



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

Weekly Report - Snowpack / Drought Monitor Update

Date: 21 March 2013

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: [SNOTEL](#) and ACIS 7-day temperature anomaly ending 20 March shows a warmer week on average with the exception of colder departures over northern Montana (Fig. 1a). ACIS [7-day](#) average temperature anomalies show the greatest positive temperature departures over southern California (>+12°F). The greatest negative departures occur over northeastern Montana (<-15°F) (Fig. 1b). Since the beginning of March, warmer temperatures have dominated much of the Southern Tier States of the West (Fig. 1c).

Precipitation: [ACIS](#) 7-day average precipitation amounts for the period ending March 20 show heavy precipitation dominating the Olympic and Cascade Ranges, with lesser amounts over the Sierra Nevada and the Northern Rockies (Fig. 2a). This is clearly reflected in the lower panel (Fig. 2b), that shows these as higher percentage from the long-term average. SNOTEL [month to date](#) precipitation percent of normal pattern for March shows significant variability across the West. The Northern Cascades, the Northern Rockies, and parts of Arizona and New Mexico are showing above normal precipitation. However, significantly below normal amounts of precipitation dominate from eastern Oregon to eastern Utah (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) with Arizona standing out as an exception to the dryness seen over the Southern Tier of the West. However, average precipitation (Fig. 2d) does not always translate to average snow-water equivalent, as noted in Fig. 3b.

Snow: The [7-day snow depth changes](#) for the week show an early spring storm delivering significant snowfalls over the Washington Cascades and to a lesser extent over the Northern Rockies. Elsewhere, snowpack is on the decline (which is typical for Arizona and southern New Mexico this time of year) (Fig. 3a). Current [Snow-Water Equivalent](#) (SWE) conditions across the West reveal that only the Washington Cascades have a surplus of SWE for the 2013 Water Year... The Northern Rockies, Upper Snake Drainage, and Oregon Cascades have closer to normal conditions. For the remainder of the West, deficits prevail (Fig. 3b).

Weather Summary: Over the past week, the upper-air flow pattern featured a trough over the eastern contiguous U.S. and a ridge over the western U.S., followed by a flattened east-west oriented flow, and ending with a developing trough over the Nation's midsection. Temperatures averaged several degrees below normal for the week across most of the Northeast and Florida, generally 4 to 8 degrees below normal across the Midwest, and nearly 15 degrees below normal in eastern North Dakota. Above normal temperatures prevailed from the southern Great Plains and Rockies westward to near the Pacific Coast. The largest positive departures were observed from central Nevada southeastward to western New Mexico, on the order of 10 to 14 degrees above normal. Several storm systems moved across the country during the period. Heavy precipitation (2 inches or more) fell across the northern Cascades and Olympic Peninsula of Washington, parts of the northern Rockies, southern Missouri and southern Illinois, the Ohio Valley, eastern Pennsylvania, and northern New Jersey. Light precipitation (less than 0.5-inch) was observed over California, the Southwest, the interior Pacific Northwest, most of the Great Plains, Louisiana, parts of the Corn Belt and Great Lakes, and much of Florida. Most other

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areas of the contiguous U.S. reported moderate precipitation (between 0.5 and 2 inches) during the past 7 days.

The Rockies: Many areas received light amounts of precipitation during this past week. Moderate to heavy precipitation (greater than 0.5-inch) was widespread across the northern Rockies, but most of this precipitation did not fall on areas farther south needing it. Moderate precipitation (0.5 – 1 inch) was reported over the Colorado Front Range, but not enough to warrant alterations to this week's Drought Monitor depiction.

The West: Little, if any, precipitation fell over the Southwest and the interior Pacific Northwest. The areas that received significant precipitation (water equivalent) included the coastal ranges and Cascades of Washington and Oregon. However, the rain and mountain snow missed the drought areas farther east and south. As a result, abnormal dryness (D0) was expanded across north-central and extreme southwestern portions of Oregon, and introduced to the far northern counties of California. In addition, a 1-category degradation (from D0 to D1) was rendered to the drought depiction in east-central California, notably the Yosemite National Park counties of Tuolumne, Mariposa, and Madera. As of March 20, the basin-wide Snow Water Content (SWC) from SNOTEL locations across the Sierras was measured at 50 to 75 percent of average. In California, 154 intrastate reservoirs are collectively holding a near-average volume of water for this time of year, though the runoff situation appears to be fairly pessimistic for the second year in a row. Snowmelt in March is a concern for reservoirs that are at the top of their conservation pools. Because flood control curves wait until April 1 before easing, reservoir managers would have to pass any snowmelt runoff. Those reservoirs with capacity in the conservation pool can catch the snowmelt runoff. NDMC Author: Anthony Artusa, NOAA/NWS/NCEP/Climate Prediction Center.

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/>.

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. For more information about SCAN see [brochure](#).

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

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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

Weekly Snowpack and Drought Monitor Update Report

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

Mar 20, 2013

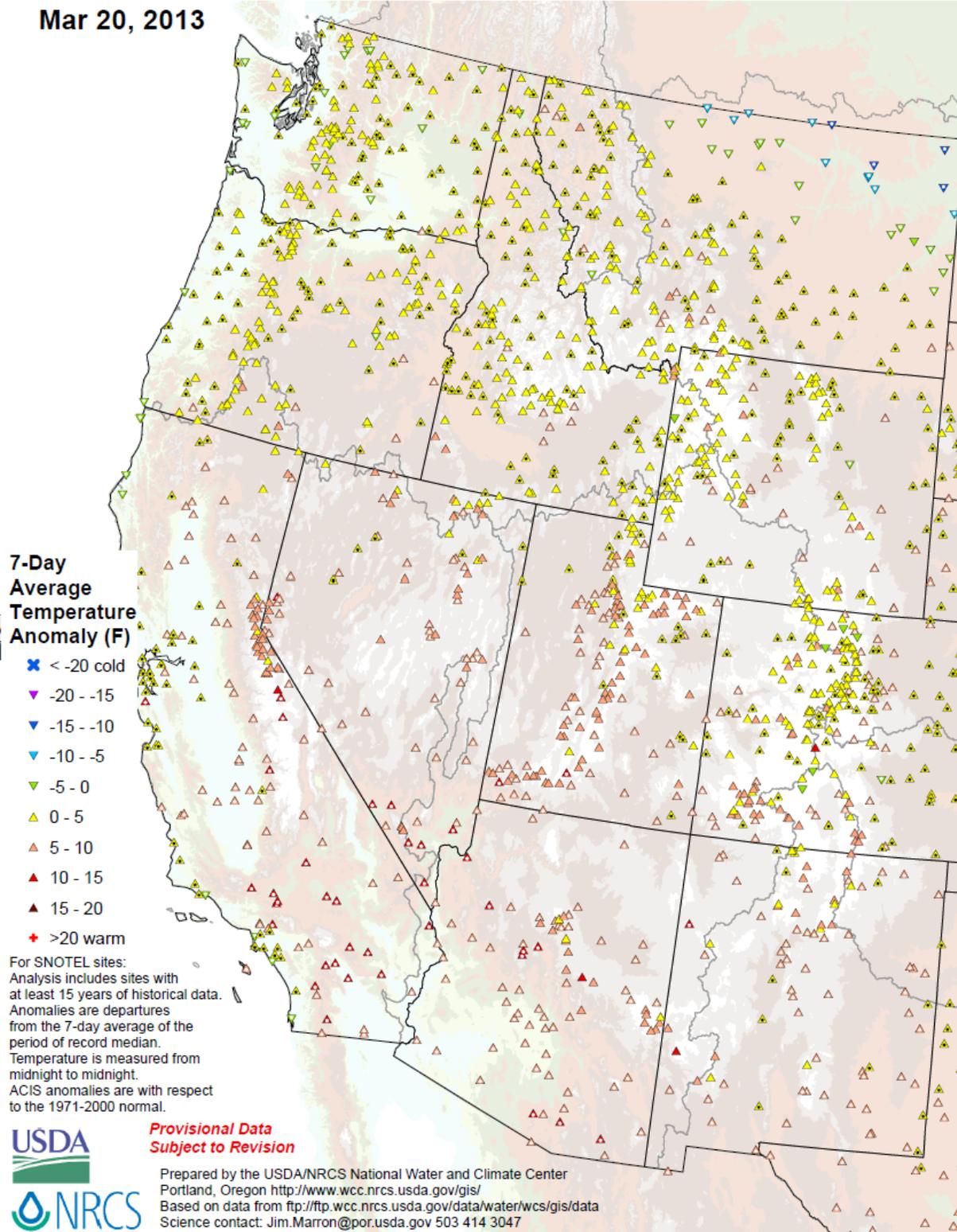
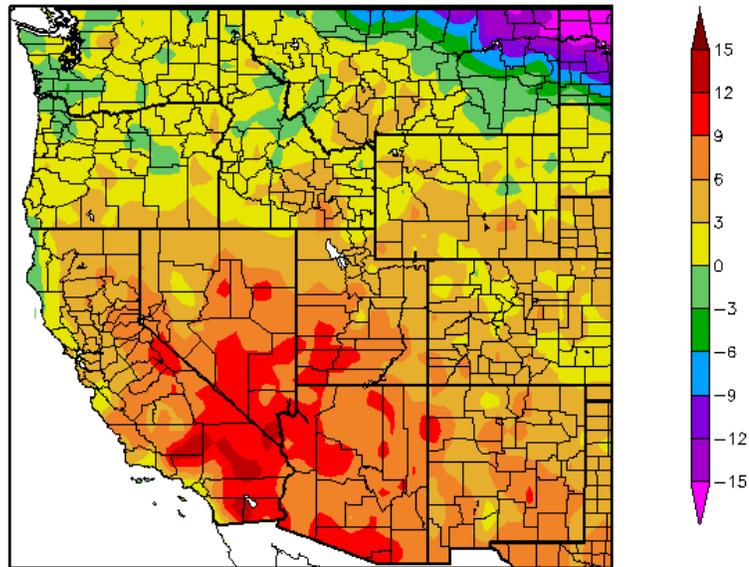


Fig. 1a: **SNOTEL** and ACIS 7-day temperature anomaly ending 20 March shows a warmer week on average, with the exception of colder departures over northern Montana.

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Departure from Normal Temperature (F)
3/14/2013 – 3/20/2013

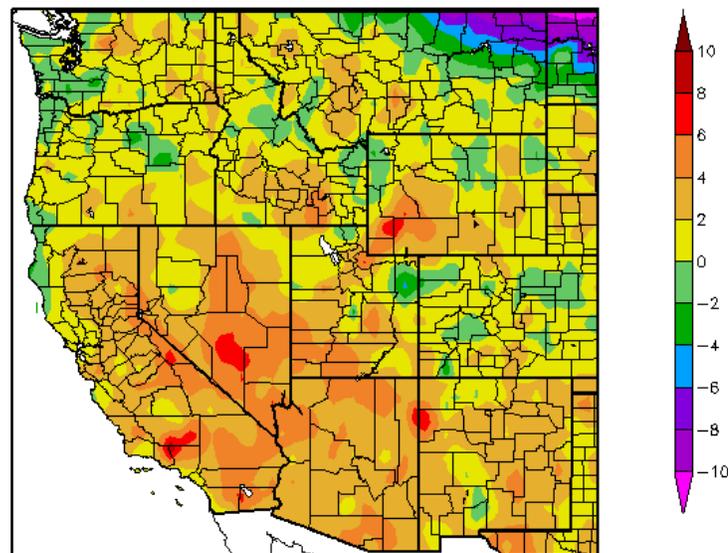


Generated 3/21/2013 at HPRCC using provisional data.

Regional Climate Centers

Fig. 1b: ACIS [7-day](#) average temperature anomalies show the greatest positive temperature departures over southern California (>+12°F). The greatest negative departures occur over northeastern Montana (<-15°F). For more figures, see the Western Water Assessment's Intermountain West Climate [Dashboard](#).

Departure from Normal Temperature (F)
3/1/2013 – 3/20/2013



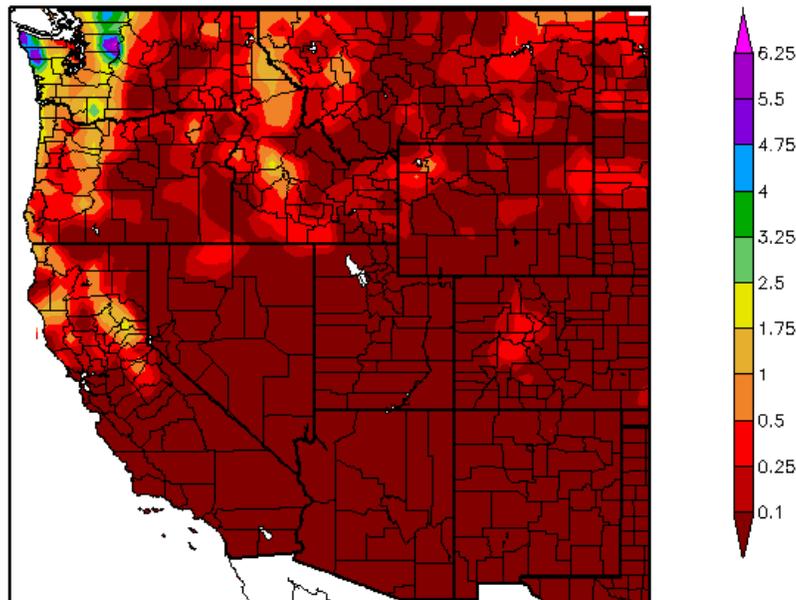
Generated 3/21/2013 at HPRCC using provisional data.

Regional Climate Centers

Fig. 1c: Since the beginning of March, warmer temperatures have dominated much of the Southern Tier States of the West.

Weekly Snowpack and Drought Monitor Update Report

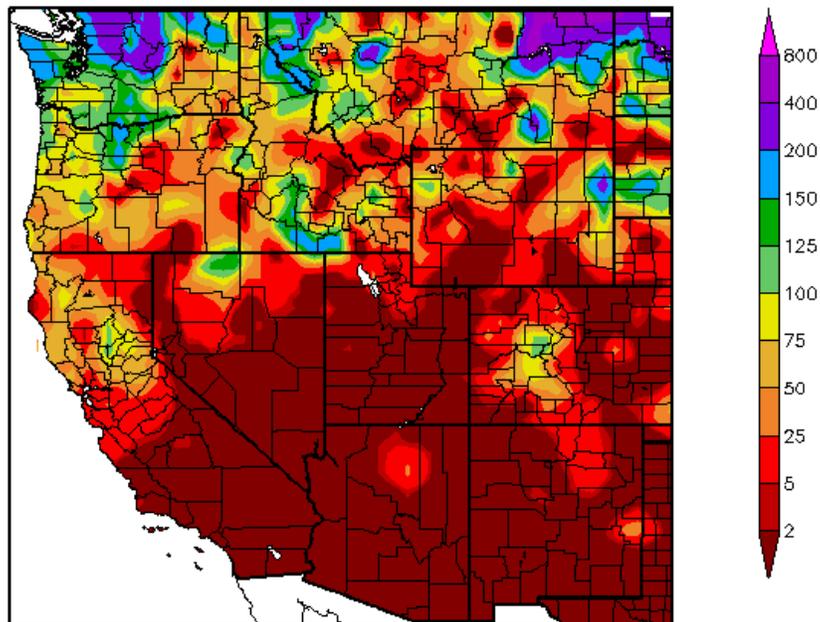
Precipitation (in)
3/14/2013 – 3/20/2013



Generated 3/21/2013 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
3/14/2013 – 3/20/2013



Generated 3/21/2013 at HPRCC using provisional data.

Regional Climate Centers

Fig. 2a and 2b: [ACIS](#) 7-day average precipitation amounts for the period ending March 20 show heavy precipitation dominating the Olympic and Cascade Ranges, with lesser amounts over the Sierra Nevada and the Northern Rockies (Fig. 2a). This is clearly reflected in the lower panel (Fig. 2b), which shows these as higher percentage from the long-term average.

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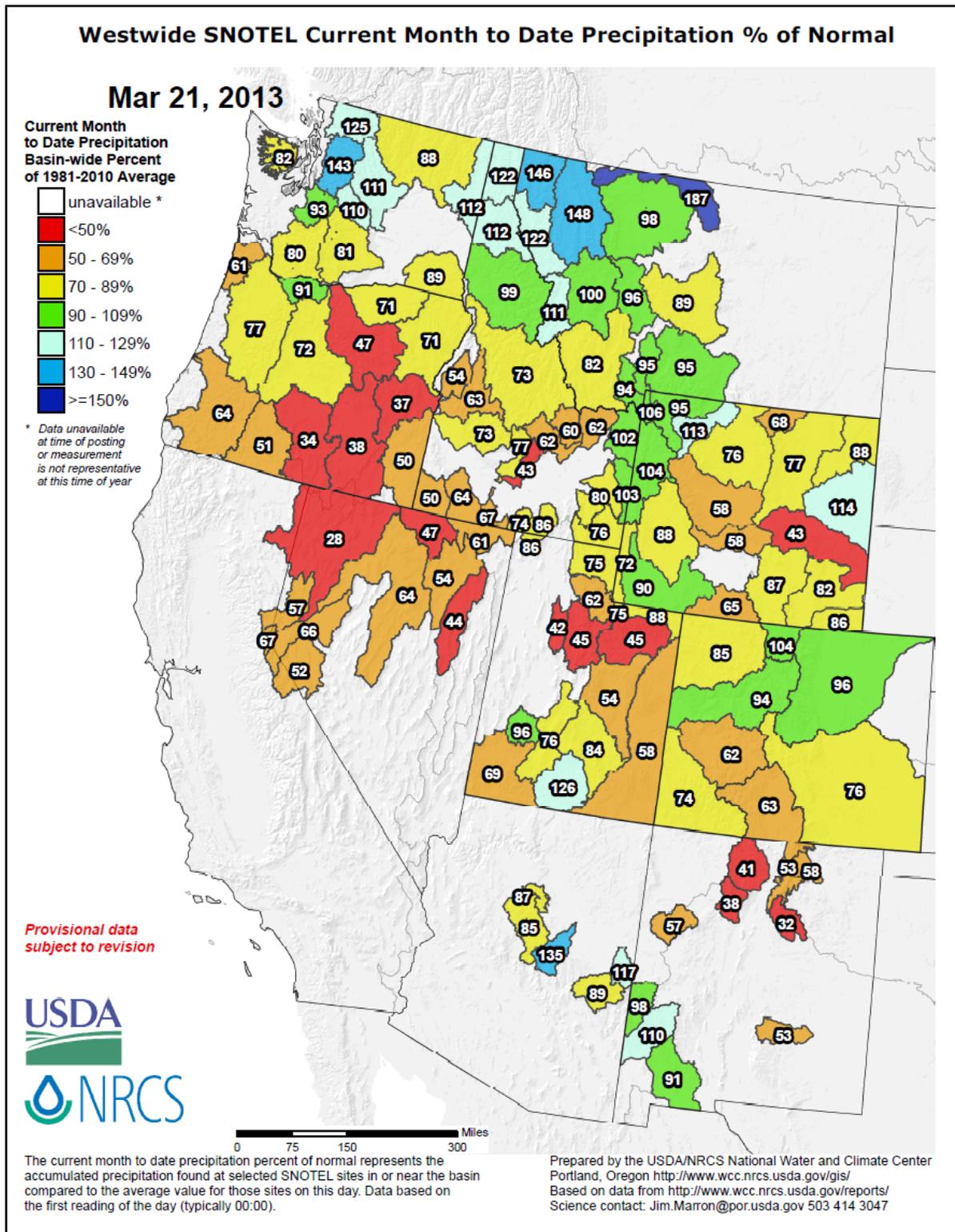


Fig. 2c: SNOTEL month to date precipitation percent of normal pattern for March shows significant variability across the West. The Northern Cascades, the Northern Rockies, and parts of Arizona and New Mexico are showing surpluses. However, significant deficit amounts dominate from eastern Oregon to eastern Utah.

Weekly Snowpack and Drought Monitor Update Report

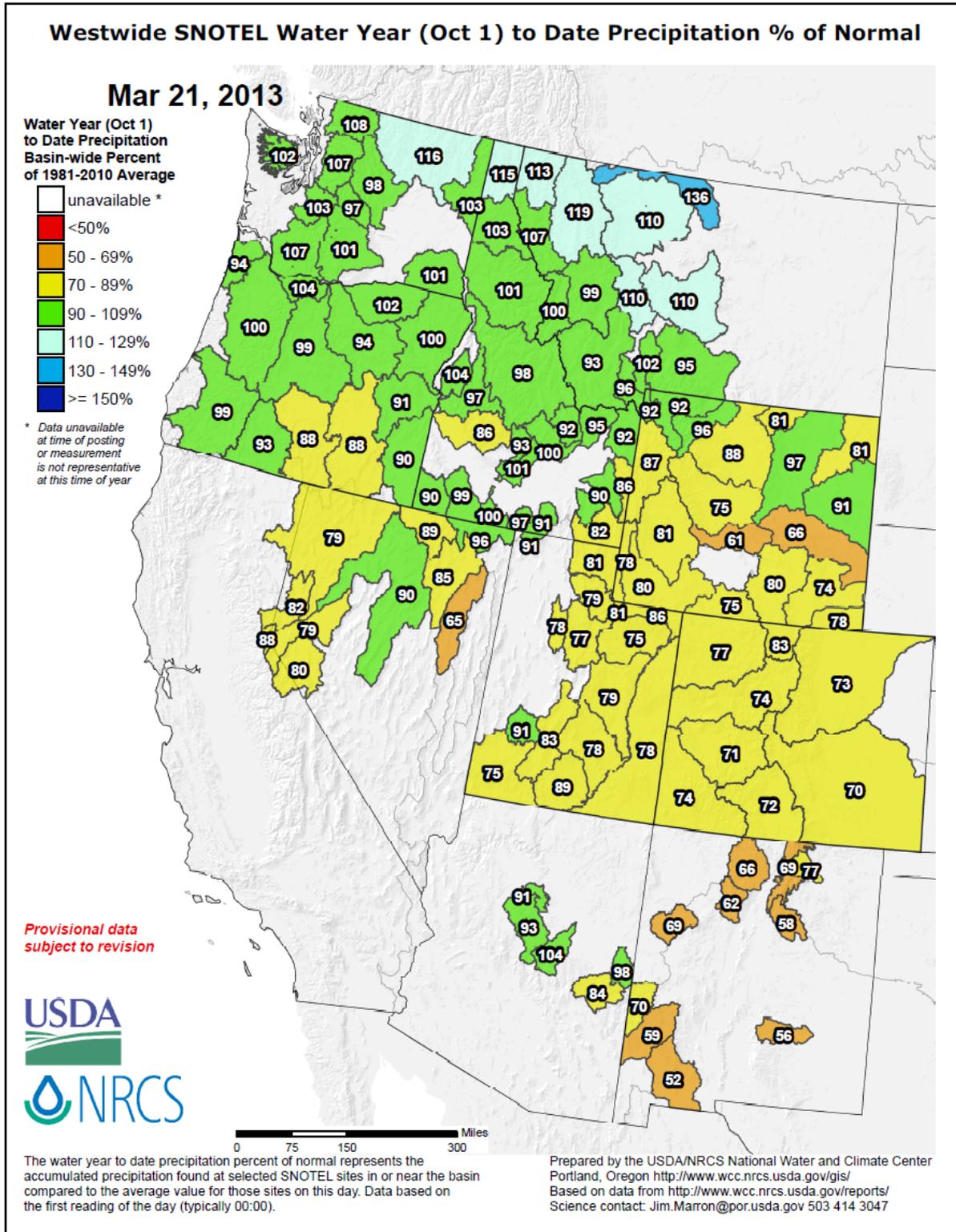


Fig. 2d: For the [2013 Water Year](#) that began on 1 October 2012, the pattern continues to resemble La Niña (e.g., wetter Northern Tier) with Arizona standing out as an exception to the dryness seen over the Southern Tier of the West. However, average precipitation does not always translate to average snow-water equivalent as noted in Fig. 3b. For additional information, daily reports by SNOTEL sites are available [here](#).

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SNOTEL 7-Day Snow Depth Change (Inches)

Mar 21, 2013

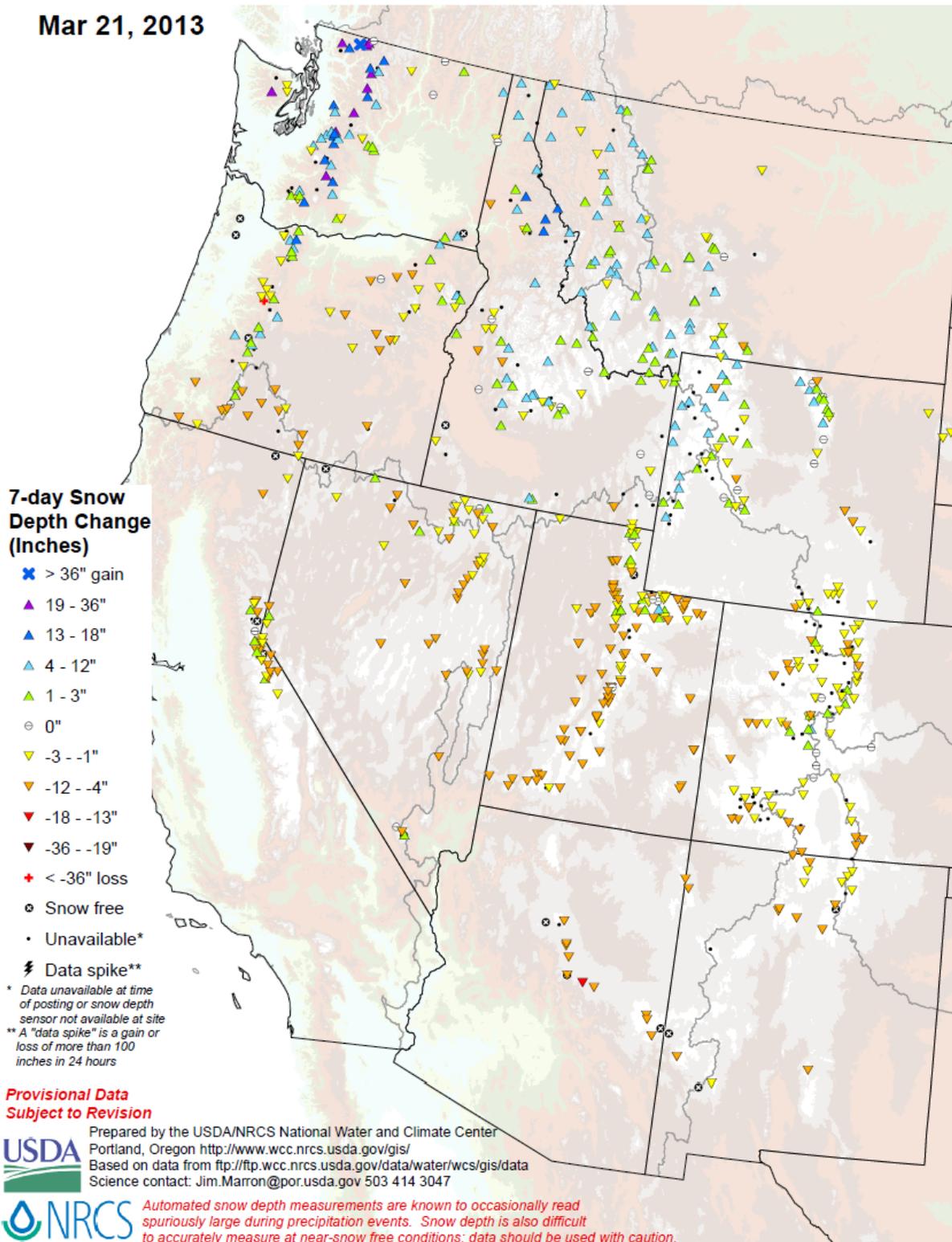


Fig. 3a: The 7-day snow depth changes for the week show an early spring storm delivering significant snowfalls over the Washington Cascades and to a lesser extent over the Northern Rockies. Elsewhere, snowpack is on the decline (which is typical for Arizona and southern New Mexico at this time of year).

Weekly Snowpack and Drought Monitor Update Report

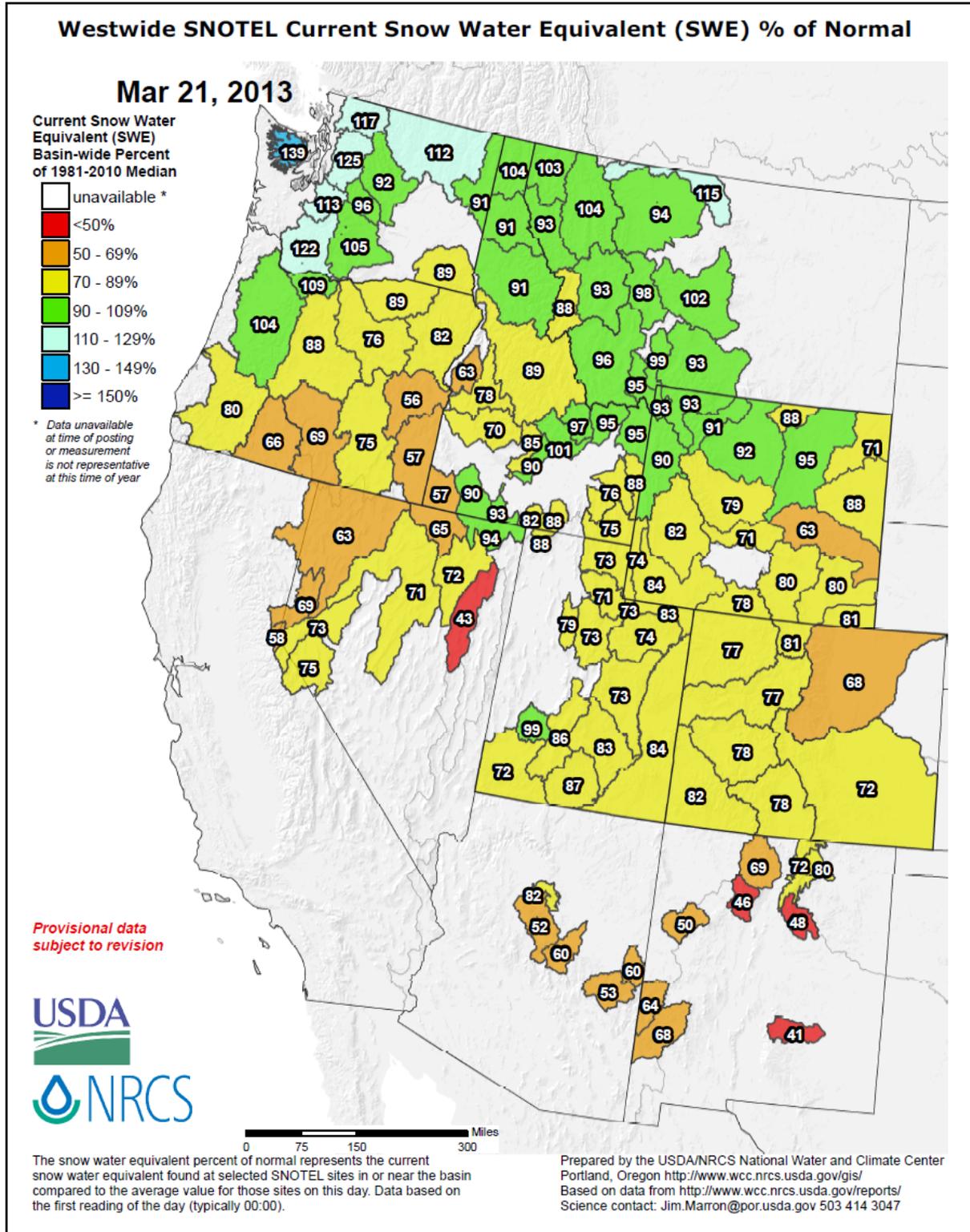


Fig. 3b: Snow-Water Equivalent (SWE): Only the Washington Cascades have a surplus of SWE in the West for the 2013 Water Year. The Northern Rockies, Upper Snake Drainage, and Oregon Cascades have closer to normal conditions. For the remainder of the West, deficits prevail. A useful basin-by-basin assessment of SWE to date can be viewed by state [here](#) and [here](#).

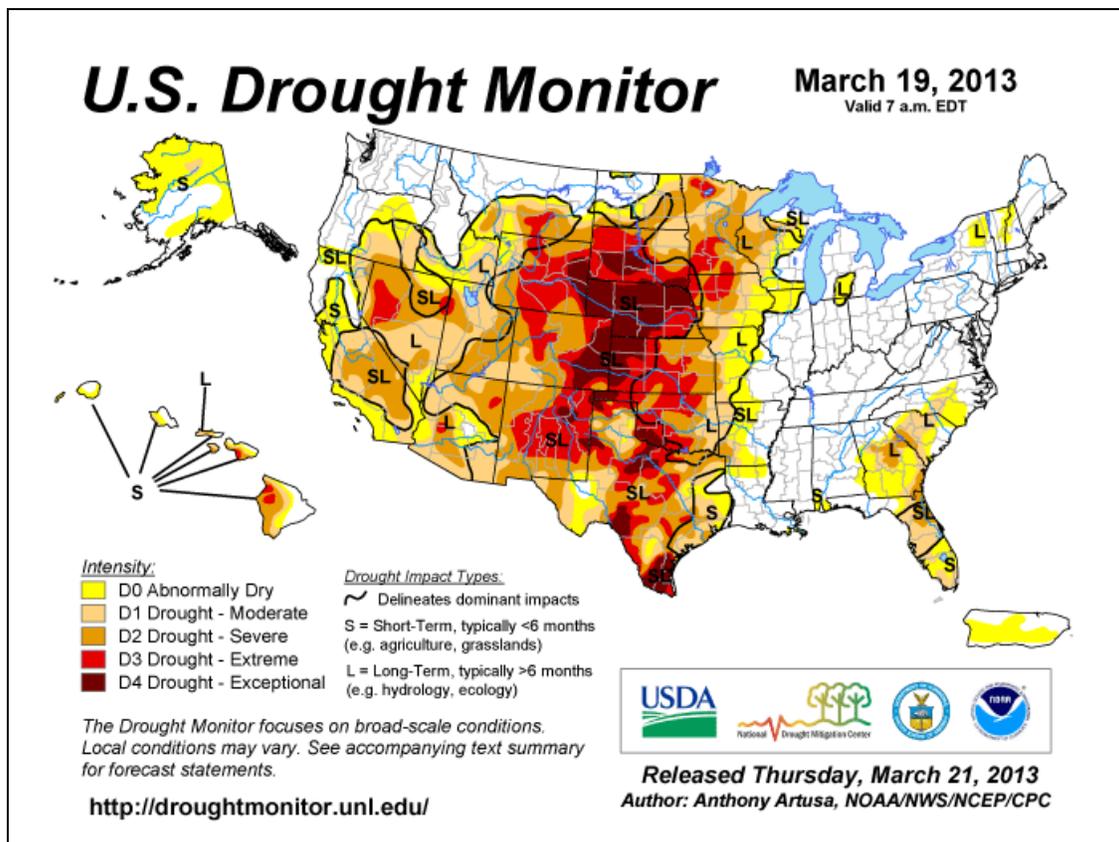


Fig. 4: Current [Drought Monitor](#) weekly summary. The exceptional D4 levels of drought are scattered across the western Corn Belt of the Plains into southeastern Colorado and Wyoming, easternmost New Mexico, and southward into Texas. For more drought news, see [Drought Impact Reporter](#). Click for the latest statistics for [California Reservoirs](#). 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](#).

For additional agriculture and drought information, see the end of this report.

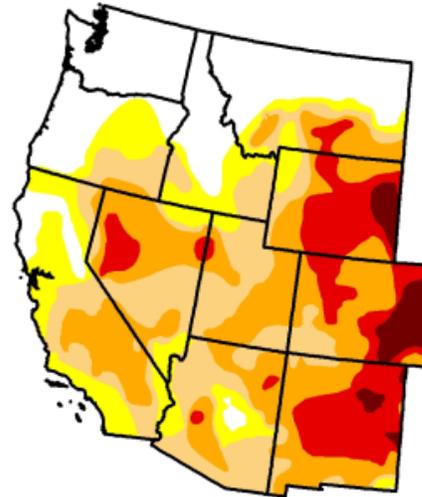
U.S. Drought Monitor

West

March 19, 2013
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	22.56	77.44	63.05	41.15	15.72	3.13
Last Week (03/12/2013 map)	23.94	76.06	62.77	41.15	15.72	3.13
3 Months Ago (12/18/2012 map)	24.28	75.72	69.42	45.92	18.83	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 (03/13/2012 map)	31.09	68.91	49.48	24.29	3.39	0.94



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, March 21, 2013
National Drought Mitigation Center,

<http://droughtmonitor.unl.edu>

Fig. 4a: Drought Monitor for the [Western States](#) with statistics over various time periods. Little change has occurred this past week.

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.

From the latest USDA/NASS weekly agricultural report, valid February 25, 2013:
http://www.nass.usda.gov/Statistics_by_State/California/Publications/Crop_Progress_&Condition/index.asp

Also see:

<http://www.usda.gov/oce/weather/pubs/Other/MWCACP/Graphs/USA/allhay.pdf>
http://www.usda.gov/oce/weather/pubs/Other/MWCACP/Graphs/USA/US_WheatWinter.pdf

U.S. Drought Monitor

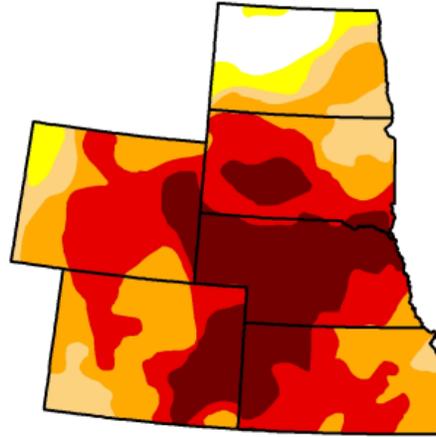
High Plains

March 19, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	4.65	95.35	91.29	81.46	55.52	24.37
Last Week (03/12/2013 map)	4.65	95.35	91.29	81.46	55.58	24.37
3 Months Ago (12/18/2012 map)	1.54	98.46	93.01	86.20	59.98	26.99
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 (03/13/2012 map)	42.17	57.83	21.23	5.06	1.56	0.04

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, March 21, 2013
National Drought Mitigation Center,

<http://droughtmonitor.unl.edu>

Fig. 4b: Drought Monitor for the [High Plains](#) with statistics over various time periods. Note no changes this past week. See [Kansas Drought Update](#).

U.S. Drought Monitor

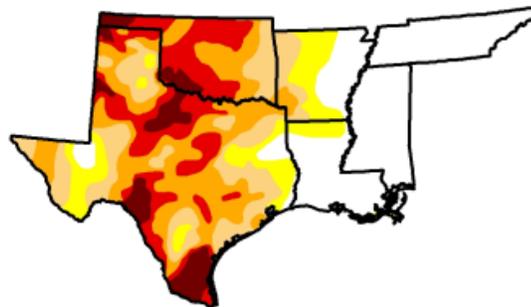
South

March 19, 2013
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	30.52	69.48	58.96	41.68	21.37	6.28
Last Week (03/12/2013 map)	36.36	63.64	54.54	38.61	19.37	5.62
3 Months Ago (12/18/2012 map)	19.12	80.88	65.58	49.90	32.03	9.60
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 (03/13/2012 map)	38.44	61.56	51.60	37.36	22.23	10.79

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.

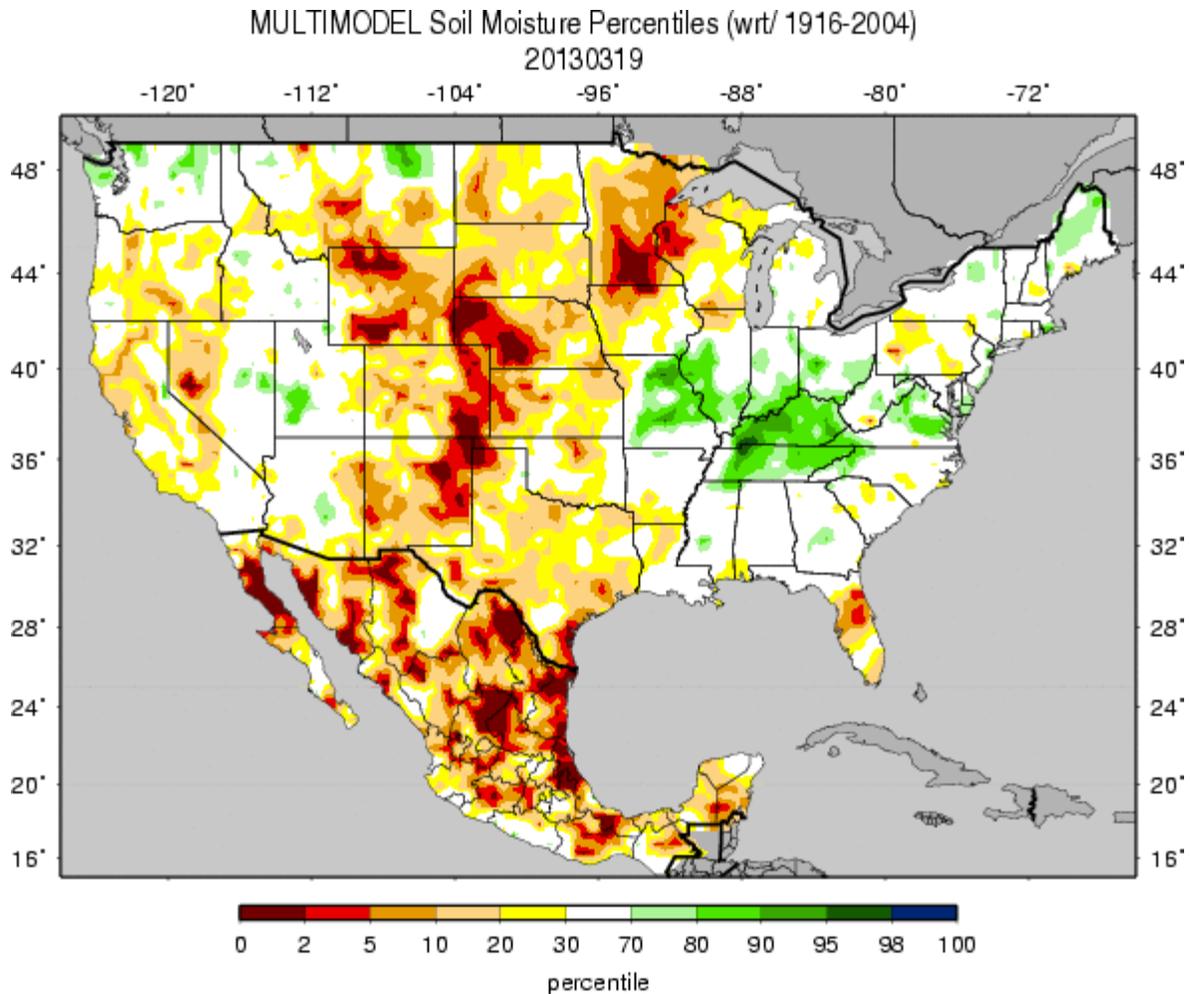


Released Thursday, March 21, 2013
National Drought Mitigation Center,

<http://droughtmonitor.unl.edu>

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

Weekly Snowpack and Drought Monitor Update Report



Figs. 5: Soil moisture ranking in [percentile](#) as of 19 March shows dryness over the Western High Plains and much of the Rockies. Increased moisture is noted over Kentucky and adjacent states during the past week while increasing dryness is dominating Minnesota.

Useful Hydrological Links:

USDA western U.S. mountain snow water content anomaly map.

USGS (U.S. Geological Service) [observed streamflow](#); NOAA Climate Prediction Center (CPC) modeled runoff [anomalies](#) and [percentiles](#); VIC (University of Washington Variable Infiltration Capacity macro scale hydrologic model) [1-](#), [2-](#), [3-](#), and [6-month](#) and [water year-to-date](#) runoff percentiles; NLDAS (North American Land Data Assimilation System) modeled streamflow [anomalies](#) and [percentiles](#); NLDAS model runoff [anomalies](#) and [percentiles](#); USGS groundwater observations ([real-time network](#), [climate response network](#), [total active network](#)); USDA snow water content observations for the West (SNOTEL station [percentiles](#) and [percent of normal](#), SNOTEL basin [percent of normal](#) and [percent of average](#)) and Alaska ([SNOTEL station percent of normal](#), [SNOTEL basin percent of normal](#)); USDA reservoir storage as [percent of capacity](#).

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

079) MONTH=2013-02-19 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision
Thu Mar 21 07:25:30 PDT 2013

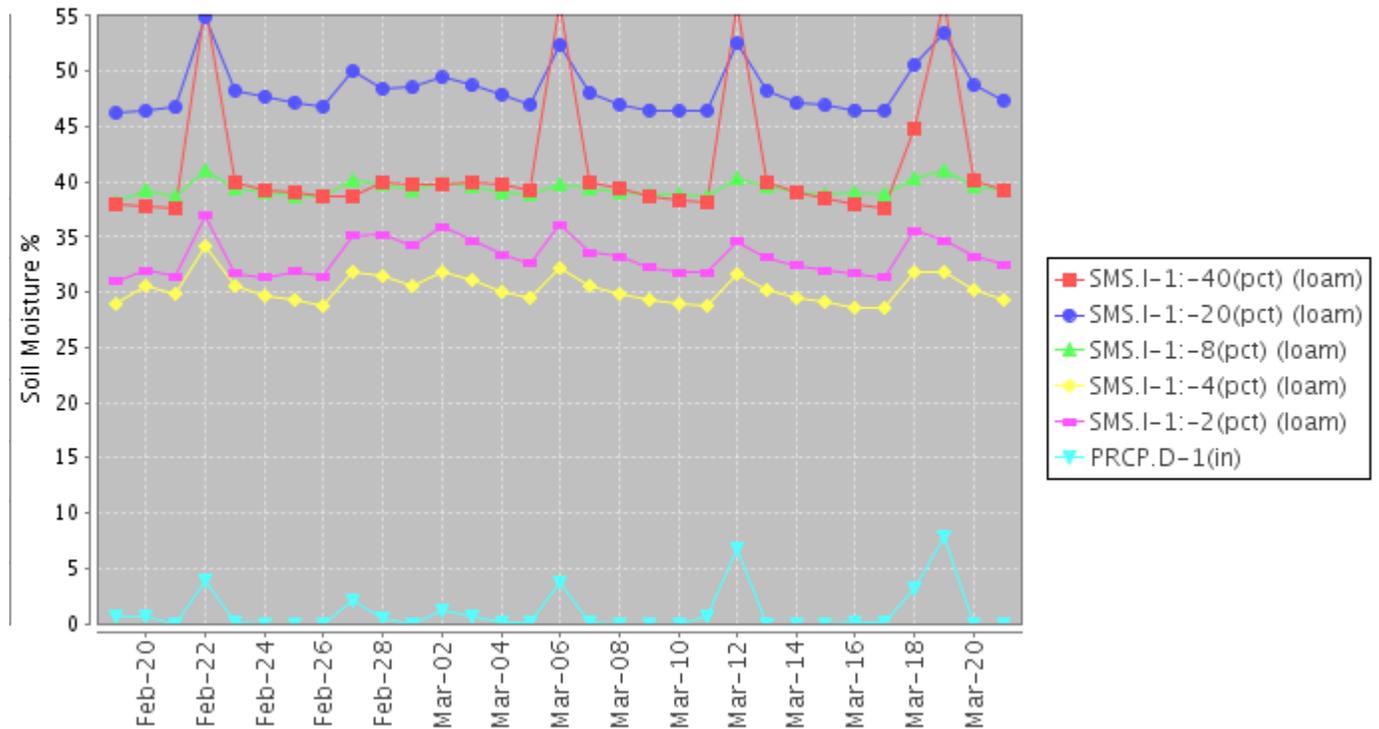


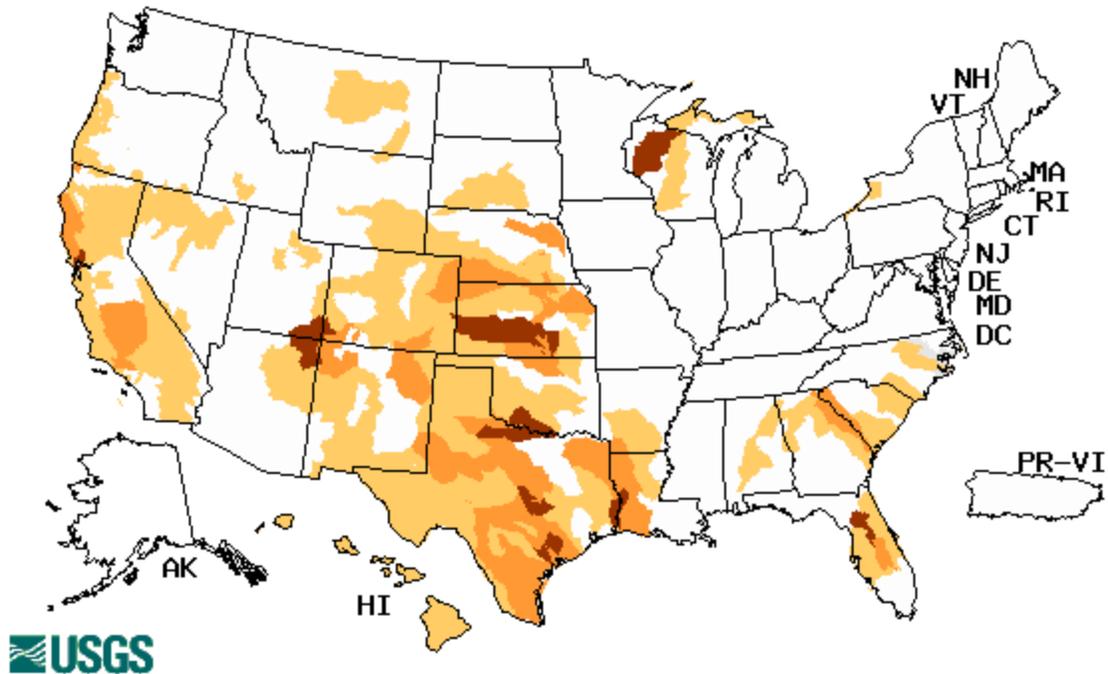
Fig. 6: This NRCS resource shows a site over [central Kentucky](#) with high soil moisture values at all levels. Note the heavy precipitation during the past month.

Useful Agriculture Links:

USDA (U.S. Department of Agriculture) [observed soil moisture conditions](#), [departures and percentiles](#), and comparison to [5-year average](#) and [10-year average](#); the Palmer [Crop Moisture Index \(CMI\)](#), which intensified during the month in the West and Lower to Mid-Mississippi Valley (weeks [1](#), [2](#), [3](#), [4](#), [5](#)); CPC modeled soil moisture [anomalies](#) and [percentiles](#) for end of May, and [soil moisture anomaly change](#) compared to previous month; CPC's Leaky Bucket model [soil moisture percentiles](#); NLDAS modeled soil moisture percentiles for the [top soil layer](#) and [total soil layer](#); VIC modeled [soil moisture percentiles](#), and [soil moisture percentile change](#) compared to previous month; USDA observed [pasture and rangeland conditions](#); [Vegetation Drought Response Index \(VegDRI\)](#); the NOAA/NESDIS satellite-based [Vegetation Health Index \(VHI\)](#); the USGS agro-hydrologic model ([Soil Water Index](#), [Water Requirement Satisfaction Index](#)); Selected SNOTEL Sites (measured [2"](#), [4"](#), [8"](#), [20"](#), and [40"](#) soil moisture depths); Monthly [SCAN Report](#) from Utah.

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Wednesday, March 20, 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 southeastern and northern Texas, Four Corners Region, central Kansas, and now over western Wisconsin. As with soil moisture, streamflow data can be severely compromised by prolonged freezing temperatures. See the USGS [National Water Information System Mapper](#).

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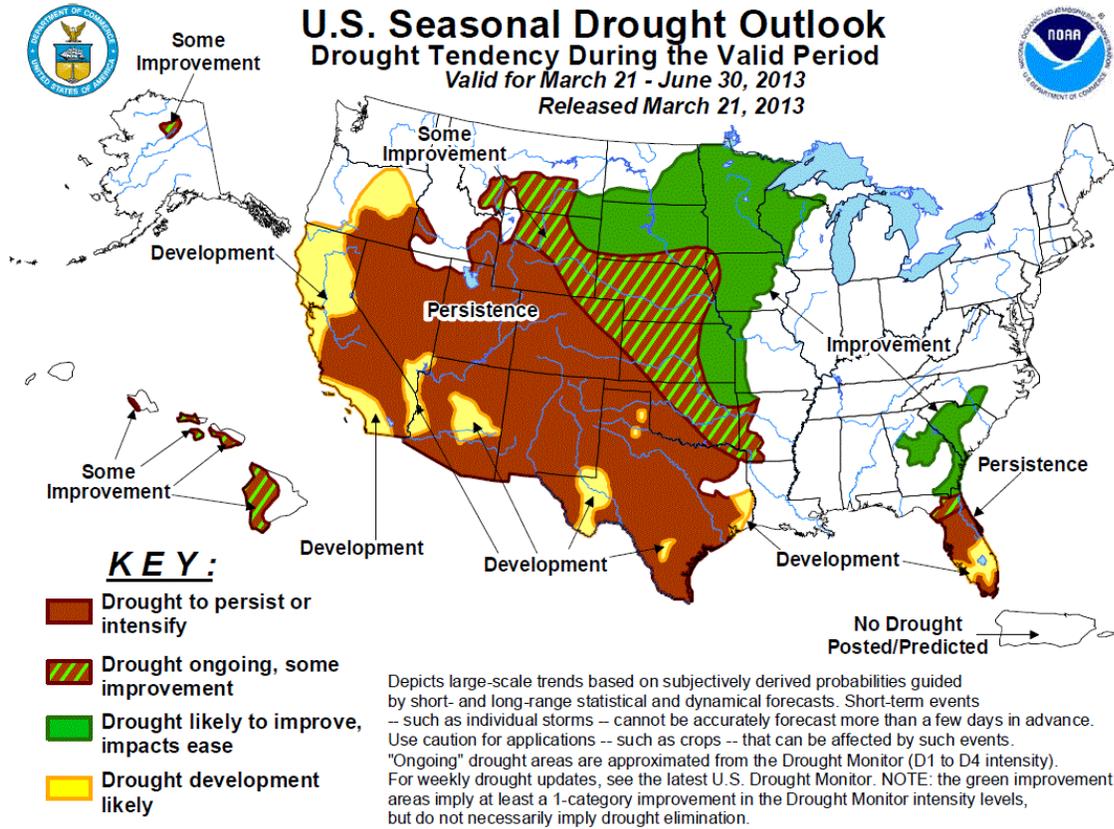
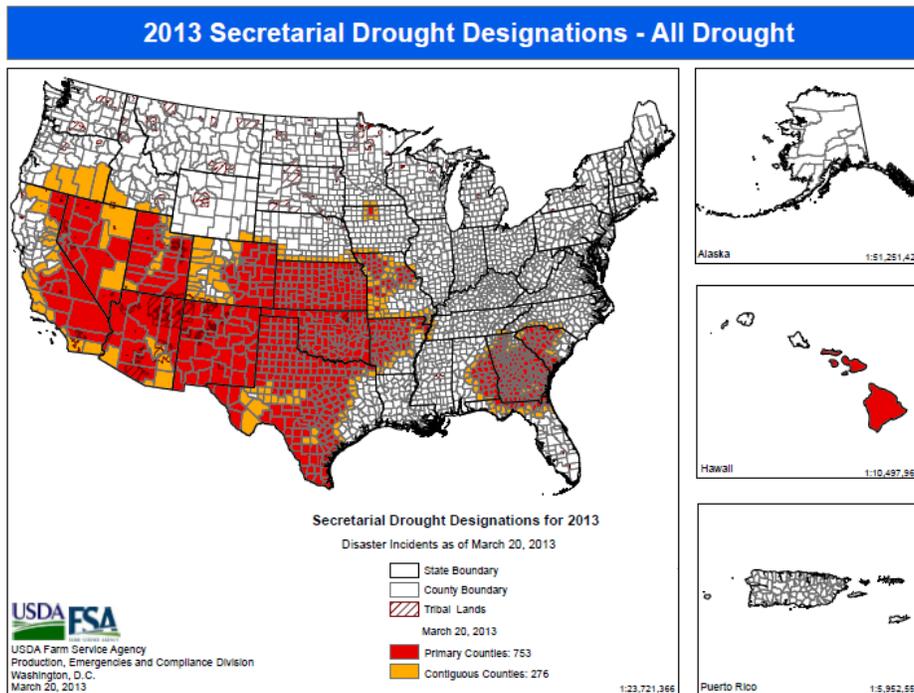


Fig. 8: U.S. Seasonal [Drought Outlook](#) updated today, 21 March.



See [USDA Drought Assistance website](#).

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National Drought Summary -- March 19, 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: Over the course of the past week, the upper-air flow pattern featured a trough over the eastern contiguous U.S. and a ridge over the western U.S., followed by flattened east-west oriented flow, and ending with a developing trough over the Nation's midsection. Temperatures averaged several degrees below normal for the week across most of the Northeast and Florida, generally 4 to 8 degrees below normal across the Midwest, and nearly 15 degrees below normal in eastern North Dakota. Above normal temperatures prevailed from the southern Great Plains and Rockies westward to near the Pacific Coast. The largest positive departures were observed from central Nevada southeastward to western New Mexico, on the order of 10 to 14 degrees above normal. Several storm systems moved across the country during the period. Heavy precipitation (2 inches or more) fell across the northern Cascades and Olympic Peninsula of Washington, parts of the northern Rockies, southern Missouri and southern Illinois, the Ohio Valley, eastern Pennsylvania, and northern New Jersey. Light precipitation (less than 0.5-inch) was observed over California, the Southwest, the interior Pacific Northwest, most of the Great Plains, Louisiana, parts of the Corn Belt and Great Lakes, and much of Florida. Most other areas of the contiguous U.S. reported moderate precipitation (between 0.5 and 2 inches) during the past 7 days.

The Northeast and Mid-Atlantic: Widespread light to moderate precipitation (under 2 inches) amounts were noted over the region during the past 7-days. Eastern Pennsylvania and parts of northern New Jersey reported heavy precipitation (2-3 inches). Weekly temperatures averaged 2-4 degrees below average for most of this region, limiting evapotranspiration. With green-up still several weeks away for areas of higher terrain, it was decided not to modify the regional drought depiction this week.

The Southeast: Moderate rains (0.5 - 2 inches) fell across the Tennessee Valley, Georgia, much of the Carolinas, southeastern and far northern Alabama, and in very isolated locations across Florida. A 1-category improvement was made across extreme southwestern-, west-central-, and extreme east-central Georgia due to the recent rainfall, and Percent of Normal Precipitation (PNP) values ranging from 110-150 percent of normal over the past 3 months (Advanced Hydrologic Prediction System, AHPS). In contrast, there was expansion of abnormal dryness (D0) over southeastern North Carolina and extreme southern Alabama, based on increasing rainfall deficits and fairly low stream flows.

For the Florida peninsula, rainfall departures (Departure from Normal Precipitation – DNPs from AHPS) for the past 90-days generally ranged from 4-6 inches (locally greater). The area of moderate drought (D1) in southern Florida was expanded northward

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to include eastern portions of both Miami-Dade and Broward counties.

The Midwest: Light precipitation (less than 1 inch) was noted over much of this region. A 1-category improvement (from D1 to D0) was made over northern Illinois to be consistent with surrounding areas that had approximately the same weather and soil conditions. In southern Wisconsin, a 1-category upgrade was made, warranted by DNPs (from 14-days to 180-days) in significant surplus, rivers running high with some minor flooding reported, and a wet, snowy winter overall. The remaining areas of the Midwest were left unchanged in the drought depiction, due to the continuing presence of frozen ground. Davenport, IA reported a frozen soil depth of 5 inches, with very slow thawing occurring.

Lower Mississippi Valley/Delta region: Significant precipitation deficits (AHPS PNP values of 25-75 percent of normal rainfall during the past 2 months) justified an eastward expansion of D0 conditions along and near the border between Arkansas and Louisiana. Stream flows in this region are down in the lowest 10 percent of the historical distribution. In addition, a 1-category degradation was also made to extreme southwestern counties in Arkansas.

The Great Plains: In Texas, little if any precipitation during the past week resulted in several small-scale adjustments to the drought depiction. Six-month DNPs are on the order of 8-16 inches in much of eastern Texas. These deficits, and the fact that reservoirs in most of this area recharged during 2012, resulted in a new, short-term impact area designation for this region. In far northwestern Oklahoma, the two separate D2 areas were combined into one, and expanded slightly to the southeast. In the far western Panhandle region, Cimarron County in particular is experiencing widespread winter wheat and native grass loss. There were some reports of similar, if not worse, conditions occurring across the Colorado border in Baca County.

The Rockies: Many areas received light amounts of precipitation during this past week. Moderate to heavy precipitation (greater than 0.5-inch) was widespread across the northern Rockies, but most of this precipitation did not fall on areas farther south needing it. Moderate precipitation (0.5 – 1 inch) was reported over the Colorado Front Range, but not enough to warrant alterations to this week's Drought Monitor depiction.

The West: Little, if any, precipitation fell over the Southwest and the interior Pacific Northwest. The areas that received significant precipitation (water equivalent) included the coastal ranges and Cascades of Washington and Oregon. However, the rain and mountain snow missed the drought areas farther east and south. As a result, abnormal dryness (D0) was expanded across north-central and extreme southwestern portions of Oregon, and introduced to the far northern counties of California. In addition, a one-category degradation (from D0 to D1) was rendered to the drought depiction in east-central California, notably the Yosemite National Park counties of Tuolumne, Mariposa and Madera. As of March 20th, the basin-wide Snow Water Content (SWC) from SNOTEL locations across the Sierras was measured at 50 to 75 percent of average. In California, 154 intrastate reservoirs are collectively holding a near-average volume of water for this time of year, though the runoff situation appears to be fairly pessimistic for the second year in a row. Snowmelt in March is a problem for reservoirs that are at the top of their conservation pools. Because flood control curves wait until April 1 before easing, reservoir managers would have to pass any snowmelt runoff. Those reservoirs

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with capacity in the conservation pool can catch the snowmelt runoff.

Hawaii, Alaska, and Puerto Rico: In Hawaii, some windward locations reported anywhere from 0.5-inch to as much as 3-4 inches of rain this past week, while little if any rain fell over the leeward areas. In Alaska, the interior reported little, if any, precipitation as well, though anywhere from 0.5-inch to as much as 3-4 inches of precipitation was recorded this past week across the Panhandle area. No changes were made to the depictions in both Hawaii and Alaska.

Mainly light rains fell across Puerto Rico during the past week. Rainfall deficits of 6-8 inches have accumulated over the past 3 to 6 months across the island, with the southern and western coasts reporting the worst conditions. Daily grass fires have been reported over parts of the southern slopes. The area of abnormal dryness (D0) was expanded southward to include the southern slopes.

Looking Ahead: During the next 5 days (March 21-25, 2013), a corridor of 1.5 – 2.7 inches of rain is expected from northern Arkansas southeastward into central and southern Georgia, which will be beneficial for areas experiencing ongoing drought. Up to 1.5 inches of precipitation is anticipated over the Rockies, including the High Plains of eastern Colorado. In the West, 0.5 – 2.5 inches is forecast to accumulate over the coastal ranges, Cascades, and Sierras, with little precipitation for the interior West.

Author: [Anthony Artusa, NOAA/NWS/NCEP/Climate Prediction Center](#)

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 March 20, 2013

The latest NOAA CPC Seasonal Outlook released today, 21 March can be accessed [here](#).

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USDA Highlights

With respect to California water supply and the Sierra Nevada, CDEC's daily water equivalency numbers (<http://cdec.water.ca.gov/cgi-progs/snow/DLYSWEQ>) for the last two seasons (2011-12 and 2012-13) are shown. Even though California's 154 intrastate reservoirs are collectively holding a near-average volume of water for this time of year, the runoff situation appears to be rather bleak for the second year in a row.

-Brad Rippey, USDA

STORAGE AS OF FEBRUARY 28							
Summary By Drainage Area							
Area	Number of Reservoirs	Total Capacity 1000 AF	Hist Ave 1000 AF	2012 1000 AF	2013 1000 AF	% Ave	% Cap
NORTH COAST	6	3096.3	2224.6	2295.5	2390.9	107	77
SAN FRANCISCO BAY	17	688.0	505.7	418.6	448.4	89	65
CENTRAL COAST	6	970.3	656.8	725.2	542.8	83	56
SOUTH COAST	29	1973.8	1447.2	1410.8	1212.3	84	61
SACRAMENTO	43	16001.7	11244.0	10917.8	12192.2	108	76
SAN JOAQUIN	34	11440.4	7211.1	8174.1	6979.2	97	61
TULARE LAKE	6	2087.4	840.9	953.4	535.0	64	26
NORTH LAHONTAN	5	1072.0	526.8	720.9	557.3	106	52
SOUTH LAHONTAN	8	402.5	267.7	301.4	249.0	93	62
SUBTOTAL	154	37732.4	24924.8	25917.7	25107.1	101	67
NORTH COAST	3	1107.9	656.9	550.9	477.8	73	43
COLORADO RIVER (1)	4	52910.4	39353.2	32572.8	27949.0	71	53
SUBTOTAL	7	54018.3	40010.1	33123.7	28426.8	71	53
TOTAL	161	91750.7	64934.9	59041.4	53533.9	82	58

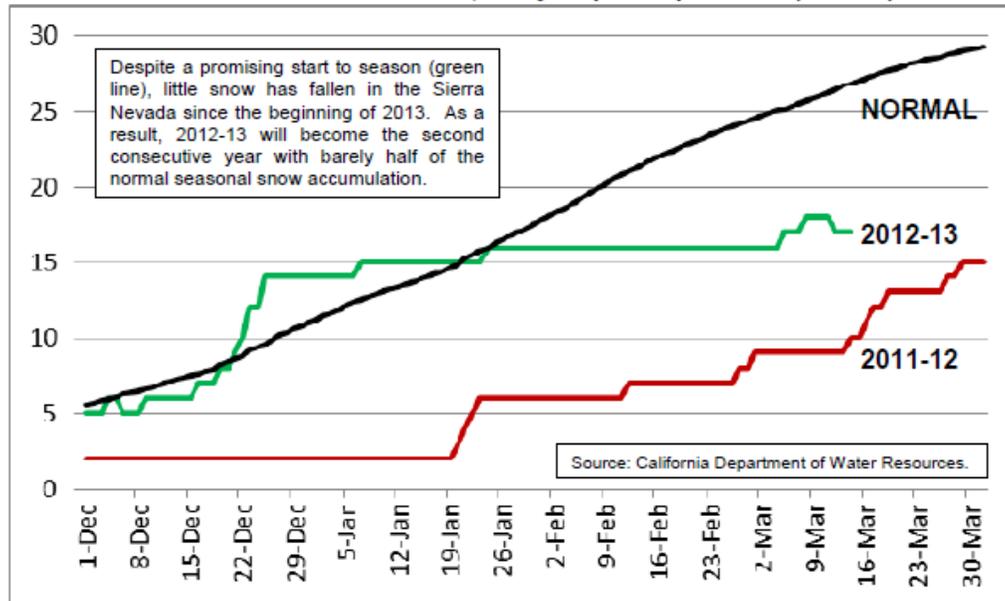
EXPLANATION OF NOTES:

- 1 - INCLUDES LAKE POWELL AND LAKE MEAD
- 2 - MISSING DATA IN THIS DRAINAGE AREA

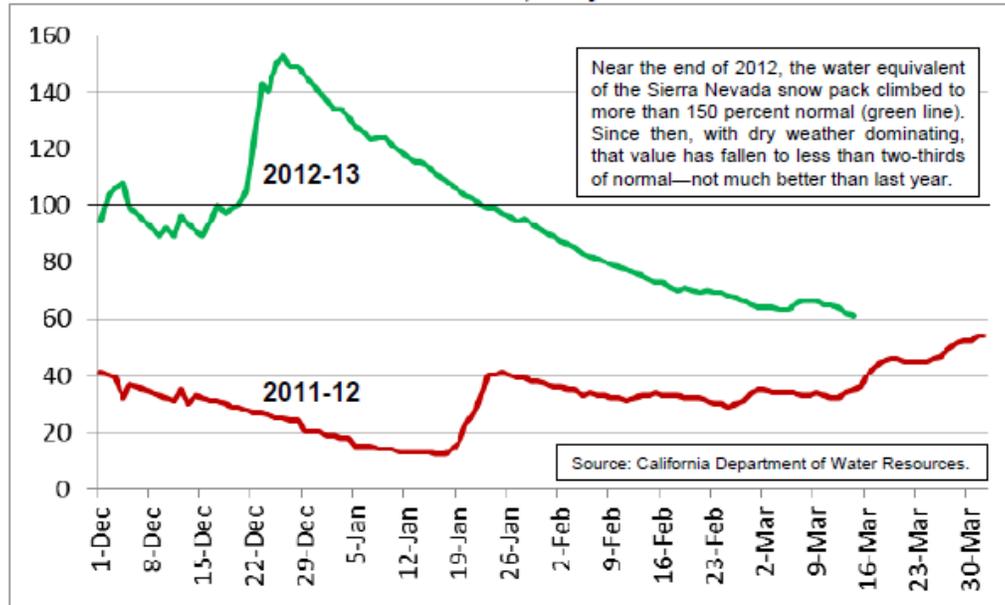
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Sierra Nevada Snow Pack, 2012-13 vs. Last Year and Normal

Sierra Nevada Snow Pack, Daily Liquid Equivalent (Inches)



Sierra Nevada Snow Pack, Daily Percent of Normal



We're starting to receive a few more weekly state reports from USDA's National Agricultural Statistics Service. Georgia came on line this week; complete national reporting will begin in early April:

<http://www.nass.usda.gov/Statistics by State/Georgia/Publications/Crop Progress and Condition/index.asp>

According to the National Agriculture Statistics Service's Georgia Field Office, there were 4.9 days suitable for fieldwork for the week ending Sunday, March 17, 2012. Statewide topsoil moisture was rated at 0% very short, 2% short, 78% adequate, 20% surplus. Subsoil moisture 0% very short, 9% short, 76% adequate, 15% surplus. Precipitation estimates for the state

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ranged from no rain up to 2.1 inches. Average high temperatures ranged from the high 50's to the mid 70's. Average low temperatures ranged from the mid 30's to the mid 60's.

Improvements across my whole area can be considered. Precip for the past week, not including Monday's rain ranged from normal to 1 inch below normal. 1 inch below normal amounts were scattered about the area. Most of the area had between 0.5 inches below to 0.5 inches above normal amounts. Monday's rainfall ranged from about 0.05 to 1.63 inches.

Highlights include:

Pasture Condition, Percent by Category
Date // Very Poor / Poor / Fair / Good / Excellent
Nov. 25, 2012 // 19 / 34 / 29 / 17 / 1
Mar. 17, 2013 // 1 / 5 / 44 / 41 / 9

Topsoil Moisture, Percent by Category
Date // Very Short / Short / Adequate / Surplus
Nov. 25, 2012 // 38 / 41 / 21 / 0
Mar. 17, 2013 // 0 / 2 / 78 / 20

Subsoil Moisture, Percent by Category
Date // Very Short / Short / Adequate / Surplus
Nov. 25, 2012 // 39 / 40 / 21 / 0
Mar. 17, 2013 // 0 / 9 / 76 / 15

-Brad Rippey, USDA