

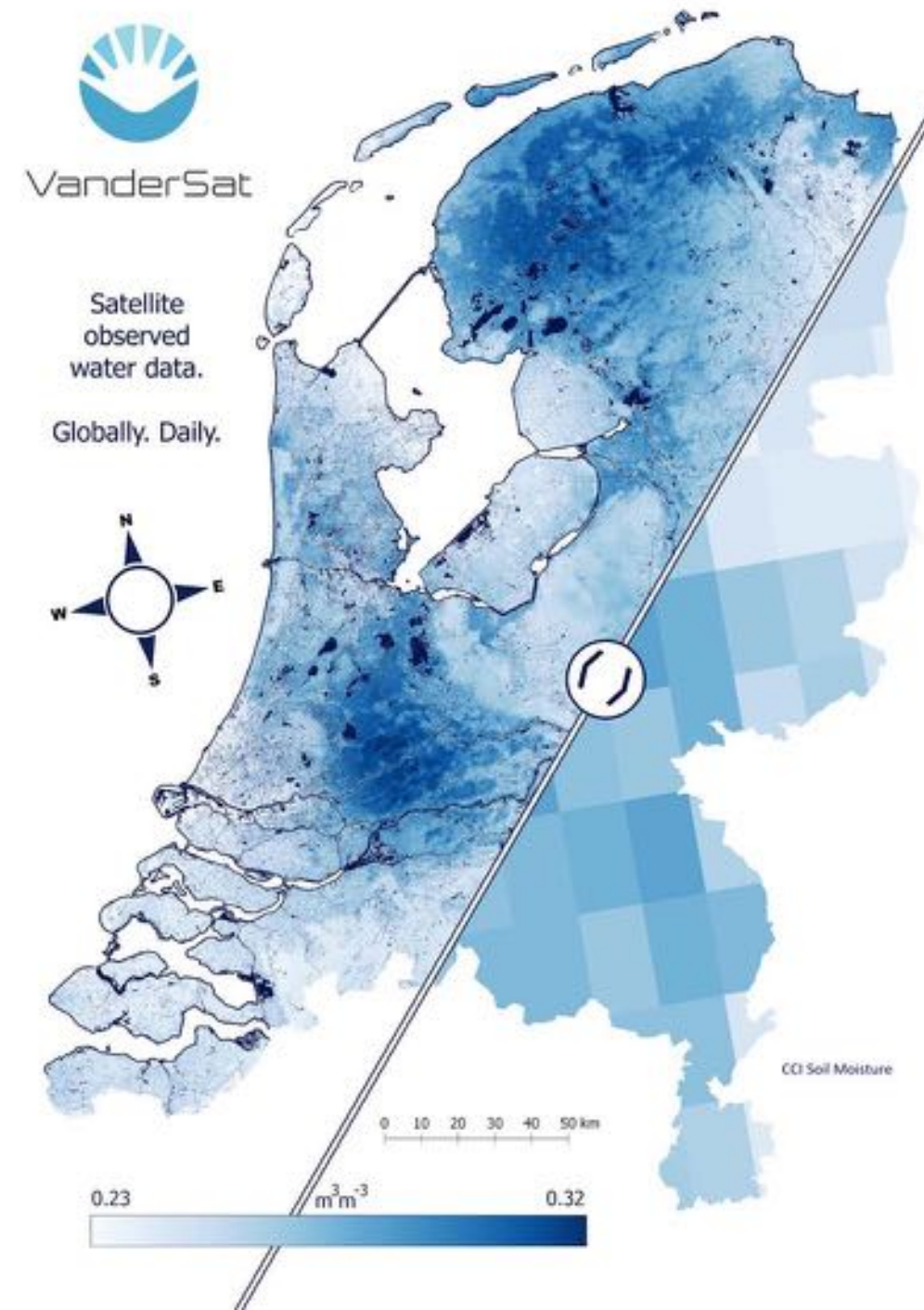


VanderSat

**Near Real Time Soil Moisture at high resolution for
Agriculture (re)Insurance and Water Management**

VanderSat

- Founded in 2015
- ~~10, 14~~ 23 employees (scientists (> 50 % has a phd in EO) and entrepreneurs)
- Located in Haarlem, The Netherlands
- Commercial EO services
- Mission:
 - To develop products and services from earth observation data which have a positive impact to our society.
 - Our key focus will be on the development of high quality soil moisture products and services from microwave satellite sensors.



Passive Microwave Technology



- **Most reliable system** for soil moisture monitoring (ESA/NASA)
- Systems sensitive to moisture content of **first 5 cm** of the soil
- **Daily** observations, all **weather proof** (no problems with clouds)
- **Global coverage**, 40 years of data
- **Scientific** soil moisture retrieval **algorithms** (e.g. Owe et al., JGR, 2008)



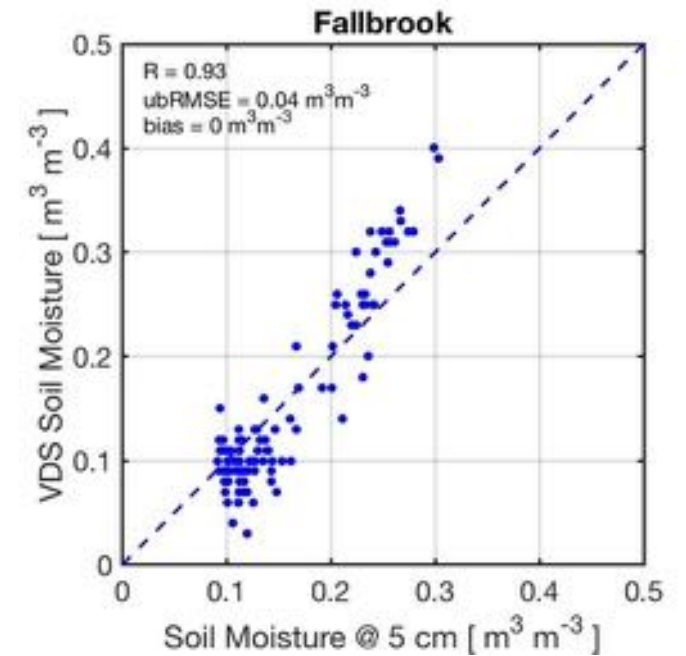
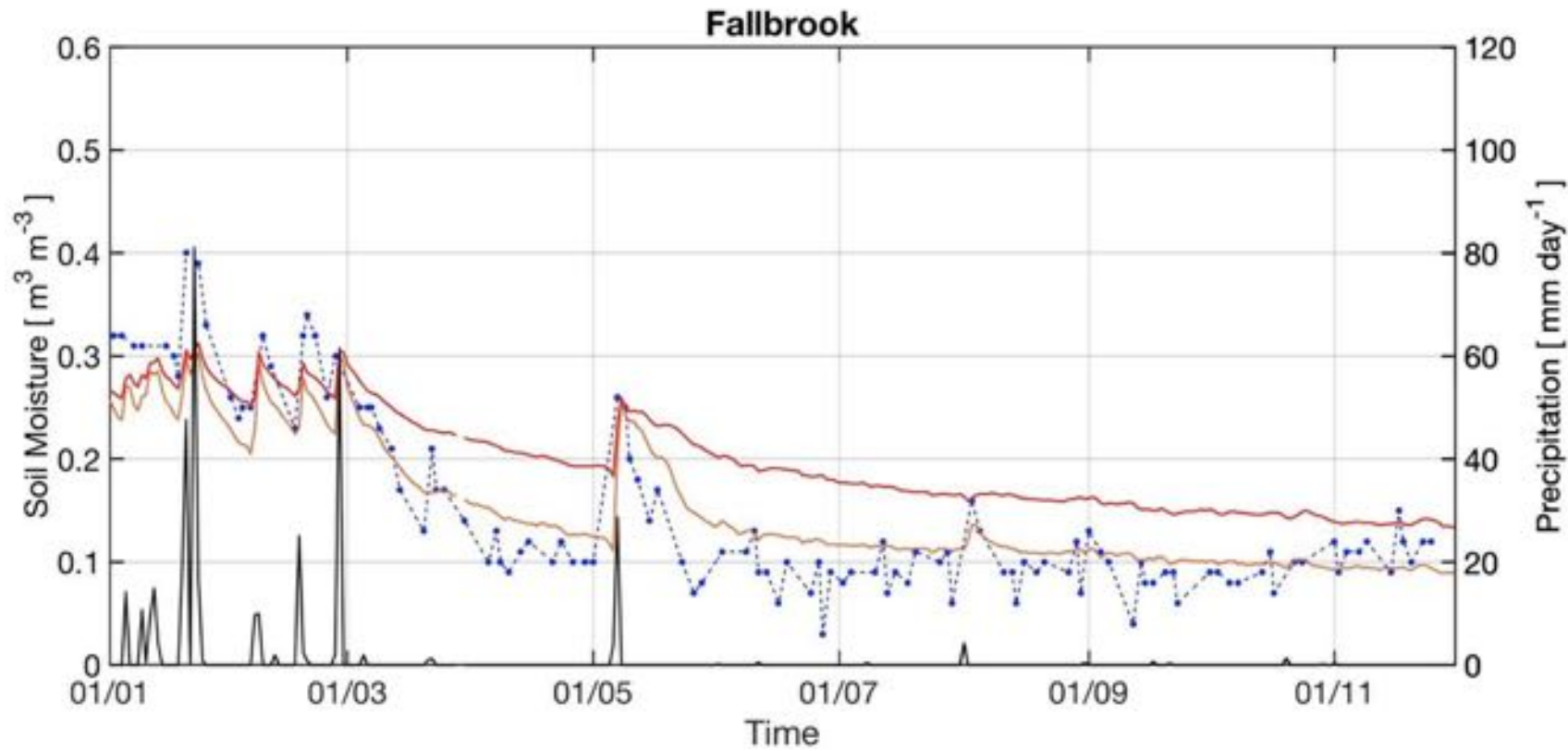
Products



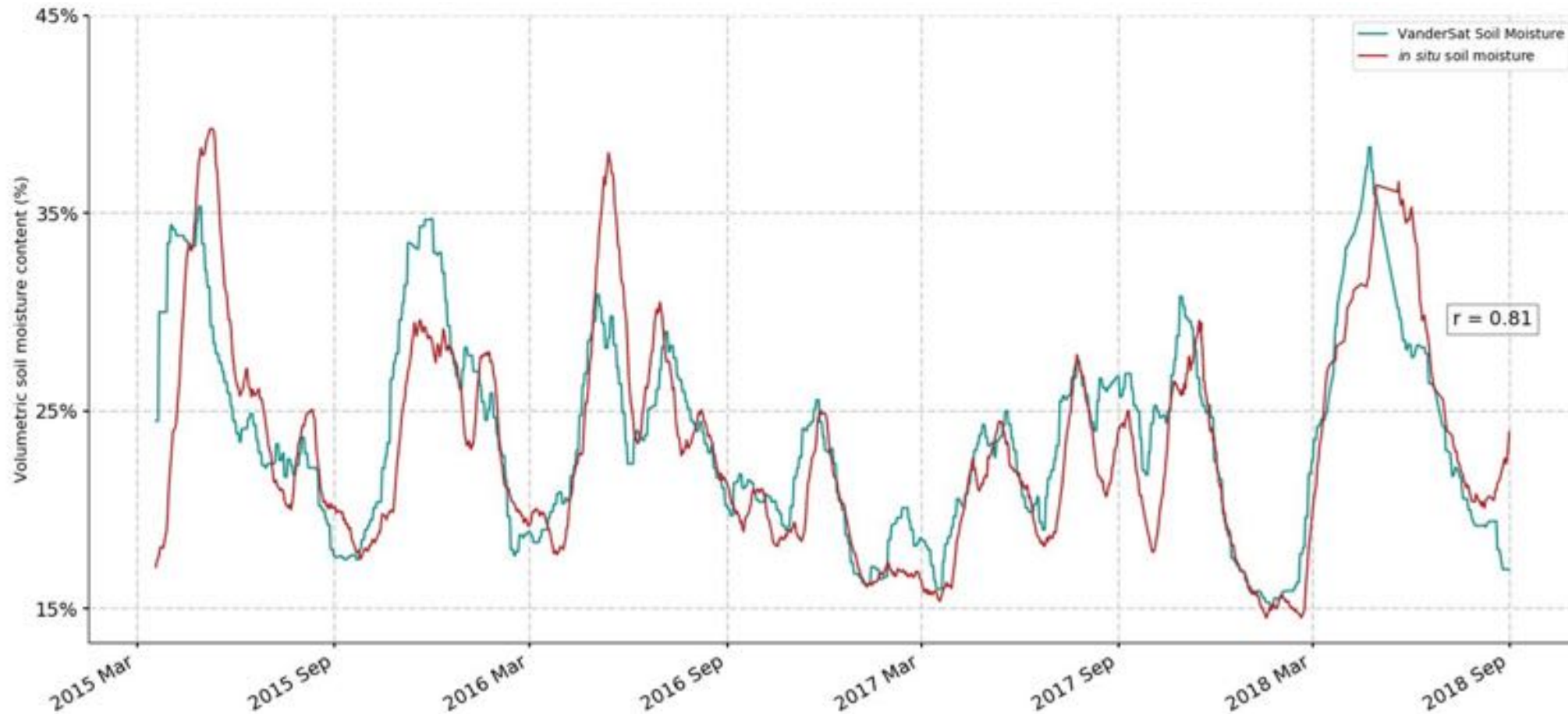
- **100 m Soil moisture (daily, global, 2002-now)**
- **100 m Land Surface Temperature (daily, global, 2002-now)**
- **100 m Vegetation Optical Depth (daily, global, 2002-now)**
- **10 m Inundation/Flooding (based on Sentinel 1)**
- **10 m Land Use Maps (Annual, NL)**



Validation – USA



Validation - Kenya

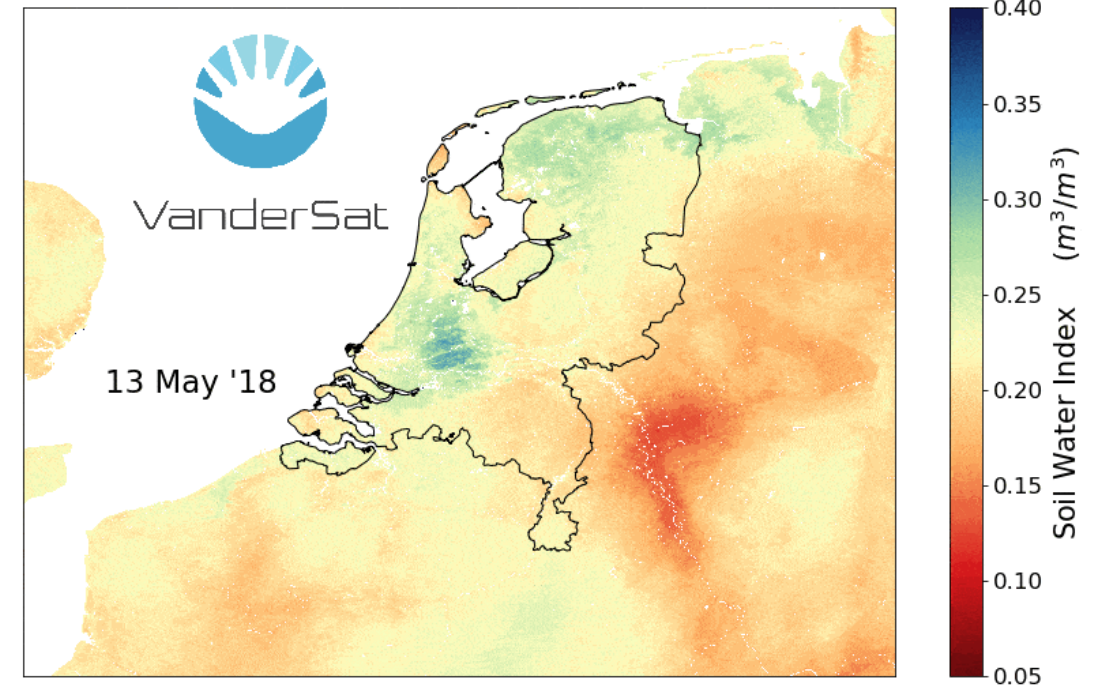
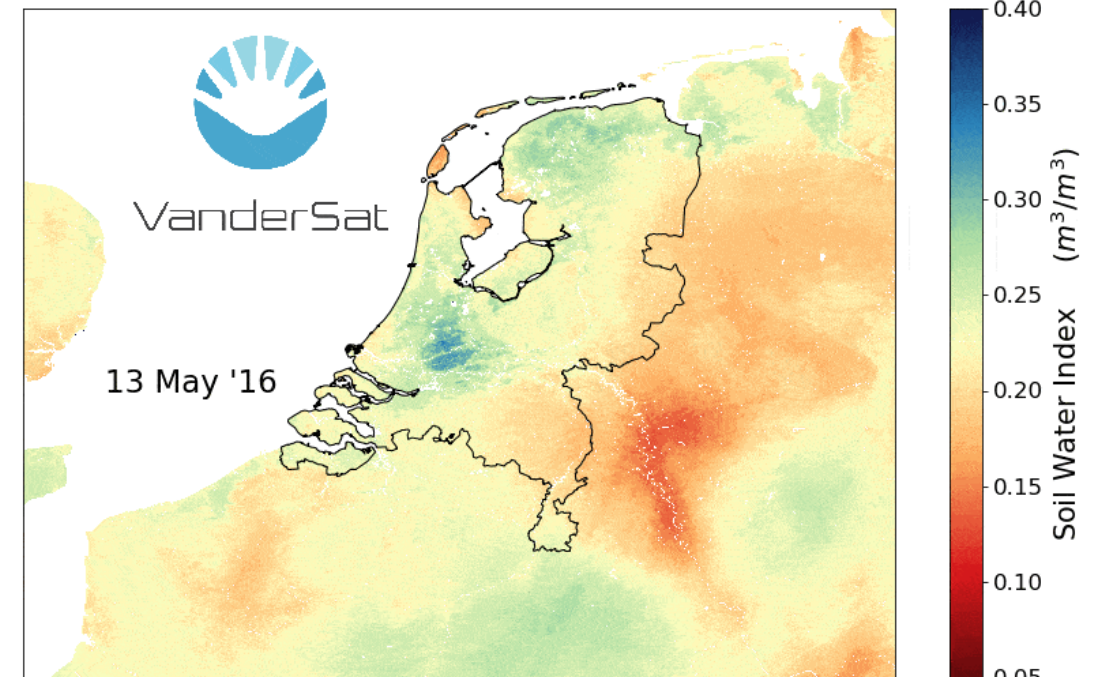


In situ data source: Probe 50 (KLEE) from the COSMOS network from the University of Arizona (<http://cosmos.hwr.arizona.edu/>)
Download link: <http://cosmos.hwr.arizona.edu/Probes/StationDat/055/index.php>

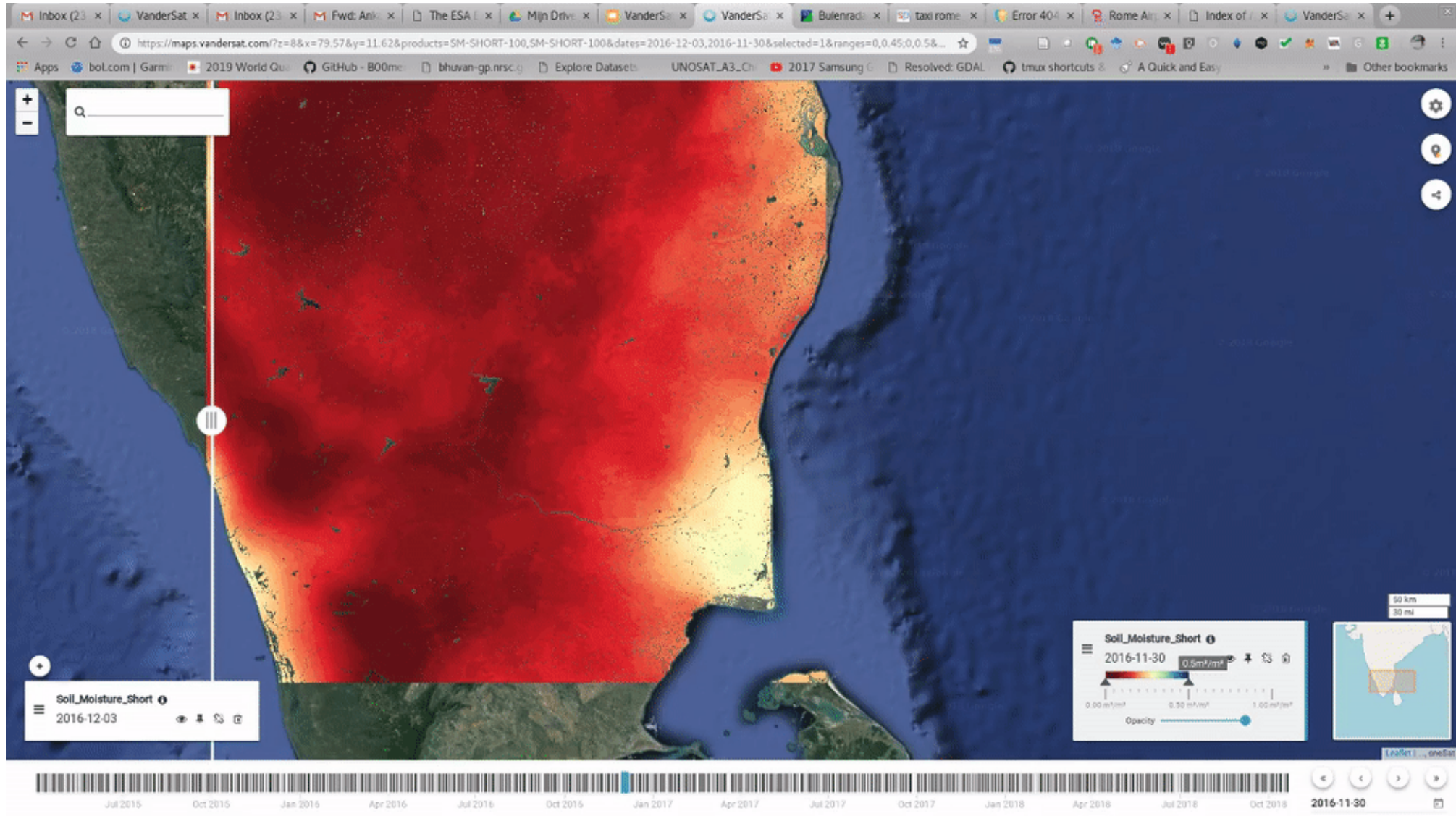


Application: drought monitoring

- Animation shows Derived Root Zone Soil Moisture:
 - Top 2016
 - Bottom 2018



Application: Water Management

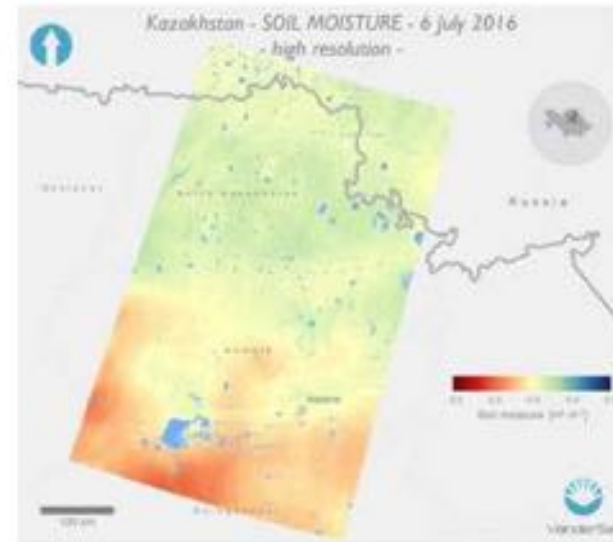
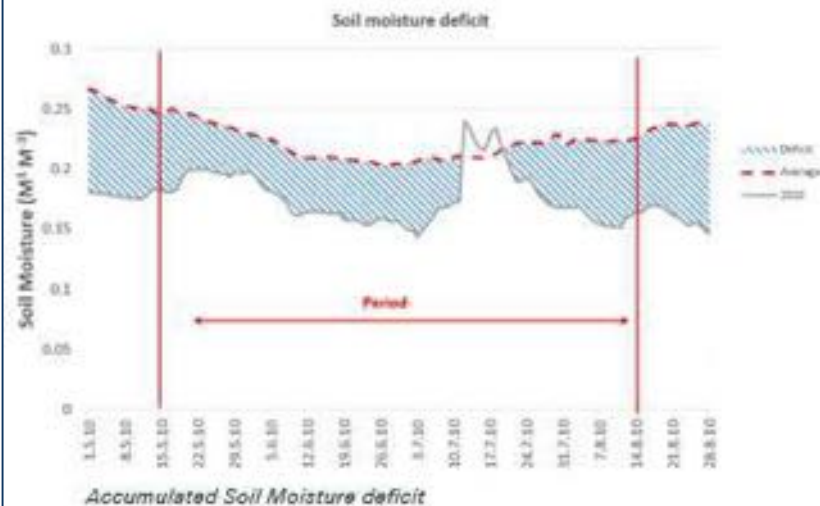


Application: (Re)insurance



Soil Moisture Deficit Index

- Crop: Spring Wheat
- Period: 15 May – 15 August
- Soil Moisture Value: Last 20-day average
- Index: Accumulated Deficit

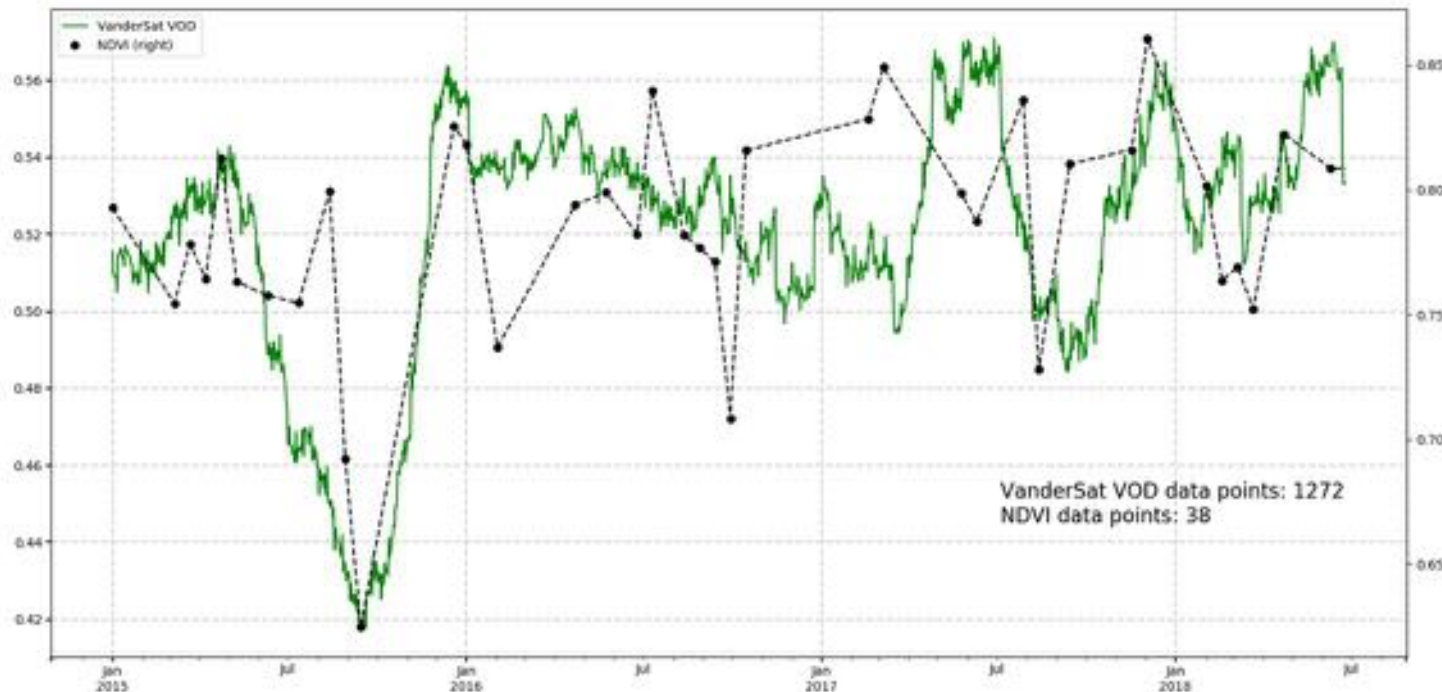
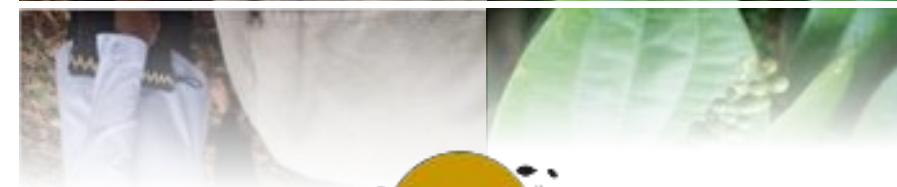


Loss	Deficit	<u>Payout</u>
Drought	> 1	11% of SI
Severe drought	> 1.5	22% of SI
Extreme drought	> 2	33% of SI

 Swiss Re

Advice based on VOD:

- Agricultural Advice for Pepper Farmers in an area dominated by clouds:
 - Irrigation, Fertilizer, Pesticide



MODIS data has been downloaded through the AppEEARS data base
<https://lpdaacsvc.cr.usgs.gov/appeears/>

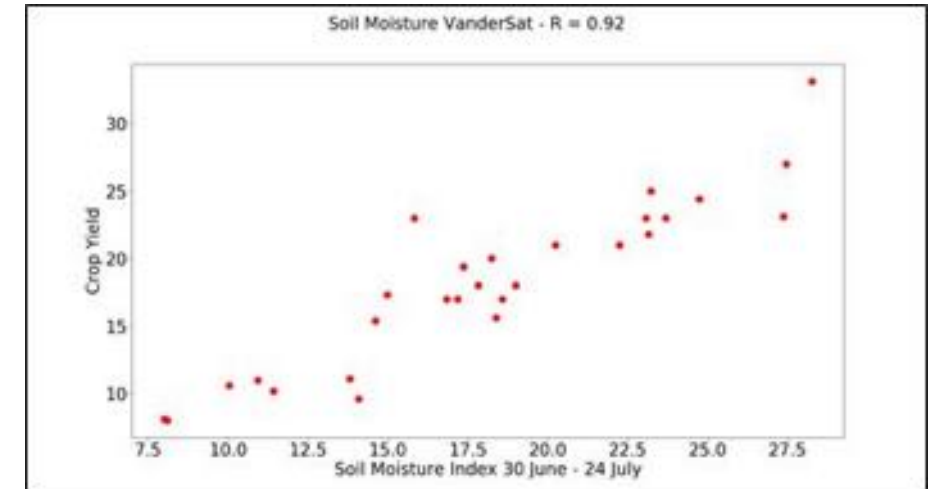
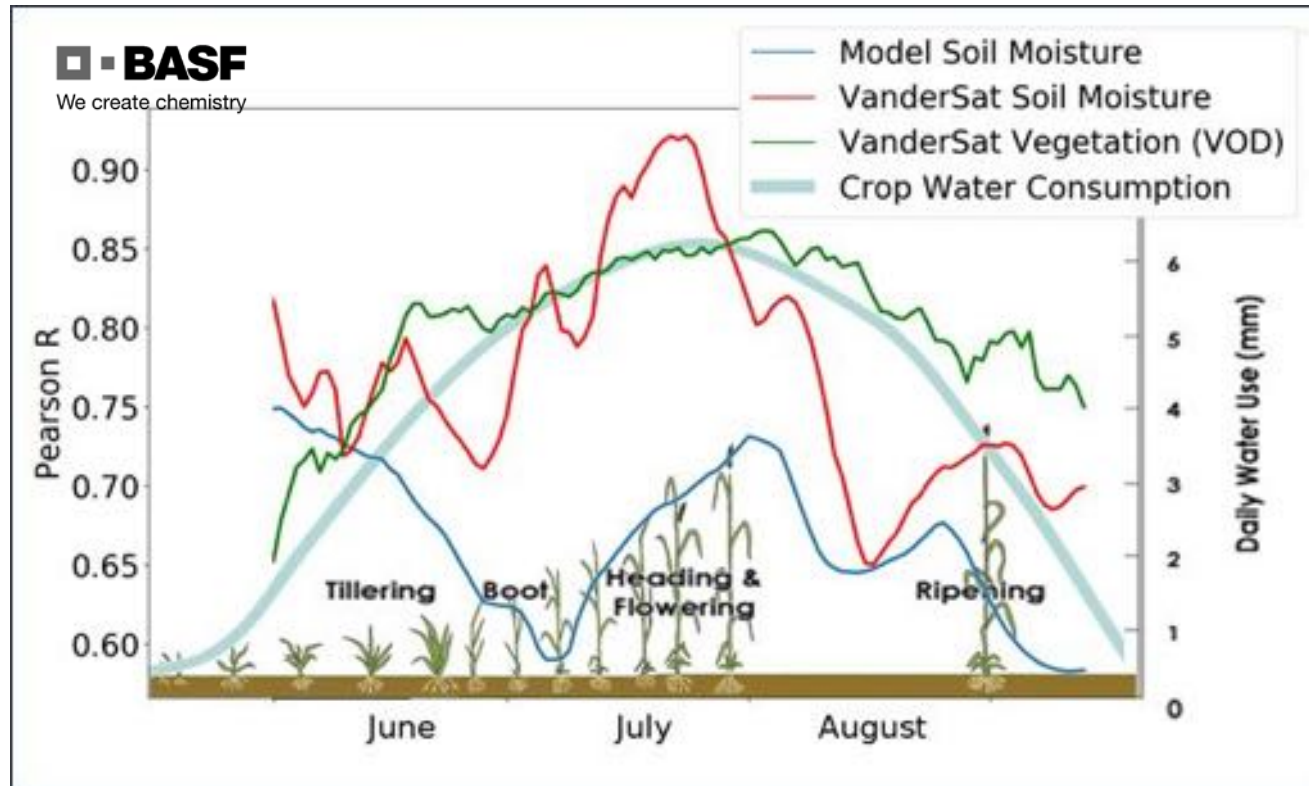


SPICEUP

Application: Agri Food



VanderSat Spring Wheat Yield evaluation



Application: Social/Envir. Impact



- Humanitarian relief
- Landscape restoration
- Rural communities



→ Myanmar, Indonesia, Cambodia, Kenya, Mozambique, Ethiopia, etc.

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