

EXDIMUM

Processing of Satellite Images with Machine and Deep Learning

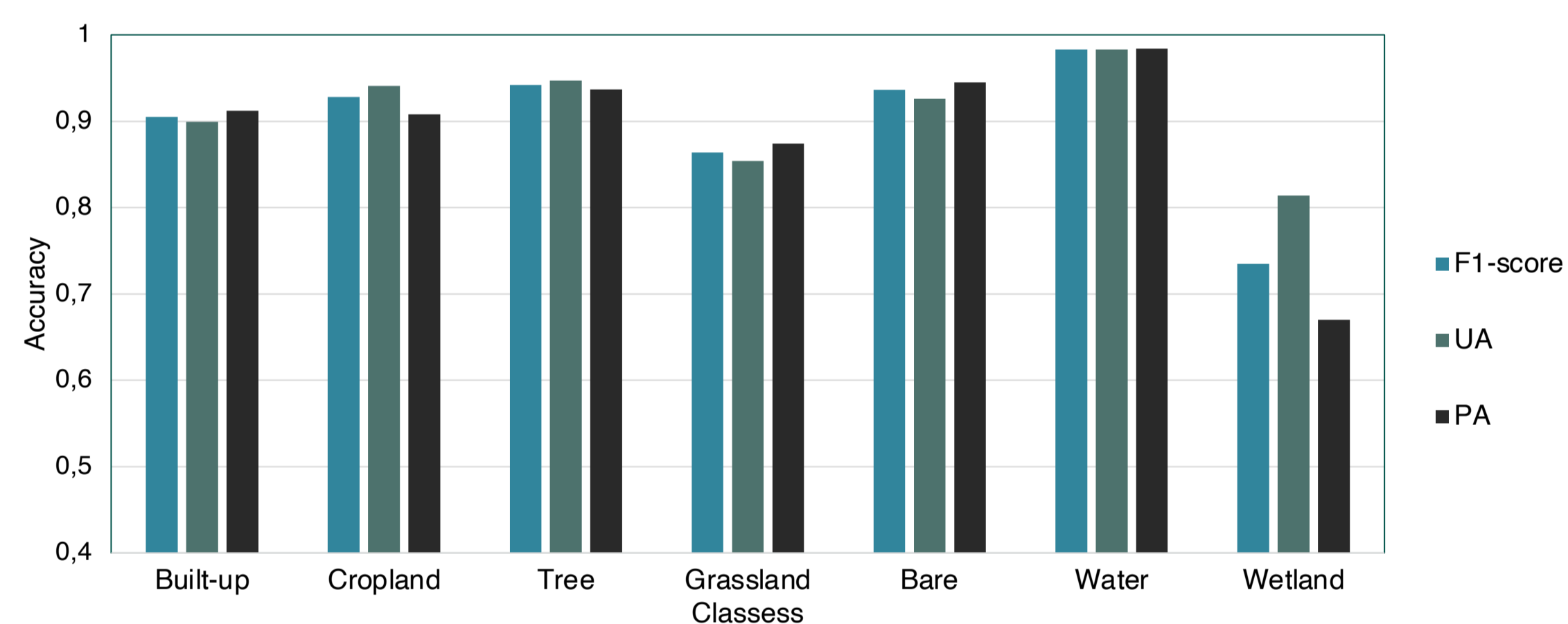
Land Cover Classification

Dataset

- Combination of time series optical and radar satellite data
- Rapideye, Sentinel-1/ -2 and Landsat-8
- Region : Goslar city and surrounding
- composite of cloud-free surface reflectance images (May-July) for 2017, 2018 and 2019
- Land cover labels from ELC-10m 2018

Model

- Random Forest
- Polygon-based Stratified random sampling
- Stack features: spectral bands, vegetation indices and polarizations
- Test: 92% OA and 90% Kappa



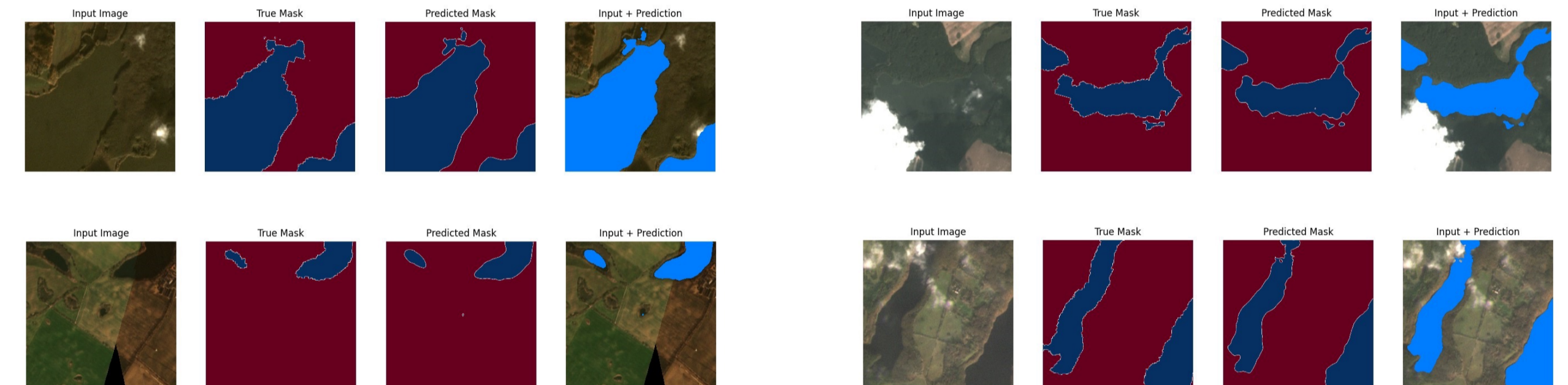
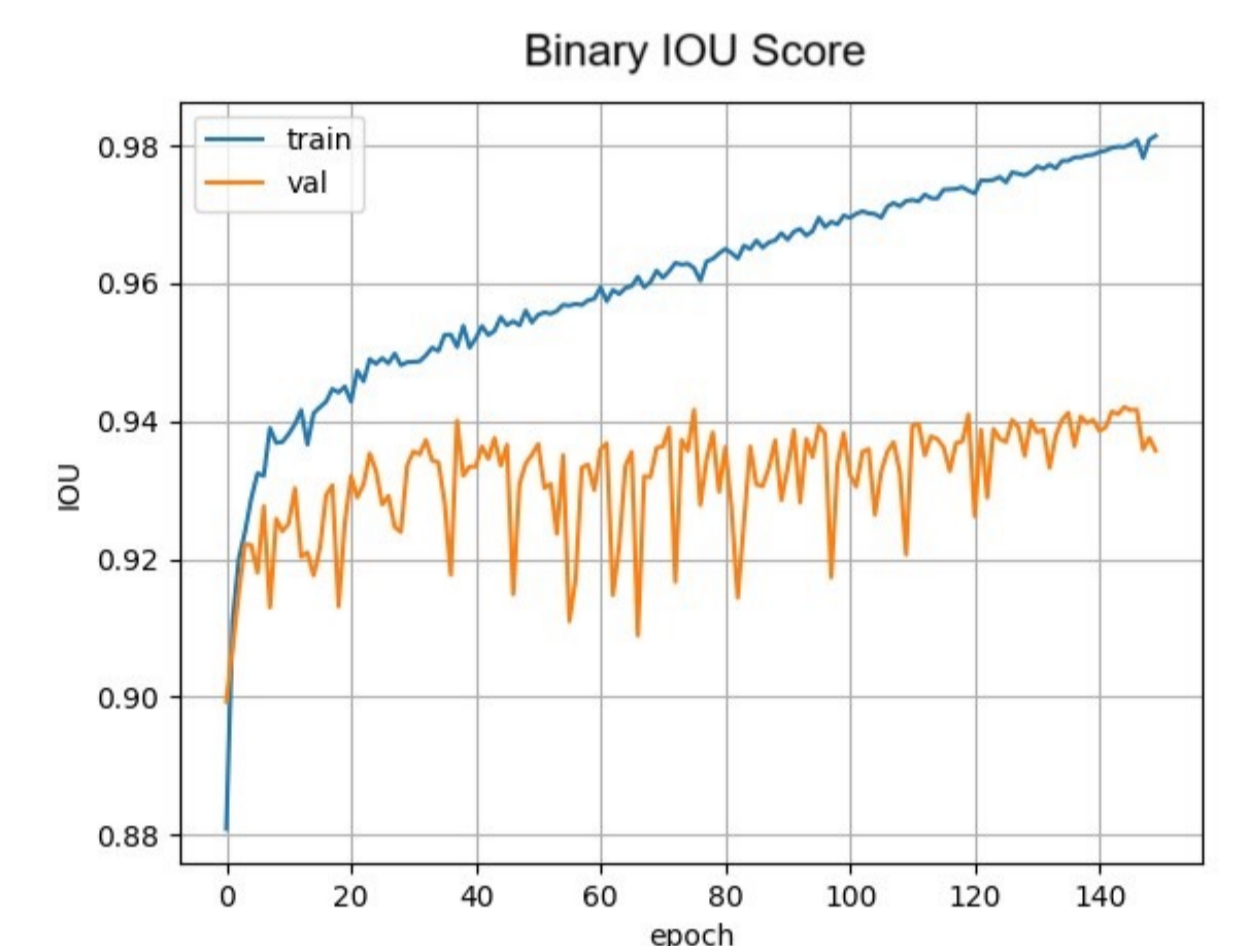
Neural Network for Water Segmentation

Dataset

- 4-channel satellites images from Planet.com (R,G,B, NIR)
- Region of Neustrelitz
- Water labels from ESA 2020 and ESA 2021 WorldCover
- Monthly raw image data from 2020 and 2021
- Patch size: 512 x 512
- Dataset size: 1332 patches

Model

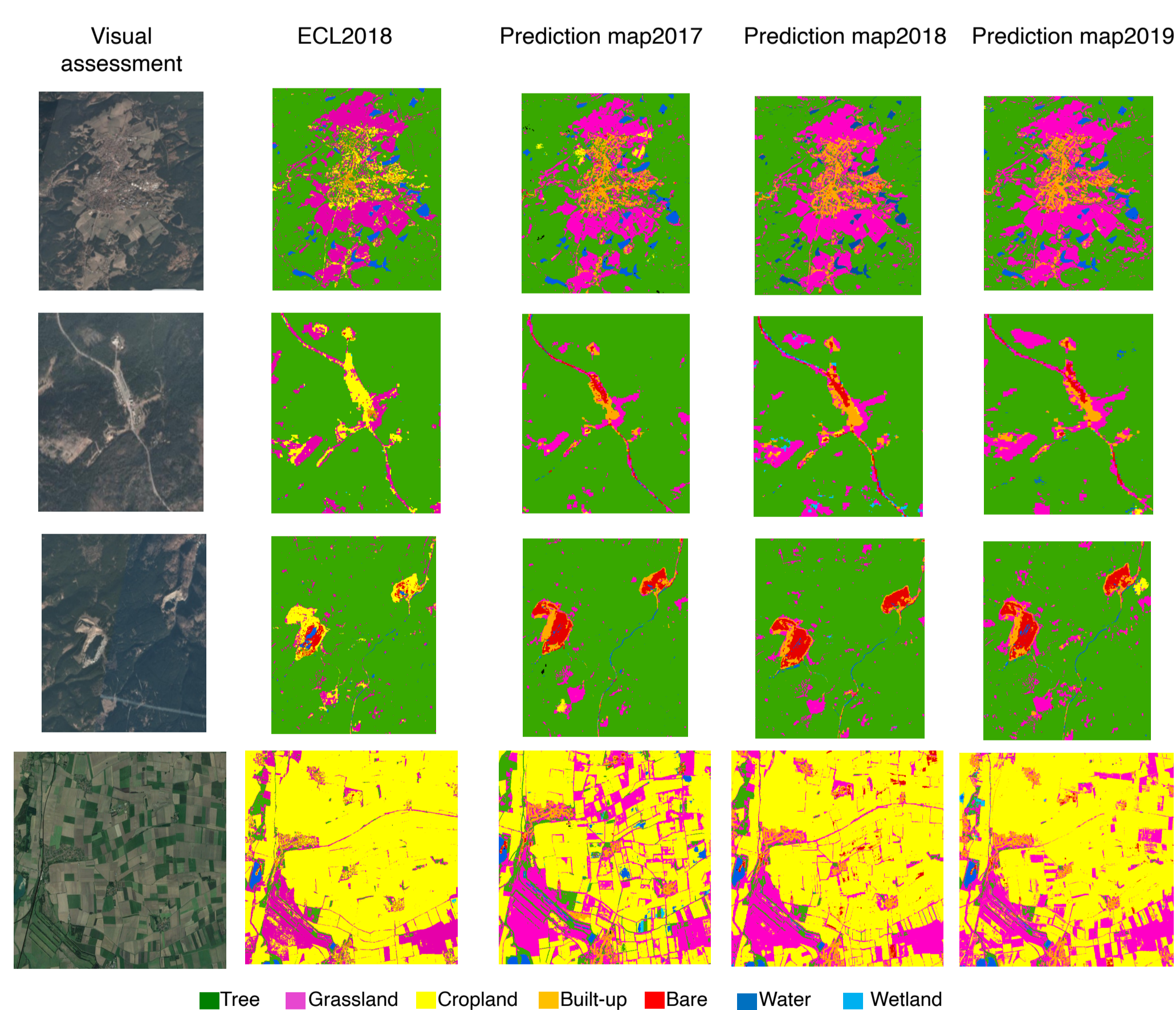
- U-Net architecture
- Invariant to color changes
- Invariant to clouds
- 94% IOU - score on validation
- Invariant to shadows from clouds
- Invariant to seasonal changes



Preliminary Results

Limitation:

- ✓ Reference map
- ✓ Cloudy area



Preliminary Results

- Time Series of the Odersee
- One picture per year (July, August)

