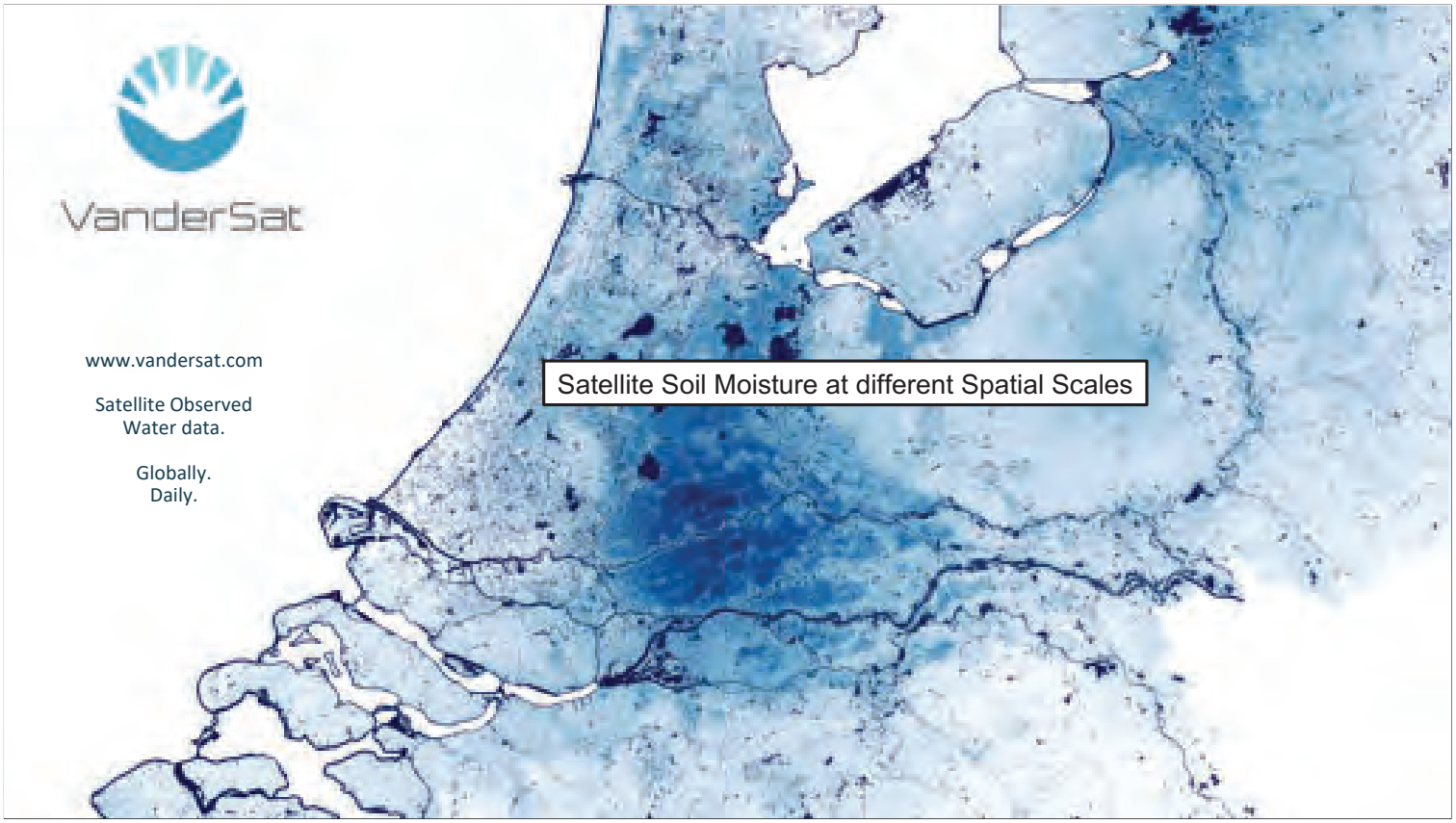
VanderSat

www.vandersat.com

Satellite Observed Water data.

Globally.
Daily.



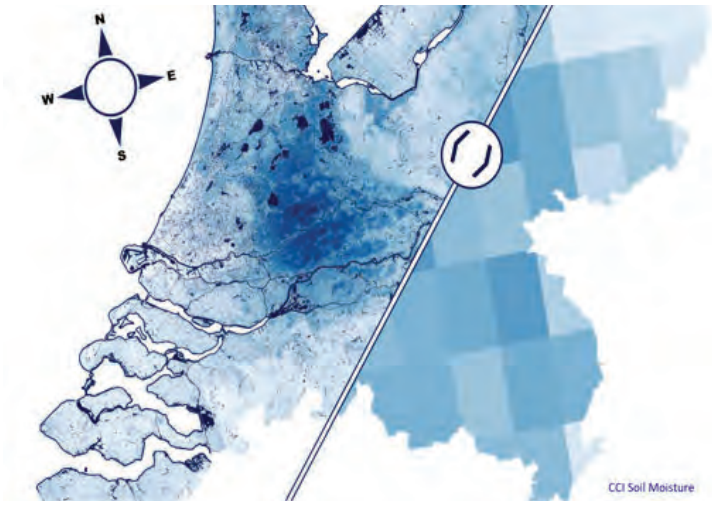
Outline

Coarse Scale Soil Moisture (~25 km)

- Public available Satellite Soil Moisture Climate Records
  - Background
  - Applications
  - Next Steps

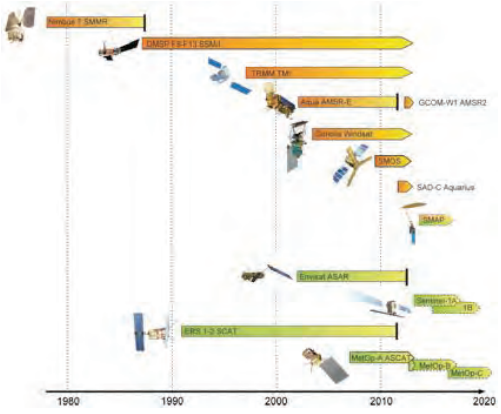
High Resolution Soil Moisture (~100 m)

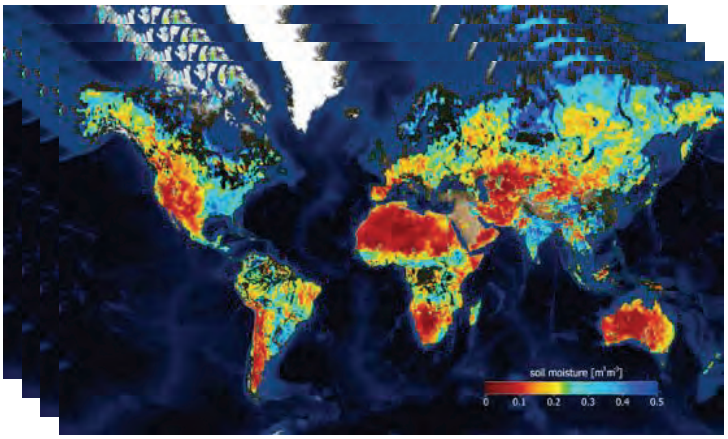
- Commercial Soil Moisture Service
  - Background
  - Applications
  - Next Steps



Coarse Scale Soil Moisture (Background)

ESA WACMOS (2009-2012)+ESA CCI (2012-2021) + Copernicus Climate Services, C3S (2018-2022): Combine passive+active microwave soil moisture products to make one “benchmark” soil moisture product



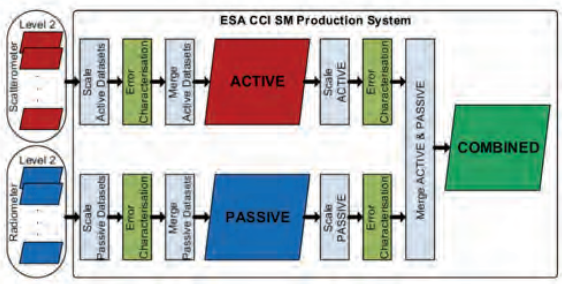


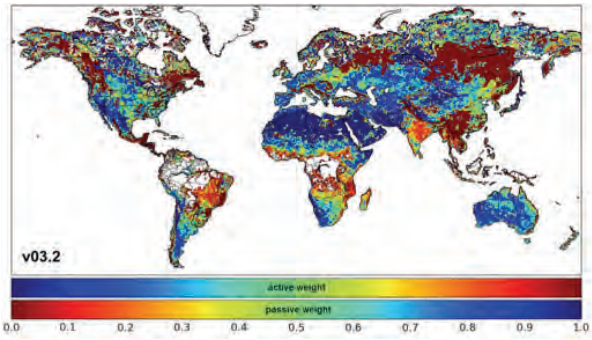
de Jeu et al, J. Geophys, 2008; Wagner et al, ISPRS 2012; Liu et al., RSE 2012 ; Dorigo et al., RSE, 2017

Coarse Scale Soil Moisture (Background)

- Daily soil moisture from 1978-Now
- 0.25 degree resolution
- Represents 0-5 cm of the soil
- Global Coverage
- Data free available at https://www.esa-soilmoisture-cci.org
- NRT datafeed https://cds.climate.copernicus.eu/

- Currently ~9000 registered users

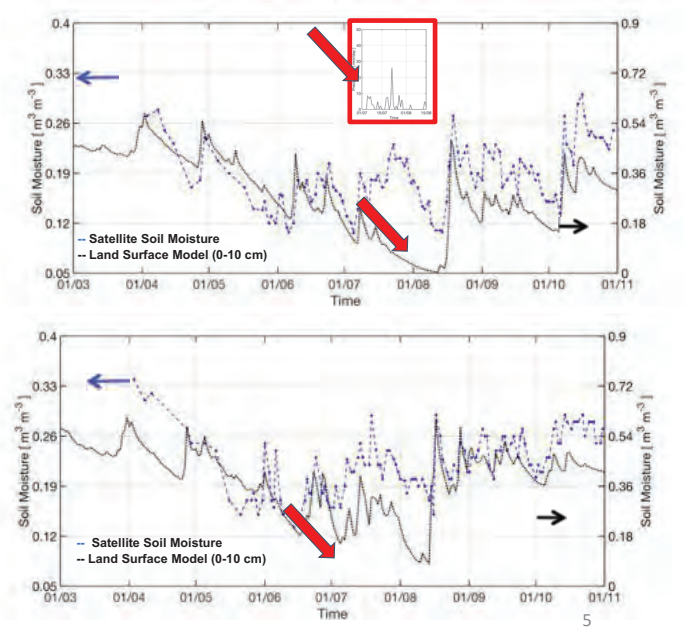




Coarse Scale Soil Moisture (Applications)

Benchmarking Models:

- Support model improvement (e.g. rainfall, and evaporation input)
- Independent data record
- 40+ years

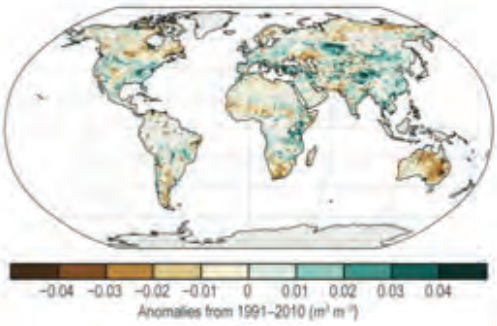


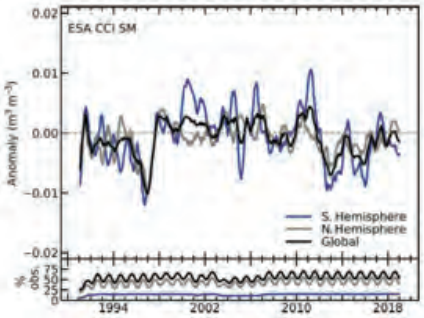
Coarse Scale Soil Moisture (Applications)

- Climate Variability and Change (*e.g.* Albergel et al., J Hmet, 2013)
- Land Atmosphere Interactions (*e.g*. Guillod et al., Nat. Com. 2014)
- Global Biogeochemical Cycles (*e.g.* Rebel et al., HESS, 2013)
- Land Surface Modelling (*e.g.* Schellekens et al., ESSD, 2016)
- Drought Applications (*e.g.* Liu et al., RSE, 2019)
- Hydrological Applications (*e.g.* Ciabatta et al.,ESSD, 2018)

NB complete overview can be found at Dorigo et al., RSE 2017

CCI soil moisture is used in 200+ scientific studies

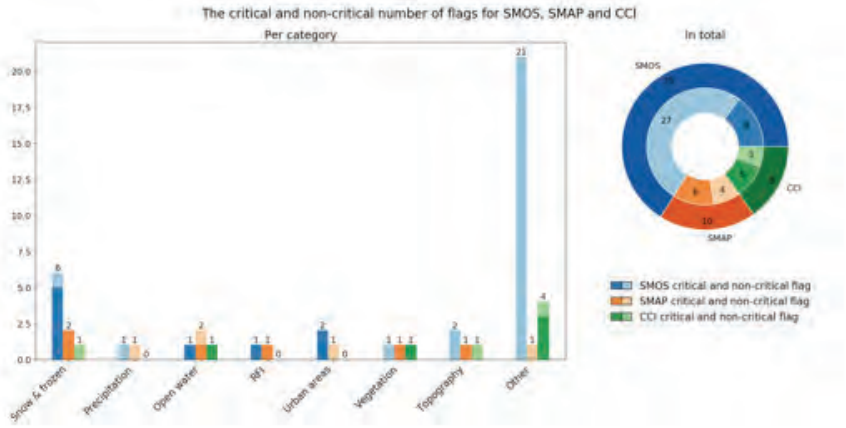




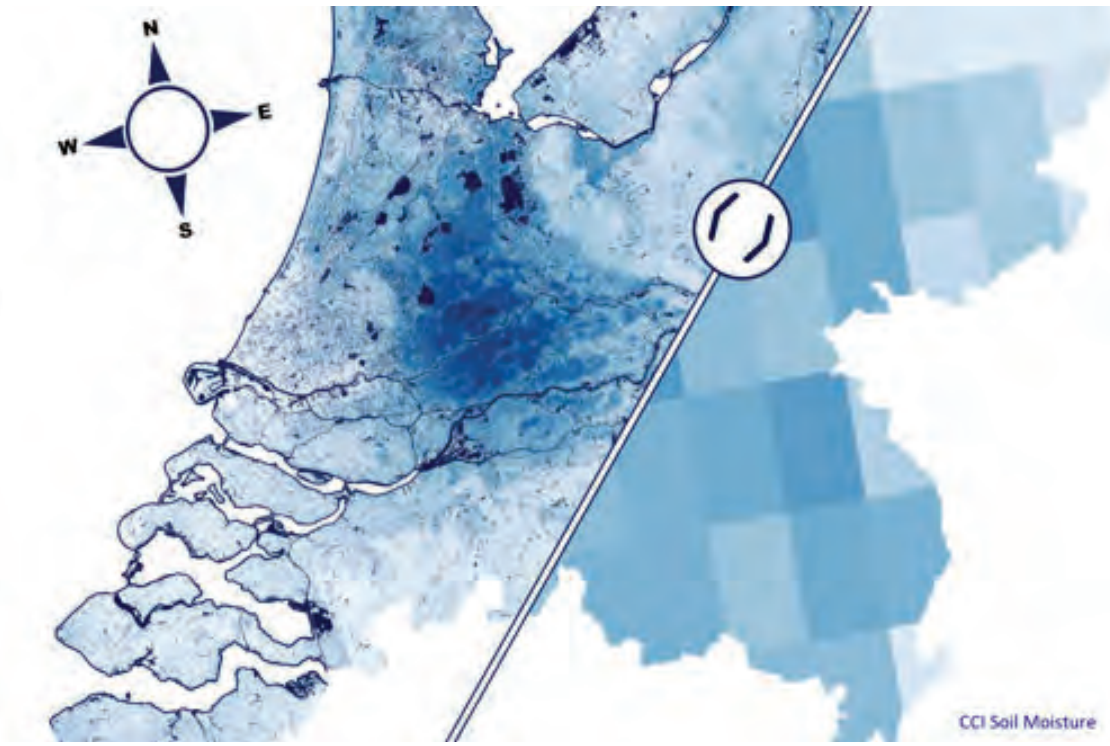
Scanlon et al., BAMS, 2019

Coarse Scale Soil Moisture (Next Steps)

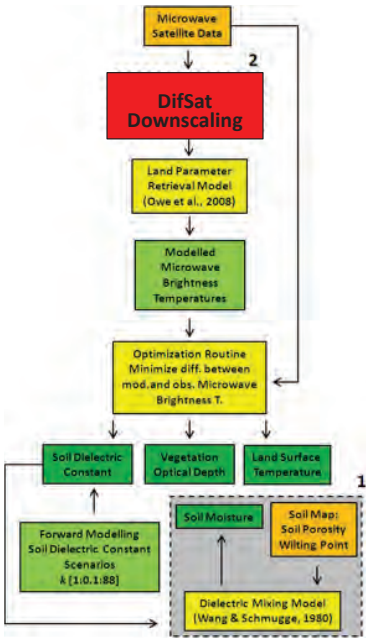
- Multi model approach (ensemble of different soil moisture retrieval algorithms)
- Improved data flagging strategy (Van der Vliet et al., in prep)
- Inclusion of new satellite data sets
- CCI V5 release in 2020

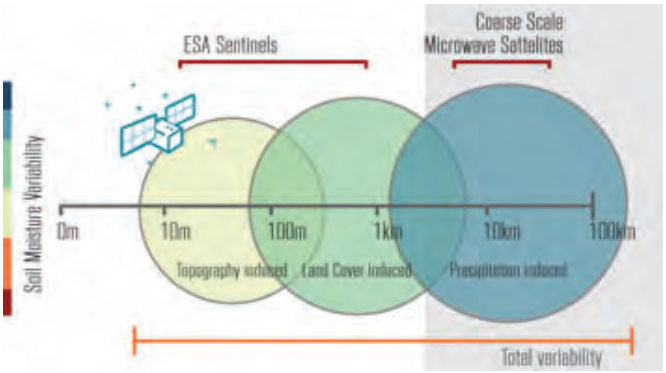


Van der Vliet et al., in prep

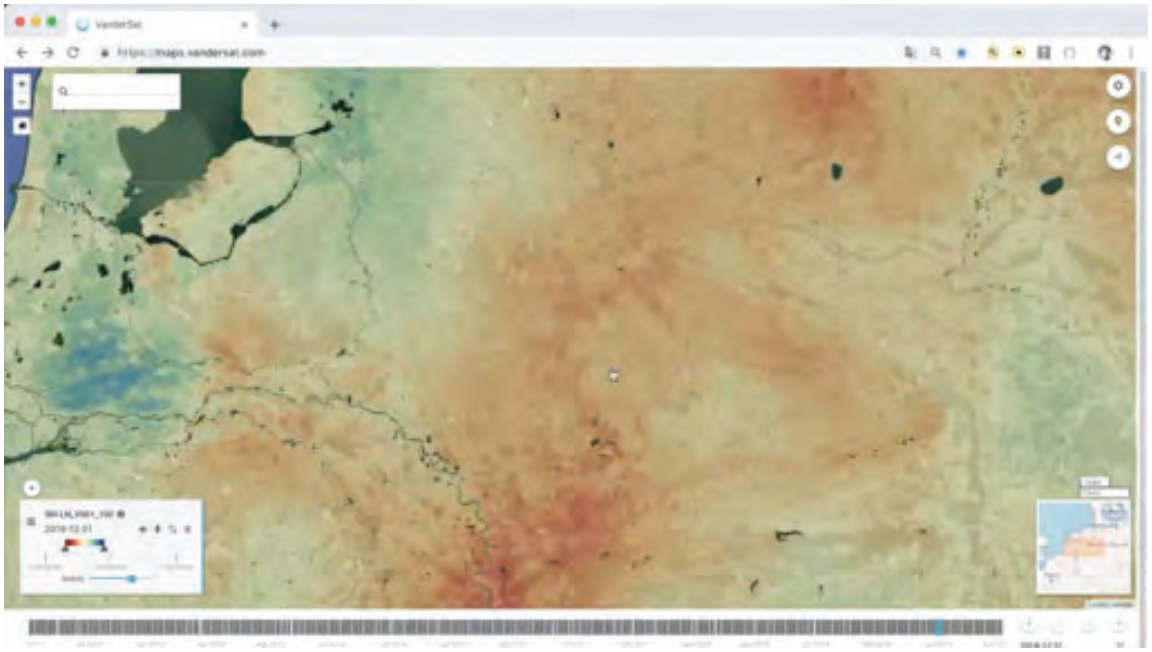


High Resolution Soil Moisture (Background)



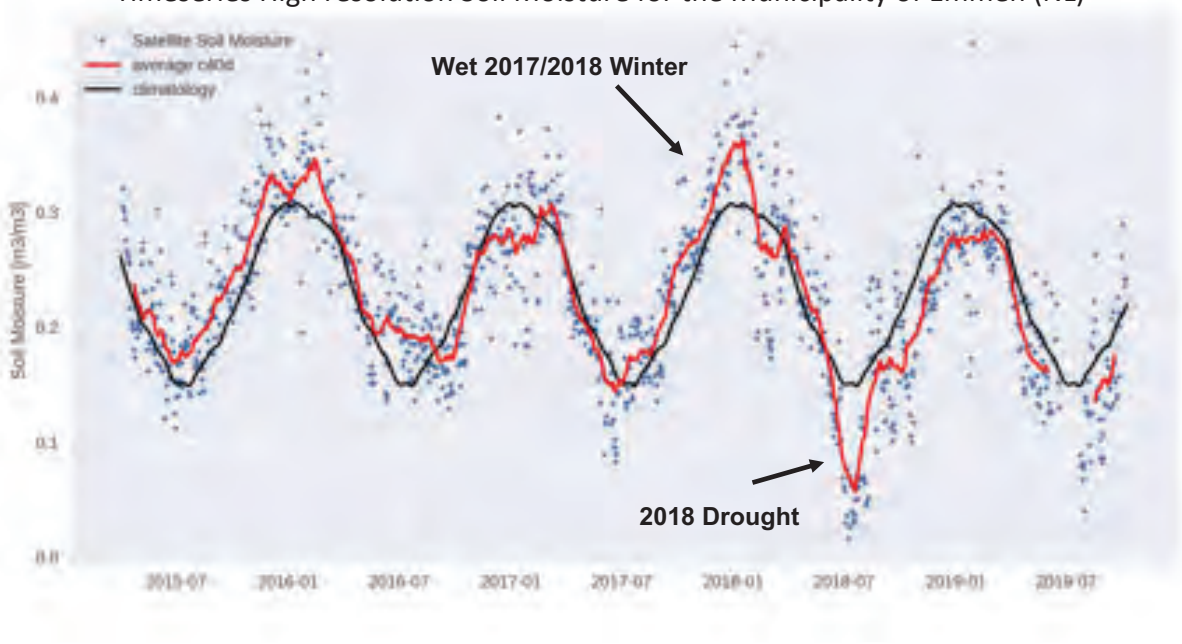


High Resolution Soil Moisture (Background)



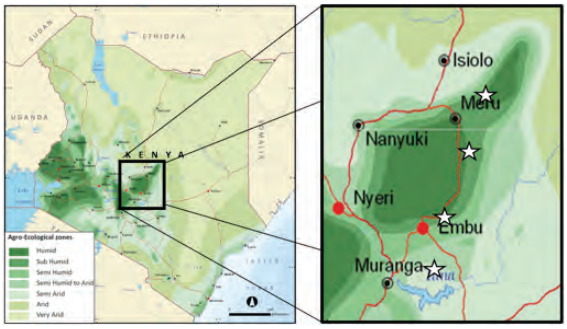
High Resolution Soil Moisture (Background)

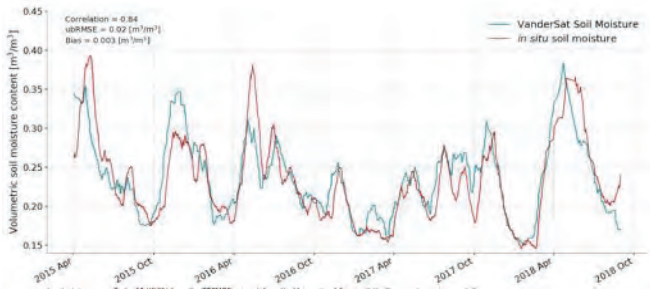
Timeseries High resolution Soil Moisture for the Municipality of Emmen (NL)



High Resolution Soil Moisture (Applications)

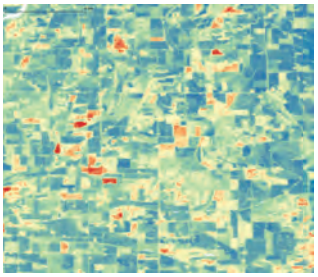
“Can we improve the financial security for small holder farmers in Kenya?”
ACRE Africa Case; Agricultural Insurance for Maize farmers



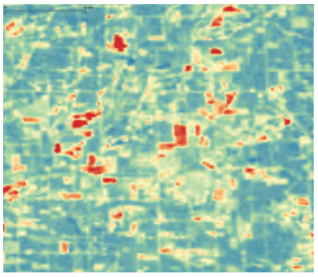


High Resolution Soil Moisture (Next Steps)

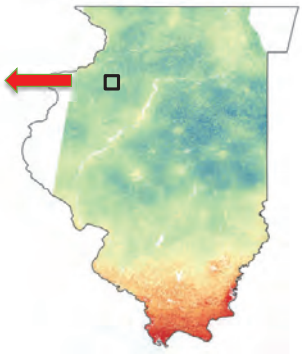
- Further development back-up system
- Inclusion of more satellite data (*i.e.* GMI, Sentinel 3)
- Derived RootZone Soil Moisture
- Thorough spatial validation
- Improvement other microwave based data products (*i.e.* LST, VOD)
- V4 release in 2020



VanderSat LST



LandSat LST



LST Illinois (USA)

VanderSat

www.vandersat.com

Satellite Observed Water data.

Globally. Daily.

Thank You for your Attention