AI for sustainable and resilient agriculture

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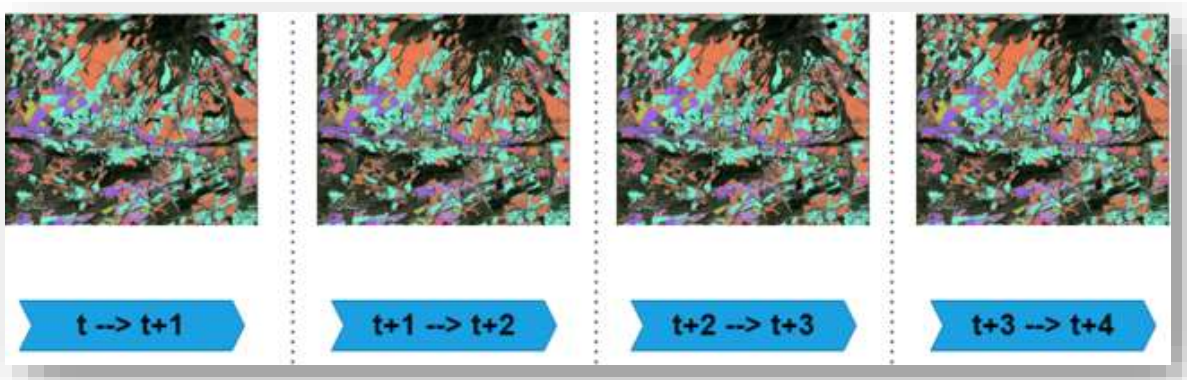
National Observatory of Athens

Cultivated crop type maps

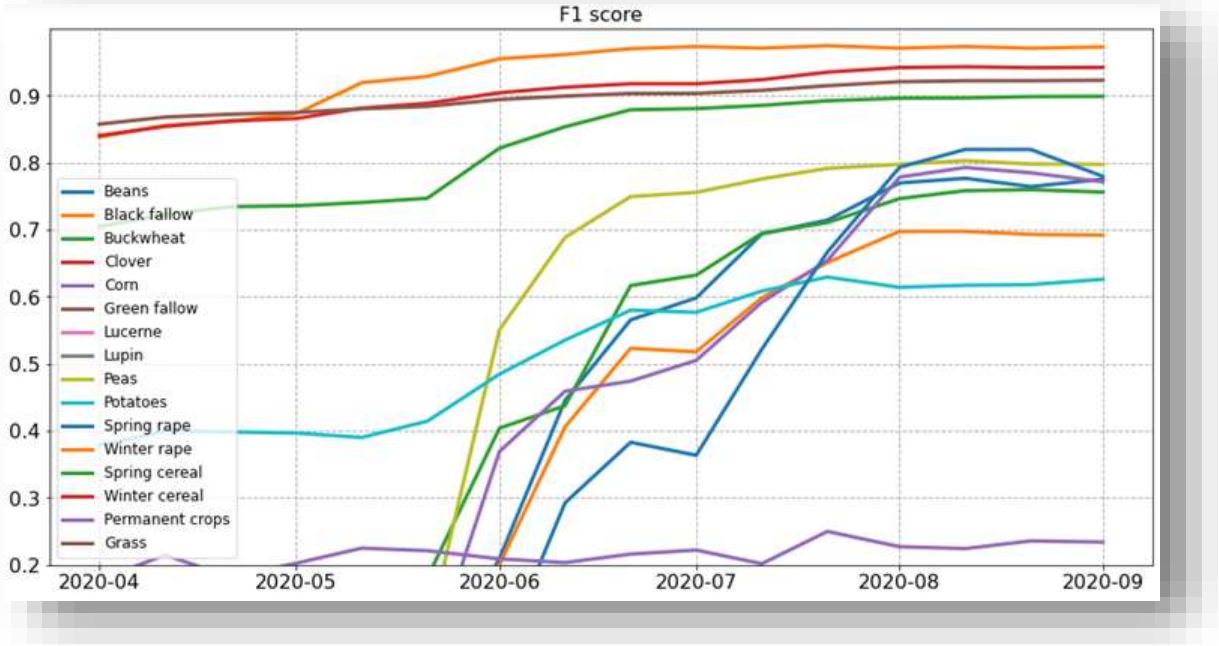
Crop Type Maps

- Train ML models using the farmers declarations
- Dynamic mapping within the year
- National scale application

Multi temporal Crop type mapping



Lithuania classifier performance (F1 score) progress over cultivation period



Cultivated crop type maps

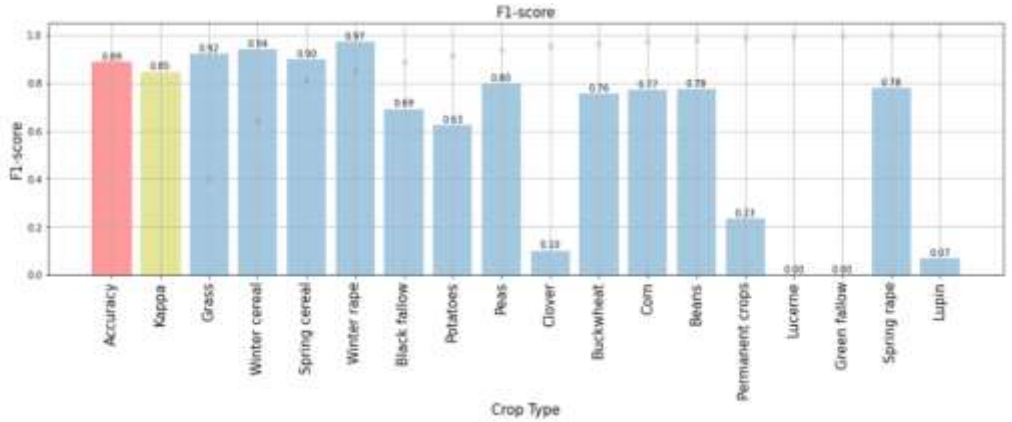
Challenges:

1. Early in the year
2. Crop ambiguity
3. Cloud coverage
4. Small parcels

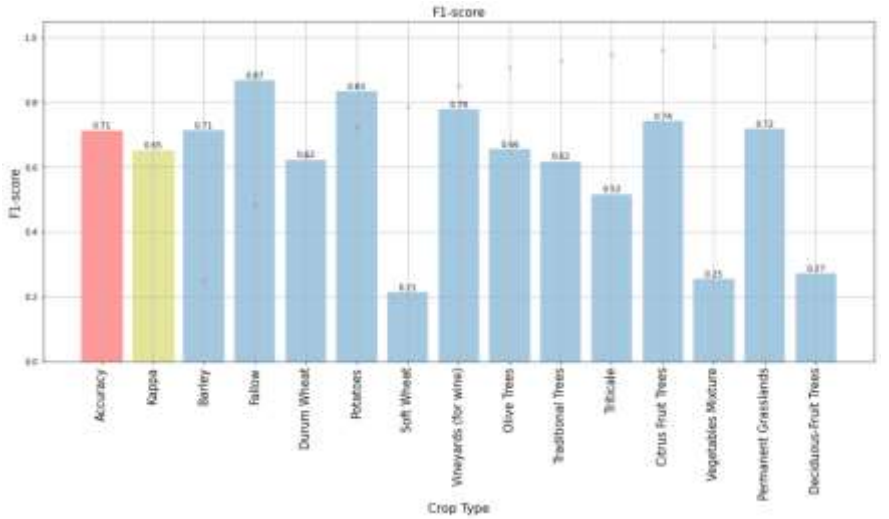
Lithuania Validated areas

Cyprus Validated areas

F1 score based on the predictions provided at the end of cultivation period

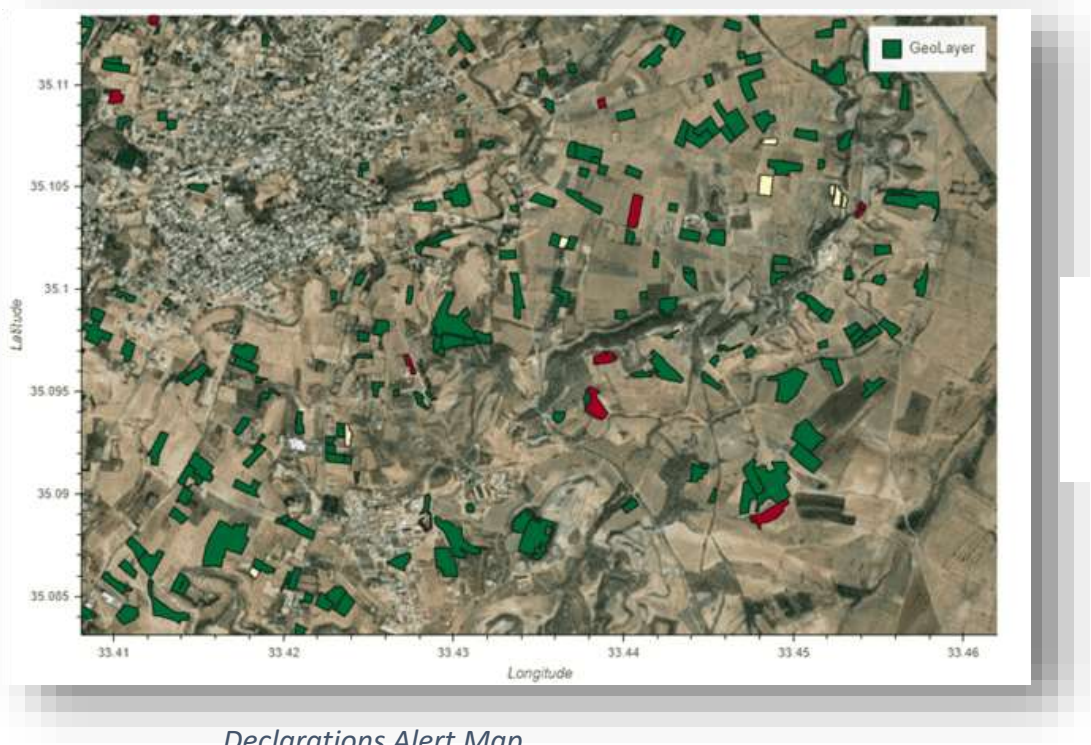


F1 score based on the predictions provided at the end of cultivated period

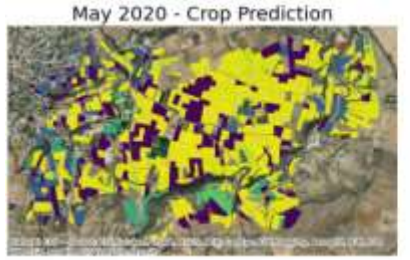


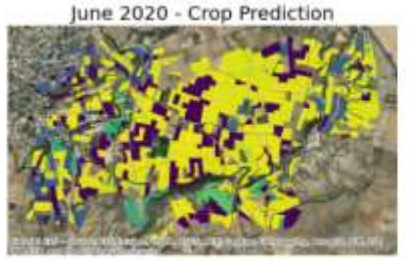
Crop type maps

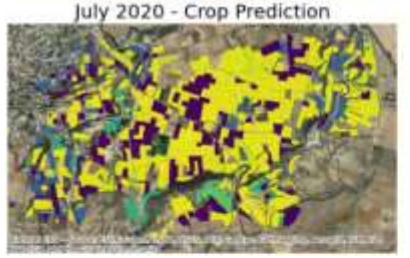
- **Assess declarations:** Smart Sampling for OTSC (*Traffic Light System*)
- **Crop diversification assessment**

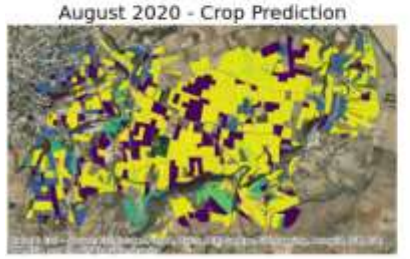


Declarations Alert Map









Grassland monitoring for the CAP

FUTURE OF FOOD AND FARMING

- Grasslands provide a wide range of ecosystem services and need to be maintained and used appropriately.
- Most countries define periods for grassland mowing activity – CAP checks
- Quantify grassland use intensity: design targeted agro-ecological and climate-focused measures (CAP post-2020)
- **Systematic and timely remote monitoring of grasslands is required**
- **Clouds are a problem – we miss events**

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Cloud masks are not perfect

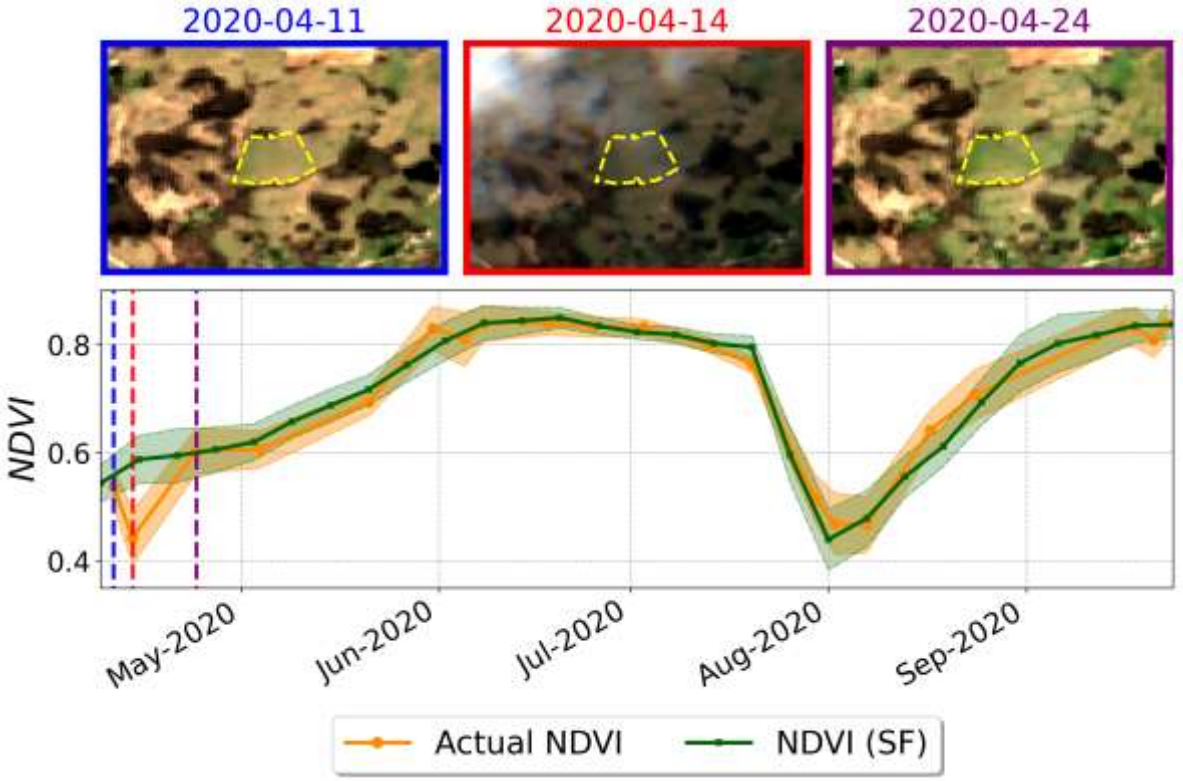
Data

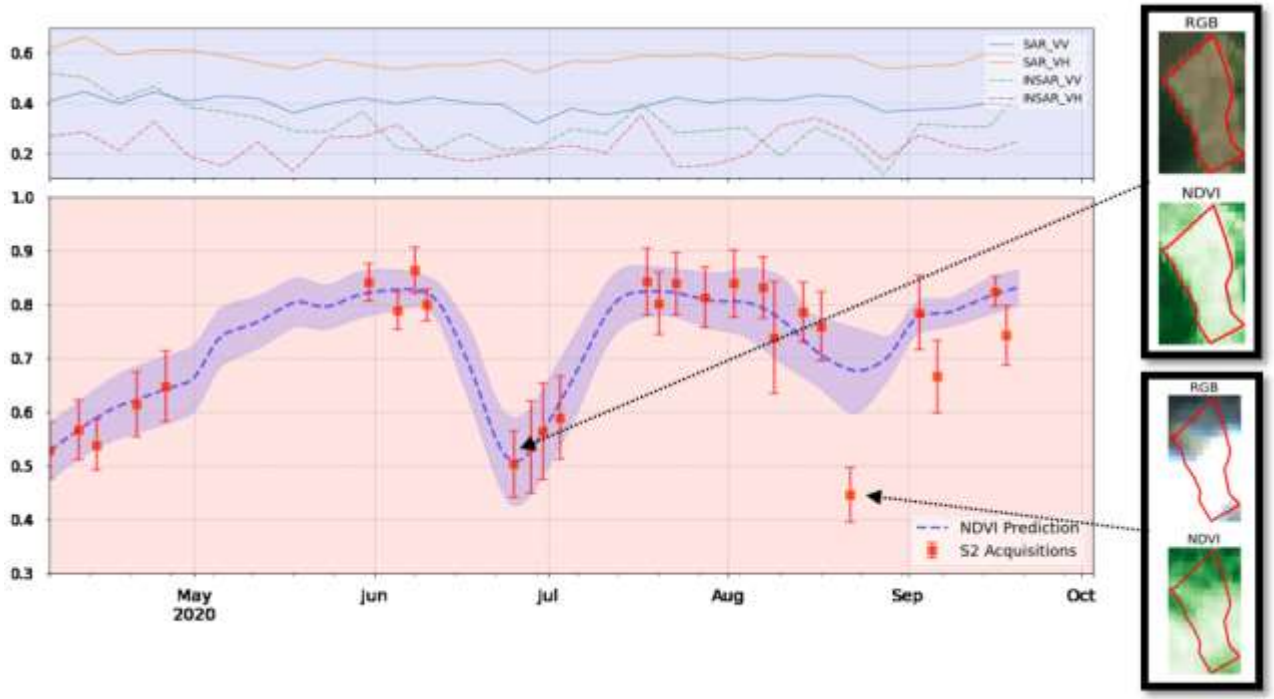
Sentinel-2 L2A time-series

- Normalized Difference Vegetation Index (NDVI)
- Scene Classification (SCL) based on sen2cor L2A processor

Sentinel-1 GRD (rel. orbits: 58, 131) → Backscattering coefficients (VV-VH)

Sentinel-1 Coherence (rel. orbits: 58, 131) →Coherence coefficients (VV-VH)





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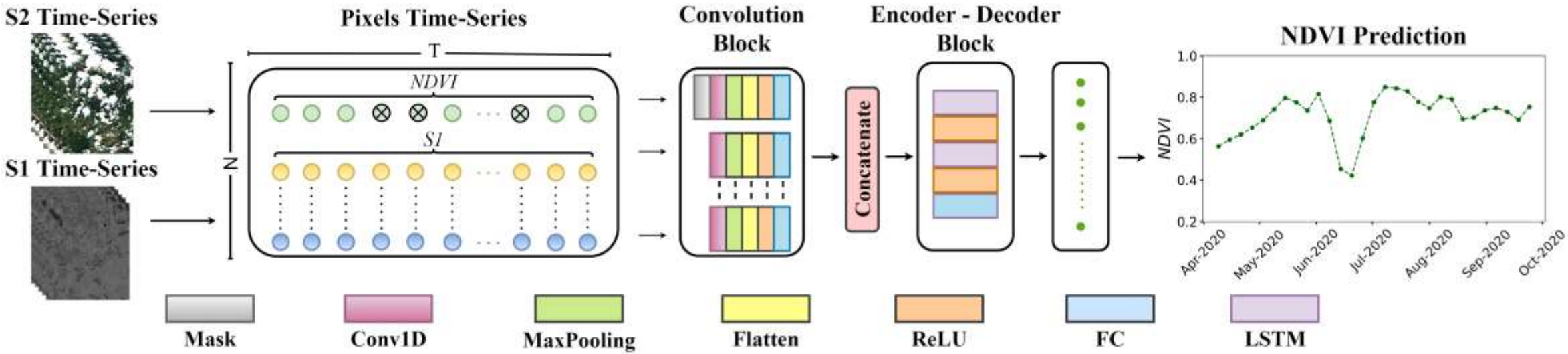
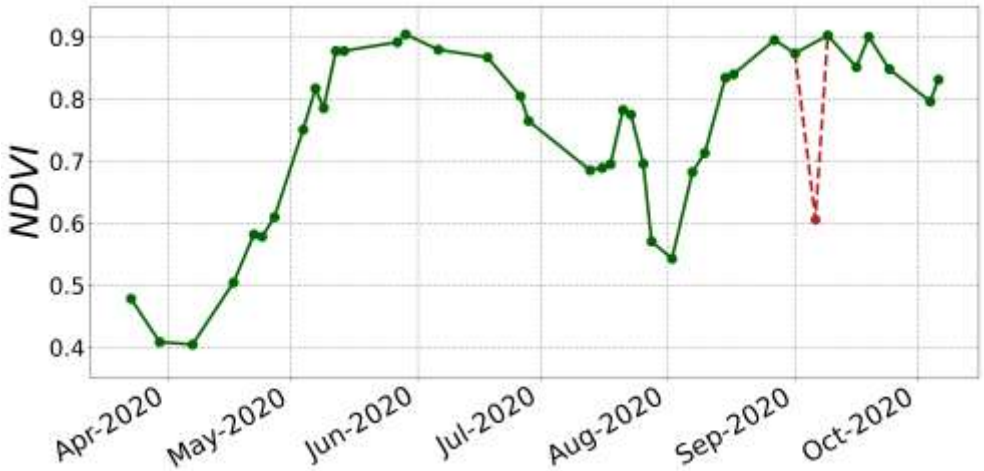
Fusion of optical and radar data





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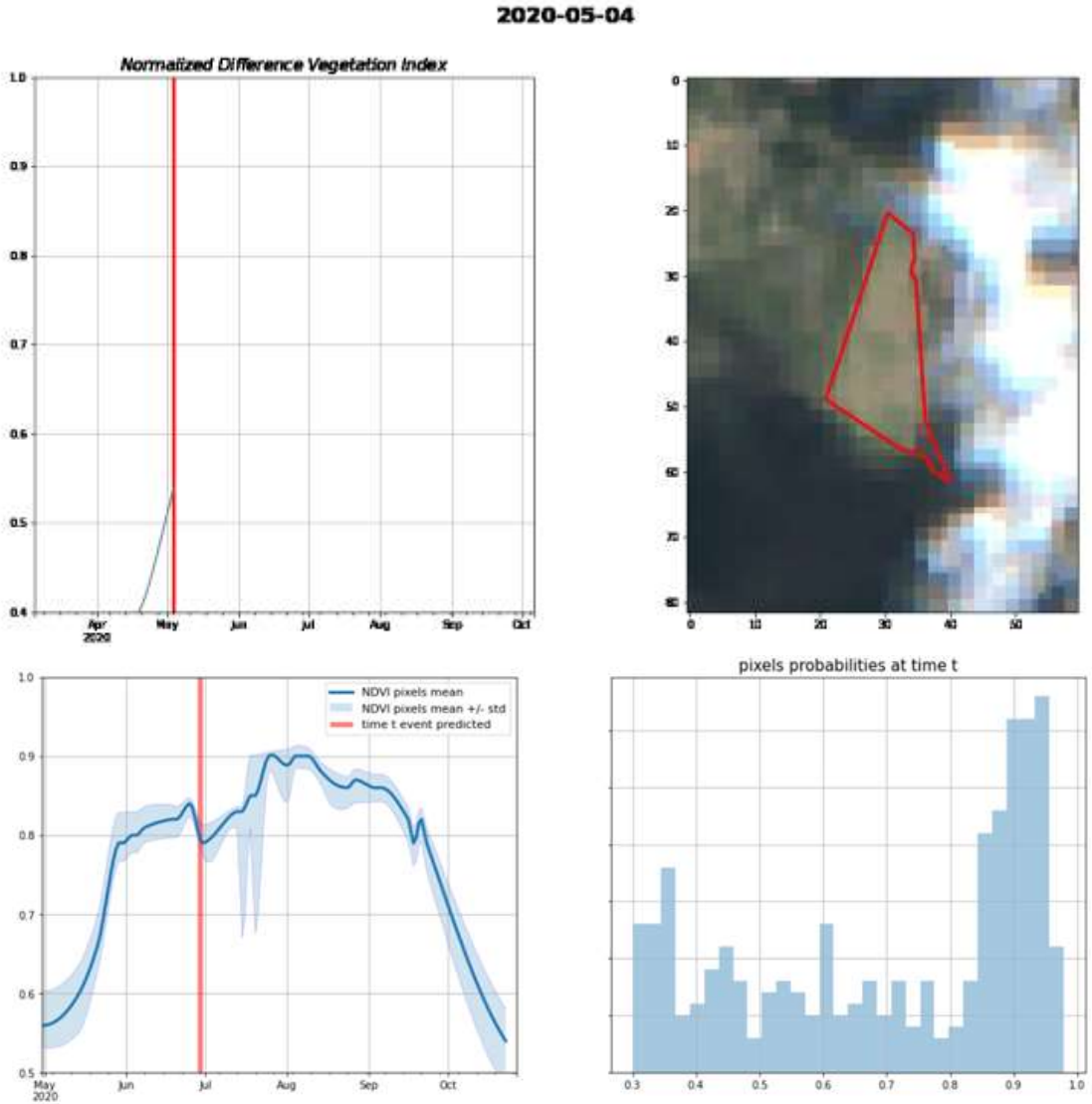
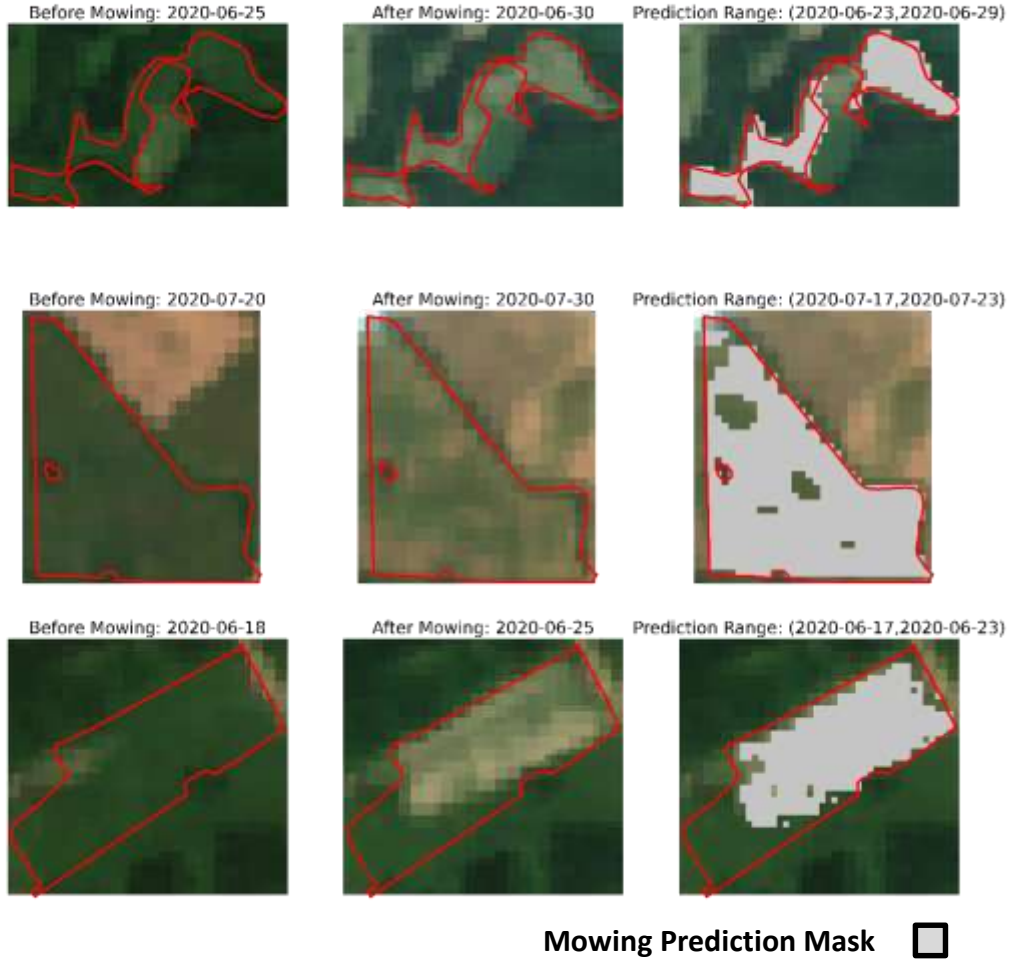
Pixel-based mowing detection on synthetic NDVI





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Thank you!

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