



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

Weekly Report - Snowpack / Drought Monitor Update **Date: 30 April, 2009**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Snow: Snow-water equivalent percent to date shows values over southern Utah and southern Colorado are accelerating downward as the spring snowmelt is taking hold. However, several areas in Montana have increased by one category and the Mt Hood region in Oregon has increased by 15 percent during this past week. Cooler than normal temperatures have helped to slow snow melt over parts of the Northern Tier States (Fig 1). Unofficial forecast changes for the past 7 days in spring and summer streamflow runoff for selected SNOTEL sites show that forecast values have increased over much of the Northern Rockies (residual impact from La Nina and the cool phase of the PDO) and have decreased over the Southern Tier States as would be expected this time of year (Fig. 1a). This past week's snow depth changes show late season increases over much of the Northern Tier States. Decreases are noted elsewhere; especially in Utah and Colorado (Fig. 1b).

Temperature: SNOTEL and ACIS-day station average temperature anomalies were below average across the West with the exception over some areas in New Mexico and Colorado (Fig. 2). ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over areas over northeastern New Mexico (>+6F) and the greatest negative departures occurred over northern Montana (<-15F) (Fig. 2a).

Precipitation: ACIS 7-day average precipitation anomaly for the period ending 29 April shows an unusually wet pattern across Wyoming, Montana, southeastern Idaho, and from central Oregon to northeastern California. Elsewhere, considerably less precipitation fell especially over most of California, Arizona, and New Mexico (Fig. 3). Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values within a few percentage points of last week's values (Fig 3a). For precipitation totals, departures, and percent of normal for several time periods. See: <http://www.water.gov/> and <http://ciq.mesonet.org/~derek/public/droughtmonitoring/>.

WESTERN DROUGHT STATUS

The West: With the end of the 2008-09 winter wet season approaching, there were only a few changes in the West. Nevertheless, late-season storms continued to produce some snow across the northern Rockies and the Intermountain West. Season-to-date (since October 1, 2008) precipitation totals as high as 100 to 130% of average resulted in the elimination of moderate drought (D1) and a reduction in the coverage of abnormal dryness (D0) across much of western Utah.

A period of record-setting heat affected portions of the West from April 19-22. In California, USDA reported that "high temperatures resulted in rapid dry down on rangeland" and that "additional rainfall was needed to help [pasture] growth." In the San Francisco Bay area, monthly record highs were attained on April 20 in locations such as San Jose (95 degrees F; tied 95 degrees F on April 9, 1989, and April 30, 1996) and the Oakland Airport (91 degrees F; previously, 88 degrees F on April 23, 1966, and April 26 and 27, 2004). Additional monthly records were set in California on April 21, when highs soared to 104 degrees F in King City (previously, 102 degrees F on April 29, 1981, and

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April 26, 2004) and 101 degrees F in Gilroy (previously, 100 degrees F on April 30, 1981). In California's San Joaquin Valley, Bakersfield notched consecutive daily-record highs (99 and 97 degrees F) on April 21-22. Author: Brad Rippey, U.S. Department of Agriculture

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, and 4b).

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/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/>

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>

Weekly Snowpack and Drought Monitor Update Report

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

Weekly Snowpack and Drought Monitor Update Report

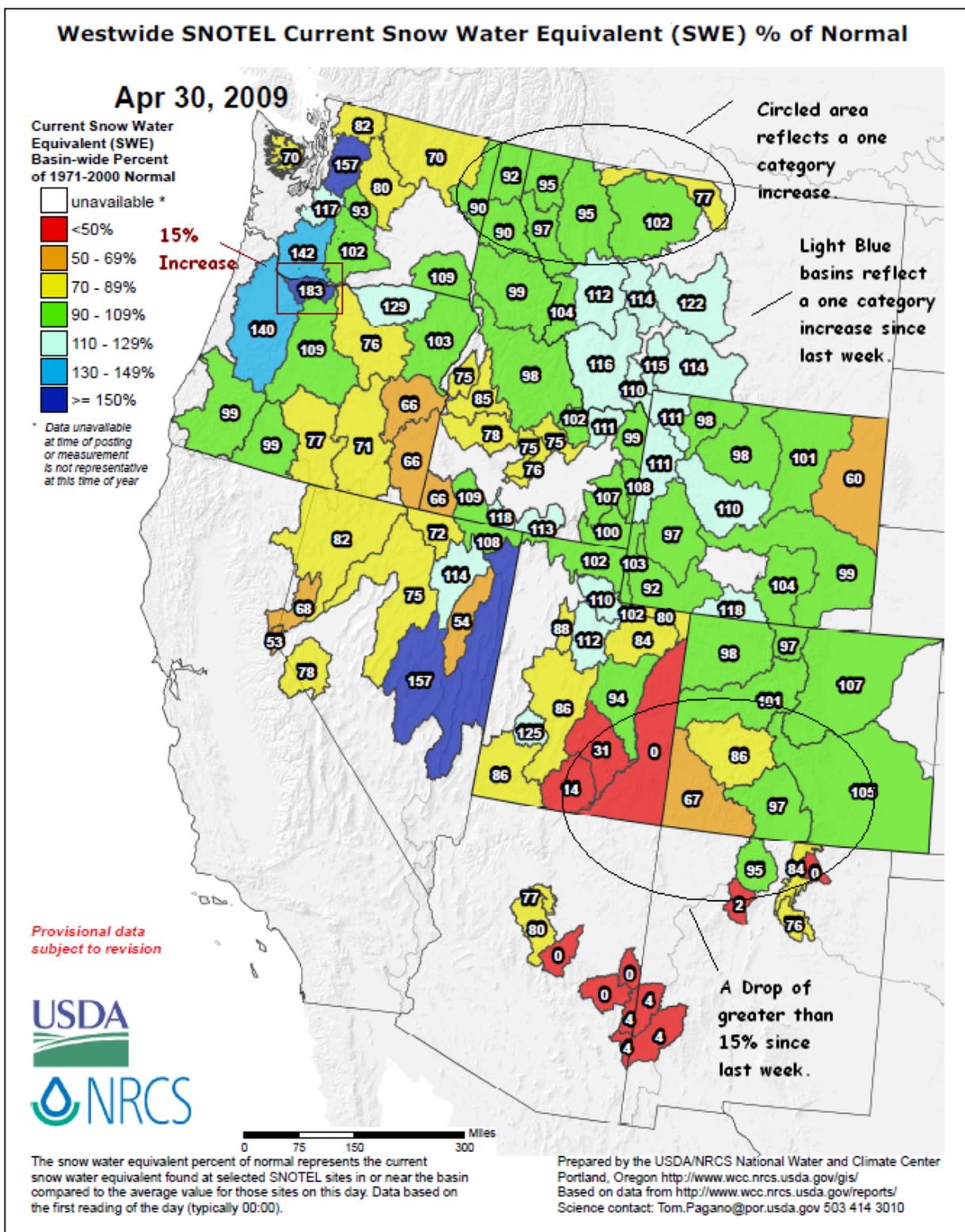


Fig. 1. Snow-water equivalent percent to date shows values over southern Utah and southern Colorado are accelerating downward as the spring snowmelt is taking hold. However, several areas in Montana have increased by one category and the Mt Hood region in Oregon has increased by 15 percent during this past week. Cooler than normal temperatures have helped to slow snow melt over parts of the Northern Tier States.

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

Weekly Snowpack and Drought Monitor Update Report

7-Day Guidance Forecast Change as Percent of 1971-2000 Normal

Apr 30, 2009

For guidance only

7-Day Guidance Forecast Change (% normal)

- ✕ > 20% gain
- ▲ 16 - 20%
- ▲ 11 - 15%
- ▲ 6 - 10%
- ▲ 1 - 5%
- ⊖ no change
- ▼ -5 - -1%
- ▼ -10 - -8%
- ▼ -15 - -11%
- ▼ -20 - -16%
- ✘ > 20% loss
- ⊖ Unavailable*

* Forecast unavailable due to insufficient realtime data or low forecast skill

Provisional Data
Subject to Revision

0 50 100 200 Miles



Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/wsf/daily_forecasts.html
Based on data from
ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/daily_forecast/SummaryOutput.csv
Science contact: Tom.Pagano@por.usda.gov 503 414 3010

This is a completely automated objective product based on SNOTEL data. This product is not meant to replace or supersede the official forecasts produced in coordination with the National Weather Service.

Fig. 1a: Selected preliminary daily water supply forecast changes since last week show that forecast values have increased over much of the Northern Rockies (residual impact from La Nina and the cool phase of the PDO) and have decreased over the Southern Tier States as would be expected this time of year.

Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/daily_forecast/maps/west_dailyfcst_7daych.pdf

SNOTEL 7-Day Snow Depth Change (Inches)

Apr 30, 2009

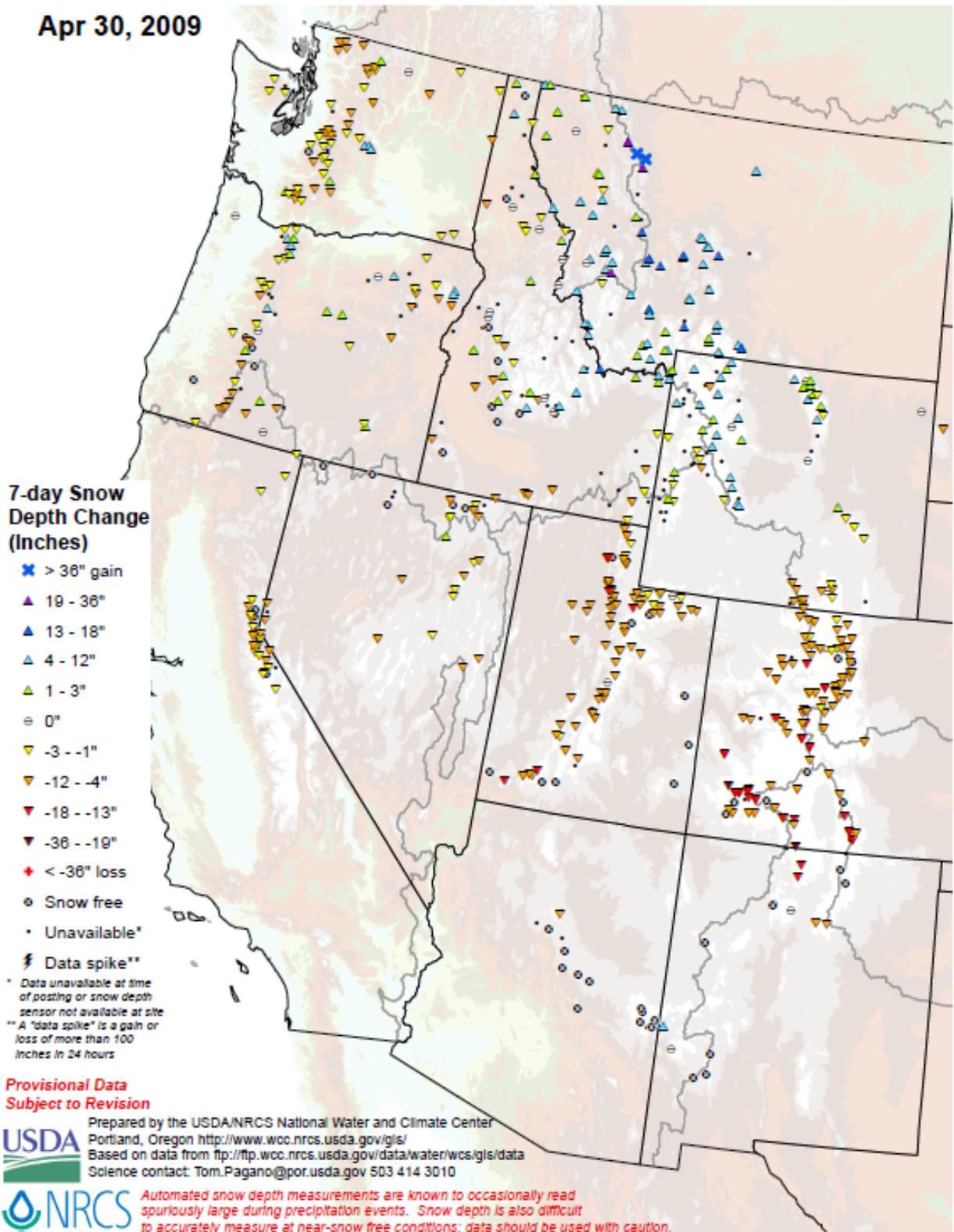


Fig. 1b: This past week's snow depth changes show late season increases over much of the Northern Tier States. Decreases are noted elsewhere; especially in Utah and Colorado.

Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_snowdepth_7ddelta.pdf

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

Apr 30, 2009

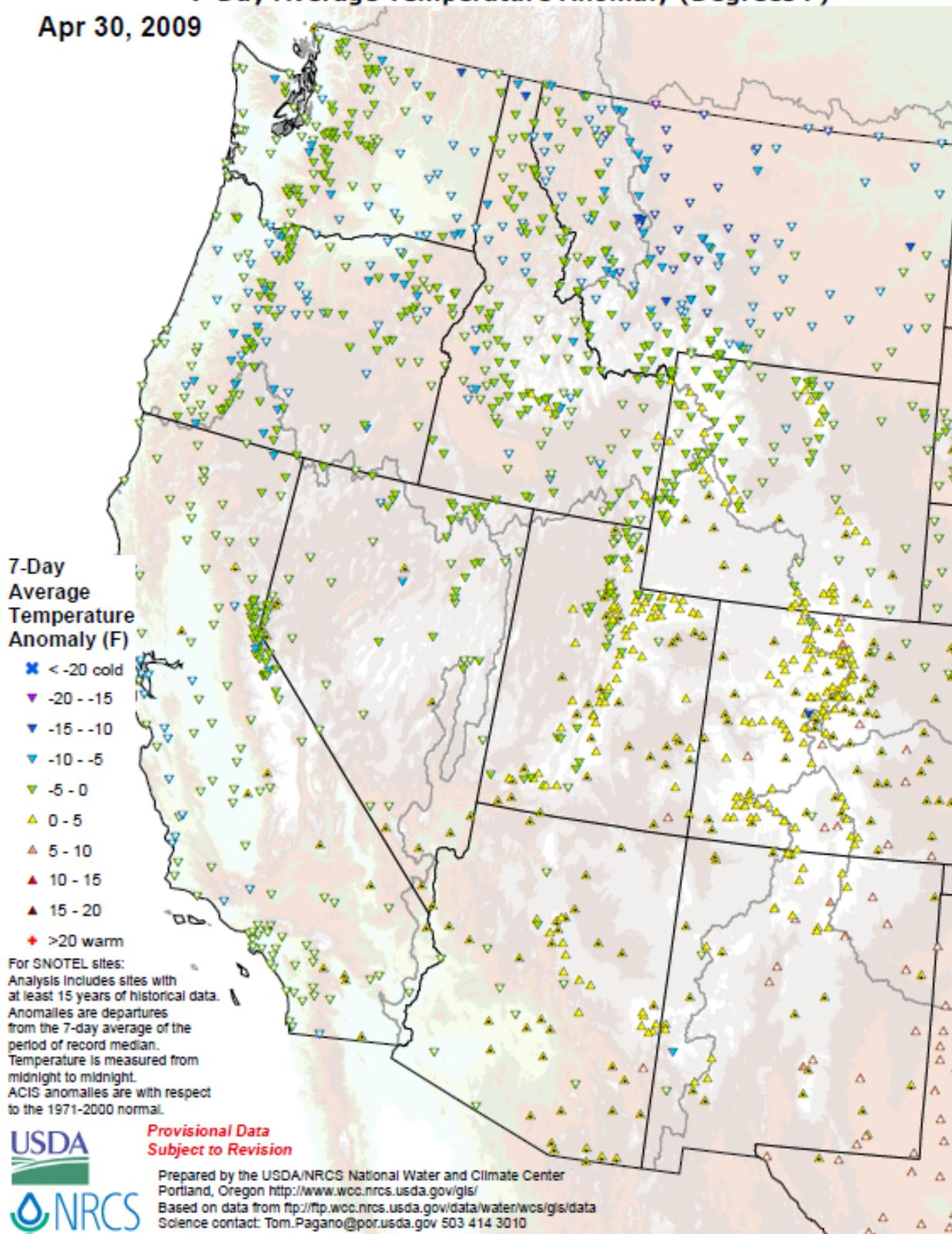
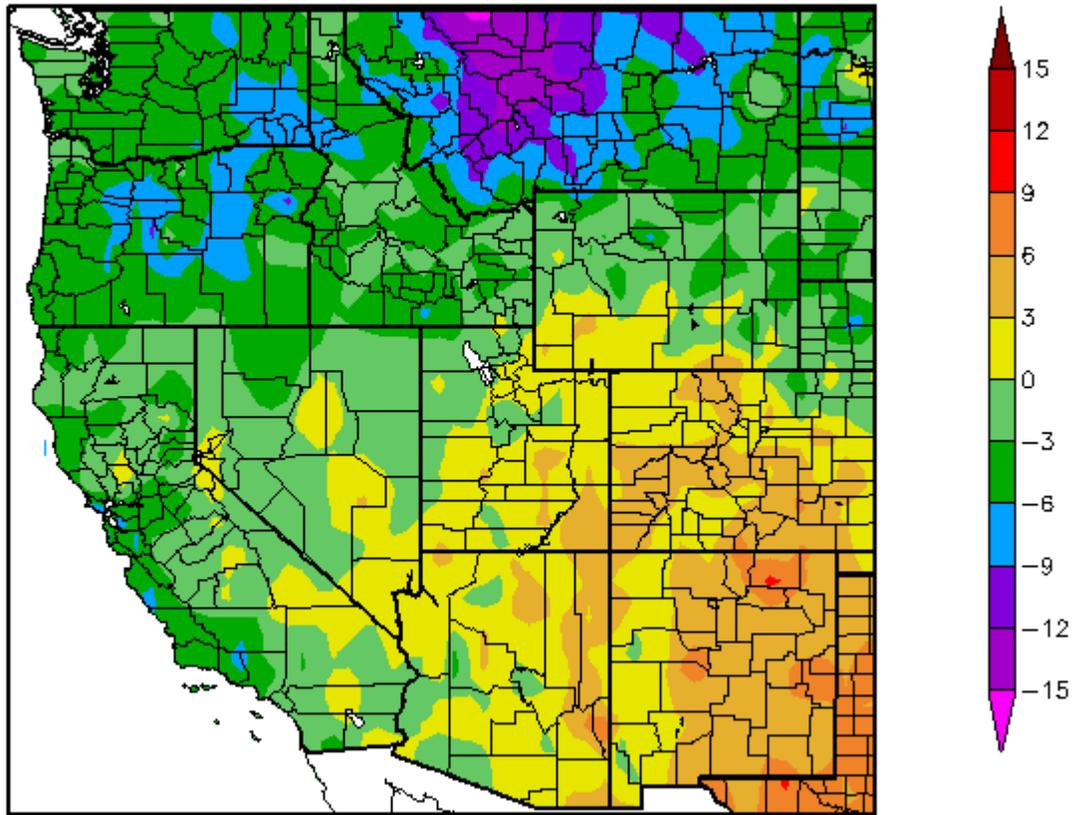


Fig. 2. SNOTEL and ACIS-day station average temperature anomalies were below average across the West with the exception over some areas in New Mexico and Colorado.

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

Departure from Normal Temperature (F)
4/23/2009 – 4/29/2009



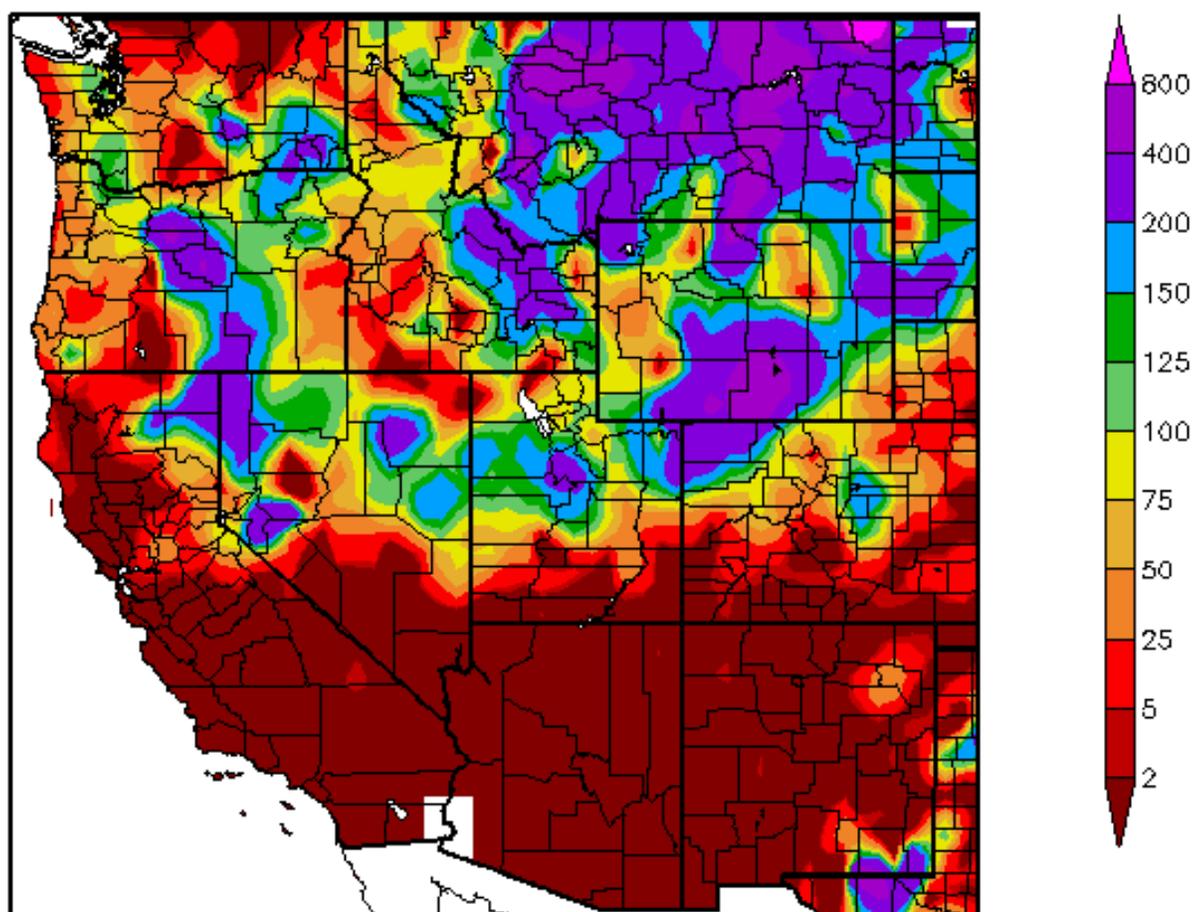
Generated 4/30/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2a. ACIS 7-day average temperature anomalies show that the greatest positive temperature departures occurred over areas over northeastern New Mexico (>+6F) and the greatest negative departures occurred over northern Montana (<-15F).

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

Percent of Normal Precipitation (%)
4/23/2009 – 4/29/2009



Generated 4/30/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 3. ACIS 7-day average precipitation anomaly for the period ending 29 April shows an unusually wet pattern across Wyoming, Montana, southeastern Idaho, and from central Oregon to northeastern California. Elsewhere, considerably less precipitation fell especially over most of California, Arizona, and New Mexico.

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

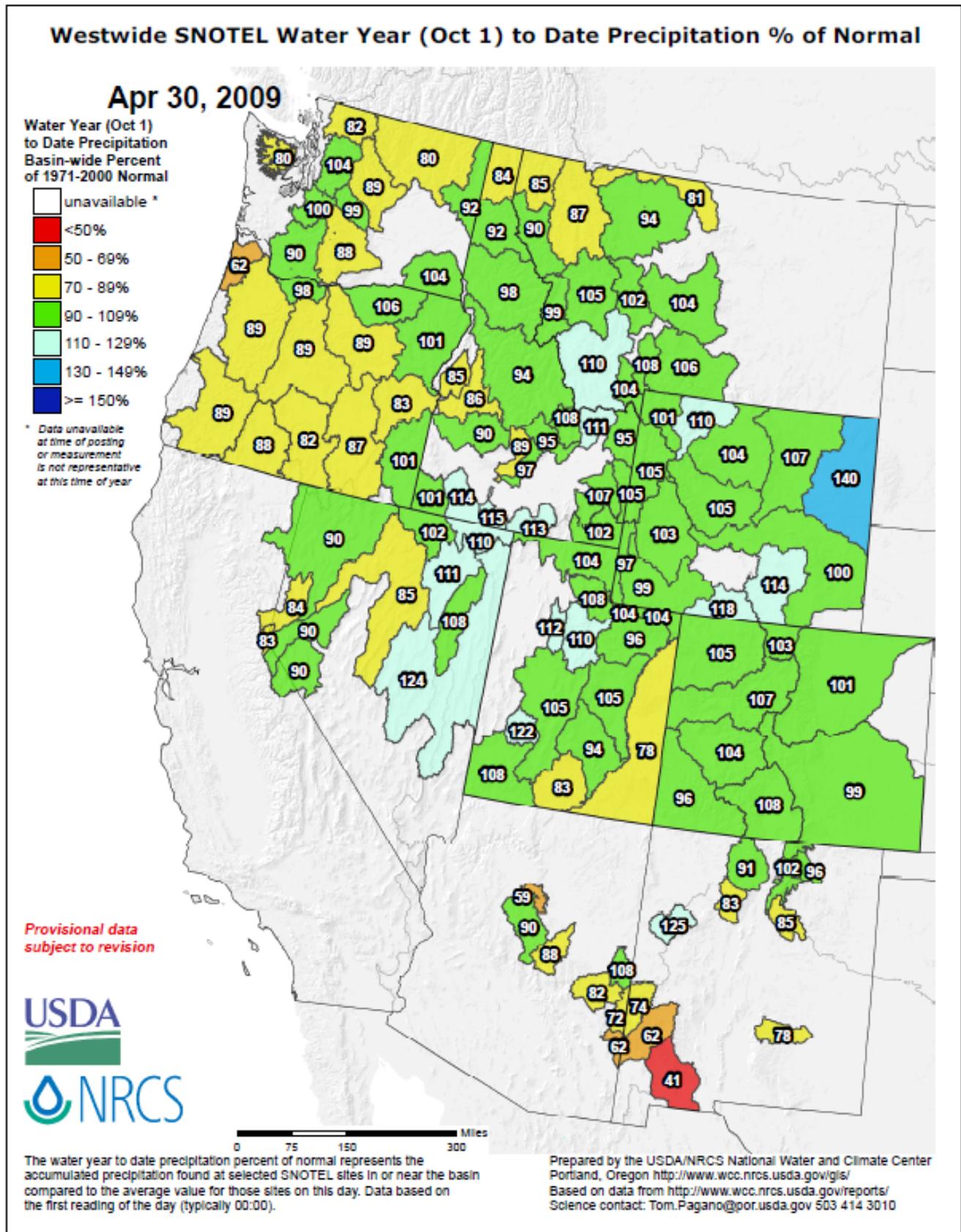
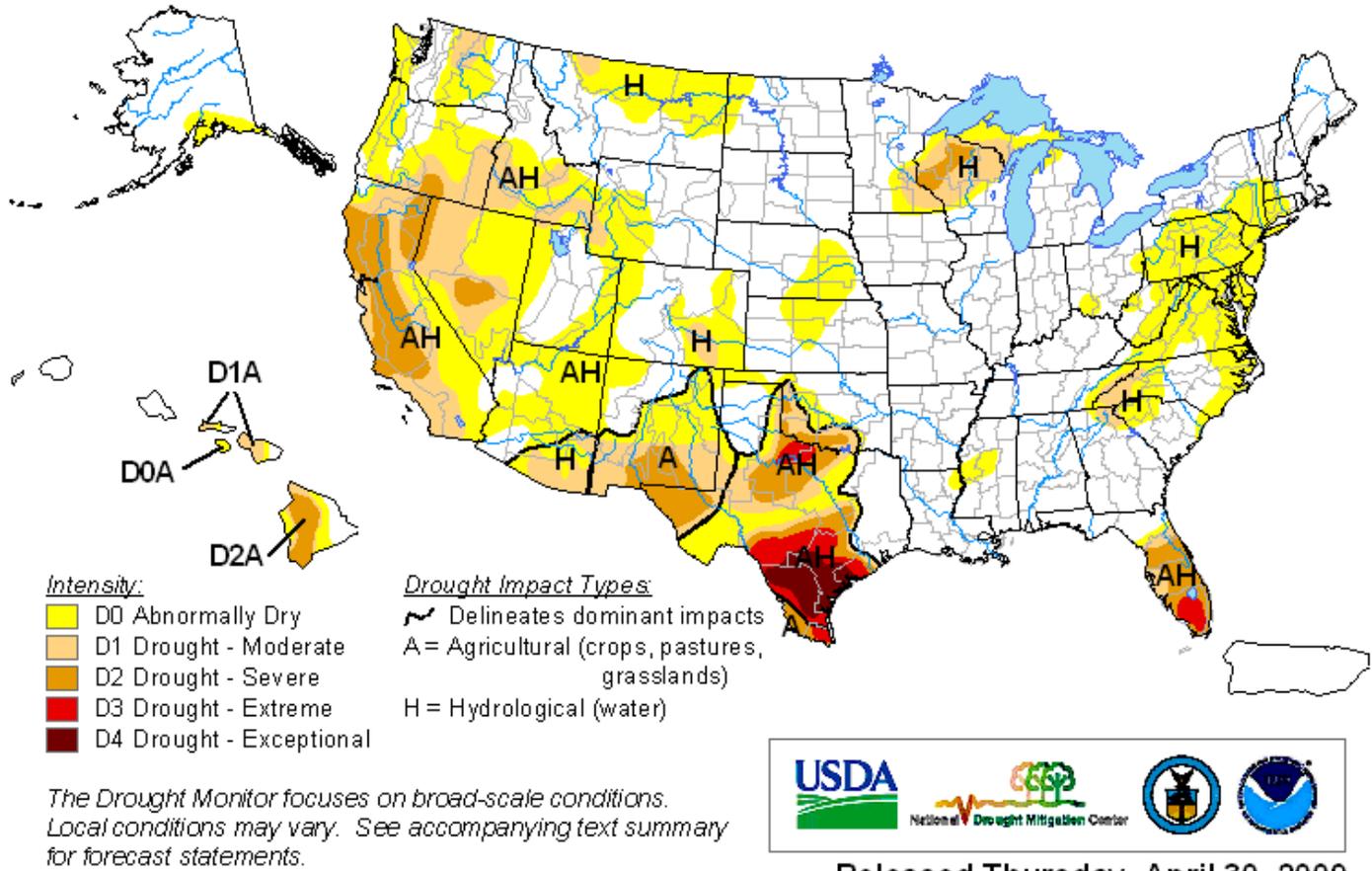


Fig 3a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2009 Water Year that began on October 1, 2008 shows values within a few percentage points of last week's values.

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

U.S. Drought Monitor

April 28, 2009
Valid 8 a.m. EDT



Released Thursday, April 30, 2009

Author: Brad Rippey, U.S. Department of Agriculture

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

Fig. 4. Current Drought Monitor weekly summary.

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

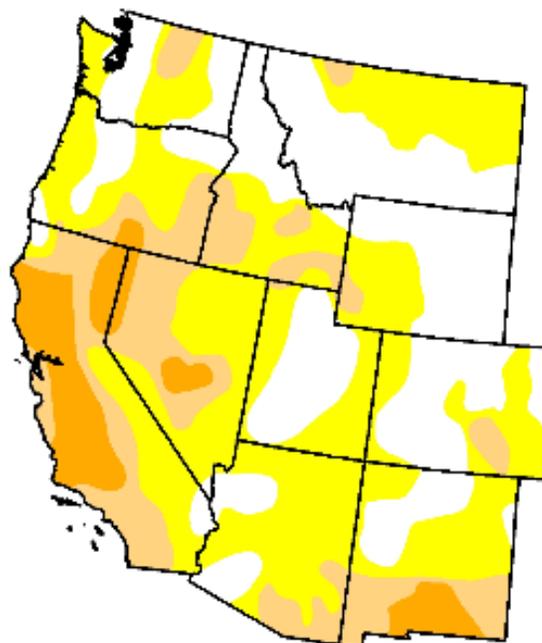
U.S. Drought Monitor

West

April 28, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	33.6	66.4	25.2	7.7	0.0	0.0
Last Week (04/21/2009 map)	32.9	67.1	25.8	7.7	0.0	0.0
3 Months Ago (02/03/2009 map)	41.1	58.9	28.6	10.7	2.5	0.0
Start of Calendar Year (01/06/2009 map)	37.4	62.6	28.9	8.8	0.4	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 (04/29/2008 map)	32.9	67.1	36.6	8.7	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

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



Released Thursday, April 30, 2009
Author: Brad Rippey, U.S. Department of Agriculture

Fig. 4a. Drought Monitor for the Western States with statistics over various time periods. Conditions have remained essentially unchanged during the past week. Ref: http://www.drought.unl.edu/dm/DM_west.htm

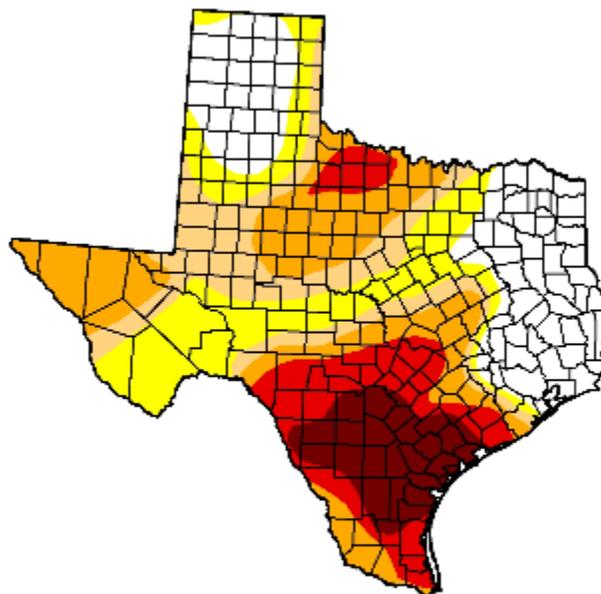
U.S. Drought Monitor

Texas

April 28, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	24.6	75.4	56.3	41.6	21.4	9.7
Last Week (04/21/2009 map)	22.1	77.9	60.5	45.9	22.7	11.2
3 Months Ago (02/03/2009 map)	4.6	95.4	66.8	42.6	19.6	6.7
Start of Calendar Year (01/06/2009 map)	41.7	58.3	24.5	15.0	9.1	4.2
Start of Water Year (10/07/2008 map)	67.2	32.8	20.5	11.0	3.6	0.0
One Year Ago (04/29/2008 map)	37.6	62.4	45.2	31.8	10.5	3.3



Intensity:

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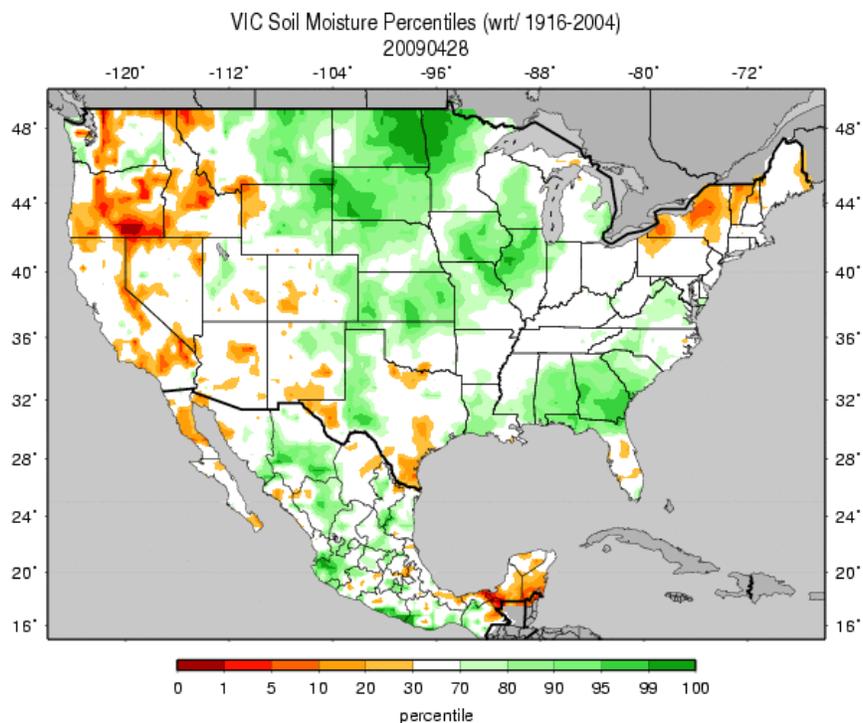
<http://drought.unl.edu/dm>



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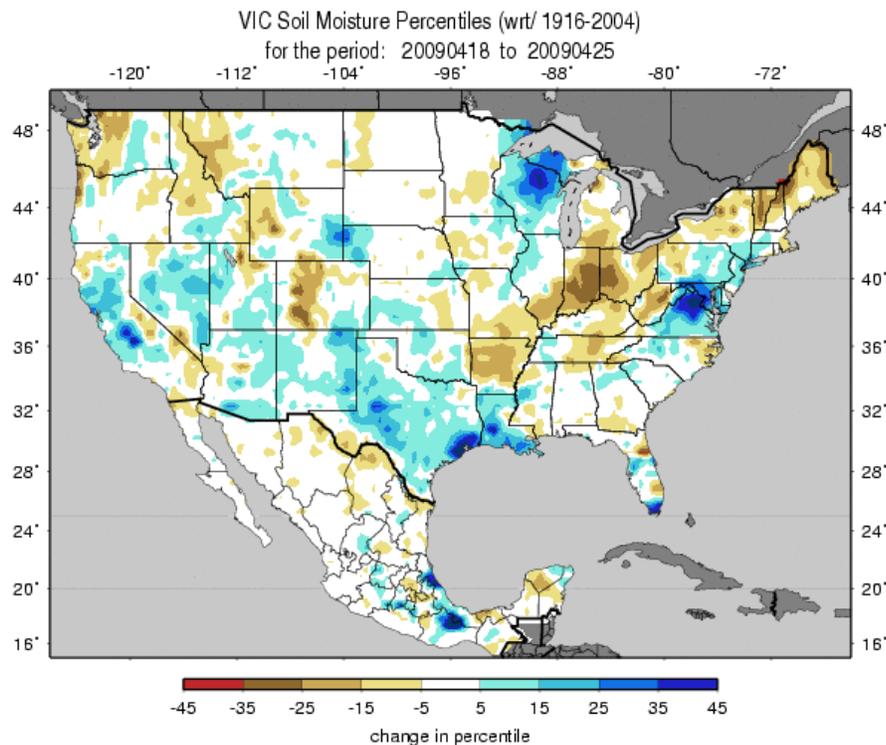
Fig. 4b: Texas is the only state with D4 drought condition in the US. Note slight improvement in all categories since last week. Ref: http://www.drought.unl.edu/dm/DM_state.htm?TX,S

Weekly Snowpack and Drought Monitor Update Report



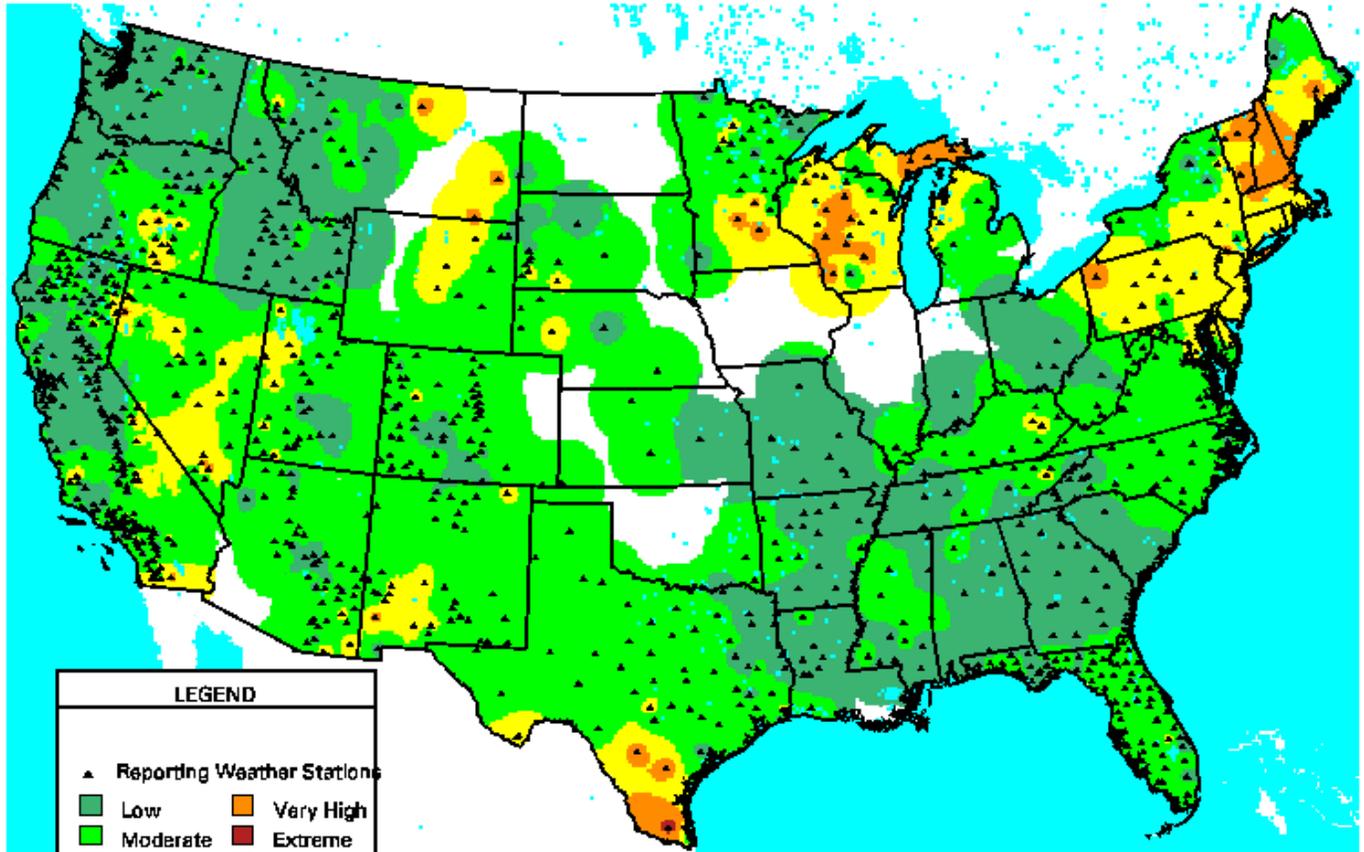
Figs. 5a: Soil Moisture ranking in percentile based on 1916-2004 climatology as of 28 April. Near saturation exists over the Northern Plain while excessive dryness is scattered across the West from Texas to Oregon and over New England.

Ref: http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.gif



Figs. 5b: Soil Moisture change in percentile based on 1916-2004 climatology for this past week. There was significant moistening over Wisconsin, Virginia, and coastal Texas since last week with significant drying over the Ohio Valley, New England, and parts of the Pacific NW. Ref: http://www.hydro.washington.edu/forecast/monitor/curr/conus.mexico/CONUS.MEXICO.vic.sm_qnt.1wk.gif

Observed Fire Danger Class: 13-APR-09



LEGEND	
▲	Reporting Weather Stations
■ (Dark Green)	Low
■ (Light Green)	Moderate
■ (Yellow)	High
■ (Orange)	Very High
■ (Red)	Extreme
■ (Light Blue)	Water

{Inv. Dist.² Interp.}

WFAS-MAPS Graphics FIRE BEHAVIOR RESEARCH MISSOULA, MT



Fig. 6. Observed Fire Danger Class. **Not Updated**

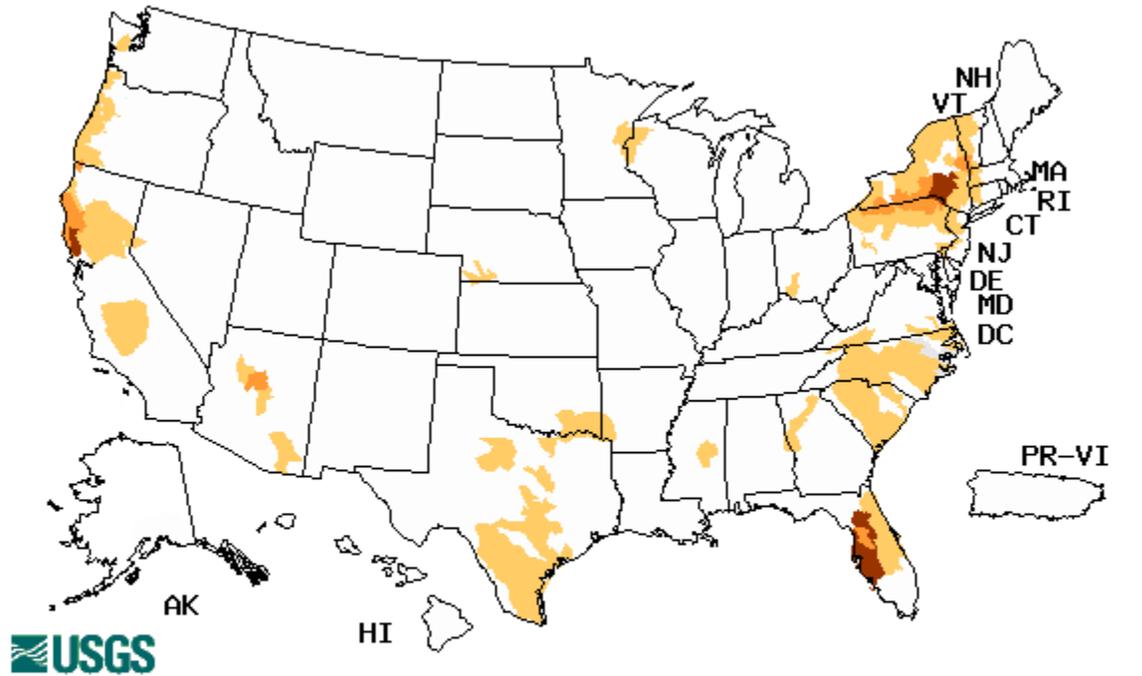
Source: Forest Service Fire Behavior Research – Missoula, MT.

Ref: http://www.fs.fed.us/land/wfas/fd_class.gif

Note: The Forest Service Web server is currently undergoing routine maintenance or has encountered an unexpected problem. We are working to bring the Web server back online as swiftly as possible.

Weekly Snowpack and Drought Monitor Update Report

Wednesday, April 29, 2009



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. Conditions are very poor over western Florida, and an area north of San Francisco. Conditions have improved greatly over Wisconsin-Upper Michigan during the past week.

Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary – April 28, 2009

The discussion in the Looking Ahead section is simply a description of what the official national guidance from the National Weather Service (NWS) National Centers for Environmental Prediction is depicting for current areas of dryness and drought. The NWS forecast products utilized include the HPC 5-day QPF and 5-day Mean Temperature progs, the 6-10 Day Outlooks of Temperature and Precipitation Probability, and the 8-14 Day Outlooks of Temperature and Precipitation Probability, valid as of late Wednesday afternoon of the USDM release week. The NWS forecast web page used for this section is: <http://www.cpc.ncep.noaa.gov/products/forecasts/>.

The East: Light rain continued to chip away at long-term precipitation deficits in the Mid-Atlantic region through April 22, followed by an early-season heat wave from April 25-28. Locations such as Philadelphia, Pennsylvania, and Virginia's Dulles Airport reached or exceeded 90 degrees F on 3 consecutive days from April 25-27. However, Dulles Airport's year-to-date precipitation deficit through April 28 stood at just 3.15 inches, down from 4.88 inches on March 25.

Meanwhile, abnormal dryness (D0) expanded both northward into southern New York and western New England, and southward through eastern North Carolina and into northeastern South Carolina. The northward expansion of dryness was driven by low streamflows and precipitation deficits during the last 3 months. In Scranton-Wilkes Barre, Pennsylvania, the year-to-date precipitation through April 28 was just 5.52 inches (54% of normal). Farther south, the Highway 31 fire near Myrtle Beach, South Carolina, charred more than 19,000 acres of vegetation and claimed more than six dozen structures.

Florida's peninsula continued to suffer through an unusually dry cool season, resulting in additional expansion of severe to extreme drought (D2 to D3). Through April 28, dry-season precipitation totaled just 2.31 inches (20% of normal) in Naples and 4.74 inches (25%) in Fort Lauderdale. The Deep fire near Miles City, Florida, 30% contained by April 28, charred at least 24,000 acres of vegetation and resulted in closures of I-75 (Alligator Alley) across the Everglades.

Farther west, short-term precipitation deficits led to the introduction of abnormal dryness (D0) in parts of central Mississippi and northeastern Louisiana. Through April 28, month- and year-to-date totals in Monroe, Louisiana, stood at 2.85 and 12.59 inches, respectively—both 64% of normal.

The Upper Midwest: Heavy snow lingered early in the drought-monitoring period across northeastern Wisconsin and the Upper Peninsula of Michigan, followed by soaking rains across much of the upper Midwestern drought area. Marquette, Michigan (10.6 and 9.9 inches), and Rhinelander, Wisconsin (6.9 and 3.3 inches), both netted consecutive daily-record snowfall totals (10.6 and 9.9 inches) on April 20-21. La Crosse, Wisconsin, received 2.39 inches of rain from April 24-27, accounting for 44% of its January 1 – April 28 sum of 5.38 inches. As a result of the heavy precipitation, coverage of moderate to severe drought (D1 to D2) was significantly reduced across northern Michigan, southeastern Minnesota, and northern, western, and central Wisconsin.

The Plains: Showers and thunderstorms dotted the central and southern Plains, erasing dryness (D0) from parts of Kansas and easing moderate to exceptional drought (D1 to D4) in central Texas and environs. However, rain bypassed several areas, resulting in the expansion of D0 from north-central Kansas into eastern Nebraska and the introduction of extreme drought (D3) into parts of north-central Texas. Across the south-central U.S., winter wheat and other fall-sown grains continued to suffer due to drought and a severe early-April freeze. According to the U.S. Department of Agriculture, nearly two-thirds (64%) of Oklahoma's winter wheat crop was rated in very poor to poor condition on April 26, along with nearly three-quarters (73%) of the Texas crop.

Weekly Snowpack and Drought Monitor Update Report

The West: With the end of the 2008-09 winter wet season approaching, there were only a few changes in the West. Nevertheless, late-season storms continued to produce some snow across the northern Rockies and the Intermountain West. Season-to-date (since October 1, 2008) precipitation totals as high as 100 to 130% of average resulted in the elimination of moderate drought (D1) and a reduction in the coverage of abnormal dryness (D0) across much of western Utah.

A period of record-setting heat affected portions of the West from April 19-22. In California, USDA reported that “high temperatures resulted in rapid dry down on rangeland” and that “additional rainfall was needed to help [pasture] growth.” In the San Francisco Bay area, monthly record highs were attained on April 20 in locations such as San Jose (95 degrees F; tied 95 degrees F on April 9, 1989, and April 30, 1996) and the Oakland Airport (91 degrees F; previously, 88 degrees F on April 23, 1966, and April 26 and 27, 2004). Additional monthly records were set in California on April 21, when highs soared to 104 degrees F in King City (previously, 102 degrees F on April 29, 1981, and April 26, 2004) and 101 degrees F in Gilroy (previously, 100 degrees F on April 30, 1981). In California’s San Joaquin Valley, Bakersfield notched consecutive daily-record highs (99 and 97 degrees F) on April 21-22.

Alaska, Puerto Rico, and Hawaii: Little or no precipitation fell in abnormally dry (D0) areas of southern Alaska, resulting in no change to the depiction. Meanwhile, Puerto Rico remained free of dryness and drought, despite a gradual drying trend across northern and eastern portions of the island during the last month. In northeastern Puerto Rico, San Juan’s April 1-28 rainfall totaled 2.56 inches (76% of normal). Finally, locally heavy showers in Hawaii were mostly confined to windward locations, which have already emerged from drought. As a result, Hawaii’s drought depiction was unchanged. Interestingly, Hawaii has been experiencing unusually cool weather this spring, with April temperatures averaging 3 to 4 degrees F below normal in locations such as Lihue, Kauai, and Hilo, on the Big Island. In fact, Lihue last experienced an above-normal daily average temperature on February 13.

Looking Ahead: During the next 5 days (April 30 – May 4), showery weather will shift from the nation’s mid-section into the South, East, and Midwest. Five-day precipitation totals could reach 4 to 8 inches from the southeastern Plains into the Mid-South, including some of the drought areas in the Red River Valley along and near the Texas-Oklahoma border. More than an inch of rain could fall in areas experiencing dryness or drought in the East, excluding Florida. Some rain will also dampen the upper Midwestern area of lingering drought. Meanwhile, some late-season storminess will arrive along the Pacific Coast on May 1 and quickly encompass the remainder of the West. Total precipitation will exceed an inch in several areas, including parts of the Sierra Nevada and the Pacific Northwest.

The CPC 6- to 10-day outlook for May 5-9 calls for above-normal precipitation in the Pacific Northwest and most of the East, South, and Midwest, while drier-than-normal conditions will be limited to the Southwest. Above-normal temperatures will accompany wet weather in the East and mostly dry weather in the Southwest, but cooler-than-normal conditions will prevail across the nation’s northern tier from Washington into the upper Midwest.

Author: Brad Rippey, U.S. Department of Agriculture

Weekly Snowpack and Drought Monitor Update Report

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: 30 April 2009