A Tool for Monitoring, Reporting and Verification of Carbon Farming as well as large-scale analyses on Carbon Sequestration - EO4CarbonFarming

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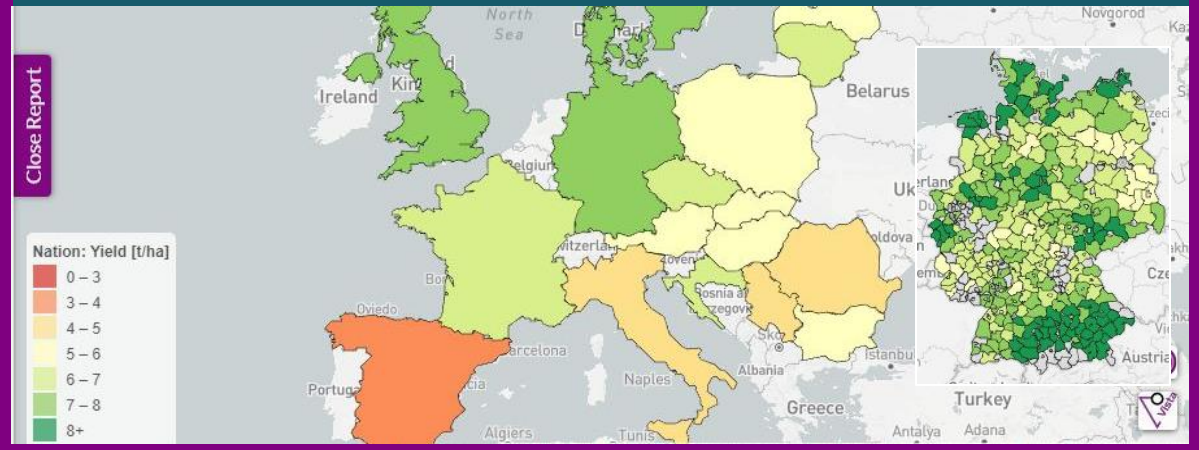
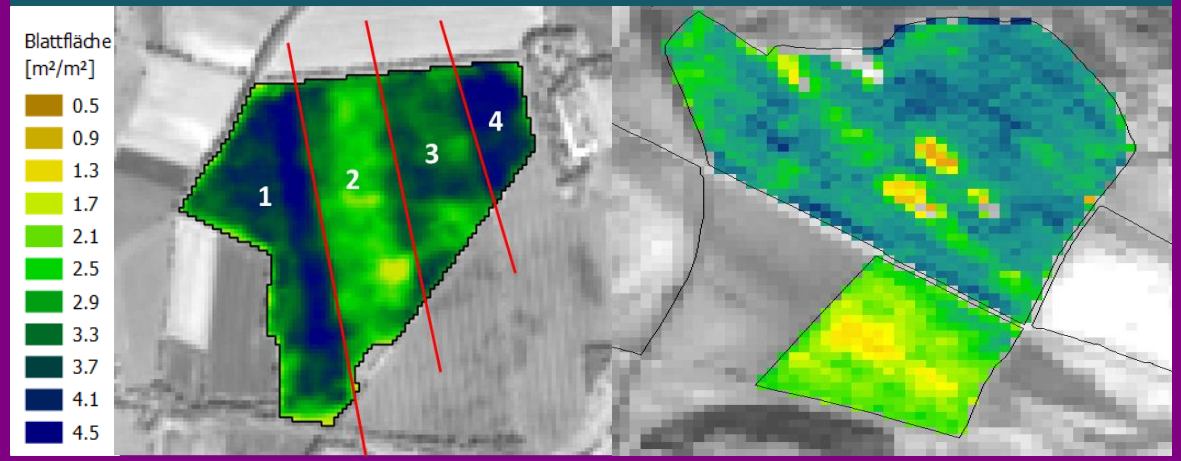
Managing Director

Vista’s Core Competencies

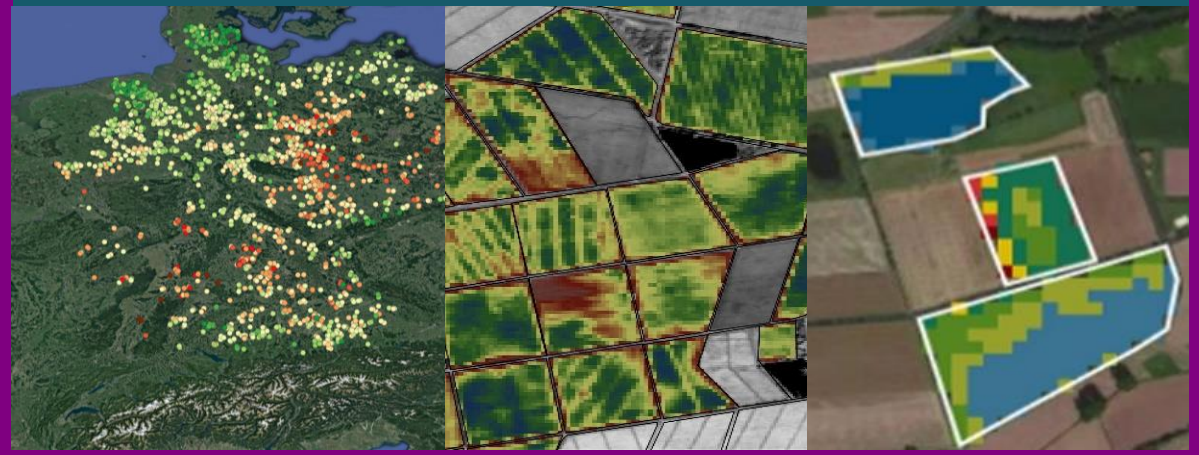
Harvest and Yield Prediction



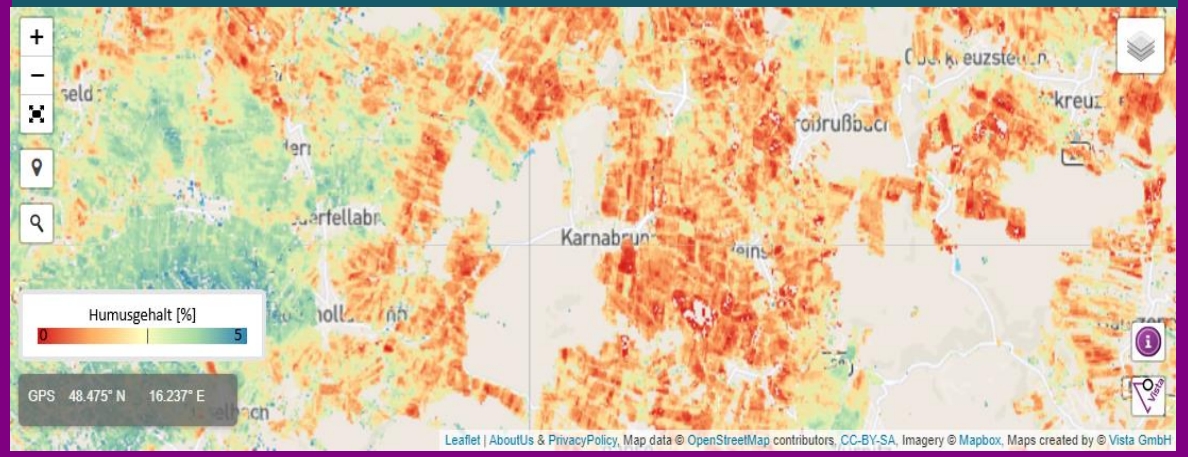
Optimization of Agricultural Measures



Crop Monitoring and Risk Management



Sustainability and Carbon Farming



Vista's USP: We accelerate the sustainable transformation of agriculture by connecting the real and digital worlds

- Satellite data
- In-situ data statistics (soil, climate, etc.)
- Ensuring scientific excellence

- Inhouse IT-expertise
- PROMET as core model
- Use of cloud computing and AI

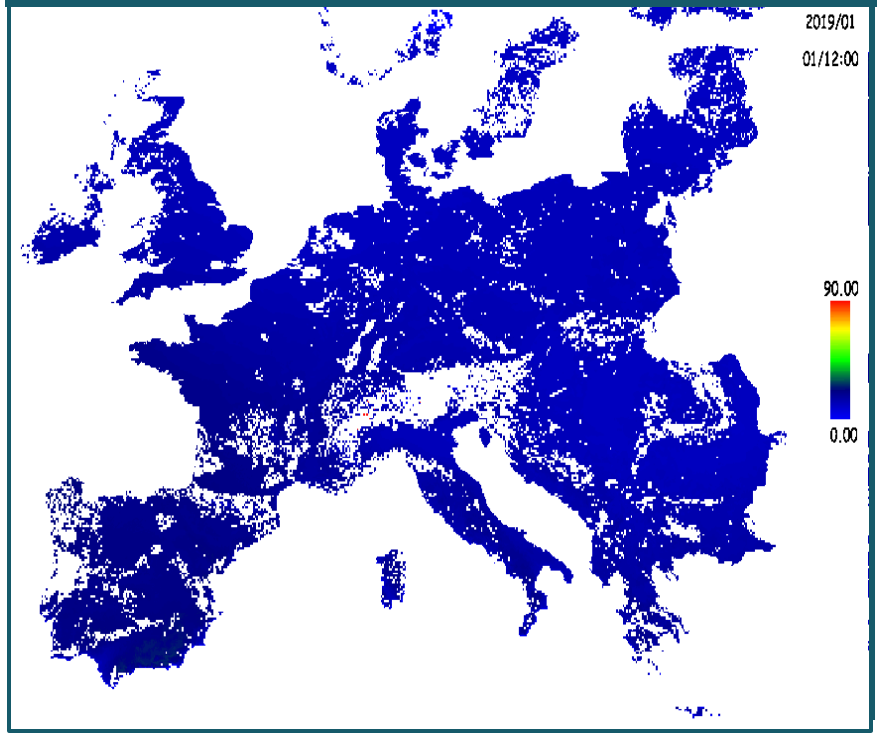
- Combining observation and simulation in digital twins
- Digitally simulate strategic decisions

- Direct sales to key customers
- Indirect sales via API and integration in partner platforms

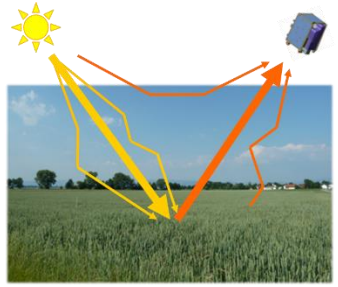
Data Generation → Big Data Processing → Digital Twin → Services

Using Digital Twins for Yield Assessment and Forecast based on Vista's PROMET, radiative transfer modelling (SLC) and EO data assimilation

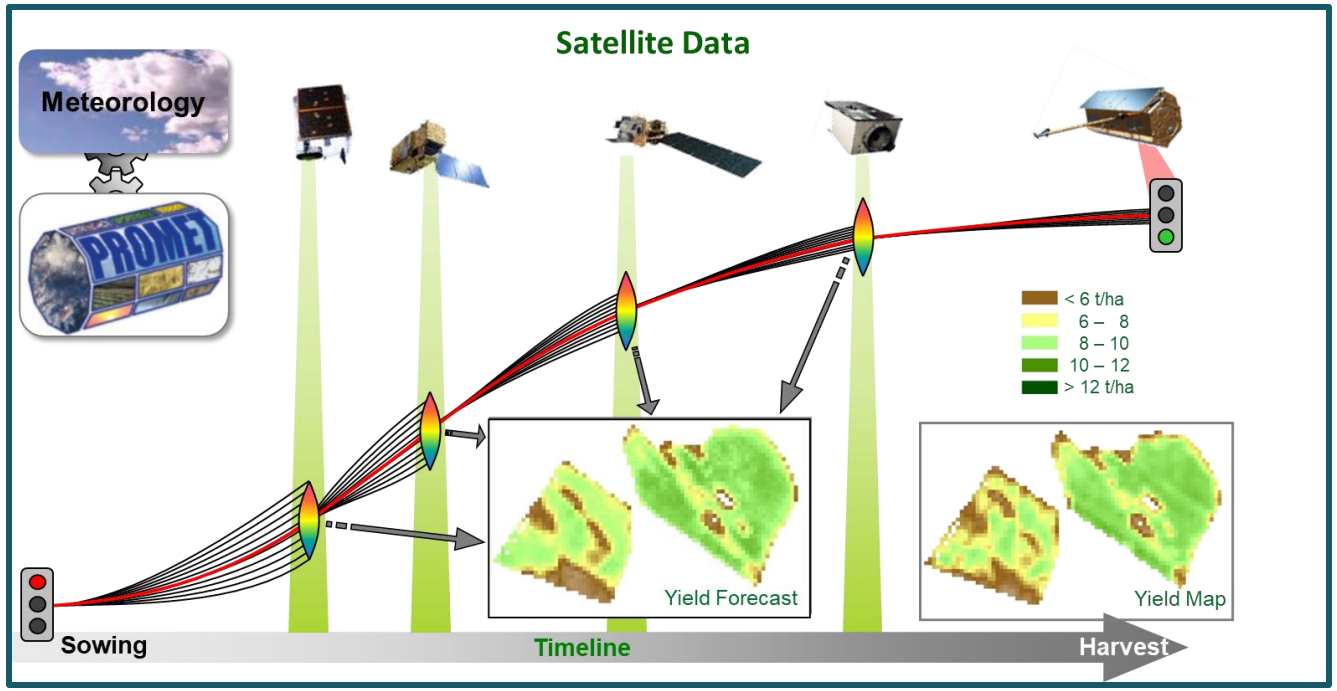
PROMET simulates crop growth, yield, the water-, carbon-, nitrogen cycles considering all relevant land surface processes under different agricultural management alternatives
e.g. wheat phenology in Europe:



SLC Soil Leaf Canopy Reflectance Model

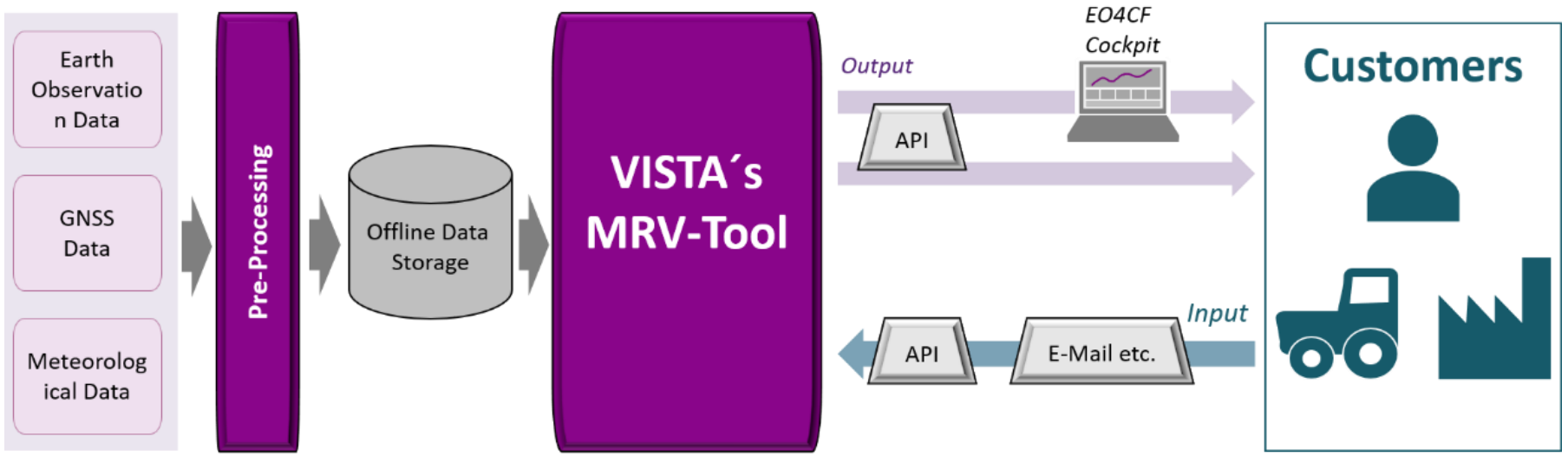


Data assimilation approach using radiative transfer modelling for multi-temporal multi-source EO data



Vista's EO4CarbonFarming – an EO-based tool for sustainable farming measures and Carbon Farming

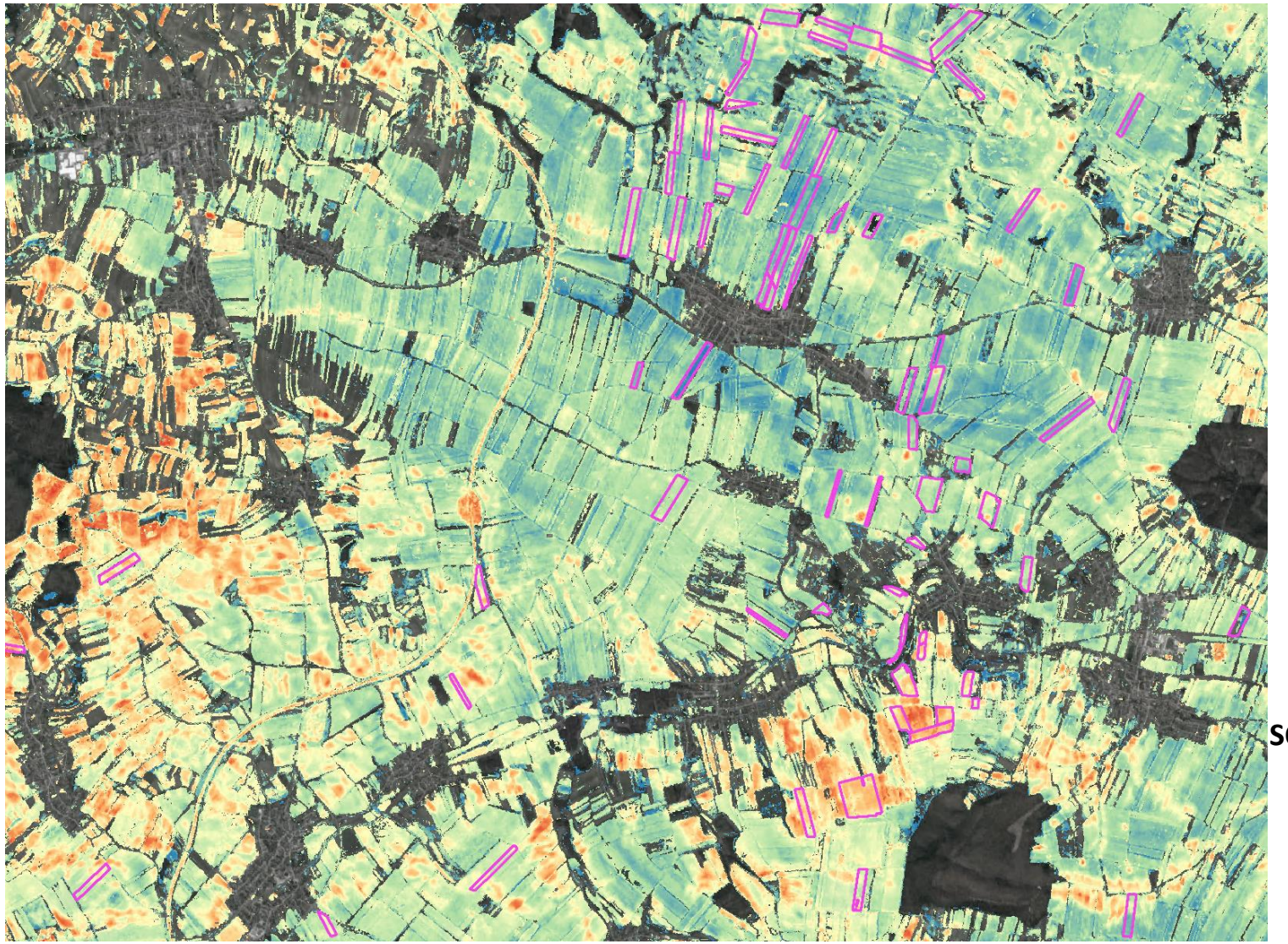
Goal:
Monitoring, **Reporting** and **Verification** (**MRV-Tool**) of measures to improve sustainability and carbon sequestration in agriculture using satellite data and modeling



Service-Outputs:

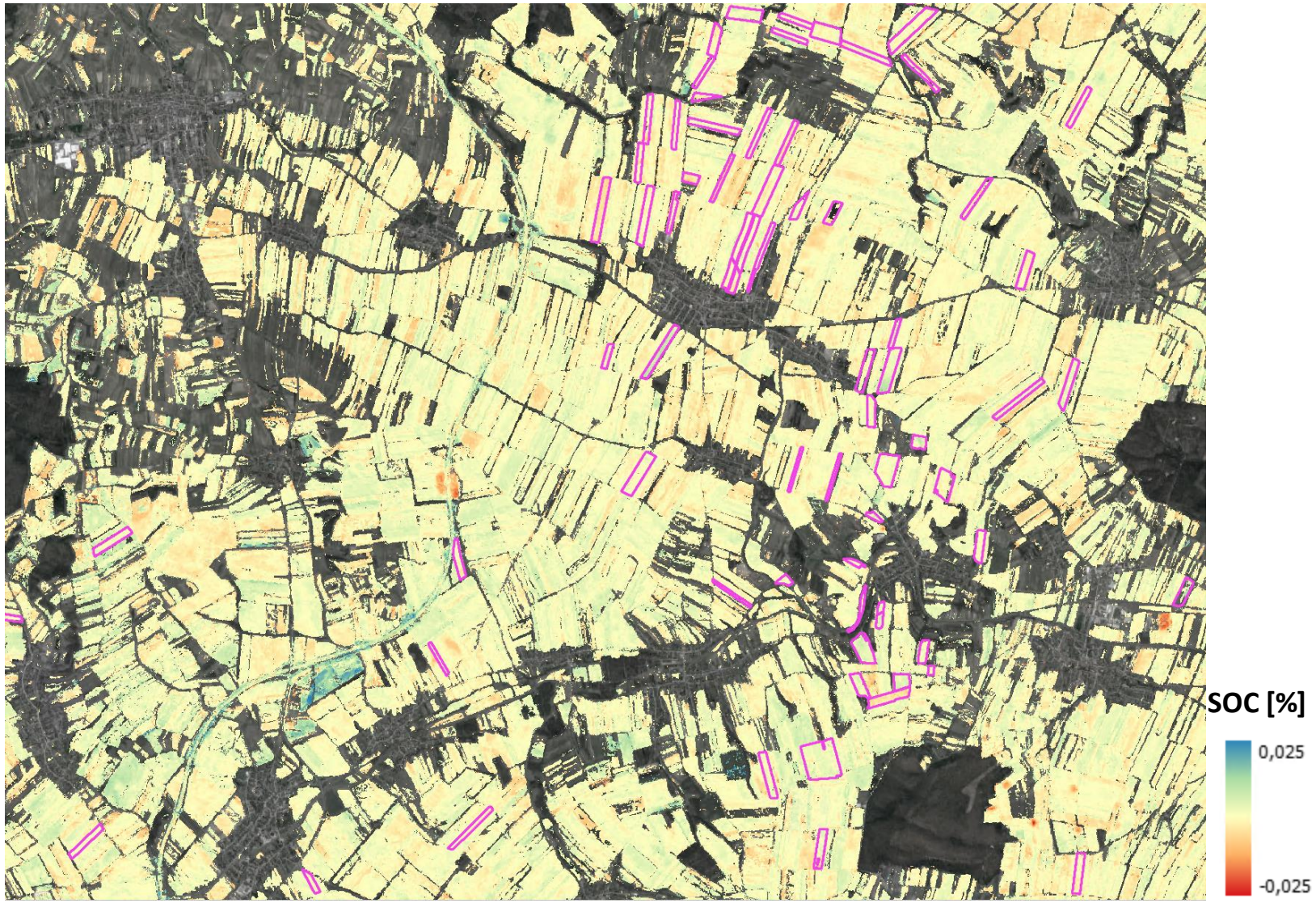
- Quantification of the distribution of the humus content in the soil
- **Monitoring** of measures, e.g. development of intercropping
- **Reporting** of measures, e.g. the effect of crop rotations and intercropping on carbon sequestration
- **Verification** of the implementation of measures, e.g. by certifiers

Vista‘s SOC Map: Case study Austria – several hundred agricultural fields



- The SOC Map shows the detailed SOC content within the fields in a 10x10 m resolution
- SOC content map based on generic or localized calibration produced for agricultural areas
- When calibrated:
  MAE = 0.07 % SOC = laboratory accuracy

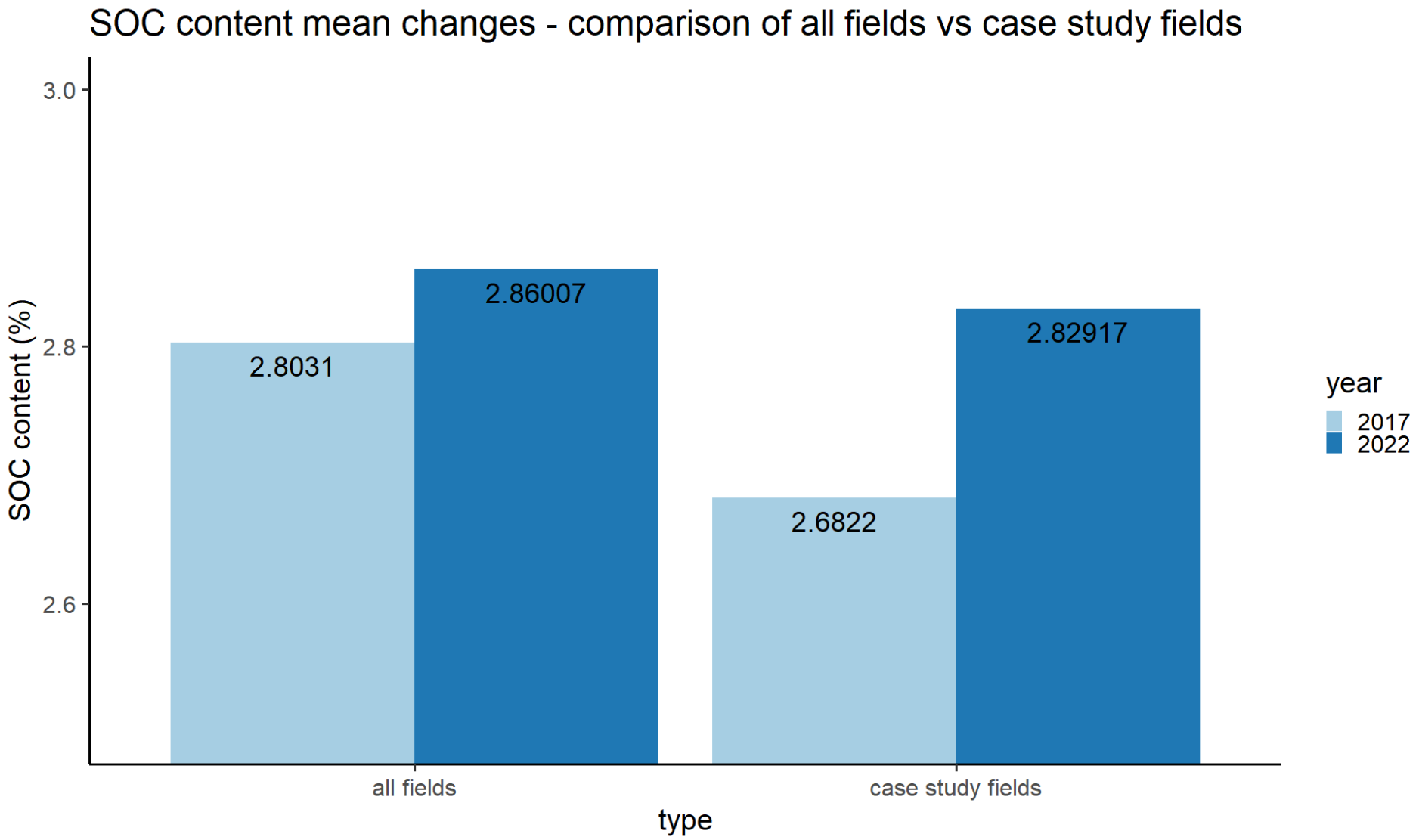
Vista‘s SOC Map: Case study Austria – several hundred agricultural fields



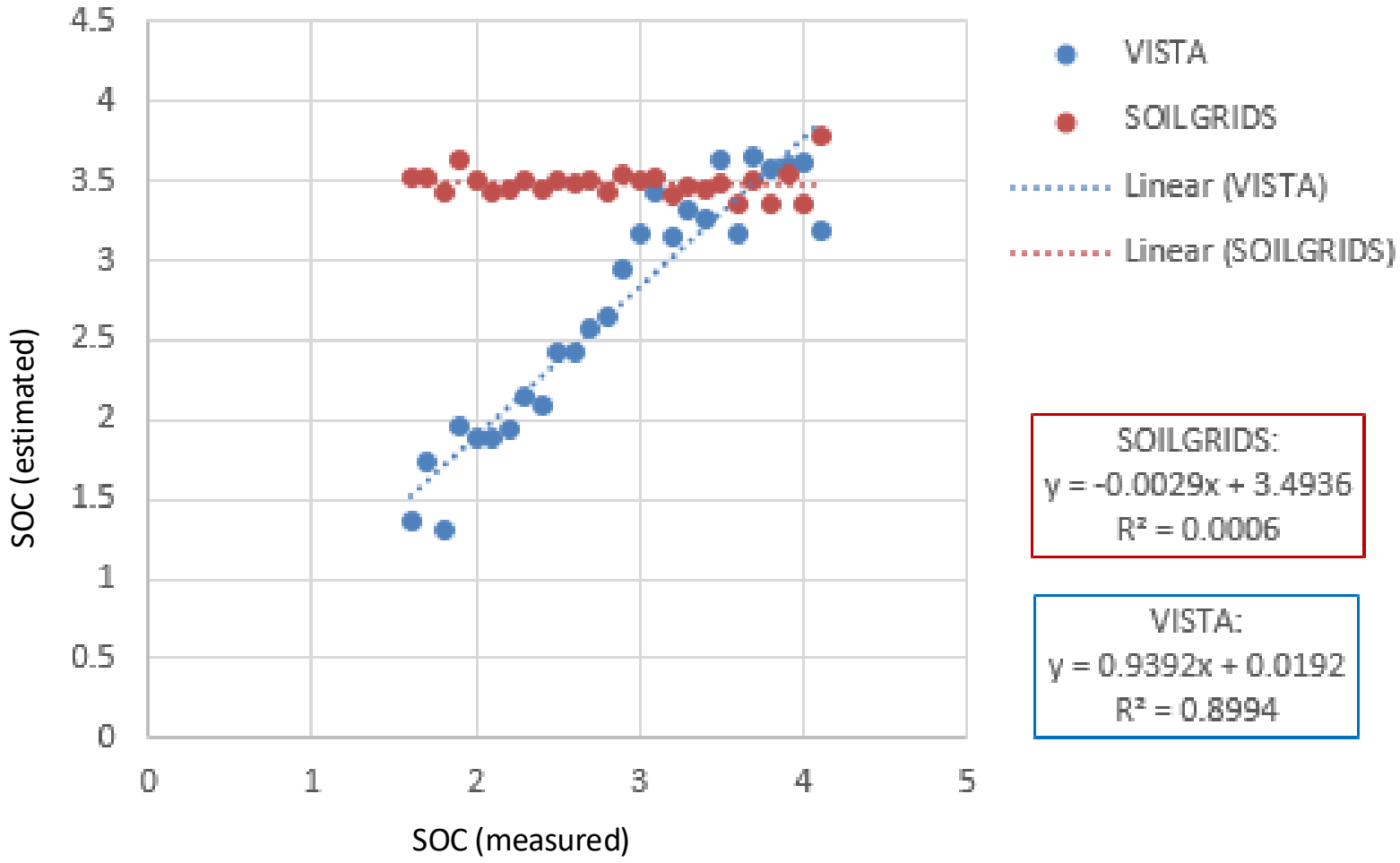
- SOC content difference 2017-2022
- Carbon increases but also carbon losses in the soil!
- Important question: Do carbon farming measures have an impact?

Increase in SOC within fields that have been managed taking Carbon Sequestration into account

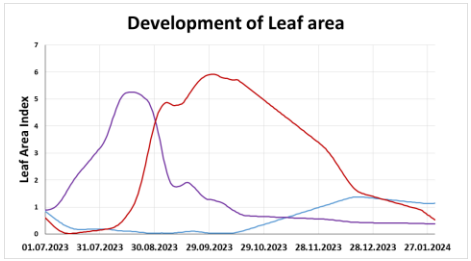
Comparison of SOC content increase over all fields in the region compared to the case study fields show that management with regards to SOC measures pays off.

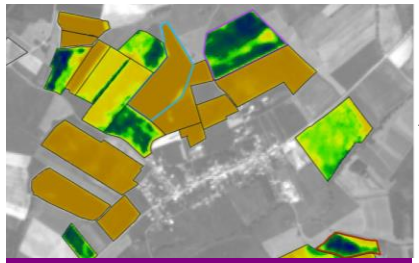


Vista's analysis captures the range of SOC in agricultural soils in detail (10x10m)

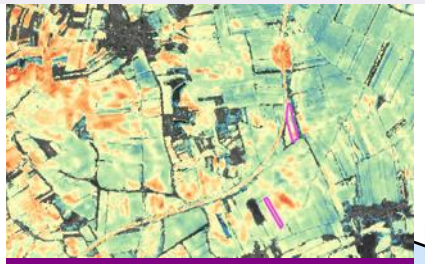


Vista‘s Carbon Farming MRV Tool – monitoring management measures as well as results!



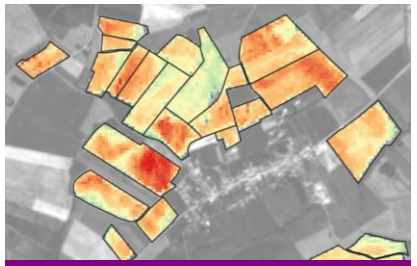


Cover Crop Monitoring



SOC Map

[in %]



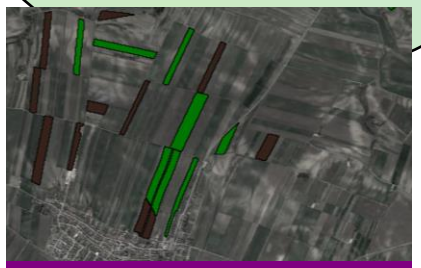
Carbon binding

[t CO_2e]

Verification Crop rotation

yes
likely

Cover Crop Detection

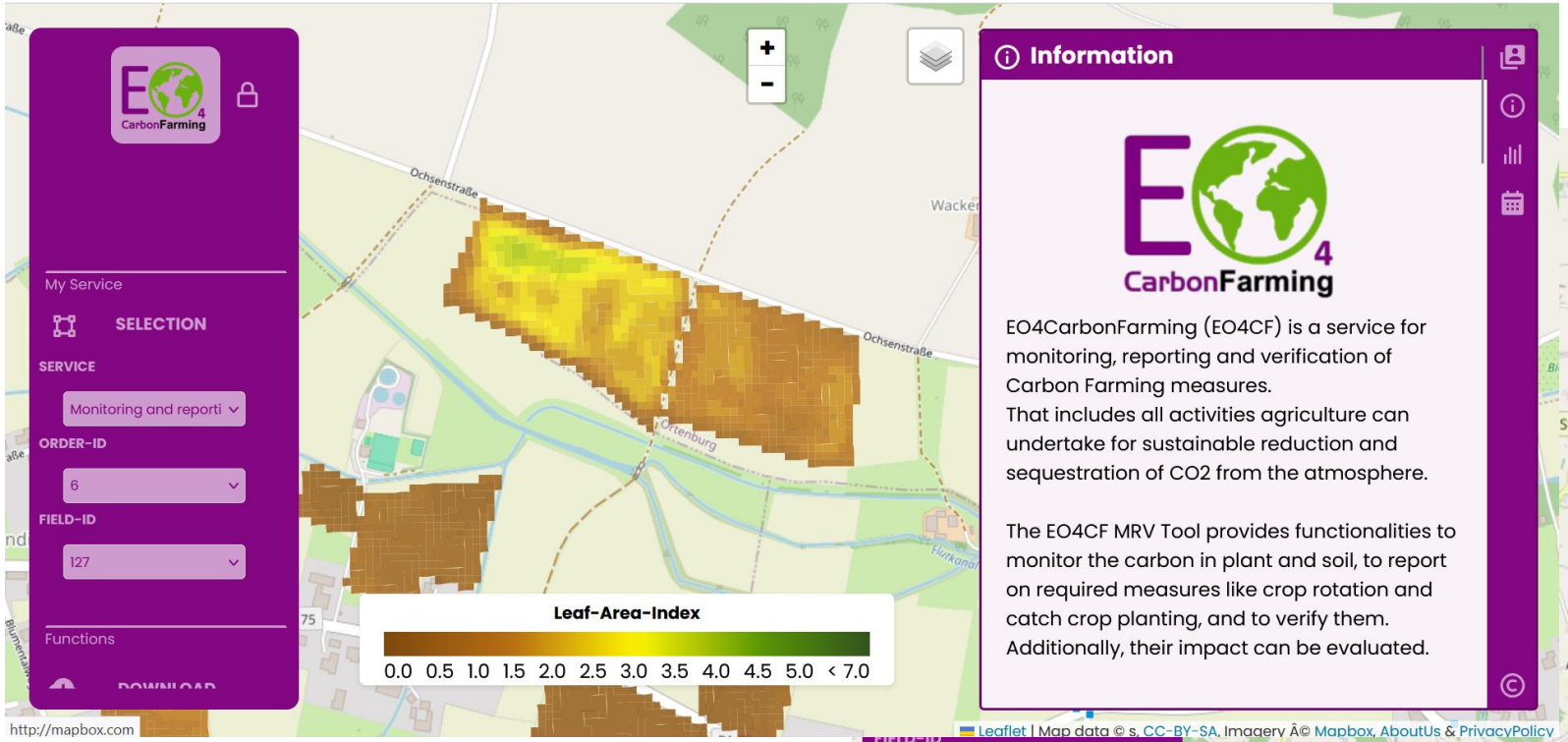


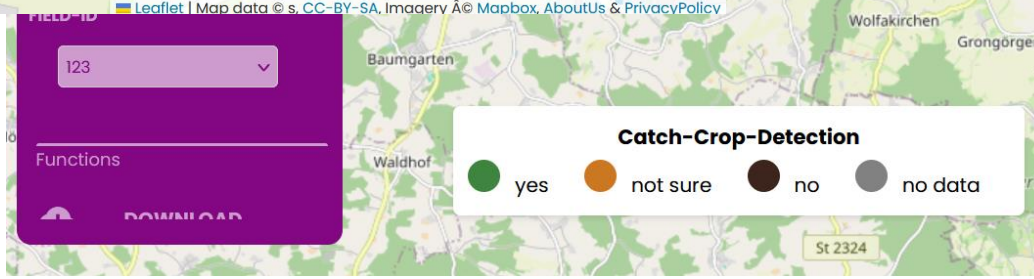
no
yes

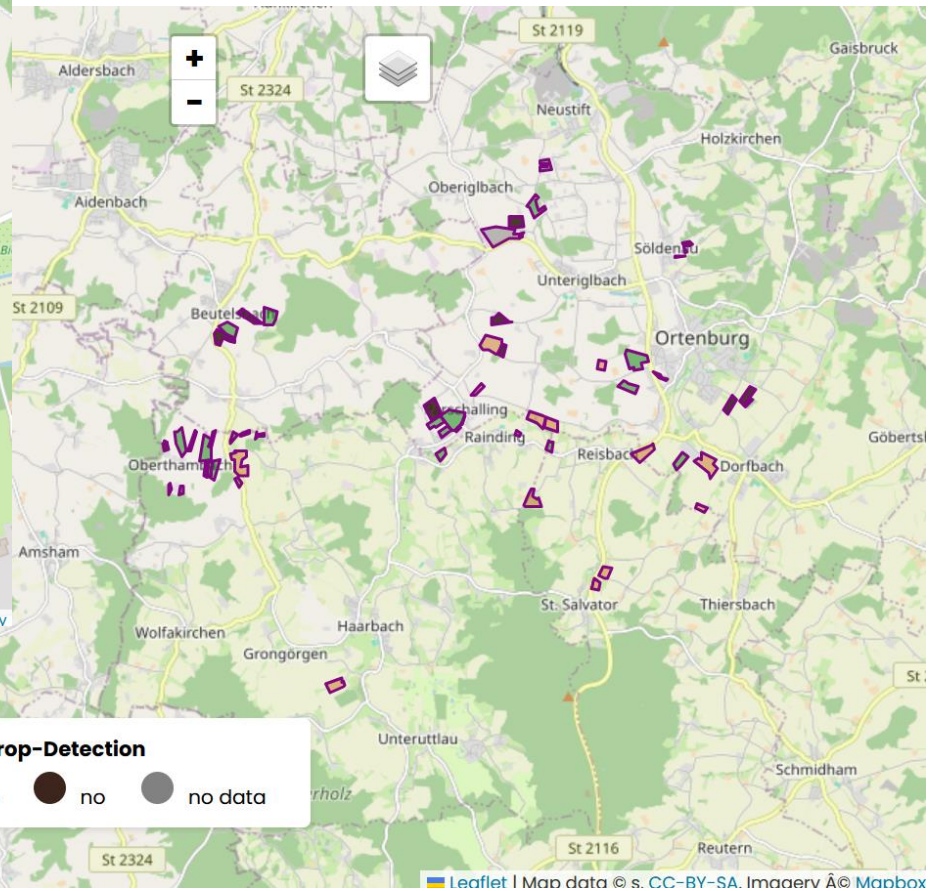
Tillage detection

Cover Crop classification

EO4CarbonFarming Cockpit: The User Interface to the MRV Tool







Results are available via the user interface or via API to implement in other front ends.

We are looking forward to discuss further!

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