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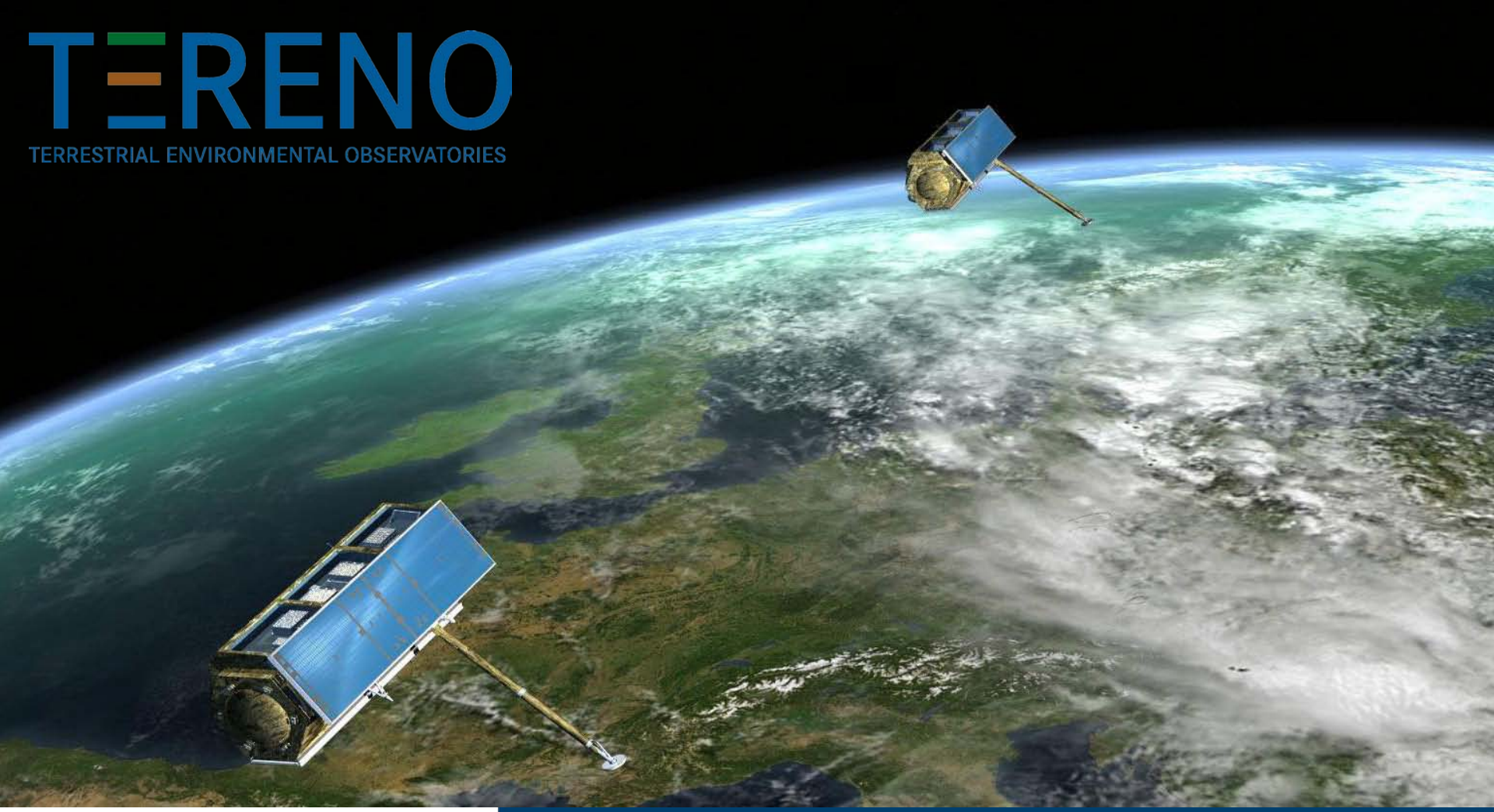

Environmental Sensing: Status

Irena Hajnsek, Andreas Reigber,
Peter Haschberger & TERENO Members

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Objective of Environmental Sensing (ES)

Information availability

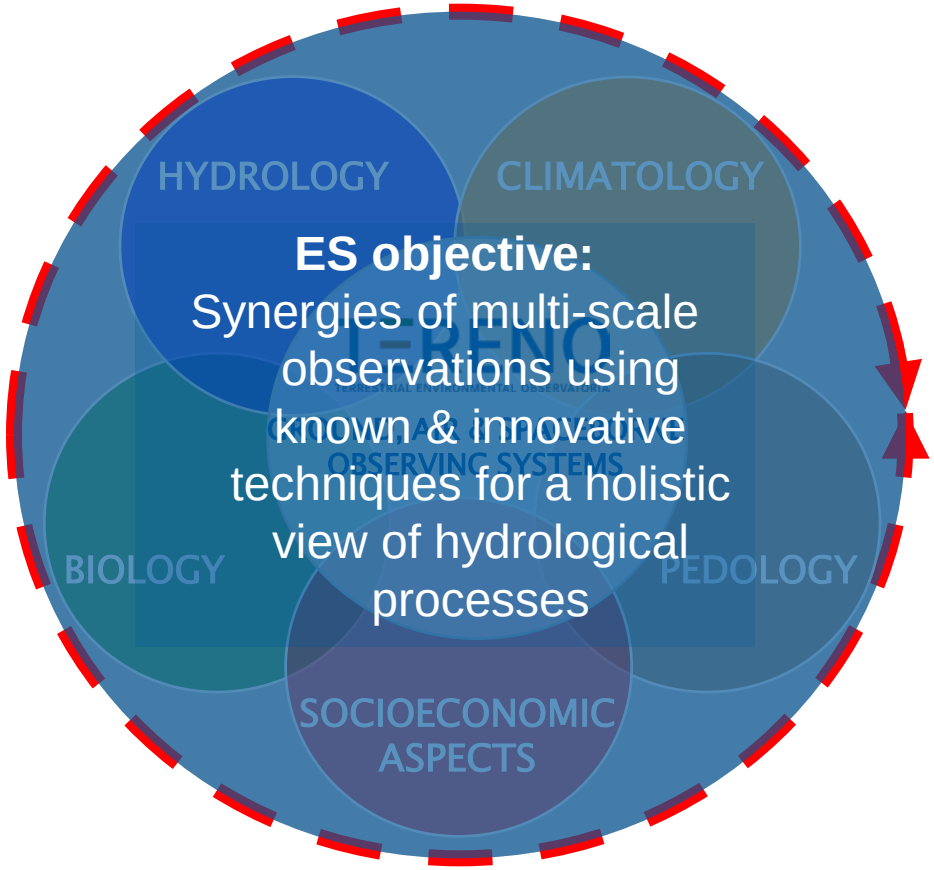
- local
- regional
- global

Information delivery

- high resolution (1-10 m)
- large scale coverage (swath 15-100 km)
- area-wide
- regular
- day & night (radar)
- weather independent (radar)

Information product derivation

- mapping (cartographic)
- observation in time
- change detection & dynamic observation
- bio-/geophysical & chemical parameter estimation



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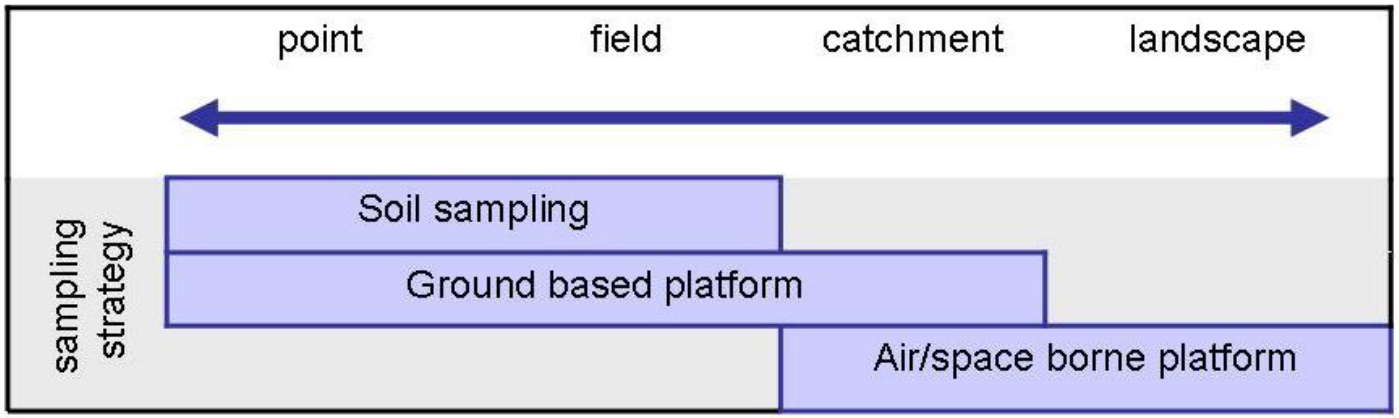
Methodological Approach

Tasks of the CT Environmental Sensing:

- Collection and coordination of requirements from the different CT's (CT Environmental Sensing is acting as an interface between the other CT's)
- Coordination of flights and instruments over regions of interest
- Coordination of common instrument operation over regions of interest
- Inter-comparison of field instruments
- Coordination of airborne/spaceborne data acquisition with ground measurements
- Reporting on data processing status and data quality
- Exchange of inversion procedures for the environmental parameters
- Synergies between different sensors
- Collection, coordination, archiving of different types of data



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Selection of Parameters and Indicators

The selection of suitable parameters and indicators is part of the TERENO research.

A table with preliminary parameters of interest that could be potentially measured/estimated from **ground/air/spaceborne** sensors was selected from each research institution (Implementation Plan).

Thereby, the following questions must be answered in collaboration with the other CTs:

- Which physical properties can be used as proxies for environmentally relevant parameters? How can these proxies be used to improve interpolation between point measurements?
- How to combine measurements on different temporal and spatial scales?
- How to perform a consistent error analysis to analyze uncertainties during measurement and processing?
- How can remote sensing, multiple geophysical surveys, borehole information and profiles be combined to gain a comprehensive description of the subsurface structure and properties?

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Status of the CT Environmental Sensing

- Establishing a consortium of the CT Environmental Sensing (Spring 2009)
- 1st meeting in April 2009 and definition of
  - Content and objective of the CT Envrionmental Sensing
  - Presentation of available sensors (ground, airborne and spaceborne)
  - Specification of potential common activities for the following research topic‘s:

    - Characterisation of spatial variability of soil moisture before and after an event
    - Regional observations of CO_2 and water vapour (sensible and latent heat)
    - Vegetation parameter estimation over forest, agricultural and grassland for flux characterisation

  - Rough description of common campaign scenarios over selected areas in the defined observatories.

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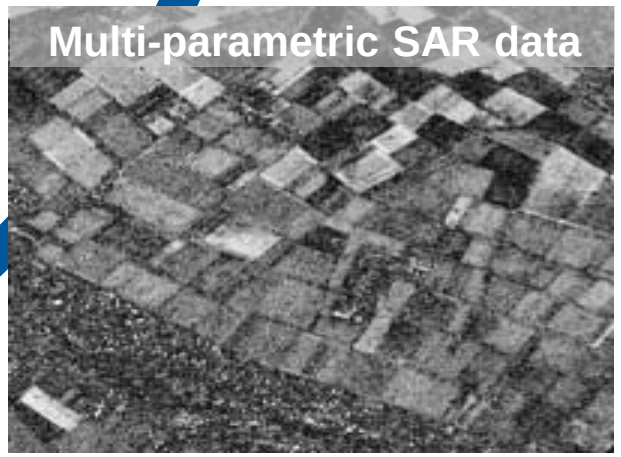
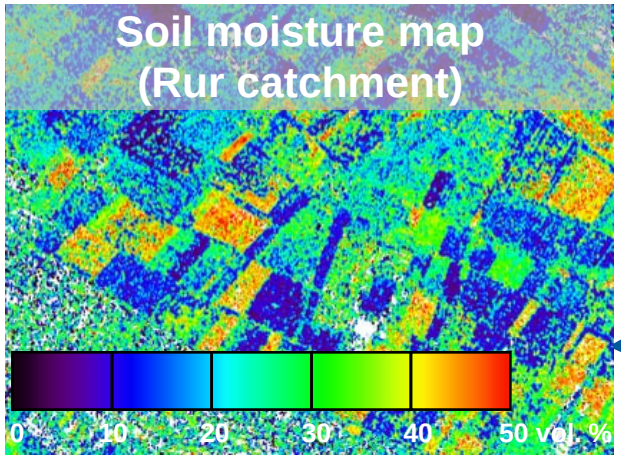
Scenario for soil moisture mapping

- Observed parameter: mapping/monitoring surface soil moisture dynamics
  - sesonally observation (min 3x a year – low and high vegetation cover)
  - continously > 5 years
- Mapping/monitoring regional differences in 2010 on the test sites with the best established equipment
  - Rur catchment
  - Bode catchement
  - Ucker catchement (optional)
- Instruments: SAR, Radiometer, Hyperspectral (ARES/APEX) & Ground measurements

SAR data processing



Modelling & Inversion



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