ECV Soil Moisture
What's Operational and What Still Requires R&D?

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General Remarks

- Question stirred by a programmatic point-of-view rather than from the perspective of the users and producers
  - Users always want to have the best available data sets
  - Producers must constantly innovate to stay competitive, i.e. they must seek to tightly couple R&D and Operations to fulfil the expectations of their users

- Copernicus funding of ECV operations is likely to be so low that only through “scaling effects” or matching funds a high service quality can be maintained

- Running ECV services is a complex and challenging task. Only big players or cooperative partnerships can reach the critical size
  - Working under the new “platform paradigm” can help small R&D groups and SMEs to stay involved

CCI Soil Moisture - What is Operational?

- According to the CORE-CLIMAX System Maturity Matrix we have reached maturity 3 or 4 for all categories (from 6 possible levels)
  - This corresponds to an Initial Operations Capability
  - Phase 2 helps us to move closer to Full Operations Capability

- We have now 3 data products with in total more than 1800 users
  - Users are coming back, i.e. they also download the new product versions
  - Each year we release a new Data Record, based on the latest satellite data and algorithm innovations

- Our three data products are ready to go into operations as regards the regular production of Data Records
  - Given strong user requests, we have also established initial near-real-time (NRT) climate data services within other projects
    - Daily updating and anomaly calculation (against the 36-years baseline)

CCI Soil Moisture – What Still Requires R&D?

- Improvement in spatial resolution
  - From the current 0.25° to 0.1° (operational) and 1 km (experimental)
- Inclusion of new sensors with different/enhanced measurement capabilities
  - SMAP, EPS-SG cross-polarisation scatterometer, Ku-band scatterometers
  - ENVISAT ASAR, Sentinel-1
  - AVHRR, MODIS, MERIS, Sentinel-3
- New approaches
  - Multi-scale error characterisation and merging, neural networks, noise filtering
- Production of complementary/associate variables
  - Vegetation water content, freeze/thaw, water bodies, precipitation
- Successive improvement of existing processing steps
  - Retrieval algorithms, spatial- and temporal resampling, error characterisation, merging, profile soil moisture estimation