



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

Weekly Report - Snowpack / Drought Monitor Update

Date: 18 April 2013

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: [SNOTEL](#) and ACIS 7-day temperature anomaly ending today reveals exceptionally cold conditions over the Northern Rockies and Northern Great Plains. California and parts of the Southwest experienced slightly above normal temperatures (Fig. 1a). [ACIS 7-day](#) average temperature anomalies show the greatest positive temperature departures scattered across California to New Mexico (>+3°F). The greatest negative departures occur over the Northern High Plains (<-15°F) (Fig. 1b).

Precipitation: [ACIS](#) 7-day average precipitation amounts for the period ending April 17 show the heaviest precipitation confined to the Washington Cascades and Central Colorado Rockies (Fig. 2a). Lesser amounts fell over the Oregon Cascades, Northern Rockies, Utah and Wyoming Ranges, and eastern Montana Plains (Fig. 2b). The widespread moisture helped boost snow-water equivalent values by 15% over northern Utah and Colorado and over 50% over eastern Wyoming. 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) did not receive this moisture (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. Southeastern Oregon, despite slightly below average precipitation, has seen much below average amounts of snowpack this winter (Fig. 3b). This week's precipitation over Colorado has helped decrease the moisture deficit.

Snow: The [3-day snow depth changes](#) show a spring storm delivering heavy snowfall over the mountains in Utah, Colorado, and Wyoming. Elsewhere, a noticeable decrease in snow cover occurred over the Cascades and northern Idaho mountains despite a very wet week (Fig. 3a). The [Snow-Water Equivalent](#) (SWE) map (Fig. 3b) shows SWE rebounded significantly across parts of Utah, Colorado, and Wyoming. This is the first significant increase since the start of the 2013 calendar year. Only basins across eastern Wyoming received enough snow to push their values to near or above the long term average.

The following **Weather and Drought Summary** is provided by this week's NDMC Author: [David Miskus, NOAA/NWS/NCEP/Climate Prediction Center](#):

Weather Summary: "The storm system that brought beneficial moisture to parts of the central Plains and western Corn Belt last week slowly trekked eastward. It dropped widespread moderate to heavy precipitation (more than 2 inches) on the remainder of the Corn Belt and Great Lakes region, and on the Delta, Tennessee Valley, southern Appalachians, and South. Heavy snows also blanketed portions of the northern Plains. Later in the period, a new storm system produced light to moderate precipitation in the Pacific Northwest, northern and central Rockies, and northern Plains. Unfortunately, little or no precipitation was observed in California and the Southwest, Intermountain West, southern and central High Plains, and portions of the southern and middle Atlantic Coast States. Light showers covered most of Puerto Rico, showers increased on Kauai and Oahu but were lacking on eastern islands of Hawaii, and light to moderate precipitation was observed in southeastern and east-central Alaska. Temperatures

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averaged above-normal in the Southwest, Southeast, and mid-Atlantic, where highs topped 90 degrees F in the latter region early in the period. In contrast, subnormal readings prevailed across the Northwest, Rockies, Plains, upper Midwest, Great Lakes region, northern New England, and Alaska. It was up to 20 degrees F below normal in the Black Hills of South Dakota and in interior Alaska.”

The Rockies and Intermountain West: “Light to moderate precipitation (0.5 to 1.5 inches) was measured across most of the Rockies, from Idaho and western Montana southward to northern New Mexico, with heavier totals (1.5 to 3 inches) in north-central Colorado, eastern and northwestern Wyoming, and south-central Montana. The precipitation in these four areas was enough to create small surpluses at short and medium-term periods (out to 180-days), thus allowing for a one category improvement. Colorado’s NRCS basin average snow water content (SWC) rose to between 85 to 93 percent as of April 16, with basin average water year-to-date (WYTD) precipitation increasing to around 85 percent. A stakeholder in Eagle County, Colorado stated that the recent snow the past few weeks has bought 4-6 weeks for their water supply. Many of Wyoming’s basin average SWC increased to near normal, as did southern Montana. In contrast, little or no precipitation fell on much of the Intermountain West, but last week’s light to moderate precipitation was enough to maintain conditions.”

The Far West and Southwest: “The bulk of this week’s precipitation fell on the Pacific Northwest and northern Rockies (non-drought areas) as little or no precipitation was observed in areas to the south. However, light to moderate precipitation was reported last week in many areas that recorded little or none this week, thereby maintaining conditions. An exception to this was two straight weeks of dry weather across southern California, southern Nevada, and most of Arizona, but this area is headed into a normally dry time of the year. In the latter area, a recent VegDri map indicated poor conditions in south-central Arizona, and based upon this and other products, D0, D1, and D2 was slightly increased in Gila and Graham counties. In New Mexico, which was mostly dry last week, welcome precipitation (0.25 to 1 inches) fell on western and northern sections, resulting in status-quo conditions. Still, 97 percent of the state’s topsoil moisture was rated short or very short on April 14, according to NASS/USDA.”

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 4c).

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/>.

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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 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/cgibin/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

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

Apr 18, 2013

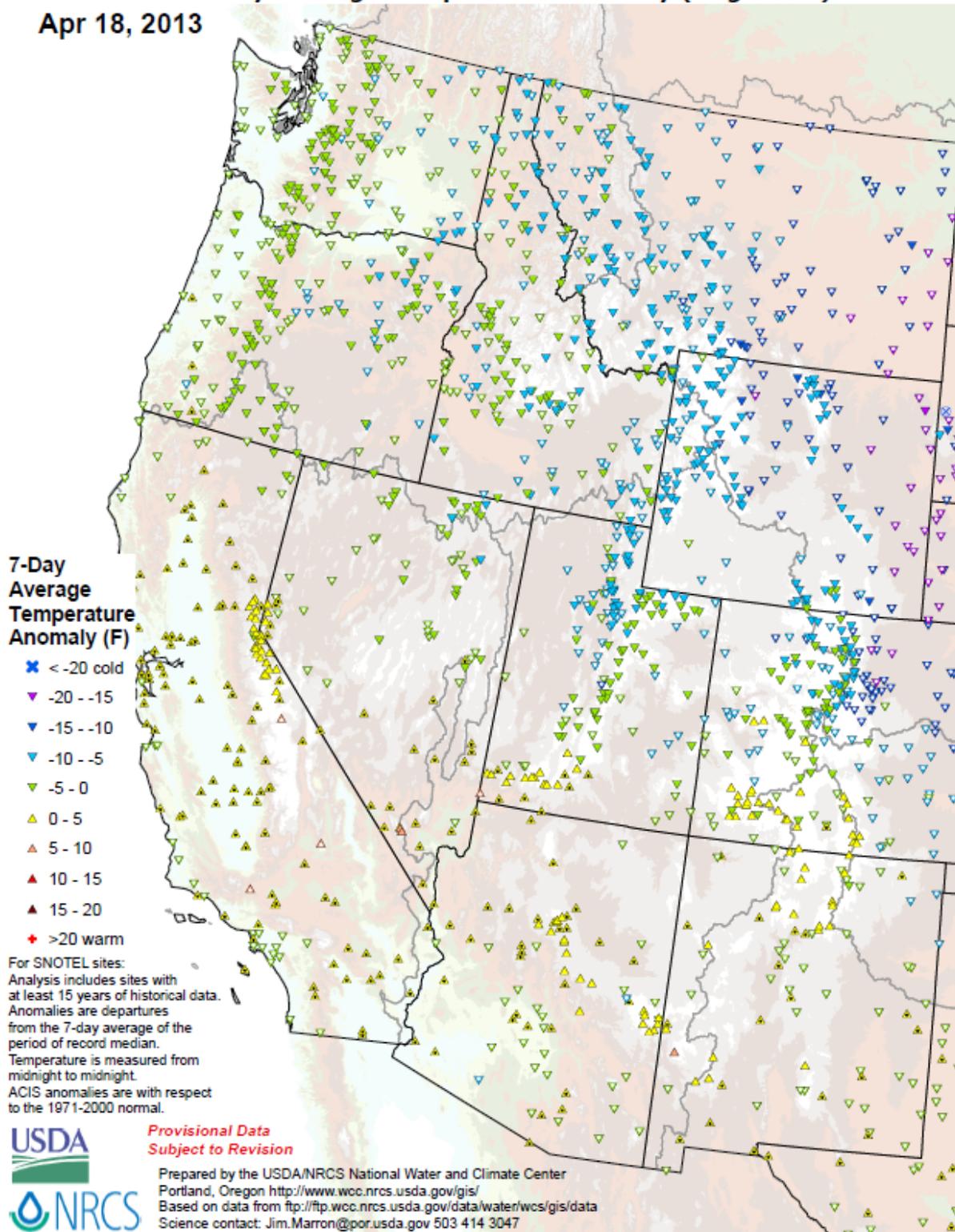
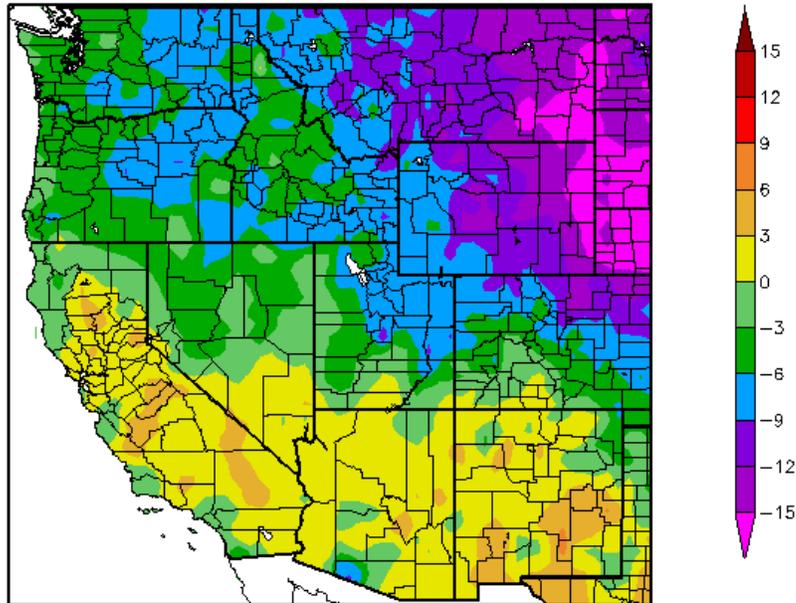


Fig. 1a: [SNOTEL](#) and ACIS 7-day temperature anomaly ending today reveals exceptional cold conditions over the Northern Rockies and Northern Great Plains. California and parts of the Southwest experienced slightly above normal temperatures.

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Departure from Normal Temperature (F)
4/11/2013 – 4/17/2013

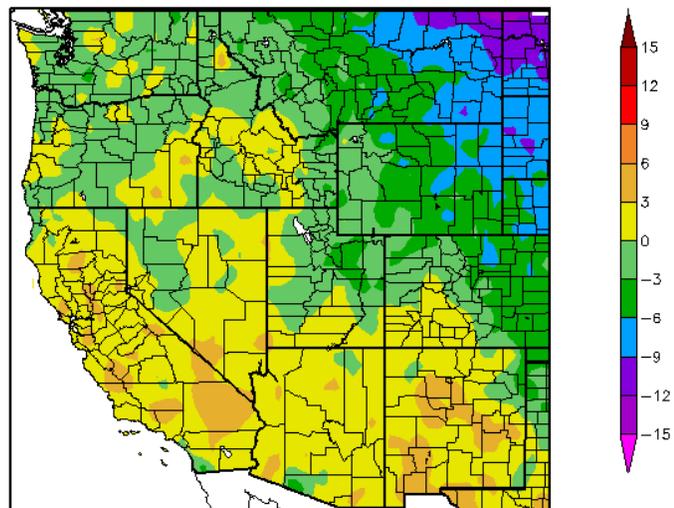


Generated 4/18/2013 at HPRCC using provisional data.

Regional Climate Centers

Fig. 1b: [ACIS 7-day](#) average temperature anomalies show the greatest positive temperature departures scattered across California to New Mexico (>+3°F). The greatest negative departures occur over the Northern High Plains (<-15°F). For more figures, see the Western Water Assessment's Intermountain West Climate [Dashboard](#).

Departure from Normal Temperature (F)
4/1/2013 – 4/17/2013



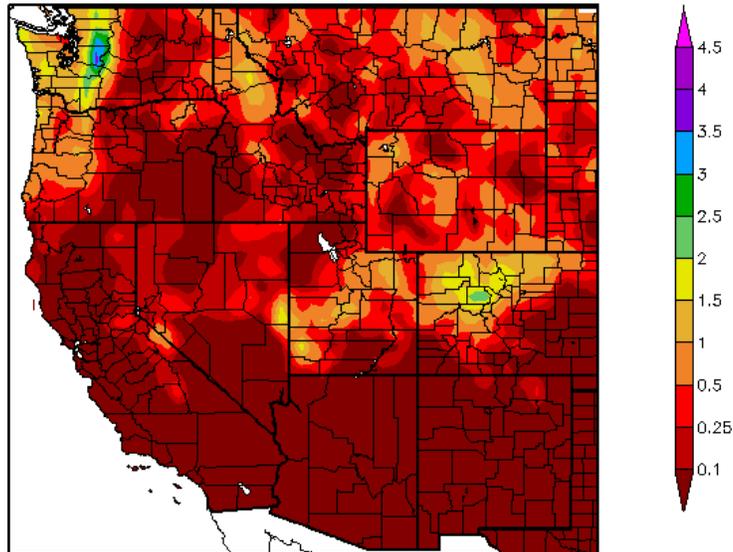
Generated 4/18/2013 at HPRCC using provisional data.

Regional Climate Centers

Fig. 1c: ACIS 7-day average temperature anomalies for [April](#) show the greatest negative temperature departures over northeastern Montana. Cooler weather is beneficial in slowing down snow melt, especially important in regions with limited snow pack.

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Precipitation (in)
4/11/2013 - 4/17/2013



Percent of Normal Precipitation (%)
4/11/2013 - 4/17/2013

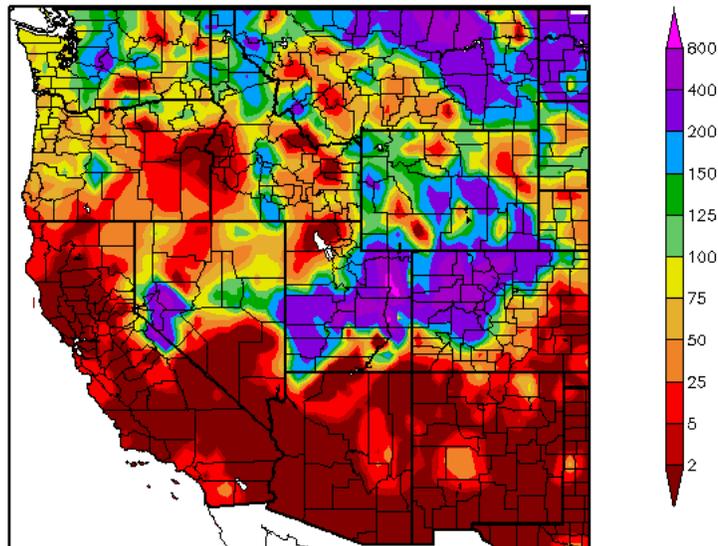


Fig. 2a and 2b: [ACIS](#) 7-day average precipitation amounts for the period ending April 17 show the heaviest precipitation confined to Washington Cascades and Central Colorado Rockies (Fig. 2a). Lesser amounts fell over the Oregon Cascades, Northern Rockies, Utah and Wyoming Ranges, and eastern Montana Plains (Fig. 2b). The widespread moisture helped boost snow water equivalent values by 15 percent over northern Utah and Colorado and over 50 percent over eastern Wyoming.

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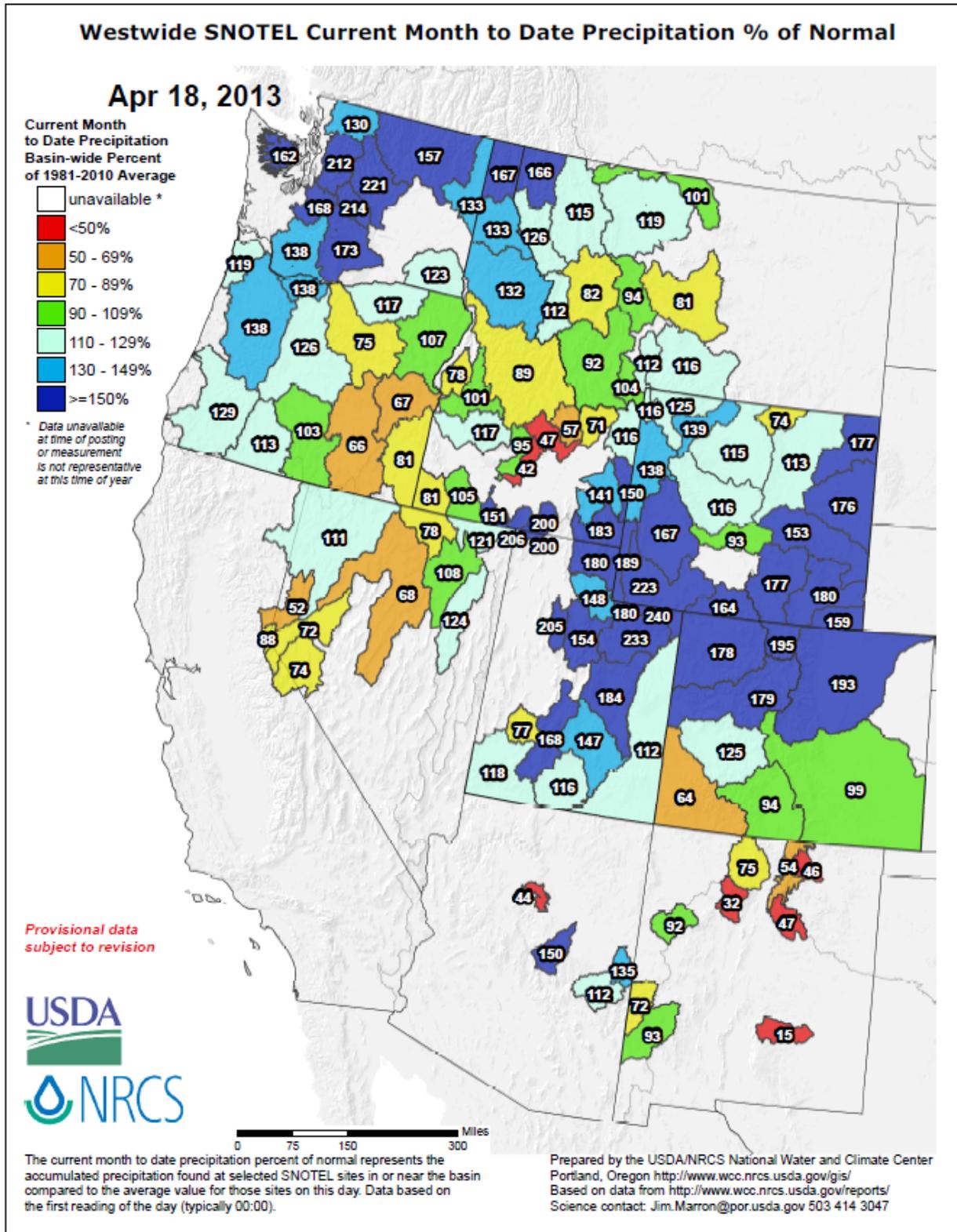


Fig. 2c: SNOTEL month to date precipitation percent of normal pattern for April shows significant precipitation across much of the West. New Mexico and parts of the Great Basin (including the Sierra Nevada) did not receive this moisture.

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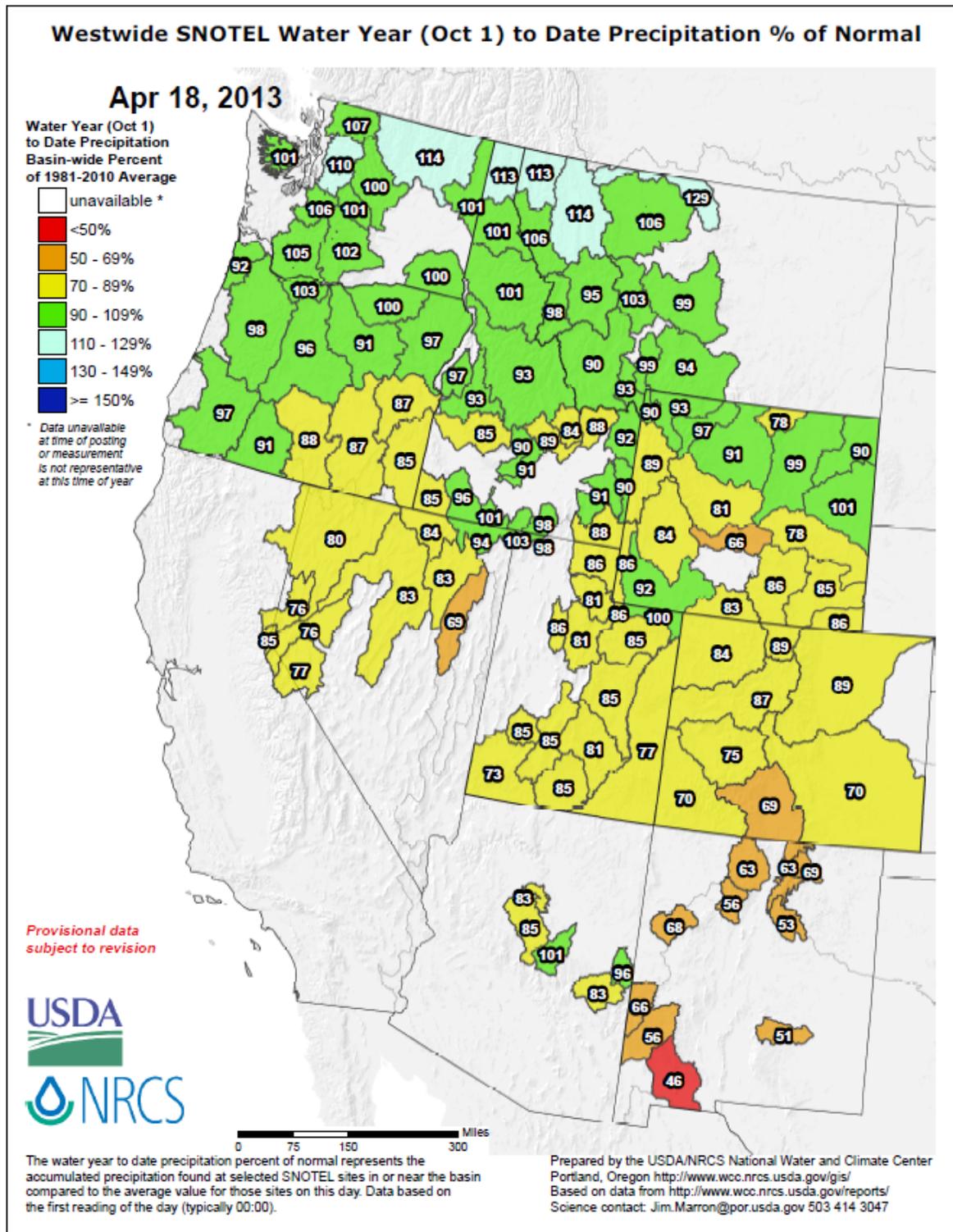


Fig. 2d: For the [2013 Water Year](#) that began on 1 October 2012, the pattern continues to resemble La Niña (e.g., wetter Northern Tier). Parts of Arizona are still the exception for the Southern Tier with near normal amounts. Southeastern Oregon, despite slightly below average precipitation, has seen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

SNOTEL 3-Day Snow Depth Change (Inches)

Apr 18, 2013

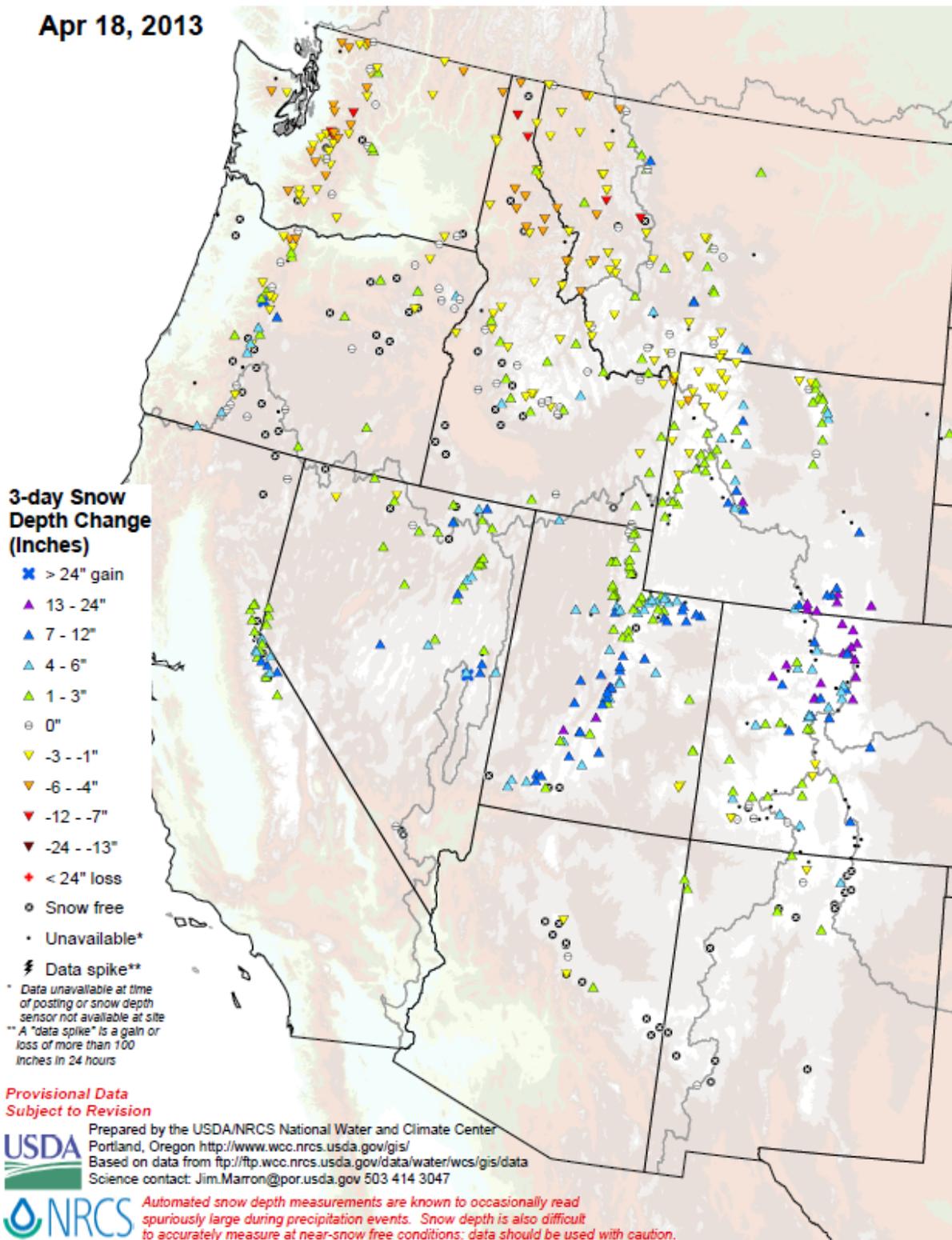


Fig. 3a: The 3-day snow depth changes show a spring storm delivering heavy snowfall over the mountains in Utah, Colorado, and Wyoming. Elsewhere, a noticeable decrease in snow cover occurred over the Cascades and northern Idaho mountains despite a very wet week.

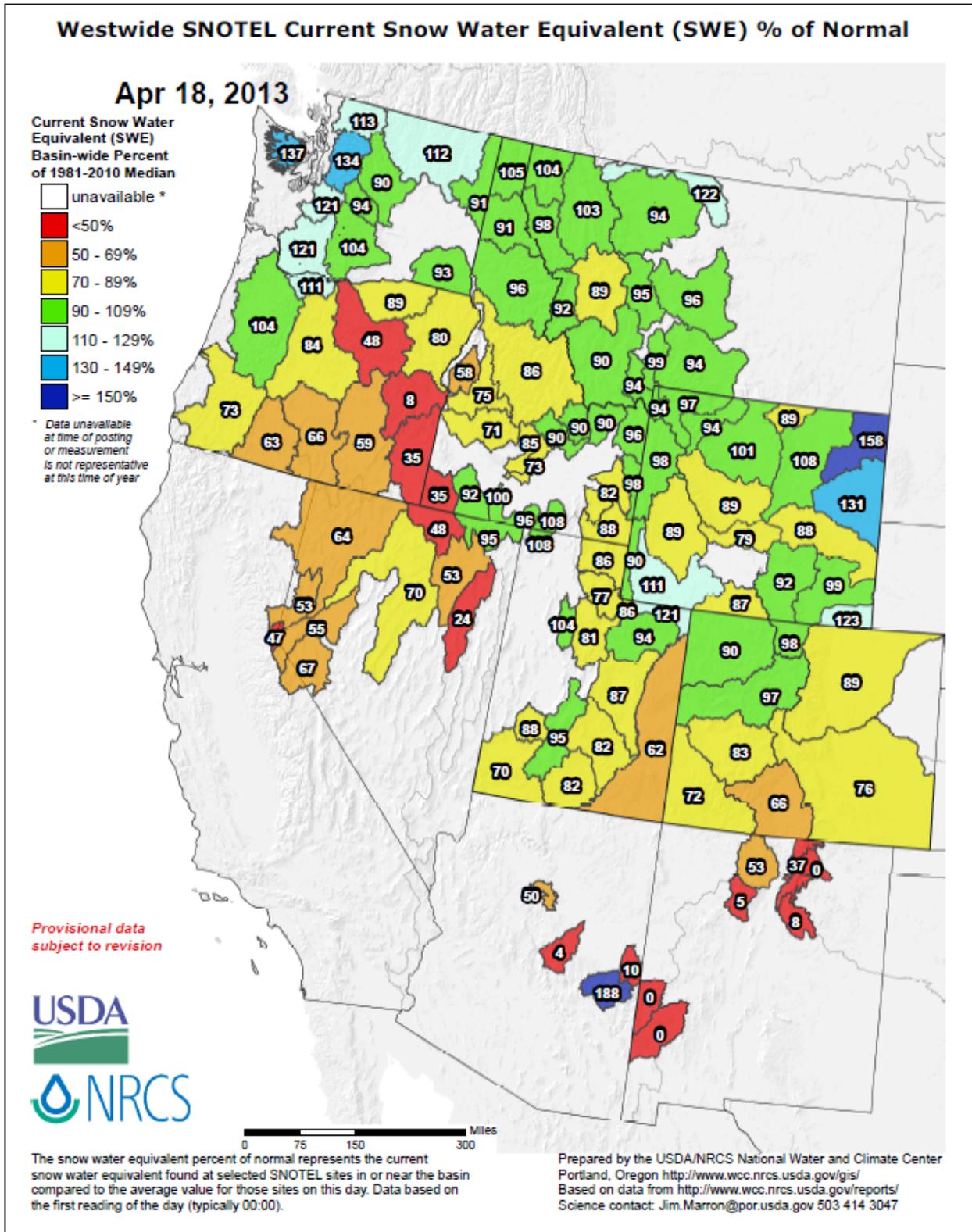


Fig. 3b: **Snow-Water Equivalent (SWE)**: Today's map shows SWE rebounded significantly across parts of Utah, Colorado, and Wyoming. This is the first significant increase since the start of 2013. Only basins across eastern Wyoming received enough snow to push their values to near or above the long-term average. 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

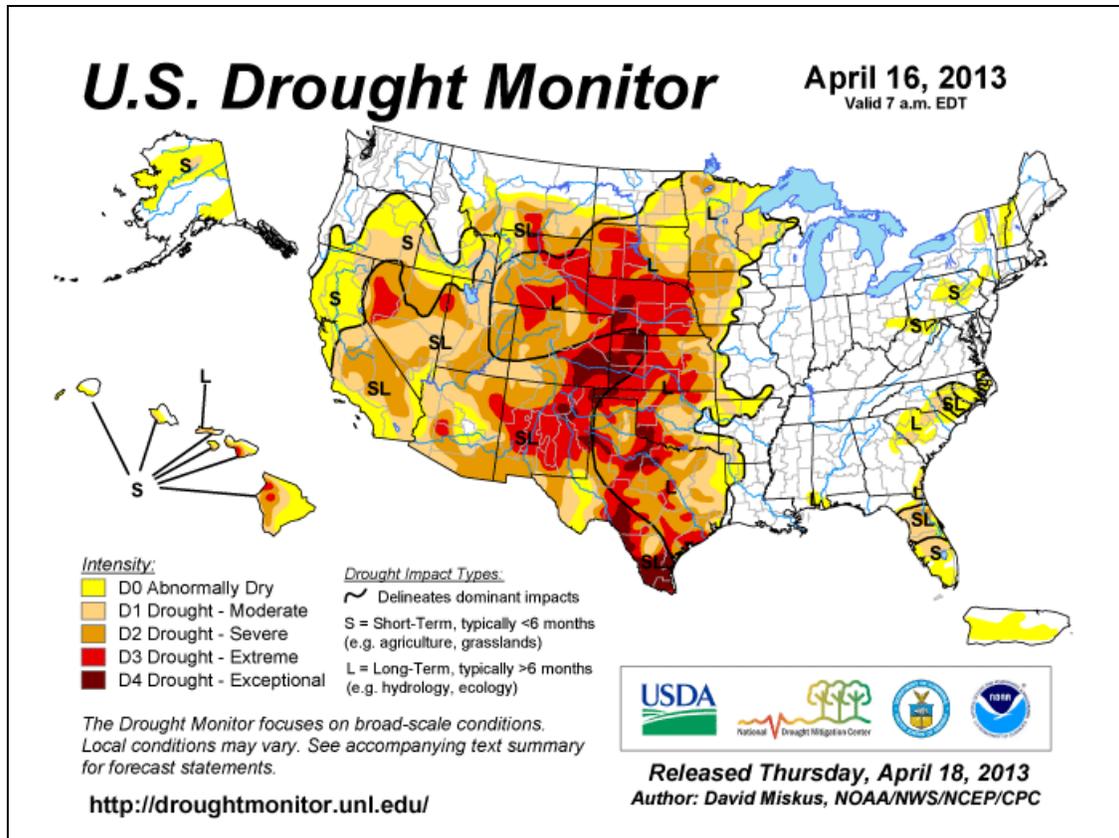


Fig. 4: Current [Drought Monitor](#) weekly summary. The exceptional D4 levels of drought are scattered across the western Corn Belt of the Plains into eastern Colorado, Wyoming, and New Mexico. For more drought news, see [Drought Impact Reporter](#). The latest [drought indicator blend and component percentiles](#) spreadsheet is a great resource for climate division drought statistics. See Fig. 8 for the latest [Drought Outlook](#) (forecast).

For an interesting website on Lake Mead drought update, click [here](#).

Drought News—April 12, 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](#).

Agriculture

[BLM restricting grazing due to drought](#)

April 8, **Southwestern Montana**. The Bureau of Land Management requested that livestock owners curb grazing on public land by 30 percent, due to drought. The request affects lands in Beaverhead, Broadwater, Jefferson, Gallatin, Lewis and Clark, Madison, Park and Silver Bow counties, which are administered by the Dillon and Butte field offices. Ranchers should limit grazing to no more than 70 percent of their allocated forage by reducing grazing time or reducing the number of cattle on the land or both.

[Corn Boom Goes Bust With U.S. Sales in Record Drop: Commodities](#)

April 9, **U.S.** Corn exports plummeted 54 percent since Sept. 1, 2012, leaving the forecast for stockpiles at the end of August 2013 near 836 million bushels, or 32 percent higher than the USDA forecast in March. Corn prices have fallen, too, as farmers plant more acres of corn than they have in the last 77 years. The price of corn futures has dropped 8.5 percent this month to \$6.365 on the Chicago Board of Trade.

U.S. Drought Monitor

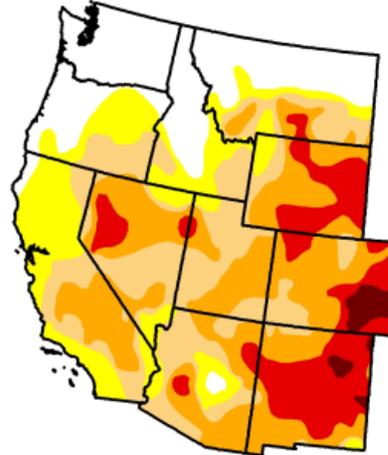
West

April 16, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	19.84	80.16	63.67	41.05	14.73	1.64
Last Week (04/09/2013 map)	19.71	80.29	63.56	41.59	16.73	2.41
3 Months Ago (01/15/2013 map)	24.75	75.25	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 (04/10/2012 map)	31.33	68.67	48.44	24.87	3.77	0.93

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 18, 2013

David Miskus, NOAA/NWS/NCEP/Climate Prediction Center

Fig. 4a: Drought Monitor for the [Western States](#) with statistics over various time periods. Some improvement in D3 and D4 occurred this past week due to decent precipitation over Colorado and Wyoming. See CLIMAS [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

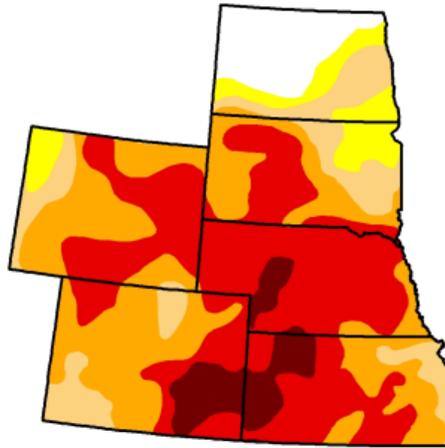
High Plains

April 16, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	7.10	92.90	86.43	73.47	44.28	6.77
Last Week (04/09/2013 map)	4.96	95.04	91.67	80.57	53.33	11.70
3 Months Ago (01/15/2013 map)	4.79	95.21	92.08	87.25	61.27	26.81
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 (04/10/2012 map)	37.71	62.29	23.92	4.25	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 18, 2013
David Miskus, NOAA/NWS/NCEP/Climate Prediction Center

Fig. 4b: Drought Monitor for the [High Plains](#) with statistics over various time periods. Note significant improvement in D1 to D4 as a result of heavy precipitation this week. See [Kansas Drought Update](#).

U.S. Drought Monitor

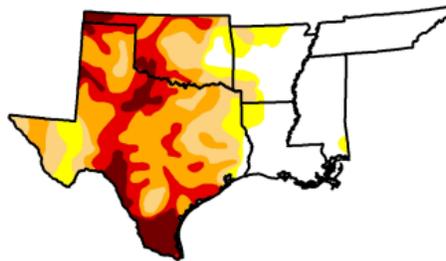
South

April 16, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	32.96	67.04	58.25	44.18	22.04	7.17
Last Week (04/09/2013 map)	29.39	70.61	57.93	43.15	19.96	6.98
3 Months Ago (01/15/2013 map)	29.64	70.36	56.14	42.31	23.78	8.57
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 (04/10/2012 map)	48.52	51.48	35.14	27.33	16.18	6.78

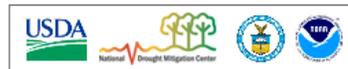
Intensity:

- D0 Abnormally Dry
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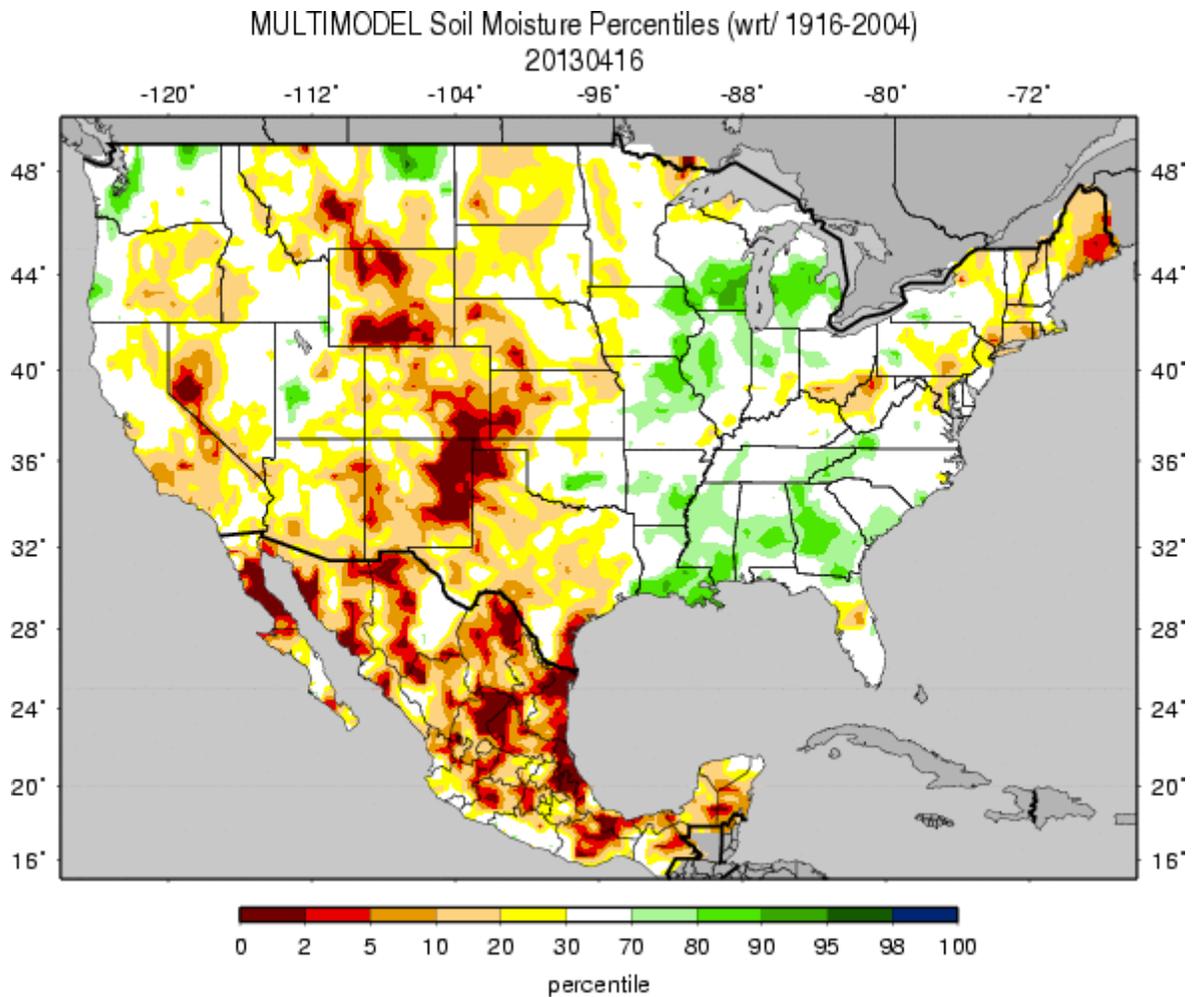
<http://droughtmonitor.unl.edu>



Released Thursday, April 18, 2013
David Miskus, NOAA/NWS/NCEP/Climate Prediction Center

Fig. 4c: Drought Monitor for the [South-Central Region](#) with statistics over various time periods. Note some deterioration in D3-D4 this week. Check out the Texas Drought [Website](#). See [Texas Reservoirs](#).

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Figs. 5: Soil moisture ranking in [percentile](#) as of 16 April shows dryness over the western High Plains, much of the Rockies, western Great Basin and eastern Maine. Useful Hydrological Links: [Crop Moisture Index](#); [Palmer Drought Severity Index](#); [Standardized Precipitation Index](#); [Surface Water Supply Index](#);

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

Station (2017) MONTH=2013-03-19 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision as of Thu Apr 18 10:04:32 CDT 2013

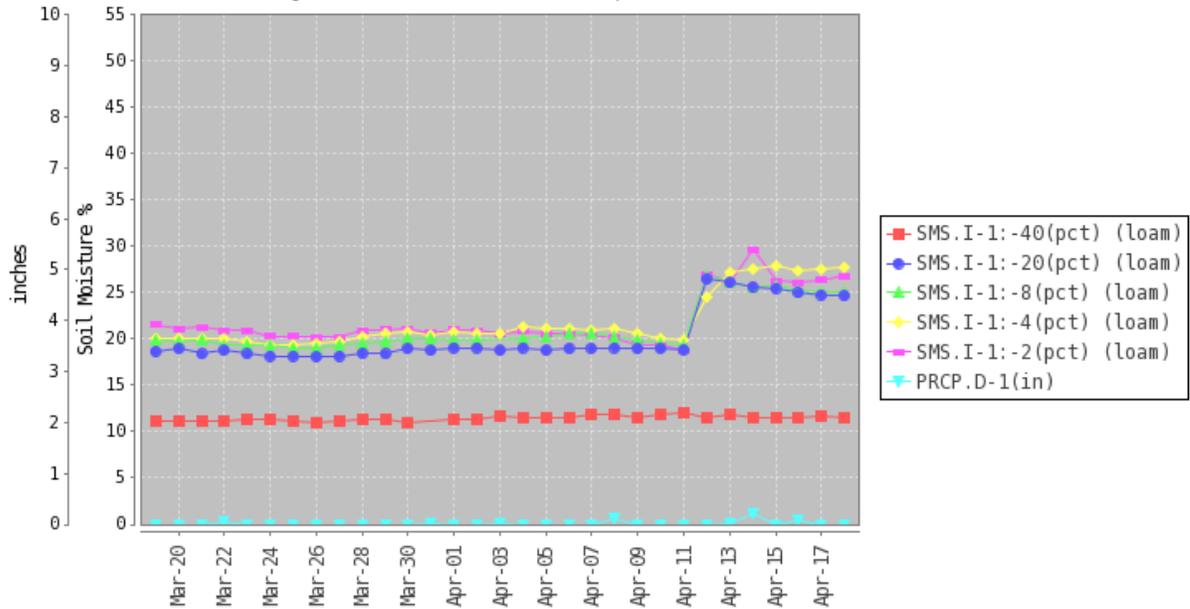
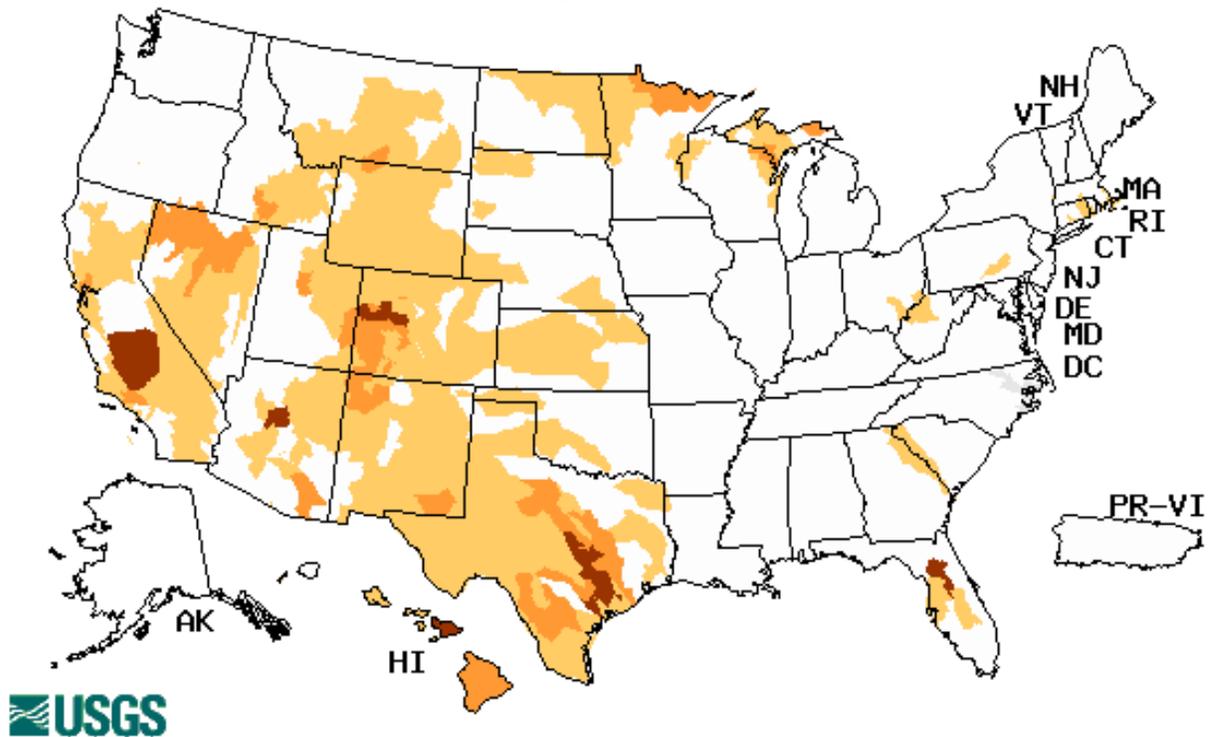


Fig. 6: This NRCS resource shows a site over [northern Colorado](#) with recent increases in soil moisture. Useful Agriculture Links: [Vegetation Drought Response Index](#); [Evaporative Stress Index](#); [Vegetation Health Index](#); [NDVI Greenness Map](#); [GRACE-Based Surface Soil Moisture](#); [North American Soil Moisture Network](#).

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Wednesday, April 17, 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 Colorado, Arizona, California, Texas, and Florida. See the USGS [National Water Information System Mapper](#).

Weekly Snowpack and Drought Monitor Update Report

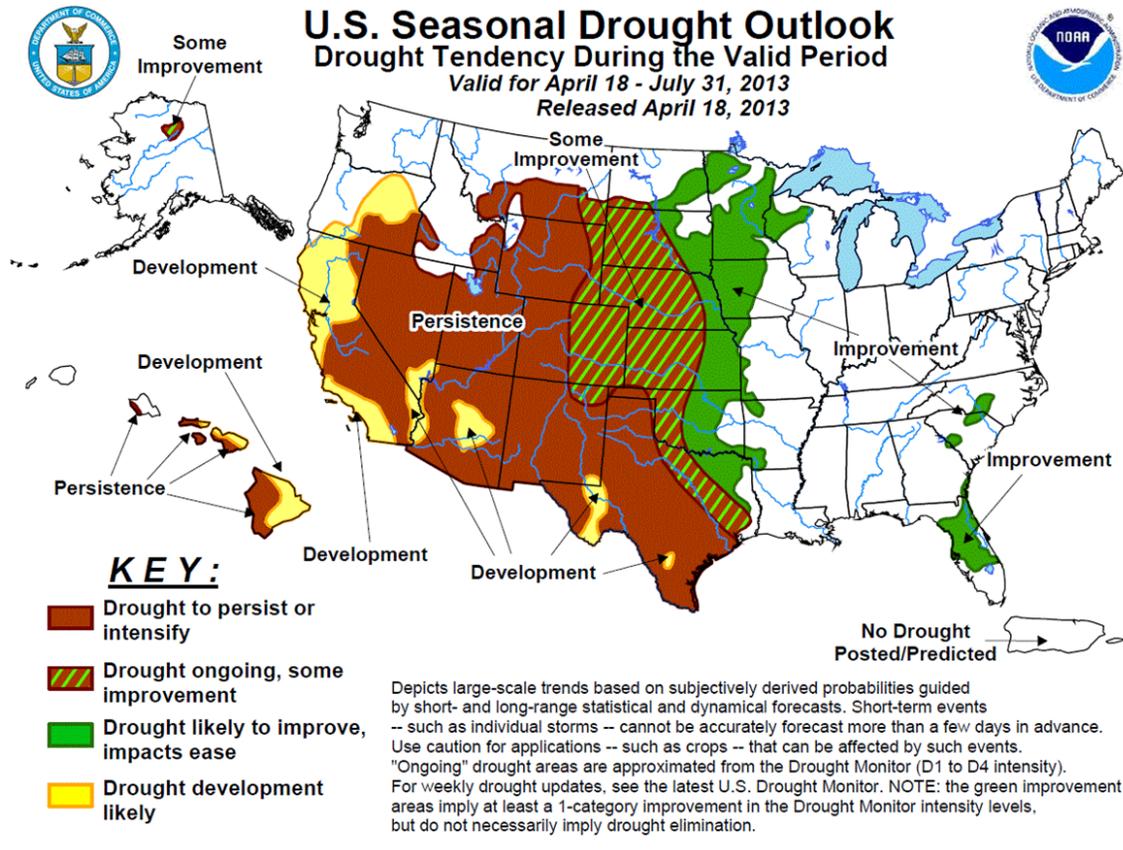
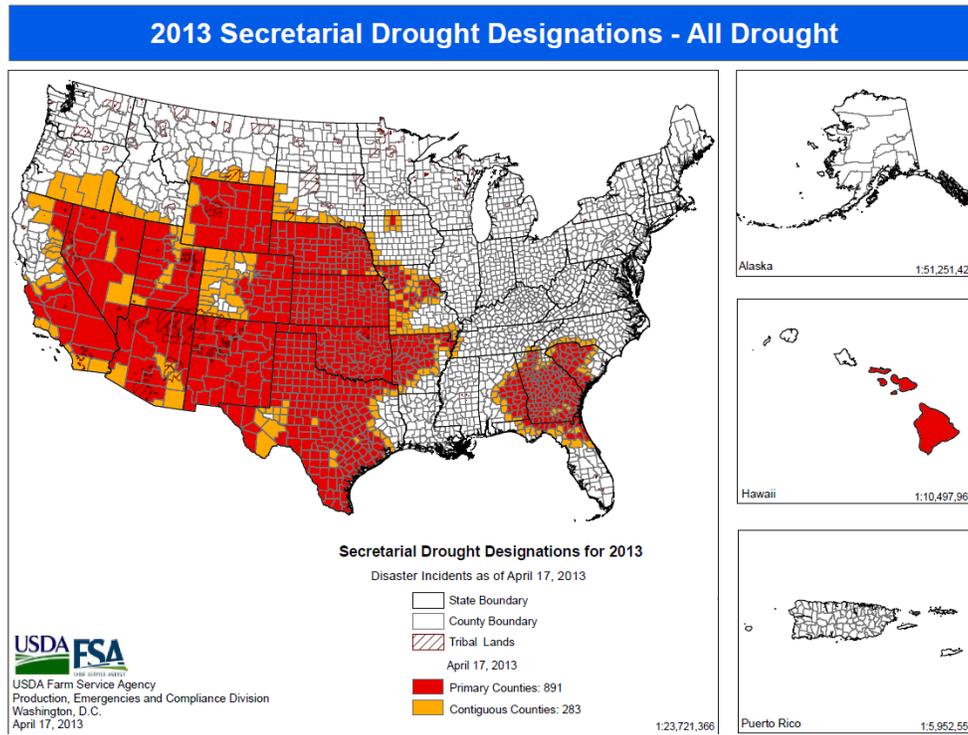


Fig. 8: U.S. Seasonal Drought Outlook today. Note that the “some improvement” areas expanded westward into the eastern slope of the Rockies due to this week’s spring storm.



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:** [David Miskus, NOAA/NWS/NCEP/Climate Prediction Center](#)

National Drought Summary -- April 16, 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/>.

Weather Summary: “The storm system that brought beneficial moisture to parts of the central Plains and western Corn Belt last week slowly trekked eastward. It dropped widespread moderate to heavy precipitation (more than 2 inches) on the remainder of the Corn Belt and Great Lakes region, and on the Delta, Tennessee Valley, southern Appalachians, and South. Heavy snows also blanketed portions of the northern Plains. Later in the period, a new storm system produced light to moderate precipitation in the Pacific Northwest, northern and central Rockies, and northern Plains. Unfortunately, little or no precipitation was observed in California and the Southwest, Intermountain West, southern and central High Plains, and portions of the southern and middle Atlantic Coast States. Light showers covered most of Puerto Rico, showers increased on Kauai and Oahu but were lacking on eastern islands of Hawaii, and light to moderate precipitation was observed in southeastern and east-central Alaska. Temperatures averaged above-normal in the Southwest, Southeast, and mid-Atlantic, where highs topped 90 degrees F in the latter region early in the period. In contrast, subnormal readings prevailed across the Northwest, Rockies, Plains, upper Midwest, Great Lakes region, northern New England, and Alaska. It was up to 20 degrees F below normal in the Black Hills of South Dakota and in interior Alaska.

The Northeast: Widespread light to moderate precipitation (0.5 to 2 inches) fell across most of New England and the mid-Atlantic, with heavier amounts (2 to 3 inches) occurring in the eastern Great Lakes region. Accordingly, abnormal dryness was removed from areas where 60 and 90-days deficits were greatly reduced or alleviated, and the percent of normal was close to 100. This included western sections of Pennsylvania and New York, eastern Pennsylvania and western New Jersey, and the D0 area in upstate New York and Vermont-New Hampshire was reduced. Farther to the south and east, although 30-, 60-, and 90-day deficiencies have increased, D0 was not introduced in Connecticut and Massachusetts since most stations received an inch of rain this week. But this area will need to be watched as many 7-day average USGS stream flows have dropped below the 25th percentile. In contrast, the heavy rains bypassed portions of the eastern Ohio Valley and central Appalachians yet again. Precipitation has been between 50 to 70 percent of normal since mid-February, accumulating shortages between 2 and 4 inches. As a result, abnormal dryness has developed from southeastern Ohio into western Maryland.

The Southeast: The heaviest rains (more than 2 inches) fell mainly on non-drought

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areas, although enough moisture (1 to 2 inches) was reported in Georgia and South Carolina to justify a one category improvement. In the Carolinas, this year's wet weather continued to warrant improvements in central South Carolina as D1 was diminished and the western D0 edge was removed in central Georgia and western South Carolina. In eastern Georgia and northeastern Florida, additional rains slightly shrunk the D0 and D1 areas, although deficits still remained at 6-months. In North Carolina, moderate rains along the coast erased D0 there, but in northeastern sections, 30, 60, and 90-day departures have been climbing, thus D0 was expanded. In southeastern Louisiana, southern Mississippi, and southern Alabama, 2 to 5 inches of rain helped shrink the D0(L), but longer-term deficits still lingered as normal precipitation is large in this region. In Florida, hit and miss showers (2 to 4 inches) provided some relief along portions of the Atlantic Coast, namely around the Cape Canaveral area (D1 to D0) and in Palm Beach and Broward Counties (D0 to none). Elsewhere, however, totals were lower, and conditions remained the same.

The Midwest: Heavy, widespread precipitation soaked much of the Midwest, with most locations from southern Minnesota, central Wisconsin, and lower Michigan southward all the way to the Gulf Coast measuring at least 2 inches. Parts of northeastern Iowa and southwestern Wisconsin were particularly drenched (4 to 6 inches of rain), as well as central lower Michigan. After last week's decent precipitation, soils finally thawing in southern portions of the upper Midwest (southern Minnesota and Wisconsin), and no drought changes previously made in most parts of the upper Midwest due to the frozen soils, a broad one category improvement was implemented for most areas in Minnesota, Iowa, Wisconsin, and Missouri. Where year-to-date precipitation was 3 to 4 times normal, a two category reduction was justified in northeastern Iowa, southeastern Minnesota, and southwestern Wisconsin (D1 to none). In Iowa, the State Climatologist Harry Hillaker noted that this was the wettest week in terms of statewide average precipitation since June 2010 (2.90 inches, normal is 0.78). Not surprisingly, many daily and 7-day average USGS stream flows are in the upper 90th percentile, with numerous streams and river flooding. In Minnesota, State Climatologist Greg Spoden stated that the southern one half of the state was nearly completely free of subsoil frost, but the northern half remains blanketed by a significant snow cover, with roughly the first six inches now thawed. Similar conditions existed in Wisconsin. A few areas, however, stayed status-quo in extreme northwestern and northeastern Minnesota as year-to-date precipitation was not as great as surrounding areas. As of April 14, USDA/NASS topsoil moisture rated short or very short had dropped to 26, 22, 9, 5, 4, 3, 2, and 0 percent in Iowa, Minnesota, Wisconsin, Illinois, Indiana, Missouri, Ohio, and Michigan, respectively.

Lower Mississippi Valley/Delta region: Similar to the Midwest, widespread heavy rains (more than 2 inches) also provided one category relief from abnormal dryness or drought from Missouri southward into Louisiana. For the most part, where the heavy rains missed last week, they hit this week in the Delta region. The few exceptions where status-quo was kept because not enough rain fell during the past two weeks was in extreme southern Missouri and northern Arkansas (D0), northwestern Arkansas (D1), and southwestern Arkansas and northeastern Texas (D1). Unfortunately, only extreme eastern and north-central parts of Texas observed decent rainfall as little or no precipitation fell elsewhere in the state (see **The Plains**).

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The Plains: After last week's beneficial precipitation, some amounts from that storm figured into this week's totals since it fell after the 12 GMT Tuesday April 9 cutoff. In addition, a second storm system added to this week's totals, allowing for another decent week in much of the Plains with respect to precipitation and drought improvements. The lone exception was Texas, where only the north-central and extreme eastern sections received decent (more than 0.5 inches) rain. In addition, parts of the High Plains saw little or no precipitation (west Texas northward into eastern Colorado-western Kansas and southwestern Nebraska). As a result, some deterioration occurred in northern and southern Texas, with extreme southern Texas nearly all in D4. Elsewhere, weekly totals of 1 to 2 inches were common from eastern Oklahoma northward into North Dakota, with many northern locations receiving heavy snows. In Rapid City, SD, the April 8-10 snow total was 28.2 inches, with Bismarck, ND, receiving 17.3 inches on April 14, an all-time 24-hour record. Many other locations in southeastern Wyoming, western Nebraska, and the western Dakotas measured 6 to 12 inches of snow. Some small one category improvements were made in parts of eastern Oklahoma, in eastern Kansas, in extreme eastern Nebraska and its Panhandle, and throughout most of the Dakota where few or no changes were made last week. In Kansas, although 1 to 1.5 inches fell, most of it on Tuesday, many areas have not seen runoff or surface water recharge. One producer in Saline County reported no runoff from a 1 inch event that fell in 1 hour. Farther north, another 1.5 to 2 inches of rain allowed for a small one category reduction (D3 to D2) in extreme eastern Nebraska, while 0.75 to 2 inches in western Nebraska and eastern Wyoming over the past 2 weeks improved conditions from D4 to D3. The rest of Nebraska remained status-quo, with totals generally between 0.5 to 1.5 inches (but lower in the southwest). In the Dakotas, after minimal or no changes last week due to the 12 GMT Tuesday precipitation cutoff, widespread decent precipitation (1 to 2.5 inches) resulted in a general one category improvement across both North and South Dakota. In North Dakota, although much of the state is snow covered, the State Climatologist Adnan Akyuz reported that there has been significant infiltration into top layers of the soil; extensive snow cover and its water equivalency will further improve soil moisture into deeper layers; above freezing daytime and below freezing nighttime temperatures are causing slow melt and infiltration rather than surface runoff; no shortages in the river systems; and the Red River of the North is expected to reach major flood stage in most locations along the river from Richland (in south) to Pembina (in north) Counties.

The Rockies and Intermountain West: Light to moderate precipitation (0.5 to 1.5 inches) was measured across most of the Rockies, from Idaho and western Montana southward to northern New Mexico, with heavier totals (1.5 to 3 inches) in north-central Colorado, eastern and northwestern Wyoming, and south-central Montana. The precipitation in these four areas was enough to create small surpluses at short and medium-term periods (out to 180-days), thus allowing for a one category improvement. Colorado's NRCS basin average snow water content (SWC) rose to between 85 to 93 percent as of April 16, with basin average water year-to-date (WYTD) precipitation increasing to around 85 percent. A stakeholder in Eagle County, Colorado stated that the recent snow the past few weeks has bought 4-6 weeks for their water supply. Many of Wyoming's basin average SWC increased to near normal, as did southern Montana. In contrast, little or no precipitation fell on much of the Intermountain West, but last week's light to moderate precipitation was enough to

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maintain conditions.

The Far West and Southwest: The bulk of this week's precipitation fell on the Pacific Northwest and northern Rockies (non-drought areas) as little or no precipitation was observed in areas to the south. However, light to moderate precipitation was reported last week in many areas that recorded little or none this week, thereby maintaining conditions. An exception to this was two straight weeks of dry weather across southern California, southern Nevada, and most of Arizona, but this area is headed into a normally dry time of the year. In the latter area, a recent VegDri map indicated poor conditions in south-central Arizona, and based upon this and other products, D0, D1, and D2 was slightly increased in Gila and Graham counties. In New Mexico, which was mostly dry last week, welcome precipitation (0.25 to 1 inches) fell on western and northern sections, resulting in status-quo conditions. Still, 97 percent of the state's topsoil moisture was rated short or very short on April 14, according to NASS/USDA.

Hawaii, Alaska, and Puerto Rico: In Hawaii, although Kauai had started the period rather dry and was headed for possible D1, a cold front over the weekend that produced widespread 0.5 to 2 inches of rain helped to mitigate any deterioration. Late in the period, Oahu was the beneficiary of the frontal showers as 0.5 to 1.5 inches fell there, stabilizing current conditions. Elsewhere, little or no rain fell on the remaining islands, with conditions at status-quo for now. With a recent lack of trade wind showers, deteriorating conditions on the eastern slopes of the Big Island was possible for the near future.

In Alaska, a review of recent (30 and 60 days) and year-to-date precipitation indicated above-normal totals in southern, northern, and east-central sections, resulting in some removal of the D0 in those regions.

Scattered light to moderate showers (0.2 to 1.5 inches, locally to 3 inches), with the largest amounts in the northwestern and southeastern sections of Puerto Rico, maintained conditions across the island.

Looking Ahead: The next 5 days (April 18-22) are expected to be very wet in the middle of the country, with a swath of 3 inches of precipitation expected from Oklahoma northeastward into Michigan. Much of the eastern half of the nation should receive decent precipitation, with parts of the Pacific Northwest, northern Rockies, and central Rockies and Plains expecting moderate totals. Unfortunately, dry weather is forecast for most of the Southwest and extreme southern Plains. Subnormal 5-day average temperatures are predicted for the middle of the U.S., especially the North-Central States. Near to somewhat below-normal readings are expected elsewhere, except in California and southern Florida where temperatures should average above-normal.

For the ensuing 5 days (April 23-27), the odds favor wet weather persisting in the eastern half of the Nation and in southeastern Alaska, with drier than usual conditions

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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

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

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

Updated April 17, 2013"
