

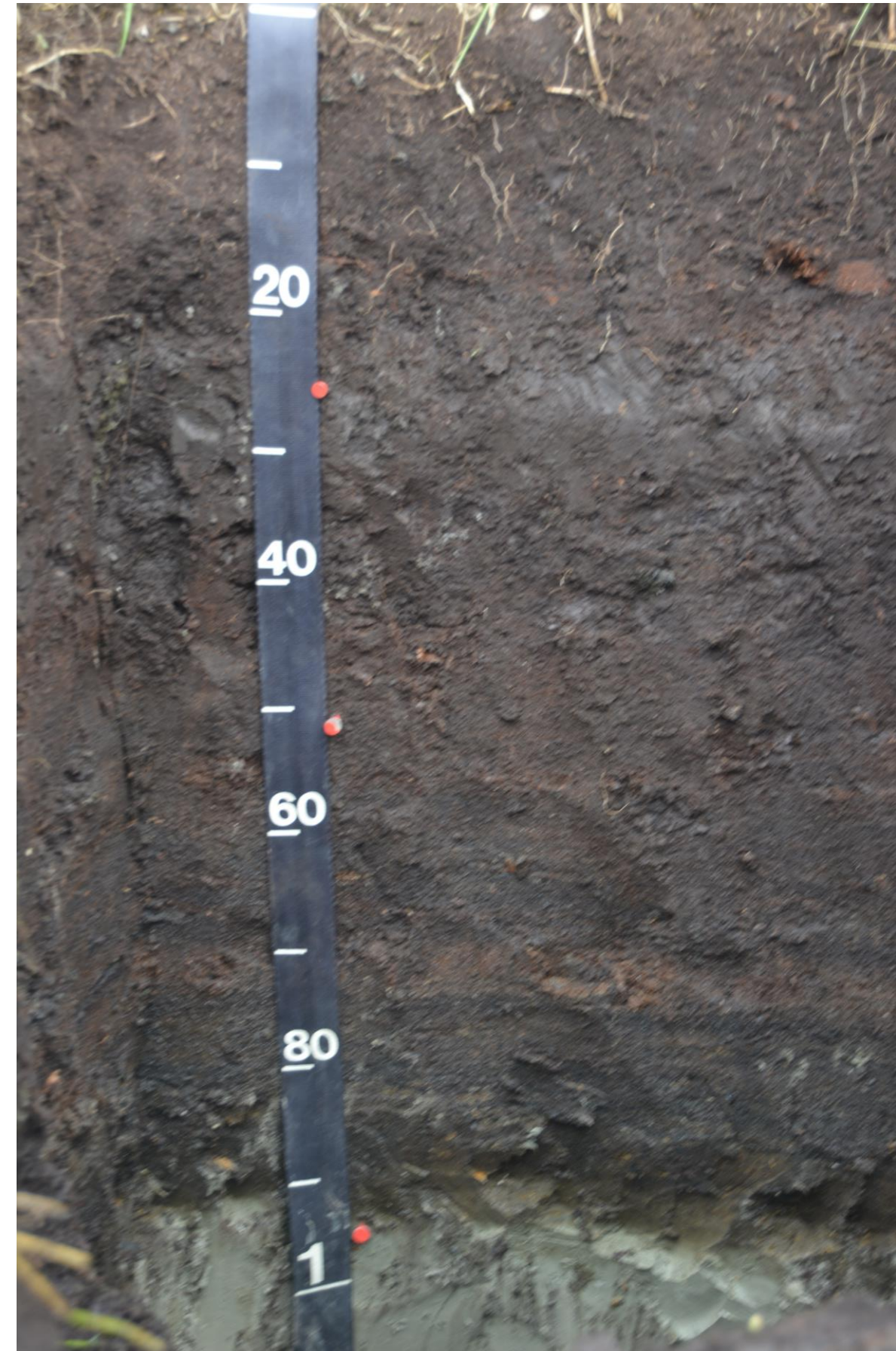
Country-scale predictive mapping of peat-soils in agricultural lands in Latvia

(LV-CLIMATE-0002) E2SOILAGRI

Implementation of international peatsoil criteria in national classification

- Peatsoils

- Soils containing organic material ($\geq 35\%$ OC) cumulatively in the 0-100 cm soil layer: (1) ≥ 60 cm (if the material contains 75% or more of moss fibres); (2) or ≥ 40 cm (if composed of other types of material); in both cases starting shallower than 40 cm from the top of the soil.



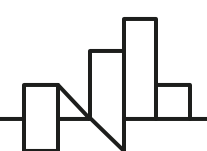
Old
classification

>30 cm



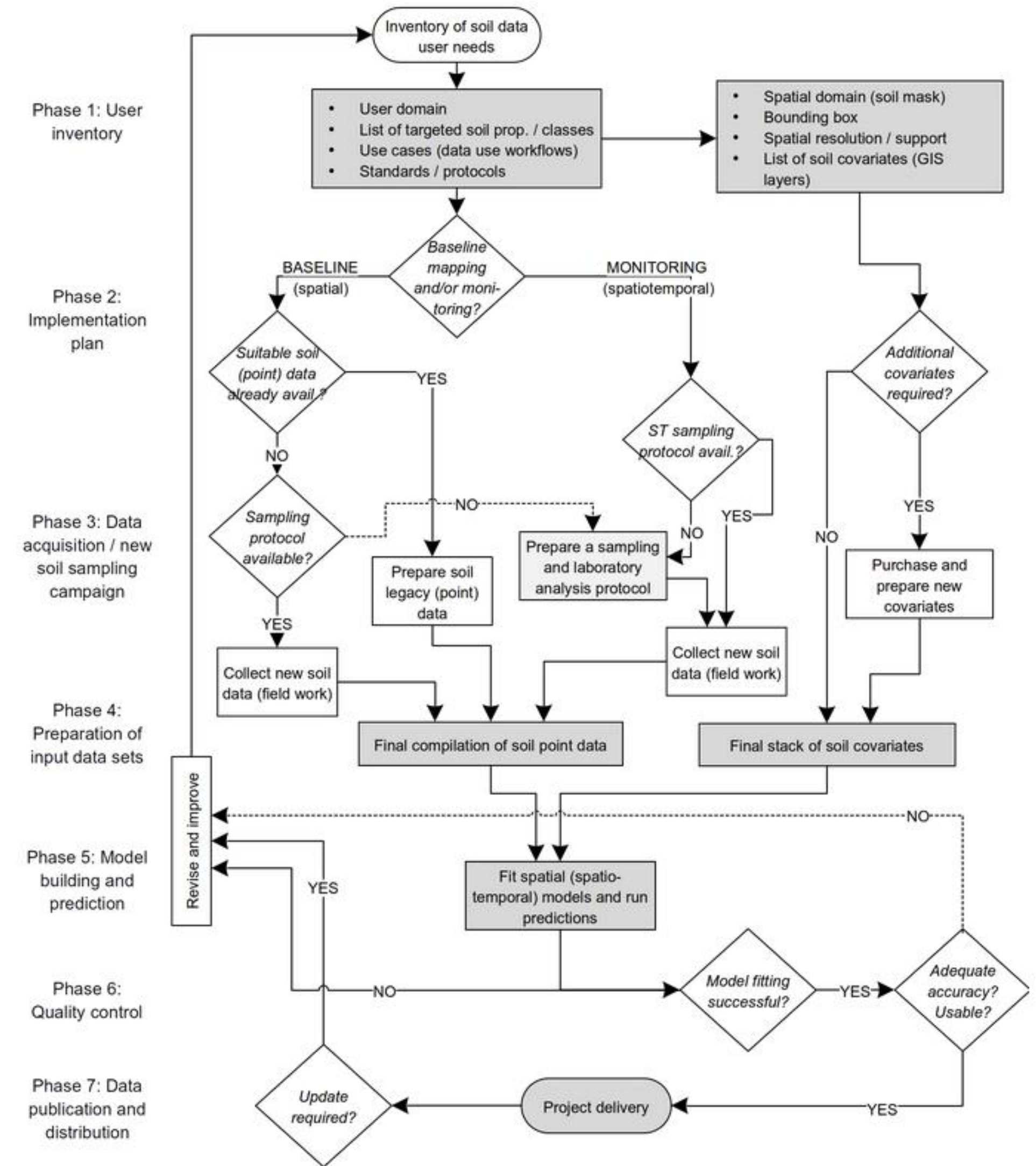
New
classification

>40 cm

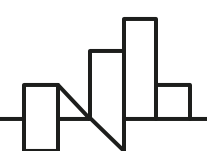


Workflow

- Preparation of point data (training data).
- Preparation of covariate data (the explanatory variables).
- Model fitting and validation (building rules by overlay, model fitting and cross-validation).
- Prediction and generation of (currently best-possible) final maps (applying the rules).
- Archiving and distribution
- Updates and upgrades.



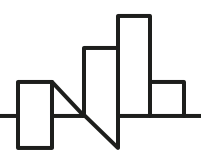
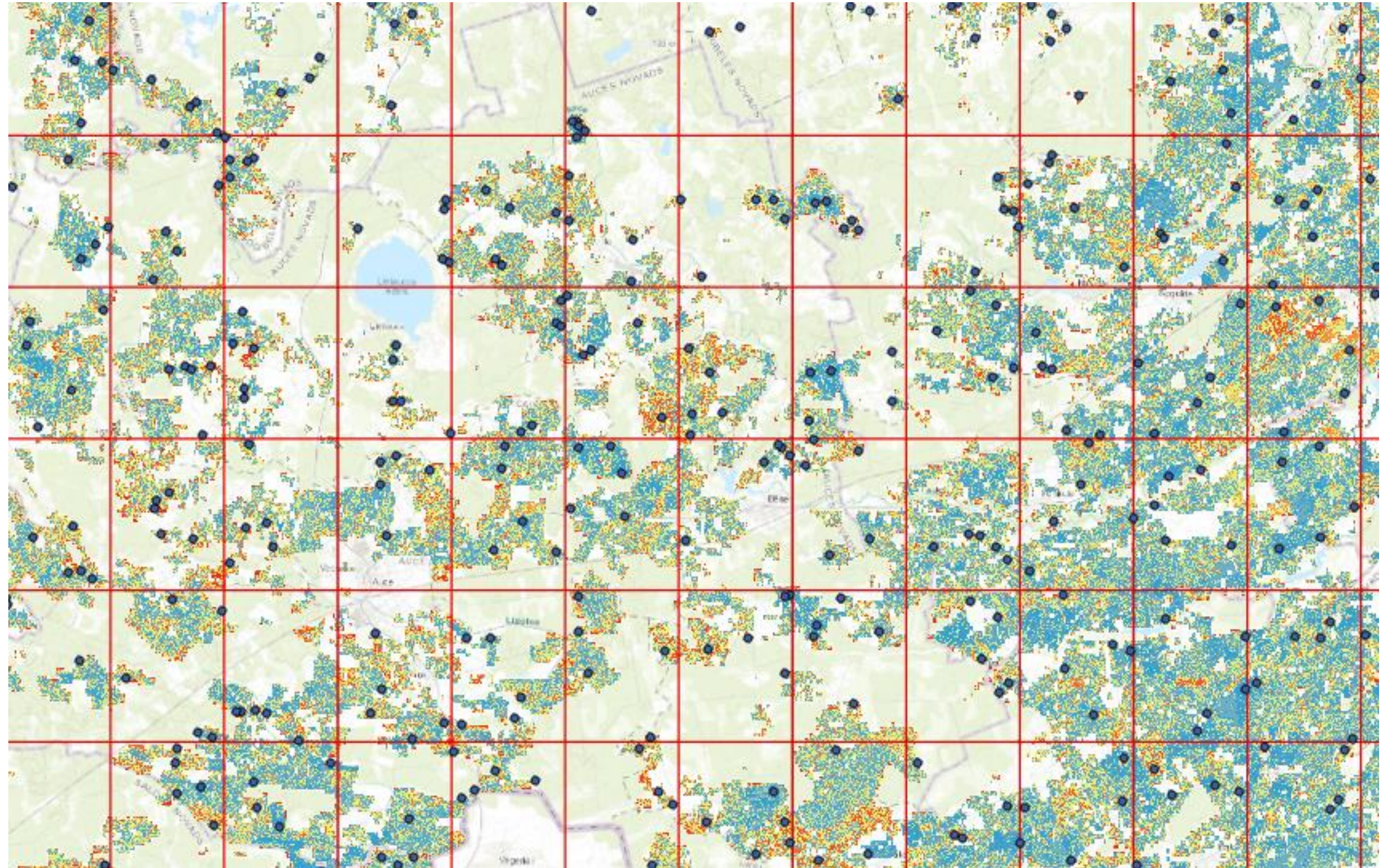
Hengl, T., & MacMillan, R. A. (2019). *Predictive soil mapping with R*.



Study area

2.366 millions ha

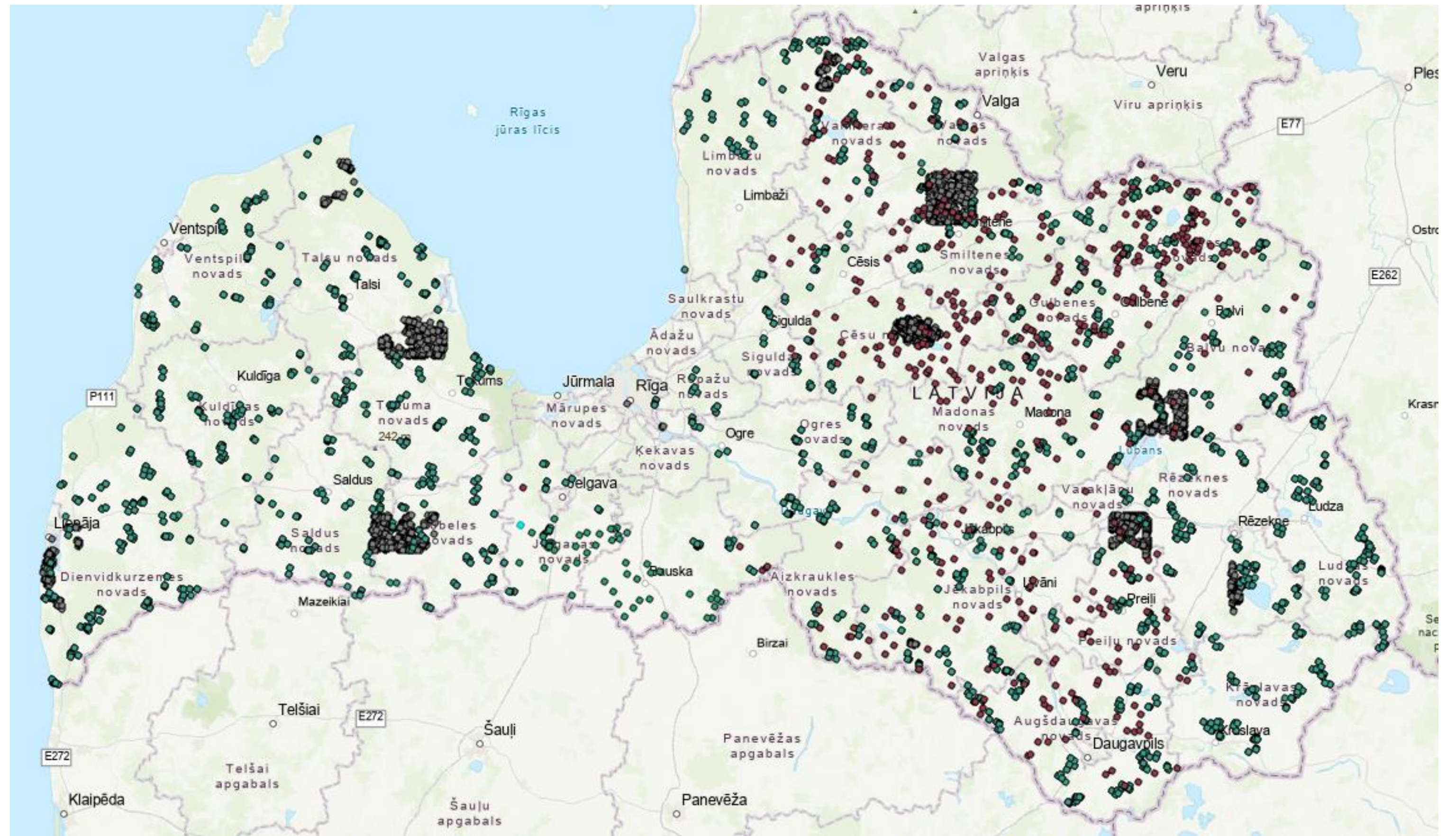
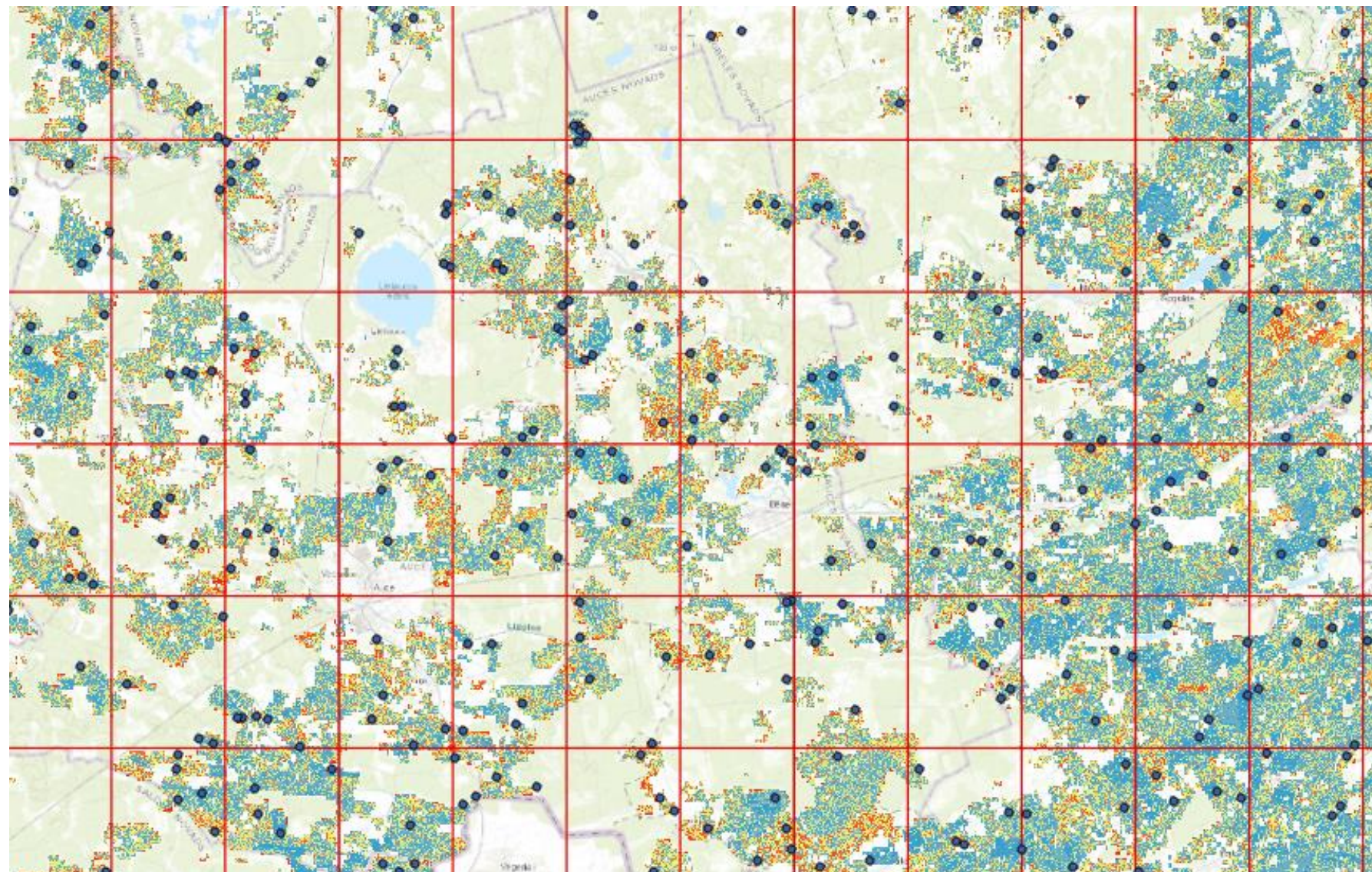
- Declared farmland
- Potential farmland



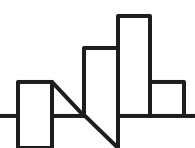
Training data

>10000 points

- 30% randomly distributed throughout the study area
- 70% concentrated in different landscape-ecological conditions

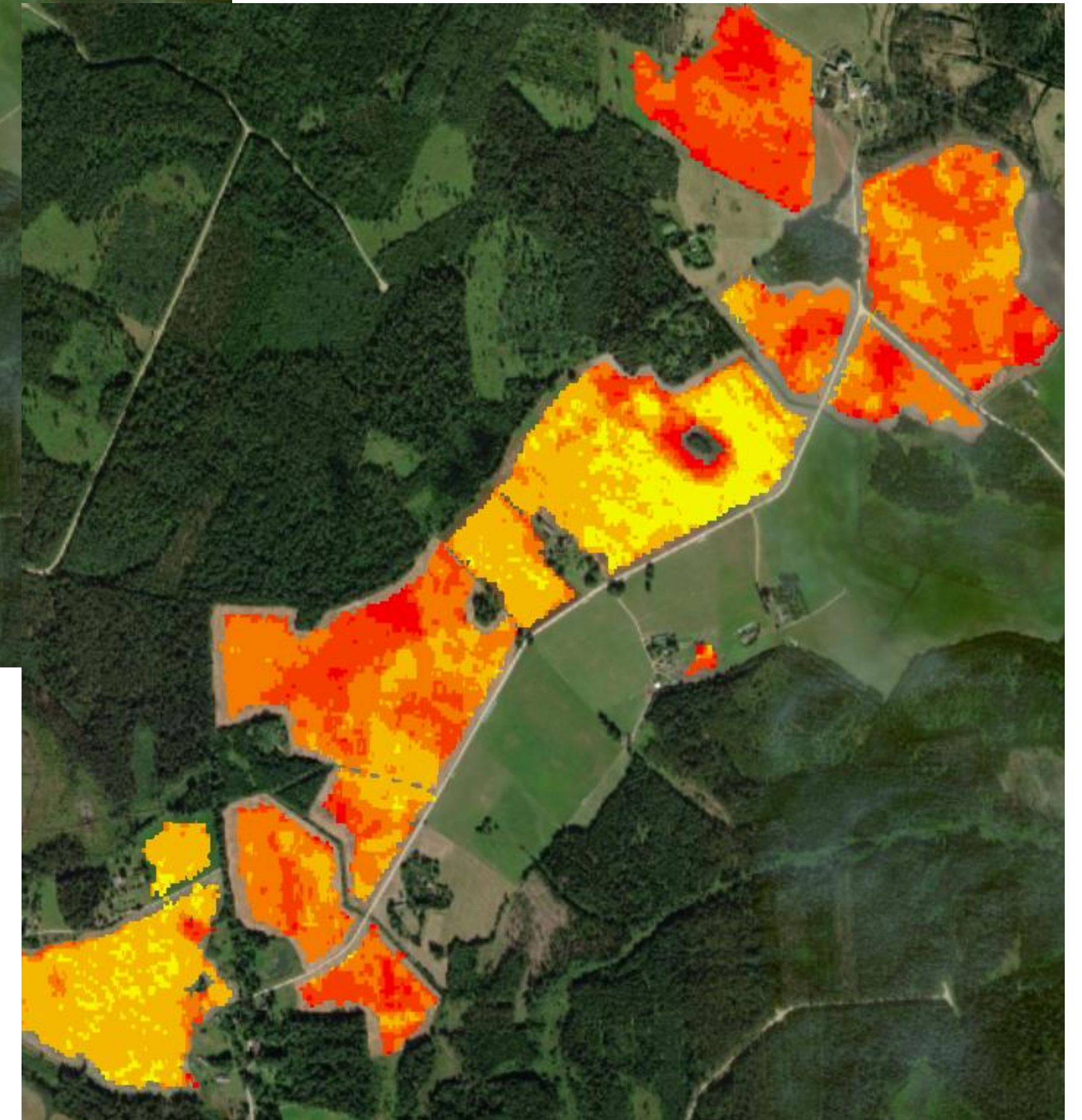


To ensure maximum utility, field data should be objective and reproducible; it should be collected using an objective sampling design that ensures reproducibility and resampling. It shall be as accurately localised as possible in both space (geolocation) and time. It shall describe and measure actual conditions in their current state (and current land use).



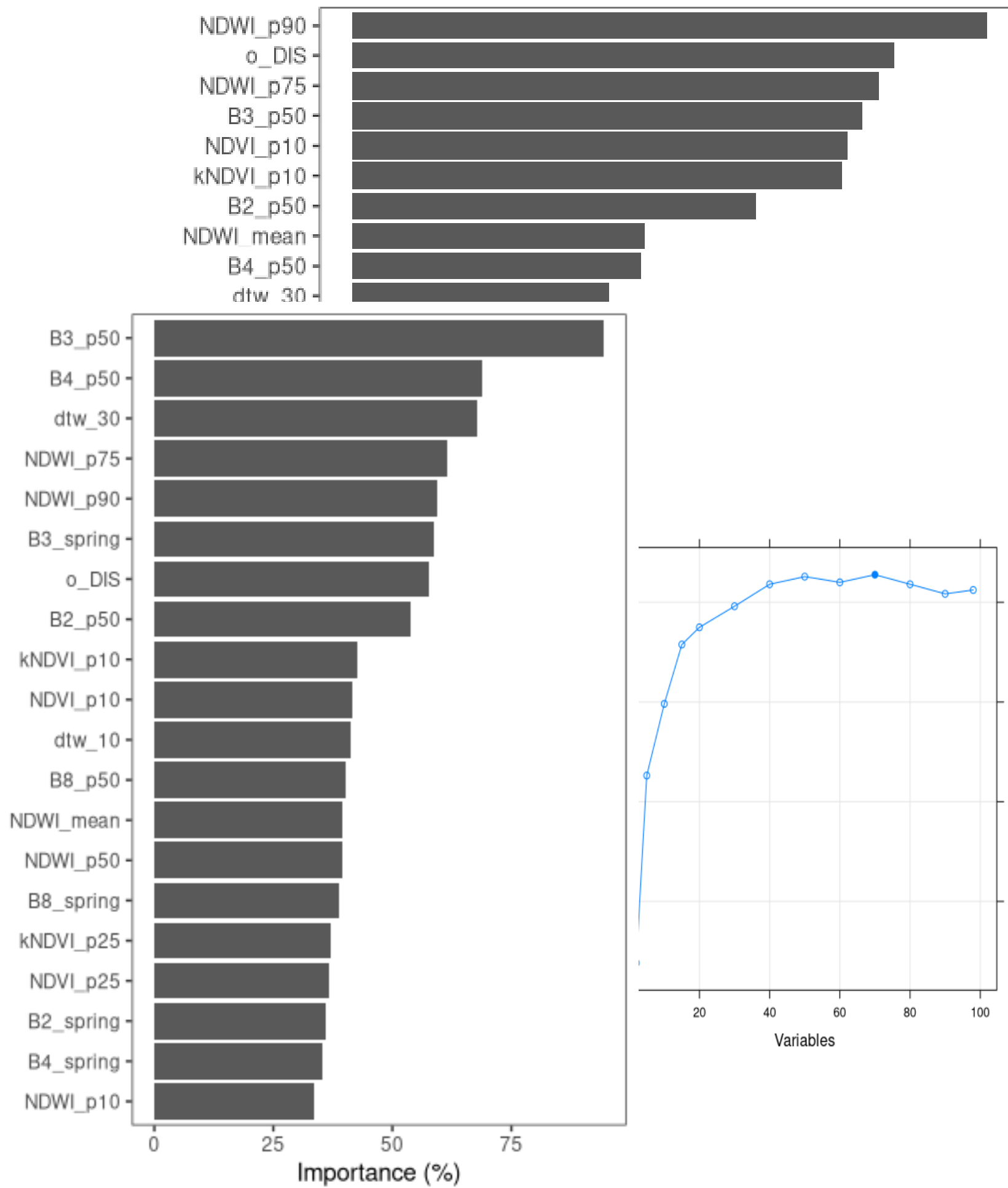
Models

- Direct observation
 - arable land
 - grasslands
 - overgrown areas
- Indirect observations
 - arable land
 - grasslands
 - overgrown areas

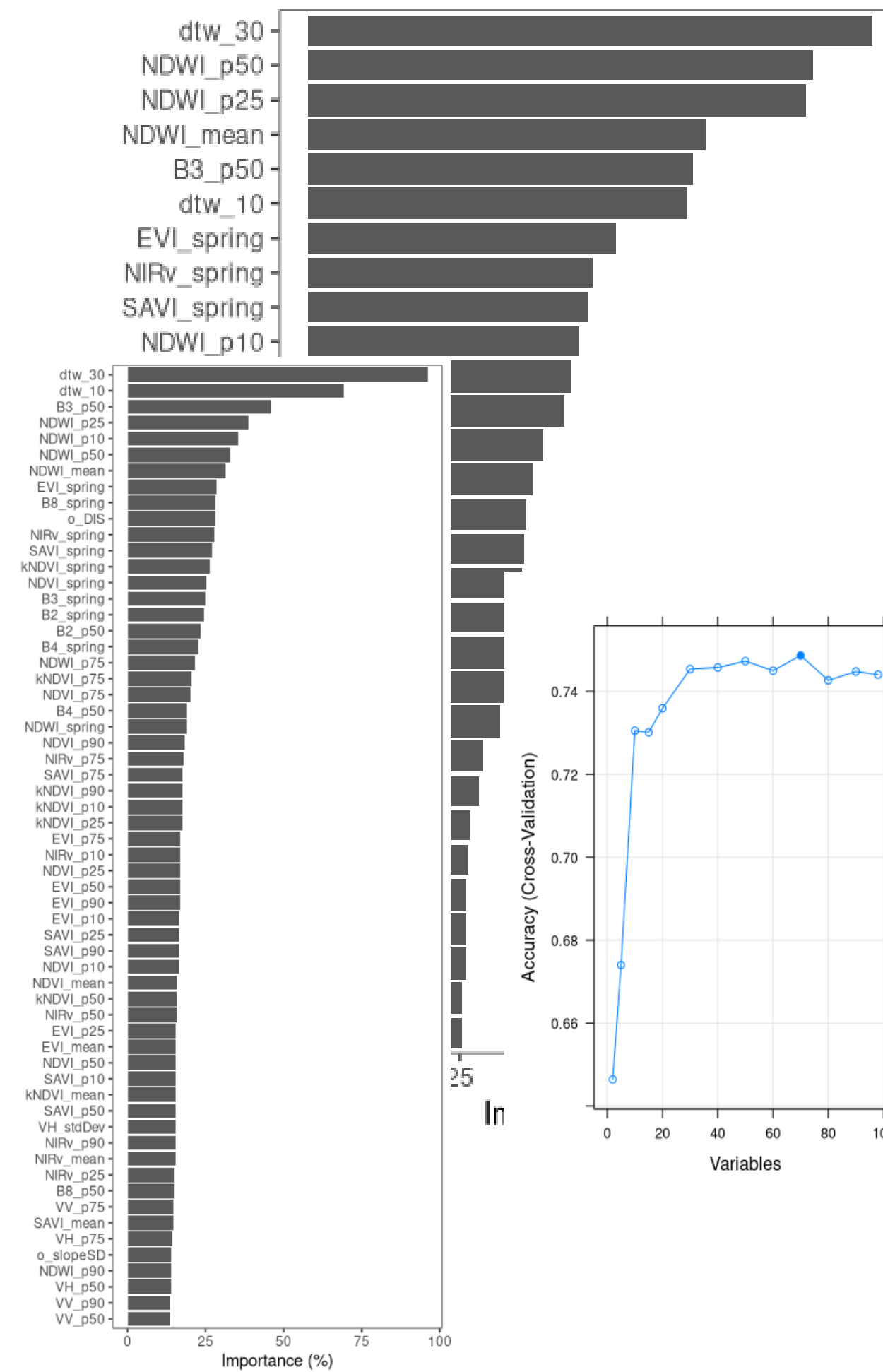


Geospatial variables

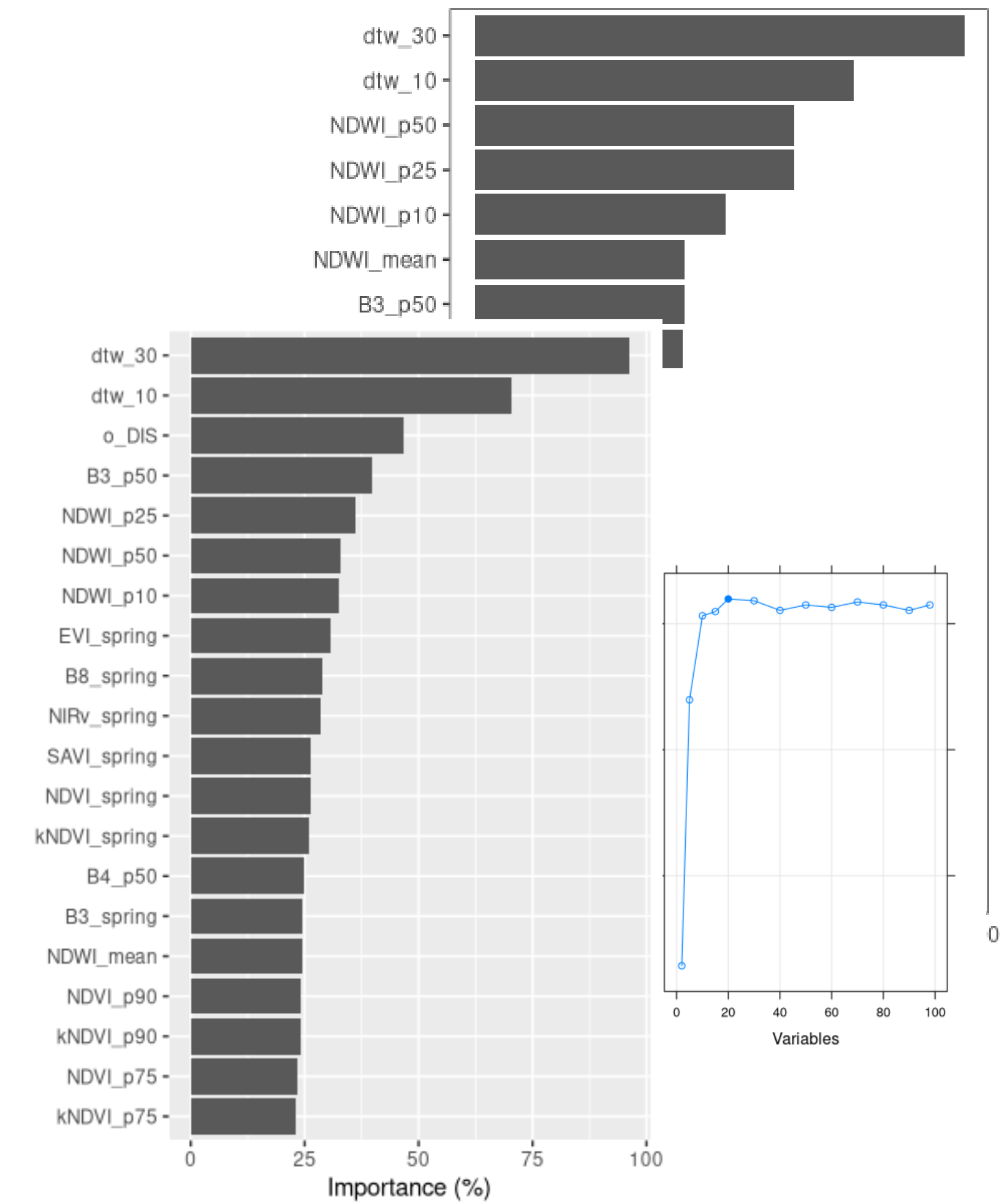
arable land



grasslands

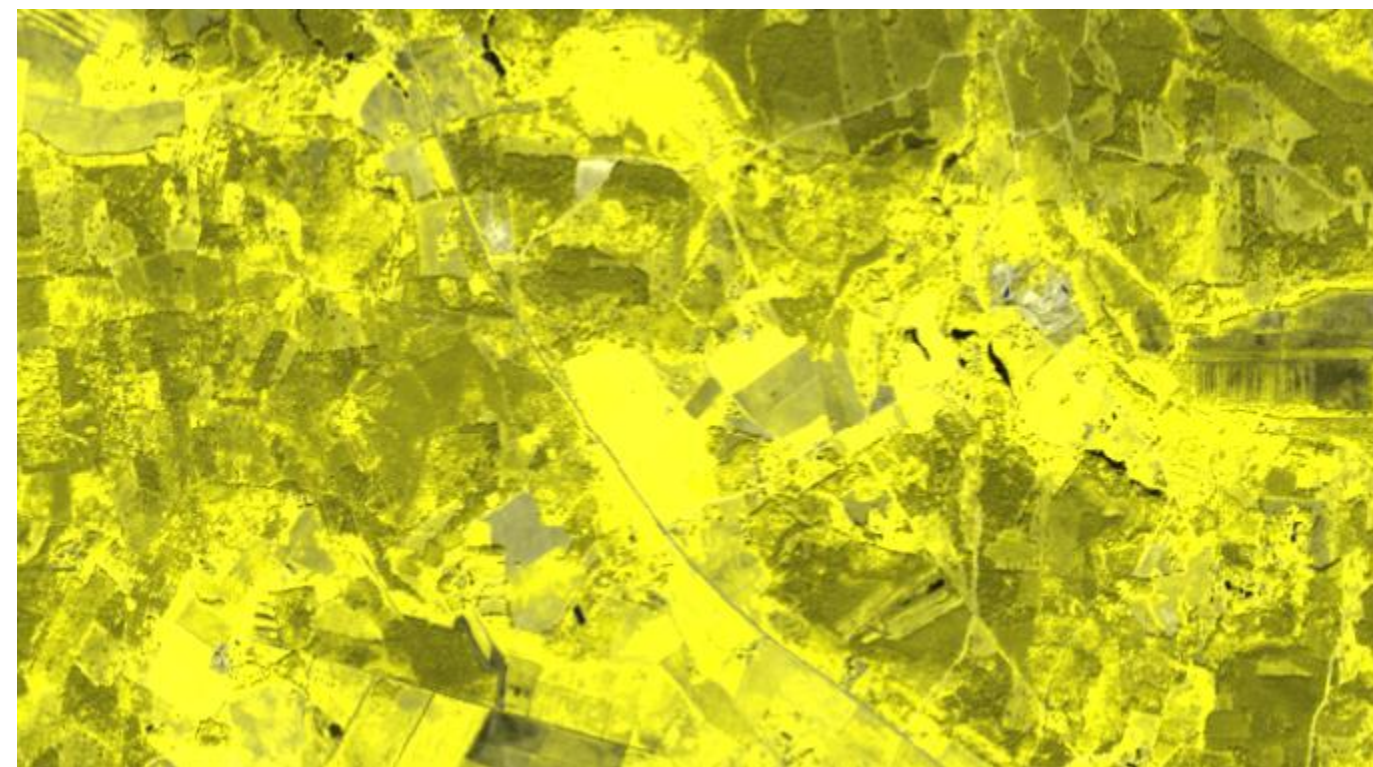
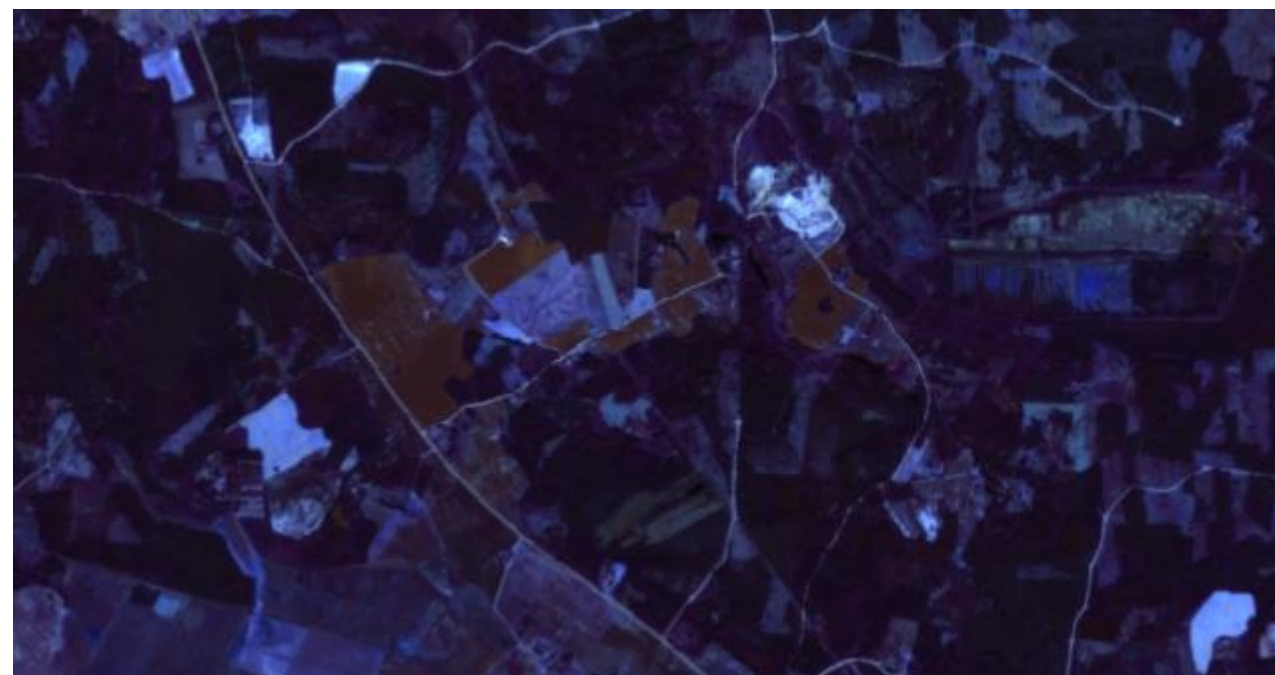
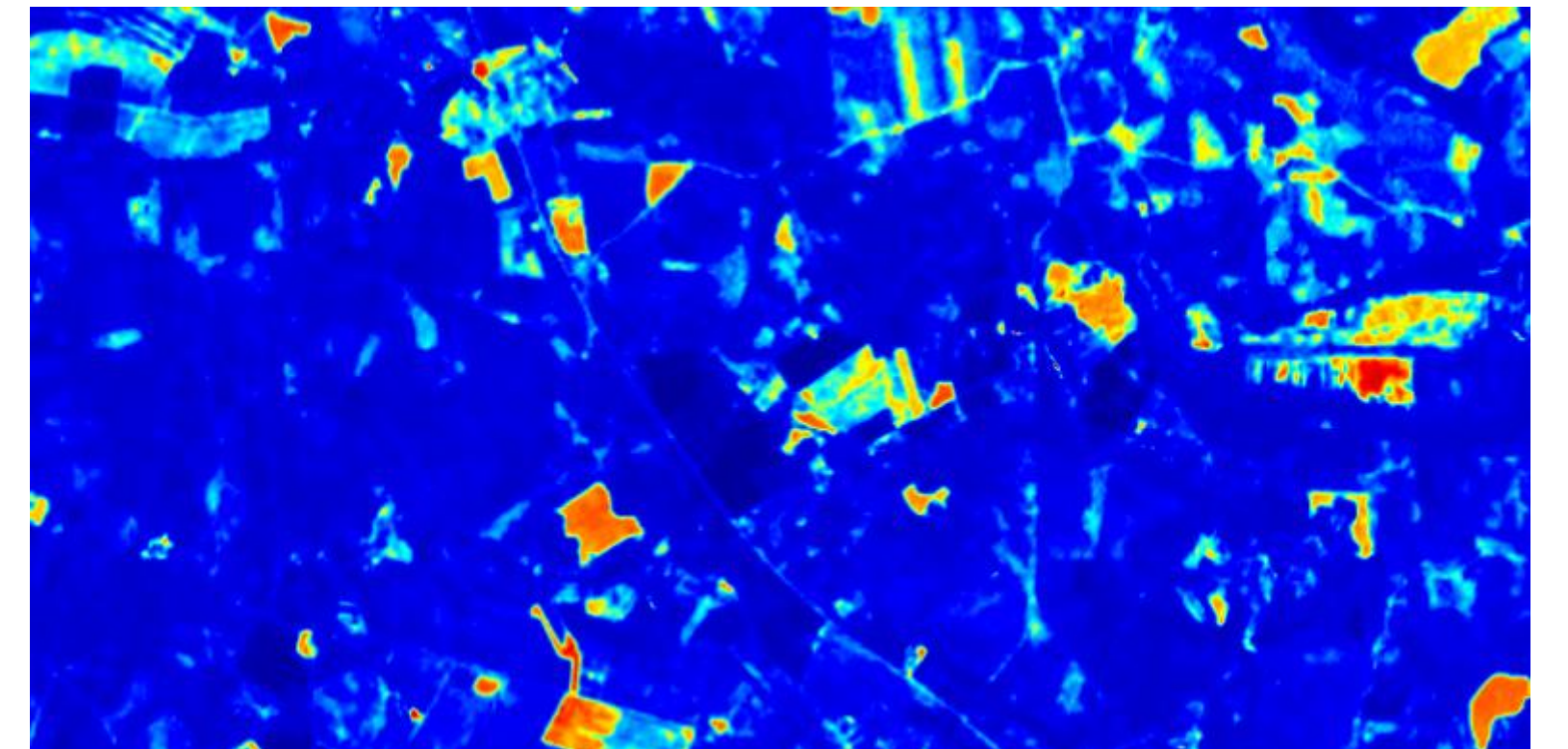


overgrown areas



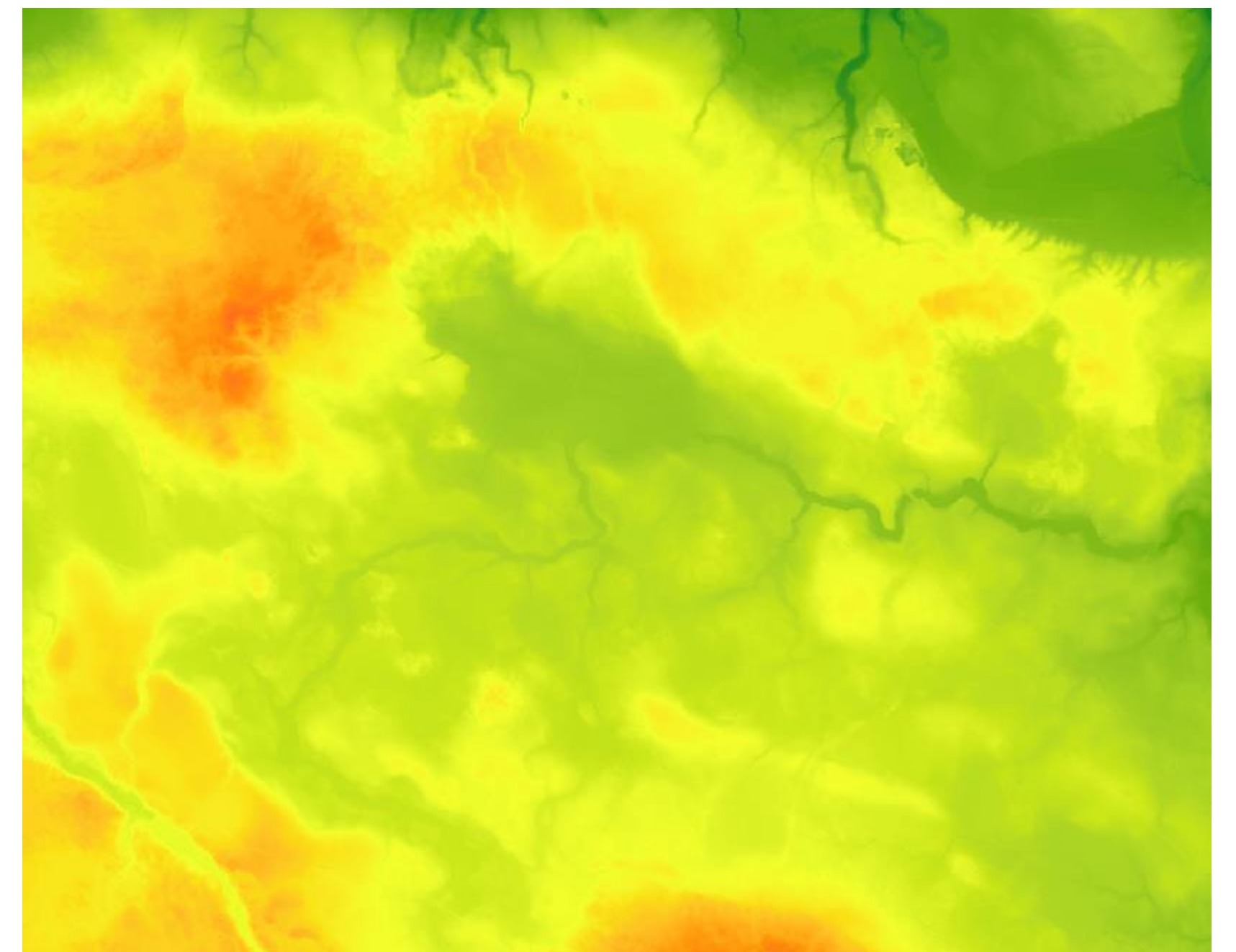
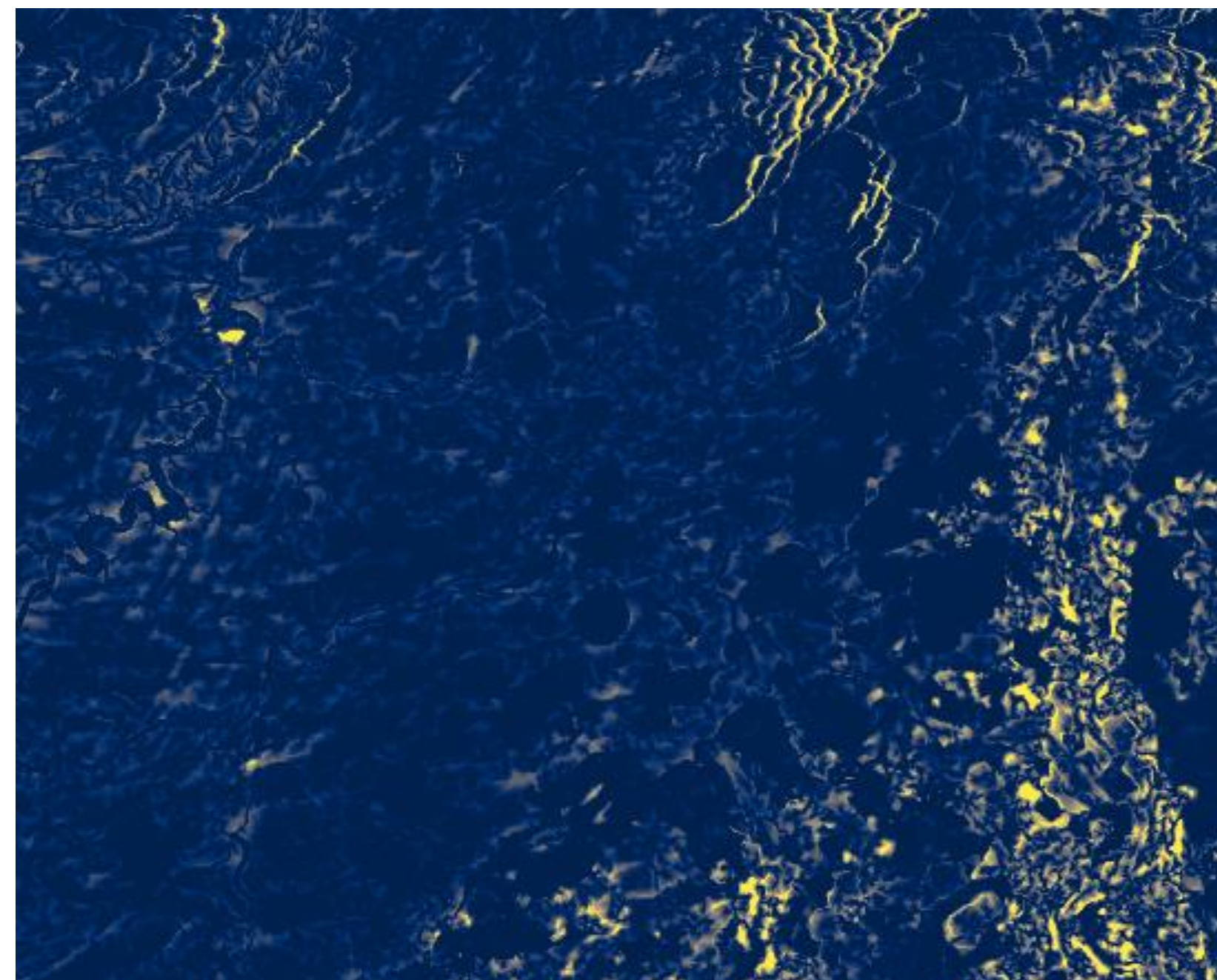
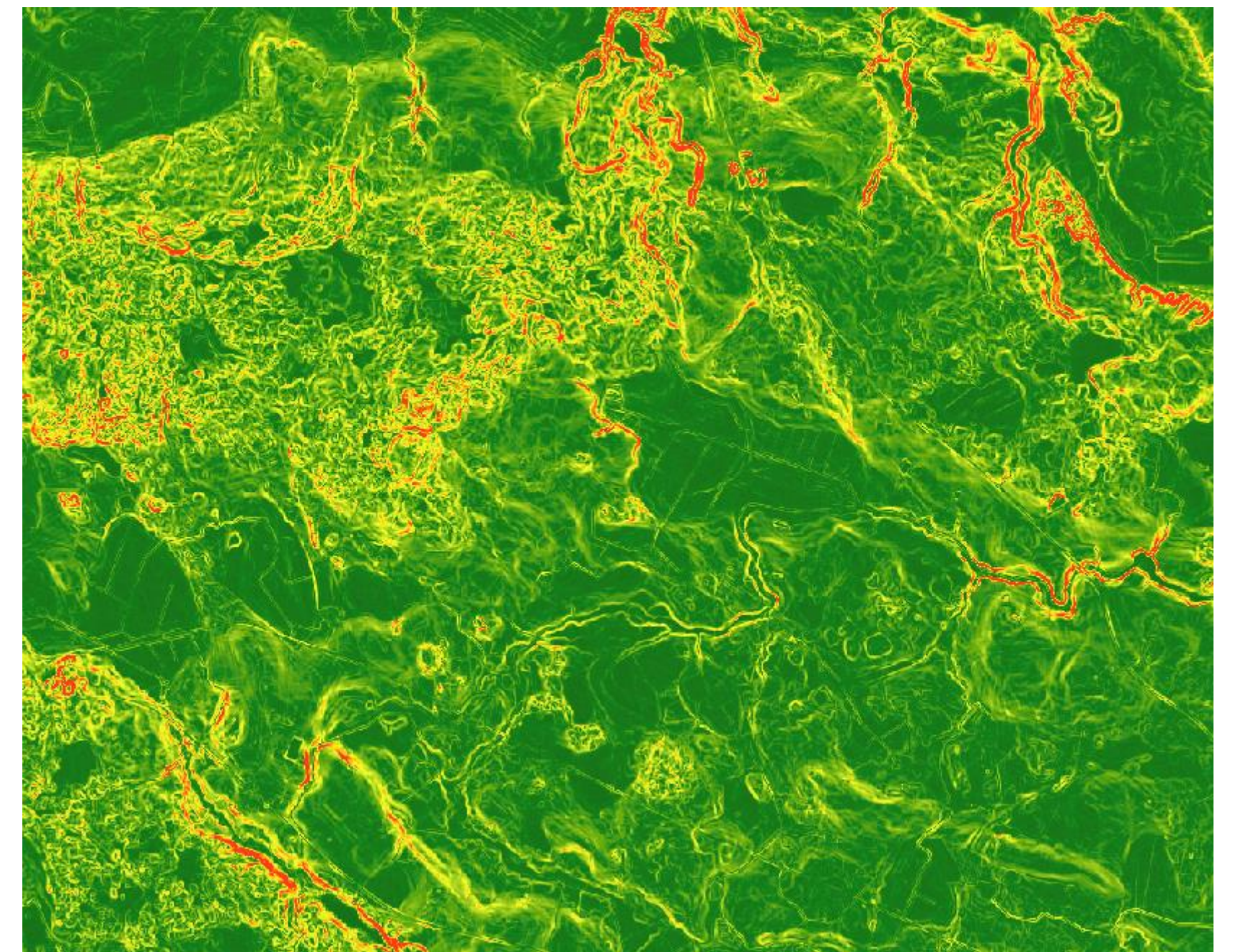
Geospatial variables

- Spectral (Sentinel-2)
 - B3 (spring; p50)
 - B4 (p50)
 - B8 (spring; p50)
 - EVI (p10; p50)
 - NDWI (p50; p90)
 - NIRv
 - kNDVI (spring; p10; p25; p75; p90)



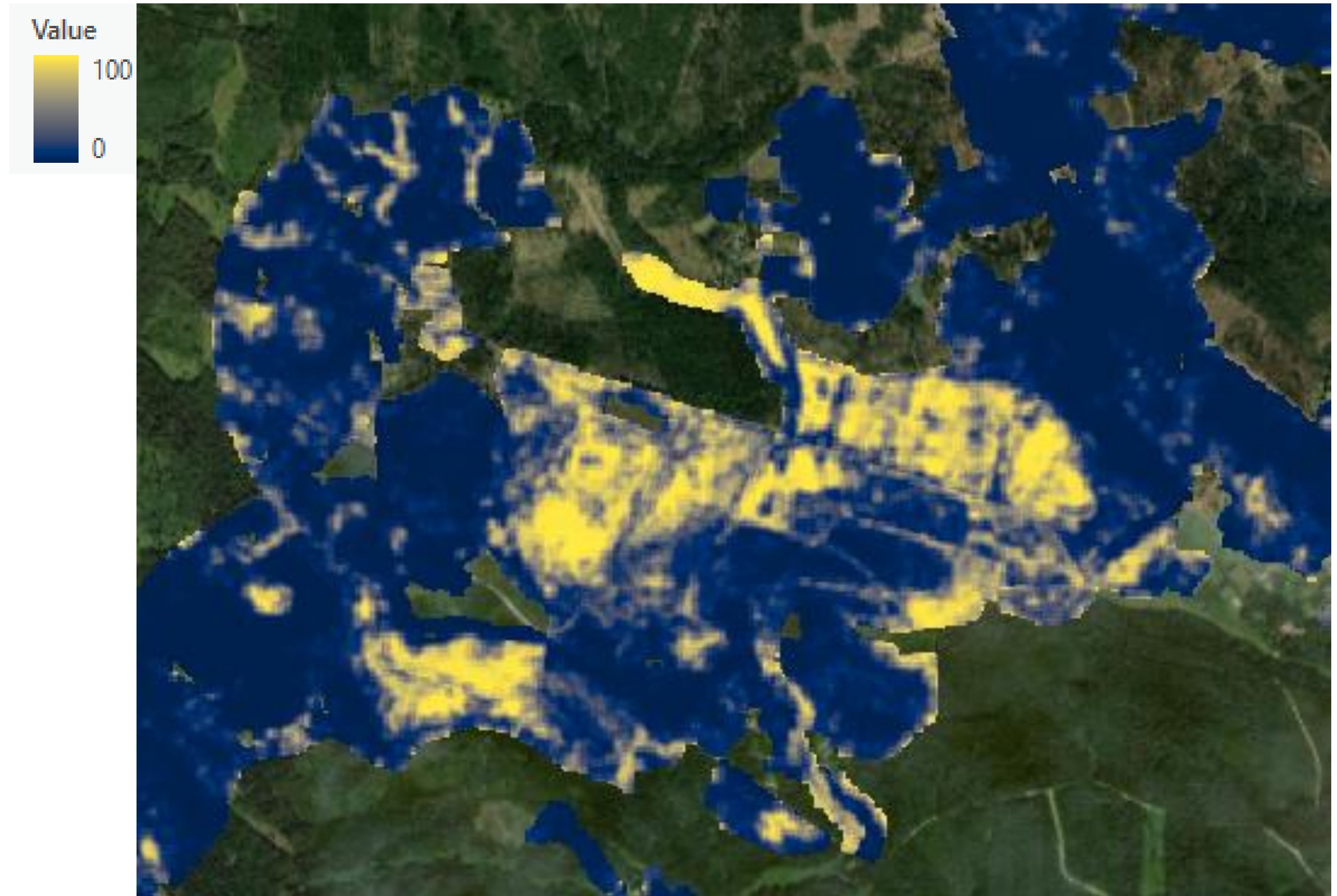
Geospatial variables

- Relief data (LiDAR)
 - DTW (10m; 30m)
 - DIS (depth in sink)
 - Slope (5m; SD)

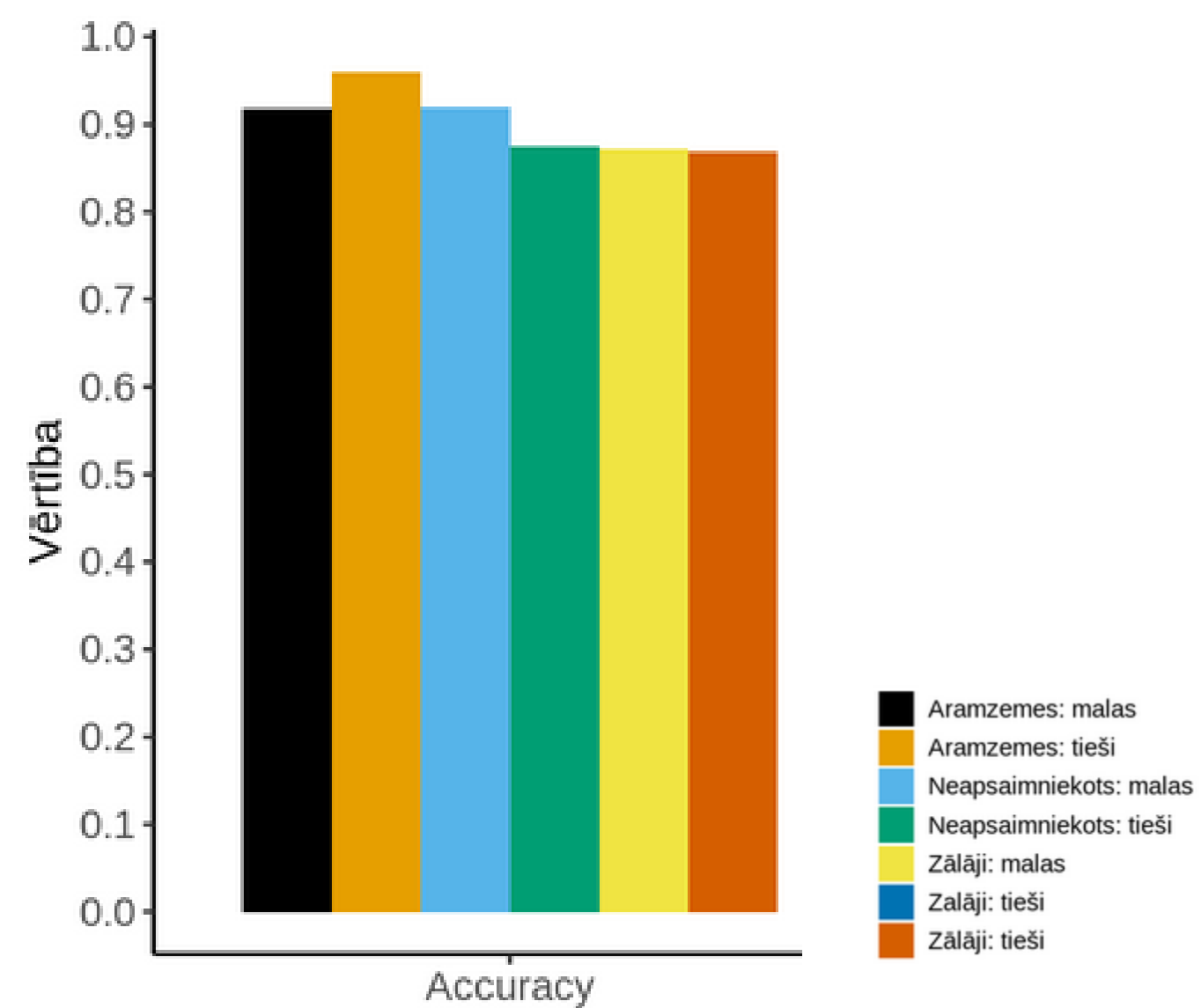


Results

Continuous probability
1-100

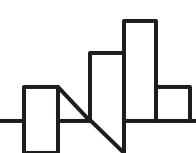
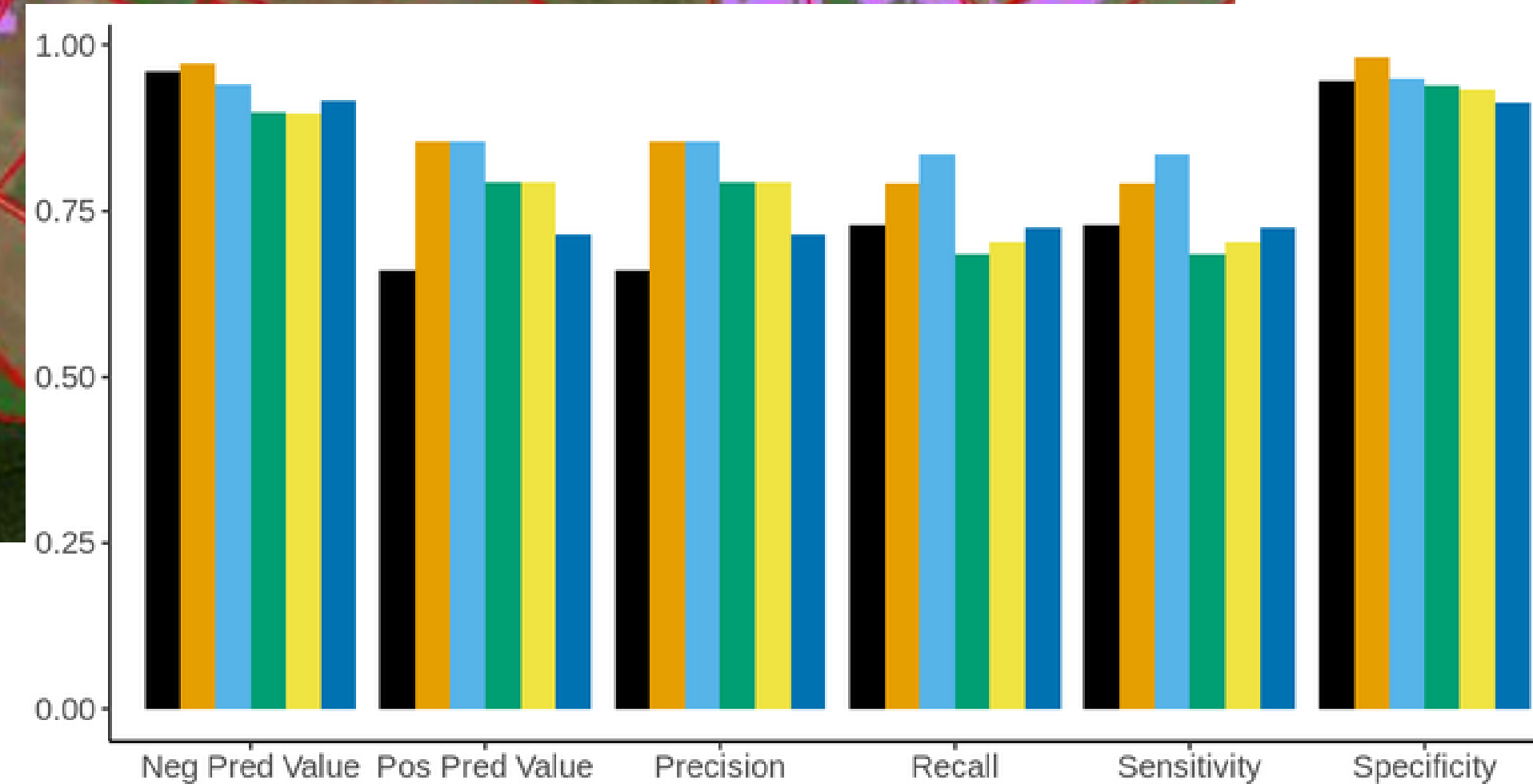
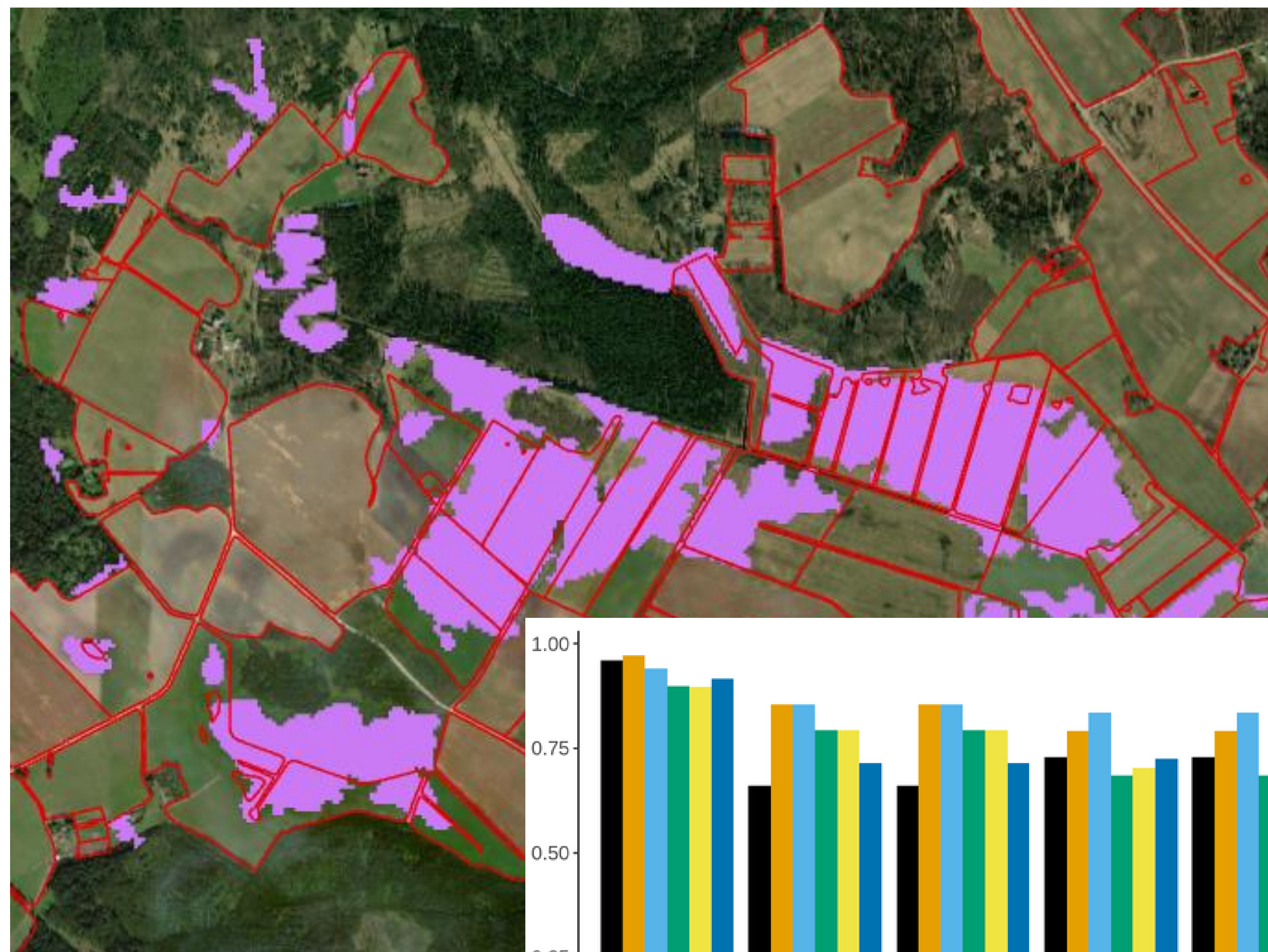


Results

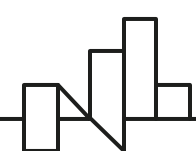
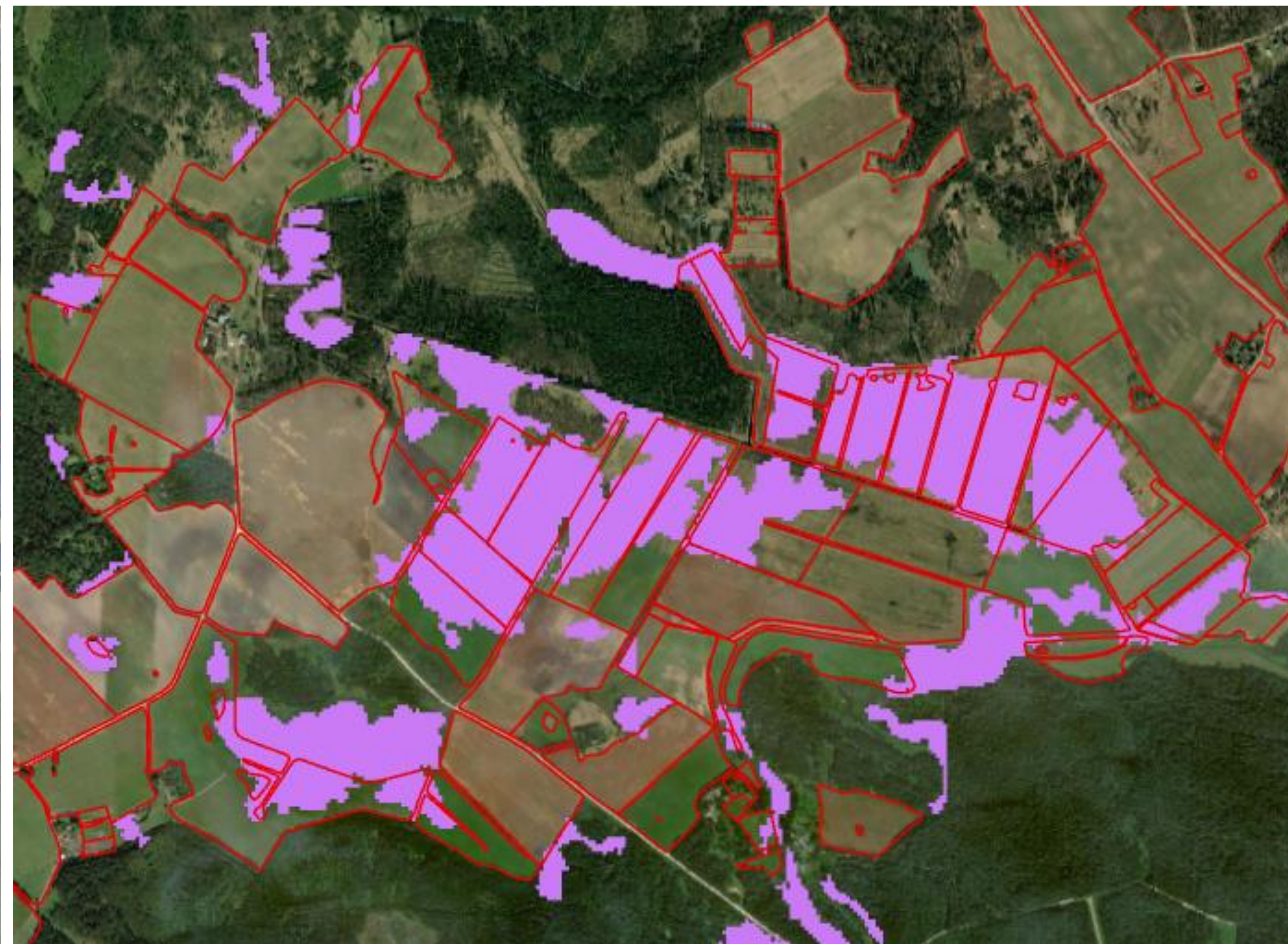
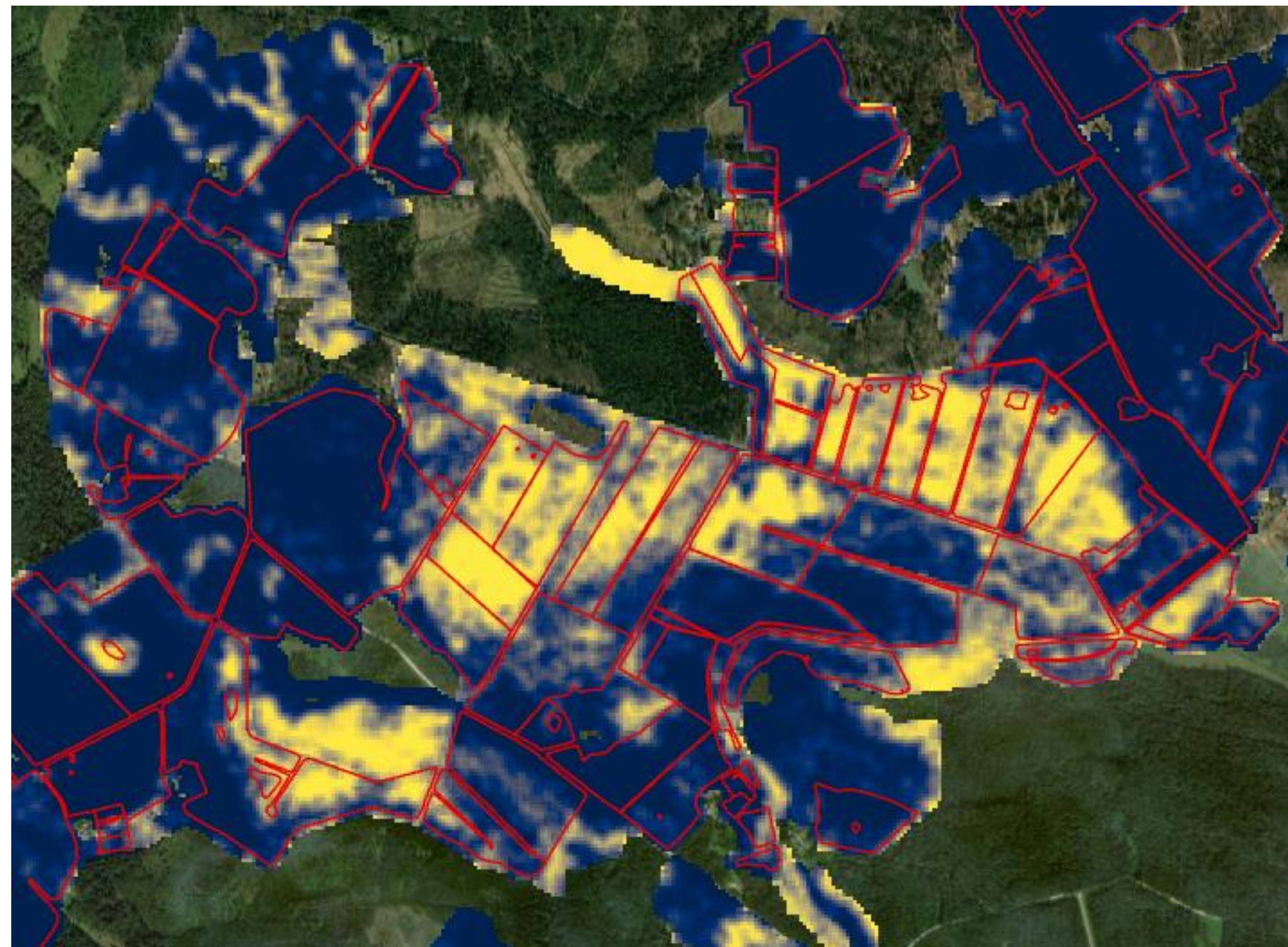


Accuracy 91.67%

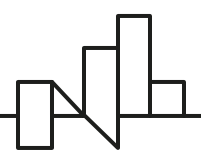
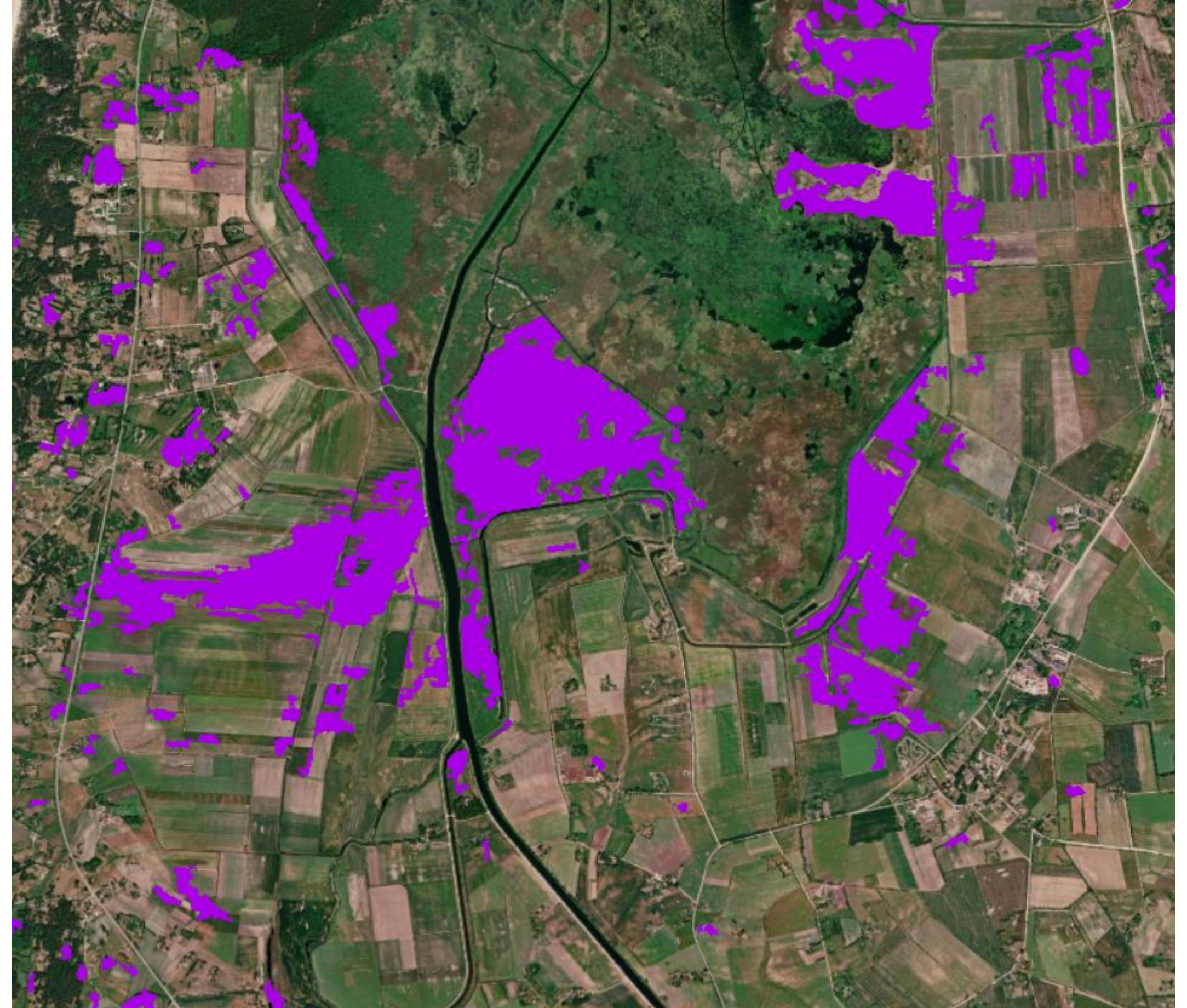
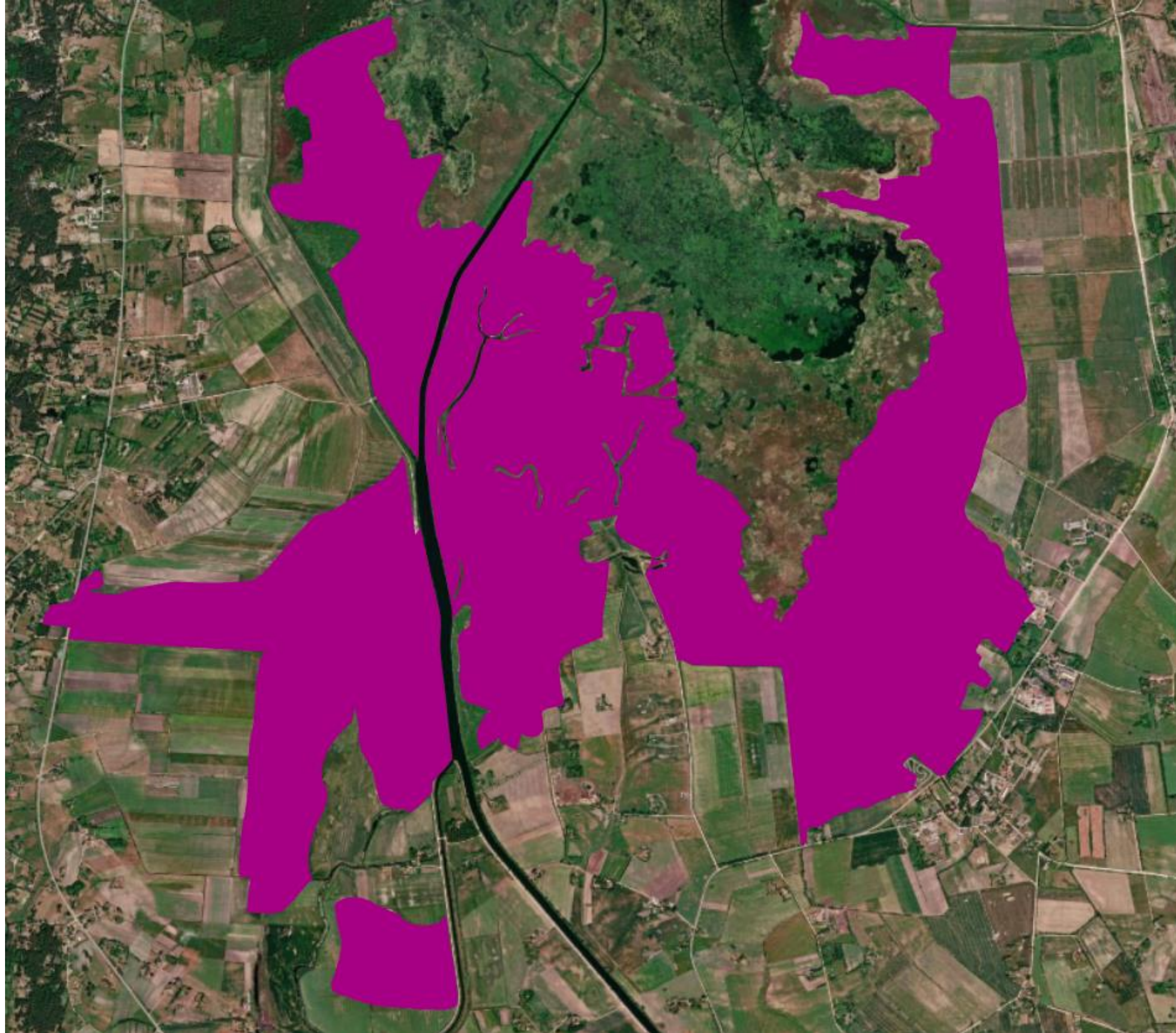
Binarizētie dati (Y / N)
1 / 0



Rezultāti



Piemēri



Thank You for Your Attention