

Organic Soil Moisture Monitoring Project

Corey Davis
State Climate Office of North Carolina
May 24, 2017

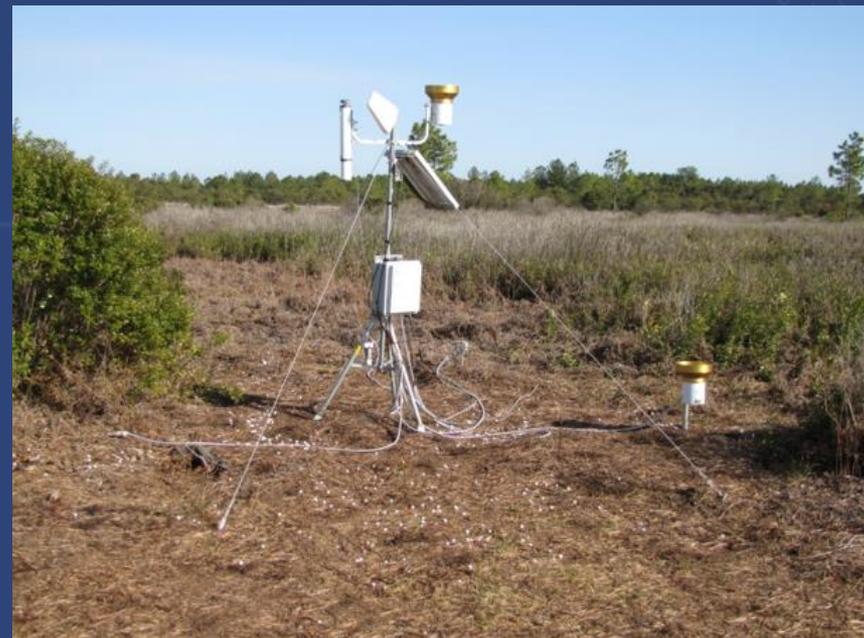
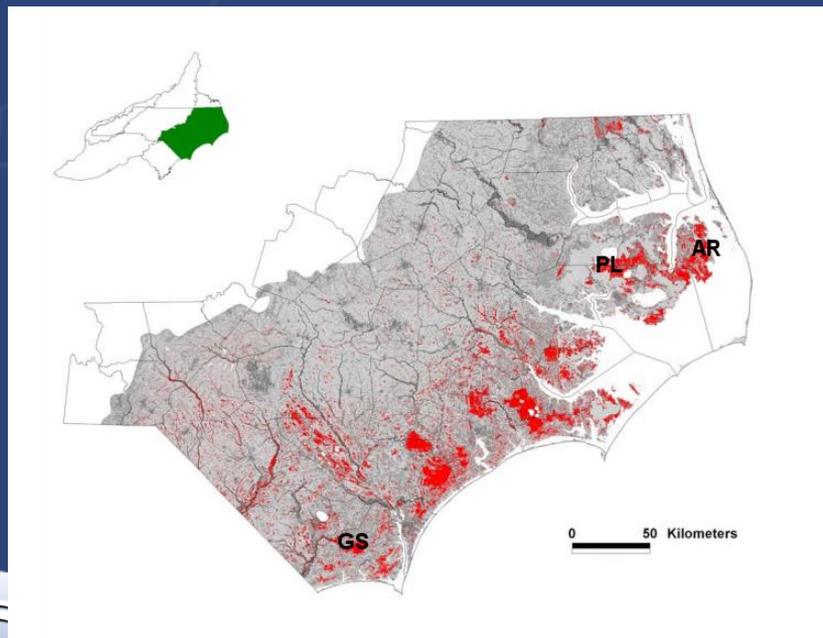
Our Work with CISA

- Carolinas Integrated Sciences and Assessments
 - “Advance scientific understanding of climate processes and impacts”
- Funding from NIDIS on coastal drought and its impacts
- In 2015, the SCO received funding to investigate organic fire risk



Experimental Probes

- Jim Reardon, Gary Curcio deployed probes at 3 organic sites in 2012



Project Findings

- Project in 2015 compared soil humidity data with KBDI, ERC, SPI

Allen Road ESP Array ($n=278$)

Comparison	Correlation Coefficient r
Normalized Soil Moisture vs. KBDI (0 day lag)	-0.331
Normalized Soil Moisture vs. KBDI (1 day lag)	-0.306
Normalized Soil Moisture vs. KBDI (2 day lag)	-0.289
Normalized Soil Moisture vs. KBDI (3 day lag)	-0.272
Normalized Soil Moisture vs. KBDI (4 day lag)	-0.255
Normalized Soil Moisture vs. KBDI (5 day lag)	-0.254

Allen Road ESP Array ($n=252$)

ERC data from the Pocosin Lakes RAWS site (NPOC)

Comparison	Correlation Coefficient r with	
	Fuel Model O	Fuel Model G
Normalized Soil Moisture vs. ERC (0 day lag)	-0.057	0.011
Normalized Soil Moisture vs. ERC (1 day lag)	-0.109	0.001
Normalized Soil Moisture vs. ERC (2 day lag)	-0.123	0.035
Normalized Soil Moisture vs. ERC (3 day lag)	-0.102	0.058
Normalized Soil Moisture vs. ERC (4 day lag)	-0.095	0.078
Normalized Soil Moisture vs. ERC (5 day lag)	-0.046	0.126



New Project with CISA

- Deploy three new monitoring stations at sites with organic soils
- Data analysis: soil moisture variation with depth, relationships with other datasets, best soil moisture estimate
- Data integration into the Fire Weather Intelligence Portal



Project Status

- Proposed a 5-year project
- CISA has agreed to fund year 1, beginning in August
 - Expected to fund additional years, possibly with NIDIS funds toward the end
- Planning to have stations up for at least 3 years beginning in August or September

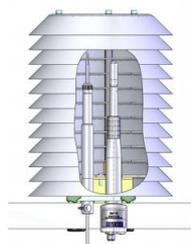


Monitoring Station Details

- Basic above-ground instrumentation
 - Temperature, humidity, wind speed/direction, precipitation
- Concreted post ~6 feet tall
- ML3 ThetaProbe soil moisture sensors at five depths in 3 locations



Installation in DTR13



0901-071

Figure 4 HMP155 with T-probe Installed in DTR13



Station Requirements

- Must have cell phone coverage
 - Nearby power source is ideal, but can use solar power if needed
 - Few nearby obstructions, if possible
 - Need relatively easy access, either by car or on foot if it's a short walk
- *Can you recommend a site?*



Planned Data Analyses

- Does the new data find similar results as the previous study?
 - How does soil moisture vary with depth?
 - Do any other datasets capture the variations in organic soils? (SMAP?)
 - In areas with no sensors, what is the best estimate for organic soil moisture?
- *What research questions do you have?*



Monitoring Products

- Station data will be displayed in the Fire Weather Intelligence Portal
 - Raw weather and soil moisture data
 - Estimated Smoldering Potential (after lab testing of soil samples)
- *What other information would you want to see concerning organic soil moisture and fire risk?*

