The South Central Climate Science Center Presents the following Seminar:

Adapting Socio-Ecological Systems to Increased Climate Variability: The Role of Soil Moisture Science and Technology

Date: **Tuesday, March 22, 2016**

Time: **3:00-3:45 p.m., Followed by Q&A**

Location: **University of Oklahoma**
4 Partners Place, Room 3065
Norman, OK

Questions: **emma.kuster@okstate.edu**

Presenter: **Dr. Tyson E. Ochsner,**
Oklahoma State University

Abstract:

The current Oklahoma NSF EPSCoR project is significantly advancing our understanding of how socio-ecological systems can sustainably adapt to increased climate variability. The EPSCoR team is working to develop a first-of-its-kind, statewide, coupled human and natural systems observatory, with integrated measurement, modeling, and prediction capabilities and decision-support systems. These systems are being designed to facilitate adaptation to climate extremes, like those experienced during the severe southern Great Plains drought of 2010-2014. Drought indicators are important decision-support tools in this context, and a recent survey by Shafer and Quiring (2016) revealed that farmers and ranchers in the region consider soil moisture levels to be the single most important drought indicator. Unfortunately, adequate soil moisture information is not widely available because soil moisture measurements are relatively sparse and soil moisture levels exhibit exceptional spatial variability due to human and natural factors.

With funding from NSF EPSCoR, the South Central Climate Science Center, and other sources, our group is working to improve the quality, availability, and use of soil moisture information in Oklahoma and beyond. This presentation will provide a brief overview of these ongoing efforts, including:

1. using the cosmic-ray neutron rover to understand the primary drivers of spatial variability in soil moisture
2. creating high-resolution, operational, statewide soil moisture maps by merging multiple data sources
3. developing tools for both site-specific and statewide estimation of soil moisture conditions under cropland where no measurements exist
4. exploring the use of soil moisture information to improve wildfire danger ratings and
5. providing annual soil-moisture based, statewide maps indicating potential groundwater recharge

These efforts provide a glimpse of the growing importance of soil moisture science and technology in adapting socio-ecological systems to increased climate variability.

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