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# Monitoring of the SDG 2.4.1 and 15.3.1 indicators on the CREODIAS platform with using in-situ data

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## Objectives and data

### Objectives

- ☐ **SDGs indicators monitoring**
  - ➢ 15.3.1 - Proportion of land that is degraded over total land area
  - ➢ 2.4.1 - Proportion of agriculture area under productive and sustainable agriculture
- ☐ **Providing land cover and in-season crop specific maps on regular basis**
- ☐ **Crop area estimation and land cover change detection**
- ☐ **Estimation of land productivity based on time-series of satellite data**

### Challenges

1. The **extension** of the existing methodology from the pilot area to the country level products
2. **Sen4CAP** software using, however run it for Ukraine and some of EU country
3. **International collaboration**

### Used data

- **Satellite data**
  - ➢ Sentinel-1 (10 meters)
  - ➢ Sentinel-2 (10 meters)
- **Train data**
  - ➢ In-situ
  - ➢ Photointerpretation

### In-situ

2016 2017 2018 2019 2020

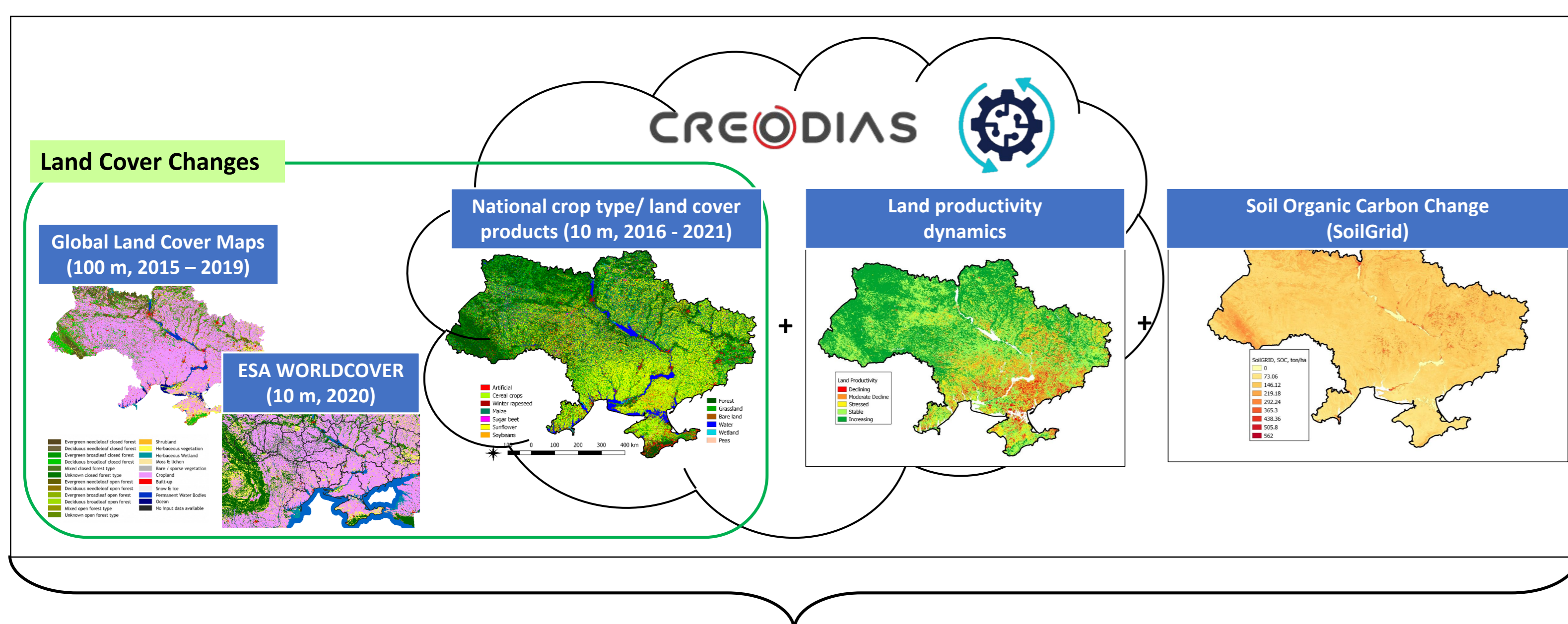Train data
Test data
Oblasts
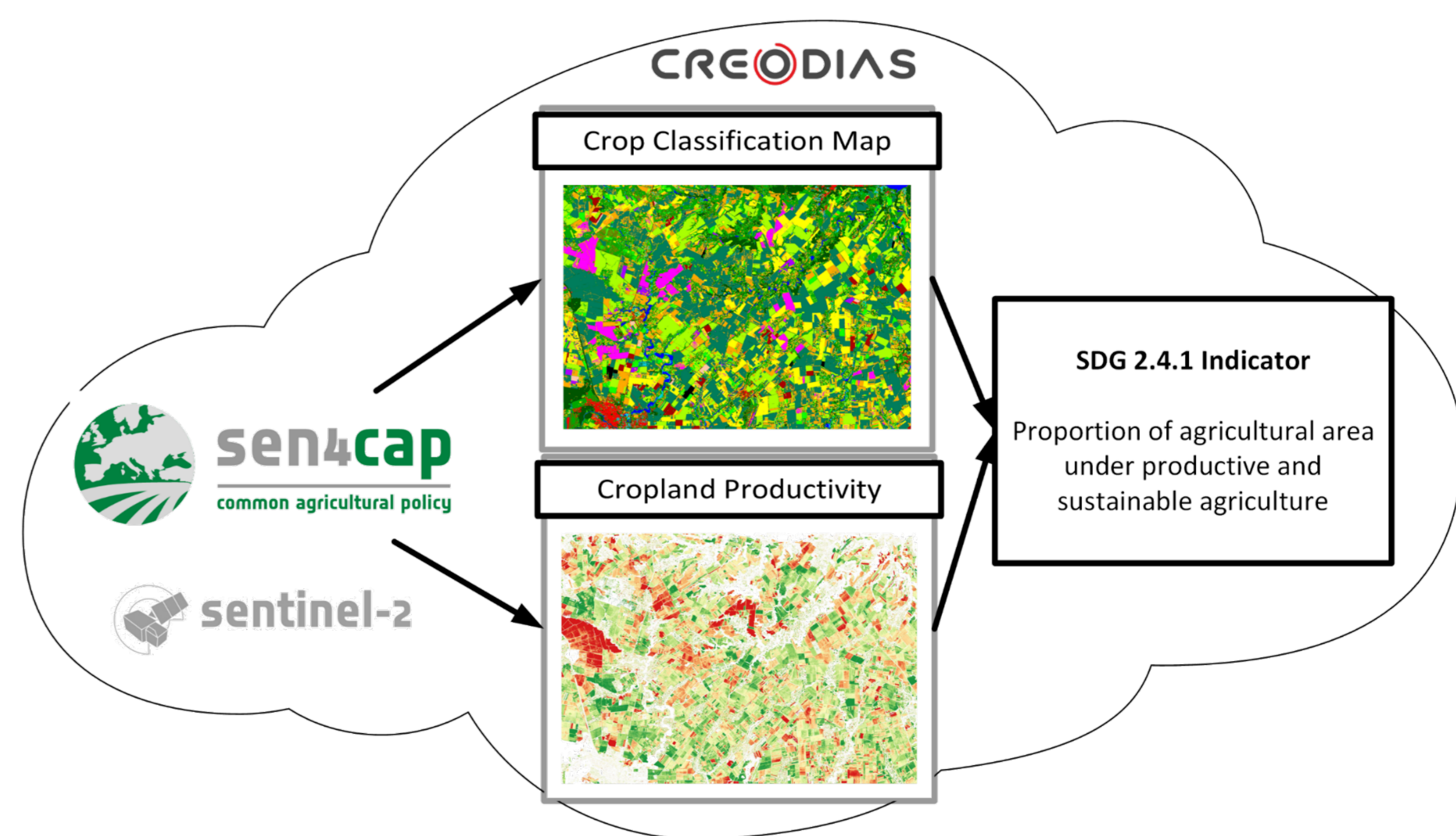Sentinel-1 Path
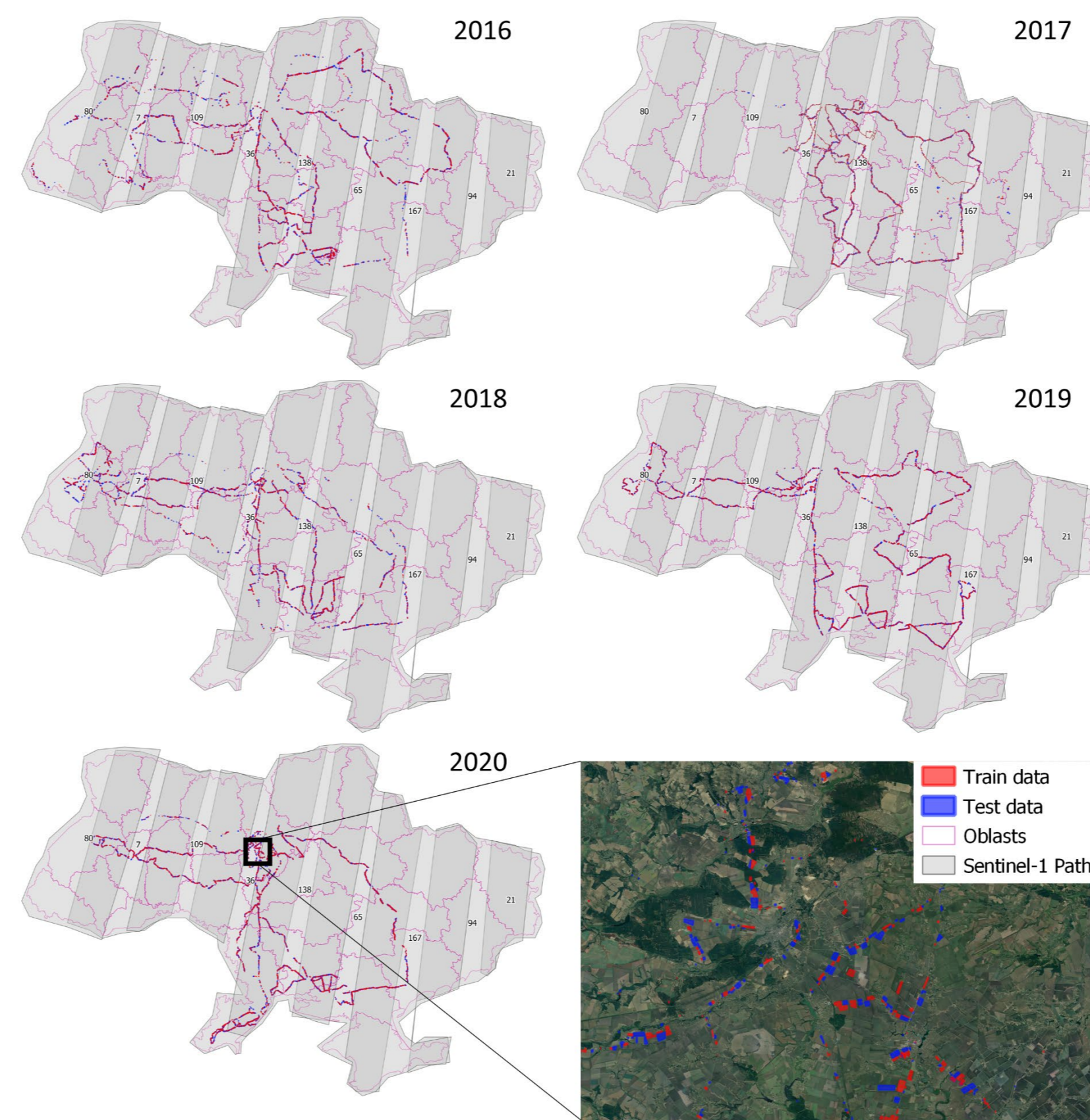
### Key users

- ☐ **Governmental institutions**
  - ➢ *Ministry of Ecology and Natural Resources of Ukraine*
  - ➢ *Ukrainian Hydrometeorological Center of the State Emergency Service of Ukraine*
- ☐ **Academic**
  - ➢ *Igor Sikorsky Kyiv Polytechnic Institute*
  - ➢ *Kyiv Academic University*
- ☐ **Research**
  - ➢ *IIASA*
  - ➢ *FZJ*
  - ➢ *UNIGE (ERA-Planet GEOEssential partners)*
- ☐ **Private companies**

## SDG indicator 15.3.1 methodology

Land Cover Changes

Global Land Cover Maps (100 m, 2015 – 2019)

ESA WORLDCOVER (10 m, 2020)

National crop type/ land cover products (10 m, 2016 - 2021)

Land productivity dynamics

Soil Organic Carbon Change (SoilGrid)

**LOOCV-rule –> SDG Indicator 15.3.1**

## SDG indicator 2.4.1 methodology

CREODIAS

Crop Classification Map

Cropland Productivity

sen4cap
common agricultural policy

sentinel-2

**SDG 2.4.1 Indicator**
Proportion of agricultural area under productive and sustainable agriculture

## First results – winter crop mask 2022 for Kyiv region, Ukraine

### NDVI max value
from Mar. 1 to Apr. 22

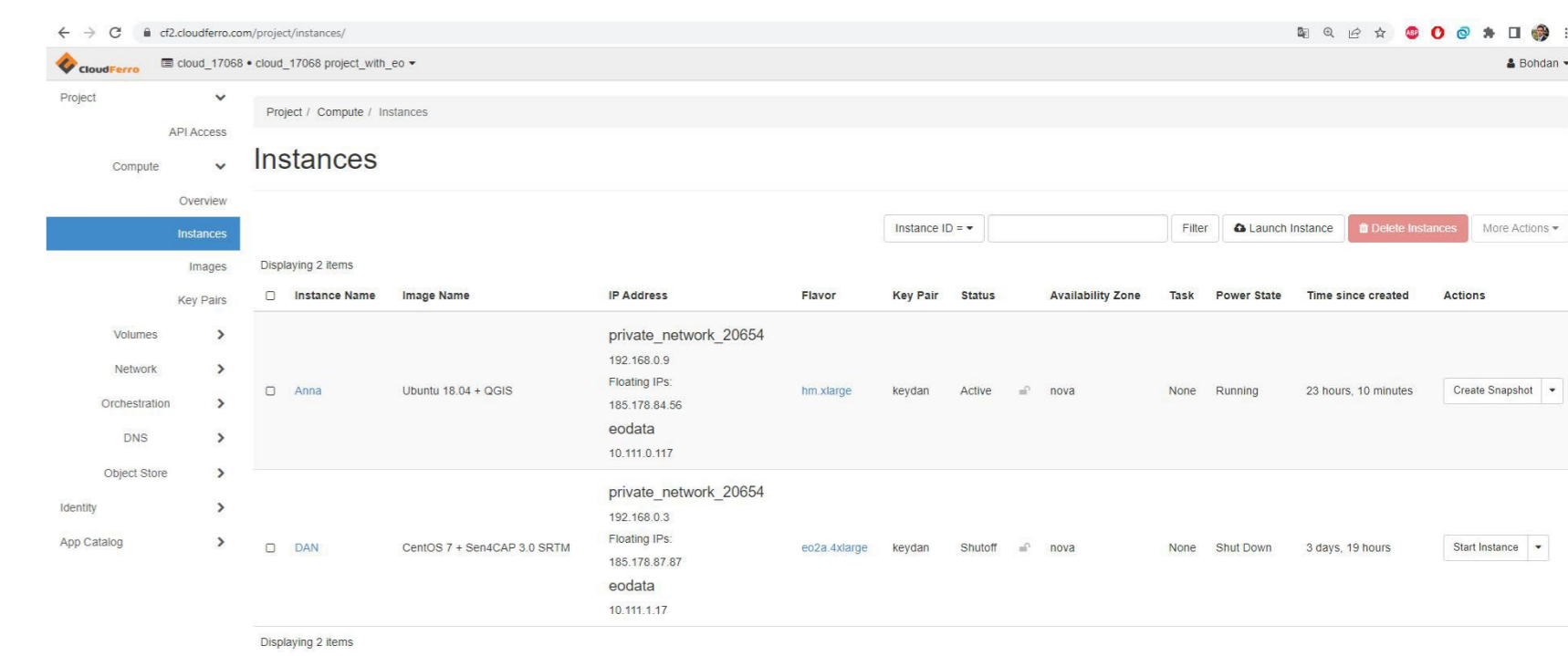Ukraine
Kyiv
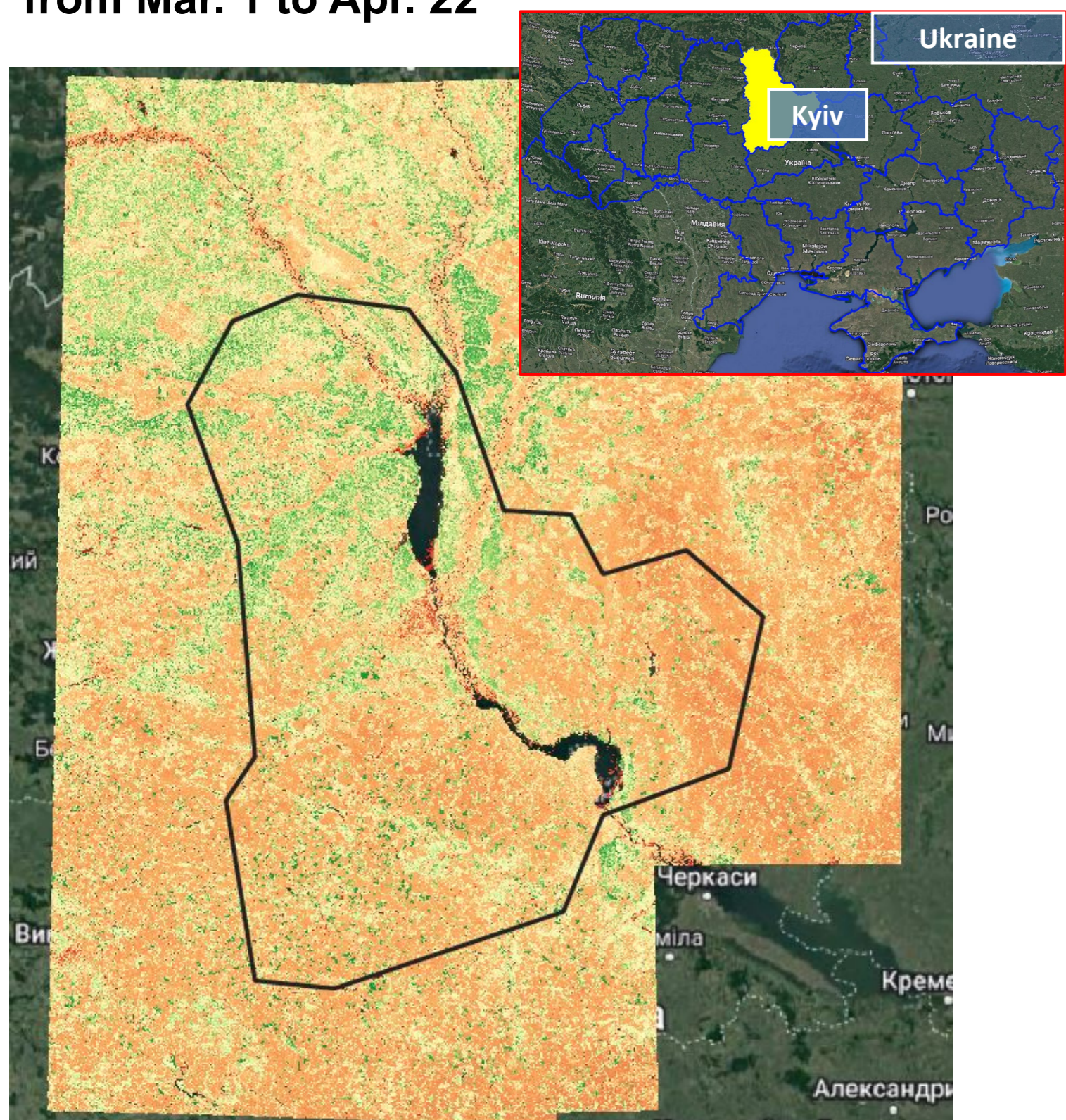
### Crop mask using
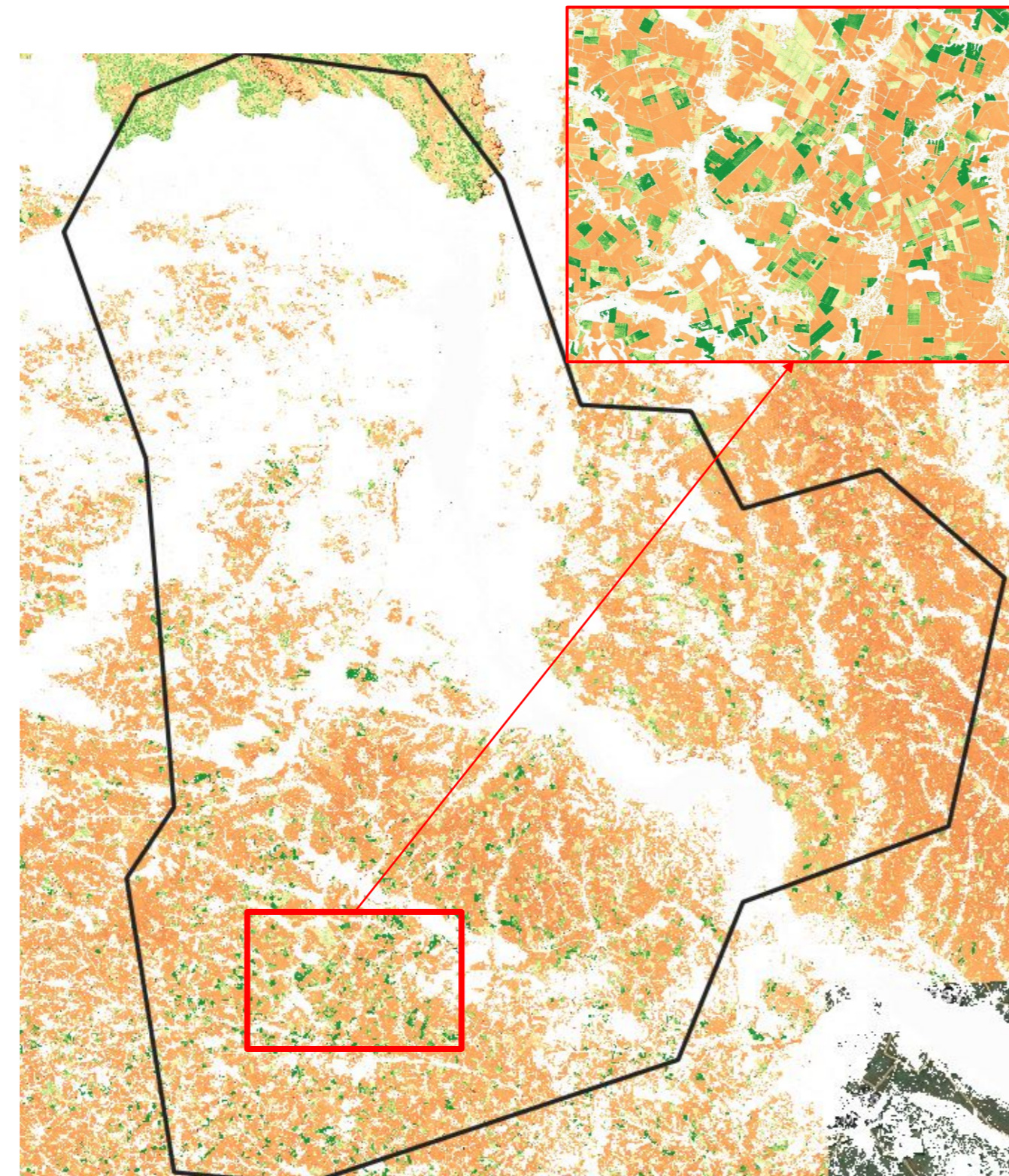
### Threshold segmentation
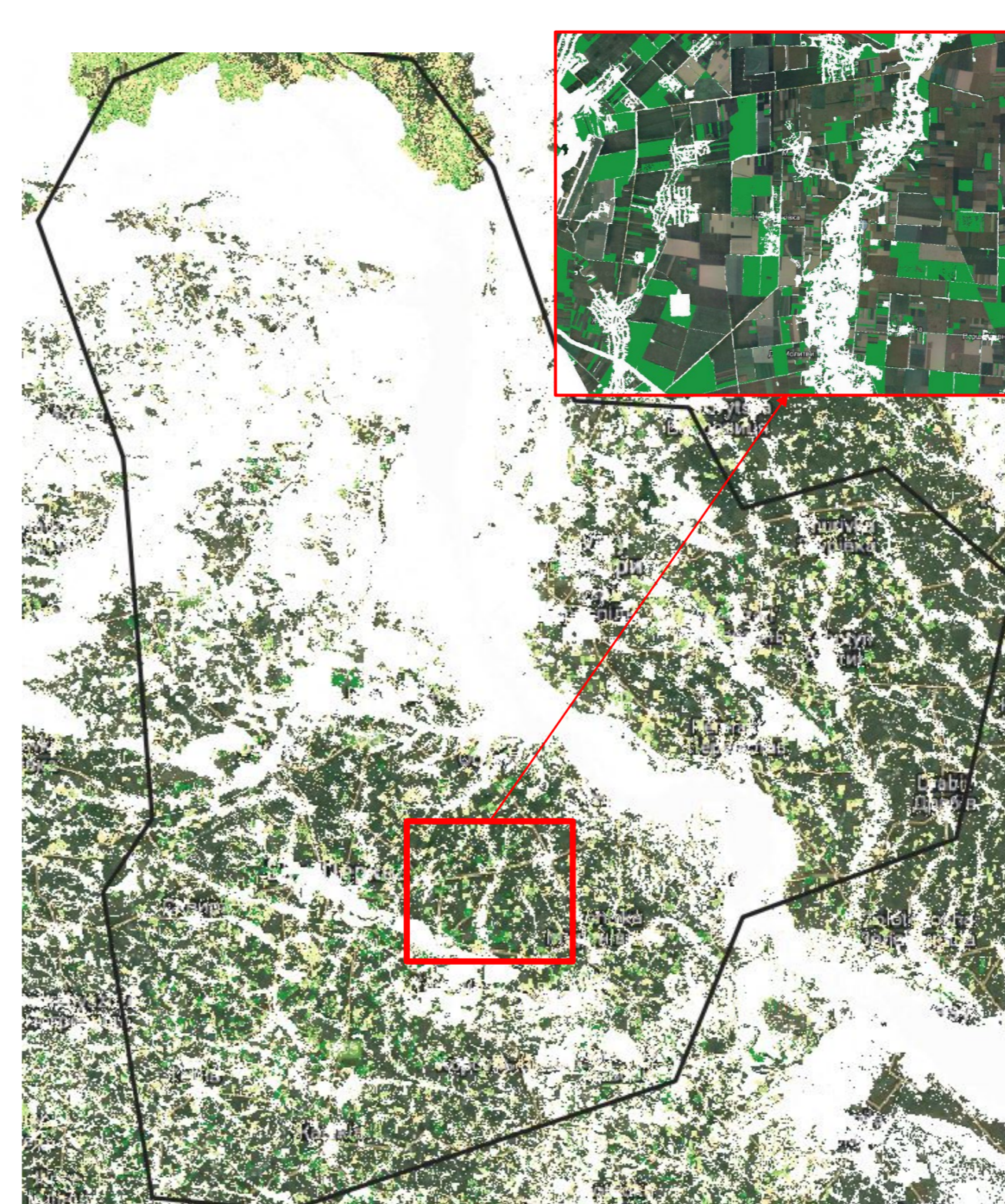
### Comparison with statistical information

- *Area of winter crops based on satellite data*
  - ➢250.6 th ha
- *Area of winter crops according to statistical information*
  - ➢255.6 th. ha

### Used instances in CREODIAS

Instances

## References

1. N. Kussul, M. Lavreniuk, A. Kolotii, S. Skakun, O. Rakoid, L. Shumilo, "A workflow for Sustainable Development Goals indicators assessment based on high-resolution satellite data," **International Journal of Digital Earth**, 2020, 13:2, pp. 309-321, DOI: 10.1080/17538947.2019.1610807.
2. N. Kussul, A. Shelestov, M. Lavreniuk, I. Butko and S. Skakun, "Deep learning approach for large scale land cover mapping based on remote sensing data fusion," **2016 IEEE IGARSS,** 2016, pp. 198-201, DOI: 10.1109/IGARSS.2016.7729043
3. The authors acknowledge the funding received by **Horizon 2020 e-shape project** (Grant Agreement No 820852)
4. https://e-shape.eu/index.php/showcases/pilot-1-6-service-for-sdg-2-4-1-and-15-3-1-indicators-assessment

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