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Southwest Climate Hub Bulletin

News, research and events for the Southwest Hub region



December 2018

The Fourth National Climate Assessment

Given the media frenzy, most likely you already know that on Black Friday, the U.S. Global Change Research Program announced the release of the [Fourth National Climate Assessment](#) (NCA4). The second volume of the NCA4 "*Impacts, Risks and Adaptation in the United States*" is the most recent comprehensive national effort to evaluate the impacts of global change in the United States. The NCA4 was written by more than 300 contributors, including many from our USDA Climate Hub network. What you may not know is that the process of writing the NCA4 took over two years, or that this is the first time since 1990 (when the NCA was mandated by Congress), that it was published within the required four-year window. The [Southwest Chapter](#) builds on the three previous NCAs in identifying drought, water shortages, and loss of ecosystem integrity as major climate change challenges in the Southwest. The chapter also delves deeper into the interconnections between water, ecosystems, the coast, food, and human health and adds new Key Messages concerning energy and Indigenous peoples. If you're interested in the climate science behind NCA4 VOL II, then see the [Climate Science Special Report](#). And to learn more about the carbon cycle, see the [Second State of the Carbon Cycle Report](#).

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Photo credit: "[Lake Mead](#)" by Dave Edens is licensed under CC BY-NC 2.0. Photo date: November 14th, 2018

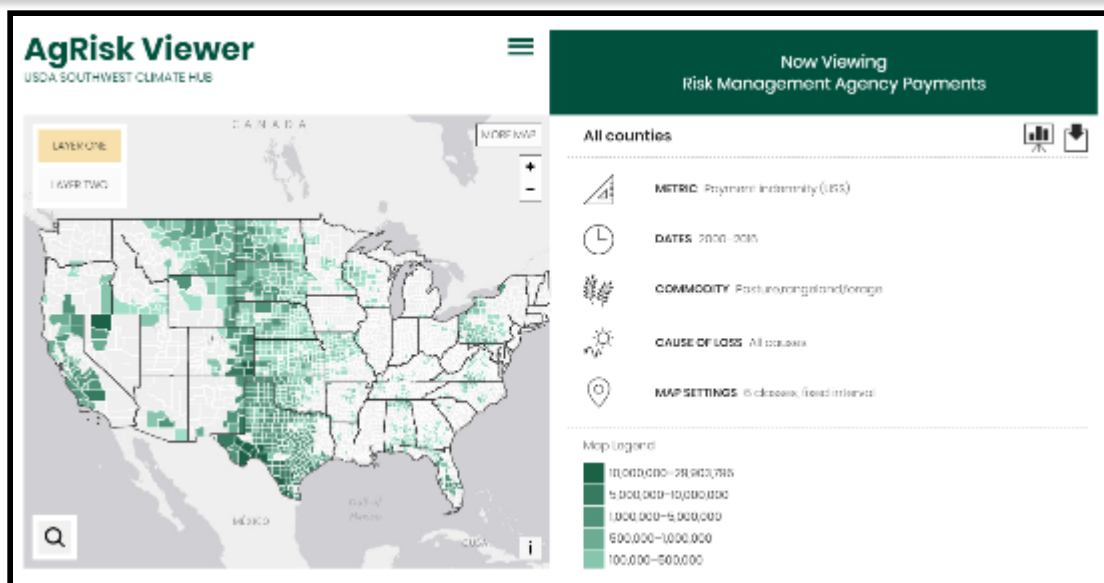
Agricultural risk in a changing climate

Once upon a time, if you wanted to analyze historical U.S. Department of Agriculture (USDA) Risk Management Agency (RMA) crop loss data, you would have to go to their webpage and download the original data files. Now, thanks to SW Hub Fellow Julian Reyes and his partners in the RMA, you can view historical data using the [AgRisk Viewer](#). The viewer allows the user to select and visualize crop losses at different spatial resolutions (county, state, national), for different time steps and time periods between 1989 and 2016, and by cause of loss (e.g., drought, excess moisture, hail), and commodity (e.g., wheat, corn). For more information about

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The example above shows the amount of acreage per county that received payments under the Pasture, Range and Forage (PRF) program between 2001 and 2016. Interestingly, most of the SW Hub counties (NM, AZ, UT, NV) show no payments likely due to lower enrollment in PRF insurance west of the High Plains and/or participation in other insurance and disaster assistance programs through the Farm Service Agency (e.g., Livestock Forage Program).

Drought News

In October, the National Drought Mitigation Center and the SW hub hosted a [Drought Monitor](#) workshop in Ogden, Utah. Attendees included state and federal agency personnel, Extension and producers, all of whom came to learn about how the Drought Monitor maps are made, the data that are used to create the maps, and the "convergence of evidence" approach that the Drought Monitor authors use when they are drawing the map polygons. Participants also learned about how the Drought Monitor is used to inform USDA decision-making, and discussed how to improve the coverage of precipitation monitoring, and drought impacts reporting. The workshop was a big success and received very positive feedback. The presentations from the workshop are available [here](#).

Throughout 2018, the SW Hub has been partnering with the National Integrated Drought Information System (NIDIS) Intermountain Drought Early Warning System (DEWS) and others to host regular drought discussion calls and drought impact webinars. The most recent webinars feature presentations on [The Developing El Niño and the On-going Drought in the Southwest](#) and an update on [El Niño and the Southwest Drought](#).

Southwest Adaptation Forum

The inaugural Southwest Adaptation Forum (SWAF) was held in Tucson, AZ from October 29-31, 2018. Hosted by the Southwest Climate Adaptation Science Center and Center for Climate Adaptation Science and Solutions, the goal of SWAF was to gather adaptation and assessment practitioners in the Southwest to share experiences and best practices and ultimately build a network dedicated to finding and implementing integrated, community-based adaptation

the [active Twitter discussion](#) during SWAF.



Drought Vulnerability Assessments to Inform Grazing Practices

Southwest Climate Hub NRCS liaison Amber Wyndham has designed a methodology for assessing rangeland forage vulnerability to drought that draws upon the [NRCS Ecological Site framework](#). Using this methodology, Amber completed drought vulnerability assessments for Major Land Resource Area (MLRA) 41 ("[Southeastern Arizona Basin and Range](#)" in SE Arizona and SW New Mexico) and Major Land Resource Area 69 (the "[Upper Arkansas Valley Rolling Plains](#)" in SE Colorado). We created Story Maps to help summarize Amber's findings. Click [here](#) to go to the Story Map for MLRA 41 and click [here](#) for the Story Map for MLRA 69.



Photo credit: Rangeland in Cochise County, AZ, by Bill Morrow is licensed under CC BY 2.0.

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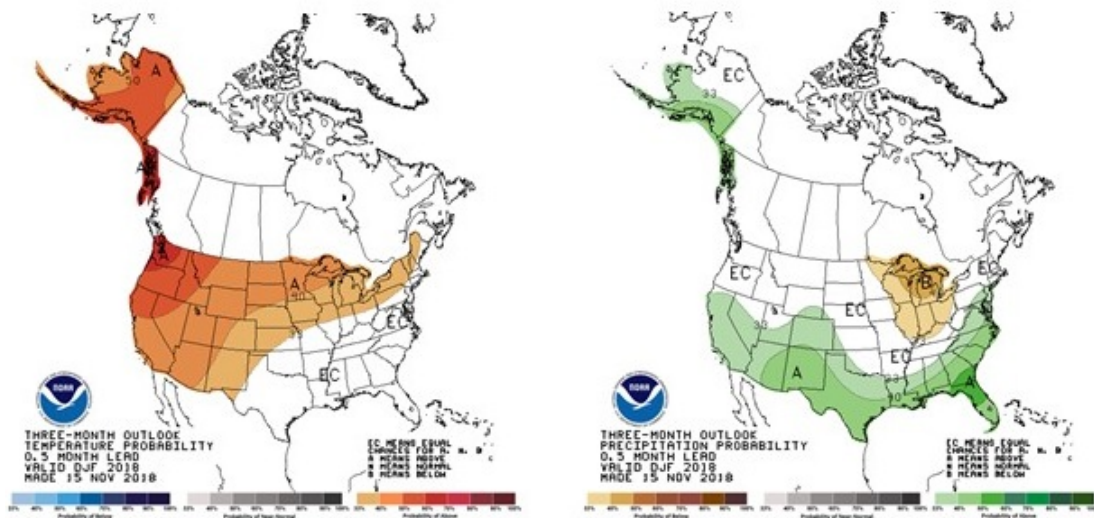
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Currently, we are on an [El Niño watch](#) status. Forecasters estimate there will be about a 90% chance of a weak El Niño for the winter 2018-2019 and ~60% chance that this will continue into the spring. El Niño can bring more snow to southwestern mountains as the winter storm track dips to a more southerly path. However, past events have shown that an El Niño winter does not guarantee a good snowpack. We recommend [this podcast](#) from Mike Crimmins and Zack Guido of CLIMAS. They discuss what we might expect for a 2018-2019 El Niño event in the Southwest.

As of Nov. 15, the [three-month outlook](#) (Dec-Jan-Feb 2018-2019) for much of the southwestern U.S. shows that there is a 33-40% chance of above normal temperatures and above normal precipitation. These outlooks are created monthly by NOAA Climate Prediction Center and based on departures from the 1981-2010 base period. If you're in Utah or eastern Nevada, you might be interested to see that that [one-month outlook for December](#) shows a 33-40% chance of below normal temperatures and a 40-50% chance of above normal precipitation. To view more short-term outlooks, please visit the [NOAA's National Weather Service Climate Prediction Center](#).

3-month outlooks

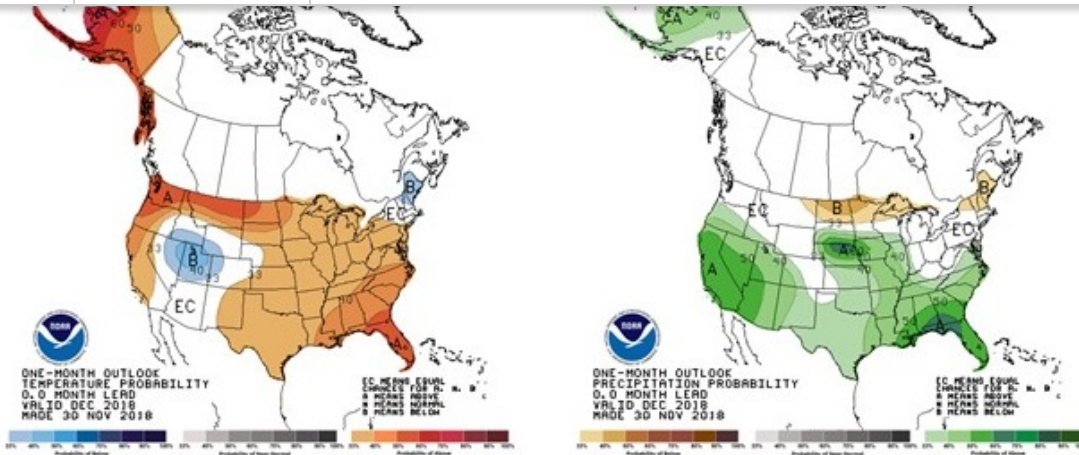


1-month outlooks

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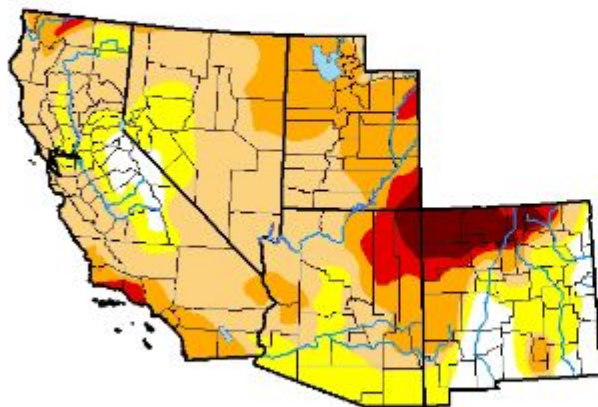


Drought

Drought conditions remain in place over much of the SW with Extreme Drought still persisting over the Colorado Plateau and Moderate Drought introduced in central Nevada where "precipitation deficits grew on multiple time scales and streamflow conditions worsened". You can see how the maps change from week to week using the [U.S. Drought Monitor Map Comparison Slider](#). Earlier maps from 2018 are also shown as a slideshow in this [story map](#), which summarizes some of the localized impacts and resilience in the region.

U.S. Drought Monitor USDA Southwest Climate Hub

December 11, 2018
(Released Thursday, Dec. 13, 2018)
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D1	D1-D2	D2-D3	D3-D4	D4
Current	7.58	92.42	72.58	31.25	8.38	4.00
Last Week 12-04-2018	7.58	92.42	71.79	31.56	8.03	4.01
3 Months Ago 09-11-2018	4.52	95.48	14.84	45.57	21.39	5.71
Start of Calendar Year 01-01-2018	30.85	68.15	41.73	8.36	0.00	0.00
Start of Water Year 09-23-2017	4.35	95.65	74.84	48.75	22.74	5.92
One Year Ago 12-11-2017	32.28	67.72	34.31	0.40	0.00	0.00

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

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

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National Drought Mitigation Center



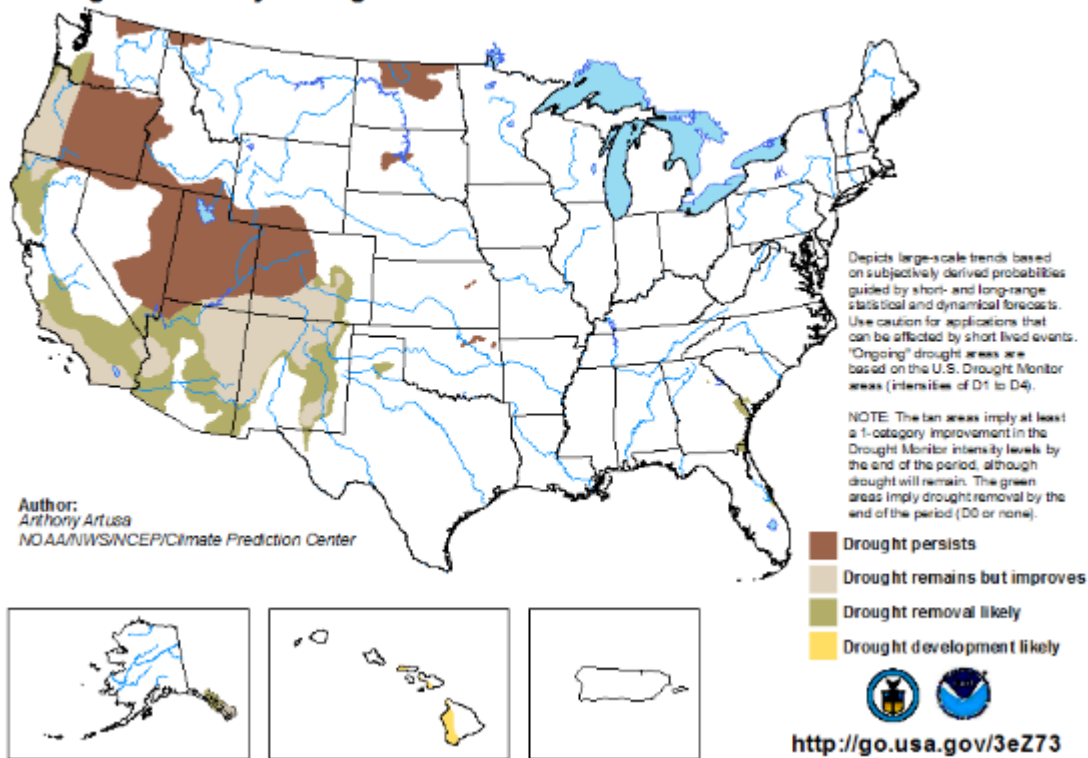
<http://droughtmonitor.unl.edu/>

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and eastern Nevada, and may develop in Hawai'i.

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for November 15, 2018 - February 28, 2019
Released November 15, 2018



Research

[What We Talk about When We Talk about Soil Health](#) The authors analyzed the assessment practices for cover crop and no-tillage studies for improving soil health. (Agricultural & Environmental Letters)

[Broad threat to humanity from cumulative climate hazards intensified by greenhouse gas emissions](#)

The authors examined the impacts of the ongoing emission of greenhouse gases and found 467 pathways by which humanity is being impacted by climate hazards. (Nature Climate Change)

[Advancing the Sustainability of US Agriculture through Long-Term Research](#)

The authors explore the concept of how and where in the U.S. agriculture can be sustainably intensified by examining the U.S. Department of Agriculture's Long-Term Agroecosystem Research network. (Journal of Environmental Quality)

[The future of subalpine forests in the Southern Rocky Mountains: Trajectories for Pinus aristata genetic lineages](#)

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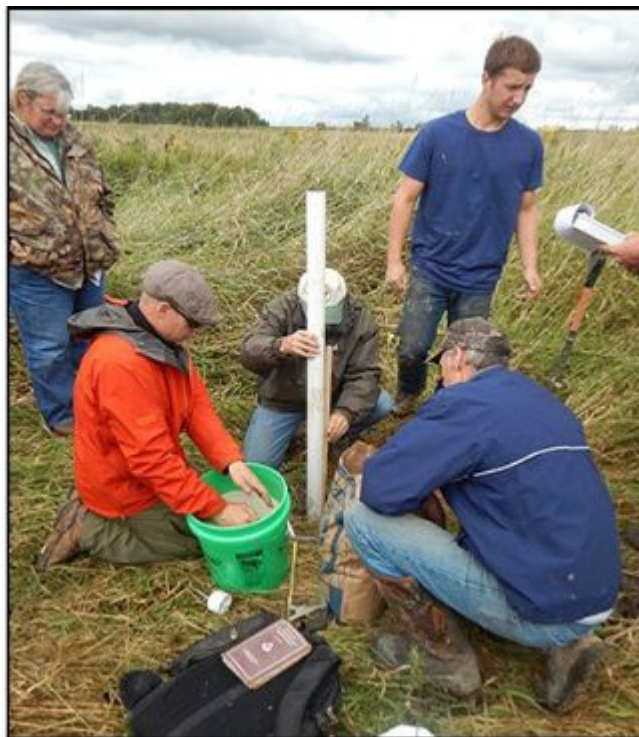
future climate projections.
(PLoS One)

[Are Landowners, Managers, and Range Management Academics on the Same Page About Conservation?](#)

The Central Coast Rangeland Coalition in California brings together ranchers, land managers, and academics and topics related to rangelands are identified. The topic for 2018 was barriers to conservation that could be addressed by agencies and nongovernmental organizations.
(Rangelands)

Internship Opportunities

The USDA has announced internship opportunities through the OneUSDA Internship Program. This program offers Federal opportunities to students currently enrolled in qualifying educational programs or institutions. [This web page](#) summarizes the available opportunities for individuals interested in an internship in soils through the Natural Resources and Biological Sciences job series. The job announcement opened December 3, 2018, and will close on January 18, 2019.



Events

- [American Meteorological Society Meeting](#) Jan. 6-10, 2019
- [Southwest Indian Agricultural Association](#) Jan. 21-24, 2019
- [SWCH Fire & Soil Moisture Workshop](#) Jan 31, 2019
- [WRRC Conference 2019 - Arizona Runs On Water: Scarcity, Challenges, and Community-based Solutions](#) Feb. 1, 2019
- [National Association of Conservation Districts](#) Feb. 2-6, 2019

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- [California Climate & Agriculture Summit](#) Mar. 4-5, 2019
- [84th North American Wildlife & Natural Resources Conference](#) Mar. 4-8, 2019
- [Sustainable Water Management Conference](#) Mar. 31-Apr. 3, 2019
- [After the Flames](#) Apr. 1-3, 2019
- [National Adaptation Forum](#) Apr. 23-25, 2019
- [UCOWR 2019 conference](#) June 11-13 2019
- [SWCS Annual International Conference](#) Jul 28-31, 2019

Webinars

- [Fourth National Climate Assessment - Tribes and Indigenous Peoples](#) Jan. 10, 2019
- [Winter Weather, Climate and Snow](#) Jan. 17, 2019
- [California-Nevada Drought & Climate Outlook](#) Jan. 28, 2019



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