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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Kings County in California due to an inch or more of precipitation. Author: Richard Heim, National Climatic Data Center, NOAA.

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 common and water restrictions imposed and crop or pasture losses likely. The possible impacts associated with D1 (S, L) drought are focused on water shortages developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 4 through 4d).

Soil Moisture
Soil moisture (Fig. 5), is simulated by the VIC macroscale hydrologic model. The detailed, physically-based VIC model is driven by observed daily precipitation and temperature maxima and minima from approximately 2130 stations, selected for reporting reliably in real-time and for having records of longer than 45 years (and various other criteria). Another good resource can be found at: http://www.emc.ncep.noaa.gov/mmb/nldas/drought/.

Soil Climate Analysis Network (SCAN)
Figure 6 provides supplemental data on soil conditions (moisture and temperatures at various depths from 2 inches to 80 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 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 SS/WSF State Office personnel are participating in state drought committee meetings and providing the committees and media with appropriate SS/WSF information - http://www.wcc.nrcs.usda.gov/cgi-bin/бор.pl.

Additional information describing the products available from the Drought Monitor can be found at the following URL: http://drought.unl.edu/dm/ and http://www.drought.gov.

For More Information
The National Water and Climate Center Homepage provide 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 on-line while ones from 2001-2006 can be acquired upon 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 Survey and Resource Assessment
Fig. 1a: SNOTEL and ACIS 7-day temperature anomaly ending 26 December shows departures varying considerably across the West. Greatest negative values were found over the Northern High Plains and western slope of the Central Rockies. Largest positive values were found over the western slope of the Northern Rockies.
Fig. 1b: ACIS 7-day average temperature anomalies show the greatest positive temperature departures over parts of southeast Washington (>+9°F). The greatest negative departures occurred over parts of the northwest Montana and the Uintah Mountains of Utah (<-15°F).
Fig. 2a and 2b: ACIS 7-day average precipitation amounts for the period ending yesterday shows heavy amounts of precipitation over the northern half of the West Coast and Northern Sierra (Fig. 2a). In terms of percent of normal, high percentages were found over the northernmost and central latitudes of the Western States including the northern half of California (Fig. 2b).
Fig. 2c: SNOTEL month to date precipitation percent of normal shows above normal values over all but parts of New Mexico and northeast Wyoming. This month was indeed a banner month for moistures for much of the Western States.
Fig. 2d: For the 2013 Water-Year that began on 1 October 2012, statistics continue to favor the Northern Tier States and the Northern Sierra with surplus. Deficits are mounting over eastern Wyoming and all of Colorado and New Mexico.
Fig. 3a: **Snow depths** for the week increased significantly over the Southern Cascades, Sierra, Wasatch, and northeast mountains of Nevada.
Fig. 3b: **Snow Water-Equivalent**: Largest deficits continue over much of New Mexico, all of Colorado and eastern Wyoming, and the northeastern Great Basin. Significant surpluses exist over the Cascades, Sierra, Wasatch, mountain of Arizona, Upper Snake River Basin, and Upper Green River Basin.
Fig. 4: Current Drought Monitor weekly summary. The exceptional D4 levels of drought are found over Georgia, Alabama, and scattered across the western corn belt of the Plains into Colorado, Wyoming, and southward into Texas. For more drought news, see Drought Impact Reporter. Click for the latest statistics for California Reservoirs. The late November 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).

Agriculture Headlines

Crop insurance: Farmers get less from safety net than after floods
Dec 8, Iowa. Through Dec. 3, Iowa farmers received $705.4 million in drought-related insurance claims.

CSU ag economists’ survey aims to determine drought impact
Dec 20, Colorado. Agricultural economists at Colorado State University were surveying farmers and ranchers in the state in an effort to learn how drought affected Colorado’s agricultural activities in 2012 for a project called “Telling the Story – Drought in Colorado.” The economists plan to use the information to create more effective management tools for use in future droughts. The survey can be accessed at http://tinyurl.com/CSU-drought. The responses will be analyzed beginning in early January 2013.

Feedlots Buy Fewer Cattle on Smaller Supply as Feed Costs Gain
Dec 21, U.S. U.S. feedlots purchased 5.6 percent fewer young cattle in November, compared with the previous year.

Billion-Dollar Weather Disasters of 2012
Dec 20, U.S. Eleven billion-dollars disasters struck the U.S. in 2012, according to NOAA, with drought topping the list as the most costly disaster this year.

U.S. drought has tight hold, snow not seen as big help
Winter weather helps Mississippi River drought
Fig. 4a: Drought Monitor for the Western States with statistics over various time periods. No significant changes occurred this week. See latest Climate Assessment for the Southwest Report. See latest Western Water Assessment Report.
Fig. 4b: D4 conditions are over Georgia and Alabama. No significant changes this week. See the Weekly GriDSSAT Output Products: [http://gridssat.nsstc.uah.edu/](http://gridssat.nsstc.uah.edu/) for more details.

Fig. 4c: Drought Monitor for the High Plains with statistics over various time periods. Conditions remained essentially unchanged this week. See the latest Kansas Drought Report.
Fig. 4d: Drought Monitor for the **South-Central Region** with statistics over various time periods. Note some further deterioration in the D4 category this week. Check out the Texas Drought Website.
Figs. 5: Soil Moisture ranking in percentile as of 25 December shows dryness scattered across Plains, much of the Rockies, and eastern half of the Southwest. Wetness dominates from northern California, eastern Washington, southeastern Idaho, and much of New England. Freezing soils will increasingly dominate in the coming months and may skew actual moisture values over the Northern States.

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.
Soil Climate Analysis Network (SCAN)

011) MONTH=2012-11-27 (Daily) NRCS National Water and Climate Center – Provisional Data – subject to revision
Thu Dec 27 07:40:17 PST 2012

Fig. 6: This NRCS resource shows a site over central New York with surplus soil moisture at most levels. It appears that the sensor at the 40" depth has failed after the 18th of December.

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).
Fig. 7: Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Severe conditions exist over northeast New Mexico, the Central and Southern Plains, southeast Texas, and parts of the southeastern Georgia. As with soil moisture, streamflow data can be severely compromised by prolonged freezing temperatures. See the USGS National Water Information System Mapper.
Fig. 8: U.S. seasonal Drought Outlook released on 20 December.

See USDA Drought Assistance website.
Weekly Snowpack and Drought Monitor Update Report

National Drought Summary -- December 25, 2012

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 last 7 days, a couple winter storm systems moved across the United States, bringing much-needed precipitation to some of the drought areas. Widespread areas of an inch or more of precipitation occurred across the East and parts of the Midwest, with locally 2+ inches of rain. The drought depiction was improved where the heaviest precipitation occurred, but generally the precipitation this week was not enough to ease long-term deficits. Half an inch to an inch of precipitation fell over parts of the Rockies and intermountain basin. Two inches to over 5 inches of precipitation occurred over much of the West Coast, but generally not over drought areas. No precipitation was observed over parts of the southern Plains, northern High Plains, Upper Midwest, and southern Florida.

The Northeast: Widespread 1+-inch rains occurred across the Northeast, with locally 2+ inches. D0 in New York was contracted where this week’s rains erased precipitation departures out to 90 days. The SL impacts label was changed to L to reflect the beneficial short-term precipitation.

Southeast to Mid-Atlantic: A half-inch to locally 2+ inches of rain fell over a large part of the Southeast. It did little, however, to erase long-term deficits which, across large areas, ranged from 4 to 8 inches for the last 90 days, 4 to 12 inches at 6 months, and up to 16 inches for the last 12 months in Georgia and Alabama. However, some improvement was made where 2 to 3 inches of rain fell. D2 and D3 were pulled back in north Georgia, D1 in western North Carolina, and D0-D2 in central Alabama. The rain missed the Atlantic coastal areas and much of Florida. D1 expanded in southeast Georgia and D0S expanded in south Florida to reflect growing deficits.

South: Except for eastern areas, much of Texas and Oklahoma received little to no precipitation this week. D3-D4 expanded in Deep South Texas and north central to northeast Oklahoma. The drought has lowered lake levels that serve north central Oklahoma communities to the point that they could run out of water soon, according to media reports.

Midwest: A second week of widespread precipitation over much of the area was welcomed. Amounts were generally half an inch with locally an inch or more. But with longer-term deficits of several inches, little change was made. Only D0 was trimmed a bit in southwest Ohio.

The Plains: A blanket of snow was laid down from south central Nebraska toward the Great Lakes, but with less than an inch of moisture equivalent, no change was made in Nebraska. The precipitation largely missed areas to the south, so D3 expanded in southeast
Kansas and D2 expanded in southwest Missouri. But D3 was pulled back in central Iowa and D2 contracted in south central Iowa, east central Iowa, and adjacent northwest Illinois where the heaviest precipitation fell.

**The West:** With only half an inch of precipitation falling over parts of Wyoming, Colorado, Utah, and Arizona, and lesser amounts over much of the rest of the western U.S. drought areas, little change was made to the drought depiction. Heavy precipitation (5 inches or more) occurred over the coastal West, but mainly over areas that were drought-free. D2 was pulled back from Kings County in California due to an inch or more of precipitation.

**Hawaii, Alaska and Puerto Rico:** The windward areas of Hawaii received rain during the week, with 4+ inches being reported at eastern stations on the Big Island. D0 and D1 were pulled back on the east slopes of the Big Island above about 3000 feet elevation. No change was made to Puerto Rico this week, but D0 expanded across southeastern Alaska due to below-normal precipitation, snowpack, and streamflow.

**Looking Ahead:** Below-normal temperatures should dominate much of the country as an upper-level trough digs in over the next five days (December 26-30), continuing an active weather pattern with multiple winter storm systems. Precipitation amounts are forecast to be less than an inch across most of the West (except 1.0-1.5 inches along the coast) and parts of the Southeast, but 1.0-2.5 inches from the Mid-Atlantic to Northeast. A swath of half-inch precipitation may blanket the northern Plains, but otherwise the Plains should be mostly dry.

The CPC 6-10 day and 8-14 day forecasts (for January 1-9) show a return of above-normal temperatures to the north central region, continued below-normal temperatures in the Southwest, and below-normal temperatures in the East slowly shifting to the Northeast. Precipitation is expected to be above normal from the southern Plains to Mid-Atlantic states and in the eastern Great Lakes, while the forecast favors below-normal precipitation for much of the West, northern to central Plains, Upper Midwest, and New England. Alaska is expected to be warmer and wetter than normal.

**Author:** Richard Heim, National Climatic Data Center, NOAA

**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 December 26, 2012*
Highlights for the drought-monitoring period ending 7 am EST on December 18 include:

- There was another small drop – less than one-tenth of a percentage point – in overall U.S. drought coverage, from 61.87% last week to 61.79% on December 18.
- However, the portion of the contiguous U.S. in the worst category – D4, or exceptional drought – crept upward to 6.64%, the greatest U.S. coverage since November 22, 2011.
- Hay in drought (64%), cattle in drought (73%), and winter wheat in drought (63%) were all unchanged from the previous week.
- Hay in drought has been at or above 60% and cattle in drought has been greater than two-thirds of the domestic inventory for 24 consecutive weeks (July 10 – December 18).
- On the central Plains, winter wheat benefited from widespread snow on December 19. Any improvement in the central Plains’ drought situation will be reflected next week.
- **Weather outlook:** Winter storm and blizzard warnings remain in effect today for a large area of the Midwest, including much of Iowa and Wisconsin, as well as portions of neighboring states. Precipitation will largely end later today across the Midwest, but heavy snow will shift into parts of the northern and central Appalachians on Friday. Snow squalls will linger into the weekend downwind of the Great Lakes. Storm-total precipitation should reach 1 to 2 inches in many areas east of the Mississippi River, except for lower totals in the southern Atlantic region. Meanwhile, stormy weather will continue to move ashore in the West. Some of the most significant precipitation will fall in northern California, where 5-day totals could reach 4 to 8 inches. By early next week, a major storm system will emerge from the West, with rain expected to develop across the South and snow likely to overspread the Plains. A significant push of cold air will accompany and trail next week’s storm.

Brad Rippey, USDA Meteorologist
Office of the Chief Economist
World Agricultural Outlook Board
Washington, D.C.

Low reservoirs and persistent drought for much of the West, according to WGA and NOAA ‘Outlook’ on weather and climate

FOR IMMEDIATE RELEASE
December 21, 2012

DENVER -- The drought that made 2012 one of the driest years in the past century will likely persist across much of the West into March of 2013, according to the new Quarterly Climate Impacts and Outlook from the Western Governors’ Association (WGA) and the National Oceanic and Atmospheric Administration (NOAA).
The *Outlook* combines maps, projections and other products that provide information to decision makers about current and likely future weather conditions. Among the features of this release is a chart depicting reservoir storage in each of the Western states, which is below average for all states but Washington and Montana.

The Western Governors are focused on preparedness and resilience in the event of continued drought in 2013. Given the extent and severity of the current drought, WGA co-sponsored the National Drought Forum on December 12-13, 2012 in Washington, DC.

"Drought impacts next year could be far more severe, especially given that the reservoir storage in many basins has been depleted," said Kansas Governor Sam Brownback, who spoke at the event.

The *Outlook* is a quarterly publication that was developed by the WGA and NOAA after the two organizations signed a Memorandum of Understanding in June 2011. WGA and NOAA have also co-sponsored two regional meetings, one in the Pacific Northwest and one in the Upper Missouri basin.

All of the maps and information presented in the Outlook are also available from the National Integrated Drought Information System (NIDIS), which provides a number of online drought information tools at drought.gov. Western Governors were instrumental to the passage of NIDIS in 2006. NIDIS is currently up for reauthorization by Congress.

NOAA also releases region-specific Outlooks, including documents that focus on the Central Region, the Southern Great Plains, and the Western Region.

The *Outlook* is available on WGA's Weather and Climate Risk Initiative webpage.