

USCRN: Improvements and Applications

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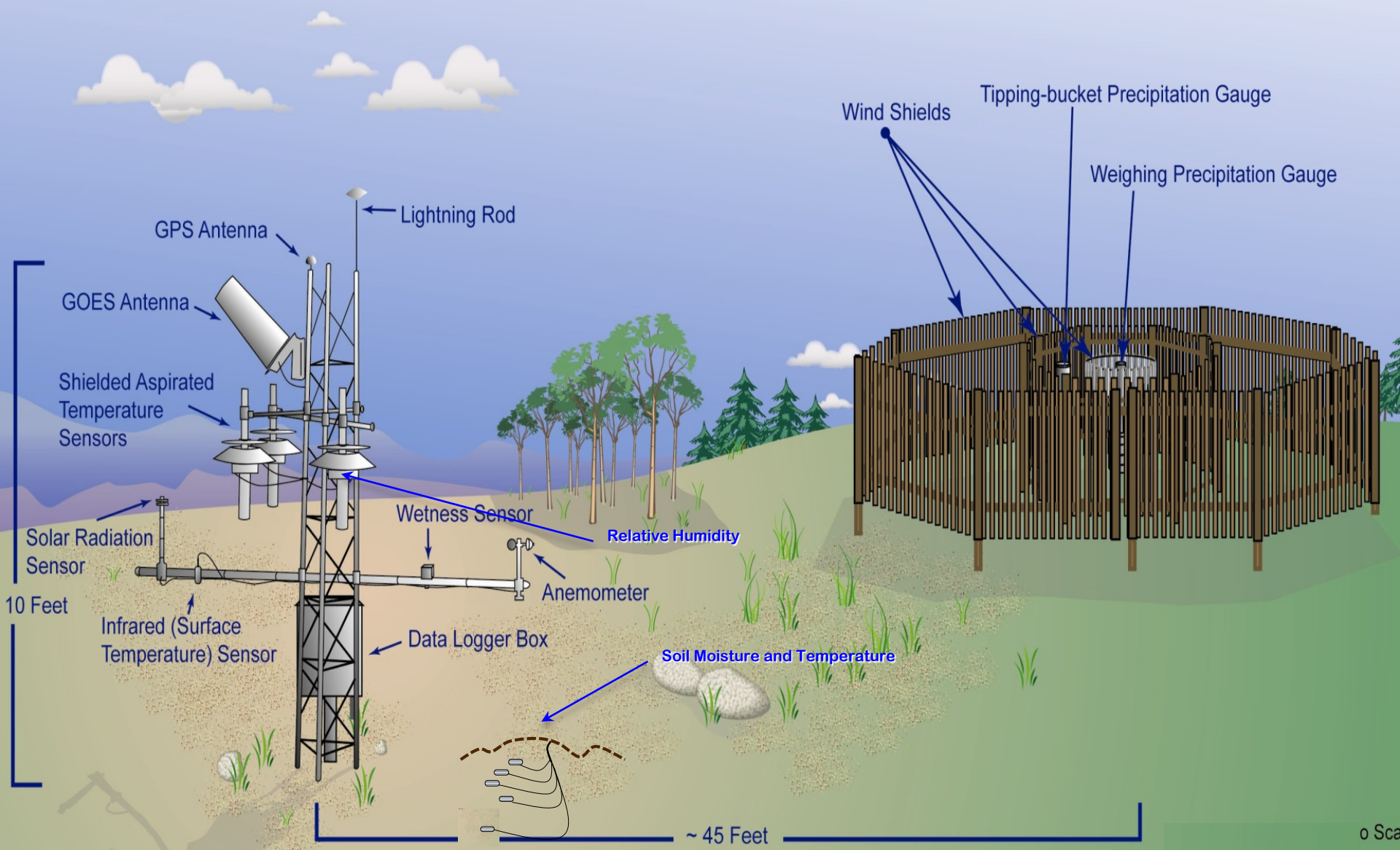
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³USDA-ARS-Hydrology and Remote Sensing Laboratory, Beltsville, MD

National Soil Moisture Network Workshop: May 24-26

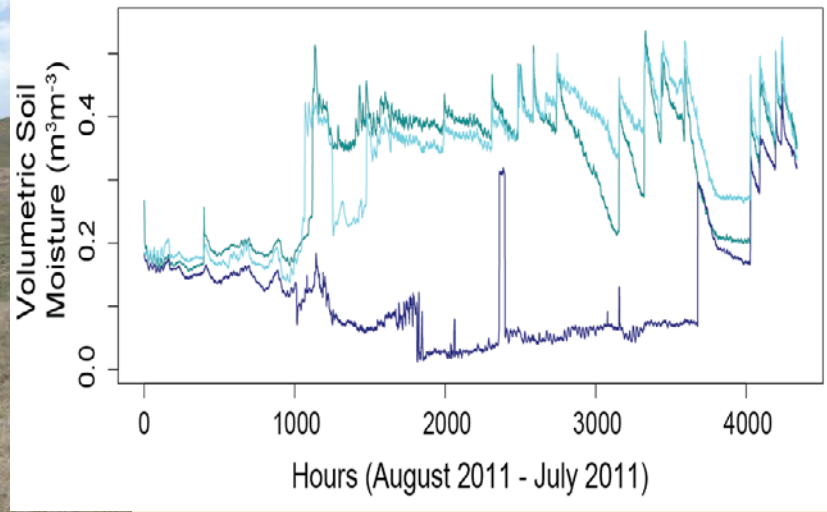
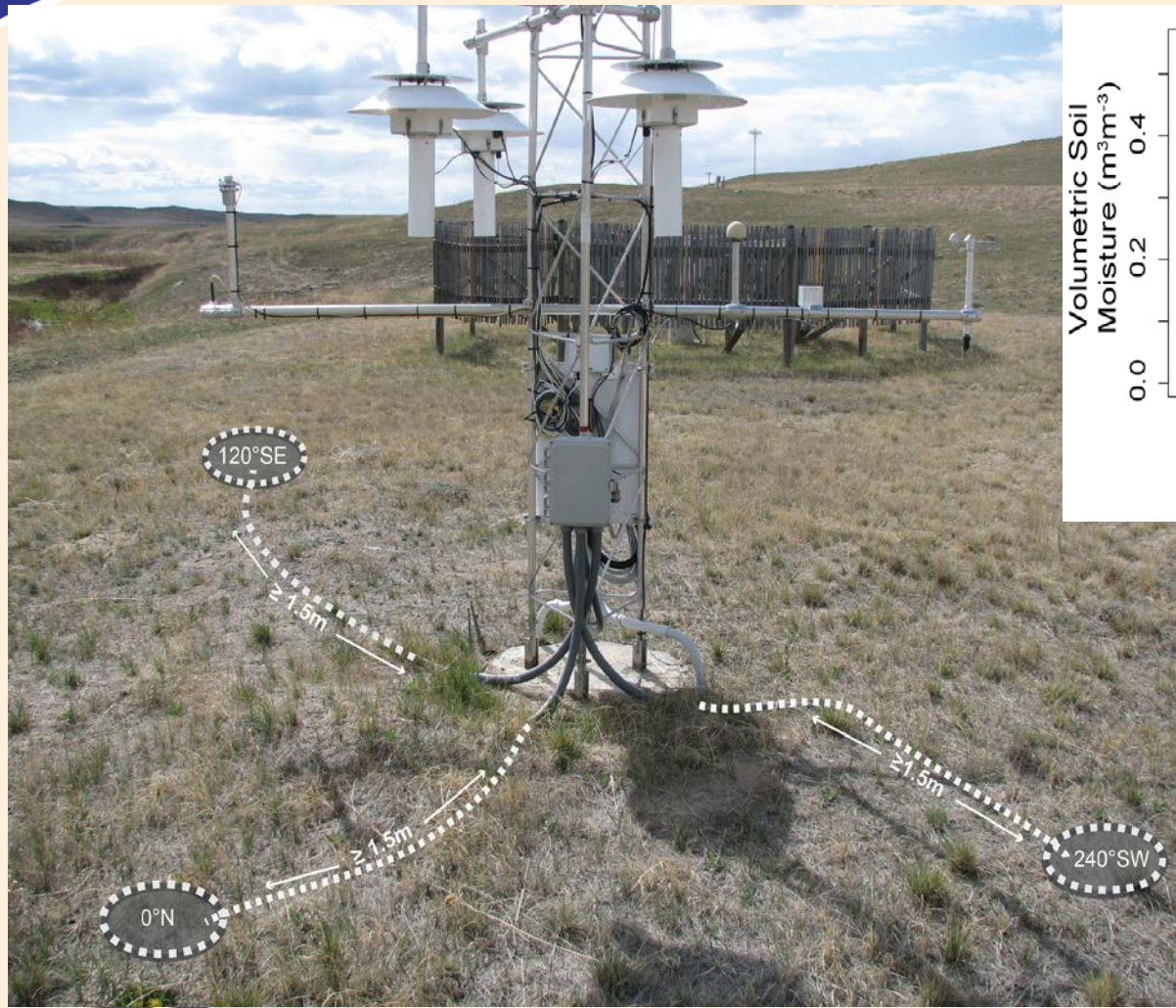
US Climate Reference Network

Measure. Advance. Engage.



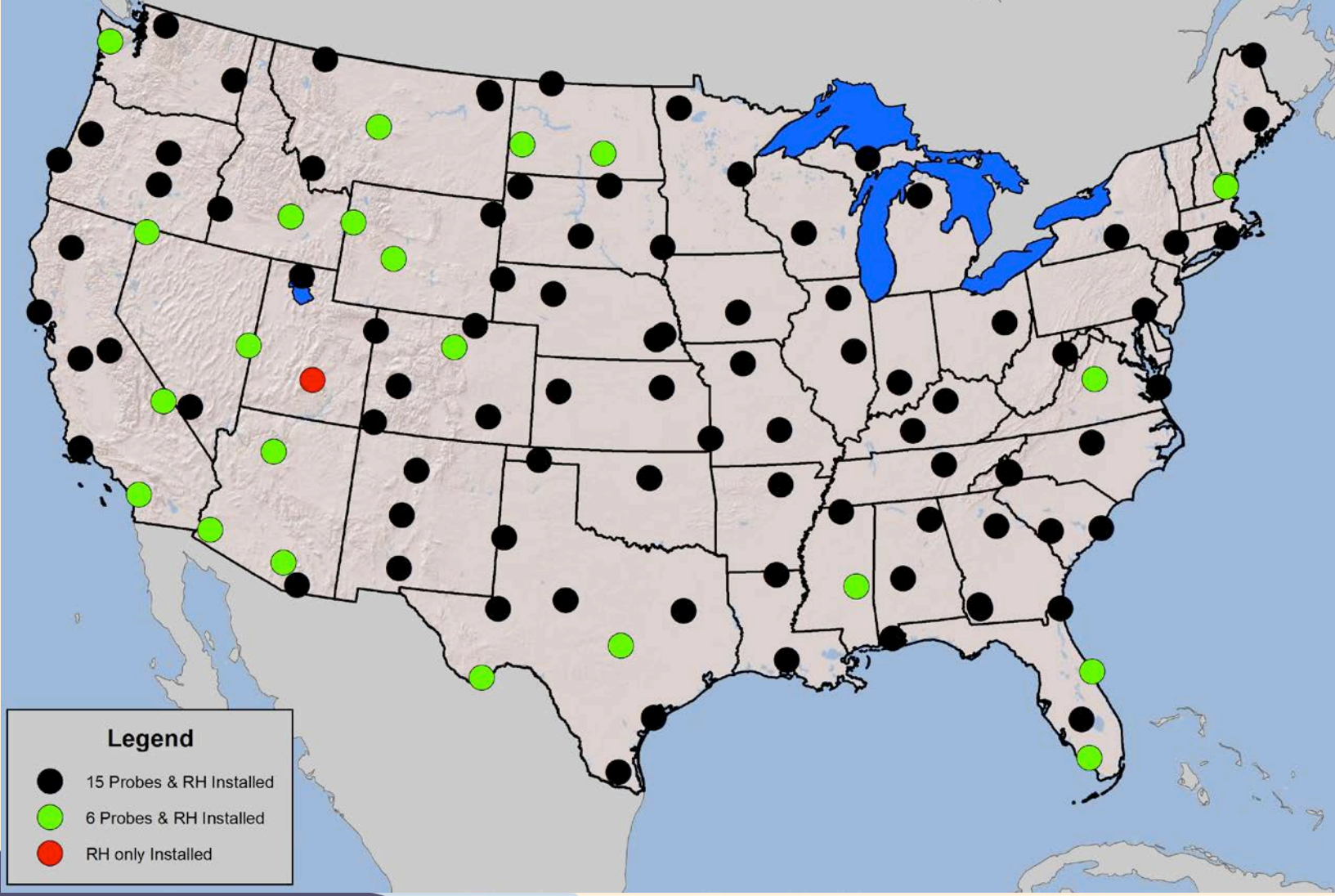
USCRN Soil Instruments

Inspire. Advance. Engage.



- Soil Temperature
- Soil Moisture
- 5cm, 10cm, 20cm, 50cm, 100cm

USCRN Station Placement and Soil Probe Depths



Inspire



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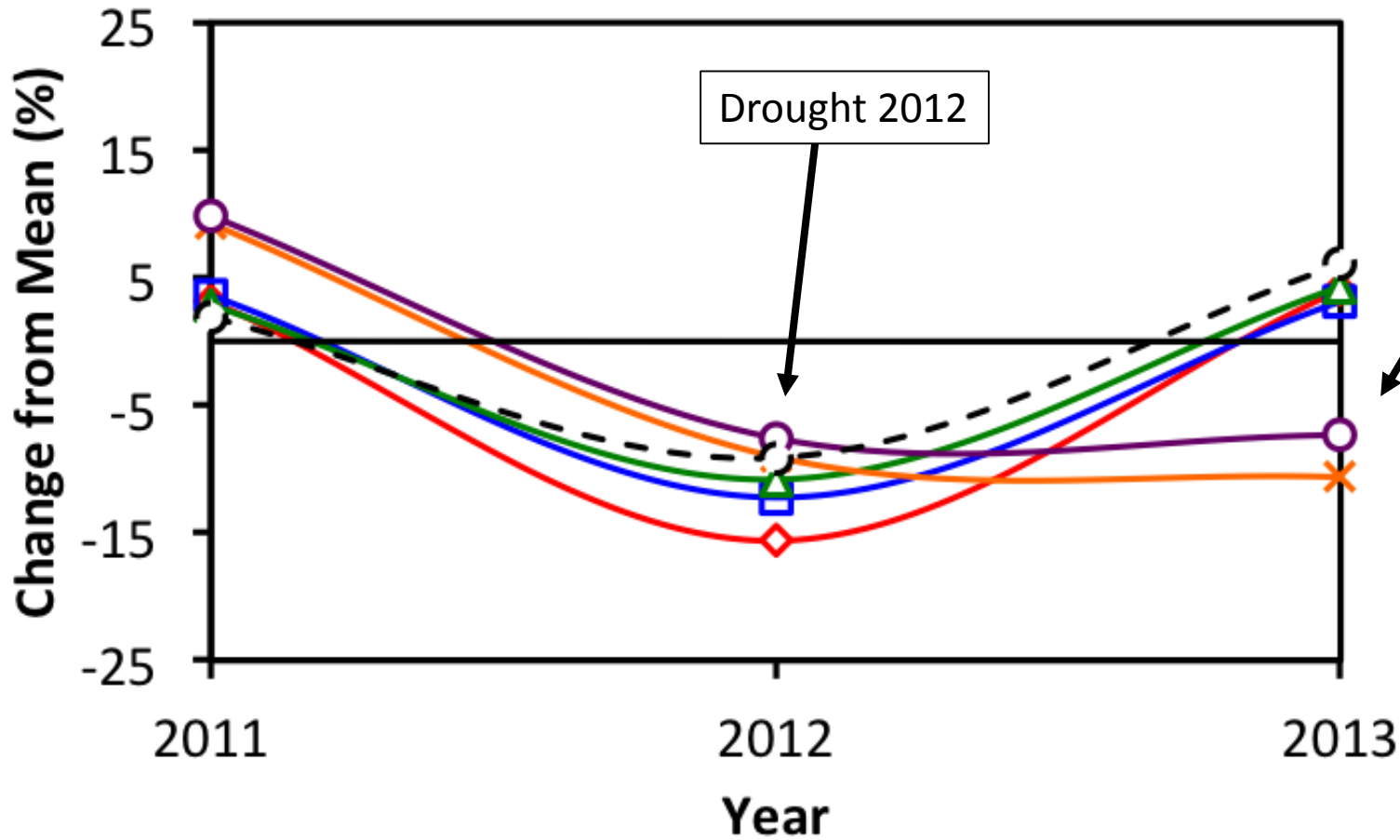
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Drought Monitoring

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Deeper depths did not recover



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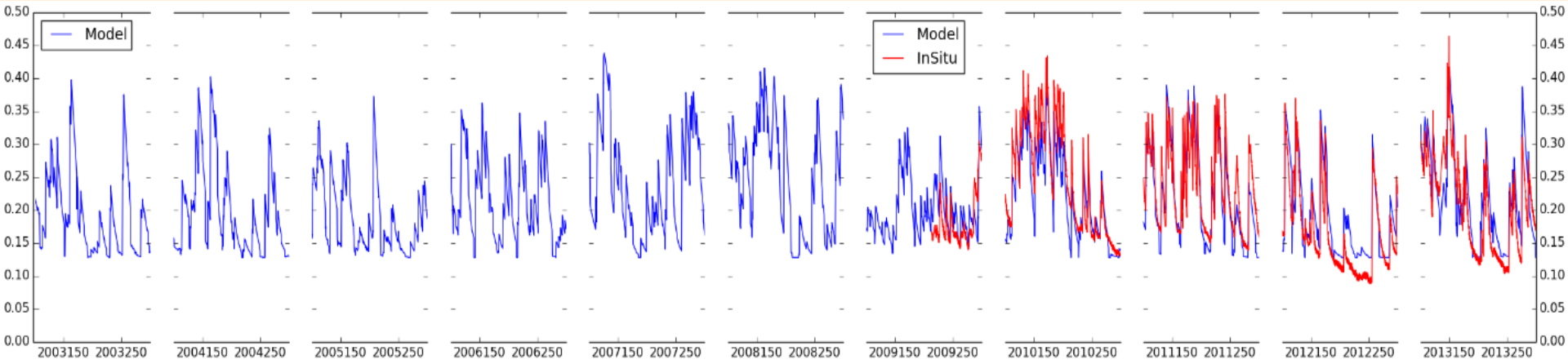
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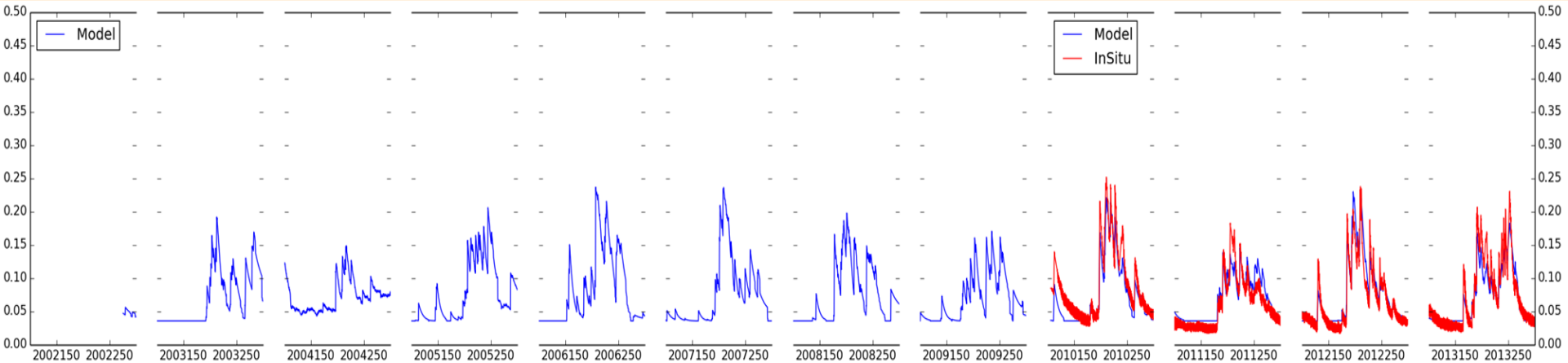
Extending Soil Moisture Record

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Nebraska



Arizona



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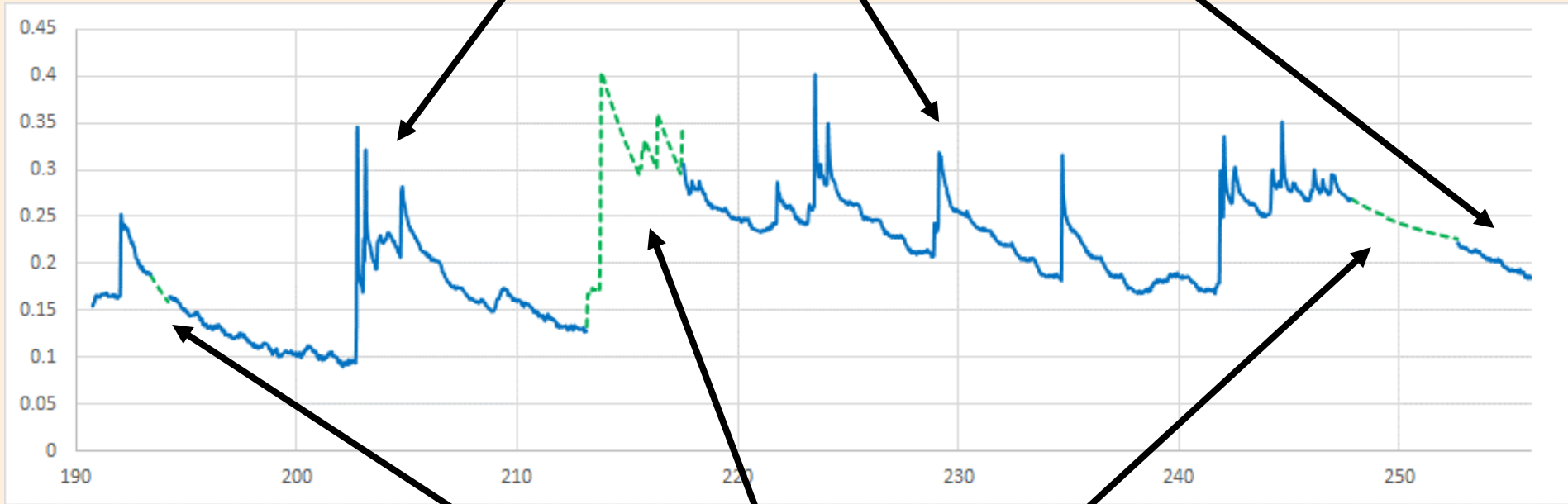
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Completing Soil Moisture Record

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In situ Soil Moisture

Modeled Soil Moisture



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Improving the Soil Moisture Record

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Soil moisture sensor issue

Model data removes sensor issue

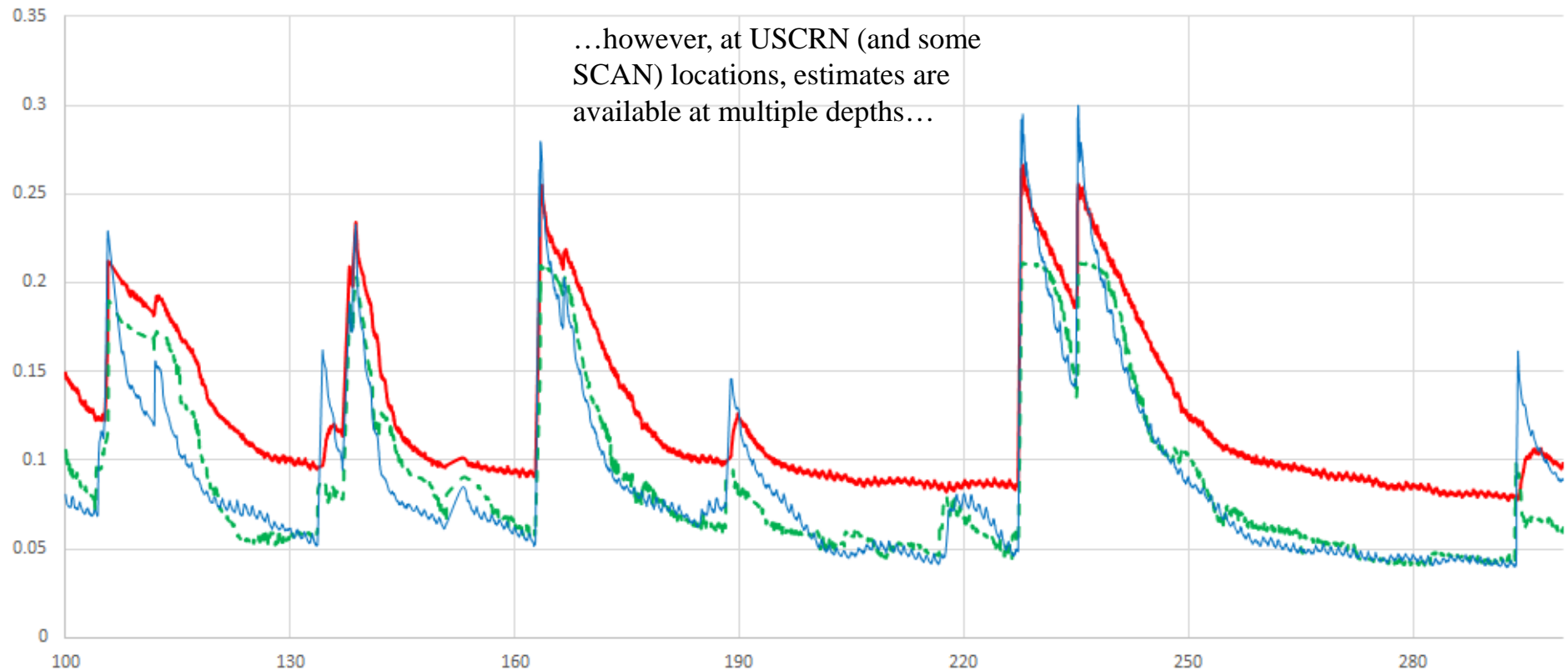


Augmenting the depth of the soil moisture record: An example in Oklahoma (Summer 2010)

At certain soil moisture sensors, a record is available at 10cm only...

...with machine learning, a 10cm series can be used to generate 5cm estimates.

...however, at USCRN (and some SCAN) locations, estimates are available at multiple depths...



Comparisons with AMSR-E: An Analysis from Coopersmith et al (2015, ii)

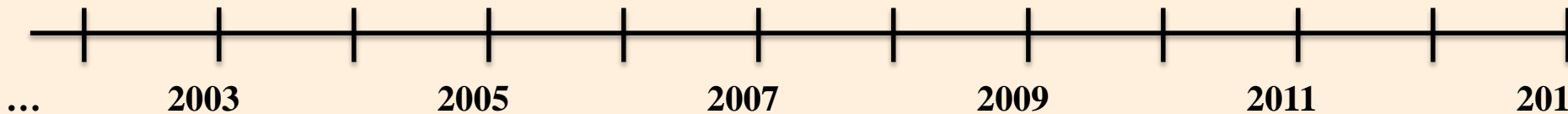
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AMSR-E Soil Moisture Data

Modeled Soil Moisture

CRN Soil Moisture Data

CRN Precipitation Data



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