



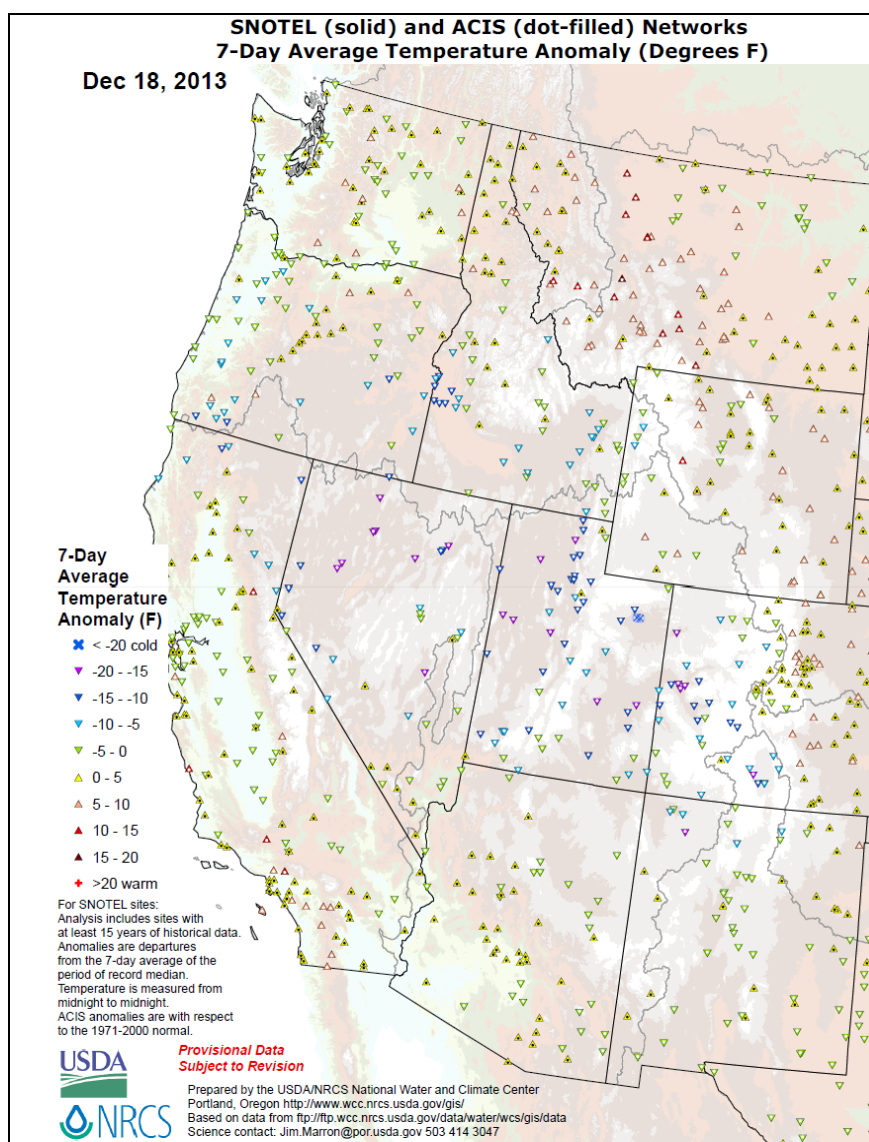
Natural Resources Conservation Service
P.O. Box 2890
Washington, D.C. 20013

Weekly Snowpack / Drought Monitor Update

December 19, 2013

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Temperature



SNOTEL and ACIS [7-day temperature anomaly](#) map shows temperatures well below normal over the interior West. The highest positive temperature departures are over Montana.

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment

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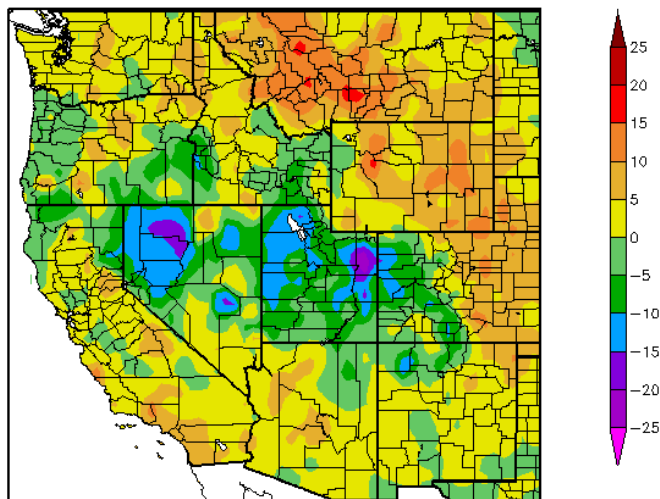
Weekly Snowpack and Drought Monitor Update Report

Click map to enlarge and see latest available update.

[ACIS](#) 7-day average temperature anomalies, ending December 18, show the greatest negative temperature departures over the northern Great Basin and south of the Uinta Mountains in northeast Utah ($<-15^{\circ}\text{F}$). The greatest positive temperature departures occurred over parts of the Montana Rockies ($<-15^{\circ}\text{F}$).

Also see [Dashboard](#) and the [Westwide Drought Tracker](#).

Departure from Normal Temperature ($^{\circ}\text{F}$)
12/12/2013 – 12/18/2013

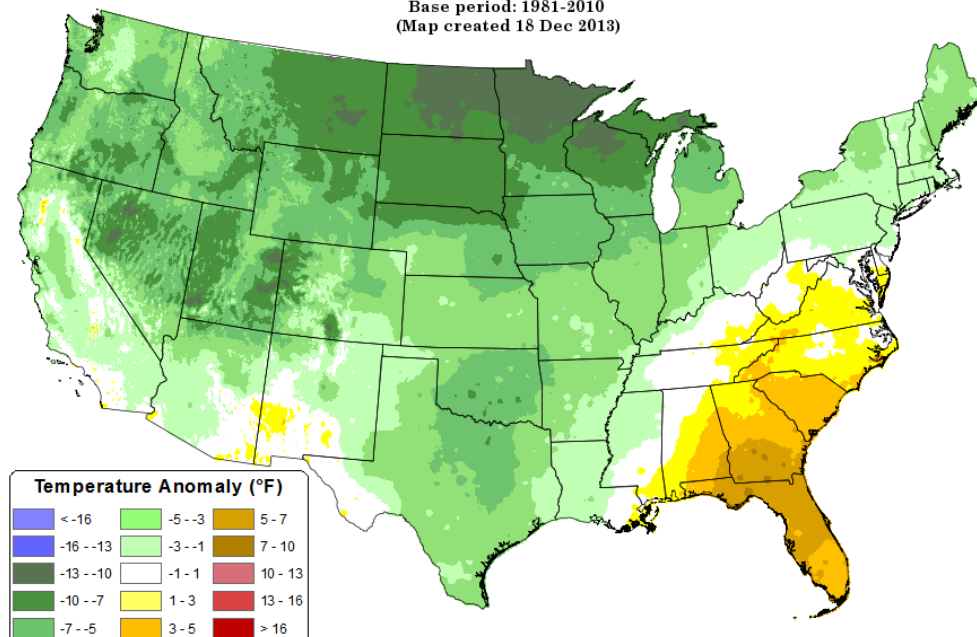


Daily Mean Temperature Anomaly: 01 December 2013 - 17 December 2013

Period ending 7 AM EST 17 Dec 2013

Base period: 1981-2010
(Map created 18 Dec 2013)

This preliminary [PRISM](#) temperature map contains all available network data, including SNOTEL data, and will be updated periodically as additional data become available and are quality controlled.



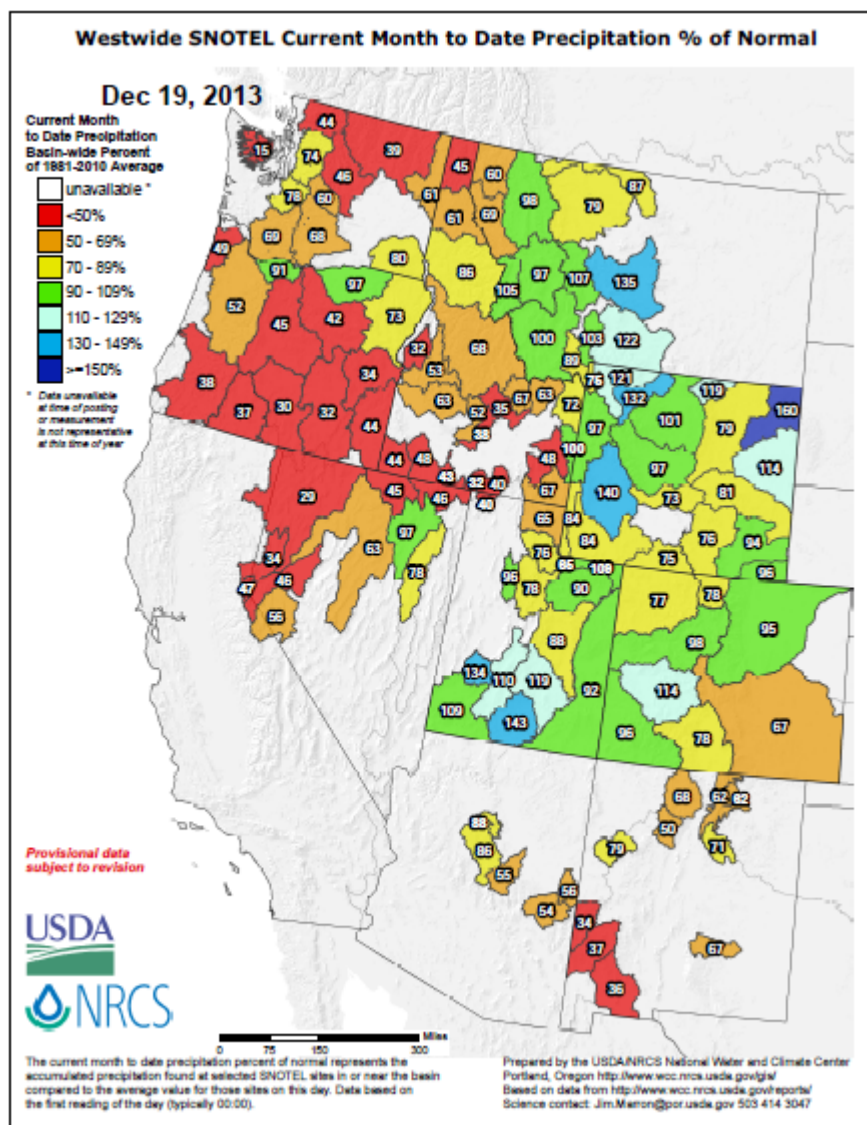
The first half of December is proving to be quite cold over all but the Southeast region of the country. Coldest departures dominate North Dakota, northern Minnesota, and northern Wisconsin.

Weekly Snowpack and Drought Monitor Update Report

Precipitation

SNOTEL [month to date](#) precipitation percent of normal shows mounting deficits across the Pacific Northwest, Great Basin, and Southwest.

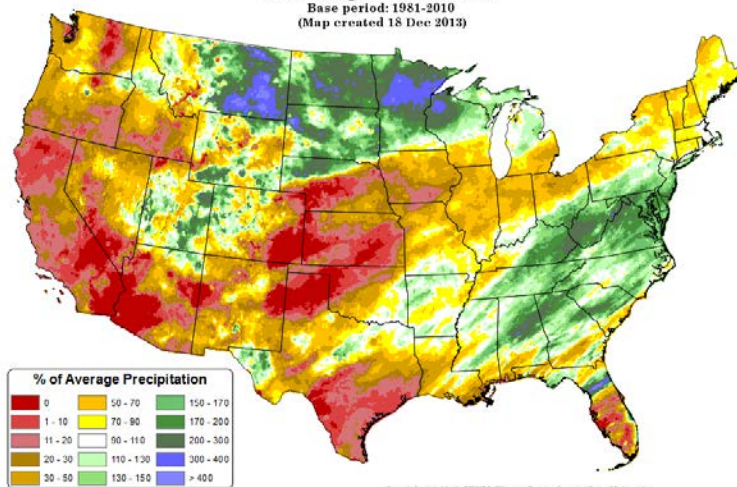
A few river basins in the Rockies and Utah ranges are experiencing surpluses, but many more basins in the Rockies are struggling to reach normal percentages.



Click on images to enlarge and get latest available updates

Total Precipitation Anomaly: 01 December 2013 - 17 December 2013

Period ending 7 AM EST 17 Dec 2013
Base period: 1981-2010
(Map created 18 Dec 2013)



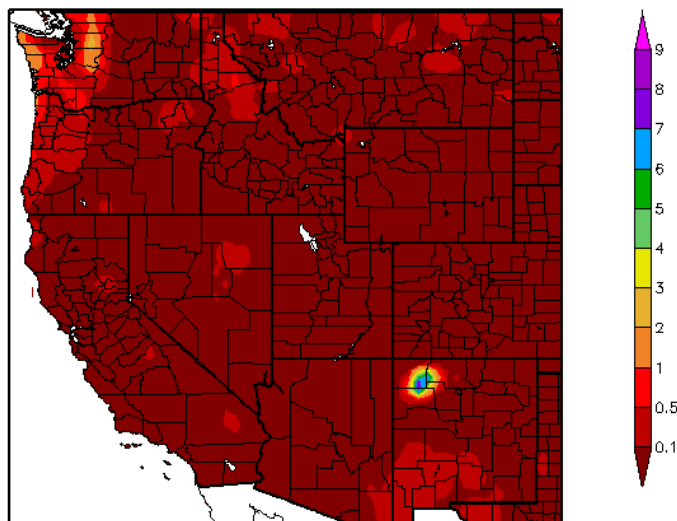
← December precipitation thus far has been a story of haves and have-nots. Alternating bands of surplus and deficit moisture can be seen in this map. With the exception of Utah and southwest Wyoming, most areas west of the Continental Divide have had little precipitation.

This preliminary daily PRISM precipitation contains all available network data, and is updated periodically as additional data become available and are quality controlled.

Weekly Snowpack and Drought Monitor Update Report

[ACIS 7-day](#) average precipitation amounts for the week show low amounts over the entire West. →

Precipitation (in)
12/12/2013 – 12/18/2013



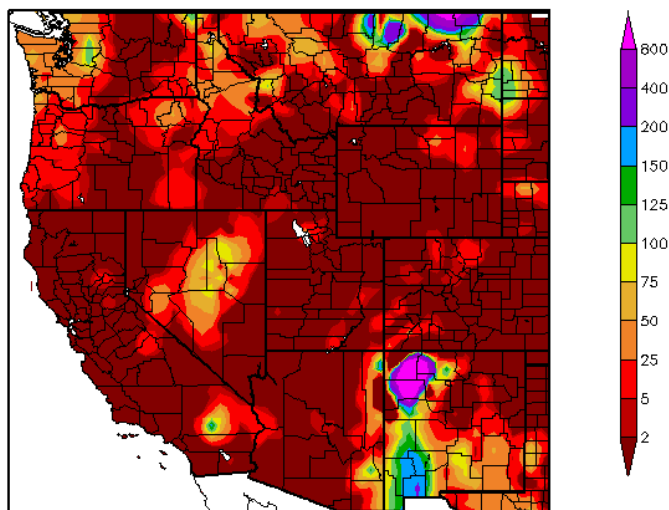
Generated 12/19/2013 at HPRCC using provisional data.

Regional Climate Centers

This [map](#) shows that the bulk of precipitation by percent of normal fell across western New Mexico and northern Montana. →

A split in the jet stream has developed and is taking most weather systems either to Canada or to Mexico.

Percent of Normal Precipitation (%)
12/12/2013 – 12/18/2013

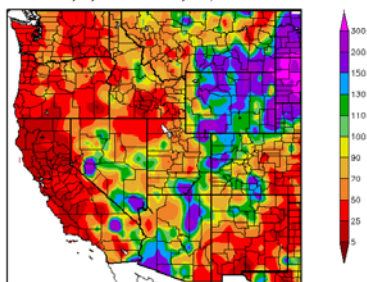


Generated 12/19/2013 at HPRCC using provisional data.

Regional Climate Centers

Since the start of the 2014 Water-Year, the west coast states have been accumulating large precipitation deficits. There are no high elevation stations depicted on this map.

Percent of Normal Precipitation (%)
10/1/2013 – 12/18/2013



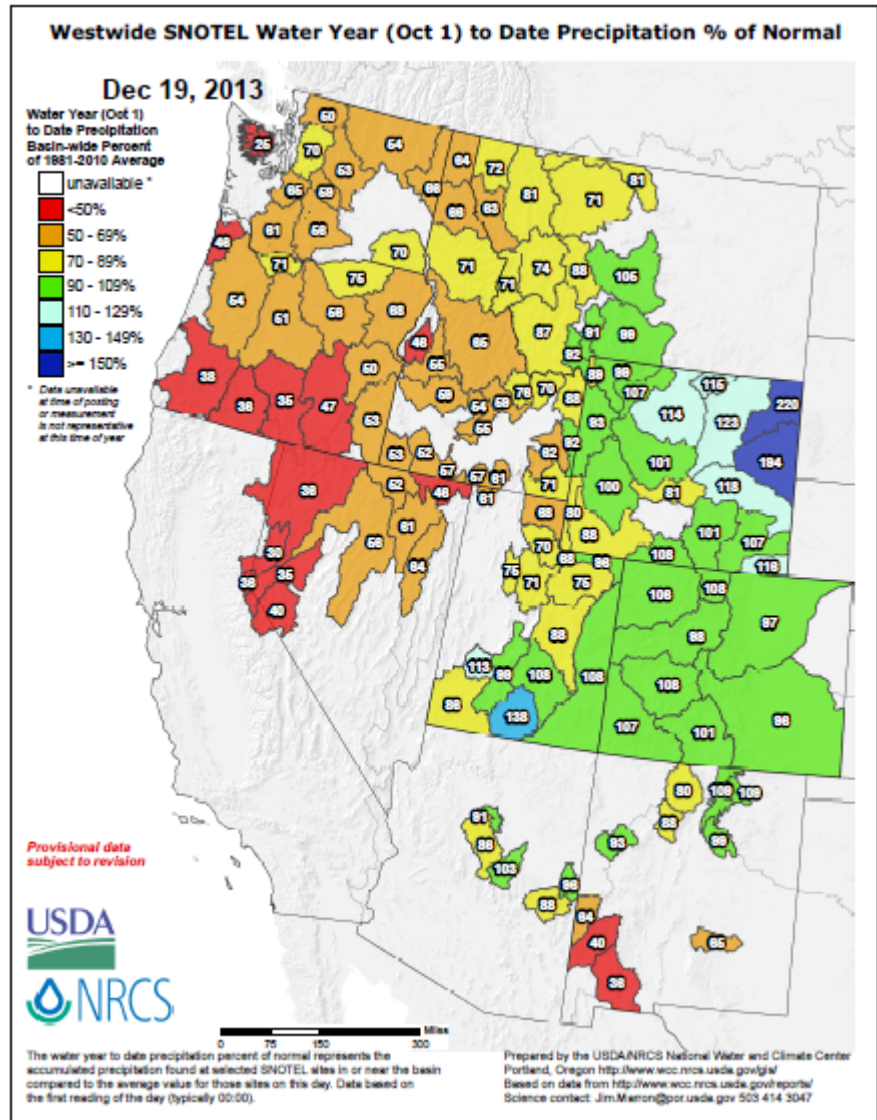
Generated 12/19/2013 at HPRCC using provisional data.

Regional Climate Centers

Weekly Snowpack and Drought Monitor Update Report

For the [2014 Water Year](#) that began on October 1, 2013, the ENSO pattern is quite dry over the western half of the West. Southern New Mexico is also showing significant deficits.

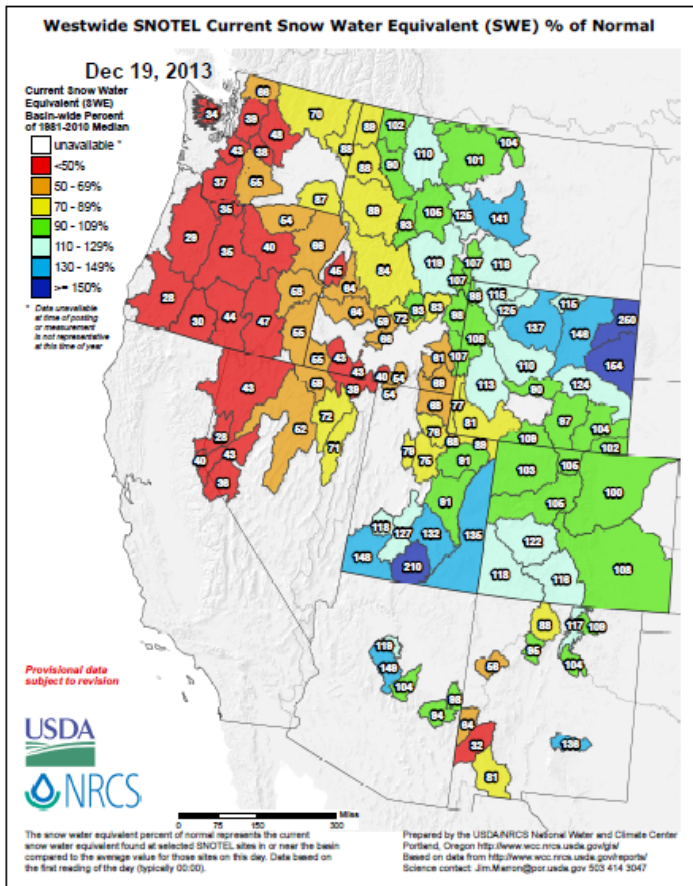
Areas east of the Continental Divide have fared better.



Click image for latest available update

Weekly Snowpack and Drought Monitor Update Report

Snow

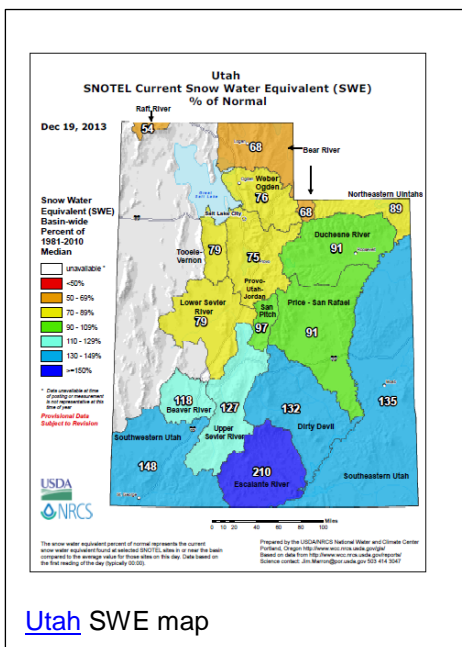


Snow Water Equivalent (SWE) values are off to a good start east of the Continental Divide and in parts of Utah and Arizona.

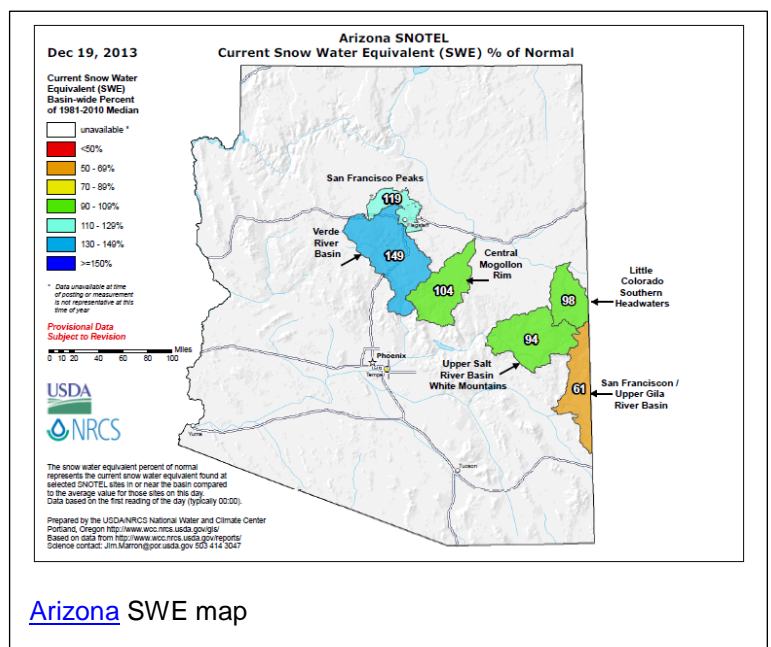
Conditions west of the Continental Divide are becoming drier.

The all-important April 1 SWE date will best determine the water supply forecasts issued by the National Water and Climate Center.

See latest National Snow Analysis



Utah SWE map



Arizona SWE map

SWE surpluses persist over parts of Utah and Arizona, however deficit areas are close by.

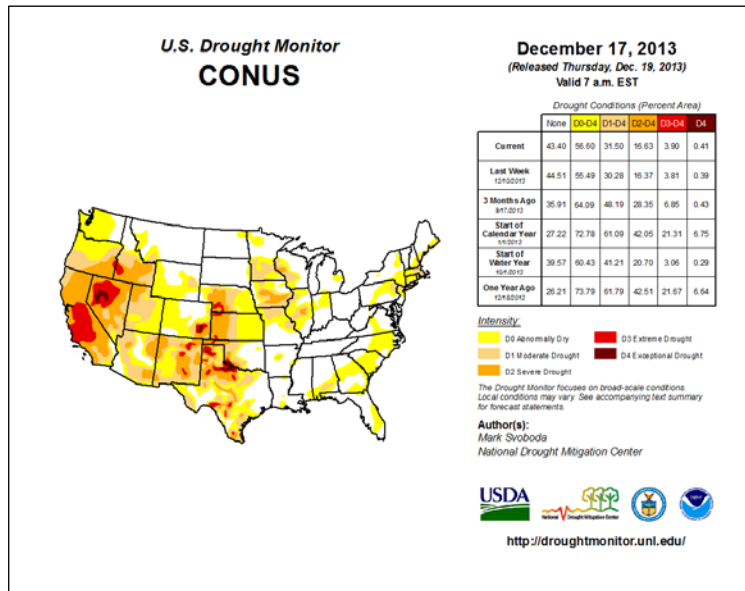
Weekly Snowpack and Drought Monitor Update Report

Weather and Drought Summary

National Drought Summary – December 17, 2013

The following **Weather and Drought Summary** is provided by this week's NDMC Drought Author, Mark Svoboda, Climatologist, Monitoring Program Area Leader, National Drought Mitigation Center.

[USDM Map Services](#): (contains archived maps)



[Current Drought Monitor](#) weekly summary. The exceptional D4 levels of drought are scattered across NV, CO, TX, and OK.

The latest [drought indicator blend and component percentiles](#) spreadsheet is a great resource for climate division drought statistics. This link is for the latest [Drought Outlook](#) (forecast). See [climatological rankings](#).

For more drought news, see [Drought Impact Reporter](#).

Drought Management Resources (✓):

- ✓ [Watch AgDay TV](#)
- ✓ [Drought Impacts Webinar Series](#)

Latest Drought Related News:

- [Drought Persists in California, Texas Panhandle](#) - Dec 12
- [U.S. Senators introduce bill to eliminate corn ethanol mandate](#) - Dec 12

“During the past week, SNOTEL and ACIS the [7-day temperature anomaly](#) shows temperatures well below normal over the interior West. The highest positive temperature departures occurred over Montana. For the [2014 Water Year](#) that began on October 1, 2013, the ENSO pattern is quite dry over the western half of the West. Areas east of the Continental Divide have fared better. Southern New Mexico is also showing significant deficits. [Snow Water Equivalent](#) (SWE) values are off to a good start east of the Continental Divide and in parts of Utah and Arizona. Conditions west of the Continental Divide are becoming drier.” – Jan Curtis, NRCS

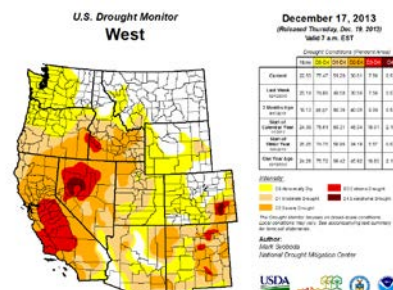
Weekly Snowpack and Drought Monitor Update Report

A comprehensive narrative describing drought conditions across other parts of the nation can be found toward the end of this document. For drought impacts definitions for the figures below, click [here](#).

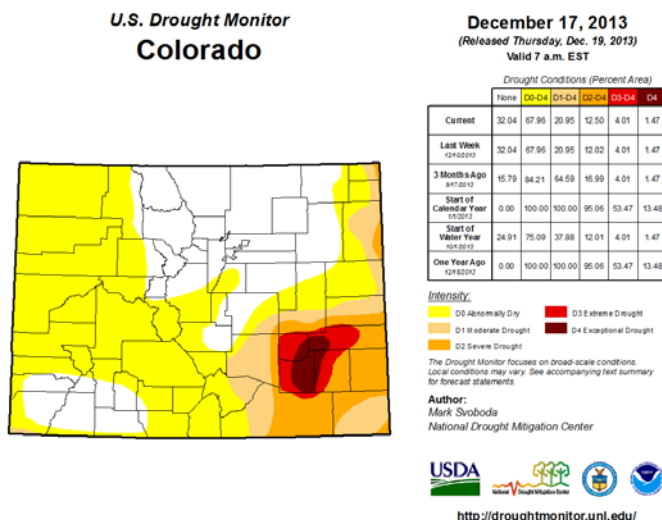
- ✓ Drought Monitor for the [Western States](#)
- ✓ Drought Impact Reporter for [New Mexico](#)
- ✓ [California Data Exchange Center & Flood Management](#)
- ✓ [Intermountain West Climate Dashboard](#)
- ✓ [Great Basin Dashboard](#)

Western Drought News

- [Industry News - Drought kills thousands of salmon eggs in the Sacramento River](#) - Dec 12, **California**.
- [California lawmakers call for drought declaration: Lake Oroville only 39 percent full](#) - Dec 11, **California**.
- [Drought taking a toll on cattle industry](#) - Dec 11, **Central coast of California**.



The West: "Region wide, early USDA-NRCS SNOTEL readings are abysmal for both Water-Year-to-Date precipitation and snow water equivalent with values as of December 17 falling in the 30-50% of normal range. There is plenty of time to make it up in January-March, but this certainly isn't the start to the season many were hoping for." - **Mark Svoboda, National Drought Mitigation Center**



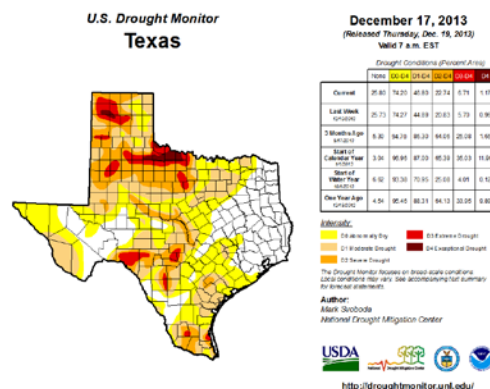
State with D-4 Exceptional Drought

- ✓ [NIDIS Upper Colorado River Regional Drought Early Warning System](#)

No changes have occurred during the past week.

State with D-4 Exceptional Drought

- ✓ Texas Drought [Website](#).
- ✓ [Texas Reservoirs](#).
- [Drought continues to worsen](#) - Dec 11, **Wichita Falls, Texas**.
- [Fall Weather Was Great For Making Hay In Parts Of Texas](#) - Dec 10, **McLennan County (Waco), Texas**.

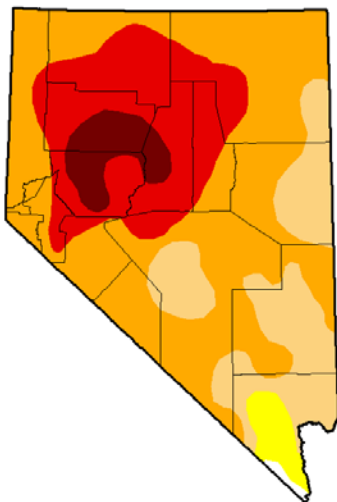


Note slight deterioration in D1 to D4 categories during the past week.

Weekly Snowpack and Drought Monitor Update Report

State with D-4 Exceptional Drought

U.S. Drought Monitor Nevada



December 17, 2013
(Released Thursday, Dec. 19, 2013)
Valid 7 a.m. EST

Drought Conditions (Percent Area)							
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	
Current	0.39	99.61	96.81	77.66	28.55	5.37	
Last Week 12/10/2013	0.39	99.61	96.81	77.66	28.55	5.37	
3 Months Ago 9/17/2013	0.39	99.61	96.79	78.93	31.07	5.37	
Start of Calendar Year 1/1/2013	0.00	100.00	94.13	62.22	16.46	0.00	
Start of Water Year 10/1/2012	0.39	99.61	96.79	79.11	28.55	5.37	
One Year Ago 12/18/2012	0.00	100.00	94.13	64.00	30.19	0.00	

Intensity:
■ D0 Abnormally Dry ■ D3 Extreme Drought
■ D1 Moderate Drought ■ D4 Exceptional Drought
■ D2 Severe Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Mark Svoboda
National Drought Mitigation Center



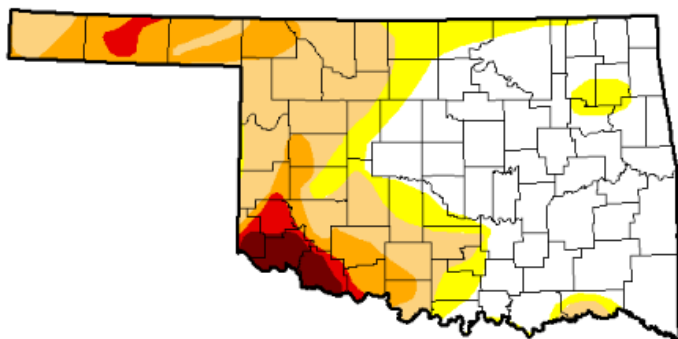
<http://droughtmonitor.unl.edu/>

Note: No changes occurred this past week.

State with D-4 Exceptional Drought

Oklahoma

Note: No changes occurred this past week.



December 10, 2013
(Released Thursday, Dec. 12, 2013)
Valid 7 a.m. EST

Drought Conditions (Percent Area)							
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	
Current	49.22	50.78	38.32	15.93	4.92	2.40	
Last Week 12/3/2013	52.66	47.34	30.90	15.93	4.92	2.40	
3 Months Ago 9/10/2013	0.00	100.00	50.45	23.13	10.34	1.46	
Start of Calendar Year 1/1/2013	0.00	100.00	100.00	100.00	94.89	37.06	
Start of Water Year 10/1/2012	21.74	78.26	43.00	17.62	4.42	1.45	
One Year Ago 12/11/2012	0.00	100.00	100.00	99.92	90.92	34.56	

Intensity:
■ D0 Abnormally Dry ■ D3 Extreme Drought
■ D1 Moderate Drought ■ D4 Exceptional Drought
■ D2 Severe Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Michael Brewer
NCDC/NOAA

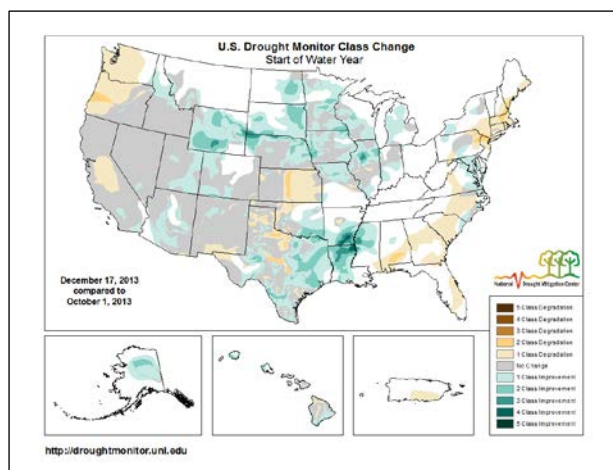
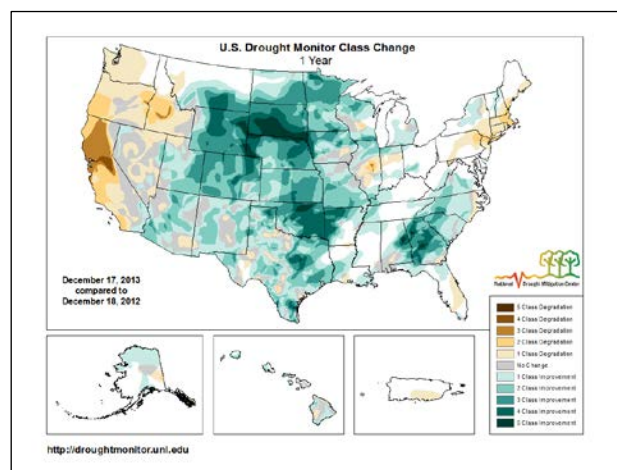
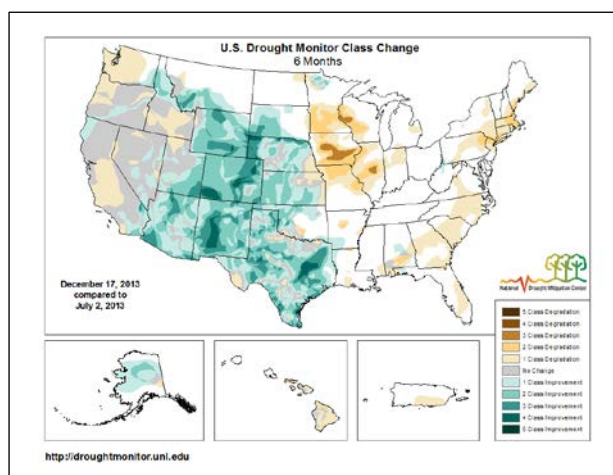
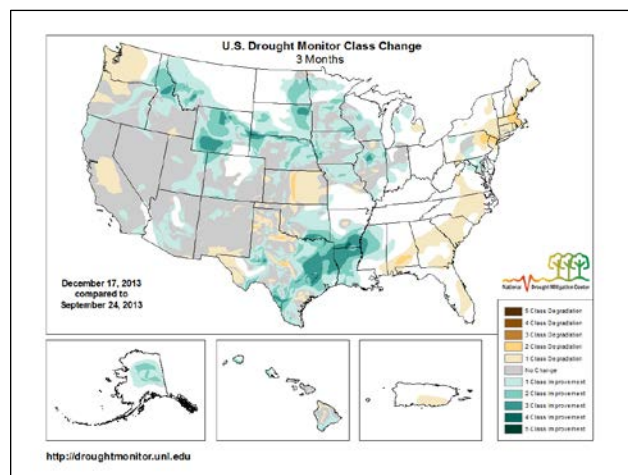
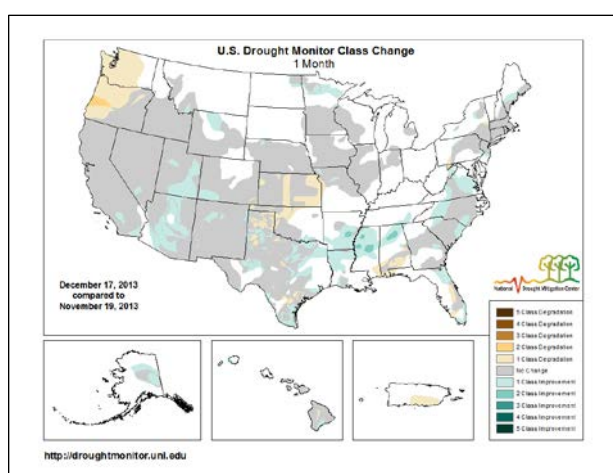
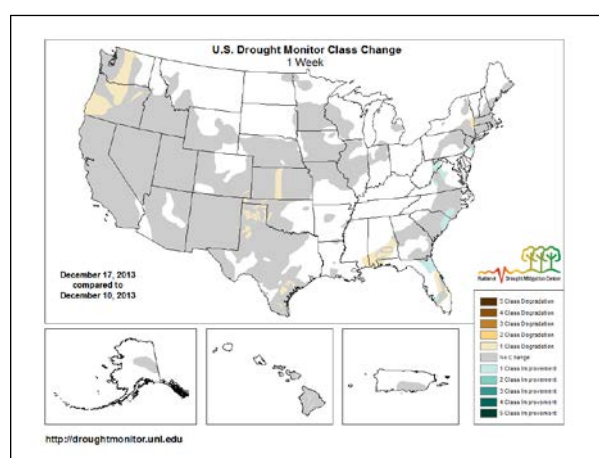


<http://droughtmonitor.unl.edu/>

- [A Wet Year Doesn't Mean Any Part of Oklahoma Is Safe From Drought In 2014](#) - Dec 12

Weekly Snowpack and Drought Monitor Update Report

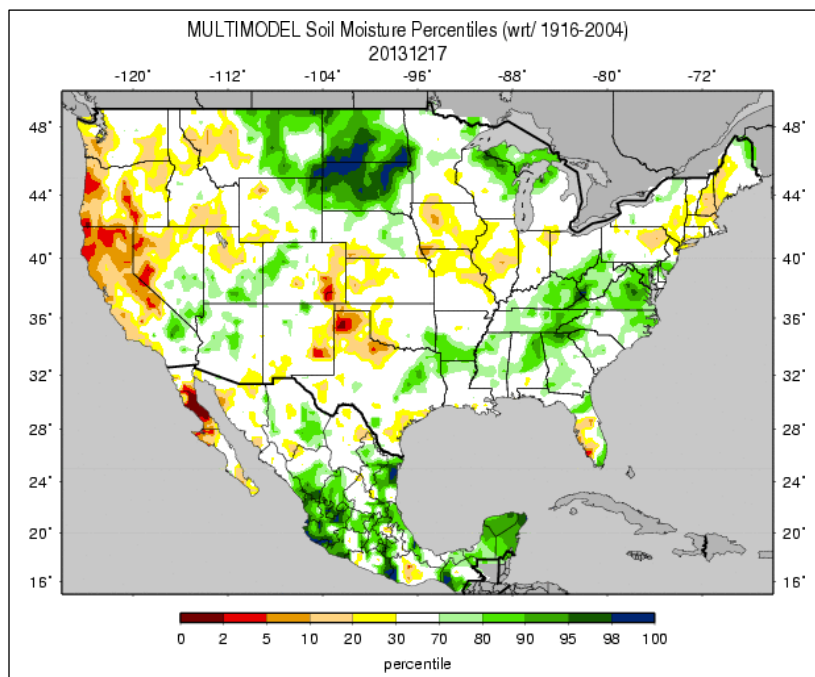
New Feature: [Changes in Drought Monitor Categories](#) (over various time periods)



Winter time changes to the drought monitor are usually minimal. However, over the past several months, drought conditions have improved significantly over a vast portion of the center of the U.S.

Weekly Snowpack and Drought Monitor Update Report

Soil Moisture



Soil moisture ranking in [percentile](#) as of December 17 shows considerable moisture over the northern Great Plains. Dryness is noted over the panhandle of Texas, southeast Colorado, Oregon, northern California, and western Nevada.

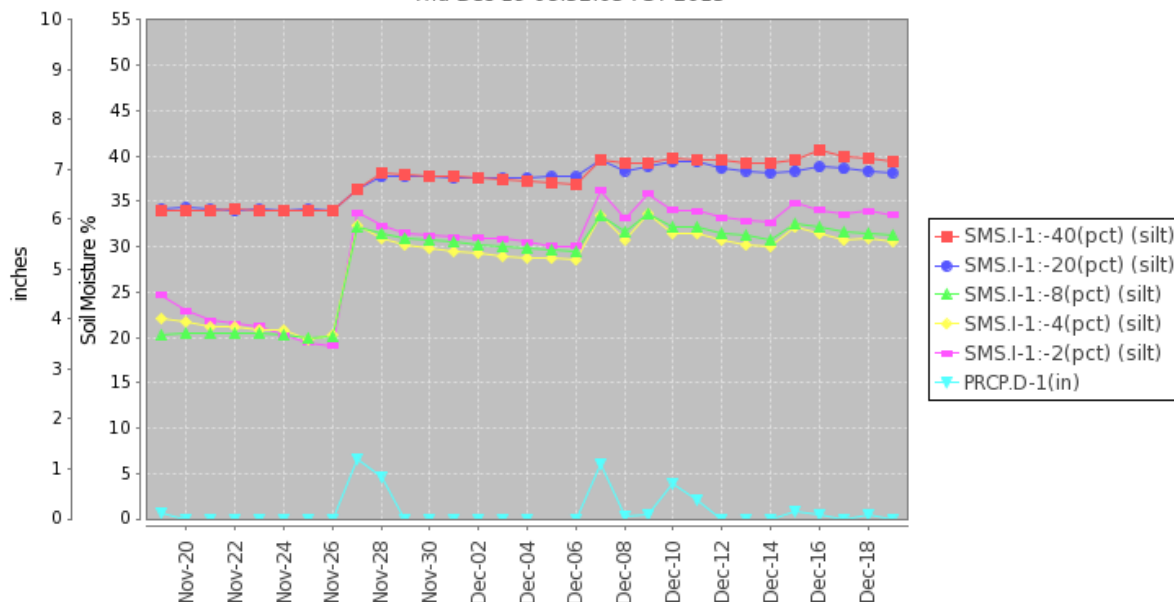
Useful Hydrological Links: [Crop Moisture Index](#); [Palmer Drought Severity Index](#); [Standardized Precipitation Index](#); [Surface Water Supply Index](#); [Weekly supplemental maps](#); [Minnesota Climate Working Group](#); [Experimental High Resolution Drought Trigger Tool](#); [NLDAS Drought Monitor](#); [Soil Moisture](#).

[Soil Health-unlock your farm's potential](#)

Note: As ground freezes, accuracy of measured moisture decreases.

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

Station (2088) MONTH=2013-11-19 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision
Thu Dec 19 08:32:05 PST 2013



This NRCS resource shows a site over [northern Virginia](#) responding to precipitation events. Soil is moist throughout the entire depth (to 40 inches).

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

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](#).

The following **Drought Summary** is provided by this week's NDMC Author: Mark Svoboda, Climatologist, Monitoring Program Area Leader, and National Drought Mitigation Center

The West

"Drought and dryness continued its march northward to the Canadian border through coastal and central Oregon and Washington this week as dismal water year numbers continue to roll in. Widespread expansion of D0 is noted in both central Oregon and Washington while D1 has now spread across the southwestern corner of Oregon up to the Umpqua Divide. In fact, many locations in southern/southwestern Oregon (around the Medford and Klamath Falls areas) are approaching record dry calendar years. Groundwater levels for wells are of increasing concern in these areas of the state, and the ski resorts (many not even open yet) are feeling the brunt of it as well given the lack of snow to date. According to the National Weather Service in Medford, OR, Mount Shasta City may epitomize the impacts: current 2013 calendar year precipitation stood at 9.99 inches as of earlier this week, and the 1981-2010 normal stands at 43.21 inches. In fact, December of 2012 was wetter (10.43 inches) than all of 2013 to date.

Region wide, early USDA-NRCS SNOTEL readings are abysmal for both Water-Year-to-Date precipitation and snow water equivalent with values as of December 17 falling in the 30-50% of normal range. There is plenty of time to make it up in January-March, but this certainly isn't the start to the season many were hoping for.

Although there are no changes to the map in California this week with D2/D3 firmly entrenched across 83% of the state, impacts are beginning to really ramp up, with the Big Sur fire and water supply issues a continual concern and making plenty of news heading into 2014. Indeed, fire has become more than just a seasonal concern for those folks in California of late. The NWS office in Los Angeles/Oxnard reported on December 16 that Los Angeles is on track for its driest calendar year on record with data going back to 1877. Through December 15, LA had recorded only 3.49 inches (26% of normal). The current record dry calendar years of 1947 and 1953 both came in at 4.08 inches. Many other locations around the region are approaching similar dubious record or near-record dry calendar years.

The East

After back-to-back weeks with significant storm systems affecting the region, last week was much quieter, but still saw below-normal temperatures along with some modest half- to one-inch precipitation totals. Only minor changes are noted this week with the trimming of D0 in south-central Pennsylvania, northeastern West Virginia and central Virginia. In addition, rains over the past 30 to 60 days have brought enough relief to remove some D0 in southeastern North Carolina as well as northeastern coastal South Carolina. For the rest, the short-term precipitation hasn't been enough to surpass the lingering 60-90 day deficits across the region and well up into New England.

The Southeast

Rains (1 to 4 inches) in north-central and northeastern Florida this past week brought relief in the form of shrinking the D0 area northward to the I-10 corridor between Florida and Georgia. Farther south, D0 continues to expand northward along the coast and into east-central Florida as the below-normal "dry" season continues its march toward 2014. After experiencing recent dryness on top of another relatively quiet (dry) tropical storm season in the Gulf, D0 and D1 have started to expand across the southern tier of counties in Alabama, and D0 is noted across the far western reaches of the Florida Panhandle and into southeastern Mississippi.

The South and Southern Plains

Last week was rather cool and dry for most parts of these regions as the drought keeps its grip and begins to swell again across parts of southern Texas and western Oklahoma and the panhandles of both states. Scattered pockets of increases and/or introductions of D1/D3 are noted in both states given the continued dryness of late on top of long-term (12- to 36-months) dryness, which has left behind dry stock ponds and slowed winter wheat and pasture growth/recovery.

Weekly Snowpack and Drought Monitor Update Report

The Central and Northern Plains and Midwest

After some modest improvements last week, most locales in these regions saw little in the way of precipitation over the past week, leading to few or no changes in the depiction on this week's map. The one area that did see some minor expansion of drought this week was in central Kansas, where the recent warm, windy and dry weather has led to a slight push eastward of D1 conditions.

Hawaii, Alaska and Puerto Rico

The improvement trend continued in Hawaii for Kauai and Oahu with the removal of D0 given another good week with widespread 2-4 inch rains. The opposite is true, however, on the Big Island, where D2 has pushed eastward on this week's map.

In southeastern Alaska, good precipitation (5 inches plus) wasn't enough to bring lake levels up enough to overcome lagging longer-term totals, which has led to impacts on the hydropower industry. As such, the D0 remains but moves from S/L to just L this week.

Conditions remain unchanged this week across Puerto Rico.

Looking Ahead

During the December 19-23, 2013, time period, a system is expected to bring some much-needed moisture to the Pacific Northwest. Additionally, heavy rains are expected across portions of the eastern southern Plains and into the middle Mississippi Valley and Ohio Valley. Others along the eastern Seaboard and up into New England can also expect to share in some of the moisture, although at more modest levels. Above-normal to well-above-normal temperatures are expected across northern California, Texas and the Gulf Coast region and from Florida northward into New England. Cold air looks to remain entrenched across the central and northern Plains along with the western Great Lakes region.

For the ensuing 5 days (December 24-28, 2013), warmer temperatures are anticipated across all of Alaska, California and the southern Atlantic Coast region from Florida up to the coastal Carolinas. Cooler temperatures are expected in the Pacific Northwest, Intermountain West, Mississippi Valley and Midwest, including the Great Lakes. Dryness seems to be in the cards for most, with below-normal precipitation likely across most of the West, central and southern Plains, Mississippi Valley and western Gulf Coast states. Alaska and the southern Atlantic Coast states can expect above-normal amounts of the wet stuff, though."

State Activities

[State government drought activities](#) can be tracked through their drought plans. 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](#). Additional information describing the [tools](#) available from the Drought Monitor can also be found at the [U.S. Drought Portal](#).

More Information

The National Water and Climate Center (NWCC) [Homepage](#) provides the latest available snowpack and water supply information. This document is available [weekly](#). CONUS Snowpack and Drought Reports from 2007 are available online. Reports from 2001-2006 are available on request.

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

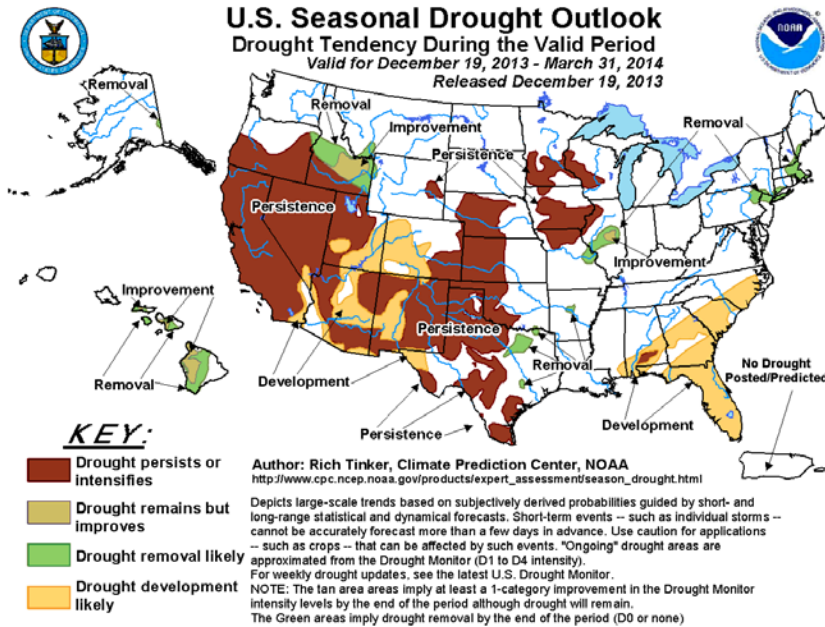
/s/

Micheal L. Golden

Deputy Chief, Soil Science and Resource Assessment

Weekly Snowpack and Drought Monitor Update Report

Drought Outlook

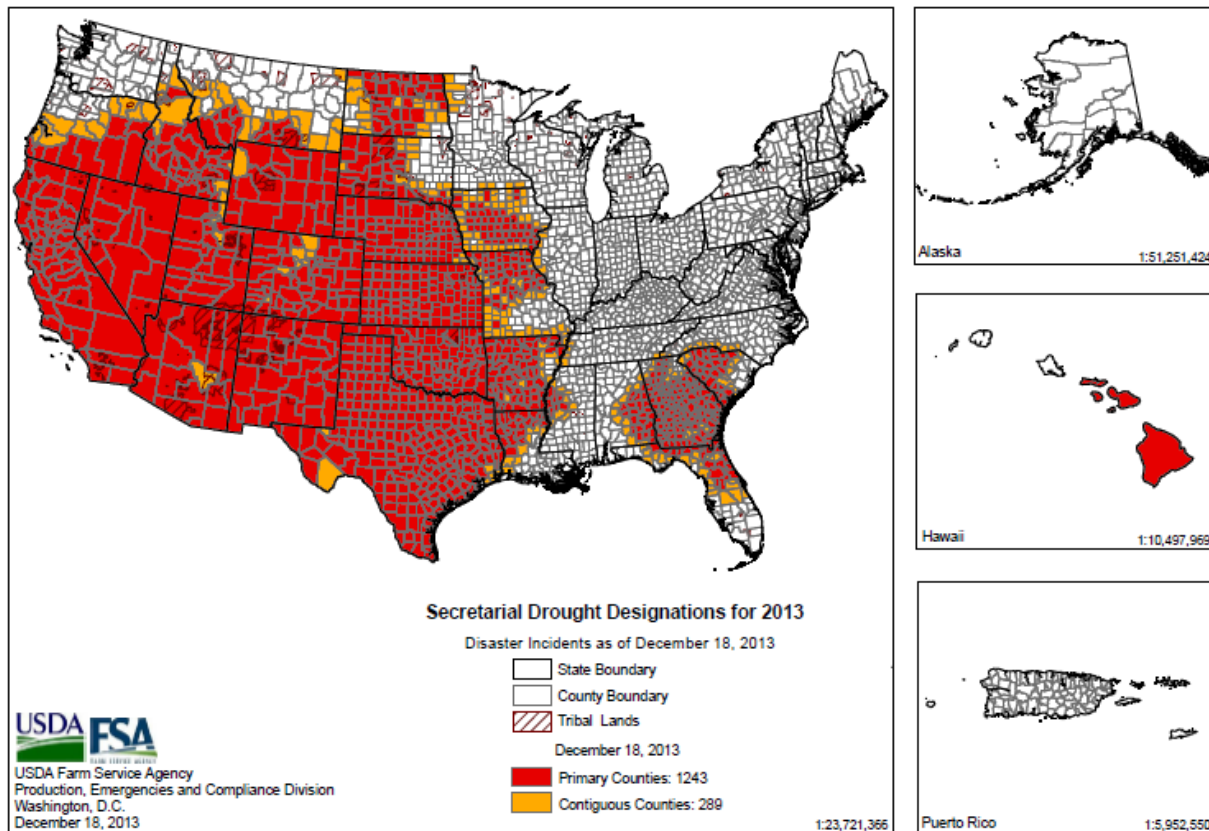


U.S. Seasonal Drought Outlook for December 19 to March 31 shows:

- Updated today:** Drought is expected to improve over parts of central Idaho; northern, northeastern Texas; central Illinois; and southern New England. Elsewhere, drought is expected to persist over much of the Great Basin, the Southwest, the southern Rockies, the Upper Mississippi River Valley, and the south-central Plains. Drought is expected to develop over part of the southeastern states.

✓ Also see: [National Significant Wildland Fire Potential Outlook](#) (updated on the 1st of each month) and contains a nice content summary of the previous month's conditions.

2013 Secretarial Drought Designations - All Drought



Refer to the USDA Drought Assistance [website](#) and [National Sustainable Agriculture Information Service](#). Read about the new [USDA Regional Climate Hubs](#).

Weekly Snowpack and Drought Monitor Update Report

Supplemental Drought News

This is a collection of drought-related news stories from the past week. Impact information from these articles is entered into the Drought Impact Reporter. A number of these articles will also be posted on the Drought Headlines page at the NDMC website.

Noteworthy topics in the news this week:

Request for California drought emergency declaration

Dozens of California lawmakers were urging Gov. Jerry Brown and President Barack Obama to declare a drought emergency and federal disaster in California after the state endured two dry winters and could be facing its third. Democratic Sen. Dianne Feinstein and Democratic Rep. Jim Costa sent a letter to Gov. Brown on Dec. 9 and dozens of lawmakers sent a separate letter to the governor, encouraging him to act. A drought has not yet been officially declared in the state.

Lake Oroville held just 39 percent of capacity, which is 63 percent of average for early December. Lake Shasta was only at 37 percent of capacity or 60 percent of normal for this time of year.

Nebraska, Kansas

Hay supplies in Nebraska and Kansas in 2013 were more abundant and less expensive than in 2012, but supplies are still relatively tight and slightly high-priced, compared to five-year averages.

Premium dairy-quality alfalfa was still pricey at \$190 to \$240 per ton, and less acreage was devoted to alfalfa in Kansas and Nebraska as growers opted to plant more corn and soybeans.

Texas

Hay supplies have been low in Texas after years of drought, but hay growers near Waco, Texas finally had a good hay season this fall. A Texas AgriLife extension agent noted that Bermuda grass production was down, presumably due to drought-stressed roots from past years. Hay prices were still somewhat high in Texas, and supplies were selling out quickly.

Mississippi River

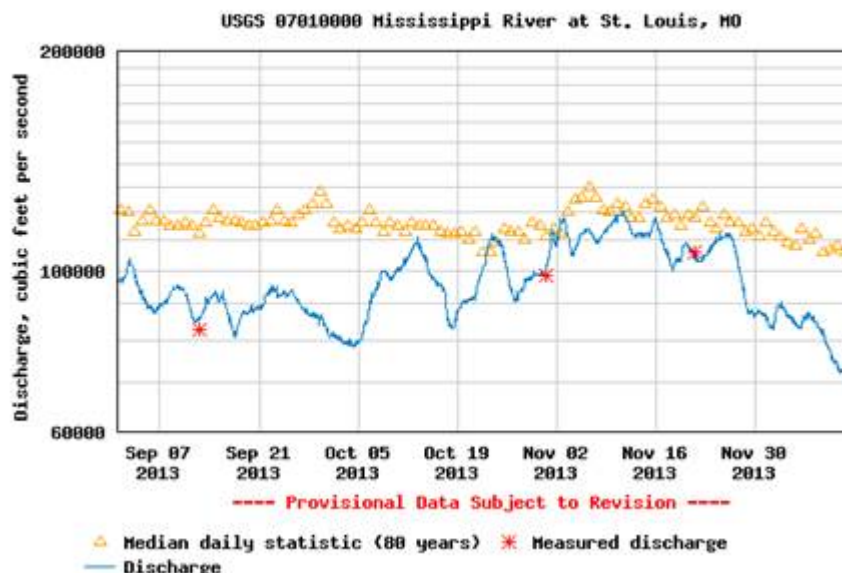
This week the Army Corps of Engineers will continue to remove rock from treacherous stretches of the Mississippi River that jeopardized shipping last winter near Thebes, Illinois. The river hit its ninth lowest point at -4.57 feet on Jan. 1, 2013. For a list of low water records, see <http://water.weather.gov/ahps2/water.php?wfo=lsx&gage=eadm7>.

Images that follow are from the USGS National Water Information System: Web Interface at <http://waterdata.usgs.gov/usa/nwis/uv?07010000>

Weekly Snowpack and Drought Monitor Update Report

Discharge, cubic feet per second

Most recent instantaneous value: 70,200 12-12-2013 14:00 CST



Daily discharge, cubic feet per second -- statistics for Dec 12 based on 81 years of record [more](#)

Min (1938)	25th percentile	Most Recent Instantaneous Value Dec 12	Median	Mean	75th percentile	Max (1983)
27800	70000	70200	106000	127000	148000	569000

The flow of the Mississippi River at St. Louis was just above the 25th percentile on Dec. 12.

Port of Wilmington, North Carolina enjoyed good year

Big demand for grain from South America led to record feed grain imports through the port of Wilmington during the 2012-13 fiscal year and a profit of \$5.1 million. The previous year's profit was \$394,000. It was cheaper to purchase grain from South America than to transport grain from the parched Midwest.

Southeastern Colorado

Chuck Hanagan with the FSA in Rocky Ford, Colorado recently shared this information for Crowley County in southeastern Colorado:

Drought affected native range in Crowley County, which received late season moisture. Because of the depressed grass condition and the large amount of open ground, Russian thistle emerged. The areas having seen livestock liquidation in excess of 50% herd reductions saw growth of these weed into mature weed's or tumble weeds. Recent winds and lack of moisture has caused the blowing and traveling of these weeds into windbreaks, fences and roadways. Crowley County Commissioners reports some 42 miles of County Roadways closed due to tumble weed blockage. There remains a huge concern of the possibility of fires with vehicles attempting to pass through these areas.

Lengthy droughts tend to produce unexpected impacts and situations.

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Other Drought Related News

[Work Continues To Help Mississippi River Barge Traffic](#)

Dec 11, **Mississippi River**;

[Federal Disaster Declarations for 29 Arkansas Counties for 2013 Drought, Floods](#)

Dec 12, **Arkansas**;

[Fearing water shortage, Ashland seeks link to MWRA](#)

Dec 8, **Ashland, Massachusetts**;

[28 parishes in drought disaster declaration](#)

Dec 12, **Louisiana**;

[Port Authority records banner year](#)

Dec 12, **Wilmington, North Carolina**;

[Shortfall from drought still affecting forage](#)

Dec 10, **Kansas, Nebraska**;
