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September Issue of the Southwest Climate Hub Bulletin

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## What's Happening at the Hub

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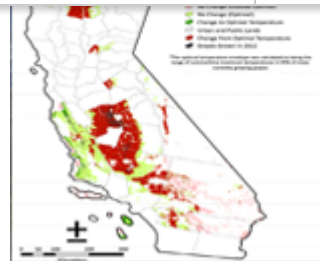
### **HOT OFF THE PRESS: Vulnerability Assessment Published**

The first ever vulnerability assessment of regional agriculture and forests to climate change is now available. If you want to know the effects of climate change on agricultural and forested ecosystems in AZ, CA, HI, NM, NV and UT, click to read the report.

[Read the Report](#)


### **UNDER COVER: Covered Agriculture to Cope with Uncertainty**

Professors Robert Taylor, Ronald Lacewell and Rodrigo Rodriguez-Kabana share the benefits of covered agriculture for coping with climate and water availability uncertainty. Production of high value crops in covered systems is expanding, where water and quality land are scarce.

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### **CHANGES TO CROPS: Spatial Thermal Envelope of SW Crops Assessed**

Southwest Hub researchers used cropscape and pixel level MACA data to evaluate the current distribution of almonds, tomatoes, grapes, alfalfa, corn and cotton in our region to estimate the present thermal envelope for each crop, which projects changes by mid-century.

[Read the Article](#)


### **RUNNING RED: Dust on Snow Research to Continue**

Red-brown dust that is deposited on annual snowpack in the Upper Rio Grande basin, lowers the albedo, contributing to earlier snowmelt, according to new research. Ismael Beltran, a civil engineering intern from University of Texas, El Paso, collected EPA air quality data of airborne particulates to uncover the largest dust storm events in the Four Corners over the last decade.

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### **GRAZING 2.0: The Southwest Hub to Host Two Workshops**

Leaders in California rangeland management are invited to Las Cruces, New Mexico February 9-10, 2016 for workshops on the current state of the livestock grazing industry and to identify post-drought actions to reestablish sustainable grazing practices. Training and education on greenhouse gasses and carbon sequestration in agriculture and forestry will be included.

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### **PRESENT THIS FALL: Submit an Abstract for the 2015 Climate Summit**

Land managers, scientists, and students involved in collaborative partnerships that seek to advance adaptation to climate change are invited to submit abstracts for a poster presentation during the 2015 Climate Summit. The Summit will be held November 2-3, 2015 in Sacramento, CA. The submission deadline is September 28, 2015 and decisions will be announced by October 15, 2015.

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## Big, But Uneven, Economic Impact of Drought on California Agriculture

A report by Howitt et al., published in August 2015, discusses the impact of the severe, long-term drought on California's agriculture and economy. It states that groundwater substitution has significantly reduced job losses and crop fallowing, but the effects of the drought are unevenly distributed over the regions in the state. Increased overdraft of groundwater during drought will slowly deplete reserves at an incremental cost.

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## Irrigation Adaptation May Be Key in Managing Future Climate Extremes

A study by Troy, Kipgen, and Pal, published in May 2015, looked at the effect of climate extremes and irrigation on crop yield. The researchers pooled county-level crop yield, daily temperature, and precipitation data to quantify the impact of climate extremes and variability on four major crops in the United States. Results show that "Non-linear and threshold-type relationships exist between yields and both precipitation and temperature climate indices; irrigation significantly reduces the impact of all climate indices."

doi:10.1088/1748-9326/10/5/054013

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## Back with A Vengeance? Developing El Niño Could Be Strongest on Record

An article published in *Nature* on August 14, 2015, discusses what's causing NOAA to forecast a particularly strong El Niño this year. One reason is that this year's event began in March instead of June, possibly because the warm waters left over from last year's weak event gave it a head start. Another reason for the forecast is that this El Niño event would be the second year in a row, predicting that it has the potential to surpass the strongest event on record, which occurred in 1997-98. Though a strong El Niño could offer some relief from the extreme drought, bringing above-average precipitation throughout the winter, it is unlikely that the effects of the drought will be erased. doi:10.1038/nature.2015.18184

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## PEA Exposes Risks to Public Health

A report published on August 7, 2015, applied probabilistic event attribution (PEA) to assess the climate attribution of summer extreme heat events in the Central Valley of California, and discusses the risks these events pose to public health in exposed communities. doi:10.1007/s10584-015-1474-3

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## Bark Beetle Outbreaks Contributing to Carbon Release

A study by Ghimire et al., published in August 2015, used postdisturbance forest growth trajectories to quantify regional carbon impacts of bark beetle outbreaks across Western United States.

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## Stress Relief? WaSSI Model May Aid Long-Term Forest Watershed Water and Carbon Balances

A study, *Drought impacts on ecosystem functions of the U.S. National Forests and Grasslands: Part I* by

### BY THE NUMBERS: CALIFORNIA DROUGHT

**542,000**

Acres expected to be idled

**2.7 million**

Acre-feet expecting a net water shortage in 2015

**\$1.84 billion**

Direct costs to agriculture as a result of the drought

**10,100**

Number of direct seasonal jobs expected to be affected

**6%**

Increase in detrimental effects of the drought in 2017 compared to 2014, assuming 2014 water supplies

**2.9 million**

Acres expecting a net water storage in 2017

Howitt et al - Aug. 2015

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throughout the contiguous United States.

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## Recent News

### [USDA: Conservation Incentives for Working Grass, Range and Pasture Lands](#)

Farmers and ranchers now can apply for financial assistance to help conserve working grasslands, rangeland, and pastureland while maintaining the areas as livestock grazing lands.

### [NASA: Drought Causing San Joaquin Valley to Sink Two Inches Per Month](#)

According to the California Department of Water Resources' recent NASA report.

### [NRCS: Social Considerations in Adaptation to Climate Variability](#)

A new paper provides insight into how producers' decisions about the management of their operation are influenced by social factor, like education, income, size of operation, and values. When considered, adaptation is more efficient.

## Upcoming Events

### [Tahoe Science Conference](#)

September 21-23

Reno, NV

### [Symposium: Climate-Smart Conservation Case Studies in the Southern California Coast](#)

September 23

San Diego, CA

### [National Tribal Energy Summit](#)

September 23-25

Washington, DC

### [13th Biennial Conference of Science and Management on the Colorado Plateau](#)

October 5-8

Flagstaff, AZ

Resource managers and research scientists discuss findings and management needs for the Southwest.

### [2015 NAFWS Pacific Region Conference](#)

October 13-14

Polson, MT

Native American Fish and Wildlife Society regional conference.

### [28th Annual Arizona Riparian Council Meeting](#)

October 15-16

Flagstaff, AZ

Contact [riparian@asu.edu](mailto:riparian@asu.edu)

### [23rd Annual Tribal/EPA Region 9 Conference](#)

October 27-29

Reno, NV

### [Restoring the West Conference 2015](#)

October 28-29

Logan, UT

### [Western Water Conference: Water Management Strategies for Addressing Long-term Drought and Climate Uncertainty](#)

October 28-29

Salt Lake City, UT

Co-hosted by two USDA Multistate groups, the conference will bring together academics, agency personnel, and water management practitioners to discuss western water issues. Travel scholarships available for graduate students wishing to present a poster.

### [Southwest Climate Summit](#)

November 2-3

Sacramento, CA

### [Water Resource Sustainability Issues on Tropical Islands](#)

December 1-3

Honolulu, HI

### [American Geophysical Union Fall Meeting](#)

December 14-18

San Francisco, CA

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Santa Fe, NM  
USFWS National Conservation Training Center, Bureau of Indian Affairs, and Choctaw Nation of Oklahoma present a course that guides conservation and resource managers in identifying which species or habitats are most likely to be affected by projected climate changes and why these resources are likely to be vulnerable. Contact [April.Taylor@chickasaw.net](mailto:April.Taylor@chickasaw.net)

### Meet Our Partners

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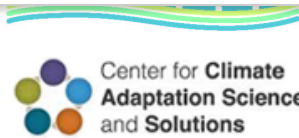


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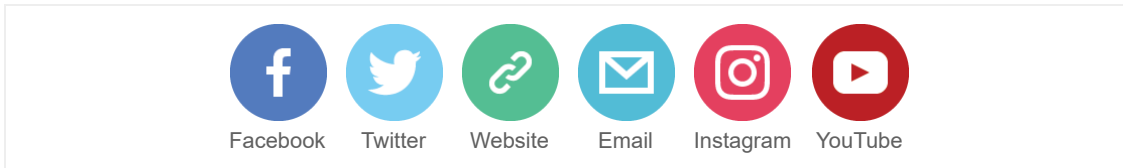
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