorous Pacific storm systems brought beneficial precipitation and cool weather to many parts of the West, including much of California, the Sierra Nevada, and the north-central Rockies and High Plains. As the systems slowly tracked eastward, numerous showers and thunderstorms developed across the Great Plains in the warm and humid air, producing severe weather and dumping heavy rains on the north-central Great Plains and upper Midwest. In the wake of the Nor'easter in the Northeast, mostly tranquil, dry weather returned to the eastern third of the nation, except for two weak upper-air lows that dropped light rain on parts of the south-central Great Plains and lower Mississippi Valley, and from the south-central Appalachians southward into eastern South Carolina. In Puerto Rico, widespread showers dumped heavy rains (more than 2 inches) on much of the island, while strong trade winds produced frequent and occasionally heavy showers on the windward sides of the Hawaiian Islands, especially in Maui and the Big Island.

The West: Once again, unusual weather occurred across the West, but this time it was welcome and beneficial. With an upper-air trough of low pressure locked over the West, a pair of strong Pacific storm systems slowly traversed the West, dropping unseasonably heavy precipitation along the Pacific Coast (including southern California), on the Sierra Nevada, southern Cascades, north-central Rockies, and Utah's Wasatch Range. In addition, much cooler conditions enveloped the West, with temperatures averaging 3 to 10°F below normal, slowing snowmelt in the mountains. With 2 to 3 inches of precipitation in northwestern California and Sierra Nevada, D0(A) and D1(A) were edged eastward to reflect short-term moisture improvement. NASS/USDA reported that the recent rains in California improved ranges where grasses were still viable. In addition, much of Idaho, Montana, northern Wyoming, and northern Nevada measured over an inch of precipitation. The storms increased both the season-to-date (STD) average basin precipitation percentage and the April 23 snow water content (SWC) percent of normal as compared to the April 17 values, in some cases by 5-10 points or more. For example, STD average basin percent of normal precipitation increased by at least 5 percentage points in northern and eastern Nevada and southern Idaho, bringing values close to normal, and some improvement was made. The April 23 average basin SWC increased by at least 10 points in southern Oregon, southern Idaho, and parts of Nevada, but values were still below to much below normal. Similarly, average basin STD percent of normal precipitation and SWC increased a few points across much of Idaho and western Montana, but values still remained below normal, thus maintaining status quo. Even in parched southern California, the heaviest rain of the season arrived on April 20, with downtown Los Angeles netting 0.50 inches, its wettest day since May 22, 2006. Despite the recent rain, Los Angeles remained on course for its driest water year on record (3.17 inches during July 1-April 24; the old record is 4.42 inches during 2001-02). Unfortunately, little or no precipitation fell on southeastern California, southern Nevada, and most of Arizona and New Mexico. Although the desert Southwest relies on the Colorado River for water supplies, it has been an exceptionally

dry water year. For example, Imperial, CA, and Yuma, AZ, have only measured 0.05 and 0.26 inches of rain, or 3% and 6% of normal, respectively, since October 1, 2006.

The Plains and upper Midwest: Moderate to heavy widespread precipitation (1 to 3 inches) from the western storm system fell on much of the northern and central Plains and upper Midwest, increasing topsoil moisture that was already adequate to surplus in many cases, and further delaying or slowing the planting of spring crops. In northern Minnesota, although the rains were gentle and widespread and provided good infiltration, long-term hydrology issues remained. Minnesota hydrologists stated that lake levels in northern sections of the state remained very low, thus the hydrologic drought conditions were maintained. In contrast, much of Wisconsin received less than 0.5 inches, and with both lingering long-term deficits and increasing short-term (30-, 60-, and 90-days) shortages building, abnormal dryness was expanded into central Wisconsin.

Farther west, 1 to 2 inches of rain this week, plus frequent and ample precipitation across most of the central and northern Plains this year, has accumulated surpluses of 2 to 6 inches during the past 30-, 60-, and 90-days. This wet weather, in combination with occasional cold outbreaks, has delayed or slowed fieldwork and spring plantings in eastern Montana, the Dakotas, Nebraska, and Kansas, along with damaging some early-emerged crops. The precipitation, however, has shrunk the aerial coverage of long-term drought in eastern Montana, southwestern North Dakota, western South Dakota, western Nebraska, and northern Colorado. In the southern Great Plains, tornadic thunderstorms caused extensive damage and casualties near Del Rio and Eagle Pass, TX, but also dumped heavy rains (1 to 4 inches) on northern portions of the D1(H) area, further diminishing moderate drought in southern Texas.

The Delta and Southeast: After finally receiving its first widespread rainfall since late February, dry weather returned to most of the Southeast and Delta, with temperatures slowly moderating and eventually rising into the low 80s (°F) by week's end. One upper-air low produced light rain (0.2 to 0.9 inches) from central Oklahoma southeastward into southern Mississippi, while another dropped 0.2 to 1.2 inches from the central Appalachians southward into South Carolina, maintaining conditions in these regions. Although last week's rains provided some relief, it was fleeting as lingering short- and long-term deficits, low humidity, gusty winds, and increasing evapotranspiration and solar radiation quickly eroded any benefits from the moisture. In contrast, locations from central Louisiana northeastward into western North Carolina and in northern Florida and southeastern Georgia only received light mid-April rains, and further deteriorated this week. During the past 90 days (through Jan. 23), less than half the normal precipitation had fallen on parts of the Delta and most of the Southeast, with deficits exceeding a foot in east-central Mississippi and north-central Alabama. Year-to-date shortages at selected locations included: 15.34 at Meridian, MS; 14.14 at Tuscaloosa, AL; 12.31 at Birmingham, AL; 10.56 at Chattanooga, TN; 9.72 at Tallahassee, FL; and 9.18 at Alma, GA. Going back even farther, Huntsville, AL, has accumulated a whopping 26.80 inch deficit since January 2006, and a 44.16 inch shortage since January 2005. April has been extremely dry in southeastern Georgia, with April 1-24 totals of 0.05, 0.19, 0.33, and 0.55 inches at Alma, Valdosta, Savannah, and Brunswick. Numerous wildfires were reported, including 4 large fires in southeastern Georgia on April 23 (the Sweat Road complex affected nearly 50,000 acres). According to the USGS instantaneous, daily, 7-day, 14-day, and 28-day stream flows (ending April 23), river gauges, after a brief mid-April rise, have rapidly retreated below the 10th percentile, and in some cases back to record low levels, in the aforementioned areas. The April 22 USDA/NASS topsoil moisture rated short or very short stood at 29, 32, 50, 52, 61, and 89% in South Carolina, Tennessee, Mississippi, Alabama, Georgia, and Florida, respectively. Many producers have postponed planting crops such as cotton and peanuts until decent rains can boost topsoil moisture. In south-central Florida around Lake Okeechobee, Phase III drought

restrictions (about a 50% reduction) are in place as the lake continued to drop, after a very brief respite from the mid-April rains, standing at 9.90 feet (about 4 feet below average) on April 23. According to the April 17 Florida Drought Action Plan, the SFWMD has never experienced a situation where all three major water storage areas of the system – upper Kissimmee Chain of Lakes, Lake Okeechobee, and the Water Conservation Areas – were at substantially below-normal water levels, and approaching record low levels. Accordingly, D3 was added to surrounding areas near Lakes Okeechobee and Istokpoga.

Hawaii, Puerto Rico, and Alaska: Brisk trade winds brought increased and occasionally heavy showers to windward locations, and isolated showers to leeward sites. The largest weekly totals fell on the windward sides of the Big Island and Maui, alleviating abnormal dryness there. Selected 7-day totals (8:45 am HST April 17 – 8:45 am HST April 24) on Maui included: 7.33 inches at West Wailuaiki; 5.57 inches at Puu Kukui; 2.84 inches at Oheo Gulch; and 1.84 inches at Haiku. On the Big Island, selected 7-day amounts included: 8.39 inches at Glenwood; 7.29 inches at Piihonua; 6.84 inches at Mountain View; 5.25 inches at Hilo; and 4.13 inches at Hakalau. Elsewhere, enough rain fell to prevent degradation but not to warrant improvement.

In Puerto Rico, a stalled cold front trailing from the Caribbean Sea northeastward into the southwestern Atlantic Ocean provided a triggering mechanism for numerous, widespread showers and thunderstorms across the island during much of the week. Across the former D0 and D1 areas of southern and eastern Puerto Rico, 3 to 6 inches of rain, with up to 8.3 inches at Rio Grande, improved drought by one category and eliminated short-term (out to 60-days) deficits. Longer-term deficiencies, however, remained at 6 months in the former D1 area (in the southeast) now depicted as D0(H).

After a cold start to the week, readings rose across most of Alaska, with weekly temperatures averaging 5 to 15°F above normal across the northern two-thirds of the state. Significant precipitation was limited to the southern coastal region, especially on the Kenai Peninsula and Kodiak Island where 2 to 6 inches was measured. Light precipitation fell on western and southwestern Alaska (0.1 to 0.5 inches) early in the period, but amounts were not enough to eliminate abnormal dryness. The mild and dry weather reduced the mountain snow pack in central and northern areas as the snow water equivalent (SWE) remained below normal for April 24.

Looking Ahead: During the next 5 days (April 26-30), a strong low pressure center over Nebraska will produce heavy rain along with severe weather in the central Plains, Delta, and Midwest. During the next few days, widespread showers and thunderstorms will develop over the Northeast and mid-Atlantic, but the showers will diminish the farther east they track across the Southeast before the storm finally pushes offshore late Friday. Behind the system, temperatures in the East will drop to near or slightly below normal levels before warmer weather in the West builds eastward by the start of next week. During Friday and into the weekend, a weak system may bring scattered light showers to the south-central Plains, Delta, and Southeast, but much of the West will remain dry.

The NWS 6-10 day outlook (May 1-5) calls for above-normal temperatures from the Rockies eastward, with subnormal readings limited to the Pacific Northwest. Drier than normal conditions are expected in the Southeast, but a swath of above-normal precipitation is forecast for the Pacific Northwest, northern halves of the Rockies and Plains, Midwest, upper Delta, and Great Lakes region.

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 April 25, 2007