



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

Weekly Report - Snowpack / Drought Monitor Update

Date: 25 April 2013

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: [SNOTEL](#) and ACIS 7-day temperature anomaly ending today reveals a warm to cold temperature gradient from California to the western High Plains (Fig. 1a). [ACIS 7-day](#) average temperature anomalies show the greatest positive temperature departures over isolated areas of California (>+9°F). The greatest negative departures occur over the northwestern High Plains (<-15°F). This temperature pattern is very similar to last week's and is helping to slow snow melt over the central and northern Rockies (Fig. 1b). ACIS 7-day average temperature anomalies for [April](#) show the greatest negative temperature departures over northeastern Montana and the greatest positive temperature departures over California (Fig. 1c).

Precipitation: [ACIS](#) 7-day average precipitation amounts for the period ending April 24 show a second week with the heaviest precipitation confined to the Washington Cascades and central and northern Rockies (Fig. 2a). Lesser amounts fell over the southern Oregon Cascades (Fig. 2b). The widespread moisture helped boost snow-water equivalent (SWE) values by 5 to 10% over areas that received precipitation greater than one inch. SNOTEL [month to date](#) precipitation percent of normal pattern for April shows significant precipitation across much of the West. New Mexico and parts of the Great Basin (including the Sierra Nevada) have not fared as well (Fig. 2c). For the [2013 Water Year](#) that began on 1 October 2012, the pattern continues to resemble La Niña (e.g., wetter Northern Tier). Parts of Arizona are still the exception for the Southern Tier with near normal amounts. Southeast Oregon and northeast Nevada, despite slightly below average precipitation, have seen much below average amounts of snowpack this winter (Fig. 3b). The opposite situation (more SWE and less precipitation) has occurred this season over Wyoming. This week's precipitation over Colorado has helped decrease the moisture deficit across the northern part of the state.

Snow: The [3-day snow depth changes](#) show a spring storm delivering heavy snowfall over central Colorado and parts of Wyoming. Here are some examples of recent increases over the [Upper Colorado](#) and [other Colorado basins](#). Here are more examples over the [Upper Bear](#) (Wyoming) and other [Wyoming basins](#). Elsewhere, a noticeable decrease in snow cover occurred over the Cascades, northern Idaho mountains, and northern Rockies, despite a very wet week. (Fig. 3a). The [Snow-Water Equivalent](#) map (Fig. 3b) shows SWE rebounding by 5 to 10% across northern Colorado, northern Utah, Wyoming, and northern Montana. Because most SNOTEL sites have passed their peak SWE dates, recent colder temperatures have delayed snow melt. Thus, some SWE values have increased without the addition of significant snowfall during the last 7 days, and some have benefitted from additional snowfall.

The following **Weather and Drought Summary** is provided by this week's NDMC Author:

Author: [Eric Luebehusen, U.S. Department of Agriculture](#):

Western U.S.: "The water year approached conclusion, with many areas of the west ending the season with bleak spring runoff prospects and increasing drought concerns. Precipitation was mostly confined to the non-drought areas of the Pacific Northwest, where 1 to 3 inches (liquid

Weekly Snowpack and Drought Monitor Update Report

equivalent) were reported during the monitoring period. Consequently, drought persisted or expanded across much of the region.”

“From central California into the Great Basin and central Rockies, the disappointing end to the water year resulted in some expansion of drought. In northeastern California and southeastern Oregon, water-year precipitation averaged 50 to 70 percent of normal, with the corresponding Standardized Precipitation Index (SPI) in this region over the same time period indicating D1 (Moderate Drought or greater). In the Sierra Nevada, where a promising start to the snow season was followed by an abrupt reversal, the liquid Snow Water Equivalent (SWE) dropped below the 15th percentile, with water-year precipitation deficits averaging 3 to 11 inches near Lake Tahoe; consequently, Moderate Drought (D1) was expanded to encompass the central Sierra Nevada. Severe Drought (D2) was expanded in the San Juan Mountains of southwestern Colorado, as well as neighboring environs, to reflect water-year precipitation values that have dropped to nearly 50 percent of normal as well as SWE which dropped into the 10th percentile or lower (corresponding precipitation rankings were at or below the 5th percentile). One exception was the central Rockies, where a late-season snow storm (locally more than 2 inches liquid equivalent) eased drought in central and northern Colorado.”

“Farther south, water-year precipitation shortfalls increased from the southern San Joaquin Valley (40 to 55 percent of normal) into southwestern Nevada (30 to 50 percent of normal) and western Arizona (less than 50 percent of normal). Consequently, Moderate (D1) to Severe (D2) Drought was expanded in these locales. Likewise, Extreme Drought (D3) was introduced in southeastern Arizona and southwestern New Mexico, where water-year precipitation totaled a meager 30 percent of normal or less (deficits locally more than 4 inches).”

A comprehensive narrative describing drought conditions for the nation can be found at the end of this document.

Drought Impacts Definitions

The possible impacts associated with **D4 (S, L)** drought include widespread crop/pasture losses and shortages of water in reservoirs, streams, and wells creating water emergencies. The possible impacts associated with **D3 (S, L)** drought include major crop/pasture losses and widespread water shortages or restrictions. Possible impacts from **D2 (S, L)** drought are focused on water shortages, water restrictions imposed, and crop or pasture losses. The possible impacts associated with **D1 (S, L)** drought are focused on water shortages developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 4 through 4d).

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). Another good resource can be found at: <http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>.

Soil Climate Analysis Network (SCAN)

Figure 6 provides supplemental data on soil conditions (moisture and temperatures at various depths from 2 inches up to 40 inches). To access SCAN data, see the National Water & Climate Center [webpage](#).

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

Weekly Snowpack and Drought Monitor Update Report

streamflow percentiles based on historical streamflow for the day of the year. Thus, the map shows conditions adjusted for this time of the year. Only stations having at least 30 years of record are used. Sub-regions shaded gray indicate that insufficient data were available to compute a reliable 7-day average streamflow value. During winter months, this situation frequently arises due to ice effects. The data used to produce this map are provisional and have not been reviewed or edited. They may be subject to significant change.

State Activities

State government drought activities can be tracked at the following URL: <http://drought.unl.edu/mitigate/mitigate.htm>. NRCS Snow Survey and Water Supply Forecasting (SSWSF) Program State Office personnel are participating in state drought committee meetings and providing the committees and media with appropriate SSWSF information - <http://www.wcc.nrcs.usda.gov/cgi-bin/bor.pl>. Additional information describing the products available from the Drought Monitor can be found at the following URLs: <http://drought.unl.edu/dm/> and <http://www.drought.gov>.

For More Information

The National Water and Climate Center (NWCC) Homepage provides 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>. Reports from 2007 are available online while ones from 2001-2006 can be acquired on request.

This report uses data and products provided by the Interagency Drought Monitor Consortium members and the National Interagency Fire Center.

/s/

Micheal L. Golden
Deputy Chief, Soil Science and Resource Assessment

Weekly Snowpack and Drought Monitor Update Report

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

Apr 25, 2013

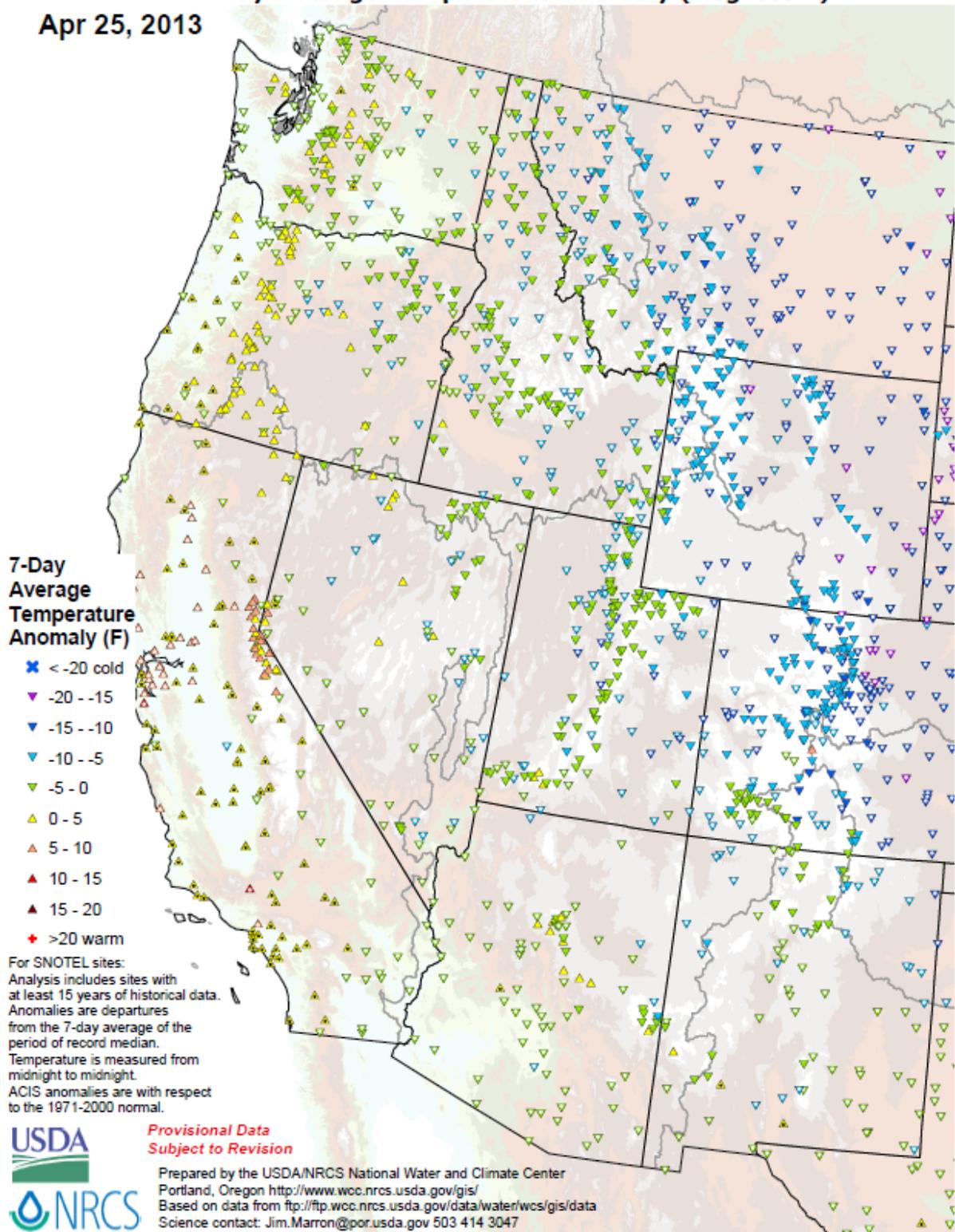
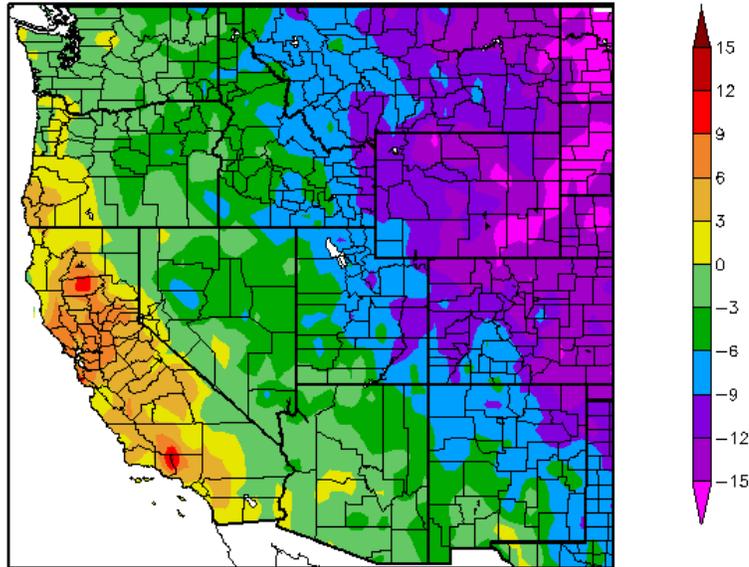


Fig. 1a: SNOTEL and ACIS 7-day temperature anomaly ending today reveals a warm to cold temperature gradient from California to the western High Plains.

Weekly Snowpack and Drought Monitor Update Report

Departure from Normal Temperature (F)
4/18/2013 – 4/24/2013

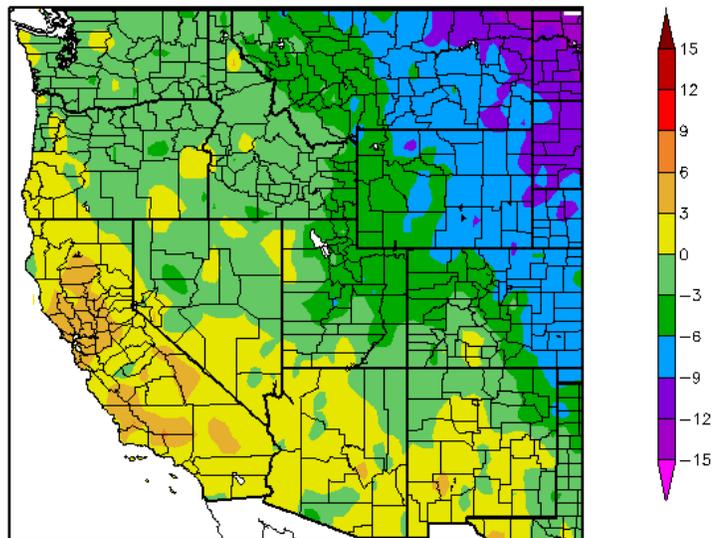


Generated 4/25/2013 at HPRCC using provisional data.

Regional Climate Centers

Fig. 1b: [ACIS 7-day](#) average temperature anomalies show the greatest positive temperature departures over isolated areas of California (>+9°F). The greatest negative departures occur over the northwestern High Plains (<-15°F). This temperature pattern is very similar to last week's and is helping to slow snow melt over the central and northern Rockies. For more figures, see the Western Water Assessment's Intermountain West Climate [Dashboard](#).

Departure from Normal Temperature (F)
4/1/2013 – 4/24/2013



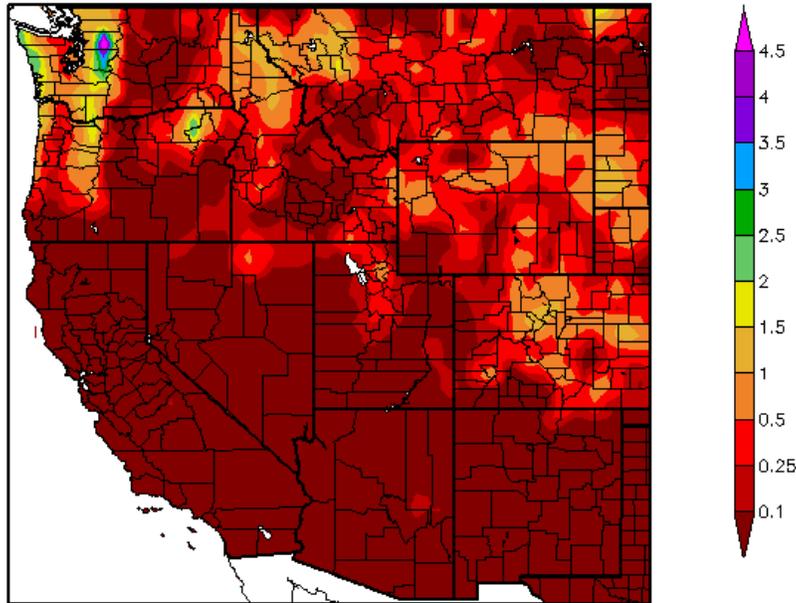
Generated 4/25/2013 at HPRCC using provisional data.

Regional Climate Centers

Fig. 1c: ACIS 7-day average temperature anomalies for [April](#) show the greatest negative temperature departures over northeastern Montana and the greatest positive temperature departures over California.

Weekly Snowpack and Drought Monitor Update Report

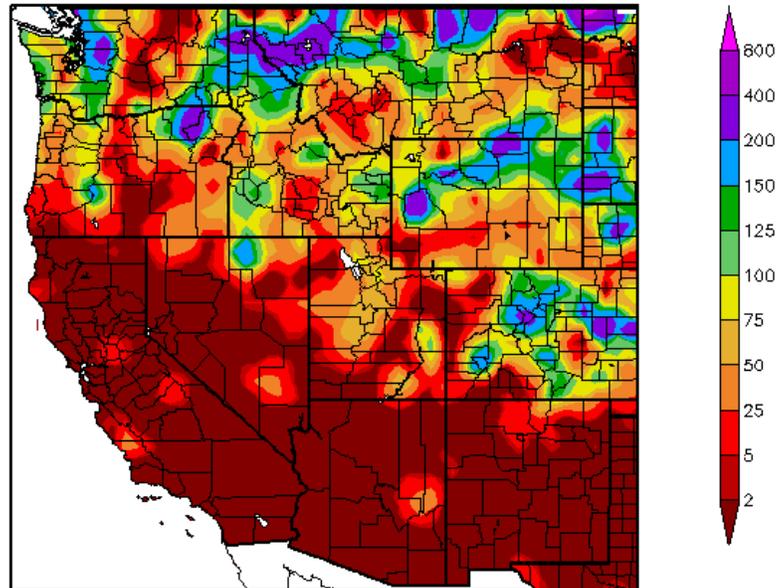
Precipitation (in)
4/18/2013 - 4/24/2013



Generated 4/25/2013 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
4/18/2013 - 4/24/2013



Generated 4/25/2013 at HPRCC using provisional data.

Regional Climate Centers

Fig. 2a and 2b: [ACIS](#) 7-day average precipitation amounts for the period ending April 24 show a second week with the heaviest precipitation confined to the Washington Cascades and central and northern Rockies (Fig. 2a). Lesser amounts fell over the southern Oregon Cascades (Fig. 2b). The widespread moisture helped boost snow-water equivalent values by 5 to 10% over areas that received precipitation greater than one inch.

Weekly Snowpack and Drought Monitor Update Report

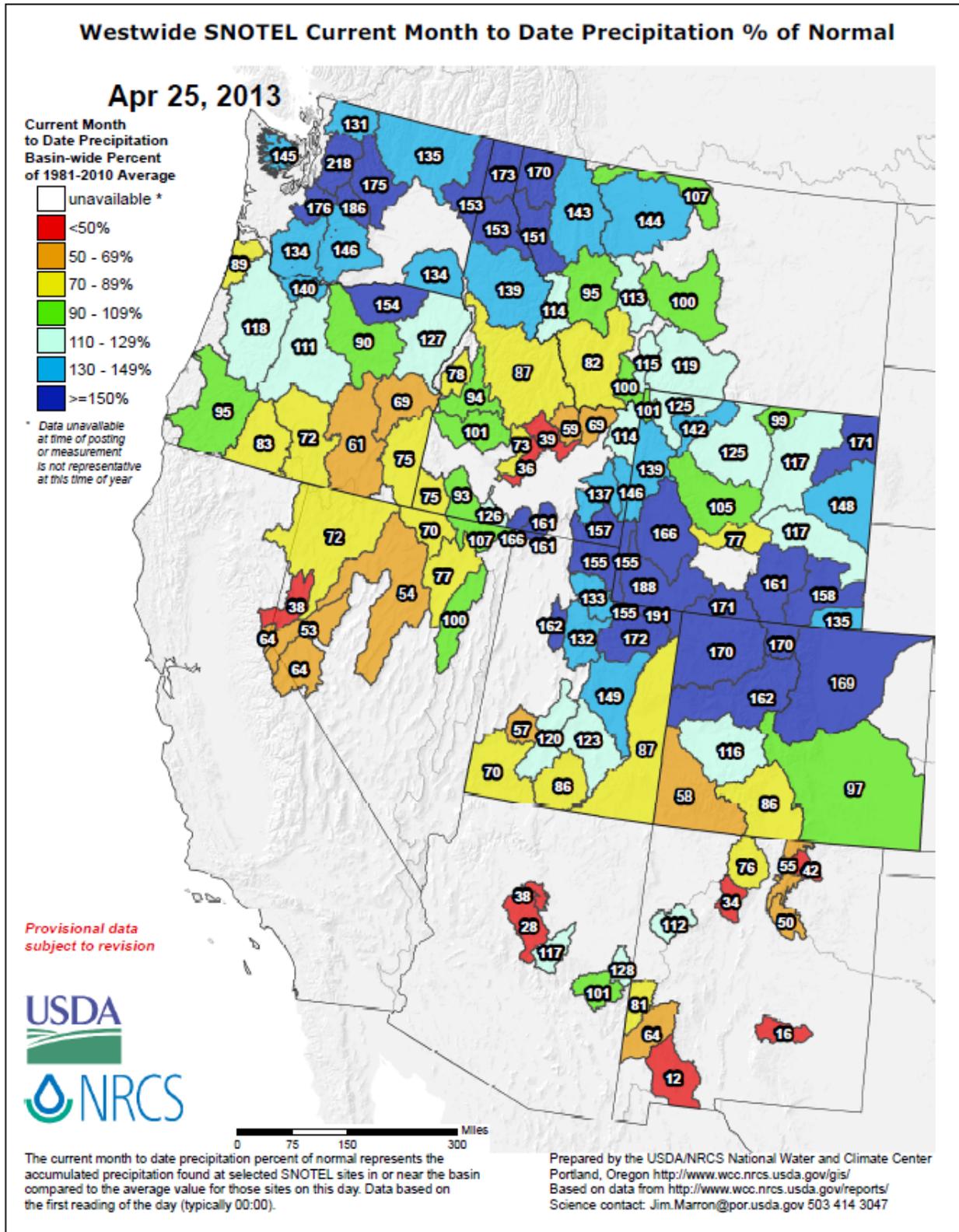


Fig. 2c: SNOTEL month to date precipitation percent of normal pattern for April shows significant precipitation across much of the West. New Mexico and parts of the Great Basin (including the Sierra Nevada) have not fared as well.

Weekly Snowpack and Drought Monitor Update Report

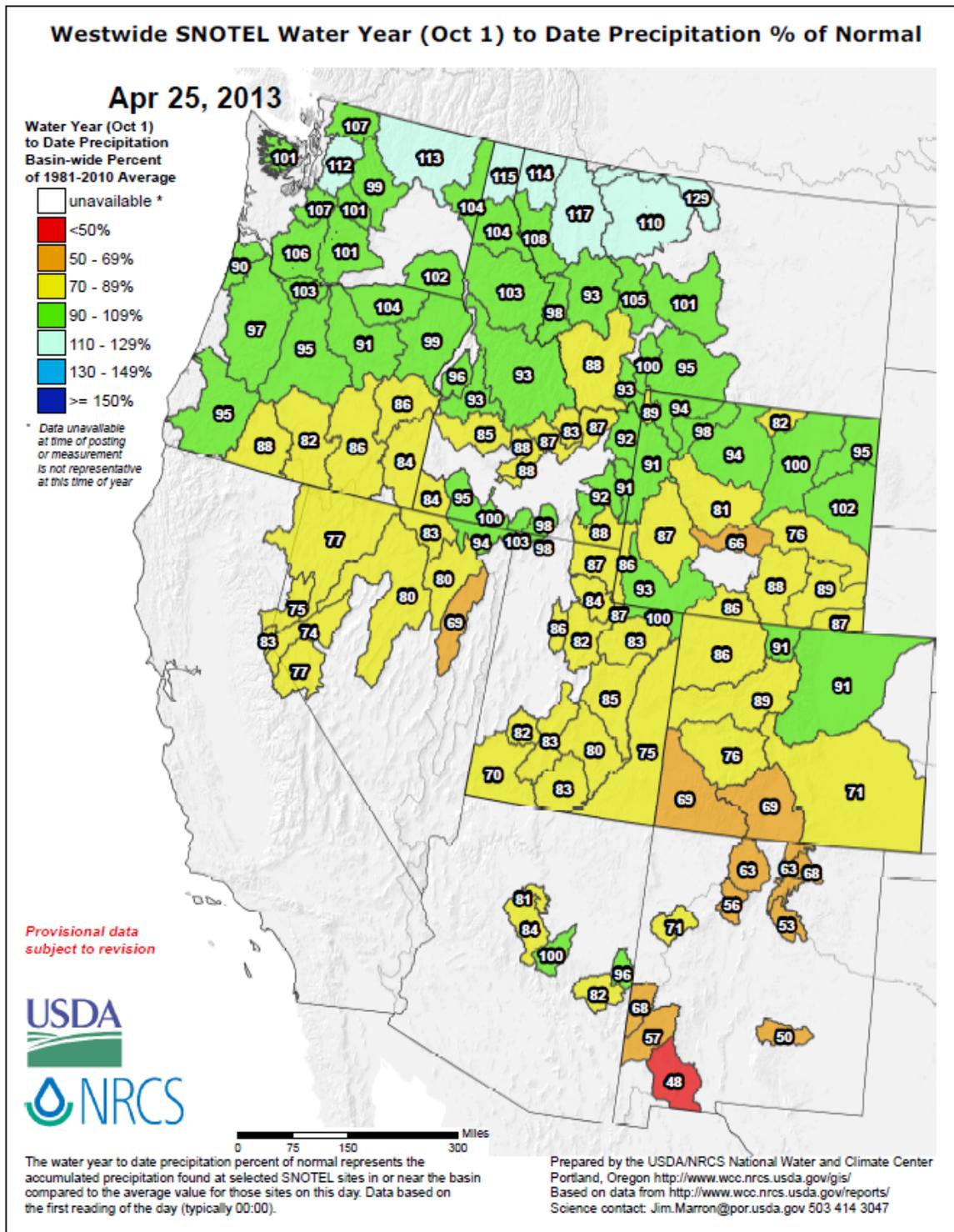


Fig. 2d: For the [2013 Water Year](#) that began on 1 October 2012, the pattern continues to resemble La Niña (e.g., wetter Northern Tier). Parts of Arizona are still the exception for the Southern Tier with near normal amounts. Southeastern Oregon and northeast Nevada, despite slightly below average precipitation, has seen much below average amounts of snowpack this winter (Fig. 3b). The opposite situation (more SWE and less precipitation) has occurred this season over Wyoming. This week's precipitation over Colorado has helped decrease the moisture deficit across the northern part of the state. For additional information, daily reports by SNOTEL sites are available [here](#).

SNOTEL 3-Day Snow Depth Change (Inches)

Apr 25, 2013

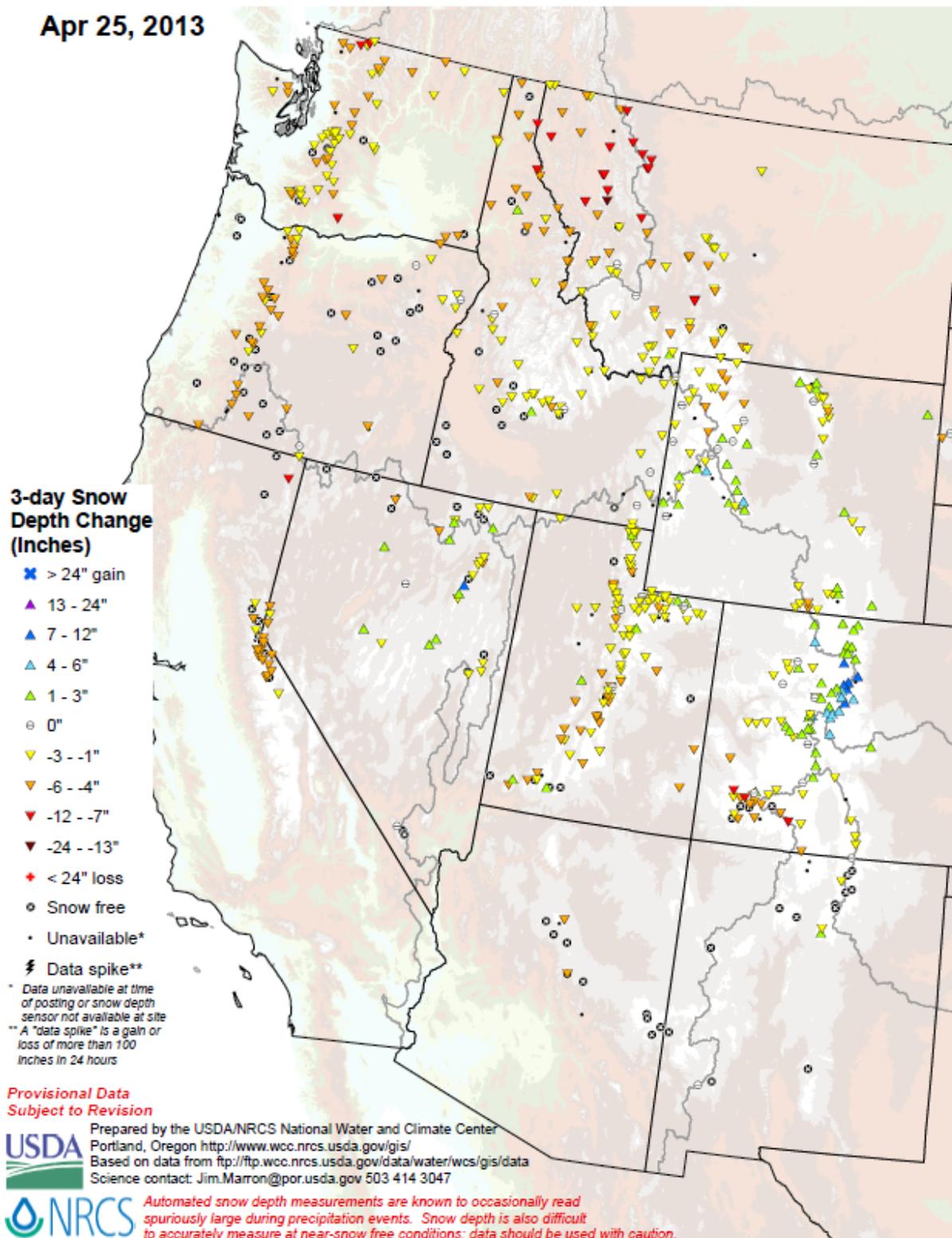


Fig. 3a: The 3-day snow depth changes show a spring storm delivering heavy snowfall over central Colorado and parts of Wyoming. Here are some examples of recent increases over the Upper Colorado and other Colorado basins. Here are more examples over the Upper Bear (Wyoming) and other Wyoming basins. Elsewhere, a noticeable decrease in snow cover occurred over the Cascades, northern Idaho mountains, and northern Rockies, despite a very wet week.

Weekly Snowpack and Drought Monitor Update Report

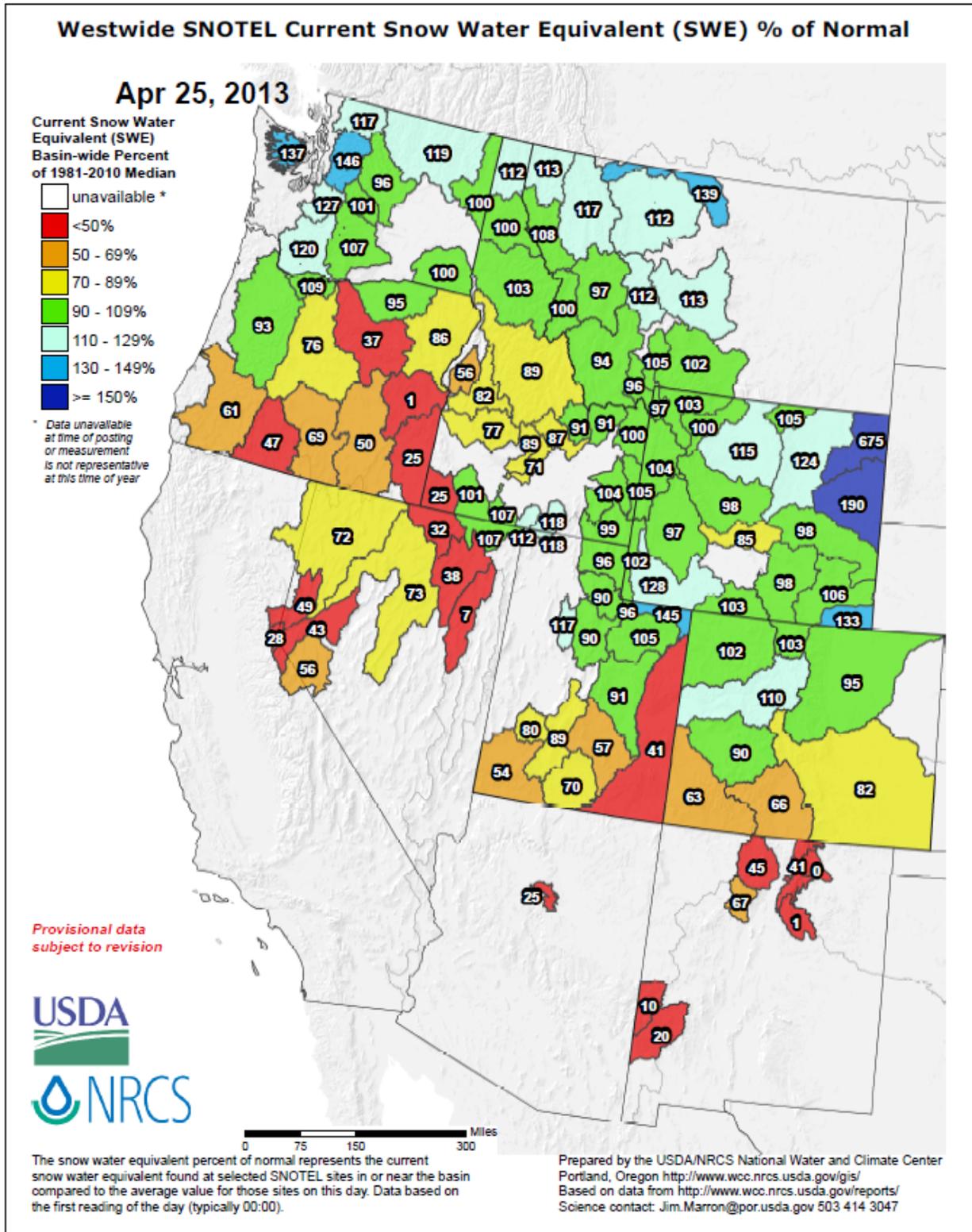


Fig. 3b: Snow-Water Equivalent (SWE): Today's map shows SWE rebounding by 5 to 10% across northern Colorado, northern Utah, Wyoming, and northern Montana. Because most SNOTEL sites have passed their peak SWE dates, recent colder temperatures have delayed snow melt. Thus, some SWE values have increased without the addition of significant snowfall during the last 7 days, and some have benefitted from additional snowfall. A useful basin-by-basin assessment of SWE to date can be viewed by state [here](#) and [here](#).

Weekly Snowpack and Drought Monitor Update Report

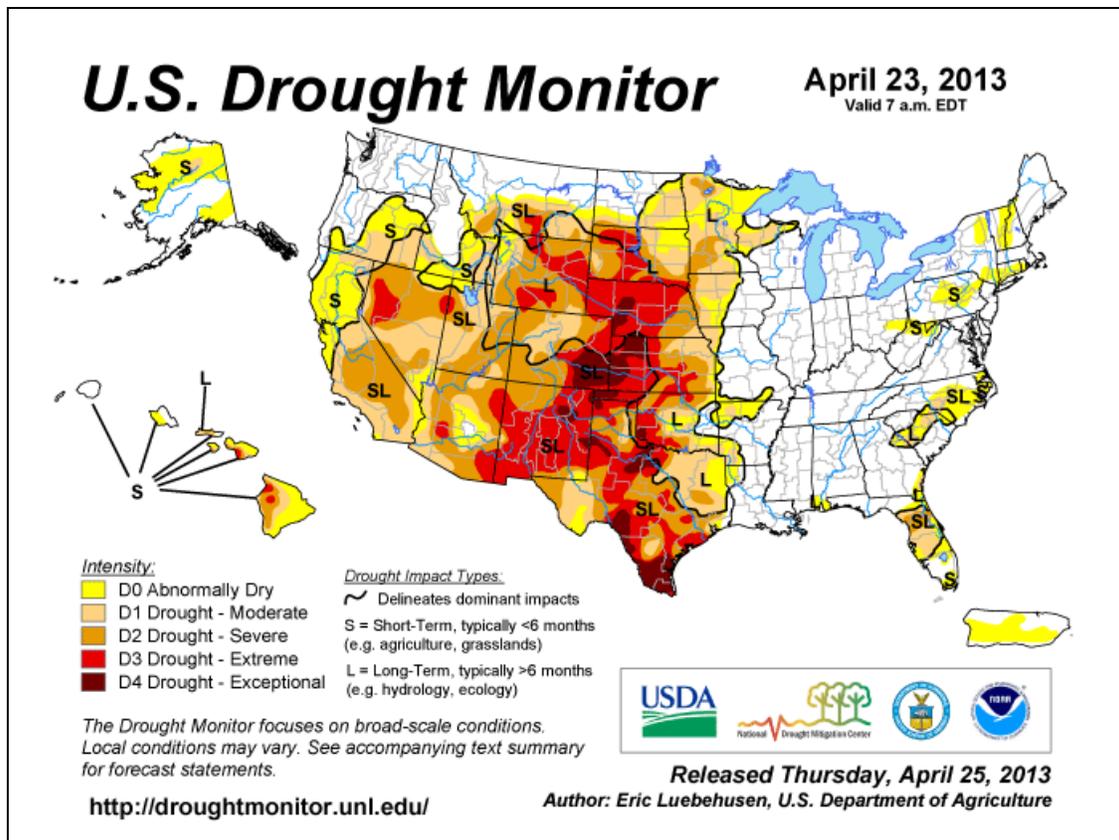


Fig. 4: Current [Drought Monitor](#) weekly summary. The exceptional D4 levels of drought are scattered across the western Corn Belt of the Plains into eastern Colorado and New Mexico. For more drought news, see [Drought Impact Reporter](#). The latest [drought indicator blend and component percentiles spreadsheet](#) is a great resource for climate division drought statistics. See Fig. 8 for the latest [Drought Outlook](#) (forecast). Spring 2013 edition of DroughtScope, the quarterly newsletter of the National Drought Mitigation Center, is [here](#). For an interesting website on Lake Mead drought update, click [here](#).

Drought News— as of April 19, 2013

This is a collection of drought-related news stories from the past seven days or so. A number of these articles will be posted on the [Drought Headlines](#) page at the NDMC website. Impact information from these articles is also entered into the [Drought Impact Reporter](#).

The water situation is sounding direr in New Mexico because the Middle Rio Grande Valley in the Albuquerque area does not have enough water to meet demand. With some operational changes and new lease agreements, they may be able to eke by this summer. There is also trouble on the Pecos River in eastern New Mexico with the recent priority call.

State water employees in western Kansas have been encountering belligerent farmers who threaten to harm the water employees if they return to monitor wells. Over pumping has been more prevalent in recent years with the drought. The Kansas Division of Water Resources' chief legal counsel sent letters to sheriffs and county attorneys in western Kansas, reminding them of state laws that may be violated when employees are physically and verbally threatened.

Agriculture

[Devastating Drought in Nueces County](#) - April 16, **South Texas**. Only 10 percent of the grain sorghum has germinated and is not expected to last long without rain. The county has gotten just 2.5 inches of rain in the last six months, the least amount for this period since 1961.

[Kansas Beef Cattle Numbers Lowest Since 1999](#) according to the USDA.

[Newly planted NM chile crop faces challenges aplenty](#) - April 12, **Southern New Mexico**.

U.S. Drought Monitor

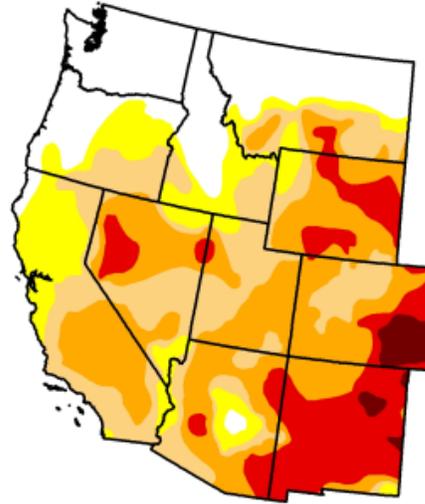
West

April 23, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	20.28	79.72	66.00	43.41	16.10	1.87
Last Week (04/16/2013 map)	19.84	80.16	63.67	41.05	14.73	1.64
3 Months Ago (01/22/2013 map)	22.60	77.40	68.24	44.51	17.27	2.15
Start of Calendar Year (01/01/2013 map)	24.39	75.61	69.31	45.04	18.01	2.15
Start of Water Year (09/25/2012 map)	15.12	84.88	77.15	43.65	16.85	1.77
One Year Ago (04/17/2012 map)	32.80	67.20	46.92	24.14	3.77	0.91

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, April 25, 2013
Eric Luebehusen, U.S. Department of Agriculture

<http://droughtmonitor.unl.edu>

Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. Some deterioration in D3 and D4 occurred this past week. See an interesting article about the San Juan region of the Southwest. Also see latest issue of the Southwest Climate Outlook.

In California, there are cooperative snow surveys made up of 35 or so utilities, water agencies, government agencies and the Department of Water Resources. The NRCS is one of the cooperating agencies. Through this cooperative, California has over 200 manual snow surveys and has a similar number of snow pillows. With this data they publish a Bulletin 120 every month from February through May which provides a forecast of April through July runoff. We provide daily snow reports through the California Data Exchange Center (which also posts the Bulletin 120 at

<http://cdec.water.ca.gov/snow/bulletin120/index2.html>) through the following links:

- Current PAGE6 report: <http://cdec.water.ca.gov/cgi-progs/snow/PAGE6>
 - Current DLYSWEQ report: <http://cdec.water.ca.gov/cgi-progs/snow/DLYSWEQ>
 - Current Regional Snowpack Plots: http://cdec.water.ca.gov/cgi-progs/snow/PLOT_SWC
- California also hosts a statewide water conditions page at: http://cdec.water.ca.gov/water_cond.html which has links to precipitation, reservoir storage, snowpack, runoff, and summary reports. Click for the latest statistics for California Reservoirs.

For the [latest USDA/NASS weekly agricultural report](#) for California:

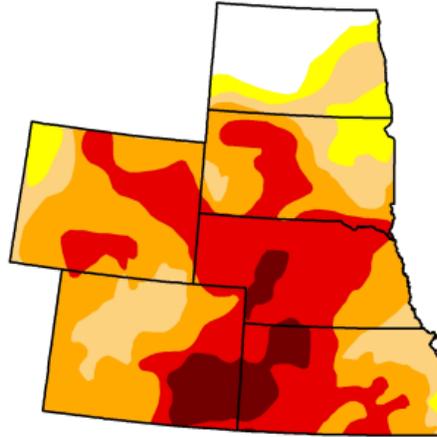
Also see USDA Agriculture Data:
U.S. Hay Production [Map](#); U.S. Winter Wheat [Map](#); NASS [Statistics by States](#)

U.S. Drought Monitor

High Plains

April 23, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	7.07	92.93	86.14	69.80	37.82	7.32
Last Week (04/16/2013 map)	7.10	92.90	86.43	73.47	44.28	6.77
3 Months Ago (01/22/2013 map)	4.79	95.21	92.08	87.25	61.30	27.02
Start of Calendar Year (01/01/2013 map)	1.54	98.46	93.01	86.20	60.25	26.99
Start of Water Year (09/25/2012 map)	0.00	100.00	98.91	83.80	61.28	24.35
One Year Ago (04/17/2012 map)	42.66	57.34	24.30	5.68	0.00	0.00



Intensity:

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

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

<http://droughtmonitor.unl.edu>



Released Thursday, April 25, 2013
Eric Luebbehusen, U.S. Department of Agriculture

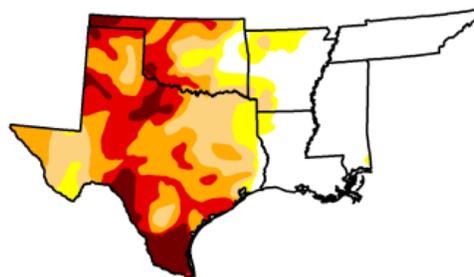
Fig. 4b: Drought Monitor for the [High Plains](#) with statistics over various time periods. Note significant improvement in all categories but D4 this week. See [Kansas Drought Update](#).

U.S. Drought Monitor

South

April 23, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	34.09	65.91	57.02	42.53	23.28	6.76
Last Week (04/16/2013 map)	32.96	67.04	58.25	44.18	22.04	7.17
3 Months Ago (01/22/2013 map)	31.00	69.00	55.13	41.37	23.50	8.66
Start of Calendar Year (01/01/2013 map)	21.18	78.82	63.69	50.50	32.80	10.98
Start of Water Year (09/25/2012 map)	24.13	75.87	66.61	51.50	29.86	9.11
One Year Ago (04/17/2012 map)	49.97	50.03	34.29	24.89	13.99	4.87



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://droughtmonitor.unl.edu>



Released Thursday, April 25, 2013
Eric Luebbehusen, U.S. Department of Agriculture

Fig. 4c: Drought Monitor for the [South-Central Region](#) with statistics over various time periods. Note slight improvement in all categories this week. Check out the [Texas Drought Website](#). See [Texas Reservoirs](#).

Drought Monitor Classification Changes for Selected Time Periods

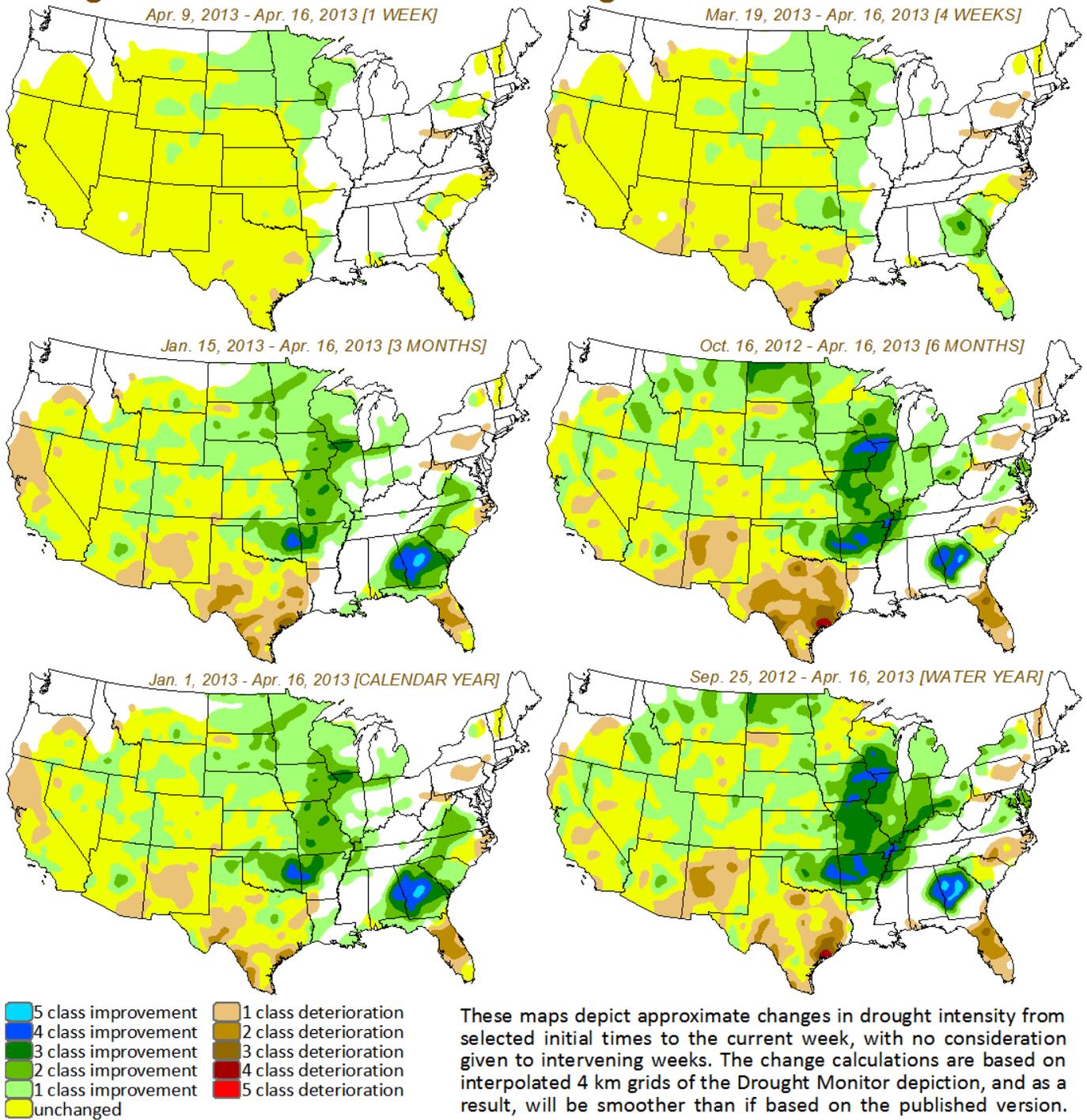
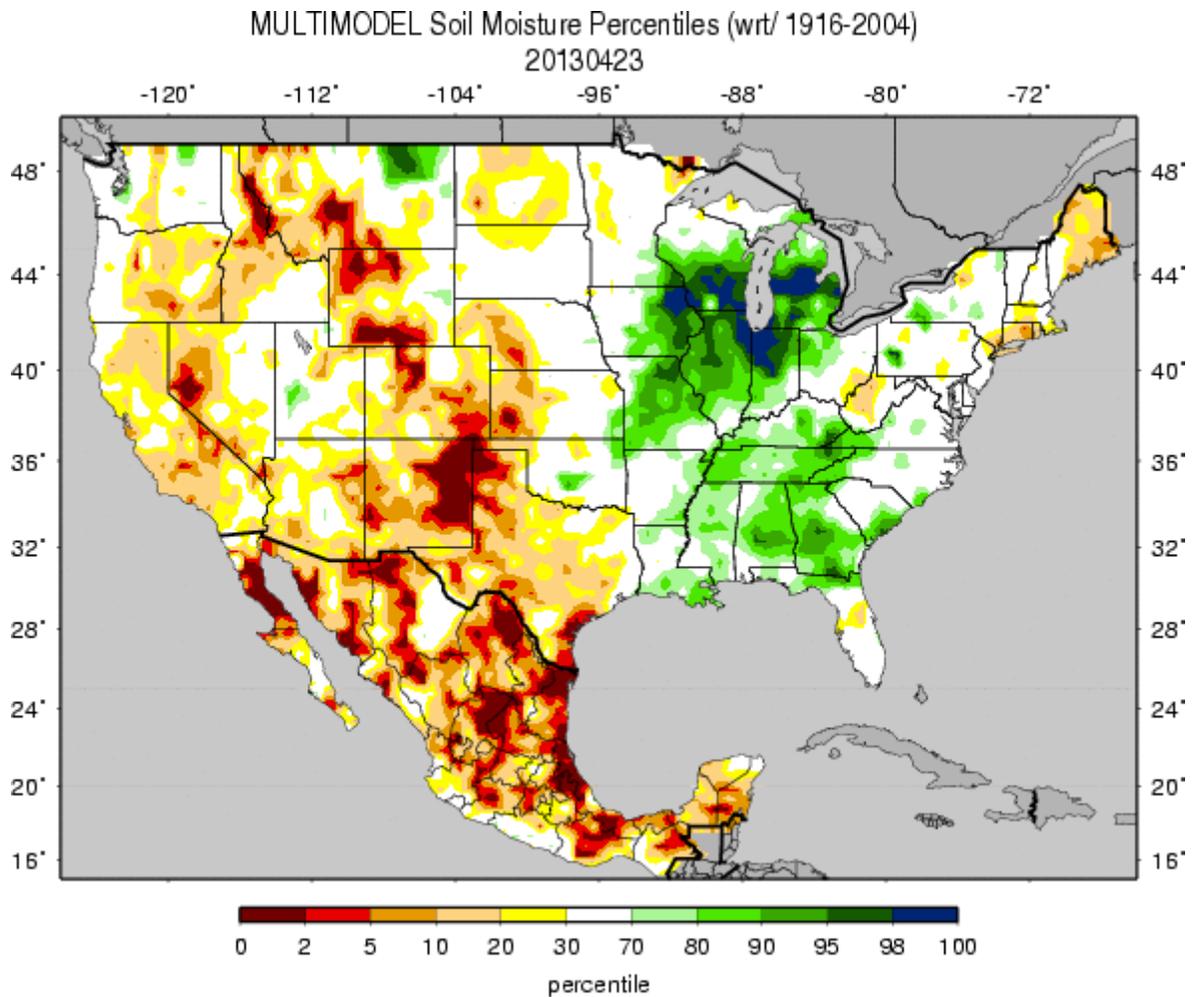


Fig. 4d: Drought Monitor [category changes](#) over several time periods. This figure is based on data through 16 April. Note recent improvements over the Western Great Lakes Region (upper level panel).

Weekly Snowpack and Drought Monitor Update Report



Figs. 5: Soil moisture ranking in [percentile](#) as of 23 April shows dryness over the western High Plains, much of the Rockies, and western Great Basin. Note abundant moisture over the Western Great Lake States. *Useful Hydrological Links:* [Crop Moisture Index](#); [Palmer Drought Severity Index](#); [Standardized Precipitation Index](#); [Surface Water Supply Index](#); [Weekly supplemental maps](#).

Weekly Snowpack and Drought Monitor Update Report

Soil Climate Analysis Network ([SCAN](#))

Station (2051) MONTH=2013-03-26 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision as of Thu Apr 25 10:11:14 CDT 2013

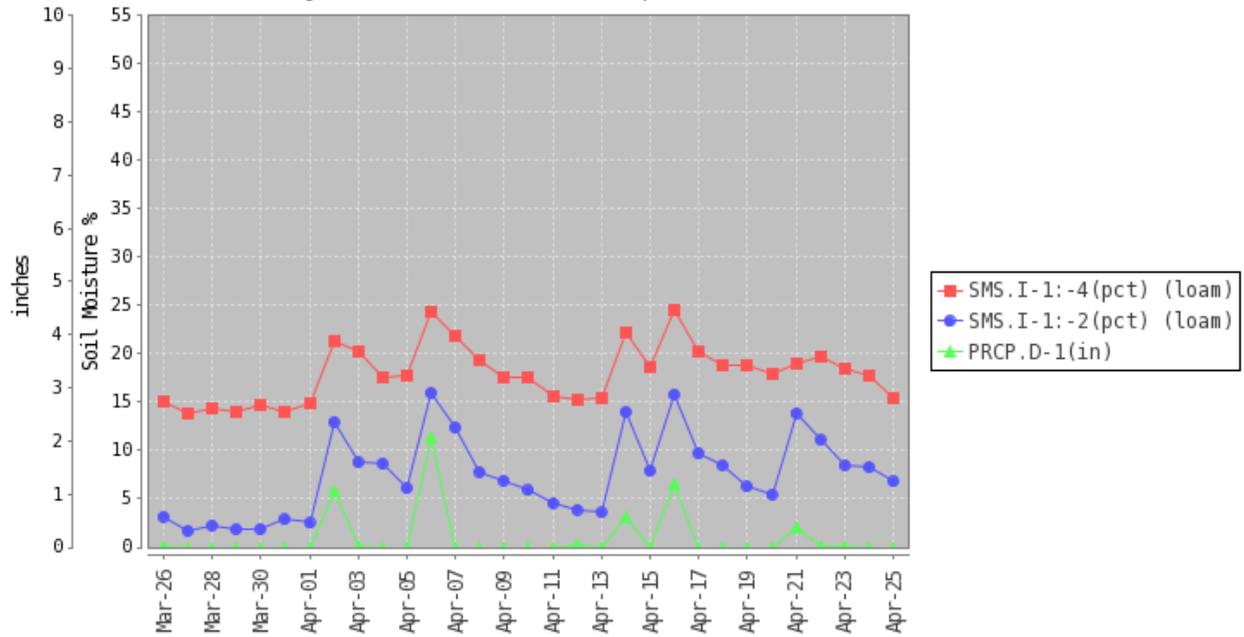
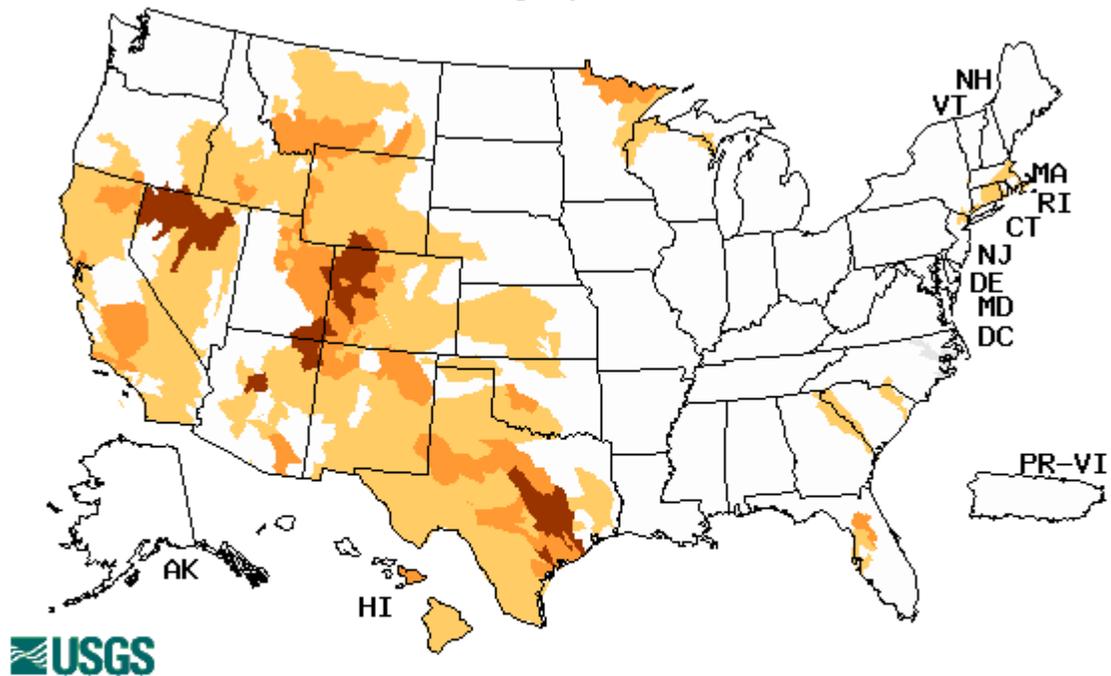


Fig. 6: This NRCS resource shows a site over [southern Florida](#) with recent increases in top layer soil moisture in response to rains. *Useful Agriculture Links:* [Vegetation Drought Response Index](#); [Evaporative Stress Index](#); [Vegetation Health Index](#); [NDVI Greenness Map](#); [GRACE-Based Surface Soil Moisture](#); [North American Soil Moisture Network](#). [Monthly Wild Fire Forecast Report](#).

Weekly Snowpack and Drought Monitor Update Report

Wednesday, April 24, 2013



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 the year. **Severe** conditions exist over parts of western Colorado, the Four Corner Region, Texas, and northern Nevada. See the [USGS National Water Information System Mapper](#).

Weekly Snowpack and Drought Monitor Update Report

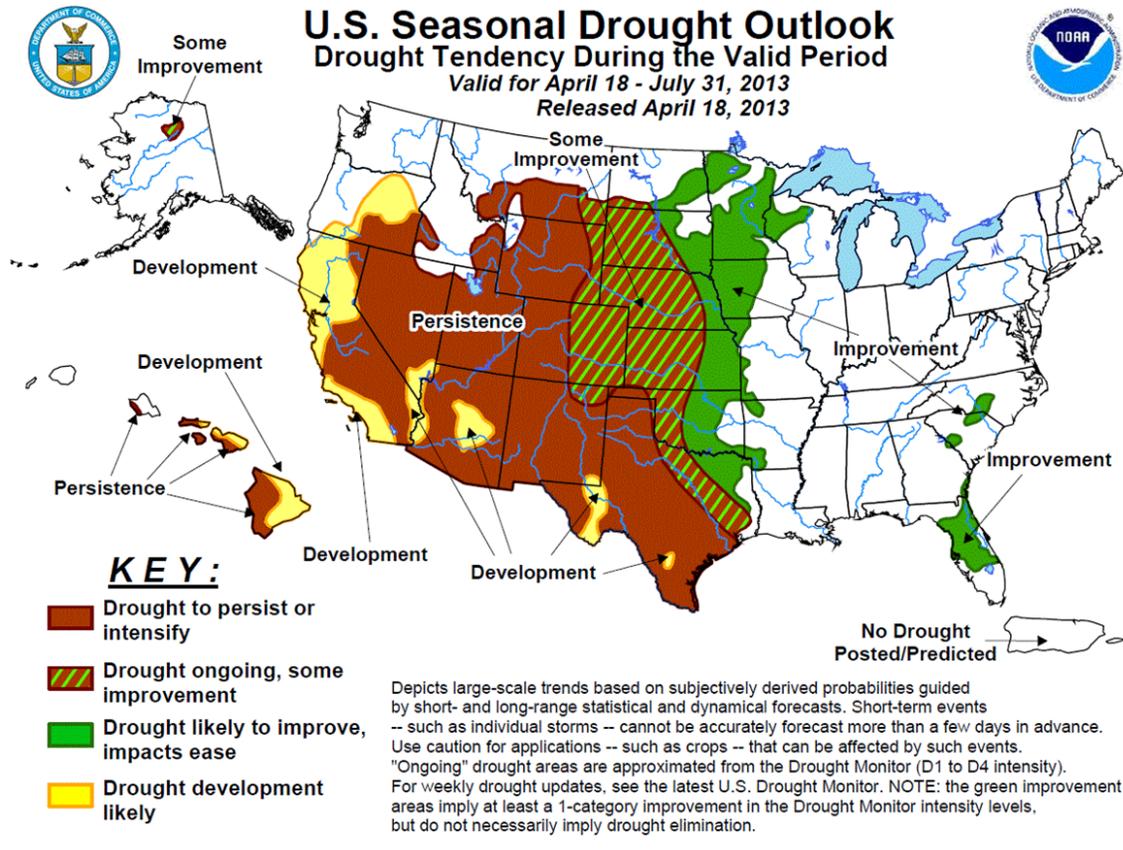
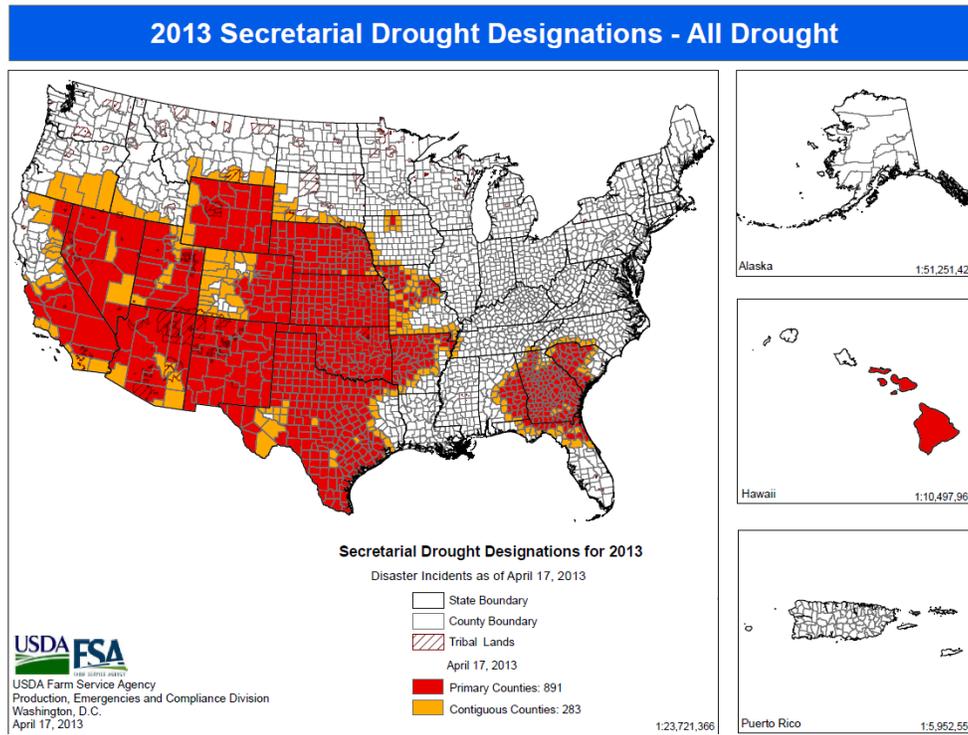


Fig. 8: U.S. Seasonal [Drought Outlook](#) as of 18 April. Note that the “some improvement” areas expanded westward into the eastern slope of the Rockies due to recent spring storms.



See [USDA Drought Assistance website](#).
See [National Sustainable Agriculture Information Service](#)

Weekly Snowpack and Drought Monitor Update Report

**National Drought Summary provided by the National Drought Mitigation Center --
Drought Author: Author: [Eric Luebehusen, U.S. Department of Agriculture](#)**

National Drought Summary -- April 23, 2013

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/>.

Summary: “Chilly, unsettled weather across the central U.S. contrasted with increasingly dry conditions in the west and parts of the south. Consequently, drought coverage decreased from the upper Midwest into the western Corn Belt and central portions of the Rockies and Great Plains, while drought intensified and expanded from western Texas into northern California and the Great Basin. Showers also eased dryness in southern Florida, while northern portions of the state wrestled with moderate to severe drought.

Mid-Atlantic and Northeast: Cool, showery weather prevailed across the region, although 90-day precipitation deficits of 6 inches or more were noted in Connecticut where Abnormal Dryness (D0) was introduced. Short-term dryness in Pennsylvania has abated somewhat, and another cool, wet week would likely ease D0 in most parts of the state.

Southeast: Occasional showers along with near-normal temperatures offered little significant change to the region’s lingering D0 and D1 (Moderate Drought) areas. However, updated Standardized Precipitation Indices (SPI) and streamflow data indicated the lingering long-term Abnormal Dryness in South Carolina continued to abate, while this week’s rainfall (locally more than an inch) was not enough to ease Moderate Drought in North Carolina. In Florida, widespread showers (1-4 inches) eased D0 in southern portions of the state. In contrast, isolated, but locally heavy showers (locally in excess of 3 inches) were not sufficient in coverage to prevent a westward expansion of Severe Drought (D2) from Ocala to the Gulf Coast; streamflows and soil moisture in this region remained in the 5th percentile or lower, indicating that 6-month rainfall deficits of 10 inches or more continue to have an impact.

Midwest: Heavy rain and wet snow eased long-term drought across western and northern portions of the region. Liquid-equivalent precipitation of 1 to 3 inches from northern Minnesota into the Upper Peninsula of Michigan eased D0 and D1 (Moderate Drought), as these areas continued to emerge from drought. From southeastern Minnesota into central Iowa, northwestern Missouri, and southeastern Nebraska, precipitation totals of 2 to 6 inches resulted in additional, widespread reductions in drought intensity and coverage. However, precipitation totals were somewhat less (1-2 inches) in northwestern Iowa and northeastern Nebraska, where

Weekly Snowpack and Drought Monitor Update Report

long-term Moderate to Severe (D1 –D2) Drought persisted.

South-Central U.S.: Beneficial rain from eastern Texas into the southeastern Plains contrasted with increasing dryness from the upper Rio Grande Valley onto the southern High Plains. Rainfall totals in northeastern Texas averaged an inch or more from the Dallas-Ft. Worth metro area to Texarkana, which eased Moderate to Severe Drought (D1-D2) in northeastern portions of the state. A swath of locally heavy rainfall (2-5 inches) from the Wichita Mountains in southwestern Oklahoma northeastward through Oklahoma City and Tulsa alleviated Exceptional (D4) to Moderate (D1) Drought, although significant, long-term deficits and impacts continue. Meanwhile, Moderate (D1) to Exceptional (D4) Drought lingered or intensified from western Texas and southeastern New Mexico into the Oklahoma Panhandle. As of April 21, 2013, the percent of the Plains' winter wheat rated poor to very poor stood at 36 percent in Oklahoma and 60 percent in Texas. Precipitation over the past 6 months has totaled less than 40 percent of normal in the worst drought areas, with some stations reporting less than 20 percent of normal.

Central and Northern Plains: Drought intensified over the central High Plains, while heavy rain and wet snow afforded drought relief to eastern portions of the region. Moderate to heavy rain (2-3 inches) in Kansas eased drought in eastern and north-central portions of the state, with totals approaching 3.50 inches near the Nebraska border. Drought relief largely bypassed central and western Nebraska, although upwards of an inch (liquid equivalent) provided some topsoil moisture near Alliance. Precipitation totals over the northern Plains' drought areas ranged from less than an inch in southern Montana to locally more than 2 inches in the Black Hills of South Dakota, where some reductions in drought intensity and coverage were made. Most of the Extreme (D3) or Exceptional (D4) Drought areas received less than 0.50 inch, however, which led to little, if any, change in the worst drought areas. In Colorado, D4 was expanded in the southeastern corner of the state where 90-day precipitation has tallied locally less than 20 percent of normal; the Colorado winter wheat crop was rated 56 percent poor to very poor as of April 21, 2013, while Kansas wheat stood at 37 percent.

Western U.S.: The water year approached conclusion, with many areas of the west ending the season with bleak spring runoff prospects and increasing drought concerns. Precipitation was mostly confined to the non-drought areas of the Pacific Northwest, where 1 to 3 inches (liquid equivalent) were reported during the monitoring period. Consequently, drought persisted or expanded across much of the region.

From central California into the Great Basin and central Rockies, the disappointing end to the water year resulted in some expansion of drought. In northeastern California and southeastern Oregon, water-year precipitation averaged 50 to 70 percent of normal, with the corresponding Standardized Precipitation Index (SPI) in this region over the same time period indicating D1 (Moderate Drought or greater). In the Sierra Nevada, where a promising start to the snow season was followed by an abrupt reversal, the liquid Snow Water Equivalent (SWE) dropped below the 15th percentile, with water-year precipitation deficits averaging 3 to 11 inches near Lake Tahoe; consequently, Moderate Drought (D1) was expanded to

Weekly Snowpack and Drought Monitor Update Report

encompass the central Sierra Nevada. Severe Drought (D2) was expanded in the San Juan Mountains of southwestern Colorado, as well as neighboring environs, to reflect water-year precipitation values that have dropped to nearly 50 percent of normal as well as SWE which dropped into the 10th percentile or lower (corresponding precipitation rankings were at or below the 5th percentile). One exception was the central Rockies, where a late-season snow storm (locally more than 2 inches liquid equivalent) eased drought in central and northern Colorado.

Farther south, water-year precipitation shortfalls increased from the southern San Joaquin Valley (40 to 55 percent of normal) into southwestern Nevada (30 to 50 percent of normal) and western Arizona (less than 50 percent of normal). Consequently, Moderate (D1) to Severe (D2) Drought was expanded in these locales. Likewise, Extreme Drought (D3) was introduced in southeastern Arizona and southwestern New Mexico, where water-year precipitation totaled a meager 30 percent of normal or less (deficits locally more than 4 inches).

Alaska, Hawaii, and Puerto Rico: In Alaska, cold, dry conditions continued, with temperatures averaging up to 10°F below normal. Streamflows in Alaska have exhibited some recovery, although water-year precipitation remained in the lowest 20th percentile in the state's Moderate Drought (D1) area. In Hawaii, D0 was removed from east Oahu; the water level in Waimanalo Reservoir continued to increase and is currently at a pre-drought level. In Puerto Rico, widespread showers (1- 4 inches) boosted streamflows, and should rain continue, some improvement from Abnormal Dryness (D0) is likely in the next several weeks.

Looking Ahead: Warmer- and drier-than-normal conditions will spread from the western U.S. eastward into the central and northern Plains. In contrast, a slow-moving, upper-air low will bring wet, cool weather to the Southeast, although rain activity will subside in Florida. Showers are also expected in central and southwestern Texas; however, the core Exception Drought (D4) areas of the central and southern High Plains will mostly miss the heaviest rainfall. The CPC 6-10 day forecast for April 30 – May 4 calls for warmer- and drier-than-normal weather across much of the west, with dryness extending eastward into the central Plains. In contrast, above-normal precipitation and near- to below-normal temperatures are expected across southern portions of the Rockies and High Plains and from the eastern Gulf Coast into the Great Lakes region.”

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

Weekly Snowpack and Drought Monitor Update Report

Drought or Dryness Types

S ... Short-Term, typically <6 months (e.g. agricultural, grasslands)

L ... Long-Term, typically >6 months (e.g. hydrology, ecology)

Updated April 24, 2013

Supplemental Drought Information

The “Ag in Drought” file that had been previously posted each week by Brian Fuchs at NDMC is now available at: <http://www.usda.gov/oce/weather/Drought/AgInDrought.pdf>

Highlights for the drought-monitoring period ending 7 am EDT on April 16 include:

- Overall U.S. drought coverage decreased 3 full percentage points from the previous week (47.82% versus 50.82% last week). Drought coverage is now down 13.27 percentage points since the beginning of 2013 and down 17.63 points from the record high of 65.45% on September 25, 2012. During the most recent monitoring period, a storm complex – which was noted at the end of last week’s monitoring period – brought moderate to heavy precipitation to sections of the Corn Belt and Great Lakes Region, as well as much of the South. Improvement was also noted on parts of the Great Plains, with snow falling in northern areas. However, dry, occasionally warm conditions prevailed from California and the Southwest to the southern Plains. A new storm system was becoming organized over the southern Rockies at the cut-off time (7 am EDT on April 9) for being included on the latest U.S. Drought Monitor, and further improvements will likely be reflected on next week’s map.

- The portion of the contiguous U.S. in the worst category – D4, or exceptional drought – fell significantly 0.8 points to 2.58%. This is the first time the coverage in D4 has fallen below 3% since July 24, 2012.

- Winter wheat in drought dropped slightly from last week to 55%. There was a four percentage point decline in hay in drought (46%) and a 3 point decline in cattle in drought (58%).

See weekly [NASS Report](#) by state.

Mark Brusberg
Deputy Chief Meteorologist
United States Department of Agriculture
Office of Chief Economist/World Agricultural Outlook Board
202-720-2012
mbrusberg@oce.usda.gov

Weekly Snowpack and Drought Monitor Update Report

Drought coverage falls below 50 percent of contiguous United States for the first time since June 2012

Lincoln, Neb. – The area of the contiguous United States in moderate drought or worse fell below 50 percent for the first time since June 19, 2012, according to the April 16 U.S. Drought Monitor.

Heavy precipitation across much of the Plains and the upper Midwest continued to ease drought, while Texas and Arizona remain dry. The area of the lower 48 states in moderate drought or worse declined to 47.82 percent from 50.82 percent the week before.

“We’ve been on a steady but slow recovery path from drought since the peak in September 2012,” said Mark Svoboda, one of the founding authors of the U.S. Drought Monitor. “We’ve seen a much more active weather pattern lately across the midsection of the country, which has been eroding the intensity of drought as we head into spring. This is exactly what we needed.”

Svoboda, the head of the Monitoring Program area at the National Drought Mitigation Center, based at the University of Nebraska-Lincoln, added, “We need to see continued improvement before the hot, dry season sets in. The cooler temperatures are also helping the cause. “

In the Midwest, heavy rains soaked into thawing soils and reduced drought in Minnesota, Iowa, Wisconsin and Missouri, observed this week’s U.S. Drought Monitor author, David Miskus, in narrative accompanying the map. The area of the Midwest in moderate drought or worse declined to 20.94 percent from 32.24 percent the preceding week, according to statistics released with the map. The narrative cited Iowa State Climatologist Harry Hillaker, who noted that this was the wettest week in Iowa since June 2010, with statewide average precipitation at 2.9 inches, compared with the normal of .78 inches.

In the Plains, drought receded in eastern Oklahoma, eastern Kansas, extreme eastern Nebraska and the Nebraska Panhandle, and throughout most of the Dakotas. An area of exceptional drought, the worst category of drought, was eliminated from South Dakota.

Heavy rains also improved conditions in Georgia, South Carolina and Florida.

Unfortunately, decent precipitation eluded Texas and Arizona, which were among the few areas where drought got worse.

Statistics for the percent area in each category of drought are automatically added to the U.S. Drought Monitor website each week for the entire country and Puerto Rico, for the 48 contiguous states, for each climate region, and for individual states. U.S. Drought Monitor data online goes back to January 2000.

<http://drought.unl.edu/MonitoringTools/USDroughtMonitor/DroughtMonitorTips.aspx>

U.S. Drought Monitor map, statistics and narrative summary: <http://droughtmonitor.unl.edu>

USDA’s weekly “Agriculture in Drought” analysis: <http://www.usda.gov/oce/weather/Drought/AgInDrought.pdf>

National Climatic Data Center’s State of the Climate Drought Summary: <http://www.ncdc.noaa.gov/sotc/drought/>

Weekly Snowpack and Drought Monitor Update Report

Seasonal Drought Outlook:

http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html

Kelly Helm Smith
Communication & Drought Resources Specialist
National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln
911 Hardin Hall
3310 Holdrege St.
Lincoln, NE 68583-0988 U.S.A.

phone: [402 472-3373](tel:4024723373) (direct)
e-mail: ksmith2@unl.edu
NDMC web site: <http://drought.unl.edu/>

Water Supply & Quality

[Colorado River Tops 2013 Endangered Waterways List](#)

April 17, **Colorado River**. American Rivers' annual endangered waterways list put the Colorado River at the top of the list, saying that drought and demand will overshadow supply in the next 50 years.

[Feds: Water forecast is grim for Middle Rio Grande](#)

April 17, **New Mexico**. Snowpack and water supplies in New Mexico are insufficient to meet demand in the Middle Rio Grande Valley, according to an annual operating plan released by the U.S. Bureau of Reclamation and the U.S. Army Corps of Engineers. Snowpack in northern New Mexico was 45 percent of average, and reservoirs were already low on the heels of three years of drought. A Bureau of Reclamation model indicated that another 65,000 acre-feet to 80,000 acre-feet of water will be needed to meet target flows for the endangered Rio Grande silvery minnow even if the region receives minimal rain this summer. Operational changes and new agreements with American Indian tribes will be needed to find additional water to meet demand this year.

[S.D. officials ask to limit releases from reservoirs](#)

April 15, **South Dakota**. The secretaries of South Dakota Environment and Natural Resources and Game Fish and Parks sent a letter to the U.S. Army Corps of Engineers, asking them to conserve water by limiting releases from the Missouri River reservoirs for the benefit of navigation in areas without commercial barges.

From California:

This has been a really interesting water year out here in California. As calendar year 2012 ended we were rivaling our wetter years and were dealing with high water issues in several locations. Calendar year 2013 started and things went really dry – many areas in northern California are recording their driest Jan-Apr period. All said this puts the water year totals a bit below average. Reservoir storage in the north is near or above average for this time of year with degradations as you head south into the San Joaquin and Tulare regions. You can find a quick summary of reservoir conditions at: <http://cdec.water.ca.gov/cgi-progs/reservoirs/RES>.

Water allocations for south of the Delta are reduced due to the dry conditions and low expectations for snowmelt volumes. Current SWE estimates by region can be found at: <http://cdec.water.ca.gov/cgi-progs/reports/DLYSWEQ.20130422>. Percent of normal for this date range from 17% in the south which is largely the Tulare region to 30% of average for this date for the north which is the Feather/Truckee and basins north, to 41% of average for this date for the Central region which is Late Tahoe down to the Merced and the Walker on the east side. The latest update to the April-July runoff forecast can be found

Weekly Snowpack and Drought Monitor Update Report

at: <http://cdec.water.ca.gov/cgi-progs/iodir/B120UP>. Focusing on the 90% exceedance estimates since we seem to be well below median gives ranges from 50% of average for the Shasta Lake Inflow to a low of 8% on the Tule River.

This is the second dry year in most of the hydrologic regions in the State with conditions being drier in the south. Water year 2012 percentages by hydrologic region can be found at: <http://cdec.water.ca.gov/cgi-progs/reports/PRECIPSUM.BSN.2012> and current year percentages through March can be found at <http://cdec.water.ca.gov/cgi-progs/reports/PRECIPSUM.BSN.2013>.

More impacts like reduced allocations, rangeland and dryland ag and small isolated water systems are being seen in the southern half of the state. Rangeland, dryland ag, and summer fire potential are likely concerns statewide.

Michael Anderson, Ph.D., P.E.
State Climatologist
California Department of Water Resources
Division of Flood Management
Hydrology and Flood Operations Office
Hydrology Branch
3310 El Camino Ave Rm 200
Sacramento, CA 95821
Phone (916) 574-2830
Fax (916) 574-2767
Email Michael.L.Anderson@water.ca.gov