SMAP Science Product Validation in the U.S. Cornbelt (Iowa)

PI: Brian Hornbuckle  
(Iowa State University)  
bkh@iastate.edu

Co-Is: Hatfield, Logsdon (USDA ARS NLAE)  
Krajewski, Kruger (University of Iowa)  
Kaleita (Iowa State University)
Site Description

Current: single point (up to 15 sites w/in 1 km$^2$) corn/soybean rotation

Future: desired expansion to core validation, partnership with Iowa Flood Center ($)

Measurements:
- soil moisture @ 1.5, 4.5, 15, 30, 60 cm
- root-zone soil moisture (neutron probe)
- COSMOS fluxes (sensible, latent, carbon)
- stream gauges
- met: http://mesonet.agron.iastate.edu
Research Focus

Extensive history in region (SMEX02, SMEX05).

NASA project (2005-2011), validation of hydrological remote sensing.

Space/time variation of soil moisture, scaling from point to field-scale using topography, vegetation, soil characteristics.

Effect of changing VWC on $T_B$ (PALS 2008), space/time variation of VWC.

Effect of VWC on COSMOS.
Site Overview

latitude/longitude: 41.98 N 93.68 W

flux towers (2)

precipitation (7)

radiation (5)

soil moisture and temperature (15)

1.5, 4.5, 15, 30, and 60 cm. 0-1 m, depth to water table.
Existing instruments and infrastructure, desired spatial expansion to watershed scale through Iowa Flood Center (state $), pending Iowa Space Grant Base Program.

Data latency: no issues (USDA ARS).

Yes, a plan for 0-5 cm GSM validation for SM.

Spatial scaling: new theory for field-scale SM.

We would like SMAP moral support (to encourage state $) and NASA THP proposal opportunities ($).