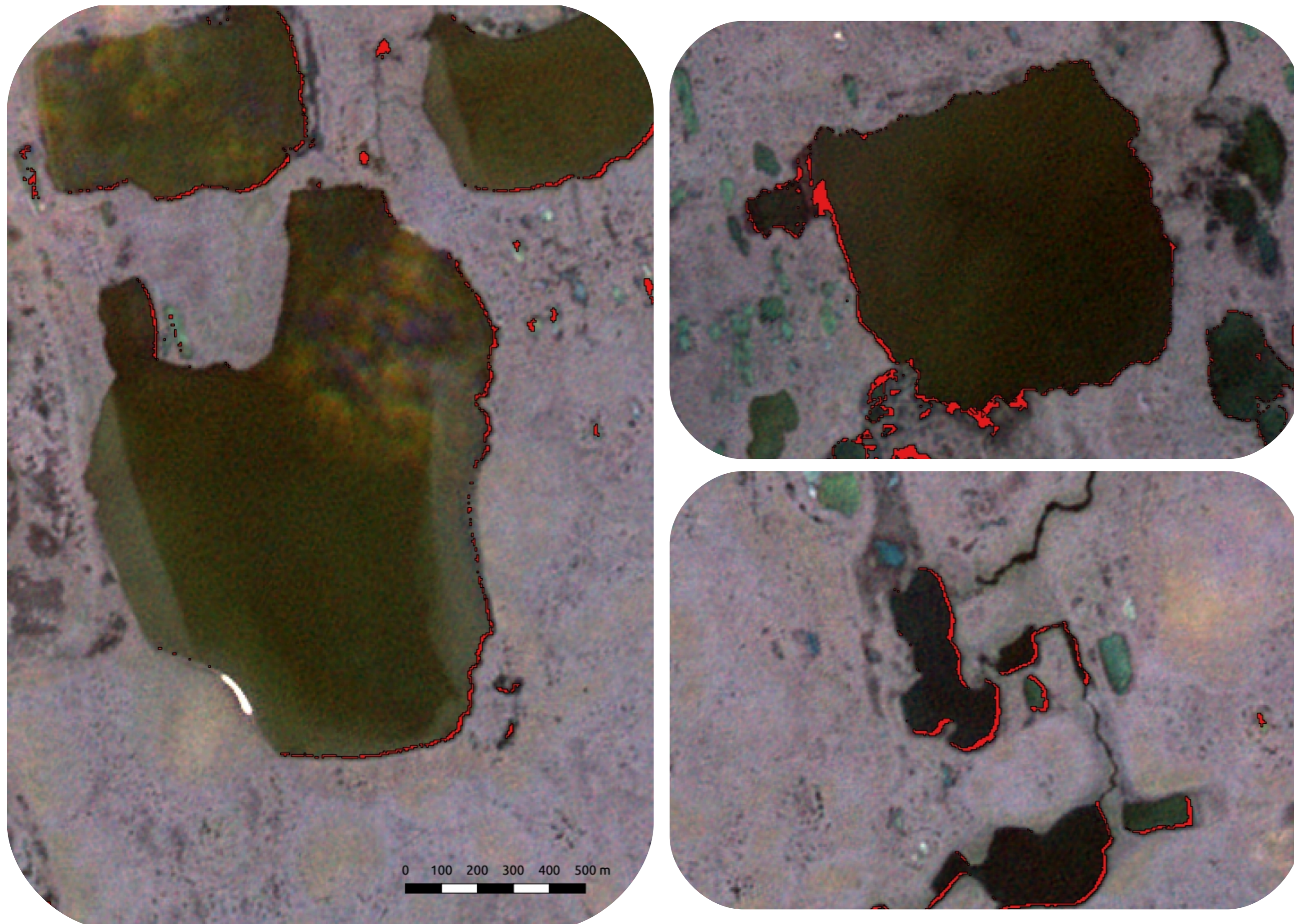
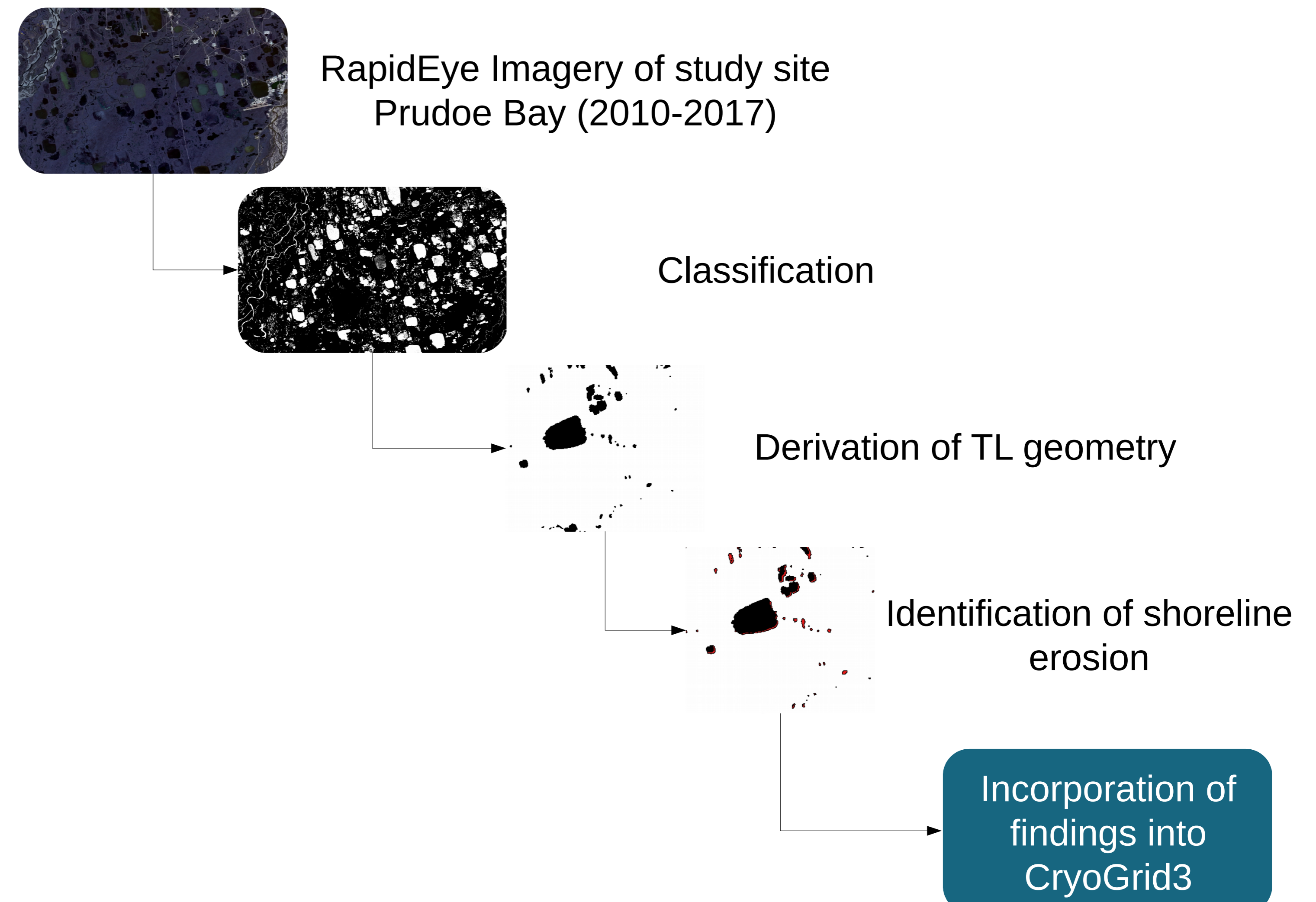


Identifying Erosional Hot Spots around Thermokarst Lakes using RapidEye Imagery

Motivation

- Abundant and dynamic periglacial landform
- Formed by settlement of the ground due to excess ice and permafrost thawing
- 25 to 40 % of the Arctic's land surface are covered by Thermokarst Lakes with their number steadily growing

Due to their lateral thermal and mechanical erosion they shape their surrounding topography and hydrological network and can affect anthropogenic infrastructure



Results

Subsampled lakes show...

- Net Shoreline Movement from -7 to -10 m
- Southeastern part of shoreline prone to erosion or
- Regular expansion

But...

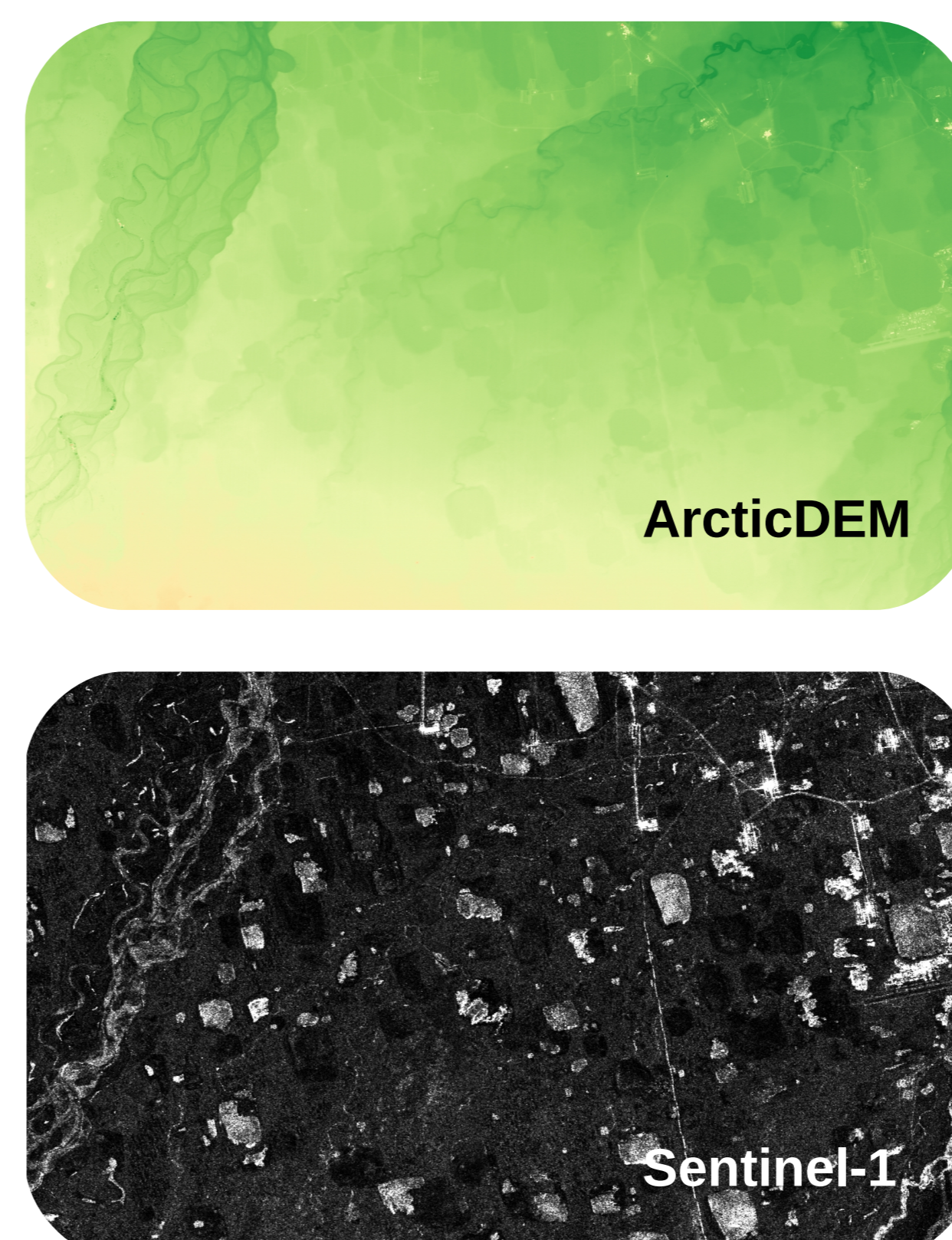
- Spatial pattern not dominant in the Prudhoe Bay area: some lakes even show no change at all
- Detailed Quantification limited by spatial resolution
- Estimation insufficient along drainage channels, gullies

Conclusions

- ✓ Identification in remote and restricted areas
- ✓ Fast and cost effective
- ✗ Quantification of shoreline erosion rates
- ✗ Capture of complexity of erosion

Improve Analysis by using datasets with a spatial resolution on a sub-meter scale (UAV, field data, Lidar) and a classification method that also considers complex erosional processes (gully formation etc)

Outlook



Identification of driving factors

- (Micro)-Topography
- Lake size
- Lake ice type
- Vegetation
- Soil
- Seasonal changes in meteorological conditions