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 | Payout
---|---|---
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
Application: Agri Food

VanderSat Spring Wheat Yield evaluation

We create chemistry
Application: Social/Envir. Impact

- Humanitarian relief
- Landscape restoration
- Rural communities

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