

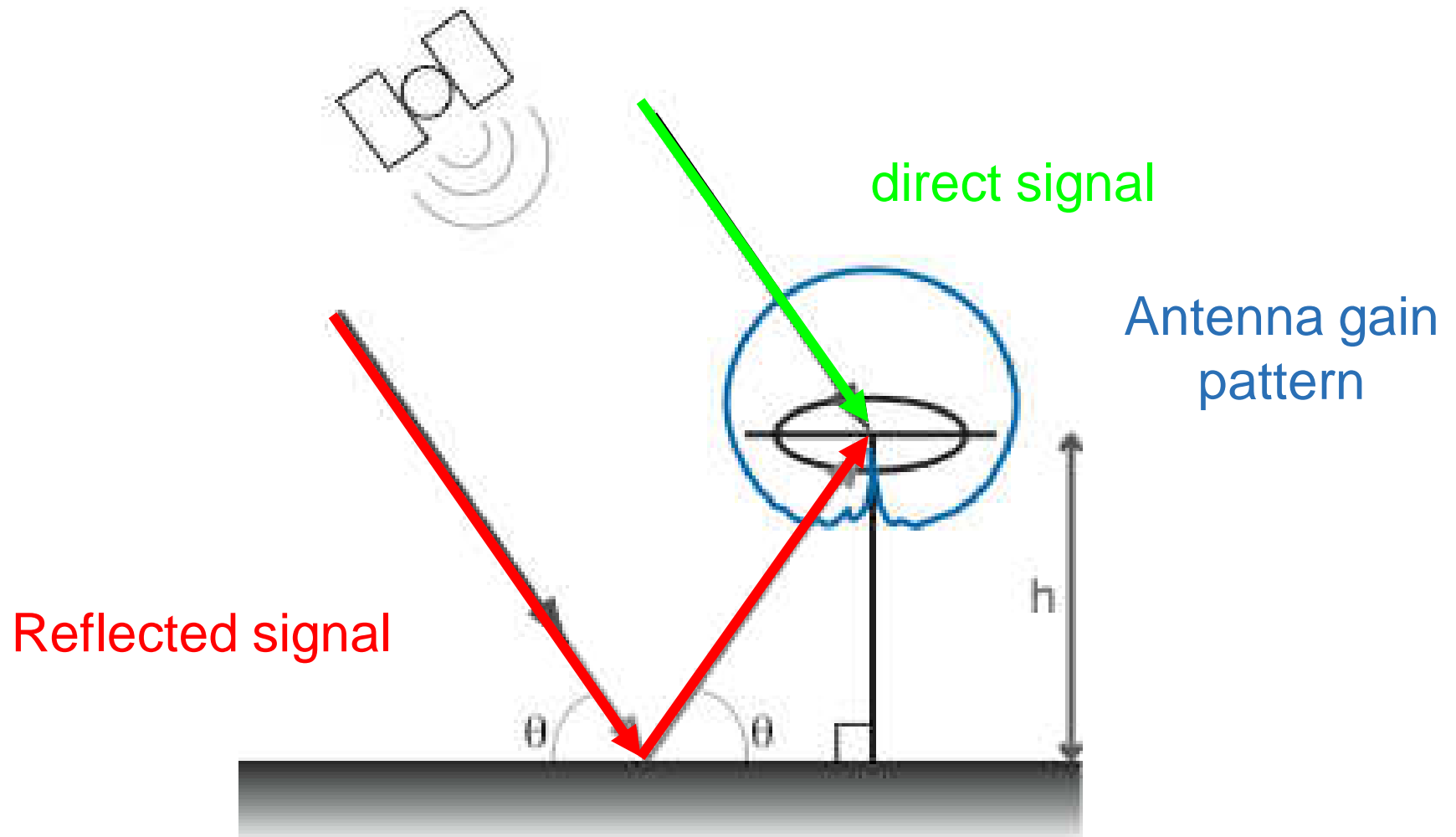
Soil Moisture Sensing Using GPS Receivers

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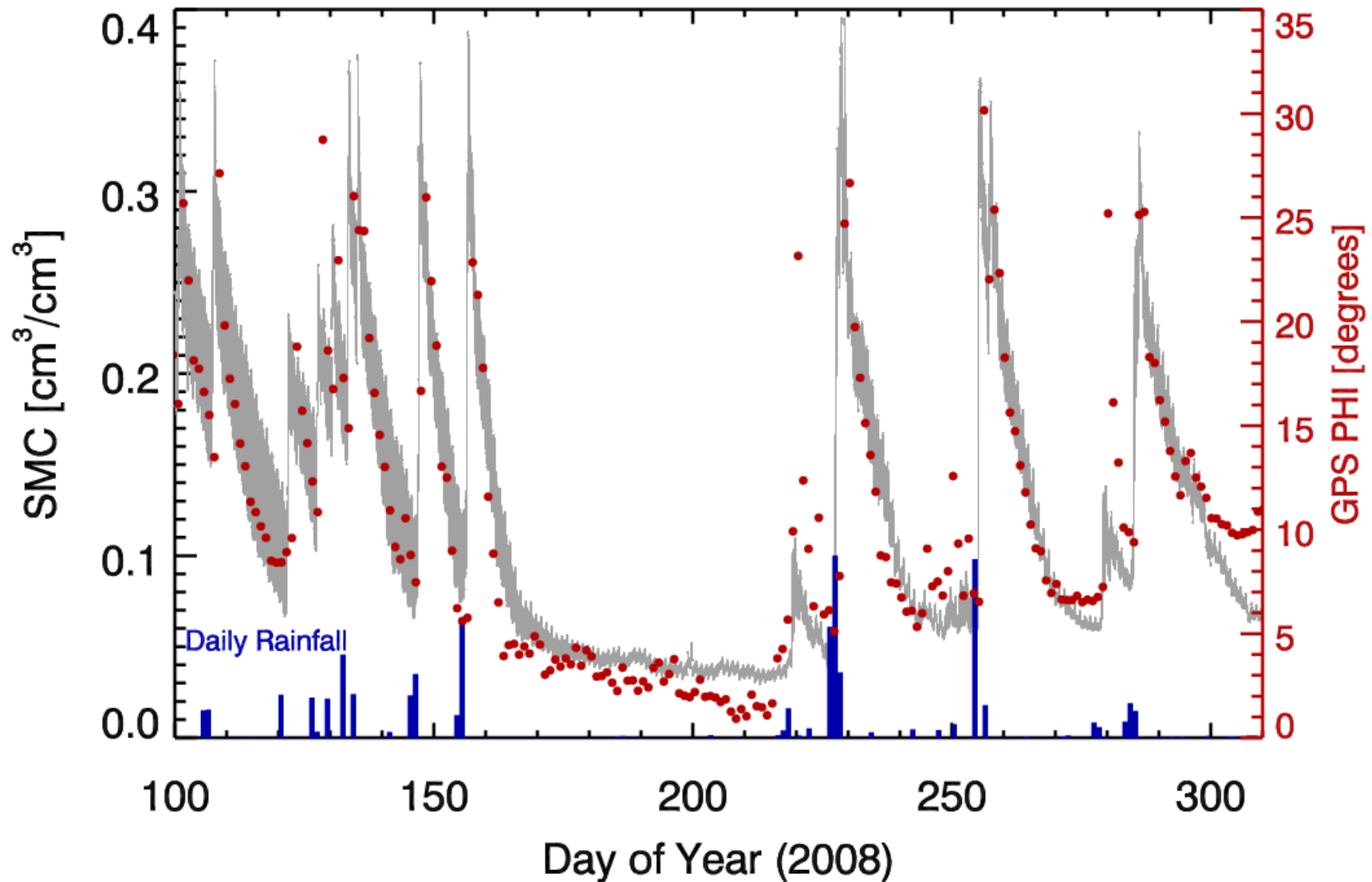
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Valery Zavorotny, NOAA



Example time series: Marshall, CO

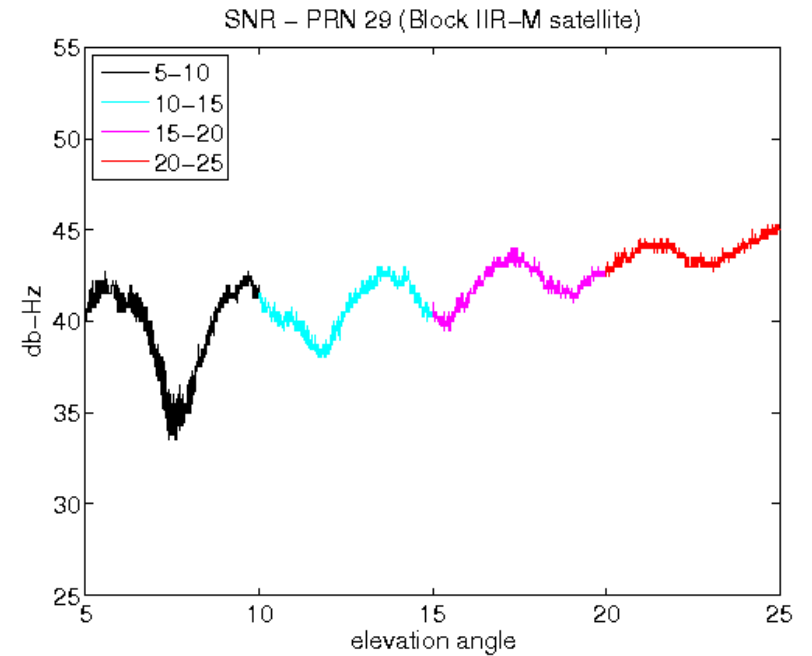
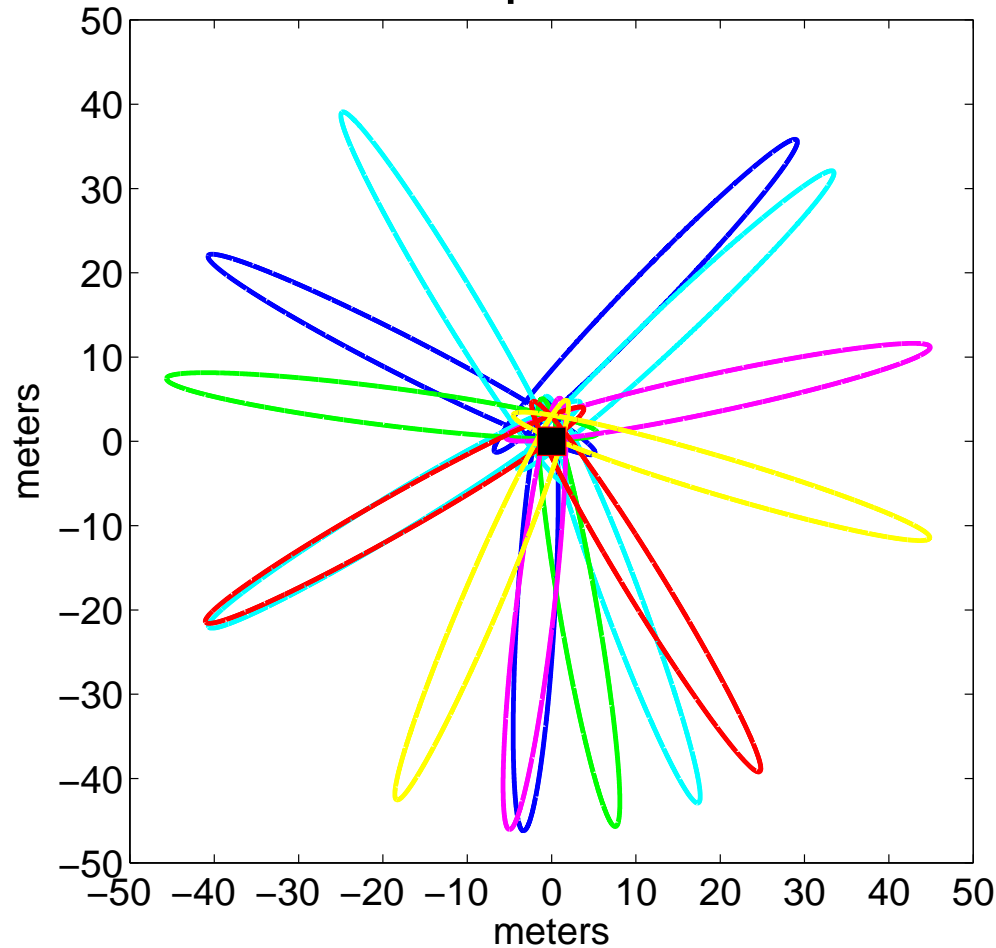
compared to 5 in situ probes at 2.5 cm depth



Sensing area: $\sim 5000 \text{ m}^2$
Frequency: daily

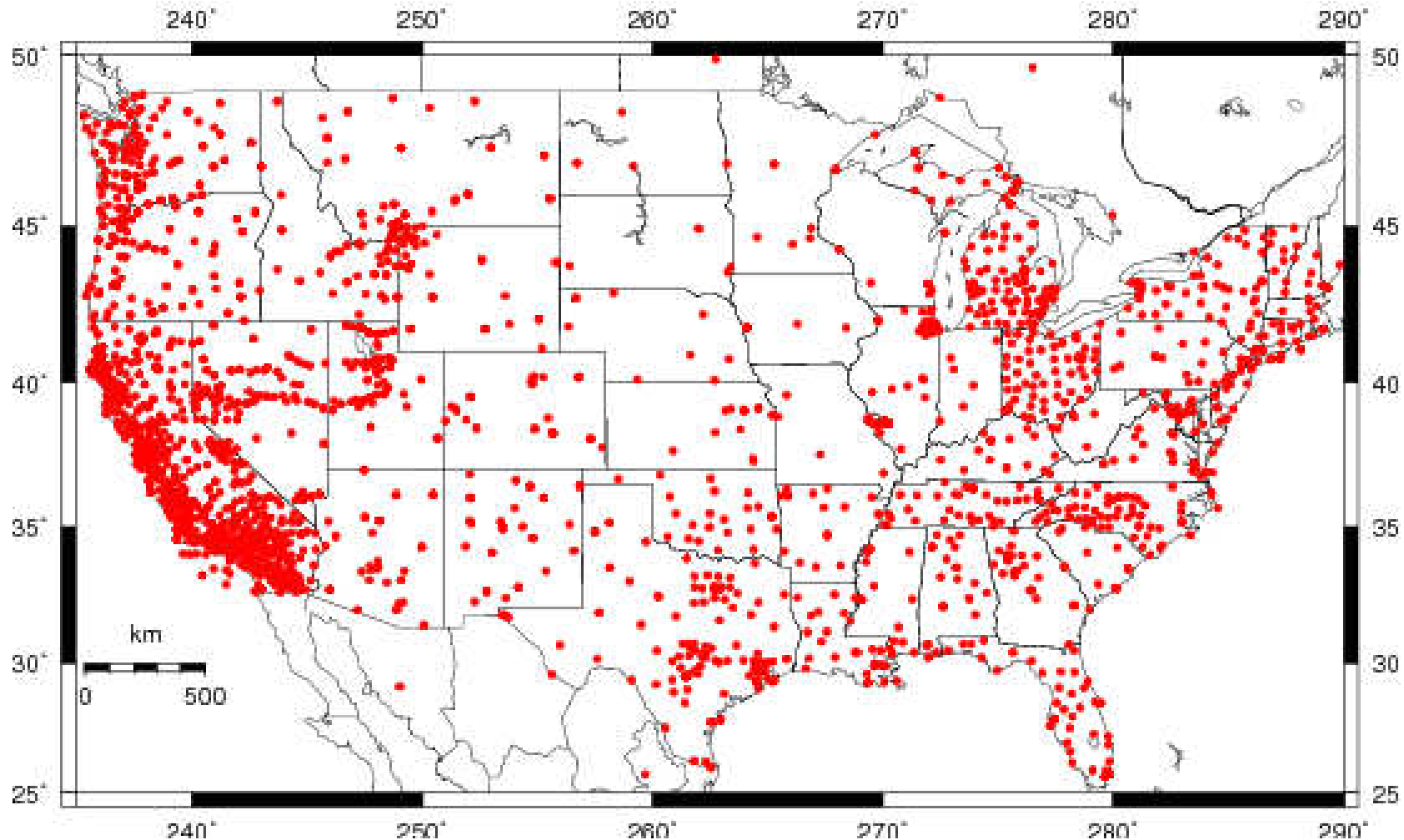
Depth: $\sim 0\text{-}5 \text{ cm}$
Effective reflector depth

Mapview



$$SNR = A \cos\left(\frac{4\pi h}{\lambda} \sin E + \phi\right)$$

GPS station distribution >1500 in US alone



Not all sites are appropriate for method
Current focus on PBO sites

Current focus

- Site characteristics
 - Vegetation
 - Roughness
 - slope
- Catalog sites

