

SoilSCAPE Wireless Network in-Situ Observations at Tonzi Ranch, CA

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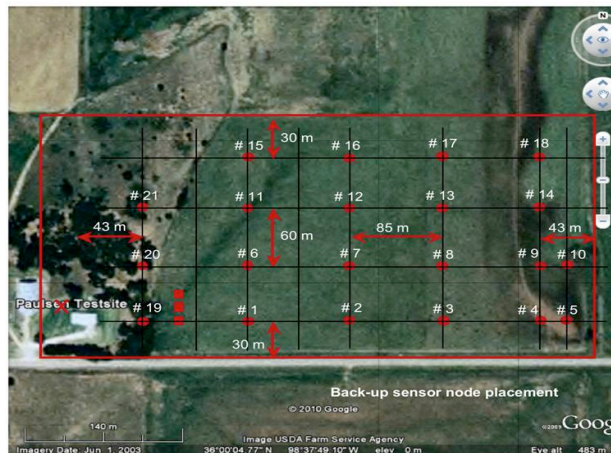
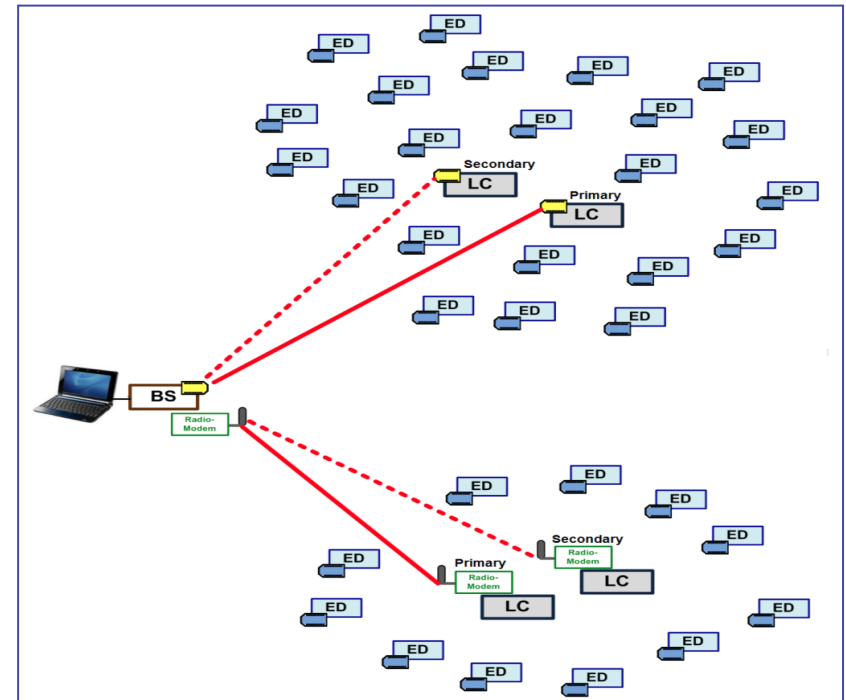
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Site Description

- Tonzi Ranch, eastern Sacramento Valley
 - Western Savanna ecosystem: grassland, pine, oak woodland
 - Complex hydrologic behavior
- Type of site
 - Flux tower site (Ameriflux)
 - **Core validation site with capability to span 3-9-36 km coverage**
 - **150 sensor nodes, 3-4 sensors per node**
 - **Unique in terms of # of nodes, flexibility in spatial sampling design, L4 product validation capability**
- Measurements provided
 - SM (5-100cm)
 - Decagon EC-5 (baseline plan)
 - Meteorological data through existing flux tower site infrastructure

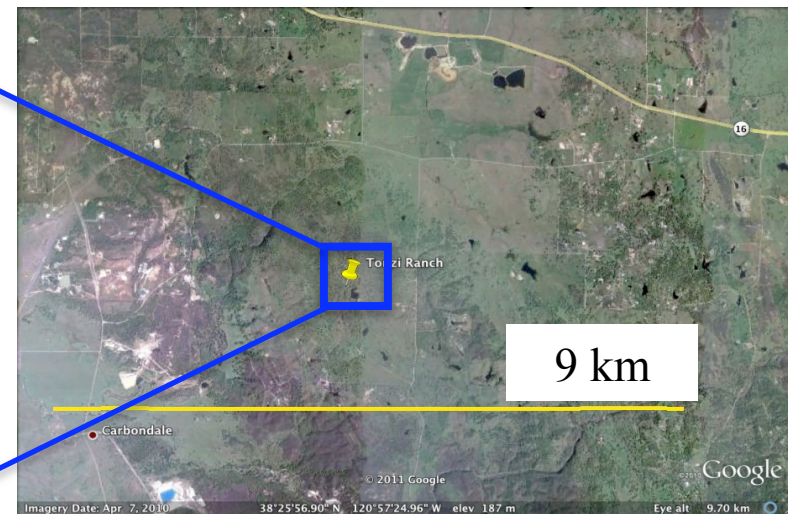
Project Description and Research Focus

- Data available since at least 2001
- Idea is to set up an extended network with wireless comm, no data loggers, solar-powered, scalable
- One base station, multiple local coordinators that are commanded by the base station
- Funded through ESTO/AIST
- Prototype installed in Canton, OK; will keep as testbed

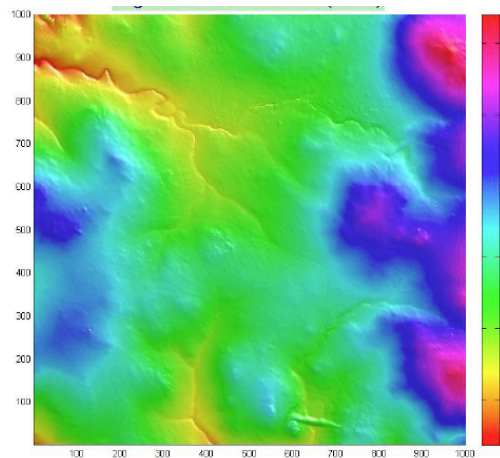


Location

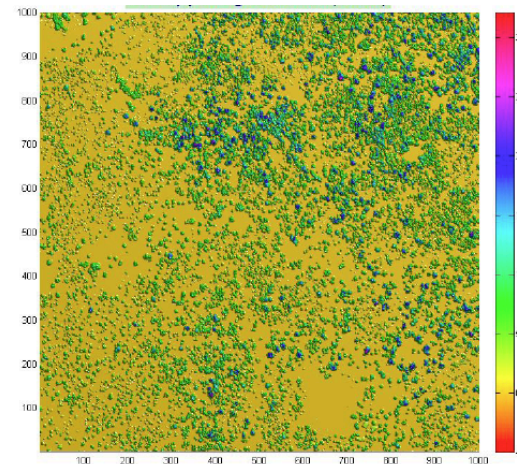
- Tonzi Ranch
 - N 38°25.867', W 120° 57.970', eastern Sacramento Valley



Topography;
50m range



Vegetation
height: 0-20m



Issues

- Flux tower site exists
 - Soil moisture in-situ sensor network to be installed within next year
- Data latency:
 - near-real-time, data uploaded to web site and available for download
- Plan for GSM 0-5 cm validation for SM:
 - 2-3 profiles at each soil type in installation domain; 2-3 times annually
- Plan for scaling points to footprints
 - Network will have 150 nodes; placement designed based on modeled statistics and will cover 3-9-36 km pixels
 - two 3km cells and two 9km cells instrumented with in-situ sensors; each 36km cell is to have at least 9 points
 - Translates into 36 nodes for each of two 3km cells, and 39 nodes for each of the two 9km cells; cells arranged to fall in 36km pixel
- What do we want from SMAP?
 - Consider this architecture as baseline for future in-situ networks