



## **Hydroclimate variability in the Southwestern US: From tree rings, to climate models, to streamflow forecasting**

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The Southwestern US experiences substantial natural variability in precipitation and temperature, on timescales ranging from daily to decadal. This variability makes the environment for prediction and management of water resources – critical tasks to ensure the well-being of society in this water-scarce region – challenging. Strong trends from the 1980s to the 2010s from cool and wet to warm and dry conditions, have led to intermittent drought conditions and reduced streamflow predictability. These impacts have led to discussion about the role of anthropogenic climate change, and have also led to other initiatives such as policy-driven drought mitigation and new drought adaptation plans issued by federal agencies.

Here I will address three questions that the trends toward drying and warming have prompted: (1) How unusual are these trends? (2) Can we attribute these trends to anthropogenic climate change? (3) How can we use the answers to question (1) and (2) to increase the resilience of society to such trends in the future? Using tree-ring based reconstructions of hydroclimate, I document the influence of precipitation and temperature on streamflow during the several hundred years before instrumental records became available, providing a baseline for the role of internal versus externally forced climate variability. I then use a constructed circulation analog technique and a set of climate model simulations to dissect and attribute the recent trends. Finally, I will illustrate how we can use this information to improve operational seasonal streamflow forecasts in the Southwest, in an attempt to close the notoriously open circle of research-to-operations.

*This seminar will be webcast live at:*  
<http://www.fin.ucar.edu/it/mms/fl-live.htm>

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**Thursday, 28 June 2018, 3:30 PM**  
Refreshments 3:15 PM  
NCAR-Foothills Laboratory  
3450 Mitchell Lane  
Bldg. 2, Main Auditorium, Room 1022