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Southwest Climate Hub Bulletin

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News and research for the Southwest Climate hub region

December 2016



Kelly Redmond

Jan. 5, 1952 - Nov. 3, 2016

We are very sad to relay the news of the passing of Dr. Kelly Redmond, deputy director of the [Western Regional Climate Center](#) and professor at the [Desert Research Institute](#). Dr. Redmond passed away on November 3, 2016, after a long illness. He was a highly respected climatologist, a veteran science communicator, and an enthusiastic mentor to young climate scientists.

Since 1989, when NOAA created its six [Regional Climate Centers](#), Dr. Redmond held the position of Regional Climatologist for the Western US. The NOAA RCCs were at the vanguard of federal attention to climate variability and change, and they helped pave the way for climate programs at other agencies, including the USDA Climate Hubs.

As Regional Climatologist, Dr. Redmond not only worked to improve data collection and analysis for the West's complicated and variable climate, he inspired and informed popular interest in these topics. He often gave public lectures (for example, on [climate change and Western water](#) at the Aspen

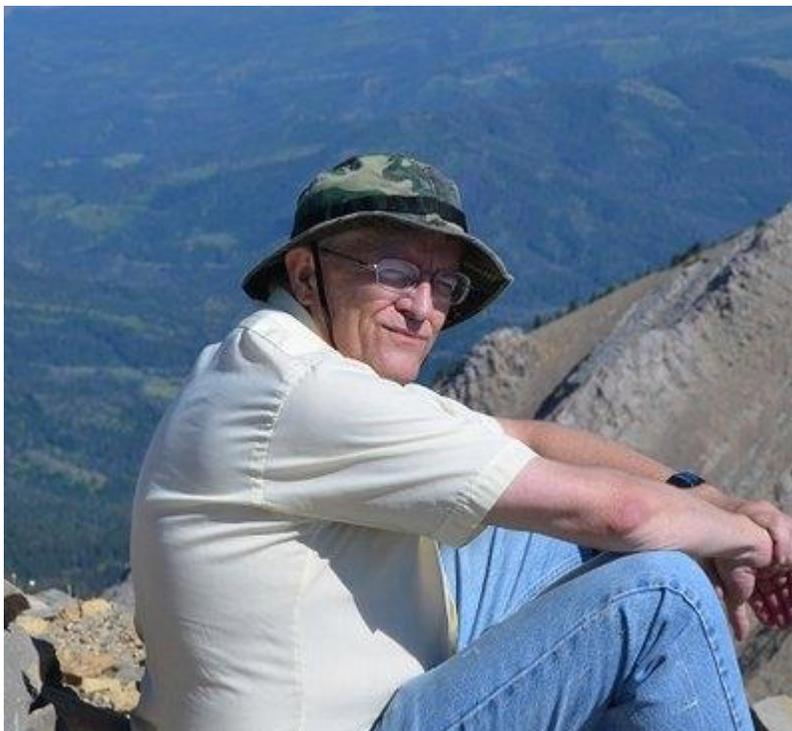
[thunderstorms](#) and [Drought Thunderstorms](#)).

At the [2015 US Drought Monitor Forum](#) in Reno, NV, Dr. Redmond discussed the challenge of seasonal forecasts: land users want short-term predictions, but current models are unreliable at that time scale. “We need to consider the ‘angle of repose’, Dr. Redmond said. *“Some problems have a steep angle of repose: it doesn’t take long to stack the building blocks up tall and reach your answer. Other problems have a shallow angle of repose: you need to amass a huge base of additional knowledge before you can even begin to make headway. Which type of problem is this? The climate system is chaotic at monthly time scales, so I would argue that it is the latter – but it is still worth pursuing. We just need to be in it for the long haul.”*

Thank you, Dr. Redmond, for your sustained effort on climate puzzles large and small, and for eloquently bringing these topics into the public view. Your Climate Hub colleagues greatly miss your insights, encouragement and friendship.

A memorial service for Kelly Redmond will be held at 2 PM on Friday, January 13, at Truckee Meadows Community College in Reno. [You can RSVP here](#). Kelly's obituary may be viewed on [legacy.com](#).

- Amber Kerr, Coordinator, California Climate Hub



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We searched YouTube archives for some classic Kelly Redmond. Here is our favorite video, filmed at UC Irvine and hosted by the [Newkirk Center for Science and Society](#). It is an example of Kelly at his best: educating, communicating and entertaining.

Southwest Extension Climate Change Workshop

In early December, 2016, Cooperative Extension agents and faculty from Land Grant Universities in the Southwest Hub region participated in a novel Climate Change Workshop. Hosted by University of Arizona's [Center for Climate Adaptation Science and Solutions](#) (CCASS), the primary goal of the workshop was to develop a regional partnership to enable Extension to successfully incorporate climate change information into their programs. The idea for a Climate Change workshop grew from a small meeting held in Davis, California, in February 2015. Discussions at the Davis meeting included the [beginnings of a regional effort](#) for introducing Extension audiences to climate change and how best to coordinate efforts with the Southwest Climate Hub. Following this meeting, Mark Walker (University of Nevada Reno) submitted a successful grant application to NIFA to fund the Climate Change Workshop in Tucson. And further financial support was committed by the Southwest Hub, University of Arizona, University of California, University of Guam, University of Hawaii, University of Nevada Reno and New Mexico State University.

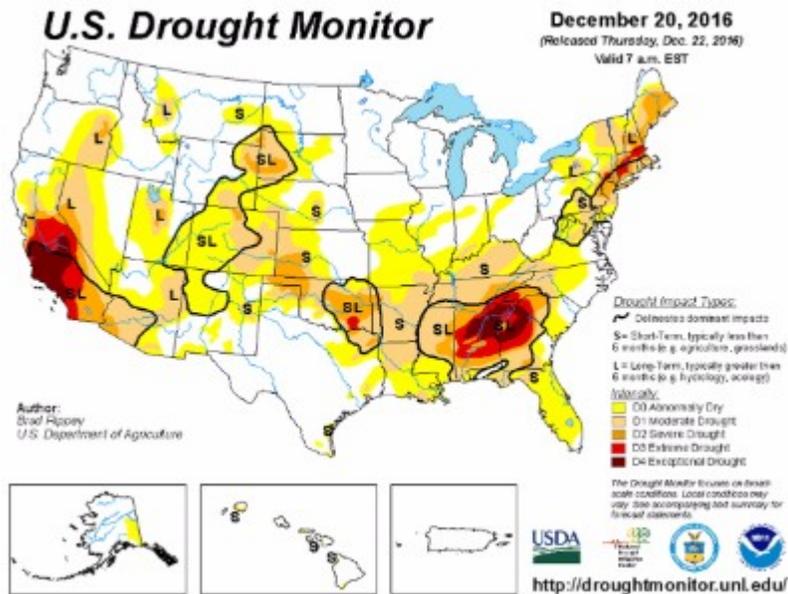
The Climate Change Workshop was a great success and there are several outputs to expect in the coming months. CCASS, Extension partners and the Hub are working on video proceedings, a conference report and workshop evaluation. Other activities are in the pipeline - watch this space for updates!

Drought and La Niña Workshop

Working with the [National Drought Mitigation Center](#), NMSU's Cooperative Extension, the [National Integrated Drought Information System](#), [CLIMAS](#), the National Weather Service, and the University of Arizona, the SW Hub hosted a one-day Drought Workshop on October 25, 2016. Over 60 stakeholders, Extension agents, and federal partners attended. The workshop was well-received and generated useful feedback to the National Drought Mitigation Center about the drought monitor and other technologies. It also highlighted the potential for collaboration between the SW Hub and the local Farm Service

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southwestern New Mexico. If this is successful we hope to expand the program to other FSA districts. We also plan to work with NMSU's Cooperative Extension to bring the information presented in the drought workshop to a wider audience via a series of smaller workshops.



La Niña conditions weaken, neutral conditions may return

[CLIMAS reports](#) that although a weak La Niña persists, we are likely to see a return to neutral conditions during this winter. But neutral conditions are unlikely to bring much relief to the current drought. Unfortunately, below-average precipitation and above-average temperatures are likely to continue. For a good summary of NOAA's Winter Outlook for your region, check out [this article](#) from LIVESCIENCE

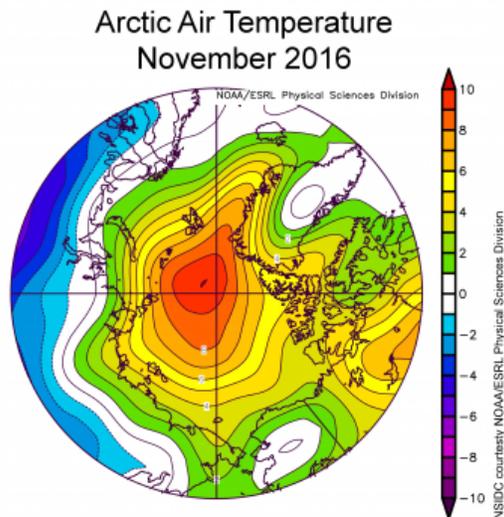
Learn about Climate Change Adaptation: Online Resource

The US Forest Service's [Climate Change Resource Center](#) (CCRC) has recently released a new education resource on climate change adaptation responses to help the Forest Service, Climate Hubs, other agencies, and the general public learn more about responding to a changing climate. The new interactive module, "[Responses to Climate Change: What You Need to Know](#)", provides a brief, 15-minute overview of adaptation options for resistance, resilience, and transition, and describes how to incorporate these ideas into natural resource planning and activities. Interactive features allow users to control their learning experience, with opportunities to explore outside links and

CCRC. [[Condensed](#) from the USDA blogs]

It's cold and it's (probably) climate change

A blast of Arctic air brought frigid temperatures to northern parts of the U.S. this week. Is it possible that such brutally low temperatures could be caused by global warming? The answer lies with the tropospheric polar vortex - a persistent low pressure system over the Arctic and its hypothesized relationship with Arctic sea ice. During the Northern Hemisphere winter, the polar vortex over the Arctic is usually strong. The strength of the vortex is thought to be due to the large temperature contrast between mid-latitudes and polar regions. But temperatures in the Arctic have been warming more rapidly than the rest of the Northern Hemisphere, reducing the latitudinal contrast in temperature. The loss of sea ice may be contributing to the rapid warming and a weakened polar vortex. When the polar vortex is weakened, its boundary becomes more wavy. When one of these waves migrates southwards, that is when we feel the chill. George Moore, Professor of Physics at the University of Toronto, discusses the processes in more detail in this [very readable scientific paper](#).



Thanks to high air temperatures, southerly winds and a warm ocean, average Arctic sea ice extent is at a record low. This map shows Arctic air temperature differences from the 1981 to 2010 average for November 2016. The scale is in Celsius. Click the image to learn more from the National Snow and Ice Data Center.

Credit: NOAA/ESRL Physical Sciences Division

Research News

Climate niche models show that trees are likely to migrate upslope under a warmer climate. However, recent research by Kueppers et al. at the Lawrence Berkeley National Laboratory found that two key subalpine conifer species in Western North American forests may not be able to migrate fast enough to keep up with warming - increasing temperatures will impact Engelmann Spruce and Limber Pine seedling recruitment and survival. Science Daily gives a

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Semi-arid plants, such as agave, are adapted to drought conditions through crassulacean acid metabolism (CAM) photosynthesis. CAM plants open their stomata to absorb carbon dioxide at night, thus limiting the loss of water through transpiration. Researchers at the Department of Energy's Oak Ridge National Laboratory are studying the genetics that control this stomatal behavior to see if these traits can be introduced into agricultural crops. Read more about their work [here](#).

Despite its beauty, morning glory is hated by farmers and gardeners, and like many other weed species it has developed resistance to glyphosate. Researchers at the University of Michigan have found that glyphosate resistant morning glory populations self-fertilize more frequently than non-resistant populations. [Their findings](#) demonstrate the impact of herbicides on the evolutionary development of an agricultural weed.

Agricultural production systems need to evolve to reduce risks imposed by climate change. In helping to develop strategies for farmers to introduce adaptive measures, it is essential that we understand their decision-making processes. [This paper](#) published in [Agronomy for Sustainable Development](#) reviews bio-economic and bio-decision models and discusses proactive and reactive adaptation.

The riparian ecosystems of the southwestern United States are characterized by stands of cottonwoods and other native trees. These tree species depend on periodic high streamflows to stimulate germination. The USFS Rocky Mountain Research Station has analyzed stream gauge data in the Colorado and Rio Grande basins and they discuss the potential impact of future flow regimes on the survival of these ecologically and culturally important species. Read more about their work [here](#).

Funding news

The **Southwest Climate Science Center** and the **South Central Climate Science Center** announced their 2017 funding opportunities recently. [Click here for more information](#). Statements of interest are due by January 18, 2017

The **U.S. Forest Service** [requests proposals](#) to substantially expand and accelerate wood energy and wood products markets throughout the United

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NIFA just announced \$5 million for research in Food, Energy and Water Systems. [Click here for more information](#). Deadline is March 6, 2017

EVENTS

[NRCS Conservation Webinar Series](#), beginning January 10, 2017

[Southwest Indian Agriculture Conference](#), January 17-19, 2017

[American Meteorological Society Annual Meeting](#), January 22-26, 2017

[California Climate Change Symposium](#), January 25-26, 2017

[70th Annual Society for Range Management Meeting](#), January 29 - February 2, 2017

[Healthy Soils for Healthy Waters 2017](#), February 1, 2017

[Annual Climate Prediction Applications Science Workshop](#), May 2-4, 2017

[National Adaptation Forum](#), May 9-11, 2017

[Universities Council on Water Resources](#), June 13-15, 2017

[AWRA Summer Specialty Conference on Climate Change Solutions](#), June 25-28, 2017

[Soil and Water Conservation Society Annual Conference](#), July 30 - August 2, 2017



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