Campaign activities in support of ESA Land Surface Carbon Constellation study

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ESA Land Surface Carbon Constellation study (https://lcc.inversion-lab.com):

- Investigation of the environmental drivers behind the net ecosystem CO_2 exchange between atmosphere and terrestrial ecosystems
- Combination of process-based model with wide range of in-situ and remotely sensed observations on local and regional scales.
- Synergistic exploitation of satellite observations from microwave and optical data for better characterization of carbon and water cycling on land
- **Field campaigns in 2020-2022** to support data assimilation scheme at local scale carried out at three well-instrumented sites
    - (1) Sodankylä, Finland, boreal forest biome;
    - (2) Majadas de Tietar, Spain, temperate savanna biome;
   - (3) Reusel, The Netherlands, agricultural land.
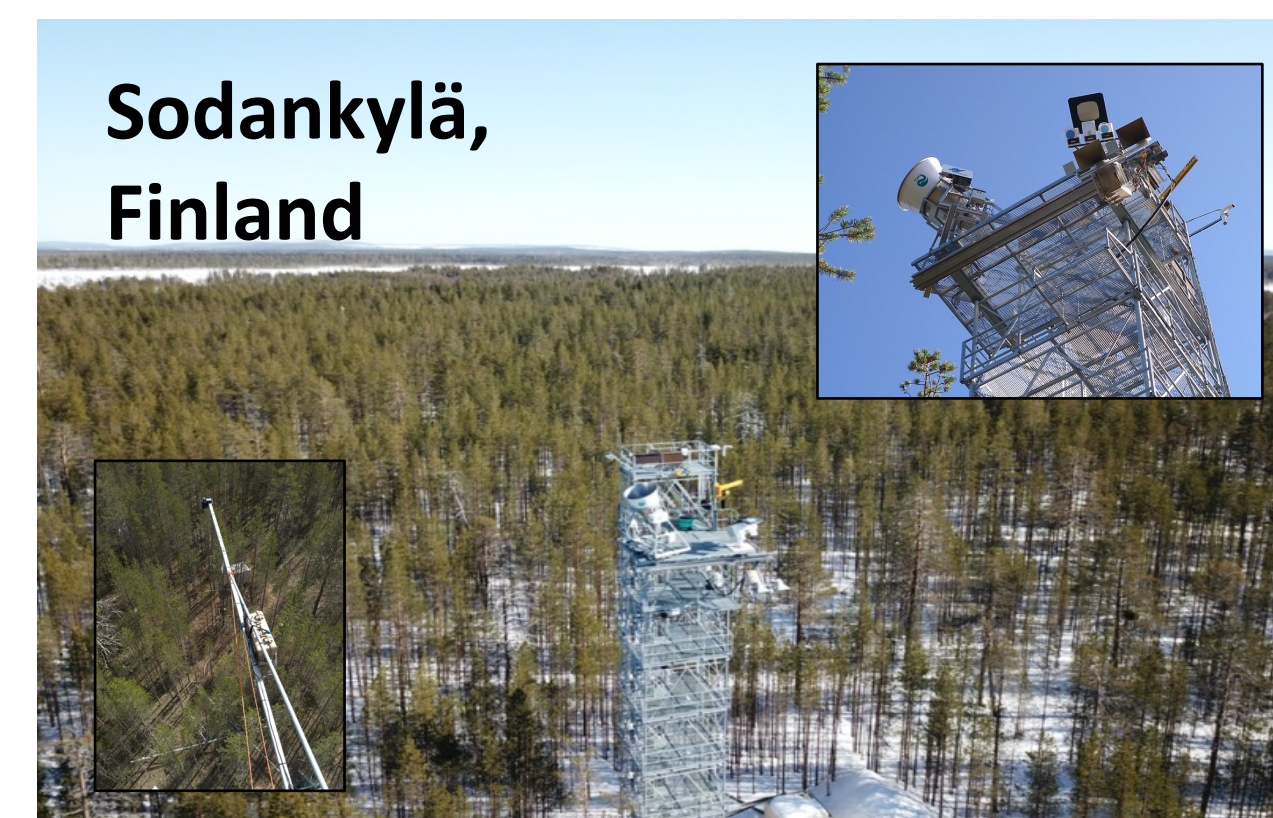
Instrumentation measuring soil, vegetation and atmospheric properties:

- Meteorological data
- Soil moisture and temperature profiles
- Water content of standing vegetation
- Eddy covariance systems to measure CO_2, water and energy fluxes
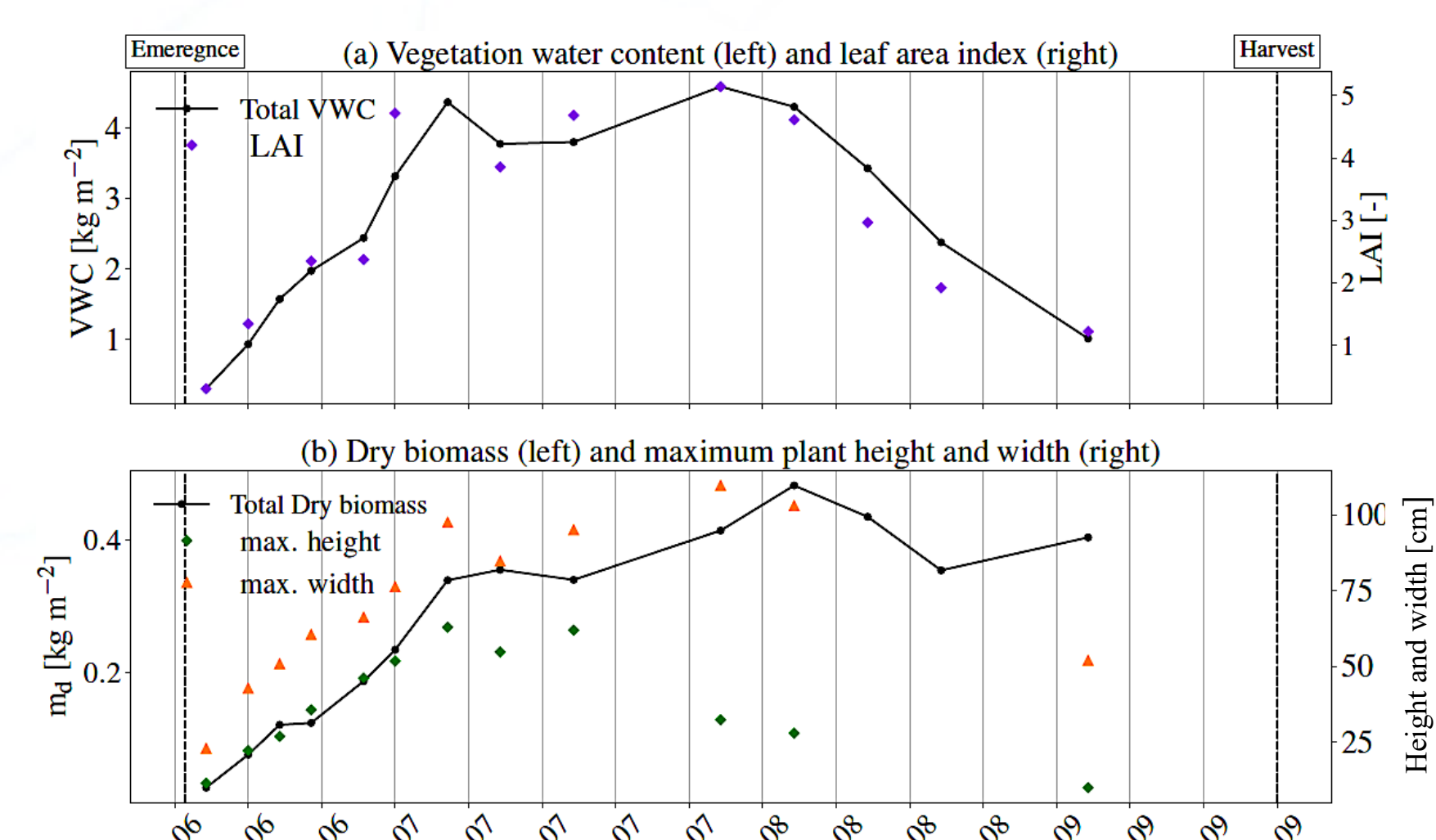
Reference instrumentation to satellite remote sensing at local scale:

- Microwave brightness temperature and backscatter
- Broadband up- and downwelling radiance
- Applied to derive Vegetation Optical Depth (VOD) and Solar-Induced Fluorescence (SIF) for local-scale model assimilation experiments.
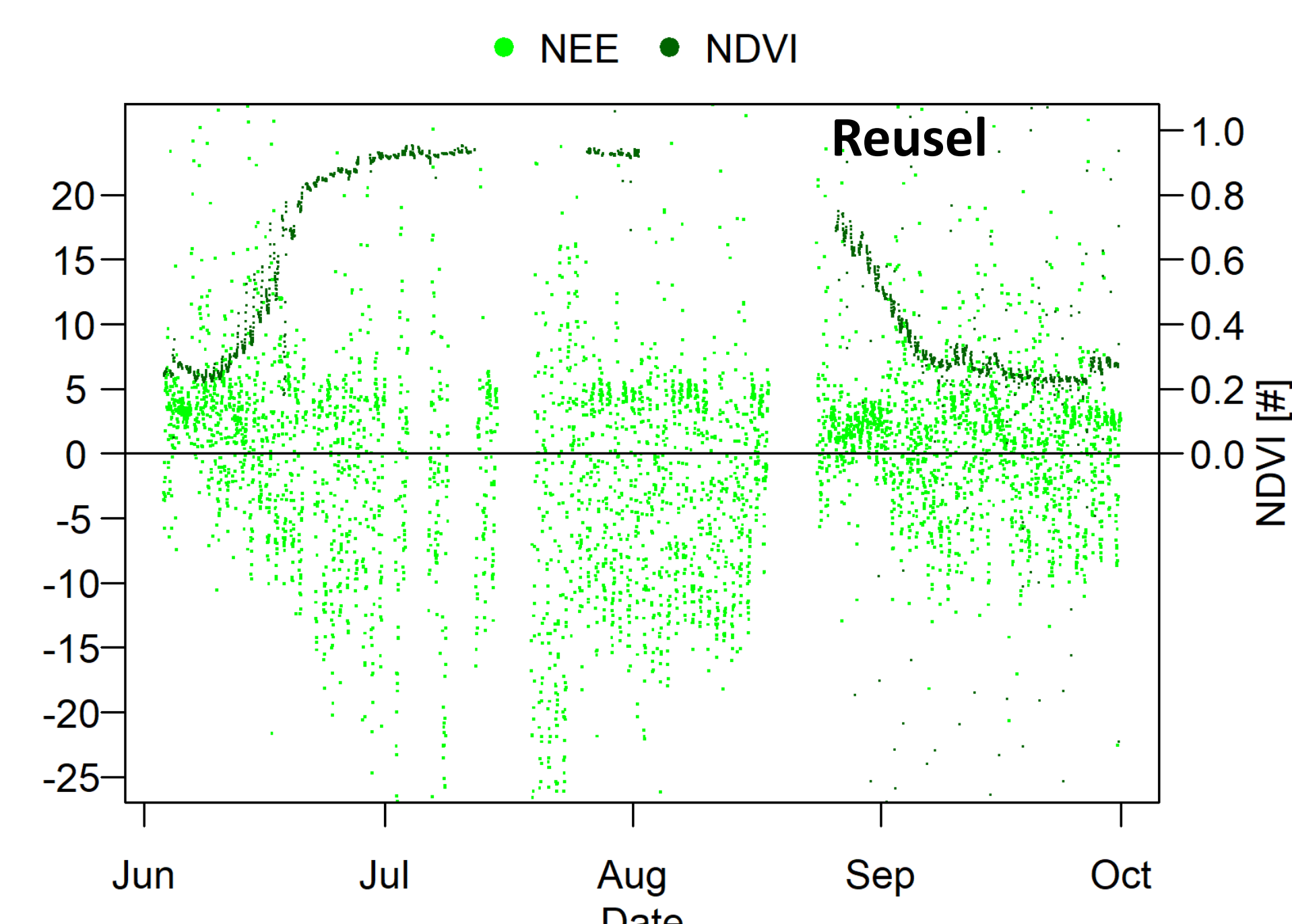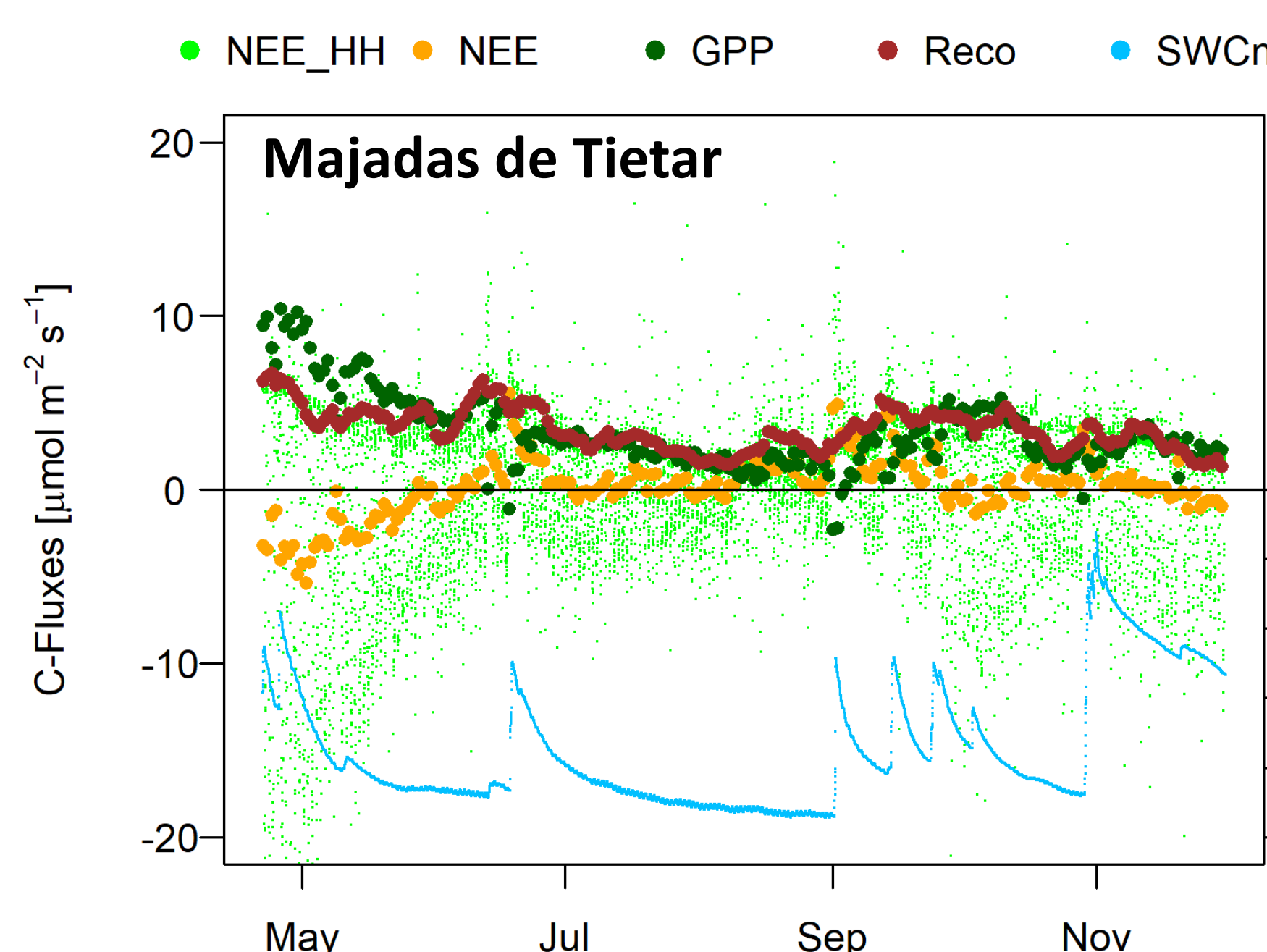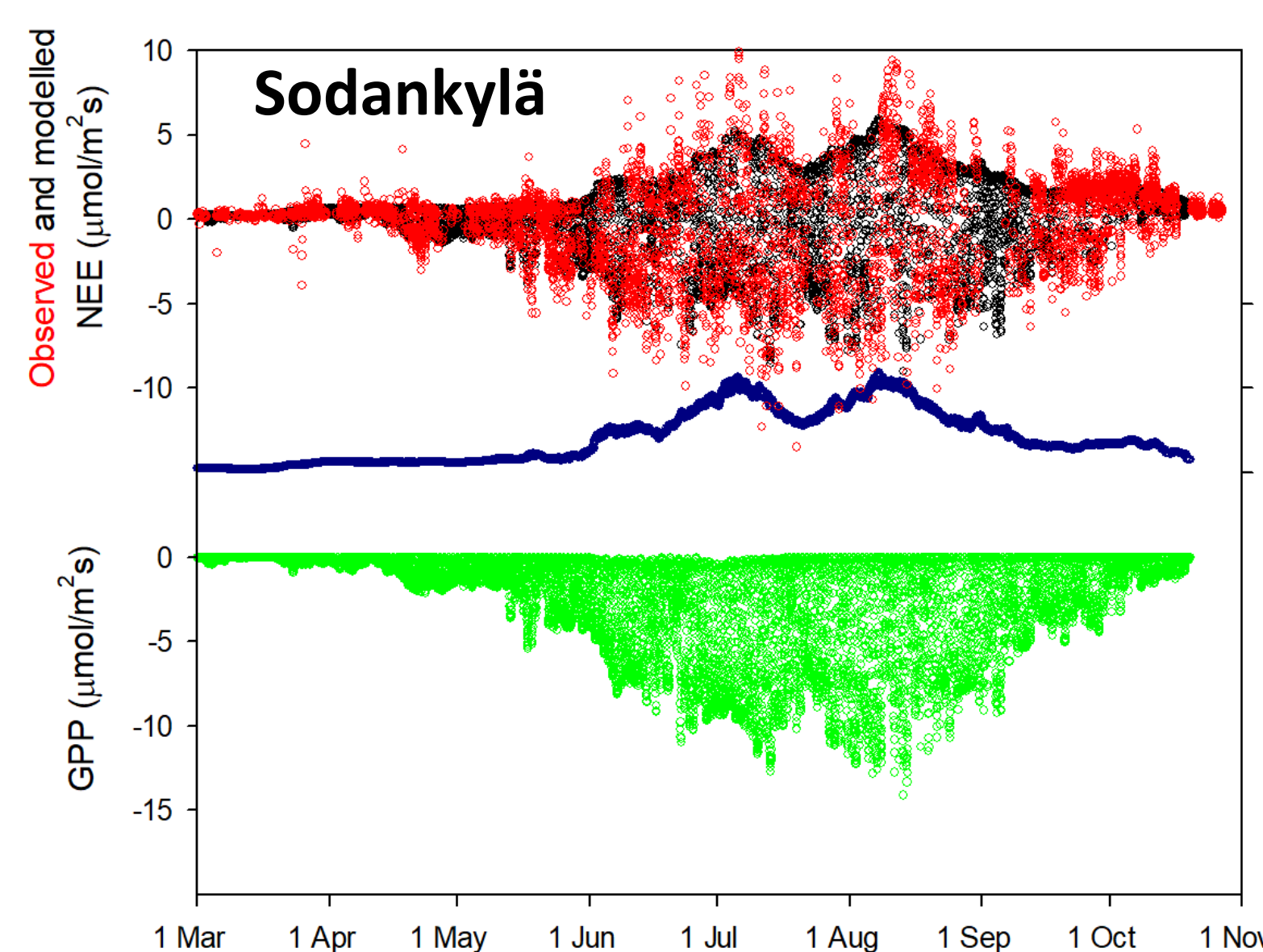
Additional campaign measurements to quantify seasonal variations in e.g. LAI, NDVI and above-ground biomass.

Sodankylä, Finland

Reusel, the Netherlands

Majadas de Tietar, Spain
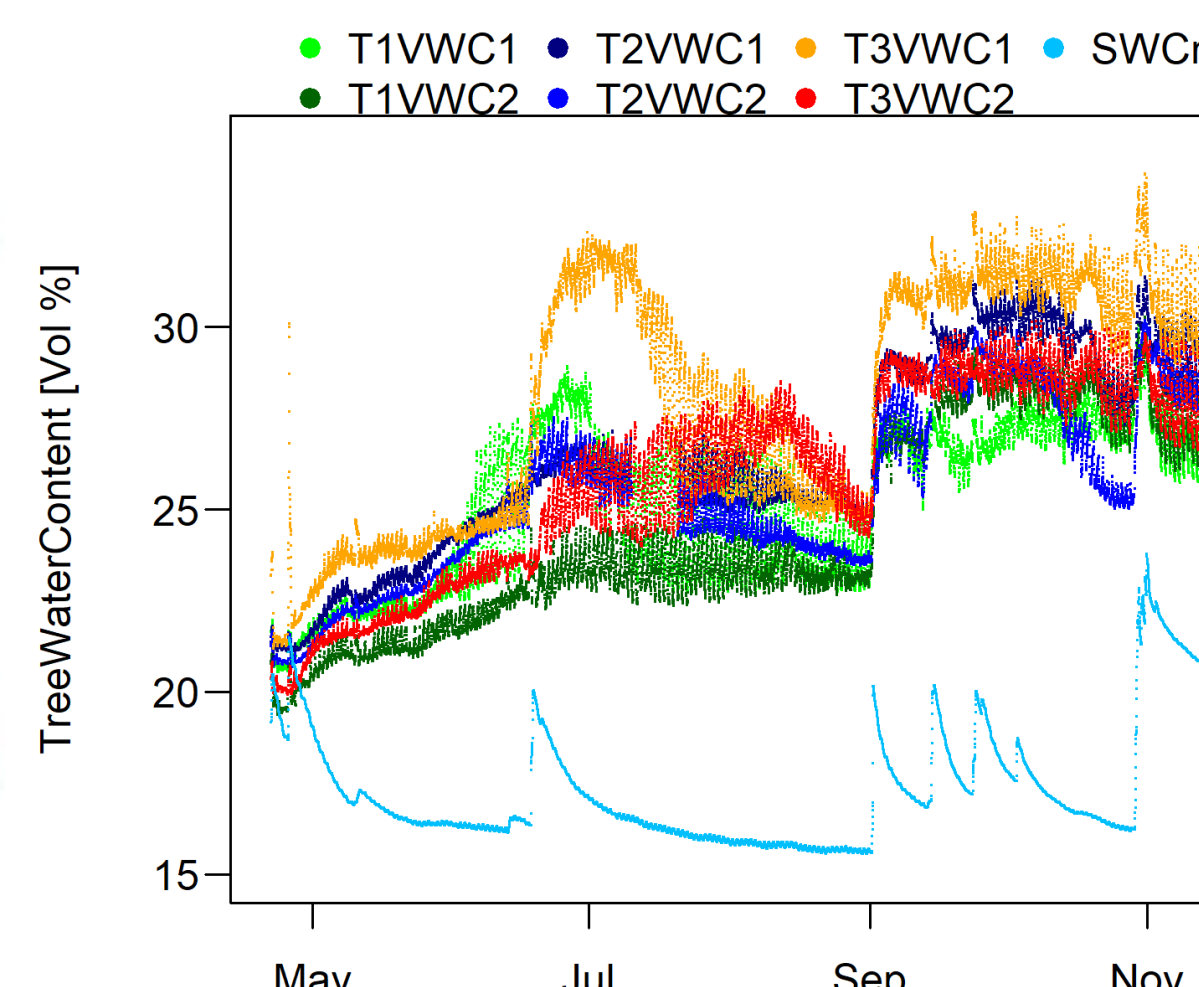
Variations of soil and tree water content, Majadas de Tietar

Vegetation water content, LAI, dry biomass and maximum plant dimensions, Reusel

Observed NEE, GPP and other parameters from the three sites:

Sodankylä

Majadas de Tietar

Reusel

The Land Surface Carbon Constellation study is a collaborative project led by Lund University with participation of The Inversion Lab, CESBIO, University of Edinburgh, University of Reading, TU Delft, TU Wien, MPI-B, University of Valencia, WSL, FZ Jülich and FMI

Project partners contributing to campaign activities