



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

Weekly Report - Snowpack / Drought Monitor Update

Date: 29 November 2012

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: [SNOTEL](#) and ACIS 7-day temperature anomaly ending 28 November shows warmer than average conditions dominated the West; especially over the Central Rockies and Interior West (Fig. 1). ACIS [7-day](#) average temperature anomalies show the greatest positive temperature departures over south-central Idaho and Wyoming ($>+12^{\circ}\text{F}$). The greatest negative departure occurred over northern Montana ($<-9^{\circ}\text{F}$) (Fig. 1a).

Precipitation: [ACIS](#) 7-day average precipitation amounts for the period ending yesterday shows heavy amounts of precipitation over northwestern Washington and northwestern Montana (Fig. 2). In terms of percent of normal, northern Wyoming, southwest and northwest Montana, southeast Idaho, and north-central Nevada exceeded 200 percent this week (Fig. 2a). [SNOTEL month to date](#) precipitation percent of normal shows many basins over the Pacific Northwest catching up or exceeded on their percentages for this time of year (many are not). As for the remainder of the West, much of the Montana and portions of northern Wyoming Rockies including the Tahoe Basin are also recovering to near average conditions. Unfortunately, much of the Southern Tier States are not fairing as well with increasing deficits. This pattern of moisture continues the La Niña-like pattern we experienced in October (Fig. 2b). For the [2013 Water-Year](#) that began on 1 October 2012, statistics continue to favor the Northern Tier States with surplus moisture but *not necessarily* snowpack (Fig. 2c).

Snow ([Snow Water-Equivalent](#)): Early season snowfall over the West continues to show significant deficits with the exception of the Tahoe Basin, southwestern Utah, Bighorns of Wyoming, and south-central Idaho. Timing of significant precipitation events, in many cases, has been associated with mild temperatures (Fig. 3).

Summary: Mostly dry weather prevailed across drought areas of the contiguous U.S., with above-normal temperatures across the western half of the nation contrasting with near- to below-normal temperatures east of the Mississippi. Locally heavy rain and mountain snow persisted, however, across the central and northern Pacific Coast states as well as the northern Rockies. Meanwhile, a disturbance generated beneficial showers late in the period from the western and central Gulf Coast into the lower Ohio River Valley, although amounts were generally too light to afford any notable drought reduction. Rain from this system had not yet reached the Southeast as of the Tuesday morning cutoff for inclusion in this analysis; any potential benefits from the Southeastern rainfall will be addressed in next week's Drought Monitor.

Western U.S.: Stormy conditions continued to provide beneficial precipitation across western and northern portions of the region, while dry, unfavorably warm weather prevailed over central and southern drought areas of the west.

From central California into the northern Rockies and Northwest, Pacific moisture continued to fuel locally heavy rain and high-elevation snow (2 to 6 inches liquid equivalent, locally more),

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maintaining a favorable start to the winter wet season. However, high snow levels were reflected in the generally low Snow Water Equivalent (SWE) rankings; across the southern Cascades and northern Rockies, many SNOTEL sites are in the lowest 50th percentile, with some stations in the 20th percentile or lower. This is in sharp contrast to the precipitation rankings, which are almost all in the upper 50th percentile, with many stations in the 80th percentile or higher. Consequently, snowpacks are off to a poor start despite the wet weather pattern. Nevertheless, the heavy precipitation (mostly rain) resulted in some decrease of D0 (Abnormal Dryness) and D1 (Moderate Drought) in northern California.

In central and southern portions of the region, warm, dry weather maintained or intensified drought. Unlike areas farther north, the water year has gotten off to a poor start from central and southern California into the Four Corners region. Precipitation over the past 90 days has totaled less than 50 percent of normal, with some locales reporting less than 25 percent of normal. These short-term deficits coupled with lingering long-term water shortages led to an increase of Moderate to Severe Drought (D1-D2) from southern California into western New Mexico, while an area of Extreme Drought (D3) was introduced in southwestern Arizona to reflect the greatest negative departures (locally less than 10 percent of normal over the past 90 days). In central Colorado, SNOTEL precipitation and Snow Water Equivalent (SWE) rankings were mostly in the lowest 10th percentile, with many stations slipping below the 5th percentile. Consequently, Extreme Drought (D3) was expanded to reflect the increasingly dry conditions. Author: Eric Luebehusen, U.S. Department of Agriculture

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

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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/cgibin/bor.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

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

Nov 28, 2012

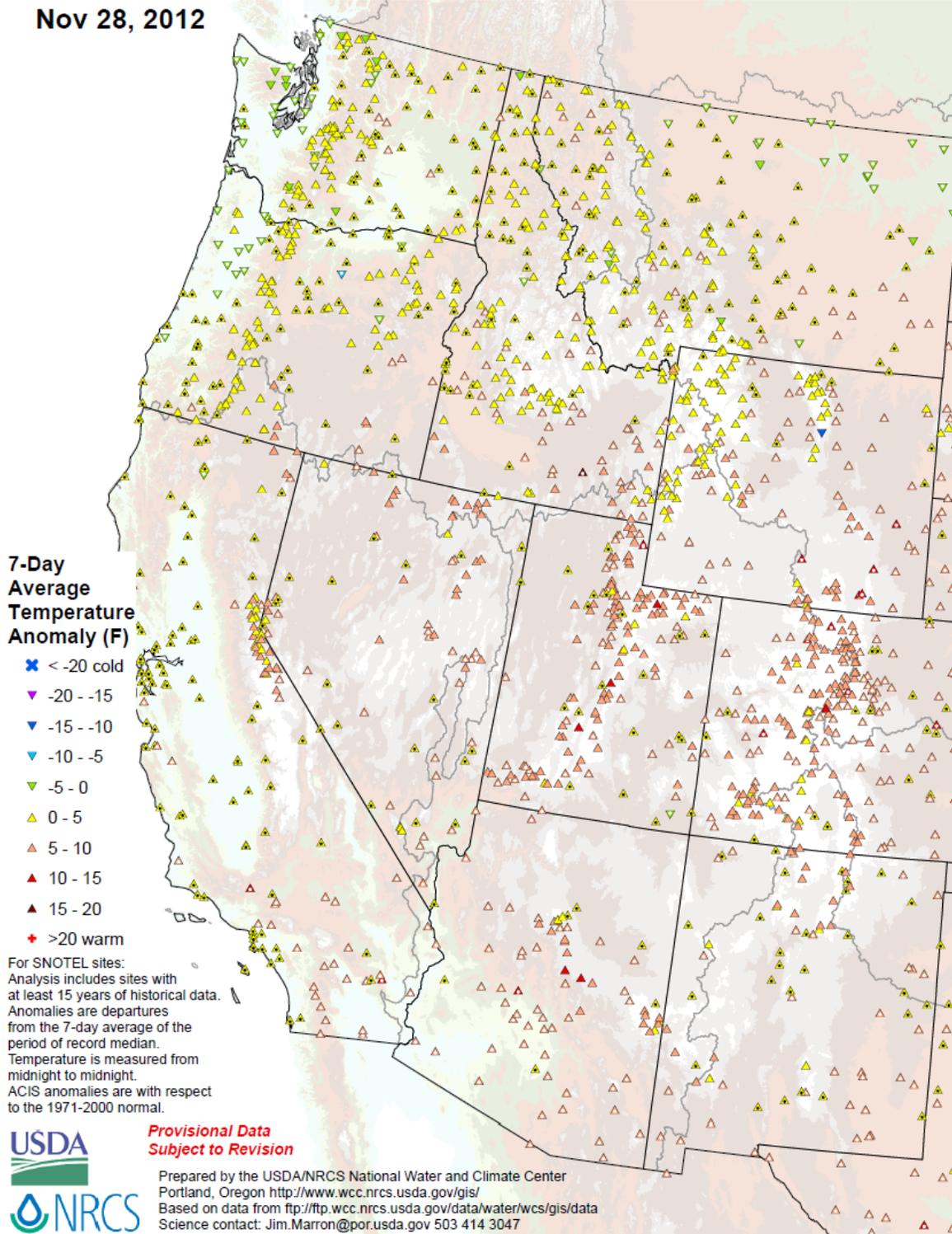
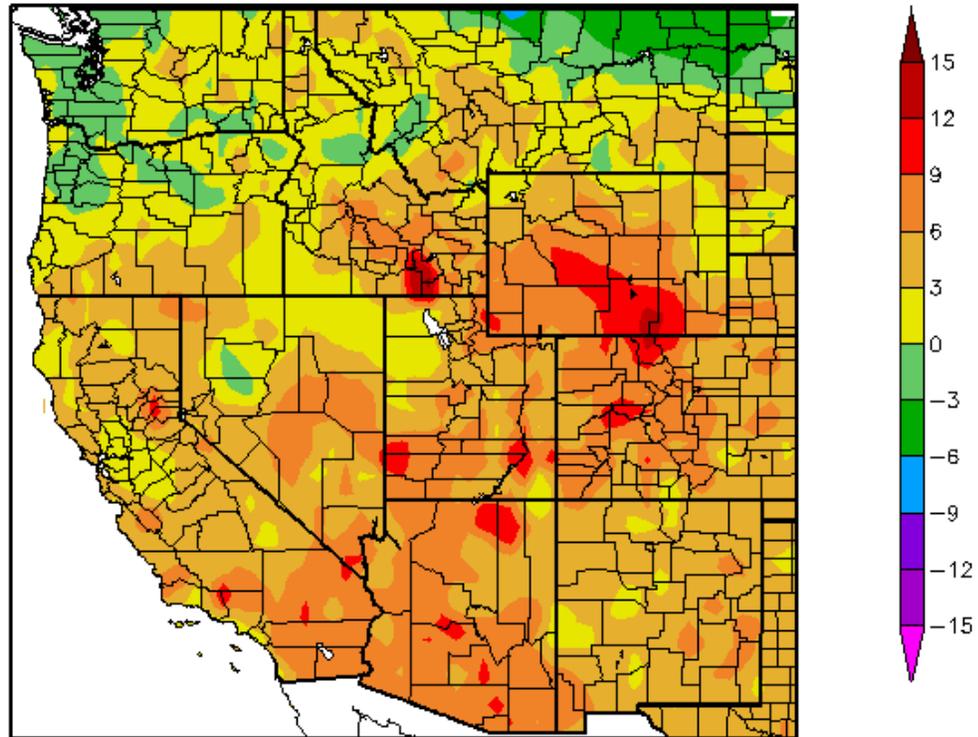


Fig. 1: SNOTEL and ACIS 7-day temperature anomaly ending 28 November shows warmer than average conditions dominated the West; especially over the Central Rockies and Interior West.

Departure from Normal Temperature (F)
11/22/2012 – 11/28/2012



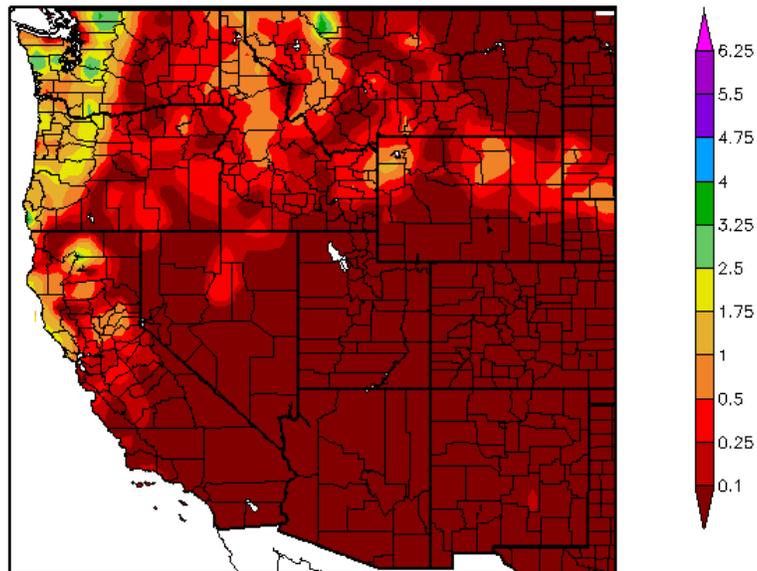
Generated 11/29/2012 at HPRCC using provisional data.

Regional Climate Centers

Fig. 1a: ACIS [7-day](#) average temperature anomalies show the greatest positive temperature departures over south-central Idaho and Wyoming (>+12°F). The greatest negative departure occurred over northern Montana (<-9°F).

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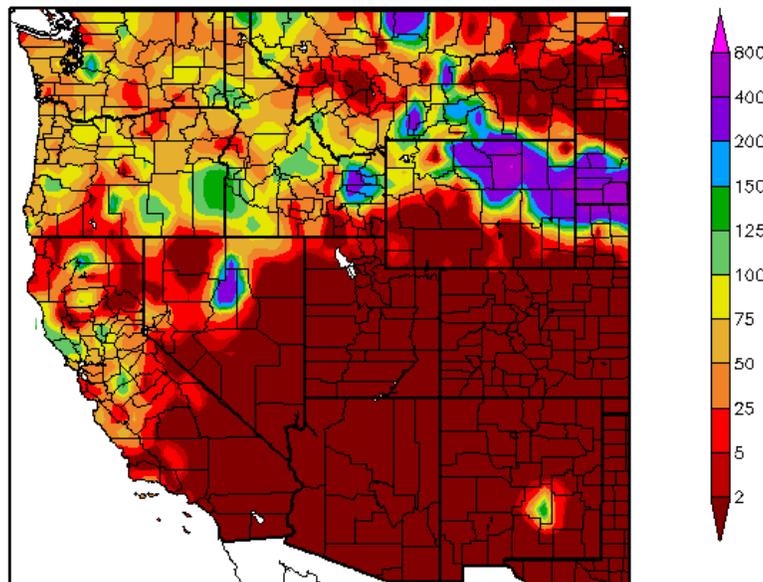
Precipitation (in)
11/22/2012 – 11/28/2012



Generated 11/29/2012 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
11/22/2012 – 11/28/2012



Generated 11/29/2012 at HPRCC using provisional data.

Regional Climate Centers

Fig. 2 and 2a: [ACIS](#) 7-day average precipitation amounts for the period ending yesterday shows heavy amounts of precipitation over northwestern Washington and northwestern Montana (top). In terms of percent of normal, northern Wyoming, southwest and northwest Montana, southeast Idaho, and north-central Nevada exceeded 200 percent this week (bottom).

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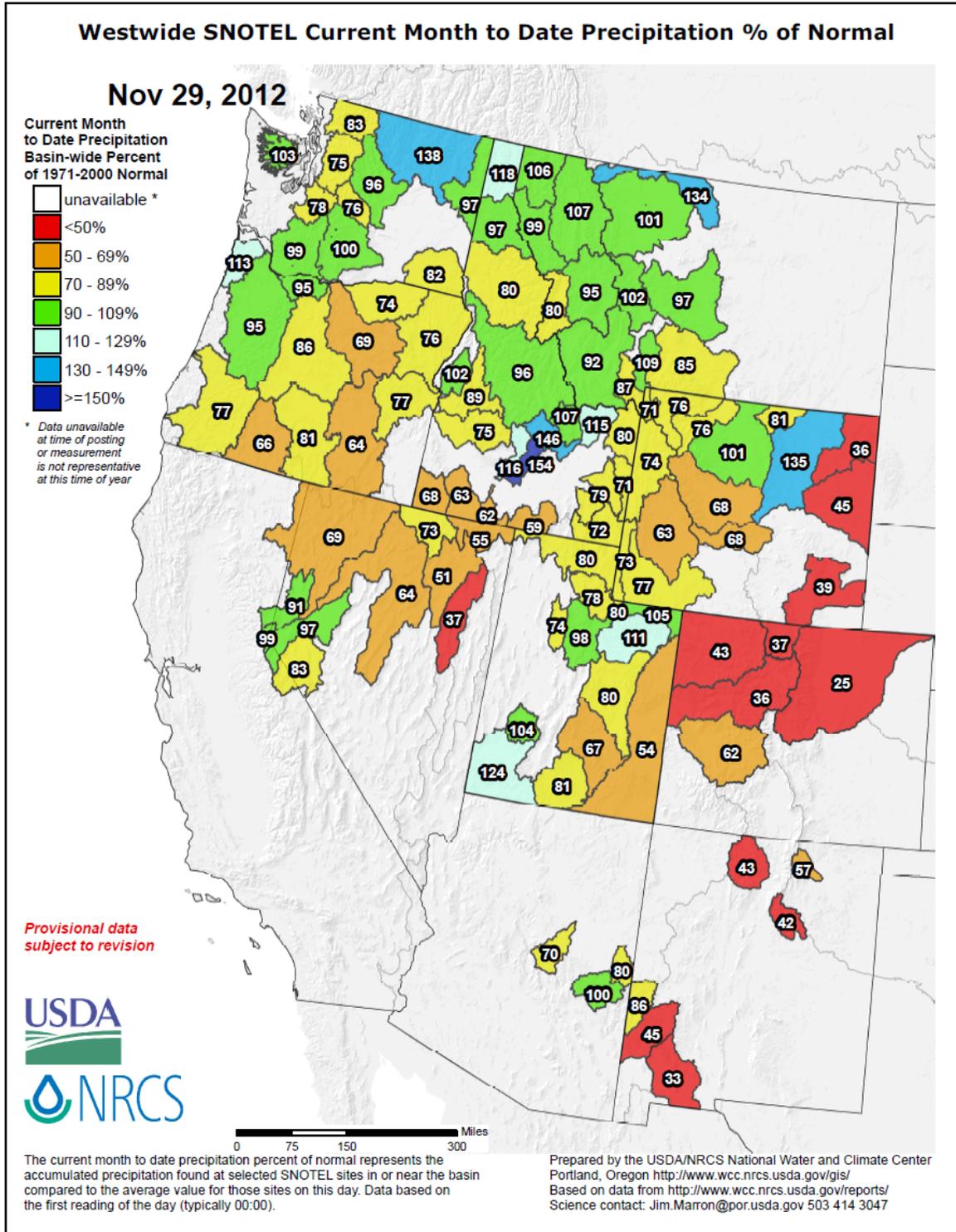


Fig. 2b: SNOTEL month to date precipitation percent of normal shows many basins over the Pacific Northwest catching up or exceeded on their percentages for this time of year (many are not). As for the remainder of the West, much of the Montana and portions of northern Wyoming Rockies including the Tahoe Basin are also recovering to near average conditions. Unfortunately, much of the Southern Tier States are not fairing as well with increasing deficits. This pattern of moisture continues the La Niña-like pattern we experienced in October.

Weekly Snowpack and Drought Monitor Update Report

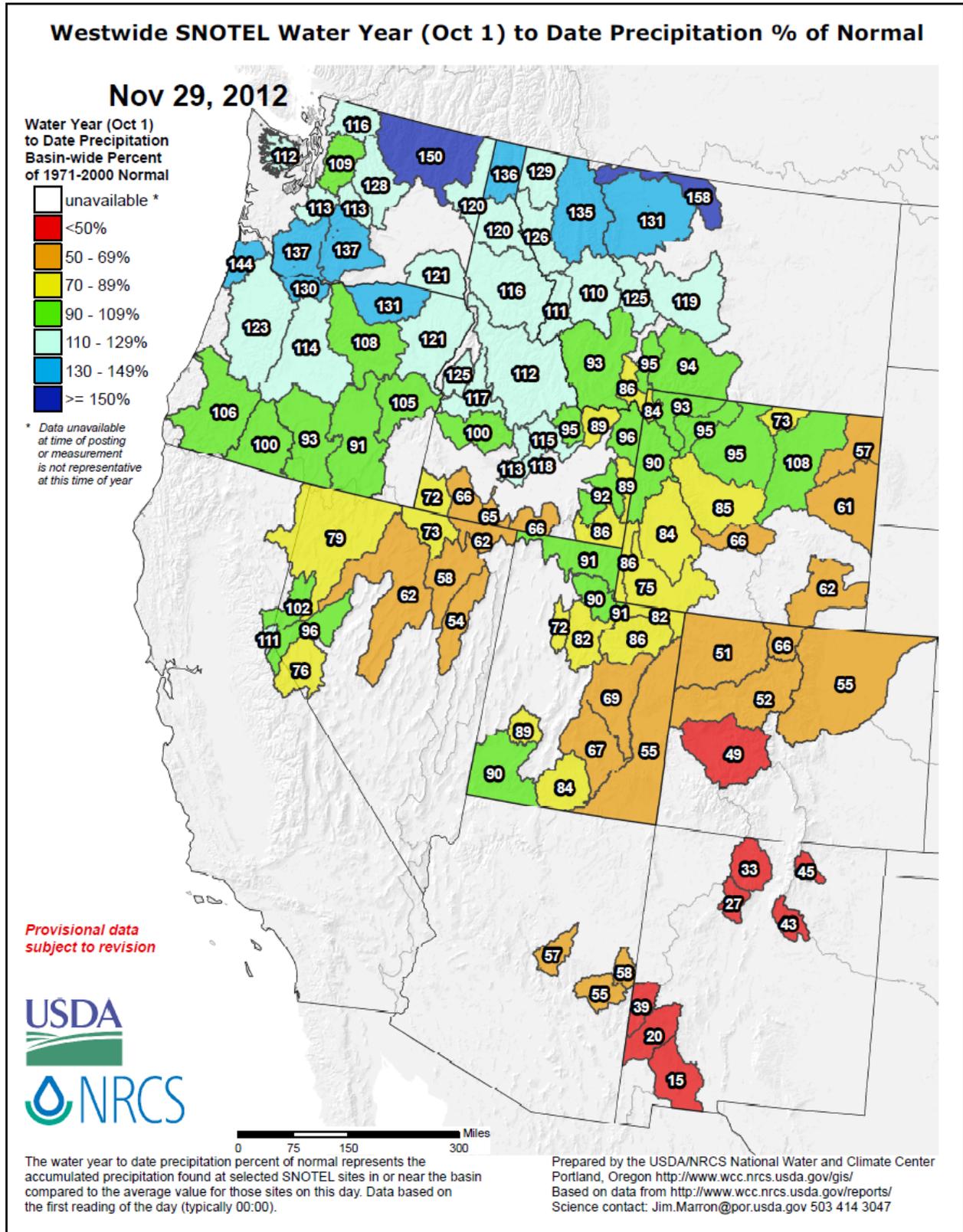


Fig. 2c: For the **2013 Water-Year** that began on 1 October 2012, statistics continue to favor the Northern Tier States with surplus moisture but *not necessarily* snowpack.

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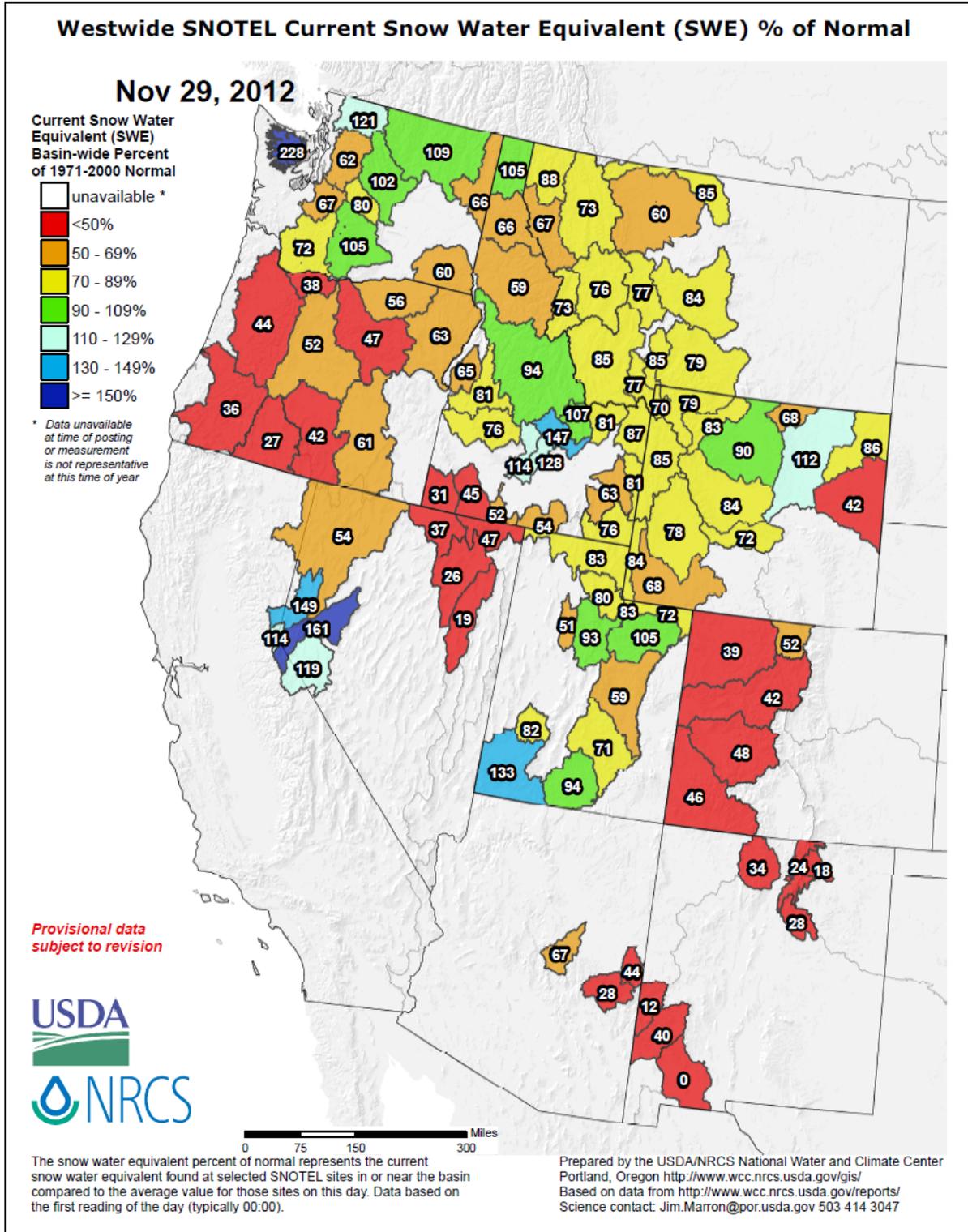


Fig. 3: Snow Water-Equivalent: Early season snowfall over the West continues to show significant deficits with the exception of the Tahoe Basin, southwestern Utah, Bighorns of Wyoming, and south-central Idaho. Timing of significant precipitation events, in many cases, has been associated with mild temperatures.

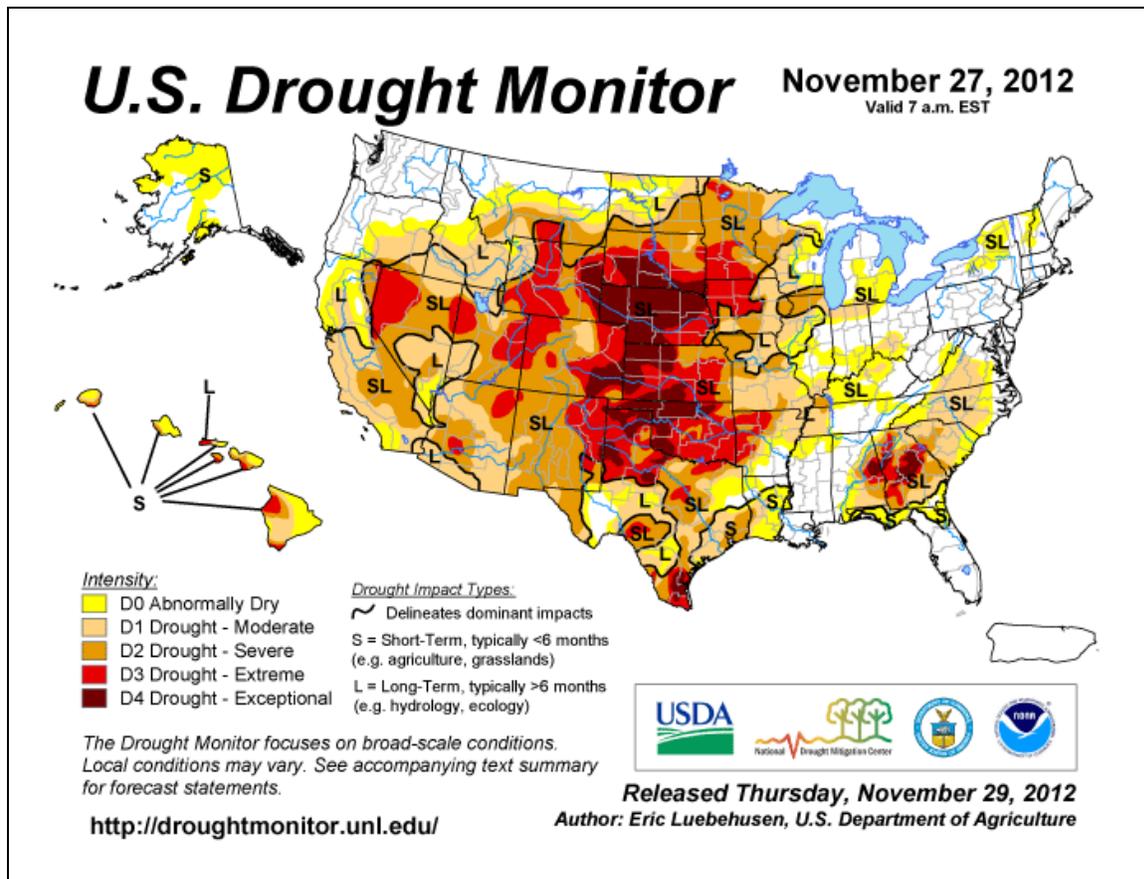


Fig. 4: Current [Drought Monitor](#) weekly summary. The exceptional D4 levels of drought are found over Georgia, Alabama, and scattered across the western corn belt of the Plains into Colorado and Wyoming. For more drought news, see [Drought Impact Reporter](#). Click for the latest statistics for [California 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

- [Another dry week stresses emerging Kansas wheat crop](#) - Nov 20, **Kansas**.
- [Christmas trees feeling effects of the drought](#) - Nov 20, **Michigan**.
- [Despite Severe Drought, Farm Income May Hit Record High](#) - Nov 16, **U.S.**
- [Indemnity checks flow to farmers after the 2012 drought](#) - Nov 20, **U.S.**
- [Nebraska wheat crop off to tough start](#) - Nov 21, **Nebraska**.
- [Texas crop, weather: Winter wheat crop in trouble](#) - Nov 20, **Texas**.

U.S. Drought Monitor

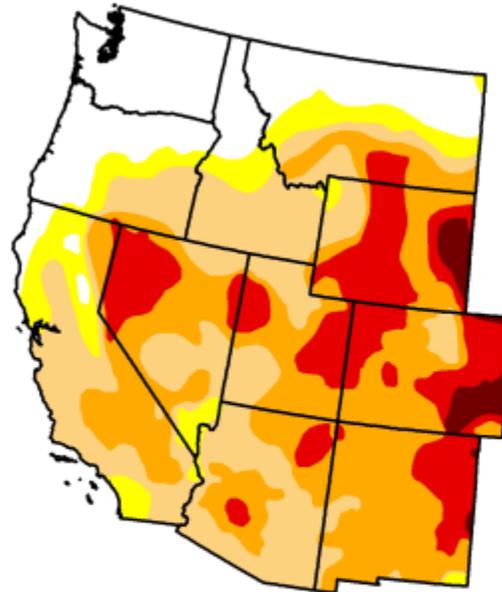
West

November 27, 2012
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	18.70	81.30	72.70	46.27	17.45	2.03
Last Week (11/20/2012 map)	18.30	81.70	72.33	43.17	16.92	1.83
3 Months Ago (08/28/2012 map)	15.07	84.93	74.27	44.37	15.89	1.15
Start of Calendar Year (12/27/2011 map)	48.49	51.51	20.05	12.22	2.67	0.78
Start of Water Year (09/25/2012 map)	15.12	84.88	77.15	43.65	16.85	1.77
One Year Ago (11/22/2011 map)	72.72	27.28	18.57	15.00	9.51	2.85

Intensity:

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



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

<http://droughtmonitor.unl.edu>



Released Thursday, November 29, 2012
National Drought Mitigation Center,

Fig. 4a: Drought Monitor for the [Western States](#) with statistics over various time periods. Some deterioration is noted this week over New Mexico (D2). See latest [Climate Assessment for the Southwest](#).

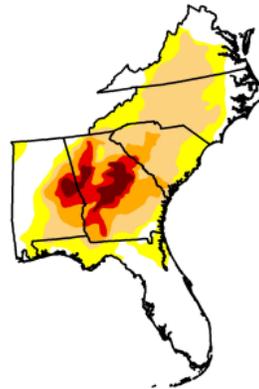
Weekly Snowpack and Drought Monitor Update Report

U.S. Drought Monitor Southeast

November 27, 2012
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	31.74	68.26	46.75	19.13	8.87	3.43
Last Week (11/20/2012 map)	42.62	57.38	30.76	15.21	8.05	3.43
3 Months Ago (08/28/2012 map)	61.21	38.79	21.48	12.09	8.59	3.46
Start of Calendar Year (12/27/2011 map)	40.38	59.62	43.05	28.62	18.71	0.00
Start of Water Year (09/25/2012 map)	66.49	33.51	17.18	11.50	8.53	3.52
One Year Ago (11/22/2011 map)	40.37	59.63	47.52	34.31	23.65	0.00

Intensity:



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

<http://droughtmonitor.unl.edu>



Released Thursday, November 29, 2012
National Drought Mitigation Center,

Here is the Georgia Ag report for November 25, 2012 from USDA office there...which will be the last one for the season.

According to the National Agriculture Statistics Service's Georgia Field Office, there were 6.7 days suitable for fieldwork for the week ending Sunday, November 25, 2012. Statewide topsoil moisture was rated at 38% very short, 41% short, 21% adequate, 0% surplus. Subsoil moisture 39% very short, 40% short, 21% adequate, 0% surplus. Precipitation estimates for the state ranged from no rain up to 0.4 inches. Average high temperatures ranged from the high 50's to the low 70's. Average low temperatures ranged from the high 20's to the low 60's.

This will be the last weekly release for the 2012 crop season. We will resume publishing the weekly reports on March 16, 2013.

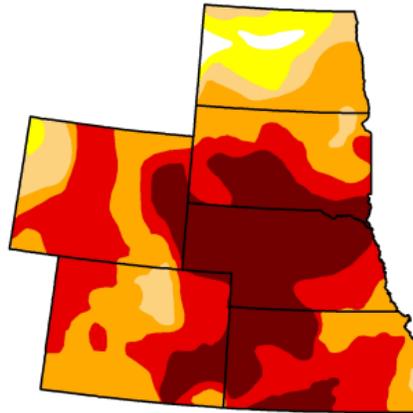
Fig. 4b: Note [Georgia's](#) drought statistics over various time periods. D4 conditions are also noted over eastern [Alabama](#). See the Weekly GridSSAT Output Products: <http://gridssat.nsstc.uah.edu/> for more details.

U.S. Drought Monitor High Plains

November 27, 2012
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.20	98.80	93.69	85.96	57.89	26.72
Last Week (11/20/2012 map)	1.20	98.80	93.88	84.32	55.94	26.28
3 Months Ago (08/28/2012 map)	1.25	98.75	88.07	79.12	54.19	14.97
Start of Calendar Year (12/27/2011 map)	61.66	38.34	18.12	7.22	2.07	0.04
Start of Water Year (09/25/2012 map)	0.00	100.00	98.91	83.80	61.28	24.35
One Year Ago (11/22/2011 map)	63.78	36.22	22.56	13.44	6.27	2.63

Intensity:



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

<http://droughtmonitor.unl.edu>



Released Thursday, November 29, 2012
National Drought Mitigation Center,

Fig. 4c: Drought Monitor for the [High Plains](#) with statistics over various time periods. D4 has increased to >26%. See the latest [Kansas Drought Report](#).

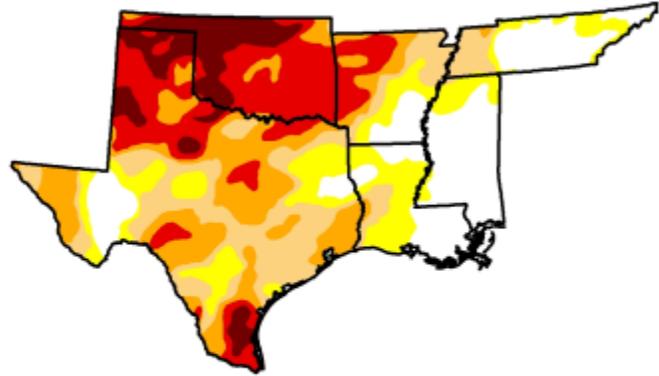
U.S. Drought Monitor

South

November 27, 2012
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	20.96	79.04	63.53	45.32	26.83	8.44
Last Week (11/20/2012 map)	24.39	75.61	61.12	42.60	23.57	8.17
3 Months Ago (08/28/2012 map)	20.94	79.06	66.22	46.19	28.33	11.29
Start of Calendar Year (12/27/2011 map)	26.47	73.53	69.01	54.81	39.11	17.15
Start of Water Year (09/25/2012 map)	24.13	75.87	66.61	51.50	29.86	9.11
One Year Ago (11/22/2011 map)	15.07	84.93	76.43	64.48	54.43	37.62



Intensity:

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

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

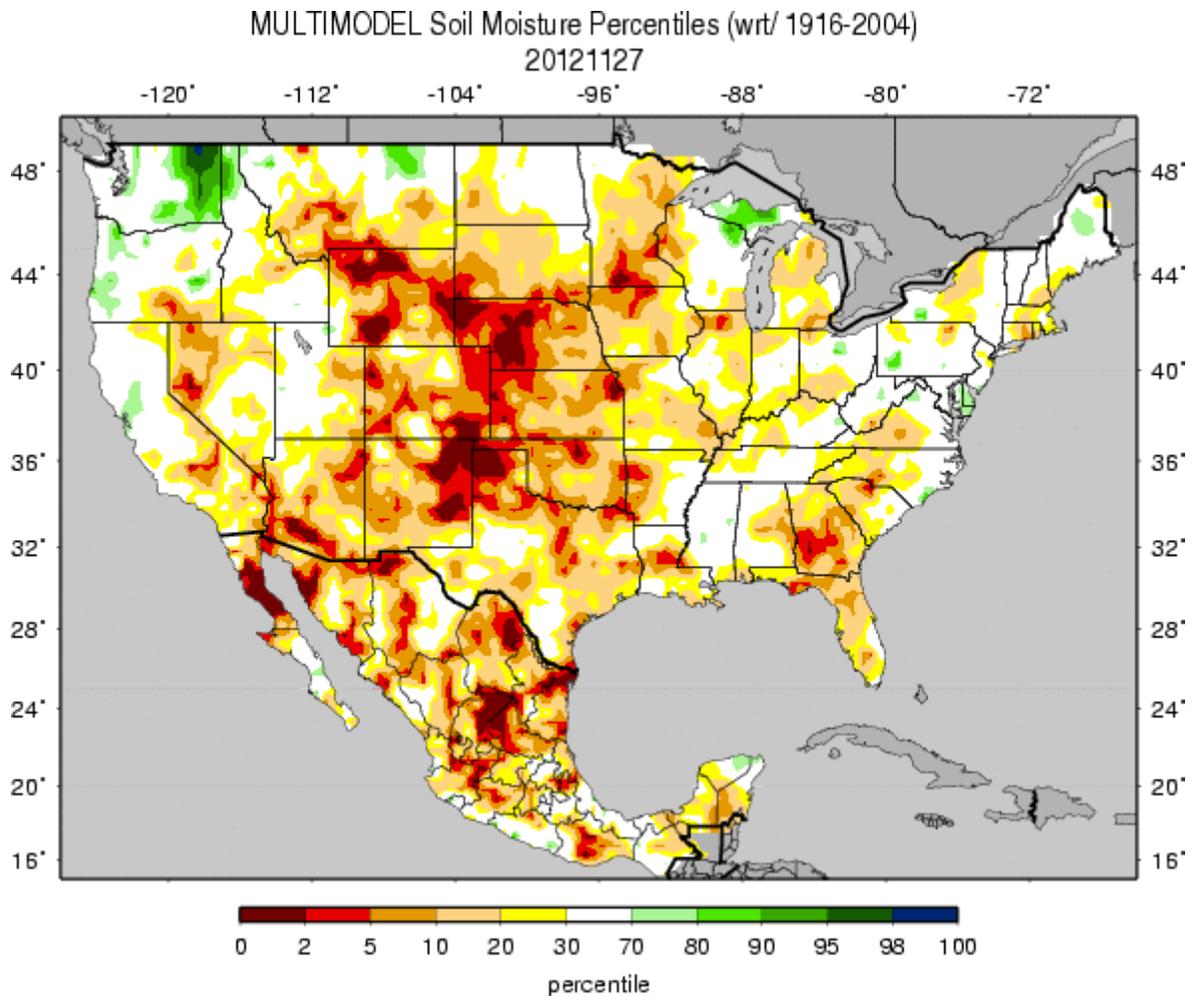


Released Thursday, November 29, 2012
National Drought Mitigation Center,

<http://droughtmonitor.unl.edu>

Fig. 4d: Drought Monitor for the [South-Central Region](#) with statistics over various time periods. Note increased deterioration in all categories this week. D4 increased to >8.4%. Check out the [Texas Drought Website](#).

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Figs. 5: Soil Moisture ranking in [percentile](#) as of 27 November shows dryness scattered across the Plains, Rockies, and Southwest.

Useful Hydrological Links:

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

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

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

ation (2093) MONTH=2012-10-30 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision
Thu Nov 29 07:38:25 PST 2012

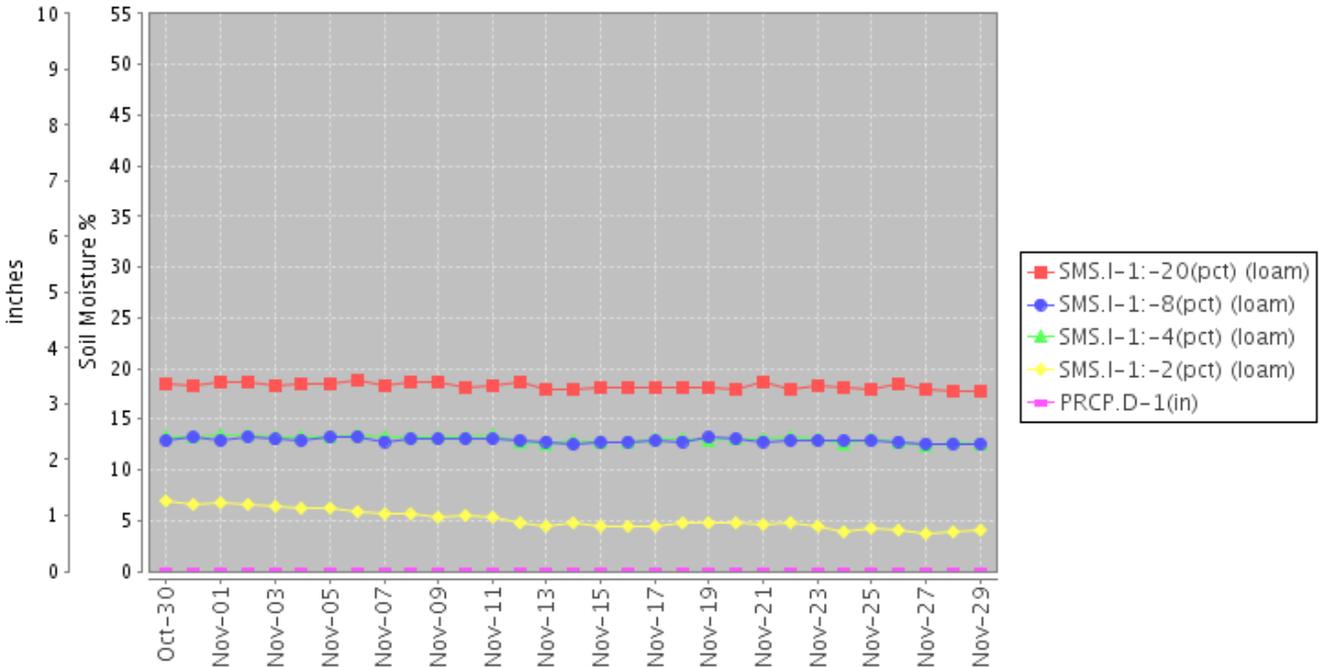


Fig. 6: This NRCS resource shows a site over [north-central Kansas](#) with soil moisture increasing with depth.

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).

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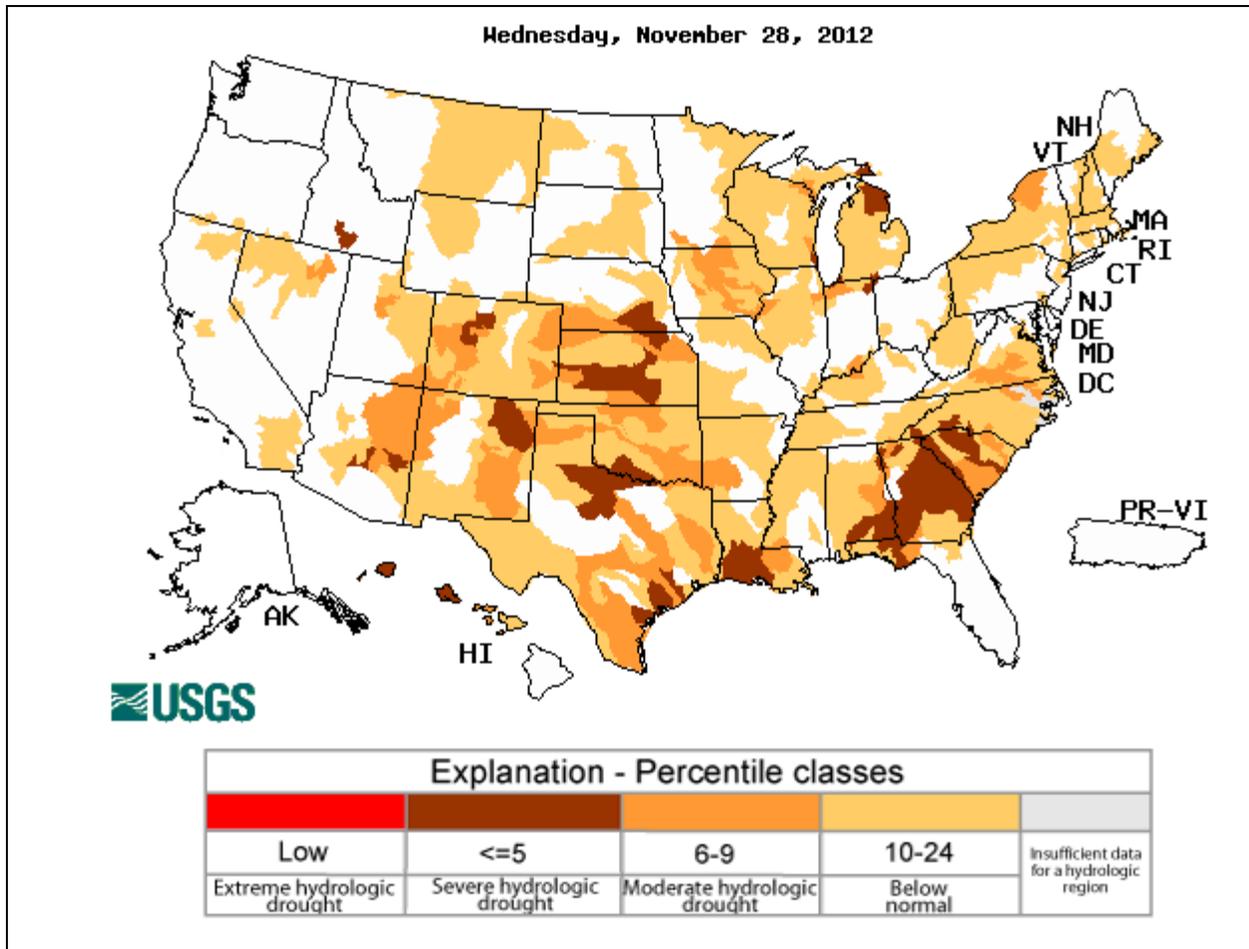


Fig. 7: Map of below normal 7-day average [streamflow](#) compared to historical streamflow for the day of year. **Severe** conditions exist over parts of Arizona, northeast New Mexico, western Colorado, the Central and Southern Plains, southeast Texas, southwest Louisiana, and Southeast. See the USGS [National Water Information System Mapper](#).

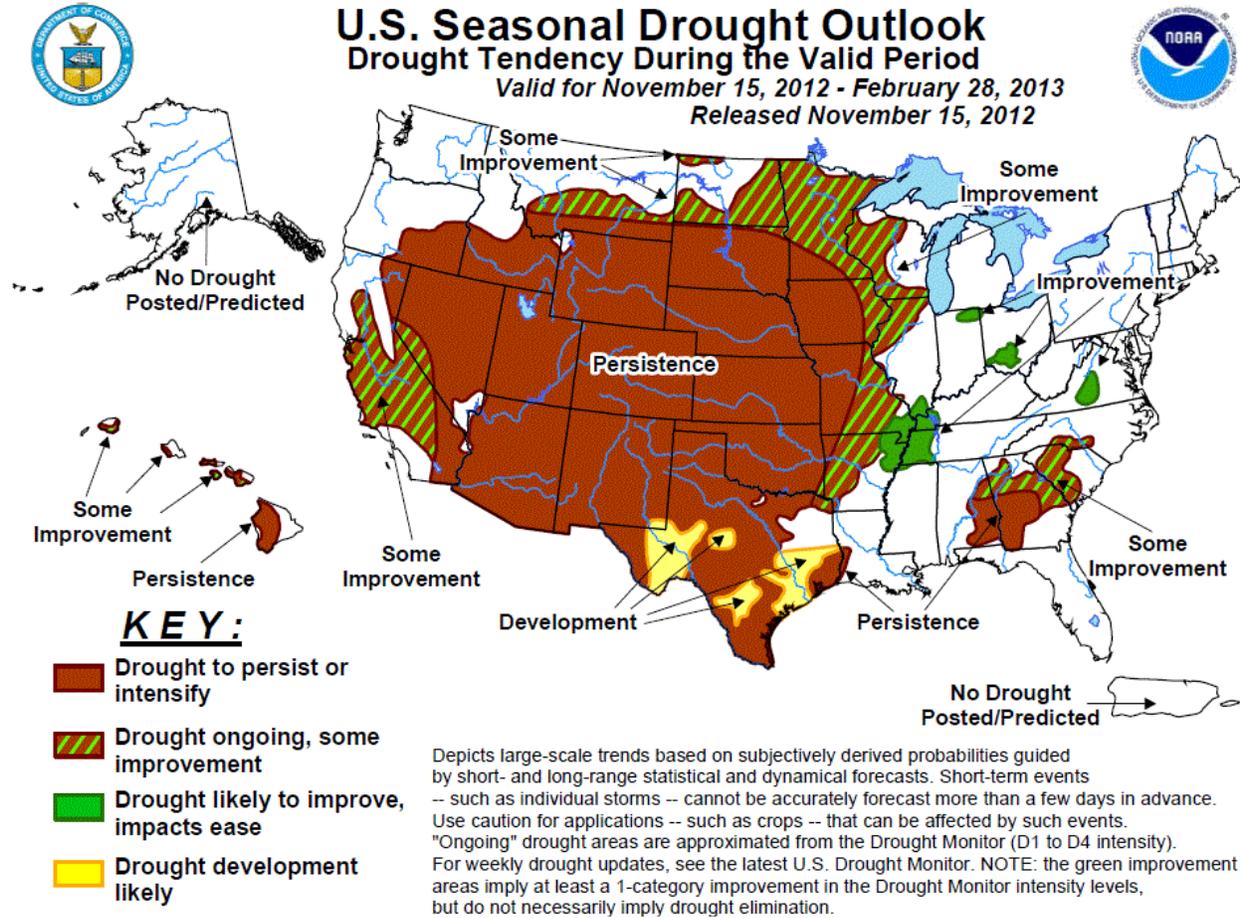


Fig. 8: [U.S. seasonal Drought Outlook](#) released 15 November 2012.

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National Drought Summary -- November 27, 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/>.

Summary: Mostly dry weather prevailed across drought areas of the contiguous U.S., with above-normal temperatures across the western half of the nation contrasting with near- to below-normal temperatures east of the Mississippi. Locally heavy rain and mountain snow persisted, however, across the central and northern Pacific Coast states as well as the northern Rockies. Meanwhile, a disturbance generated beneficial showers late in the period from the western and central Gulf Coast into the lower Ohio River Valley, although amounts were generally too light to afford any notable drought reduction. Rain from this system had not yet reached the Southeast as of the Tuesday morning cutoff for inclusion in this analysis; any potential benefits from the Southeastern rainfall will be addressed in next week's Drought Monitor.

Mid-Atlantic and Northeast: Mostly dry, cool weather continued. Abnormal Dryness (D0) was introduced along the Vermont-New Hampshire border to reflect declining streamflows as well as increasing precipitation deficits (locally less than 50 percent of normal over the past 60 days). Farther south, Moderate Drought (D1) expanded across southern Virginia, where 90-day rainfall has tallied less than 60 percent of normal and streamflows have likewise dropped into the 10th percentile or lower.

Southeast: Despite cooler-than-normal weather, conditions deteriorated across much of the region. It is important to note the rain which fell over the Southeast Tuesday into Wednesday did so after the Tuesday morning (8 am, EST) cutoff for this week's U.S. Drought Monitor (USDM); the impacts of this rain — if any — will be addressed in next week's issuance of the USDM. Abnormal dryness and drought expanded or intensified from the Carolinas into northern Florida. A disturbance triggered showers (0.5 to 1 inch) in west-central Alabama, preventing drought expansion in this locale for the time being. Elsewhere, rainfall over the past two months has totaled less than 50 percent of normal (locally less than 25 percent of normal) from northern Florida and southern Alabama northeastward across much of Georgia into central portions of the Carolinas. Streamflows across much of the Southeast — excluding central and southern Florida — are in the 5th percentile or lower. Further illustrating the drought's increasing impacts, pastures rated poor to very poor in Georgia have jumped from 29 to 53 percent over the past month (as of November 25), while winter wheat emergence in North Carolina stood at 45 percent as of November 25, 13 points behind last year and 7 percentage points behind the 5-year average.

Delta: Late-period showers provided a temporary reprieve from drought expansion, although Abnormally Dry conditions (D0) expanded in northeastern Louisiana where rain was generally light. Showers were heaviest (1-2 inches) in far northern Louisiana and central Mississippi, preventing any expansion of D0 across these locales. Lighter showers (0.5 to 1 inch) also fell across southern Louisiana, preventing expansion of Moderate Drought (D1) or Abnormal

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Dryness; however, if additional rain does not fall across the southern Delta soon, drought will likely intensify and expand. Streamflows are lowest in southwestern Louisiana (5th percentile or lower), and have been on the decline across the rest of the region in response to a drier-than-normal November.

South-Central U.S.: With the exception of far-southern Texas, drought intensified across much of the region as rainfall deficits mounted and soil moisture, streamflows, and other water reserves rapidly declined. The rain (0.5 to 2 inches), which fell primarily in the Lower Rio Grande Valley, afforded some modest reductions in Extreme Drought (D3) near and to the east of Laredo. Otherwise, widespread drought intensification was noted from southeastern Texas northward into Oklahoma, with substantial increases in the coverage of Extreme (D3) to Exceptional (D4) Drought in northern Texas and southern and eastern Oklahoma. The drought's impacts are far reaching, and are noted in the region's agricultural reports. As of November 25, the Texas winter wheat crop was rated 40 percent poor to very poor, a 15-point jump from last week. Meanwhile, the state's pastures have deteriorated from 43 percent poor to very poor in late October to 53 percent poor to very poor as of November 25. In Oklahoma, winter wheat and pastures stood at 44 and 80 percent poor to very poor, respectively. High-resolution, satellite-derived Vegetation Health Index (VHI) data indicated the worst conditions were entrenched both west of Corpus Christi and west of San Antonio, Texas, while a larger, more contiguous area of poor vegetative health extended from Lubbock, Texas northward into the Oklahoma Panhandle and eastward toward Ponca City, Oklahoma, along the Kansas border.

Central and Northern Plains: Unseasonably mild, dry conditions maintained or increased drought across much of the region, although a swath of light to moderate snow (0.25 to 1.0 inch liquid equivalent) afforded localized drought relief in southwestern South Dakota. The most notable changes were the expansion of Exceptional Drought (D4) in southern Kansas as well as an increase in Severe to Exceptional Drought (D2-D4) in central and northeastern South Dakota. Over the past 90 days, rainfall has totaled less than 25 percent of normal from south-central Nebraska northward into central South Dakota. Illustrating the drought's impacts, winter wheat was rated 64 and 25 percent poor to very poor in South Dakota and Kansas, respectively, as of November 25, while Kansas' pastures were rated 82 percent poor to very poor. Extreme to Exceptional Drought (D3-D4) also continued to afflict eastern Colorado, where pastures were rated 85 percent poor to very poor as of November 25. A small decrease in Exceptional Drought (D4) was made to southwestern South Dakota, where updated data and input from the field indicated some improvement; precipitation (including some snow) in this corner of the state has been near- to above-normal over the past 30 to 60 days.

Midwest/Tennessee Valley: Dry weather resulted in increases in drought intensity and coverage, although some showers were noted in southern portions of the region. Rain (0.25 to 1 inch) was generally confined to a pair of narrow bands, one extending across western and central Kentucky and the other across southwestern and central Tennessee. Otherwise, dry weather prevailed. Consequently, modest increases in D0 (Abnormal Dryness) and Moderate Drought (D1) were made to reflect increasingly dry conditions at 30 and 60 days as well as declining streamflows (20th percentile or lower) in eastern Tennessee, central and northern Kentucky, as well as neighboring portions of southern Illinois, Indiana, and Ohio. Farther north, a tight gradient exists between favorable rainfall over the past 90 days in central portions of Illinois and Indiana with sharply drier conditions (locally less than 50 percent of normal over the past 90 days) from northern Illinois into northern Indiana and southern Michigan. Many streamflows in these locales are currently in the 5th percentile or lower. Declining streamflows and increasing short-term precipitation deficits also resulted in the expansion of Abnormal

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Dryness (D0) across central and eastern Michigan as well as Moderate Drought (D1) in western sections of Michigan's Upper Peninsula. In the upper Midwest, Moderate to Severe Drought (D1 and D2) were expanded across northern Minnesota and northwestern Wisconsin, where short-term precipitation deficits were causing rapid declines in soil moisture and streamflows. The lingering benefits of a single heavy rain event in northeastern Minnesota during mid-June have been steadily undone by extremely dry conditions during the rest of the summer and autumn.

Western U.S.: Stormy conditions continued to provide beneficial precipitation across western and northern portions of the region, while dry, unfavorably warm weather prevailed over central and southern drought areas of the west.

From central California into the northern Rockies and Northwest, Pacific moisture continued to fuel locally heavy rain and high-elevation snow (2 to 6 inches liquid equivalent, locally more), maintaining a favorable start to the winter wet season. However, high snow levels were reflected in the generally low Snow Water Equivalent (SWE) rankings; across the southern Cascades and northern Rockies, many SNOTEL sites are in the lowest 50th percentile, with some stations in the 20th percentile or lower. This is in sharp contrast to the precipitation rankings, which are almost all in the upper 50th percentile, with many stations in the 80th percentile or higher. Consequently, snowpacks are off to a poor start despite the wet weather pattern. Nevertheless, the heavy precipitation (mostly rain) resulted in some decrease of D0 (Abnormal Dryness) and D1 (Moderate Drought) in northern California.

In central and southern portions of the region, warm, dry weather maintained or intensified drought. Unlike areas farther north, the water year has gotten off to a poor start from central and southern California into the Four Corners region. Precipitation over the past 90 days has totaled less than 50 percent of normal, with some locales reporting less than 25 percent of normal. These short-term deficits coupled with lingering long-term water shortages led to an increase of Moderate to Severe Drought (D1-D2) from southern California into western New Mexico, while an area of Extreme Drought (D3) was introduced in southwestern Arizona to reflect the greatest negative departures (locally less than 10 percent of normal over the past 90 days). In central Colorado, SNOTEL precipitation and Snow Water Equivalent (SWE) rankings were mostly in the lowest 10th percentile, with many stations slipping below the 5th percentile. Consequently, Extreme Drought (D3) was expanded to reflect the increasingly dry conditions.

Alaska, Hawaii, and Puerto Rico: In Alaska, cold, dry conditions continued, with temperatures averaging up to 10°F below normal. Dry weather has intensified over the past 60 days, and the increasing precipitation deficits along with declining SNOTEL Snow Water Equivalents (in the 20th percentile or lower across southern Alaska) led to an expansion of Abnormal Dryness (D0). In Hawaii, significant rain (1 to 4 inches) fell in some drought areas; however, it remains it's too early to tell if it was enough to show improvement. There were no concerns for drought on Puerto Rico, with moderate to heavy rain (2-6 inches) reported across central and eastern sections of the island.

Looking Ahead: Pacific moisture will continue to stream onshore, resulting in moderate to heavy rain and high-elevation snow (locally more than 12 inches, liquid equivalent) from central California into the Northwest and northern Rockies. Farther east, a weak cold front may bring some light showers to the Mississippi Valley late in the period, while light showers are possible

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in southern Texas. Otherwise, dry, warm conditions are expected across the remainder of the contiguous U.S., affording most drought areas little — if any — relief over the next 5 to 7 days. The CPC 6-10 day forecast for December 4-8 calls for above-normal temperatures across much of the nation, with cooler-than-normal weather confined to Southeastern Coastal areas. Drier-than-normal weather is expected to persist from the Four Corners region into the central and southern Plains and Southeast, while wetter-than-normal conditions prevail across the northern third of the nation.

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Dryness Categories

D0 ... Abnormally Dry ... used for areas showing dryness but not yet in drought, or for areas recovering from drought.

Drought Intensity Categories

D1 ... Moderate Drought

D2 ... Severe Drought

D3 ... Extreme Drought

D4 ... Exceptional Drought

Drought or Dryness Types

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

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

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