POSTER #6

Towards a High Resolution Soil Moisture Map of Oklahoma

Jason Patton*[,1,3], Tyson E. Ochsner[1,3], Andres Patrignani[1,3], Jingnuo Dong[1,3], and Matthew Haffner[2,3]
[1]Department of Plant and Soil Sciences; [2]Department of Geography
[3]Oklahoma State University, Stillwater, OK

jason.c.patton@okstate.edu

Large scale (> 1 km2) estimates of soil moisture have been validated by using data from single points of long-term networks with sparse soil moisture measurements and/or by using data from short-term experiments with dense soil moisture measurements. Long-term soil moisture data that match or can be scaled to match the spatial resolutions of large scale (e.g. satellite and model) estimates are needed. Our goal is to produce daily soil moisture maps of Oklahoma at quarter-section (~800 m) resolution that are suitable for not only scientific purposes — validation of modeled and remotely sensed soil moisture, for example — but also for operational purposes — weather forecasting, land management, etc. Initial results towards this goal have been developed by combining Oklahoma Mesonet soil moisture data with spatiostatistical models (e.g. ordinary kriging). These maps have been developed further by adding other relevant data (soil texture, radar precipitation estimates) to our models. The next step includes incorporating findings from a roving cosmic-ray soil moisture sensor ("COSMOS rover") to validate and improve our soil moisture maps. Mesonet soil moisture measurements are only taken under grassland conditions, so a second priority is accounting for other land cover conditions.