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October Issue of the Southwest Climate Hub Bulletin

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October 2016

## What's Happening at the Hub

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### Drought Outlook and Impacts Workshop

#### Las Cruces, October 25th, 2016

Join agricultural producers and professionals for a one-day workshop on the drought outlook for the upcoming winter season. Experts from the National Drought Mitigation Center, NOAA, NMSU, University of Arizona and the USDA will be presenting on the potential impacts of drought on agriculture in the Rio Grande Valley and surrounding rangelands of New Mexico and West Texas, and available local and regional resources to help manage and monitor those impacts. To register, please visit the [Southwest Hub webpage](#). The workshop is free. Refreshments and lunch will be provided. There is also travel support available for agricultural producers. Please contact [Caiti Steele](#) for more information.

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### Building Blocks Workshop: Save the Date!

The Southwest and California hubs are partnering to bring a Building Blocks for Climate Smart Agriculture workshop to California on February 8th, 2017. We will focus on four Building Blocks: Soil Health, Nitrogen Stewardship, Livestock Partnership, and Grazing and Pasture Land. The workshop will be held in either Sacramento or Davis, California. Please contact [Caiti Steele](#) or [Amber Kerr](#) to receive updates. For more information about Secretary Vilsack's Building Blocks, please visit the [USDA Climate Solutions web page](#).

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The California and Southwest Hubs are pleased to welcome Climate Fellow, Jennifer Balachowski. Jen did her dissertation work in ecology at UC Davis and at the CEFE-CNRS in Montpellier, France as a Fulbright fellow, receiving her Ph.D. in December 2015. She examined how Western North American grasses survive severe drought and provided management recommendations for sustainable grassland restoration. She has also conducted collaborative interdisciplinary research in human ecology as an NSF IGERT trainee, exploring how people respond to new environmental concerns. Jen enjoys translating scientific research to broader audiences, including student, community, and stakeholder groups. She holds a M.Ed. degree and has taught in a wide range of formal and informal settings, from US public school classrooms to the Laikipia Plateau in Kenya where she instructed land managers how to monitor for early signs of desertification. Born and raised in the Washington, DC area, Jen has lived in Northern California for the past six years. Welcome Jen!

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### **Fall Forum with Tom Vilsack: Climate Variability, Water and Land Use**

Agriculture is rapidly evolving, and the USDA is constantly striving to meet the shifting demands of producers, consumers, businesses, families. In this forum hosted on September 14th by the Julie Ann Wrigley Global Institute of Sustainability, guest panelists joined Secretary of Agriculture Tom Vilsack in examining how to maintain American food security into the future. Watch the presentations and discussion [here](#).

### **Recent News**

#### **Climate change has doubled Western U.S. Forest Fires**

A new study published this month in the Proceedings of the National Academy of Sciences looks at how climate change is causing bigger fires, more frequent fires and a longer fire season and will continue to do so. The Earth Institute at Columbia University give a [great](#) synopsis of the research. The full article can be accessed from the Proceedings of the National Academy of Sciences [website](#).

#### **La Niña**

What does an ENSO neutral winter mean for the Southwest? Take a look at the [U.S. Winter Outlook from NOAA](#). With La Niña, we might expect drier conditions with less snow than usual, but this looks like it will be a short-lived event.

#### **FAA clears the way for drone use in agriculture**

The Federal Aviation Authority have some strict rules about operating unmanned aircraft. [IEEE Spectrum reports](#) that new U.S. Federal rules went into effect earlier this year, making it easier for agricultural producers to legally operate a drone.

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The Food and Agriculture Organization of the United Nations has just release a new report "[The State of Food and Agriculture 2016](#)". The report emphasizes the urgent need to support smallholders in adapting to climate change and to help rural communities become more resilient. Also included in the report is evidence that 'climate-smart' practices will increase productivity and farmers' incomes.

### **NIFA: New RFA announced**

NIFA has announced the [Organic Agriculture Research and Extension Initiative](#) (due date January 19, 2017). This program area encourages projects that integrate research, education and extension.

### **What is Global Weirding?**

[Watch Katherine Hayhoe](#), science communicator extraordinaire, talk about why climate change matters. And find out what Global Weirding is!

## Recent Research and Publications

**Climate Change, Agriculture and Water Resources in the Southwestern United States:** This research focuses on the hydrologic context within which the USDA Southwest Climate Hub operates, with emphasis on regional water resources and projected impacts of climate change on agriculture.

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**Handbook of Drought Indicators and Indices:** Recently published, this handbook from the Integrated Drought Management Programme (IDMP) was developed by Mark Svoboda and Brian Fuchs of the National Drought Mitigation Center at the University of Nebraska-Lincoln. It intended as a resource guide for practitioners

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**Vegetative response to water availability on the San Carlos Apache Reservation:** The authors used remote sensing to quantify vegetation response to water availability. Using a MODIS derived Soil Adjusted Vegetation Index, they found that woodlands and grasslands respond similarly to short term water availability. The authors call for increased monitoring and management of woodlands and argue for unique management plans for woodlands and forests.

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**Plant responses to increasing CO2 reduce estimates of climate impacts on drought severity:** Many Earth System Models (ESMs) used to predict future drought stress on ecosystems overlook the physiological effect of increased atmospheric carbon dioxide causing decreased transpiration (water loss) in plants. Including this effect significantly reduces the overall magnitude of future droughts while also changing the balance of some hydrological processes within terrestrial ecosystems.

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**Economic Analysis of the 2016 California Drought for Agriculture Report:** The economic impacts of California's drought in 2015-16, though substantial, are less than in 2013-14 and 2014-15. The estimated direct costs of the 2016 drought stand at \$550 million, slightly more than 1% of California's annual agricultural output. However,

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remains a major concern.

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**Examining multi-functionality for crop yield and ecosystem services in five systems of agroecological intensification:** To learn whether improved ecological farming practices can enhance both yield and ecosystem services, the authors analyzed 104 studies in five different systems: conservation agriculture; holistic grazing management; organic agriculture; precision agriculture; and system of rice intensification. They looked at how these systems affect nine ecosystem services (pest control, pollination, soil fertility, weed control, biodiversity, carbon storage, erosion control, water flow, and water quality) and concluded that win-win outcomes are common, but effects vary and much more research is needed.

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**Characterizing the extreme 2015 snowpack deficit in the Sierra Nevada (USA) and the implications for drought recovery:** The authors use a combination of remote sensing and on-the-ground snowpack measurements to estimate that it will take at least four years of normal precipitation to rebuild the Sierra Nevada snowpack, which has fallen to record-low levels during California's 2012-2016 drought.

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## Upcoming Events

### [Climate and Agriculture Workshop](#)

St Louis, MO, Oct 24-25, 2016

### [Drought Outlook and Impacts Forum](#)

Las Cruces, NM | Oct 25, 2016

### [25th Annual California Invasive Plant Council Symposium](#)

Yosemite, CA | November 2-5, 2016

### [The ASA, CSSA, and SSSA Joint Annual Conference](#)

Phoenix, AZ | Nov 6-9, 2016

### [Considerations For Use of Non- Local Species in Ecological Restoration Workshop](#)

Davis, CA | Nov 15, 2016

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[Conference and 1st Applied Fire  
Science Workshop](#)  
Tucson, AZ | Nov 28-Dec 2, 2016

[California Alfalfa & Forage  
Symposium](#)  
Reno, NV | Nov 29-Dec 1, 2016

[Intertribal Agriculture Annual  
Meeting](#)  
Las Vegas, NV | Dec 5-8

[AGU Fall Meeting](#)  
San Francisco, CA | Dec 12-16,  
2016

[California Climate Change  
Symposium.](#)  
Sacramento, CA | Jan 25-26, 2017

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## Employment and volunteering opportunities

[Native Nations Climate Adaptation Program: Assistant Research Scientist](#). CCASS and NNCAP are currently seeking an assistant research scientist to compile, develop, and present climate information and climate change education modules for tribes and tribal environmental professionals in the Southwest, among other duties.

[Tribal Climate Science Liaison](#) This full-time, professional position will provide direct extension support to Tribes and Tribal colleges (TCUs) located in Arizona, Utah, Nevada and California, the states comprising the service area of the Department of the Interior Southwest Climate Science Center (SW CSC).



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