United States Department of Agriculture

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

Weekly Water and Climate Update

Wednesday, December 24, 2014

2014 NRCS Snow Survey and Water Supply Forecasting Photo Contest

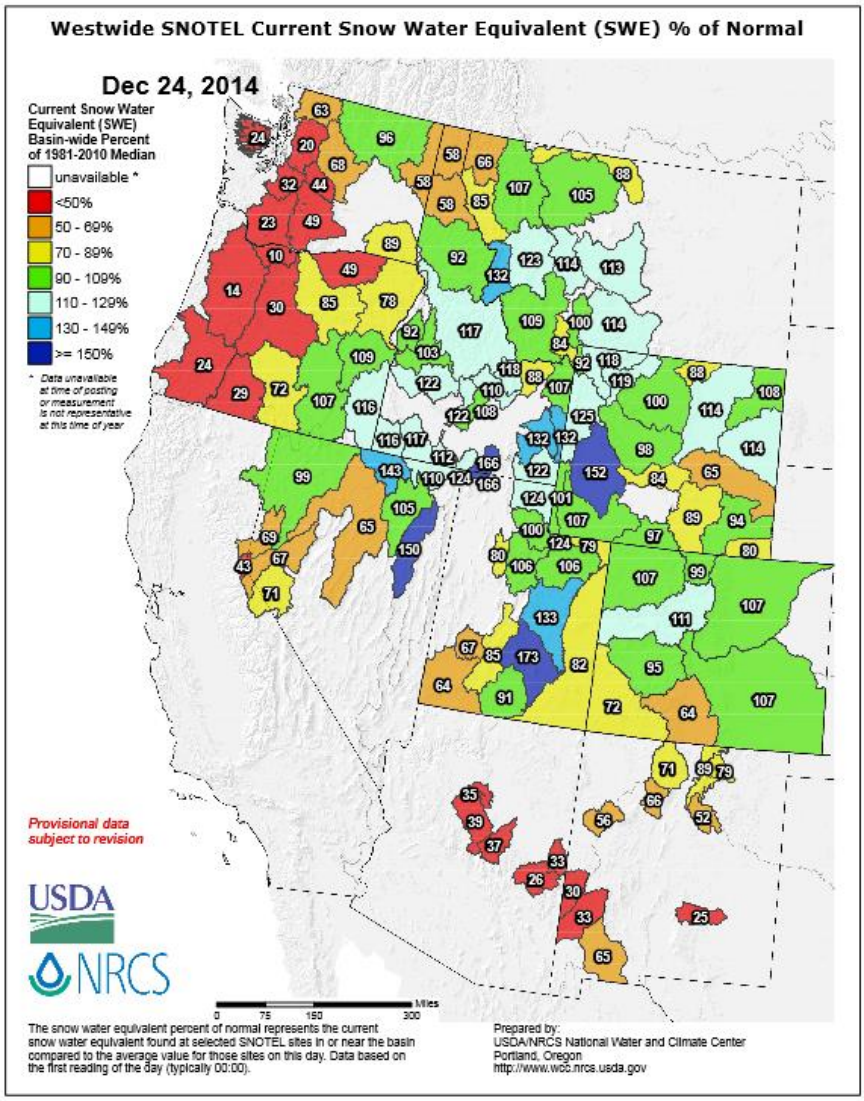
Category: Scenery 1st Place
First Snowfall, Pilot Peak, Wyoming

Photographer: Lucas Zukiewicz, NRCS Montana

U.S. Weather Outlook: "Later today, precipitation will make the transition to snow from ***east-central Illinois to northern Lower Michigan***. Meanwhile, locally severe thunderstorms will affect the ***southern Atlantic States***, accompanied by heavy rain. The rain will also spread northward along the ***Atlantic Seaboard***. On Christmas Day, colder weather across the ***northern High Plains*** and the ***West*** will contrast with mild conditions elsewhere. Rain will end on December 25 along the ***Atlantic Coast***, while snow will blanket the ***Intermountain West***. During the weekend and early next week, rain will return to the ***Southeast***, with some wintry precipitation possible from the ***Ohio Valley into the Mid-Atlantic States***. The NWS 6- to 10-day outlook for December 29, 2014 – January 2, 2015, calls for near- to below normal temperatures nationwide, except for warmer-than-normal weather in ***southern Florida***. Meanwhile, below normal precipitation across ***southern Florida*** and from the ***Pacific Coast into the Midwest*** will contrast with wetter than-normal conditions in much of the ***Gulf and Atlantic Coast States***."

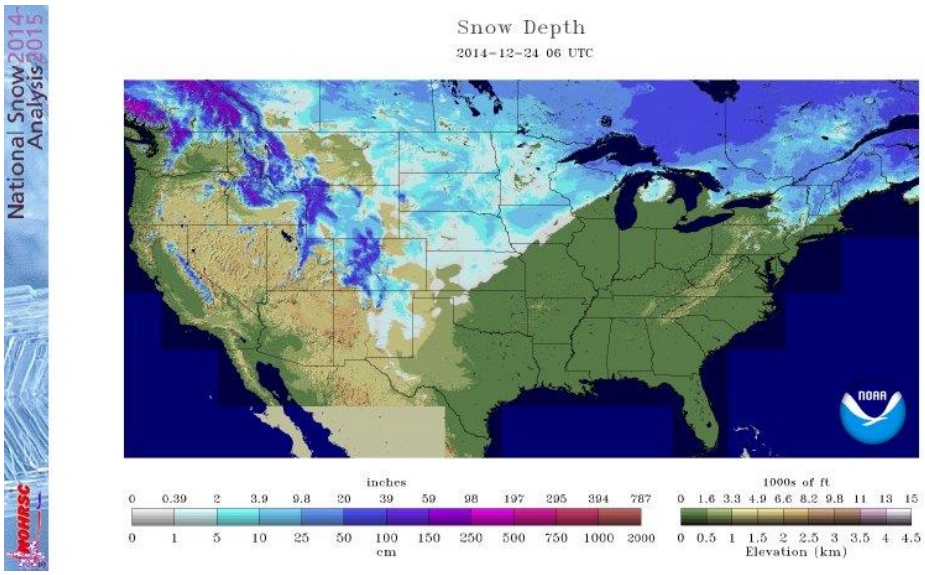
Contact: Brad Rippey, Agricultural Meteorologist, USDA/OCE/WAOB, Washington, D.C. (202-720-2397)
Website: http://www.usda.gov/oce/weather/pubs/Daily/TODAYSWX.pdf

Snow



For the 2015 Water Year that began on October 1, 2014, basins in Wyoming, Montana, Idaho, Nevada, and Utah and one each in Colorado and Oregon have recorded above normal Snow Water Equivalent (SWE) values (blue areas) at this time.

The largest snowpack deficits (red areas) are in the Cascades and Olympics of Oregon and Washington. This is in contrast to the high precipitation that fell in this area (see following maps) from the recent warm storms. The mountainous regions in Arizona and New Mexico also have low snowpacks.



Snow depth map of the U.S. as reported from NWS NOHRSC for December 24, 2014. Snow is reported across much of the mountains in the West, the upper Midwest, much of the central and northern Plains, and the Northeast. Areas with a substantial snowpack include the Upper Peninsula of Michigan, the Rocky Mountains in Wyoming, Montana, and central Idaho, and Colorado. The North Cascades in Washington and northern Maine also have substantial snow.

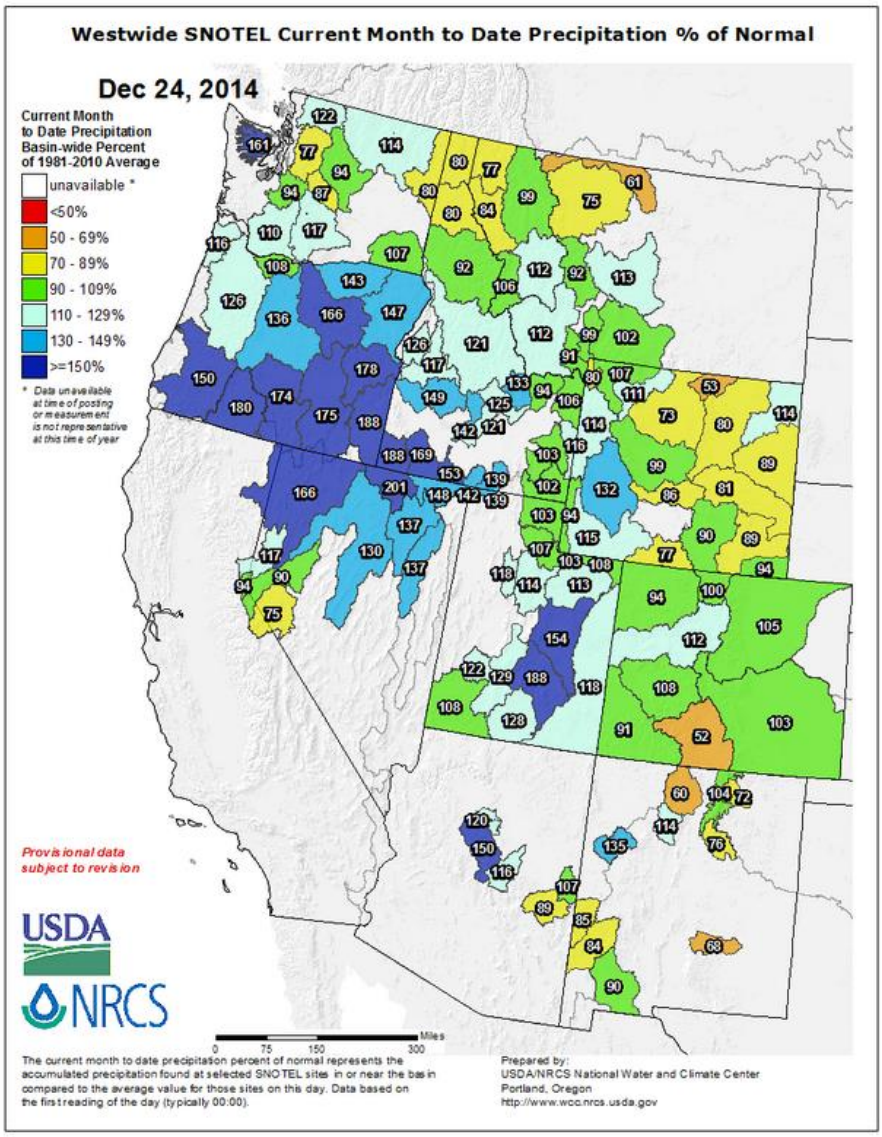
Precipitation

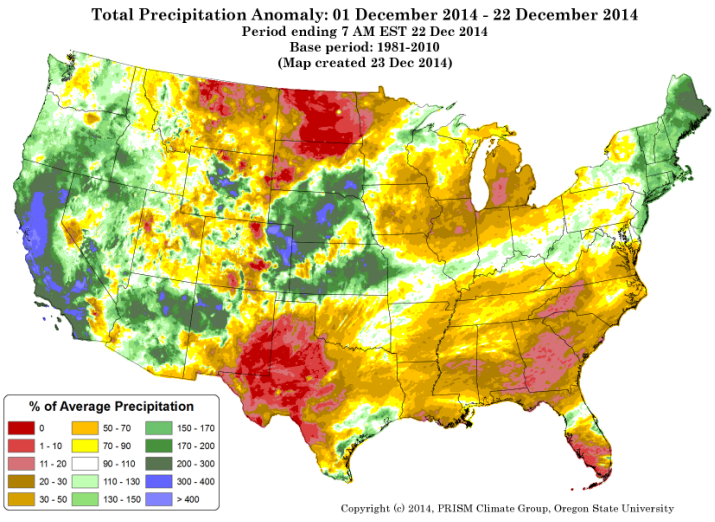
In the West, the SNOTEL precipitation percent of normal map shows a substantial increase in precipitation for December. Above and much above normal precipitation is reported in Oregon, Washington, Nevada, Idaho, Utah, and New Mexico. The rest of the western states have at least a few basins above normal for the month.

Below normal precipitation is only located in a few isolated basins in Montana, Wyoming, Colorado, and New Mexico.

The percent of normal values (especially the dark blue areas) may be amplified where normally very little precipitation falls during this time of year.

Click on most maps in this report to enlarge and see the latest available update.



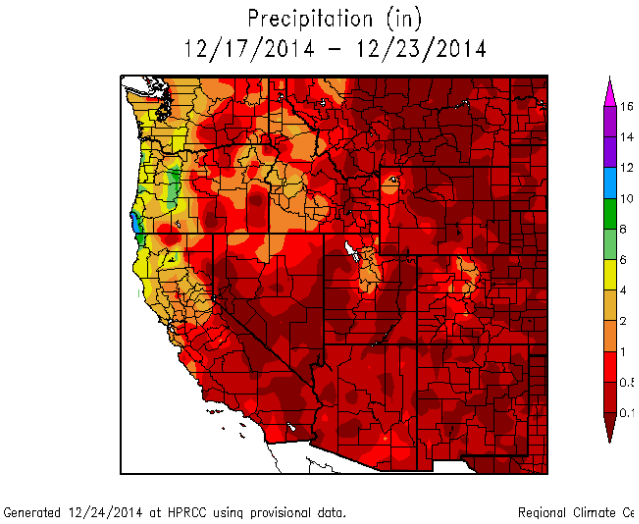


Thus far in December 2014, the national precipitation anomaly pattern reveals some higher than normal precipitation, primarily in California, Nevada, Arizona, New Mexico, eastern Colorado, central Wyoming, Nebraska, and Kansas. The New England states also received above normal precipitation. There was little or no precipitation in North Dakota, parts of South Dakota, southeast New Mexico, west and central Texas, and in southern Florida. (red areas).

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

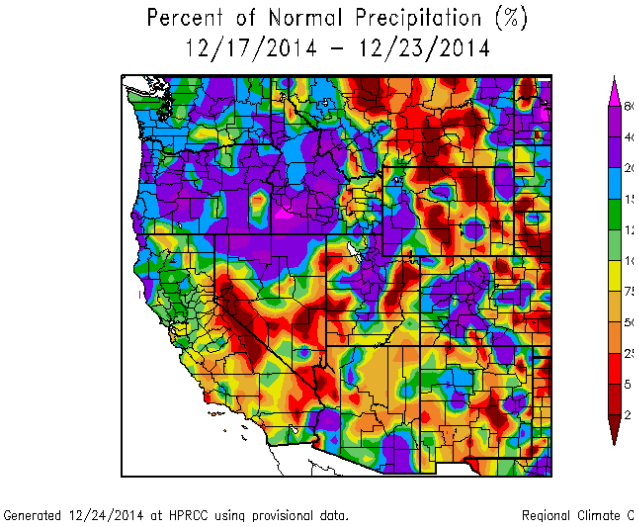
The ACIS 7-day total precipitation map for the western U.S. shows scattered precipitation across the West. Over 10 inches fell in southwest Oregon this past week. Significant precipitation has fallen in California, Oregon, Idaho, and Washington. Other states that also received notable amounts of precipitation were western Montana, western Wyoming, central Utah, and central Colorado.

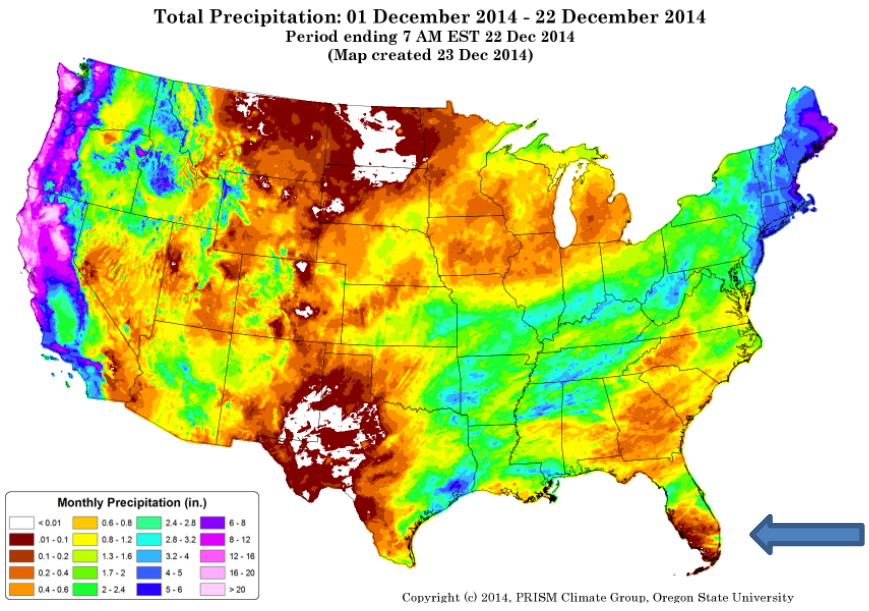
Little precipitation fell in Arizona, New Mexico, southern Nevada, eastern California, southern Utah, and east of the Rocky Mountains in Montana, Wyoming, and Colorado.



This percent of normal map of the West for the last seven days reflects heavy precipitation scattered across the region. The heaviest percent of normal precipitation fell in Oregon, Idaho, northwest California, northern Nevada, western Wyoming, central Utah, and central Colorado. Southwest Idaho recorded over 800% for the period (pink area). All the western states also had widespread areas of precipitation that were over 200% of normal (purple areas).

Percent of normal precipitation may be exaggerated in areas where the average for this period is at or near zero.





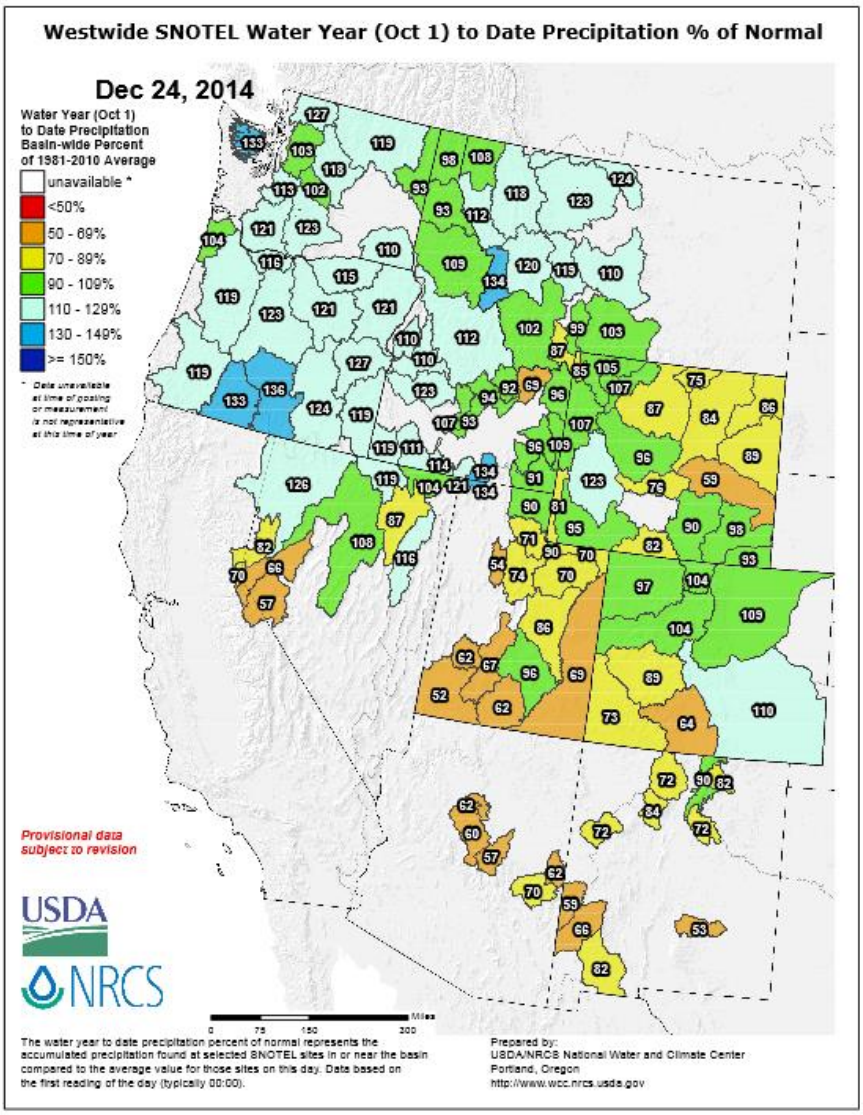
For December 2014, the total precipitation across the continental U.S. was heaviest along the west coast of Washington, Oregon, and California. At the other side of the country, eastern Maine also received over six inches so far in the month. In contrast, much of eastern Montana, North Dakota, South Dakota, eastern Colorado, southeast New Mexico, and Texas were mainly dry.

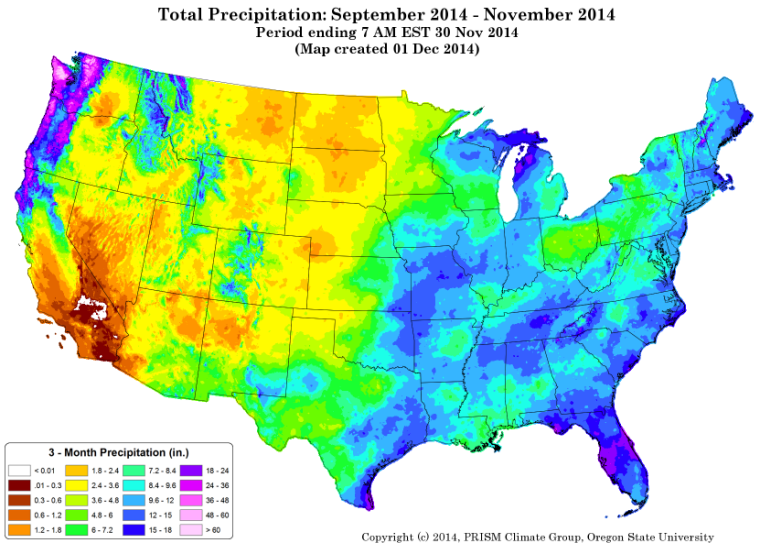
See Go Hydrology for current and forecast conditions over southern Florida.

For the 2015 Water Year that began on October 1, 2014, precipitation surpluses have increased this week, especially in Washington, Oregon, Idaho, and Montana.

Many basins across the West have near to above normal conditions for this part of the Water Year (mapped in green and light blue). A few areas have less than normal precipitation for the Water Year. These include basins in eastern Idaho, eastern Wyoming, Utah, California, Nevada, Arizona, and New Mexico (mapped in yellow and orange).

At the beginning of the Water Year, basin conditions can change rapidly with small amounts of precipitation. As the Water Year advances, it becomes more difficult for river basins to change bin categories.





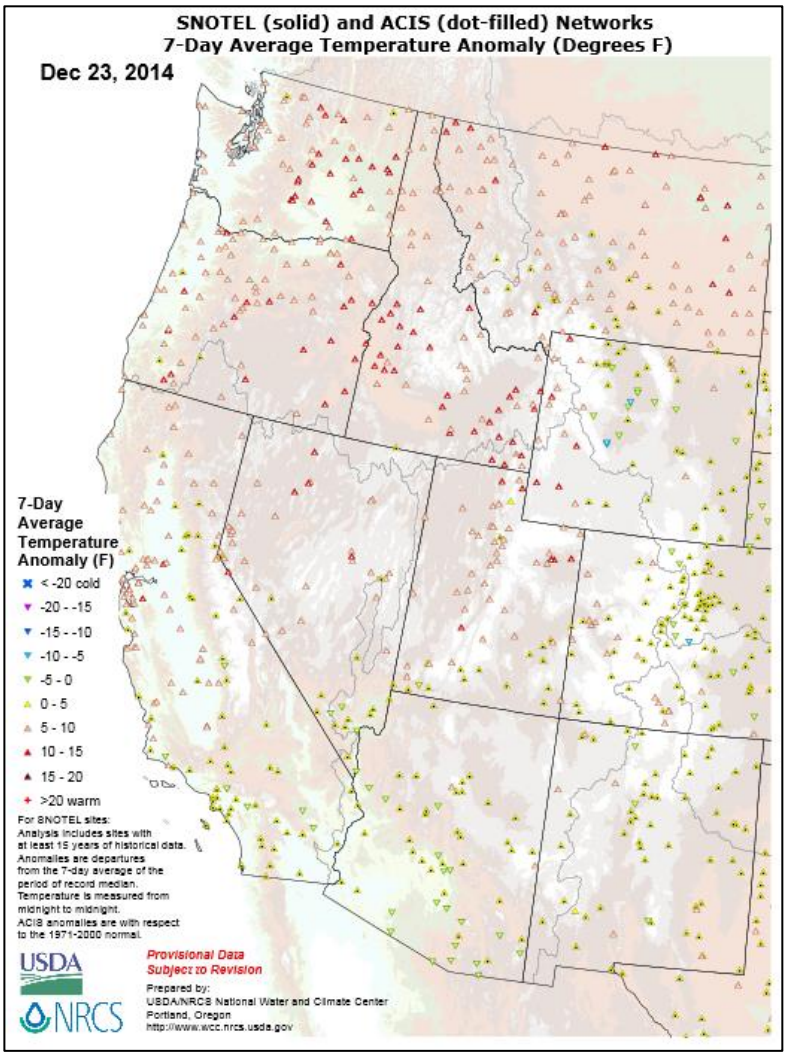
The national map of the three-month period (September - November) shows that the eastern half of the nation received precipitation in the range from 6 inches to greater than 18 inches. The highest amounts were recorded in Michigan, Florida, New Hampshire, Maine, and southern Texas. In the West, Oregon, Washington, and northern California received over 36 inches for the period.

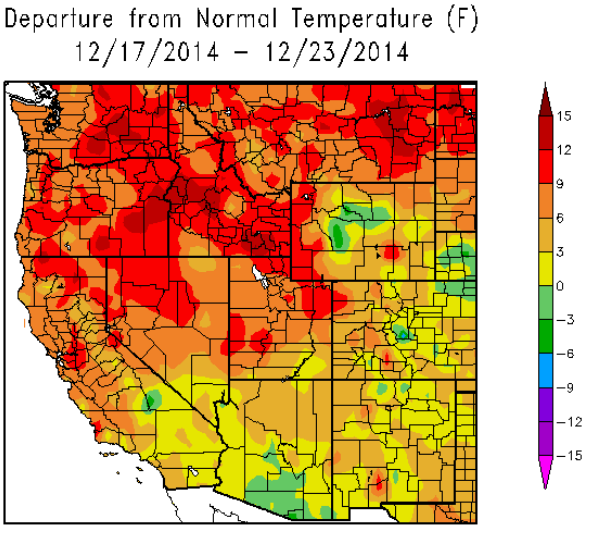
In contrast, parts of the West received totals of less than 1.8 inches. Central and southern California had little to no precipitation for the period.

Temperature

The SNOTEL and ACIS 7-day temperature anomaly map for the western U.S. shows most of the West was warmer than normal for the week. This is due to the continuation of the warm storm track that has affected the region. The highest anomalies occurred in Oregon, Idaho, Montana, western Wyoming, western Colorado, Utah, Nevada, and northern California.

The coolest anomalies in the West were in central Colorado and central Wyoming with greater than five degrees cooler than average for the period.



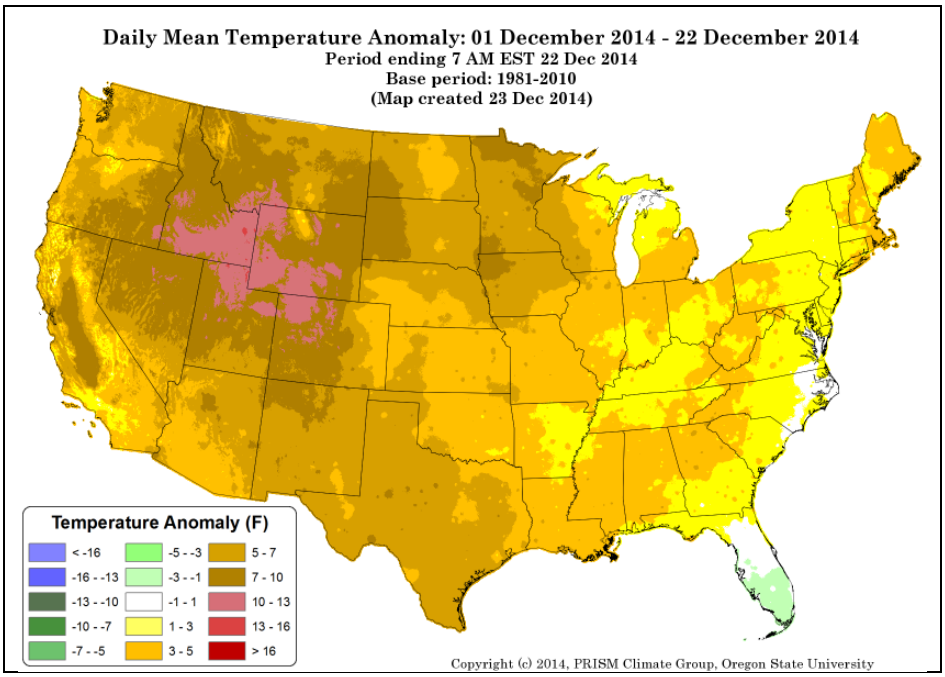


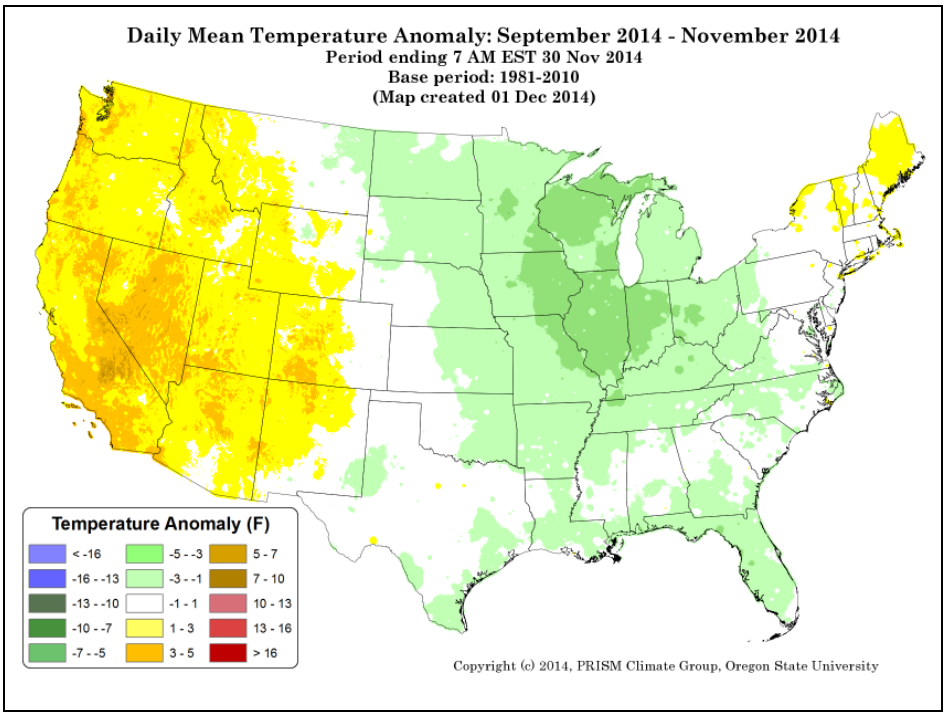
The ACIS map of the 7-day average temperature anomalies in the West ending December 23 shows that the greatest positive temperature departures occurred in Washington, Oregon, Montana, and Idaho (>+12°F). There were negative temperature departures in central Wyoming, central Colorado, southern Arizona, and southern California (<-3°F).

Also, see Dashboard and the Westwide Drought Tracker

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.

Thus far in December 2014, the national daily mean temperature anomaly map shows a very small slightly cool pattern in southern Florida. (<-1°F). Above normal temperatures were recorded in the rest of the U.S, with the warmest areas in Utah, Idaho, and Wyoming, (>+10°F).





The September – November national daily mean temperature anomalies for the U.S. in this climate map show the west coast had slightly to above normal temperatures in California (>+7°F). The north central portion of the country reported normal to slightly cooler than normal temperatures for this period, with the coolest temperatures in northern Michigan, Wisconsin, Minnesota, Iowa, Illinois, Indiana, and a few other scattered areas (<-3°F).

Weather and Drought Summary

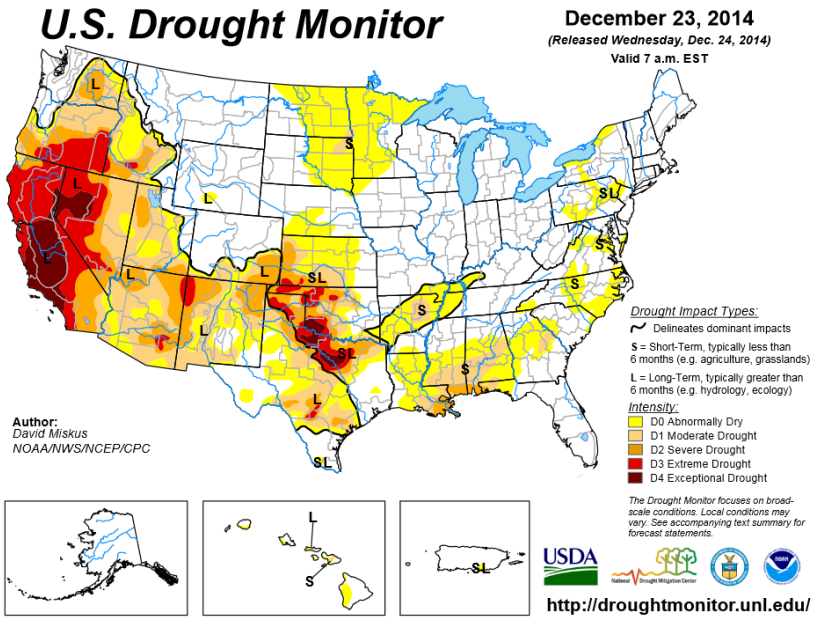
National Drought Summary – December 23, 2014

The following **Weather and Drought Summary** is provided by this week's NDMC Drought Author, David Miskus, NOAA/NWS/NCEP/CPC.

USDM Map Services: contains archived maps

"For the contiguous 48 states, the U.S. Drought Monitor showed 29.96 percent of the area in moderate drought or worse, compared with 30.05 percent a week earlier. Drought now affects 68,790,852 people, compared with 69,101,899 a week earlier.

For all 50 U.S. states and Puerto Rico, the U.S. Drought Monitor showed 25.04 percent of the area in moderate drought or worse, compared with 25.11 percent a week earlier. Drought now affects 68,814,404 people, compared with 69,125,452 a week earlier."



See: Latest Drought Impacts during the past week.

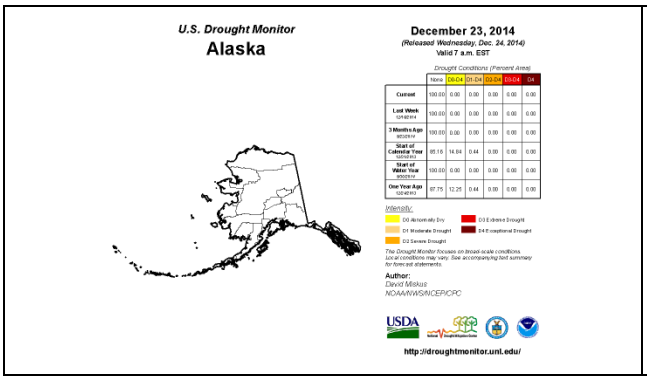
Current Drought Monitor weekly summary. The exceptional D4 levels of drought are scattered across CA, NV, TX, and OK.

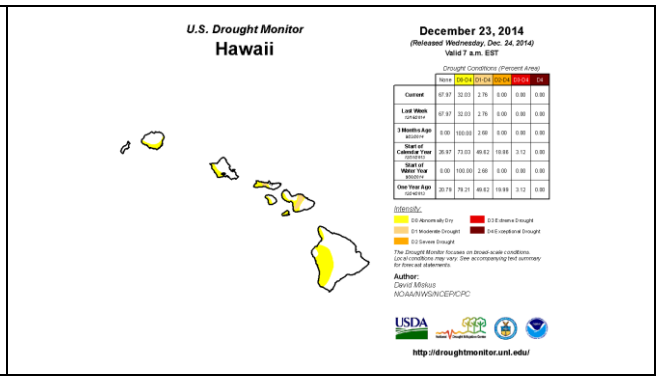
The latest drought indicator blend and component percentiles spreadsheet is a great resource for climate division drought statistics. This link is for the latest Drought Outlook (forecast). See climatological rankings.

For more drought news, see Drought Impact Reporter.
***New**: ENSO Blog.*

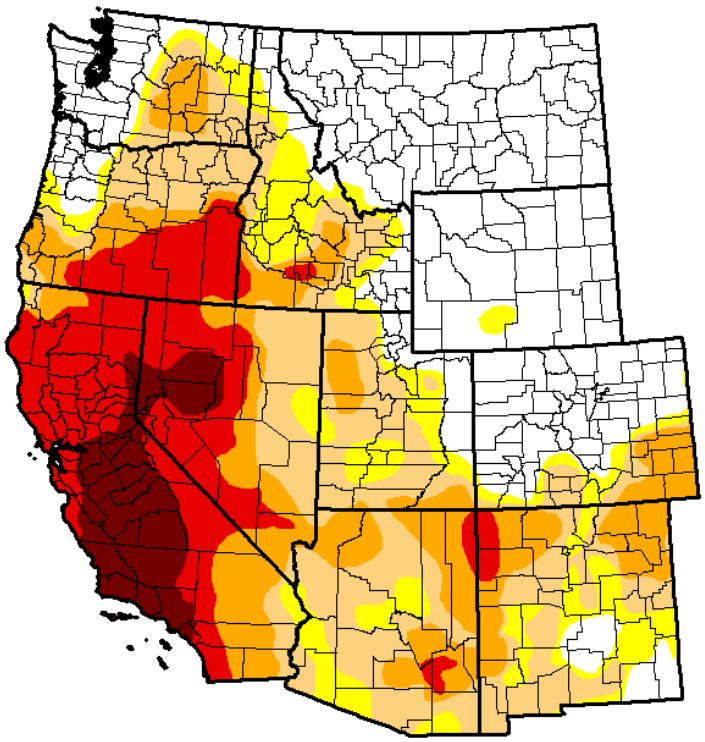
Drought Management Resources:

- ✓ http://www.usda.gov/oce/weather/Drought/AgInDrought.pdf
- ✓ Watch AgDay TV
- ✓ Drought Impacts Webinar Series
- ✓ NIDIS Quarterly Climate Impacts and Outlook
- ✓ The Spring 2014 edition of DroughtScape
- ✓ U.S.Crops in Drought





"The 49th and 50th States show normal to moderate drought conditions. No changes were noted for Alaska or Hawaii this week. 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 that follow, click here."



U.S. Drought Monitor
West

December 23, 2014
(Released Wednesday, Dec. 24, 2014)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	34.61	65.39	54.60	33.69	18.68	5.40
Last Week 12/16/2014	34.51	65.49	54.85	33.90	18.75	5.40
3 Months Ago 9/23/2014	31.18	68.82	56.42	35.96	20.00	8.90
Start of Calendar Year 12/31/2013	22.20	77.80	51.44	31.11	7.75	0.63
Start of Water Year 9/30/2014	31.48	68.52	55.57	35.65	19.95	8.90
One Year Ago 12/24/2013	22.20	77.80	51.15	30.75	7.62	0.63

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

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

Author:
David Miskus
NOAA/NWS/NCEP/CPC

http://droughtmonitor.unl.edu/

There was a decrease in D0 – D3 drought categories in the West this week. D4 remained unchanged, and the drought-free area increased slightly.

Click to enlarge maps

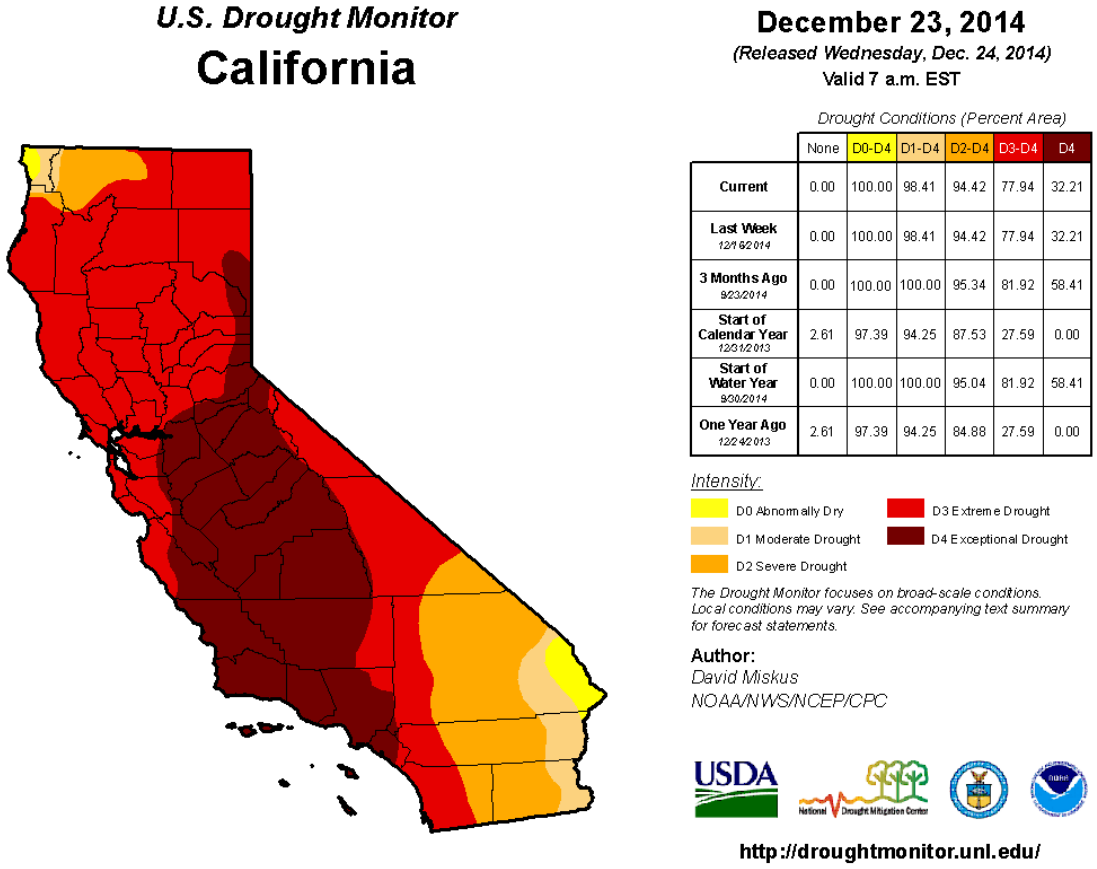
Risk Management Web Resources

Drought Monitor for the Western States. Drought Impact Reporter for New Mexico, California Data Exchange Center & Flood Management Intermountain West Climate Dashboard
California Sierra Nevada-related snow pack

U.S. Impacts during the past week:

CA/Midwest: California Dairies Look To Midwest's Greener Pastures – Dec 17
World: Climate change could cut 18 percent of world food production by 2050 – Dec 18
U.K.: Study finds varied fish response to unexpected droughts – Dec 15
Southwest: States in Parched Southwest Take Steps to Bolster Lake Mead – Dec 17
U.S.: Floods Breed Cooperation, Droughts Breed Conflict – Dec 16
N.M.: Wet weather makes a dent on N.M. drought – Dec 18

State with D-4 Exceptional Drought



There was no change in California this past week.

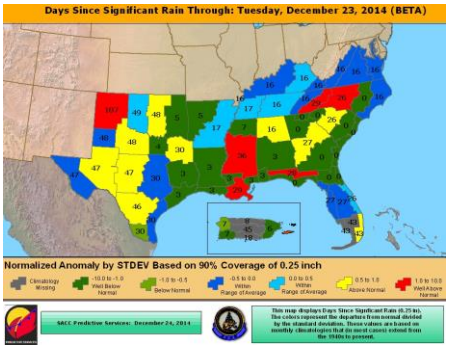
CA Drought Information Resources

Drought News from California:

Fire season ends, but vigilance still urged – Dec 18
Catching rainwater from the sky eases drought's grip for Bay Area innovators – Dec 16
Bay Area cities sign aquifer deal to share water – Dec 16
Merced County groundwater moratorium shot down – Dec 16
Monson still needs help with its water – Dec 17
Salinas Valley water report suggests shift in pumping – Dec 17
Utility to require water meter conversion come June – Dec 17
Water Rates Up Another 14 Percent – Dec 18
Waterwise: Conservation program incentives extended again – Dec 16

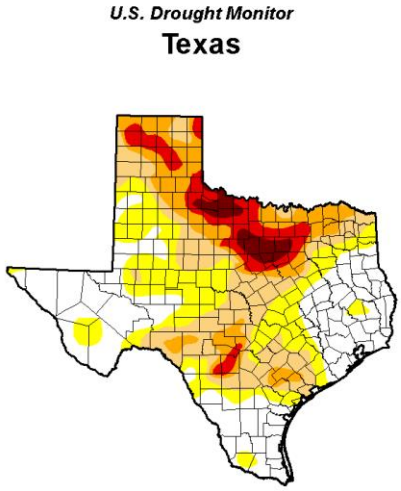
Texas Drought Website.
Texas Reservoirs.
Texas Drought Monitor Coordination Conference Call: on Monday's 2:00 PM - 3:00 PM CST

Texas Drought News:
Bad Year for Big Country Cotton Growers – Dec 16
Quenching Our Future, Part 4: Amid dry years, area wells sucking the ground dry, experts say – Dec 13
Quenching Our Future, Part 5: In drought, Rio Grande Valley irrigators feel the crunch – Dec 14



Days since Significant Rain Summary

State with D-4 Exceptional Drought



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Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	34.32	65.68	43.42	23.35	10.36	2.97
Last Week 12/16/2014	33.17	66.83	43.91	23.41	10.05	2.57
3 Months Ago 9/23/2014	24.37	75.63	52.18	28.54	11.39	1.79
Start of Calendar Year 12/31/2013	28.48	71.52	43.84	21.15	5.82	0.79
Start of Water Year 9/30/2014	28.92	71.08	48.95	29.54	11.26	2.69
One Year Ago 12/24/2013	28.30	71.70	45.90	22.44	6.78	0.79

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

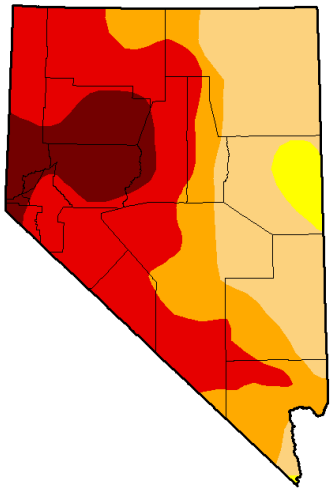
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
David Miskus
NOAA/NWS/NCEP/CPC

http://droughtmonitor.unl.edu/

There was a slight decrease in D0 – D2 in Texas this past week. D3 and D4 slightly increased and the drought-free area also increased.

State with D-4 Exceptional Drought



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Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	96.98	68.25	48.38	11.89
Last Week 12/16/2014	0.00	100.00	96.98	68.25	48.38	11.89
3 Months Ago 9/23/2014	0.00	100.00	97.06	69.89	48.38	11.89
Start of Calendar Year 12/31/2013	0.39	99.61	96.81	77.66	28.55	5.37
Start of Water Year 9/30/2014	0.00	100.00	97.04	69.89	48.38	11.89
One Year Ago 12/24/2013	0.39	99.61	96.81	77.66	28.55	5.37

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

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There was no change in Nevada this past week.

Nevada Drought News:

Utility to require water meter conversion come June – Dec 17

Related Area News:

2014 Kansas Drought Report and Summary

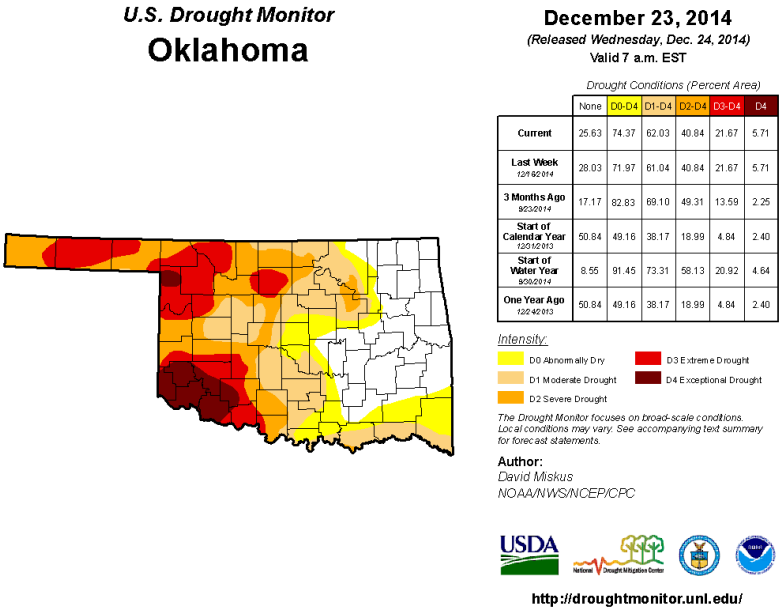
- ***Past 30 days precipitation totals***
- ***Past 30 days precipitation percent of normal***
- ***Calendar Year precipitation totals***
- ***Calendar Year Precip percent of normal***
- ***Short Crop ET***

Oklahoma Drought News:

Duncan budget proposal cuts raises, hiring – Dec 15

Scholars seek to help cattle industry with drought – Dec 18

State with D-4 Exceptional Drought



There was a decrease in D0 – D2 in Oklahoma this past week. The drought-free areas increased this week.

U.S. Population in Drought

Number of people in each drought category in the U.S. for the week ending December 23, 2014

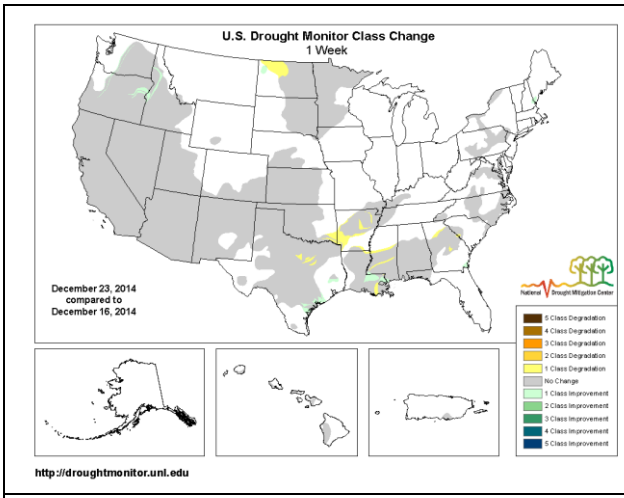
Week	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2014-12-23	194,668,209	110,729,246	68,790,852	51,389,795	40,225,268	20,388,348
2014-12-16	196,117,439	109,280,016	69,101,899	51,537,668	40,026,772	20,289,059

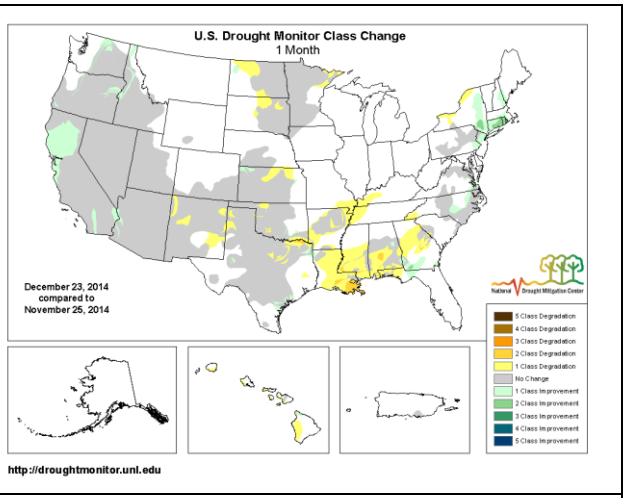
Population figures affected by drought in the U.S. Drought Monitor website show that for this week, more than 68,700,000 people in the United States were in a drought-affected area, which decreased by over 310,000 people from last week.

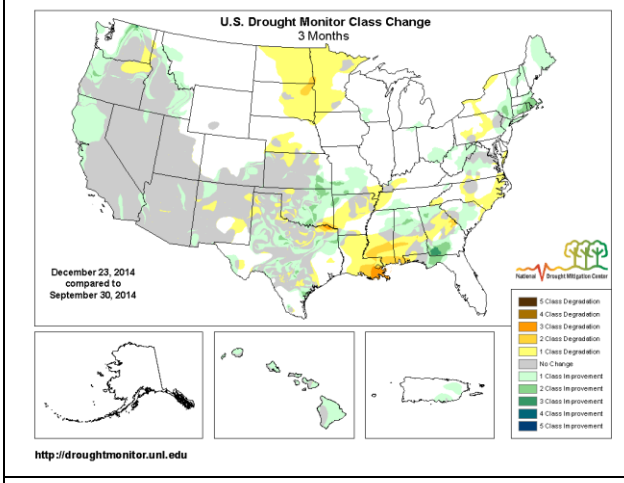
Population Statistics Methodology:
The U.S. Drought Monitor population statistics are calculated at the county level, and aggregated to the state, regional, and national levels. The population densities have been calculated for each county. The proportion of the physical area of the county that is in drought is multiplied by the uniform population density in order to obtain a number for each county. The county values are then summed at the state, regional, and national level.

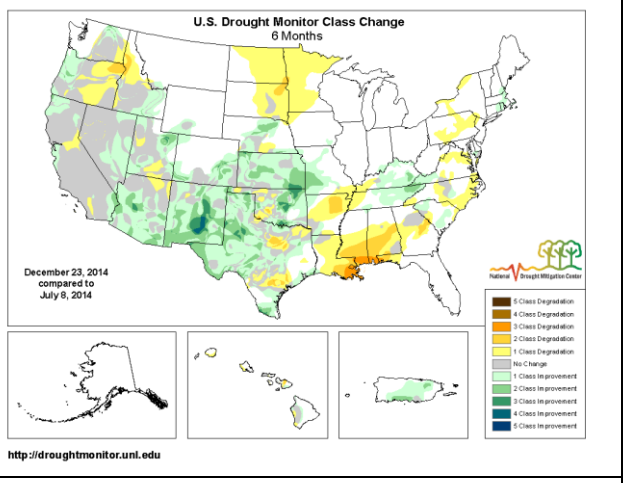
Changes in Drought Monitor Categories

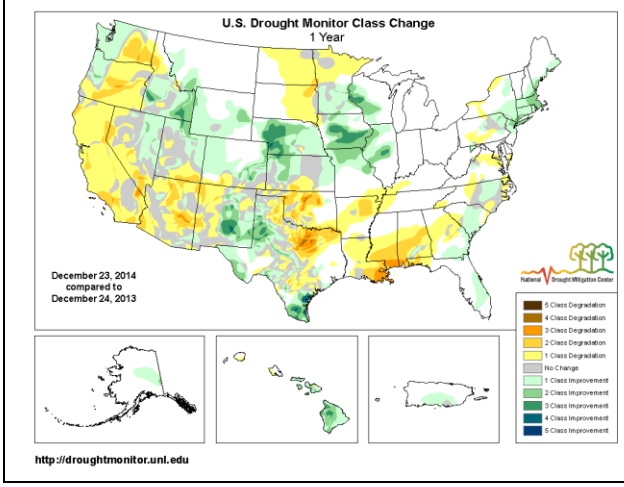
Over Various Time Periods

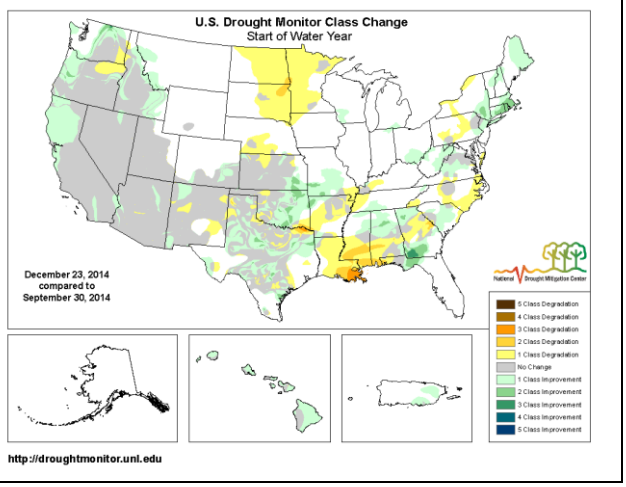






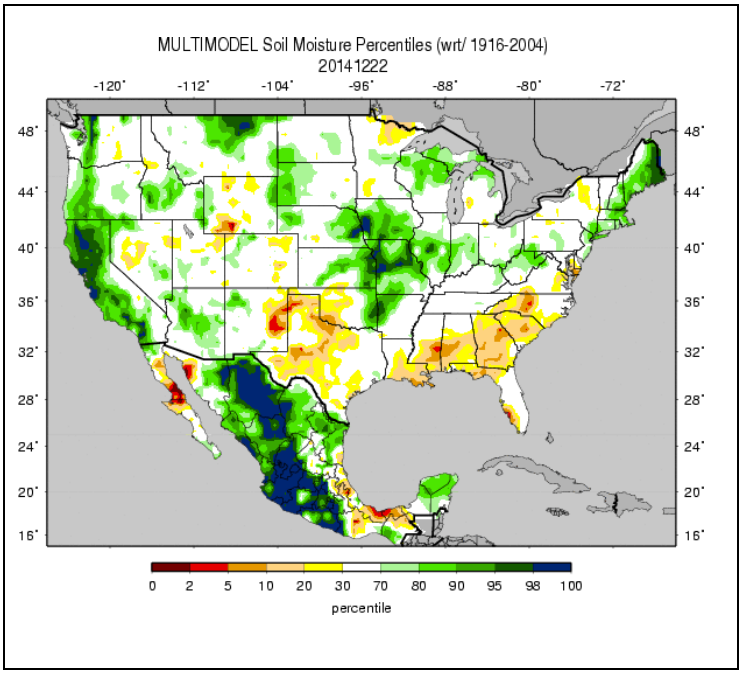






Click on any of these maps to enlarge. Note how the conditions over the Rockies and central Great Plains have improved between 6 to 12 months (middle right to lower left maps). However, also note that since a year ago, conditions over parts of the Northeast, the South, parts of the southern Great Plains, and the Pacific coast states have deteriorated significantly (lower left map).

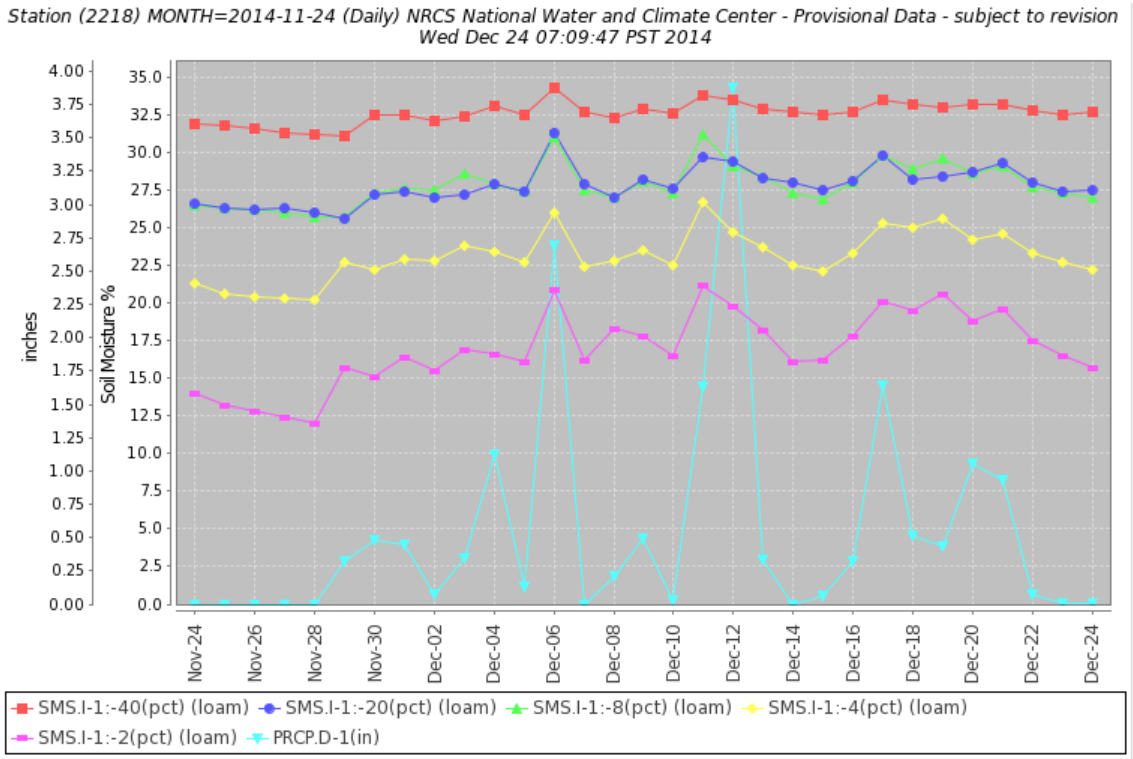
Soil Moisture



The national soil moisture model ranking in percentile as of December 22, 2014, shows dryness over most of the Southeast and south central U.S. The driest areas are in southern Wyoming, eastern New Mexico, northern Texas, Oklahoma, Louisiana, Mississippi, Alabama, southwest Florida, and North Carolina. There were additional dry areas elsewhere. Moist soils dominated north central Montana, northern California, Nebraska, Iowa, Missouri, Maine, and central Florida. Slightly moist soils were also scattered elsewhere throughout the country.

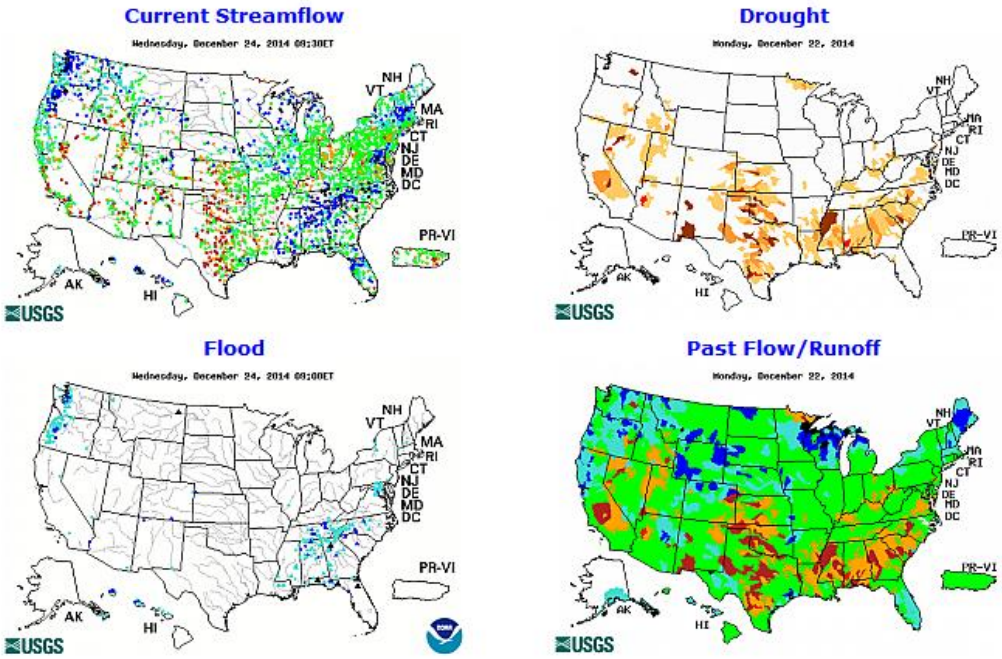
Useful Hydrological Links: *Crop Moisture Index; Palmer Drought Severity Index; Standardized Precipitation Index; Surface Water Supply Index; Weekly supplemental maps, Minnesota Climate Working Group; Experimental High Resolution Drought Trigger Tool;* NLDAS Drought Monitor; Soil Moisture

Soil Climate Analysis Network (SCAN)



This NRCS resource shows soil moisture data for the last month at the French Gulch, SCAN site 2218, in northern California. The area had fairly continuous precipitation since early December (graphed in light blue). This rainfall resulted in an increase in soil moisture at all depths in the sensor array, where the 2- and 4-inch depths were the most reactive. The 40-inch sensor increased slightly over the period, owing to the long-term drought in the area.
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.*

Streamflow



Scattered gages in many parts of the U.S. are reporting above normal streamflow. High streamflow is reported in Florida, Massachusetts, New Hampshire, Vermont, Maine, Maryland, Virginia, North Carolina, South Carolina, Tennessee, Alabama, Georgia, Florida, northern Michigan and Wisconsin, Montana, Wyoming, Colorado, California, Oregon, Washington (left maps). Hawaii is also reporting a few rivers with high streamflow. The rivers above flood stage are the Poplar River near Poplar, MT, St. Johns River at Jacksonville, FL, St. Johns River at Buffalo Bluff near Satsuma, FL, Dunns Creek near Satsuma, FL, the Aucilla R near Mouth near Nutall, FL, the Shoal R nr Mossy Head, FL, Big Ck at GA9 near Cumming, GA, and Lookout Ck near New England, GA,

National Long-Range Outlook

Click map to enlarge and update

Currently the Upper Midwest part of the map has not been calculated for the long range flood outlook (dark gray dots).

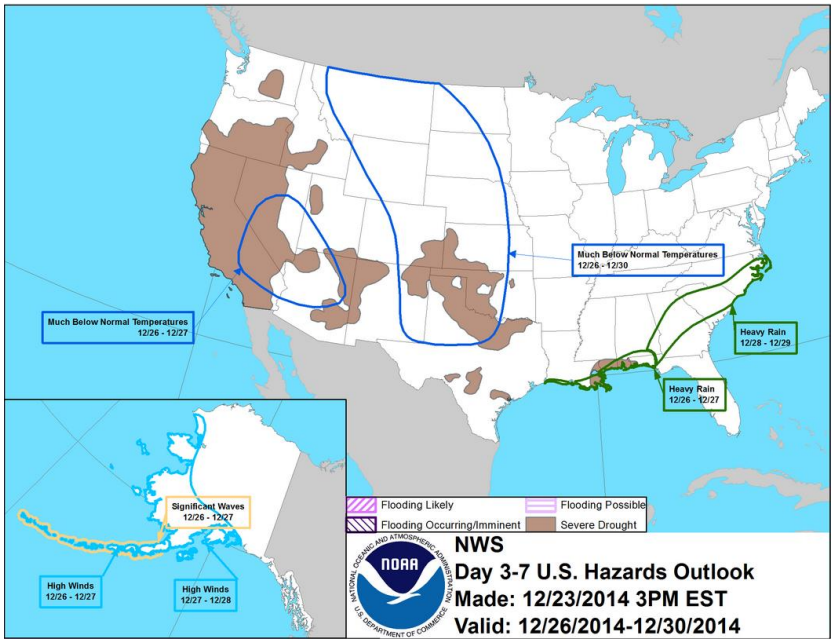
During the next three months, there is a risk of flooding in much of the eastern U.S. The Southeast, the Midwest, the Pacific Northwest, and northern Great Plains have gages with a slight to higher risk of flooding. Currently, 1 gage has a greater than 50% chance to experience major flooding; 8 gages for moderate flooding, and 175 gages for minor flooding.

These numbers represent a 7 gage increase in the greater than 50 percent chance of minor flooding category in the last 2 weeks.

National Weather Hazards

Heavy rains are expected in southern Louisiana, Mississippi, Alabama, and Florida, spreading into Georgia, and the Carolinas (12/26-29). Much below average temperatures are expected in a large area of the central U.S. extending from Canada to central Texas and in another area centered in the southwest (in dark blue) (12/26-30). In Alaska, high winds are expected in the western and southern regions (12/26-28), as well as significant waves in the Aleutians (12/26-27).

Severe drought remains a large issue in much of the south central and western U.S.



National Drought Summary for December 23, 2014

Prepared by the Drought Monitor Author: David Miskus, NOAA/NWS/NCEP/CPC.

Summary

"(Note: The weather summary covers the full 7-day period – to 12Z Dec. 23; some product tools only cover the first 6-day period – to 12Z Dec. 22 due to the holiday-shortened, 1-day early release time constraints). Early in the week, another in a series of Pacific storm systems (since after Thanksgiving) impacted the West Coast, with the bulk of the heaviest precipitation (4 to 8 inches, locally to 12 inches) shifted a bit farther north into western Oregon instead of north-central California as observed during the previous two weeks. Still, decent precipitation (more than 2 inches) fell as far south as central coastal California and on the northern Sierra Nevada Mountains, with lower amounts (an inch or less) to the south. To the east, as a storm system and associated cold front departed the Atlantic Coast, the southern section of the front became stationary in the Gulf Coast. Waves of low pressure developed along the stationary front and tracked northeastward, triggering showers and thunderstorms along parts of the Gulf Coast region. Moderate to heavy rains (more than 2 inches) fell on southeastern Texas, southern sections of Louisiana, Mississippi, and Alabama, and north-central Florida. Toward the end of the period, a change in the upper-air pattern over the West (ridging) brought drier and colder conditions to the region, while a storm in the Nation's mid-section generated light to occasionally moderate precipitation to most of the eastern half of the U.S. In Hawaii, light showers were generally limited to windward locations except toward the end of the period (Sunday into Monday) when more widespread, heavier rains fell across the western islands of Kauai and Oahu. In Puerto Rico, moderate to heavy (1-4 inches) rains fell across northeastern and central sections, enough to deter the spread of the small D0 area northward. Weekly temperatures averaged well above-normal in most of the West, Plains, upper Midwest, New England, and Alaska, and near- to slightly above-normal in the southeastern quarter of the Nation.

Central and Southern Plains

Most of the central and southern High Plains saw little or no precipitation (less than 0.3 inches) after last week's "bonus" amounts in the central Plains, so status-quo here, while locations to the east measured higher totals (0.5-1 inch), although most of that fell on non-drought areas in eastern sections of Nebraska, Kansas, Oklahoma, and Texas. An exception was in southeastern Texas where 2-5 inches of rain fell along the western Gulf Coast (especially near Houston), providing some relief to D0-D2 areas near Victoria and Corpus Christi. As mentioned in the Tennessee and lower Mississippi Valley narrative, D0 was added

between northeastern Texas and central Arkansas as lower weekly totals (less than 0.5 inches) and 60- and 90-day deficits were similar enough to merge the two D0 areas. Farther to the west, D2-D4 was degraded by a category in north-central Texas as continuing short-term deficiencies and long-term drought impacts mounted, especially in Palo Pinto and Parker counties. Lake Palo Pinto was down to 9% full as of Dec. 23, down from 100% full in early 2012, and at its current rate of drawdown, it would be empty within 6 months. In addition, the impact line was also adjusted to put this area in short and long-term drought (SL). Similarly in south-central Texas (small D3 area), Medina Lake was only 3.3% full, another good example that some areas of Texas have yet to recover from the long-term drought, even with occasional periods of wetness since it started in 2011.

Hawaii and Puerto Rico

In Hawaii, light to occasionally moderate showers were limited to the windward sides of the islands during the early portion of the period, with little or no rain falling on the leeward sides. By Sunday into Monday, however, more widespread and heavier showers were measured on the western islands of Kauai and Oahu, including the leeward locations. No changes were made this week as it was decided to wait and see what occurs with the current weather pattern and rains.

In Puerto Rico, moderate to heavy showers fell on northeastern (locally to 4 inches) and north-central (0.5-2 inches) portions of the island, enough to warrant the expansion of the small D0 area northward into central Puerto Rico. With USGS stream flows near the D0 area were running somewhat below normal and residual long-term deficits from this summer's relatively quiet (dry) Atlantic and Caribbean tropical season, this area will need to be watched for possible deterioration if dryness persists.

New England and mid-Atlantic

Widespread light (less than 0.5 inches) to occasionally moderate (0.5-1.5 inches) precipitation totals fell across the Northeast, enough to prevent additional deterioration but not enough to warrant any improvement. An exception to this was in southern Maine and southeastern New Hampshire where enough precipitation (0.8-1.2 inches) was measured to eliminate a small D0 area of short-term dryness. USGS 1-, 7-, 14-, and 28-day average stream flows in this area were above (76-90th percentile) to much above normal (more than 90th percentile), and both short and long-term blends and other modeled indices were wet.

Northern Plains and upper Midwest

Light precipitation fell on most of the region, with southern North Dakota, northern and western South Dakota, northeastern Minnesota, and northwestern Iowa measuring between 0.2-0.6 inches of liquid equivalent. The light precipitation was enough to maintain conditions there. Across northern North Dakota and western Minnesota, however, little or no precipitation occurred, and 60- and 90-day precipitation was under half of normal. With northwestern North Dakota also drying out the past 2-3 months, D0 was expanded to incorporate this area. An expansion of D1 to northeastern North Dakota and western Minnesota was considered with precipitation less than 25% and 50% of normal at 60- and 90-days, respectively, but deficits were relatively small (less than 3 inches), so no increases were made this week.

Southeast

Waves of low pressure developing along a stationary front over the Gulf of Mexico tracked northeastward, producing scattered showers and thunderstorms along portions of the Gulf Coast region, with over 2 inches of rain falling on southeastern Texas, southern sections of Louisiana and Mississippi, extreme southern Alabama, north-central Florida, and extreme southeastern Georgia. Since the past 3-months had been quite dry across the central Gulf Coast where deficits of 6-12 inches had accumulated, only the greatest totals (2.5-4 inches) were enough to warrant some improvement – and that occurred in east-central Louisiana, extreme southwestern Mississippi, and extreme southeastern Georgia. Unfortunately, significant rains did not extend that far northward into northern portions of Mississippi, Alabama, and Georgia, where generally less than 0.5 inches were recorded. With a rather wet December climatology in this area (about 1-1.5 inches a week), short-term deficiencies continued to climb across northern locations, and as a result, D2 slightly crept westward in southeastern Louisiana, D1 expanded northward into south-central Mississippi and central Georgia, and D0 extended northward in southern Arkansas, central Mississippi, and north-central Georgia. Decent rains during November and early December in northern sections of Mississippi, Alabama, and Georgia were enough for now to warrant no D0 there.

Southwest

With mostly light precipitation (less than 0.5 inches, locally to an inch) recorded across the Four Corners region, generally surplus precipitation in the short-term (30-days) and medium-term (6-months from an active southwestern monsoon), and below normal in-between (at 2 and 3 months), conditions were left unmodified. However, as of Dec. 22, Water Year-to-Date (WYTD, since Oct. 1) precipitation is below normal, as is the Snow Water Equivalent (SWE) in the basins of Arizona, New Mexico, Utah, and Colorado. With WYTD average basin precipitation ranging between 60-80% of normal and SWE at 30-80% of normal (lowest in Arizona and western New Mexico), this region will be watched closely for WYTD precipitation and snow pack numbers to increase as the winter progresses to ensure adequate spring snow melt runoff and recharge for rivers and reservoirs.

Tennessee and lower Mississippi Valley

The late-period storm system in the Nation's mid-section brought some precipitation to the Delta region this week, but the largest weekly totals (0.5-1 inch) mostly fell on areas that had no drought or abnormal dryness. However, for most portions, enough rain did occur to keep conditions status-quo, except in southwestern Arkansas and southeastern Oklahoma where the 60- and 90-day shortages were similar to northeastern Texas and central Arkansas, hence the two D0 areas were merged. In addition, 2- and 3-month anomalies and percentages were a bit lower in central Arkansas (less rainfall than surrounding locales), thus D1 was slightly expanded. The recent rains did increase recent (instantaneous, 1-, and 7-day) USGS stream flows across most areas, but longer-term values (at 14- and 28-days) were generally below to occasionally much-below normal. Changes made in Louisiana were detailed in the Southeast narrative.

The West

Another in a series of Pacific systems affected the West, with the latest one dropping the greatest precipitation totals on western Oregon and Washington (4-12 inches), although the northern half of California received 2-6 inches, with lesser amounts to the south (generally an inch or less). Although the recent precipitation was not as great as the past 2 weeks, the total capacity of water at the major reservoirs in northern and central California (e.g. Trinity, Shasta, Oroville, Folsom, and San Luis Lakes) did slightly increase on Dec. 16 from 29, 32, 33, 38, and 33% to 32, 38, 36, 41, and 36% as of Dec. 22, respectively. Unfortunately, these values are still well below the historic average capacity for Dec. 22 (47, 62, 59, 85, and 54%, respectively), with the Sierra Nevada basin average SWEs also well below normal (45-72%). The Northern Sierra 8-station precipitation index on Dec. 22 was at 22.4 inches, or 146% of normal, while the San Joaquin 5-station index was at 8.8 inches, or 78% of normal. And similar to last week, major reservoirs to the south showed little or no increase this week with the lower totals. Therefore, even with the additional precipitation, no modifications were made to California this week.

In the Pacific Northwest, with most basins reporting near to above normal WYTD precipitation, generally normal to surplus precipitation at short, medium, and long-term periods (except in southern Oregon, closest to California), the heavy precipitation was enough to slightly trim (improve) the edges of the D0-D2 in northwestern and northeastern Oregon, western Washington, and western Idaho, especially where the long-term SPIs (12- and 24-months) were wet. Since improvements were made in north-central Washington last week, no modifications were made this week. A major concern this Water Year has been the warm component of the storms. Even though WYTD average basin precipitation for the Cascades ranged between 103-134% of normal as of Dec. 22, SWEs remained quite low, ranging between 10-65% of normal. Fortunately, SWEs were close to normal in the northern and central Rockies. Across the West, not only will continued ample moisture be crucial, but also occur in combination with enough cold air to produce adequate winter mountain snow pack for spring snow melt, runoff, and reservoir recharge.

Looking Ahead

For the upcoming 5-day period (December 24-28), light to moderate precipitation (0.5-2 inches, locally to 3 inches along the Pacific Northwest Coast) is forecast for the Northwest, and with temperatures expected to be below normal, the precipitation should mainly fall as snow on the Cascades, northern Sierra Nevada, and the northern and central Rockies. Farther east, moderate (more than 0.75 inches) to heavy precipitation (over 2 inches) is forecast for the eastern third of the U.S., with most of the Southeast expecting over 2 inches of rain, and locally 4-6 inches along the east-central Gulf Coast. Readings should average above normal across the eastern half of the Nation.

For the ensuing 5-day period (December 29-January 2), the CPC 6-10 day precipitation outlook paints a dry outlook for the West (good odds of below median precipitation), but favorable probabilities of above

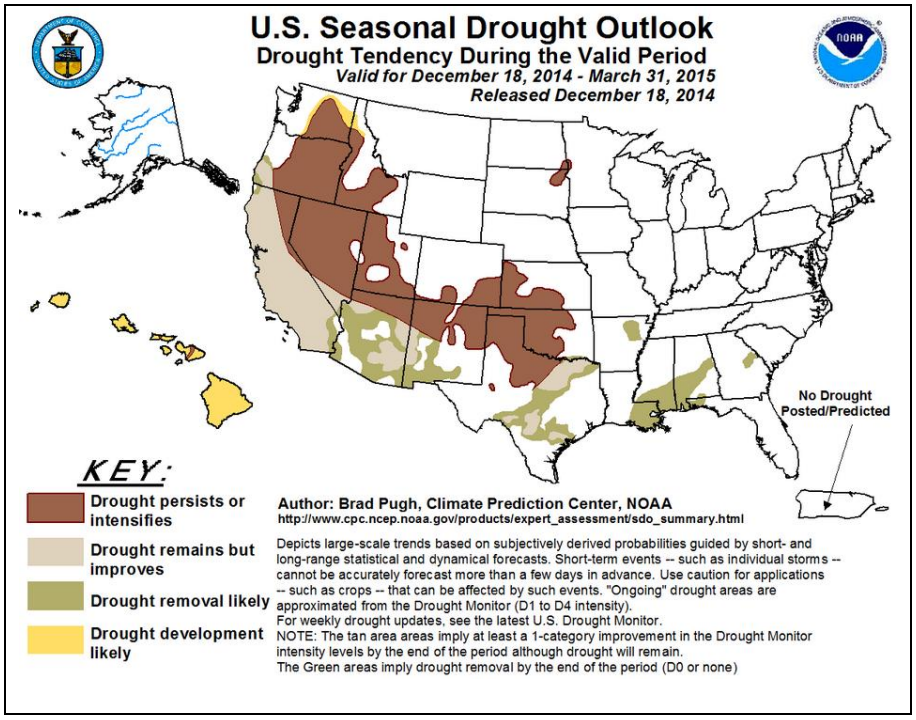
median precipitation for Alaska, the southern Plains, Southeast, and mid-Atlantic, with the best chances along the Gulf Coast. Temperatures are expected to average below normal in the western two-thirds of the Nation, with above median temperature probabilities limited to southern Florida and Alaska."

Supplemental Drought Information

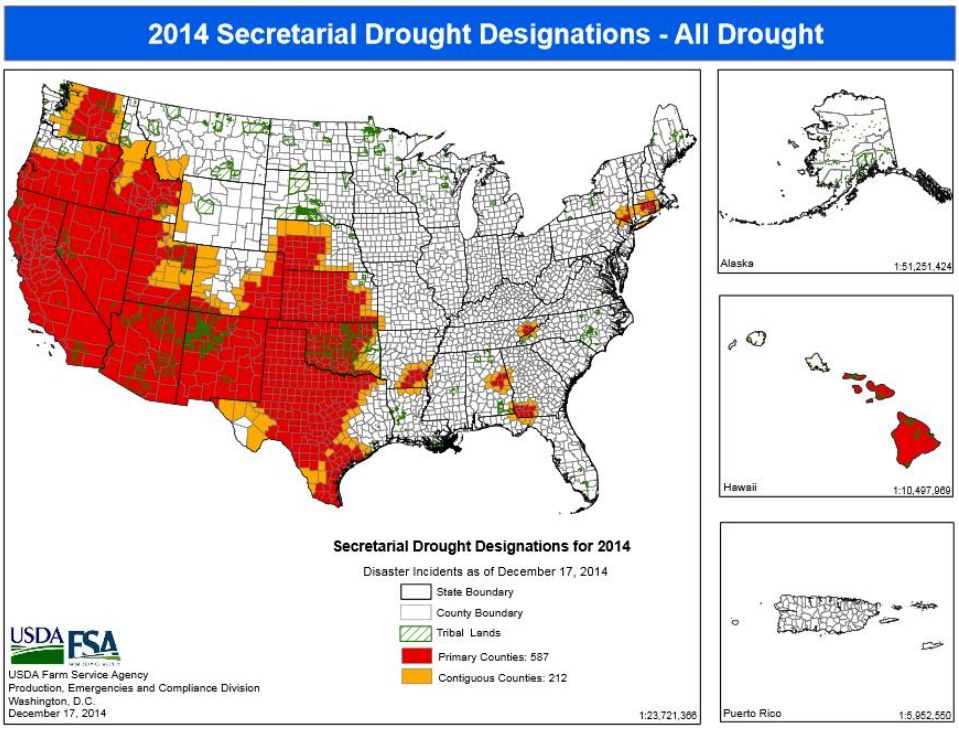
National Seasonal Drought Outlook

Nationally, drought is expected to persist or intensify over much of the West and south central U.S., including Nevada, Oregon, Washington, Idaho, Utah, Arizona, New Mexico, Texas, Oklahoma, Nebraska, and Colorado. Improvements are expected in California and in parts of the Southwest and Texas. Some areas of drought are likely to develop in Washington.

Also see: National Significant Wildland Fire Potential Outlook (updated on the **first** of each month) contains a content summary of the previous month's conditions.



2014 USDA Secretarial Drought Designations

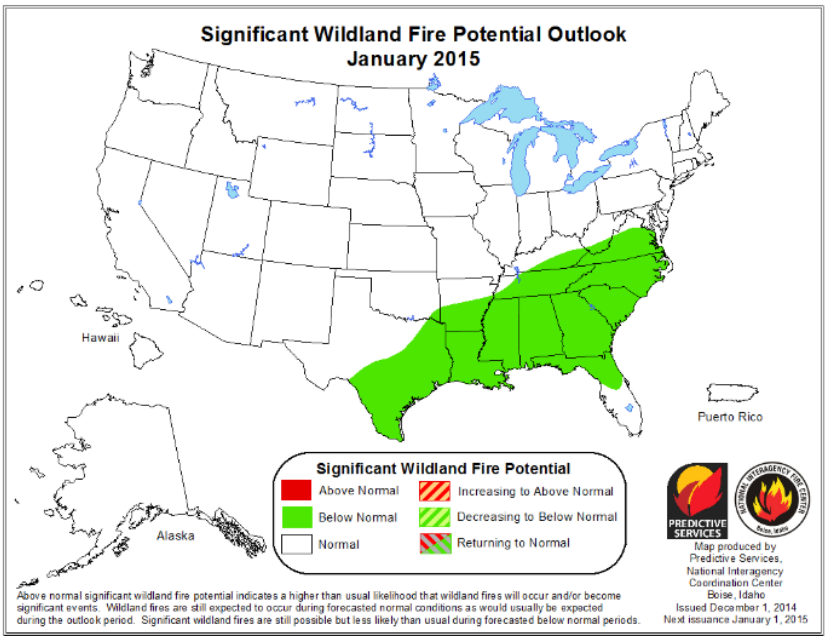


Refer to the USDA Drought Assistance website and National Sustainable Agriculture Information Service.

Read about the new USDA Regional Climate Hubs.

New useful resource: NASS Quick Stats

National Fire Potential Outlook



January Fire Forecast

In January, much of the U.S. has normal fire potential.

The below normal fire potential area in green on the map is forecast for Texas, through the Southeast, to the Mid-Atlantic states.

Additional Maps

U.S. Maps PowerPoint presentation: http://dmcommunity.unl.edu/maps/US-Maps.ppt.

Regional zooms of ACIS station data percent-of-normal precipitation: http://dmcommunity.unl.edu/maps/All-CONUS-ACIS-PNP.pptx.

National Water and Climate Center (NWCC) Surface Water Supply Index (SWSI) maps: http://www.wcc.nrcs.usda.gov/wsf/swsi.html

Supplemental Drought-Agriculture News

Download archived "U.S. Crops in Drought" files.

This is a collection of drought-related news stories from the past seven days or so from this past week. Past Impact information from these articles is entered into the Drought Impact Reporter. A number of these articles are posted on the Drought Headlines page at the NDMC website. The list is compiled by Denise D. Gutzmer, Drought Impact Specialist, and National Drought Mitigation Center.

"May all areas needing rain get it in gentle, abundant storms in 2015. See you next year!

Colorado River basin

Funds to benefit Colorado River basin

Fifty million from the $1 trillion budget passed by Congress will go toward helping the parched West and conservation programs to boost water levels in the Colorado River basin and Lake Mead. The federal Bureau of Reclamation will take part in the pilot projects.

Officials with water agencies in Arizona, California and Nevada signed an agreement at the Colorado River Water Users Association conference to try to protect Lake Mead from dwindling further. The cooperating states intend to add up to three million acre-feet of water to Lake Mead by 2020 through conservation and changes in water management to limit demand on the lake.

California

California dairy owners moving to Midwest

California dairy owners are increasingly selling cattle and moving to the Midwest for new opportunities to raise dairy cattle. High feed costs, state business and environmental regulations, drought and, in some cases, almonds have driven farmers to give up on the dairy business. Almond production is attractive because demand for the nut is high, as is the profit margin. South Dakota, Iowa, Nebraska and Kansas are popular states drawing dairymen from California.

Storms or not, communities are wisely assuming that drought will continue and are making plans for such.

- **East Bay Municipal Utility District in California considering purchase of federal water**
  Despite the recent storms, the East Bay Municipal Utility District will raise water rates 14 percent for the next few months to pay for extra federal water. If the region gets heavy storms in the next few weeks, the water purchase and uptick in water rates may not happen.
- **Water agreement to bank excess water in wet years for Bay Area, California**
  The San Francisco Public Utilities Commission, San Bruno, Daly City and the California Water Services Company agreed to a $113 million plan to diversify the region's water supply to guard against drought and other disasters.
- **Report on groundwater pumping in Salinas Valley, California**
  A Salinas Valley groundwater basin report recommended that pumping be shifted away from the coast to deeper underground water sources to reduce seawater intrusion which was worsened by drought. Agricultural interest groups opposed the recommendation. While seawater intrusion changed little during 2011-13, it seems to have penetrated further inland in 2014.
- **Possible moratorium on new wells, groundwater export in Merced County, California**
  A moratorium on new wells and groundwater exports was under consideration by the Merced County board of supervisors as the past few years of drought raise concern about having an adequate water supply. The moratorium was voted down at the Dec. 16 meeting, but will be revisited in 2015.
- **More well trouble in Tulare County, California**
  Domestic wells have been running dry and producing less water in Monson, a community of 40 homes and apartments, since June 2014. On Dec. 16, Tulare County officials voted to apply to the U.S. Department of Agriculture's Rural Development Division for a $500,000 grant to address water problems in Monson.

Southern Colorado, New Mexico, Far west Texas

Over pumping in the Upper Rio Grande basin led to water table declines of 150 to 200 feet since 2003 around El Paso. Unfortunately, the sharp drop in groundwater levels has occurred in a region where it recharges too slowly to compensate for the heavy withdrawals. The area has endured drought for nearly the last decade.

Nevada

Urgency to install water meters in Reno-Sparks, Nevada

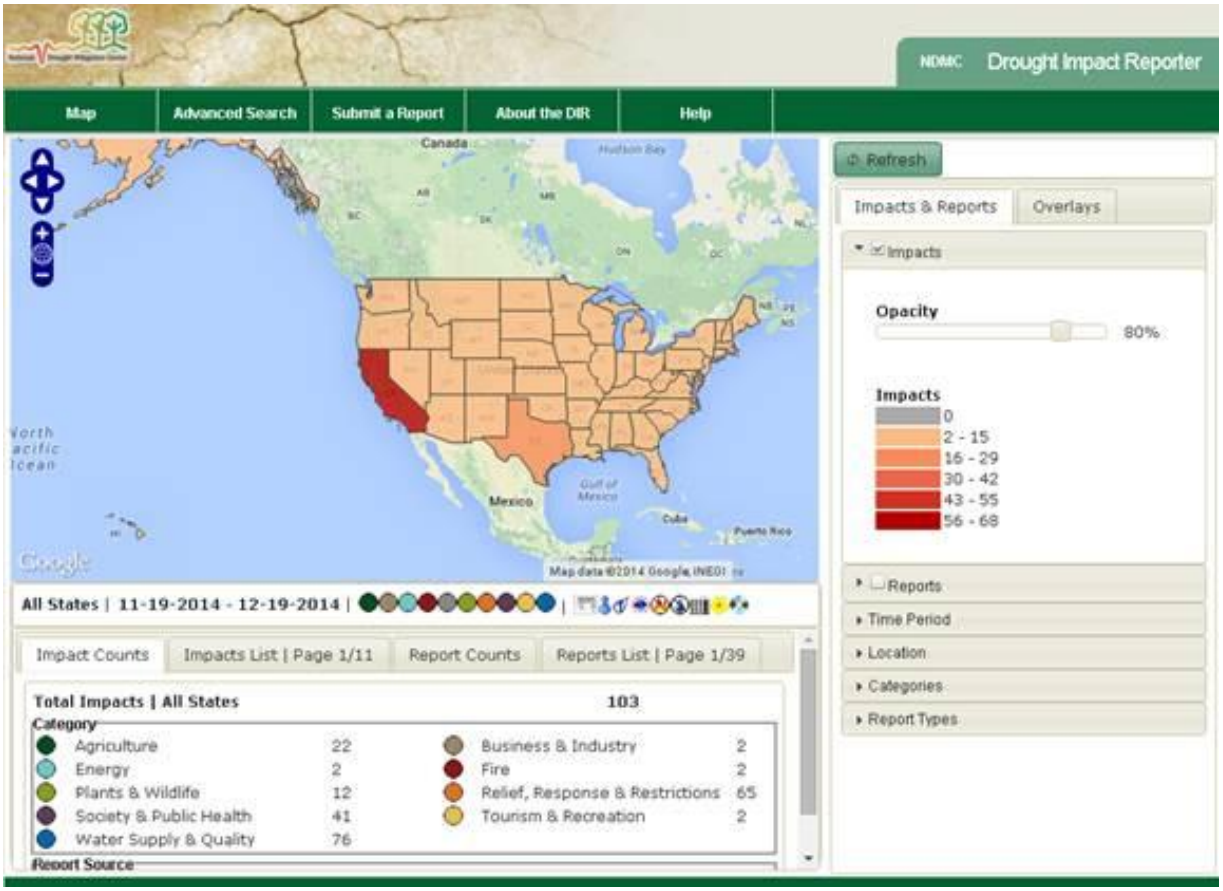
Directors of the Truckee Meadows Water Authority voted Dec. 17 to change billing so that flat-rate water customers are charged through the use of meters to help customers reduce water use. Metered billing will start in June for the 5,556 water customers still paying a flat rate.

Oklahoma

Pay, hiring freezes in Duncan, Oklahoma

The 2015 budget for Duncan includes pay and hiring freezes so the town can save nearly $1 million. Drought and past debts were some of several factors resulting in reduced revenue and the need to save money."

Drought Impact Reporter

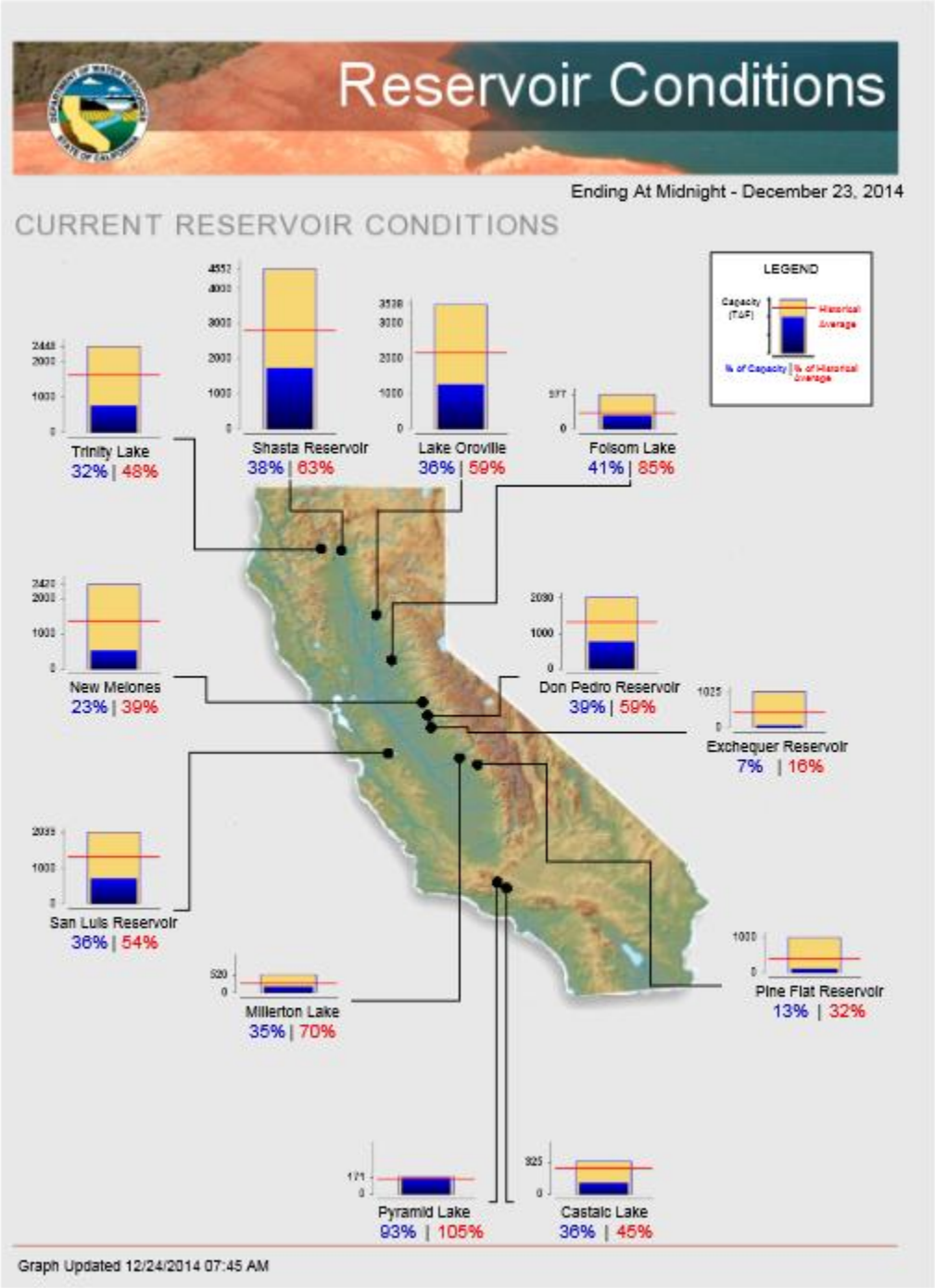


Tea Cup Reservoir Depictions

- http://www.usbr.gov/uc/water/basin/ ← Upper Colorado
- http://www.usbr.gov/uc/wcao/water/basin/tc_gr.html; ← Upper Snake
- http://www.usbr.gov/pn/hydromet/burtea.html ← Upper Colorado
- http://www.usbr.gov/uc/water/basin/tc_cr.html ← Upper Colorado
- http://www.usbr.gov/pn/hydromet/select.html ← Pacific Northwest
- http://www.sevierriver.org/reservoirs/teacup-diagram-of-reservoirs/ ← Sevier River Water (UT)

California Reservoir Conditions

[California Major Reservoir conditions from the CA Department of Water Resources]

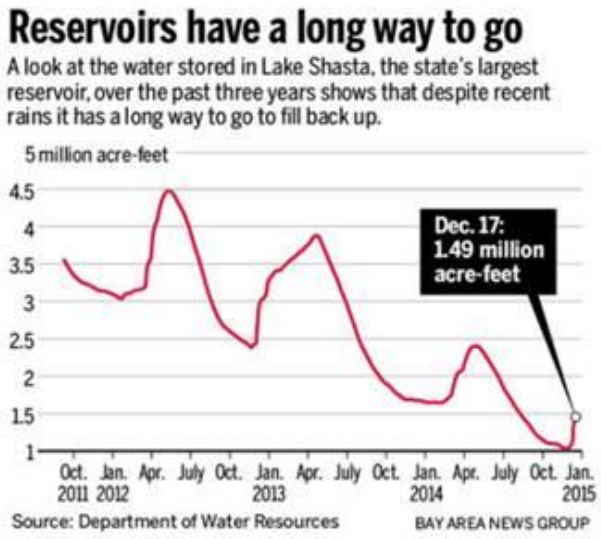


California drought: Feds forecast good chance of wet conditions for next three months

San Jose Mercury News (Calif.)

Dec 18, California. The Climate Prediction Center issued its **seasonal drought outlook** on Dec. 18, showing that improvement for California may be on the way in the next three months.

Image created by the Bay Area News Group with data from the CA Dept. of Water Resources.



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 Water and Climate Updates 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/

David W. Smith

Deputy Chief, Soil Science and Resource Assessment