

U.S. Climate Reference Network: SMAP Preparation

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USCRN: Background

- Sites are Chosen for Stability and Openness



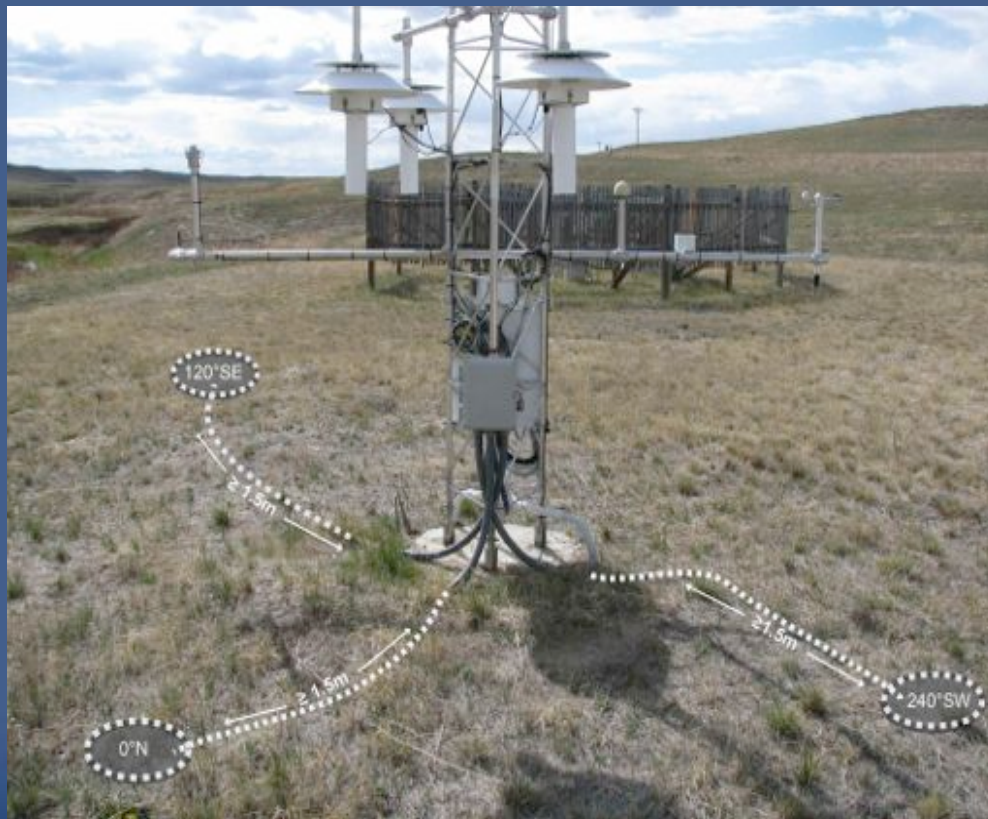
USCRN: Background

- Calibrated to the standards set by National Institute of Standards and Technology

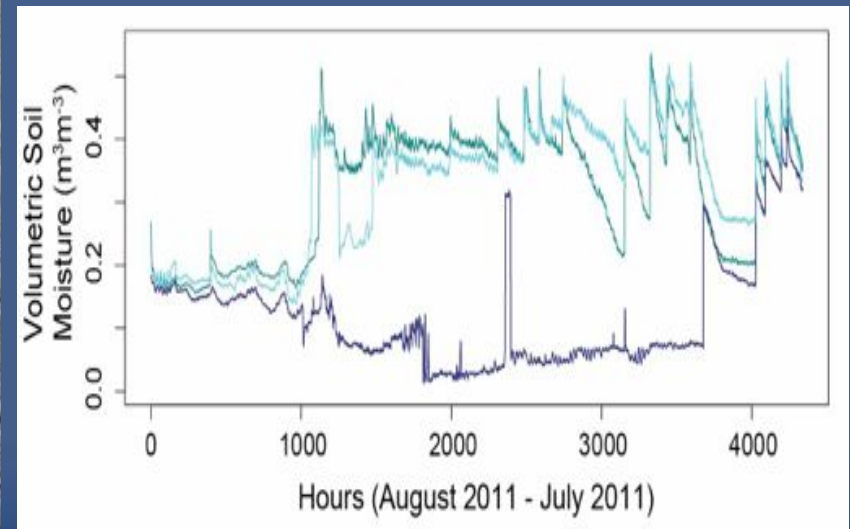


USCRN: Background

- Triplicate Configuration

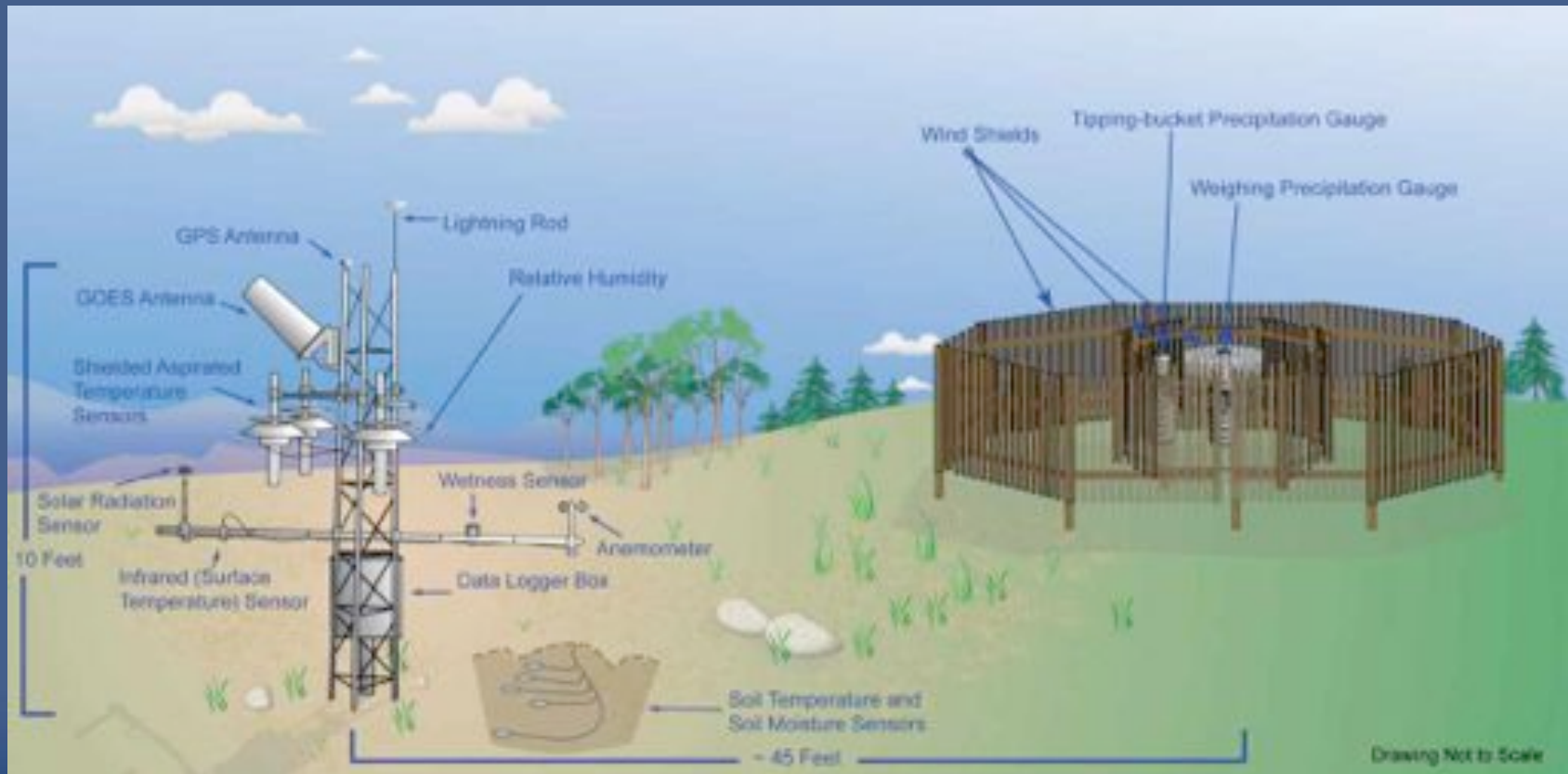


- Redundancy
- Consistency

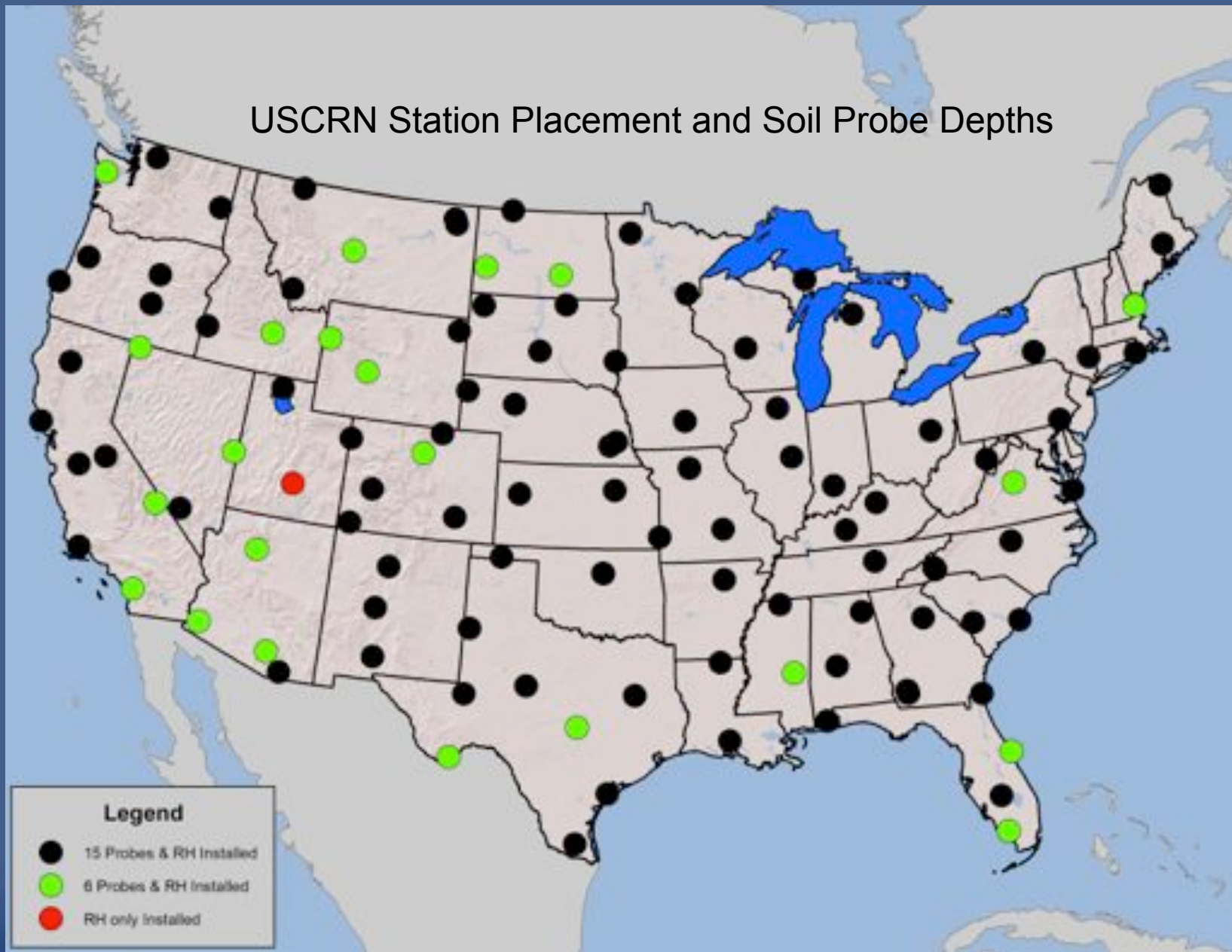


USCRN: Background

- Additional Measurements (Wind, RH, Solar, and IR)

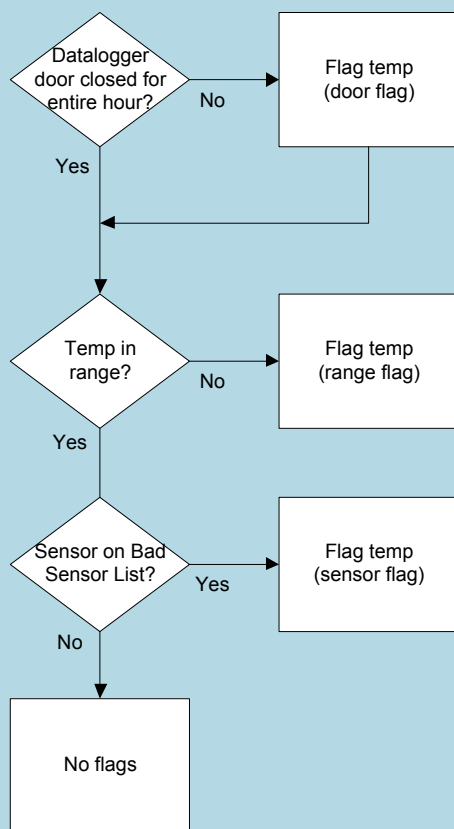


USCRN Station Placement and Soil Probe Depths

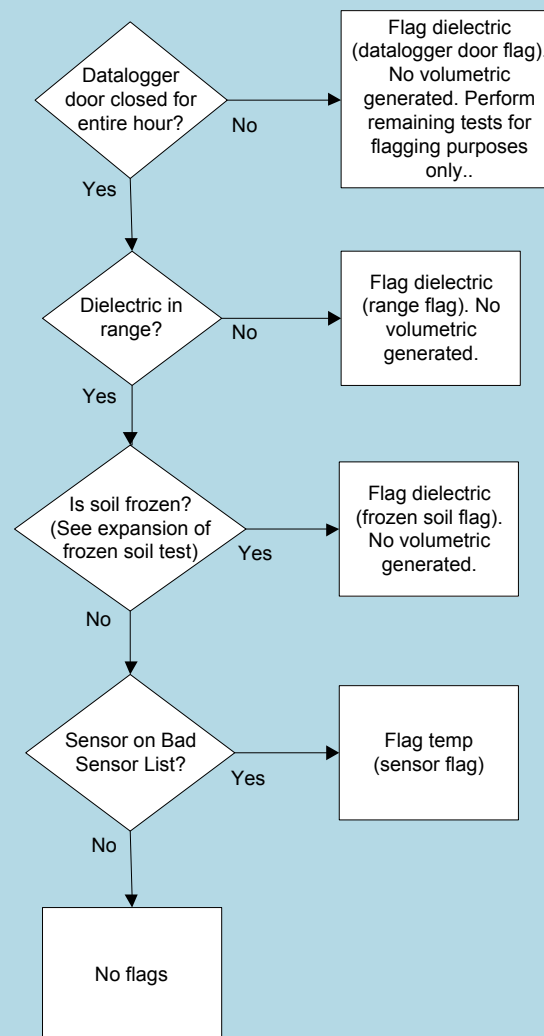


USCRN Quality Control

Temperature Flagging



Dielectric Flagging



Monthly post-processing

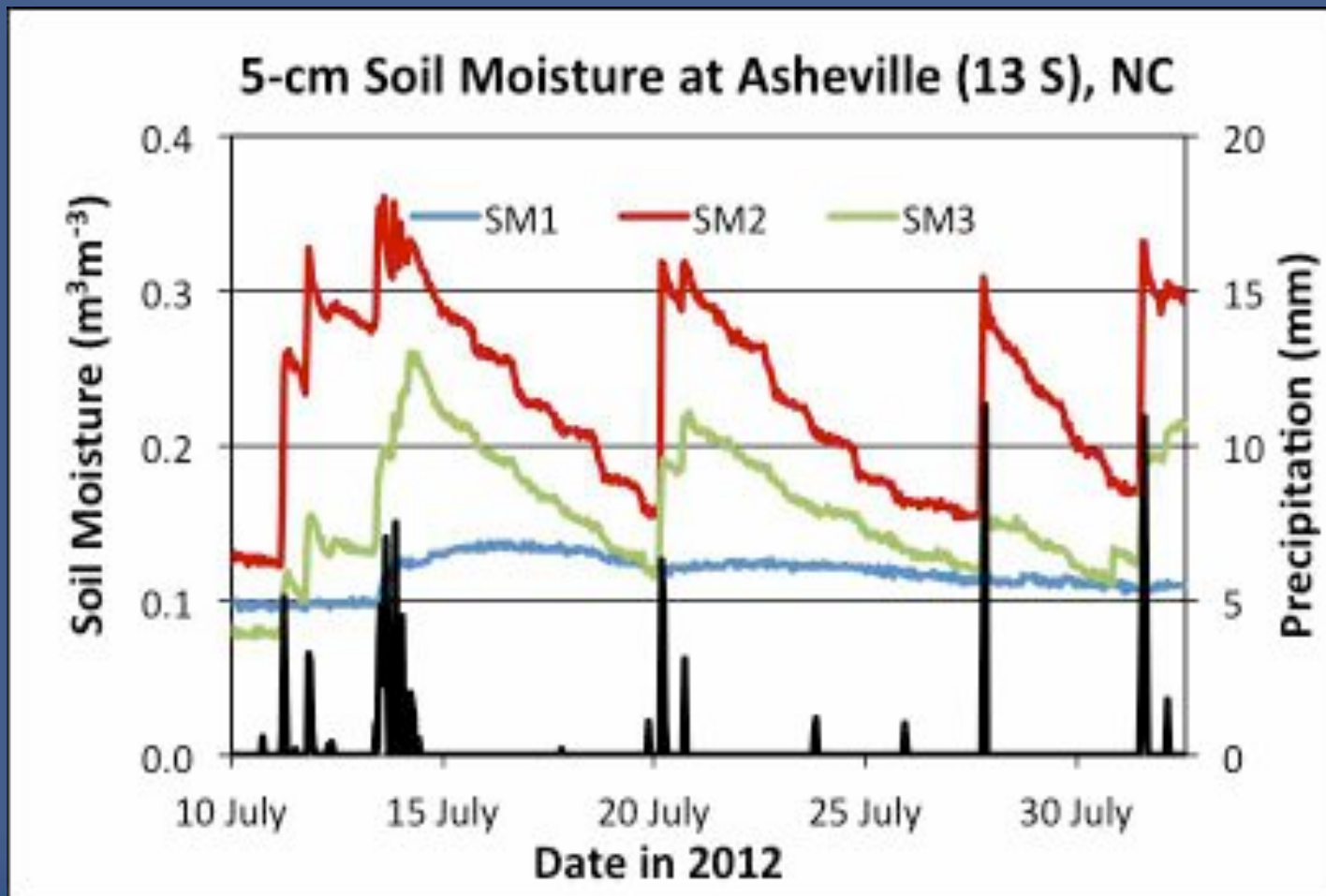
Continuous Data

	Soil Moisture Depth				
	5 cm	10 cm	20 cm	50 cm	100 cm
Stations with 3	109	108	84	79	70
Stations with 2	3	4	4	4	5
Stations with 1	0	0	1	1	3
Stations with 0	1	1	1	6	12
	Soil Temperature Depth				
	5 cm	10 cm	20 cm	50 cm	100 cm
Stations with 3	111	111	88	89	89
Stations with 2	2	2	1	0	0
Stations with 1	0	0	1	1	0
Stations with 0	0	0	0	0	1

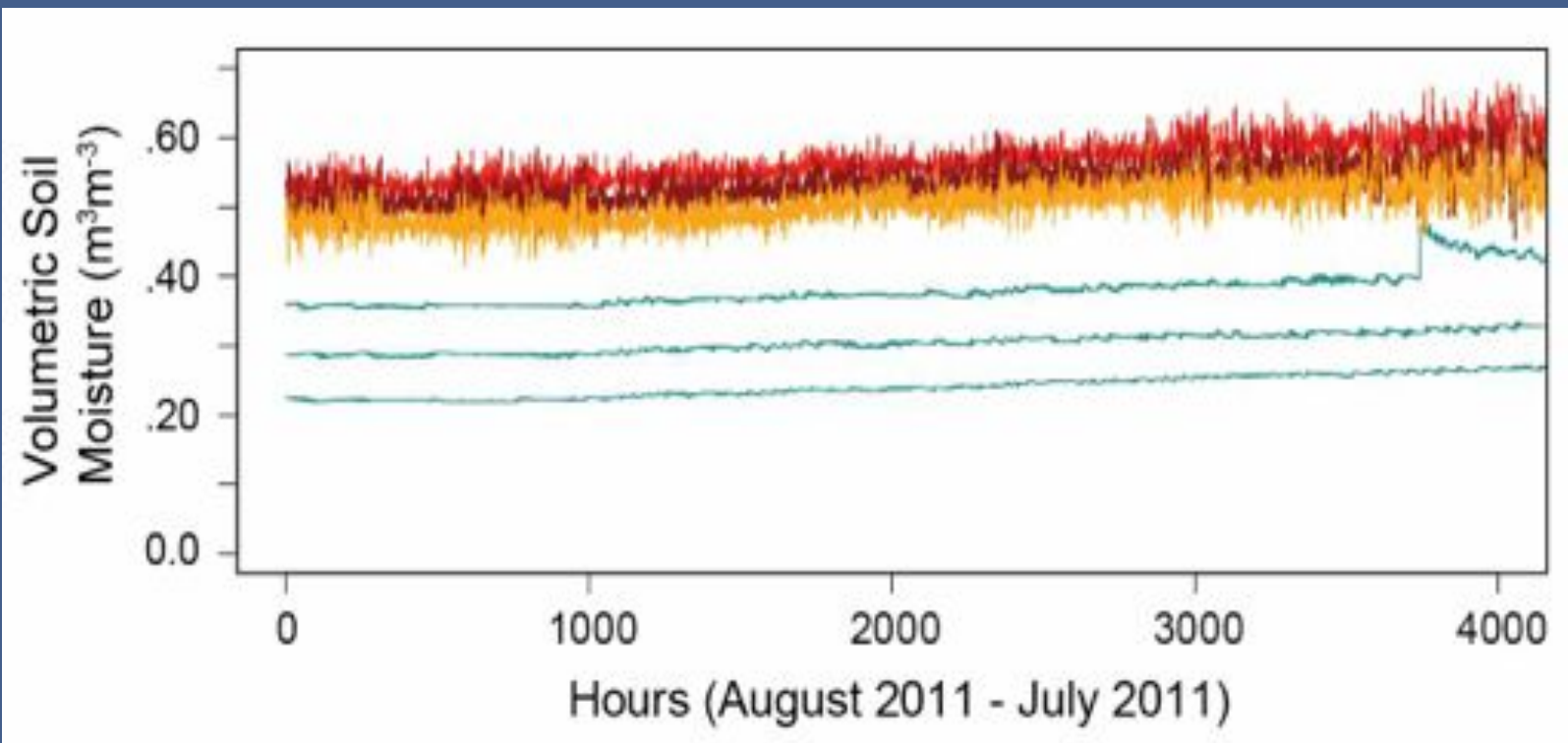
6.3% Failure
2.0% No loss

0.2% Failure

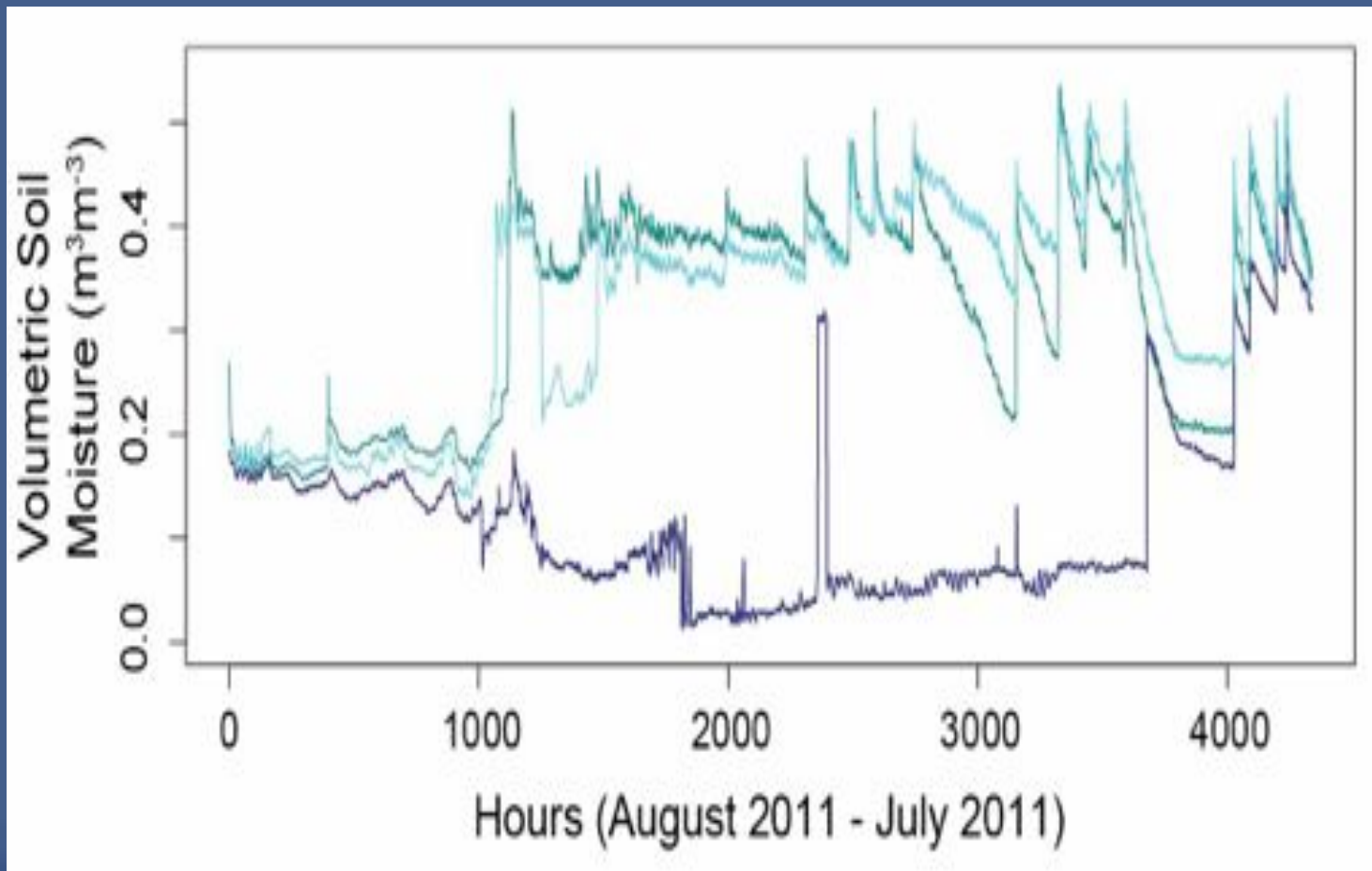
Erroneous Measurements



Erroneous Measurements



Erroneous Measurements



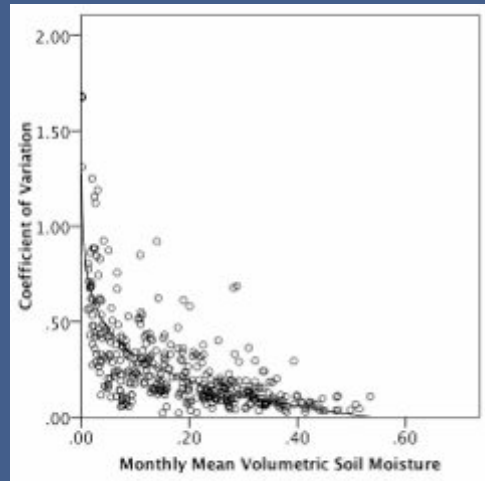
Station Maintenance



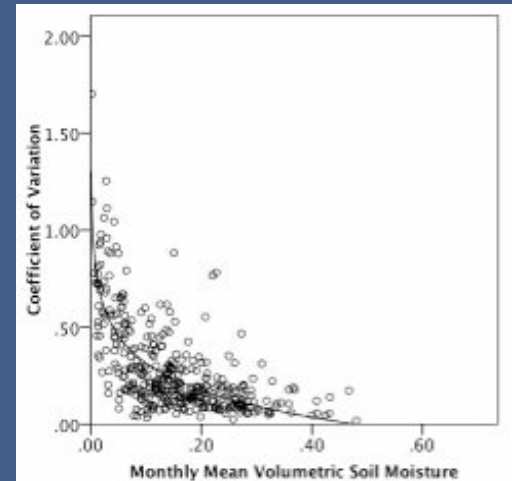
- Atmospheric Turbulence and Diffusion Division
- Annual visits
 - Maintenance
 - Installation
- Site managers
- Emergency visits

Measurement Variability

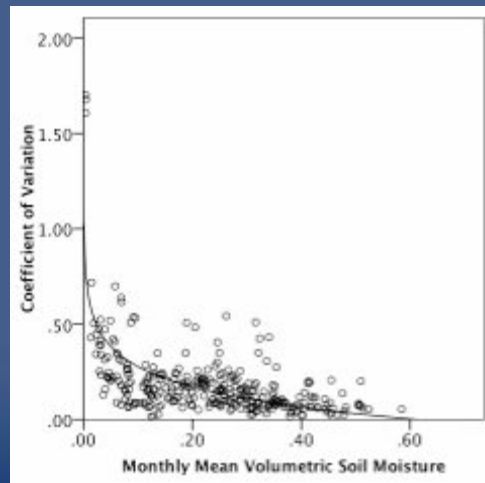
2011



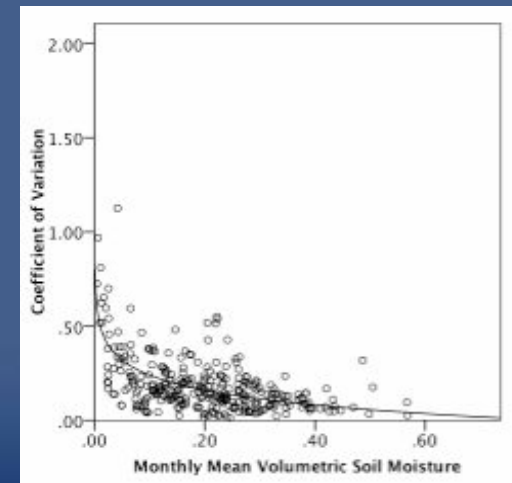
2012



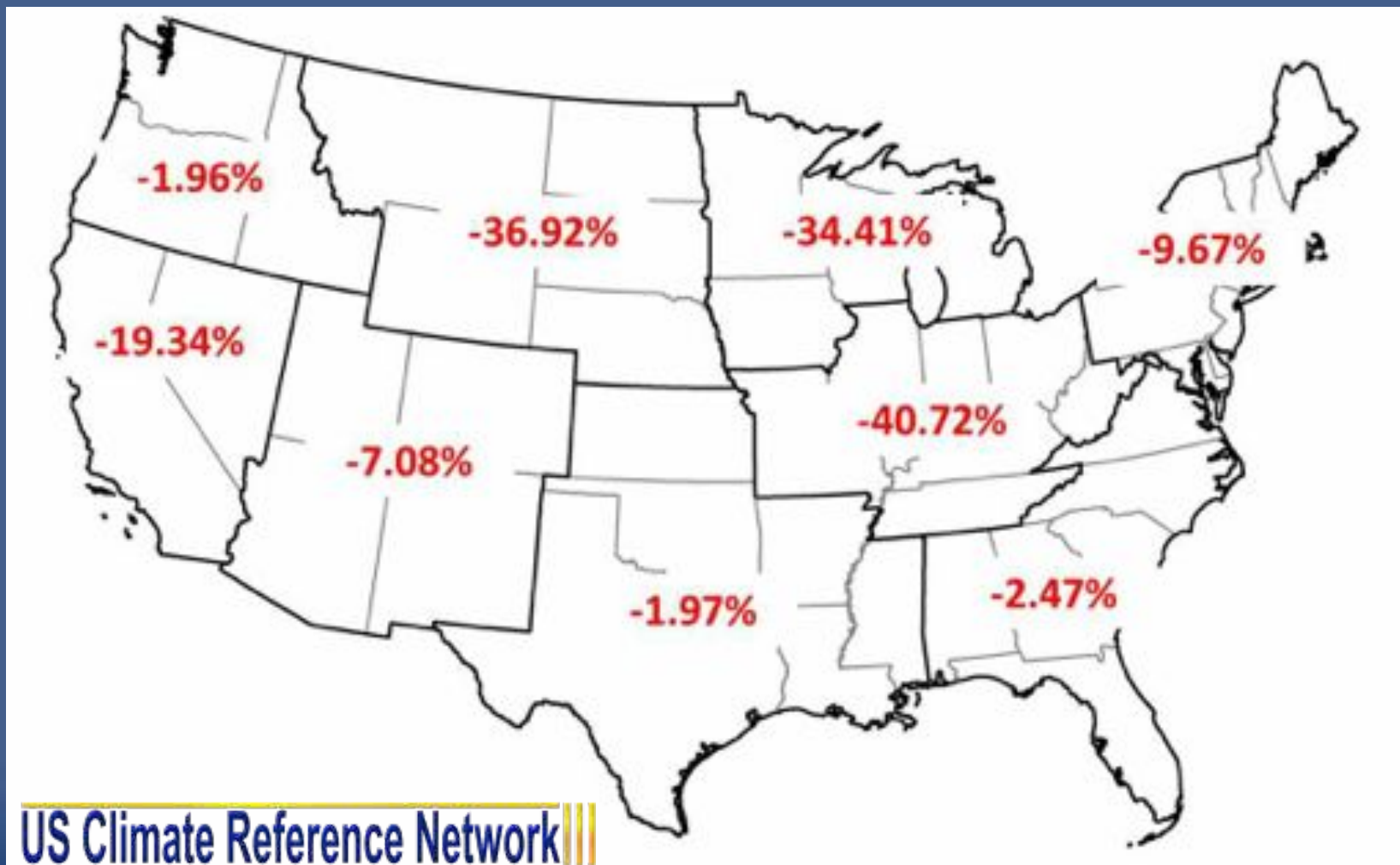
5cm



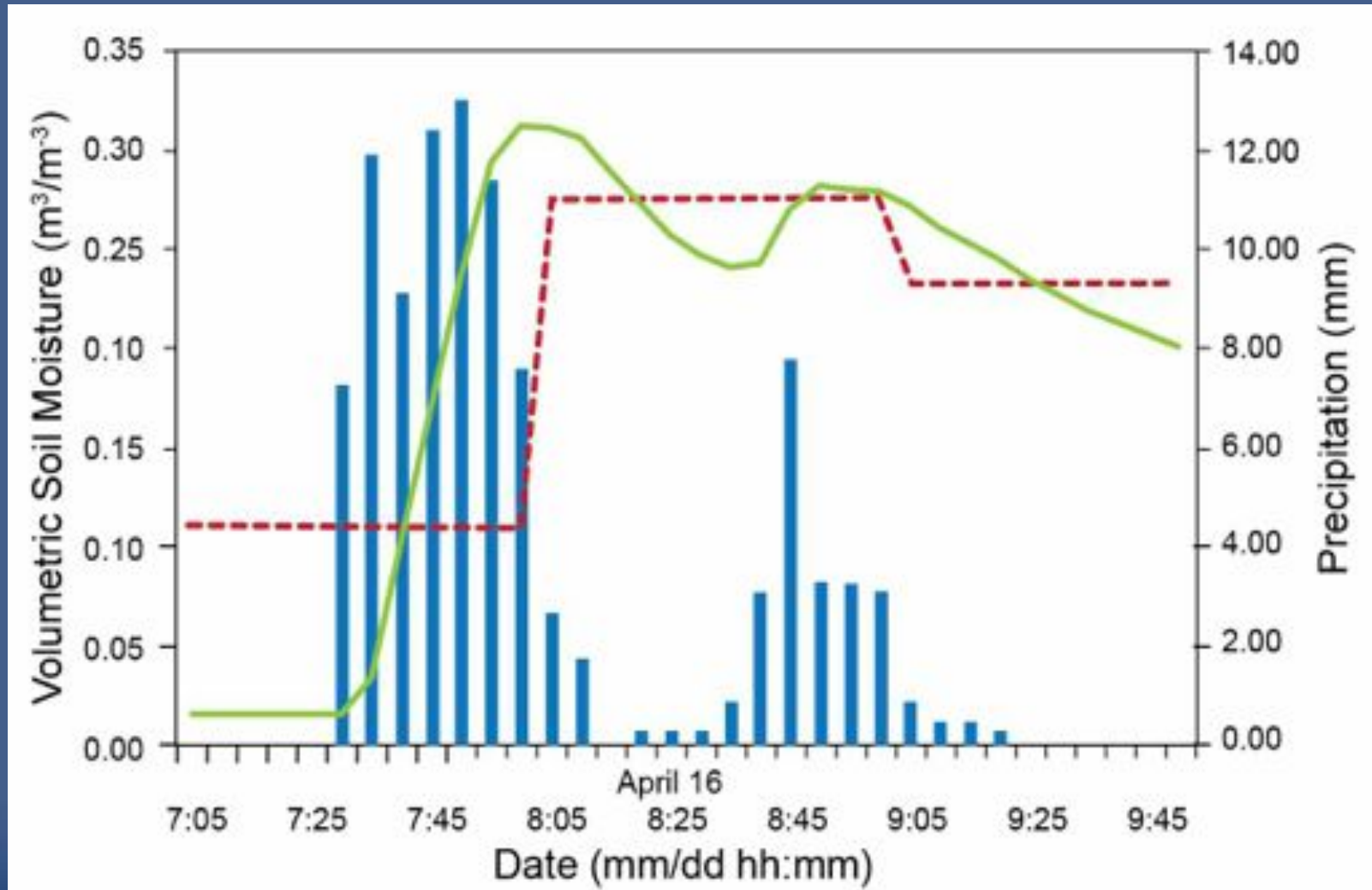
10cm



Scale and Climate Divisions: Percent Difference Between July 2011 and July 2012

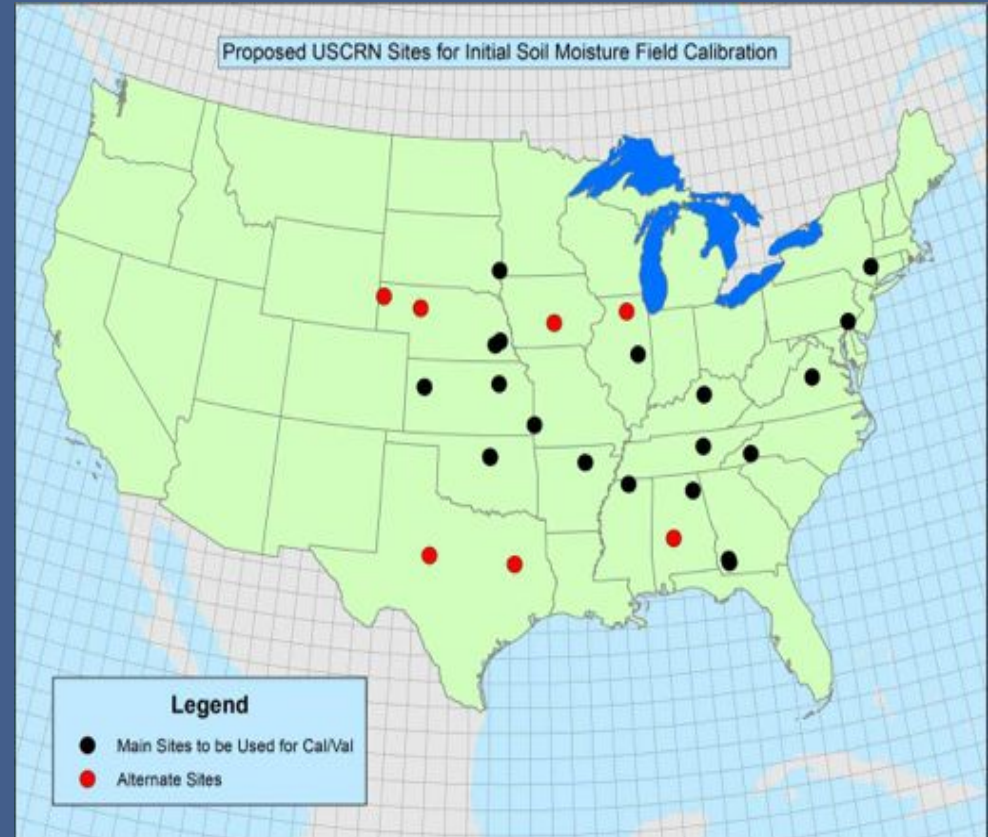


5-Minute Values



Calibration

- Gravimetric Sampling
 - 5cm
- Multiple samples over a two year period
 - 5-6 samples
- Interstate routes
- High priority sites
 - Stillwater, Sioux Falls, Champaign, Millbrook
- Great Plains
 - Fewer trees
- *Funding and Time?*



Thank you!

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<http://www.ncdc.noaa.gov/crn/>
<http://www.ncdc.noaa.gov/crn/products.html>
<http://www.ncdc.noaa.gov/crn/visualizations.html>

US Climate Reference Network



The UNIVERSITY of
NORTH CAROLINA
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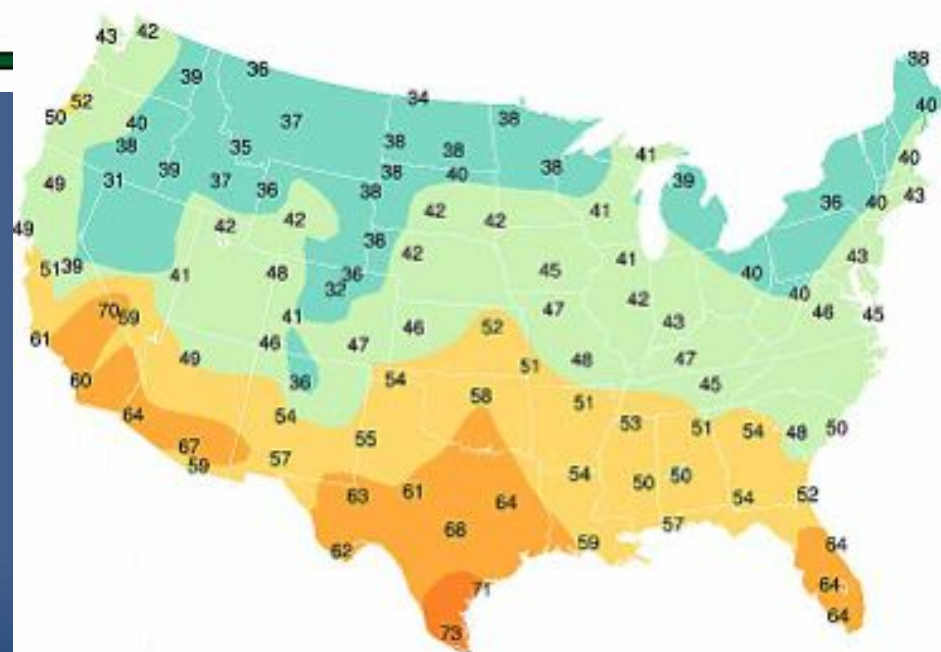
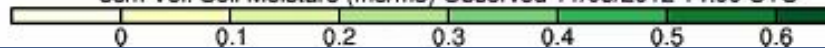
NC State University

Acknowledgements

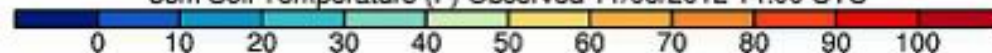
- Dr. Michael Palecki (NCDC/NOAA)
- Dr. Jessica Matthews (CICS-NC)
- Egg Davis (STG/NCDC)
- Ronald Leeper (CICS-NC)
- Dr. Ensheng Weng (Princeton University)
- USCRN Team (Debra, Andrea, Scott, and Diana)
- NCDC/NESDIS/NOAA



5cm Vol. Soil Moisture (m3/m3) Observed 11/09/2012 14:00 UTC



5cm Soil Temperature (F) Observed 11/09/2012 14:00 UTC



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NC State University

USCRN: Soil Product Development



Research: Soil Temperature and Plant Growing Season



Data Use

