

Early detection and high resolution monitoring of terrain disturbance



Identifying instability,
before it gets to this

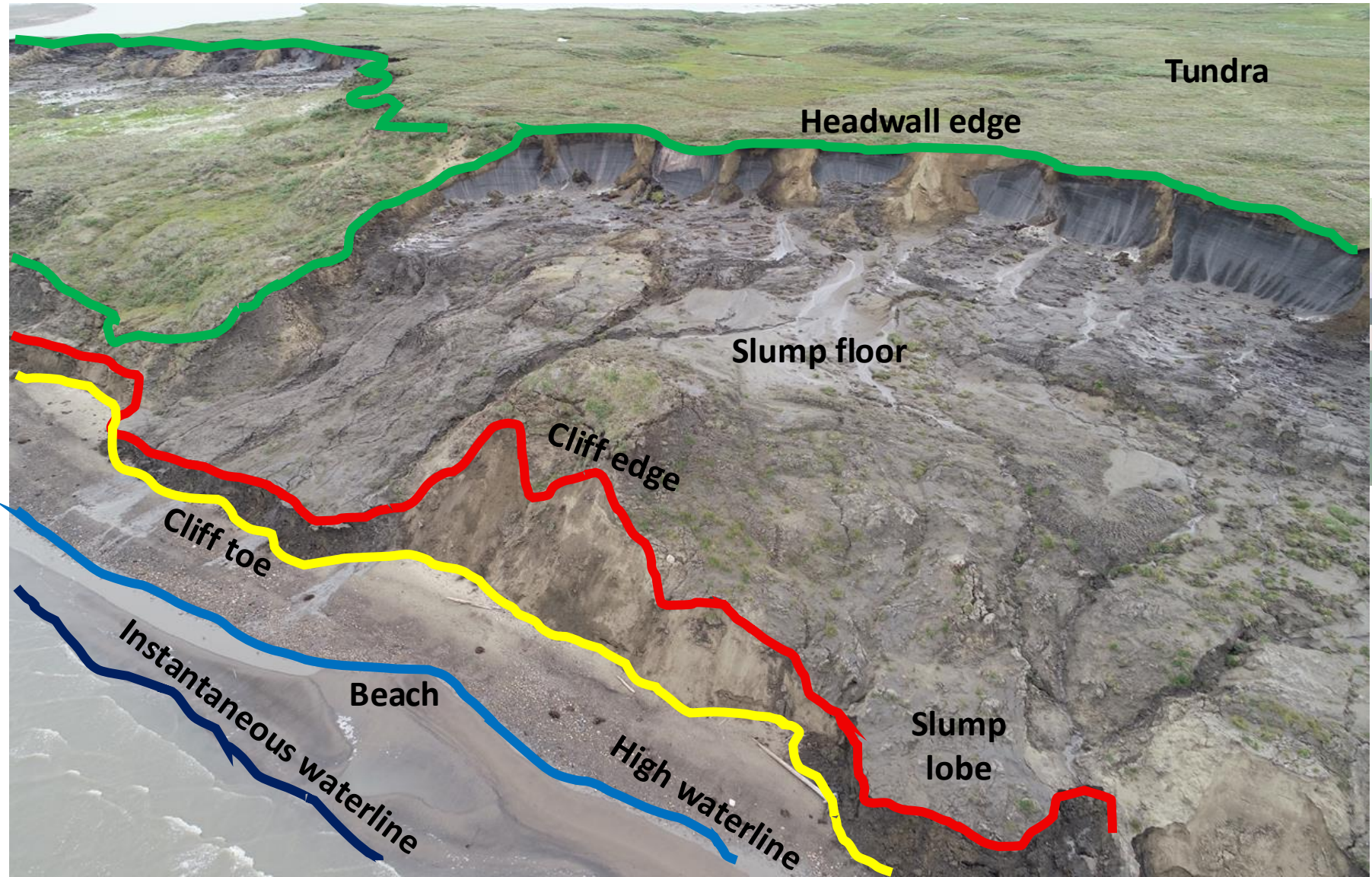
Permafrost coastal erosion

1. Very high resolution RS - UAV-SfM data collection strategies for planimetric and volumetric measurements
2. UAV-SfM and geographic object-based image analysis for multi-temporal volumetric erosion
3. Multiscale object-based classification and feature extraction along Arctic coasts
4. Towards broad-scale Arctic multi coastline proxy delineation based on object-based image classifications



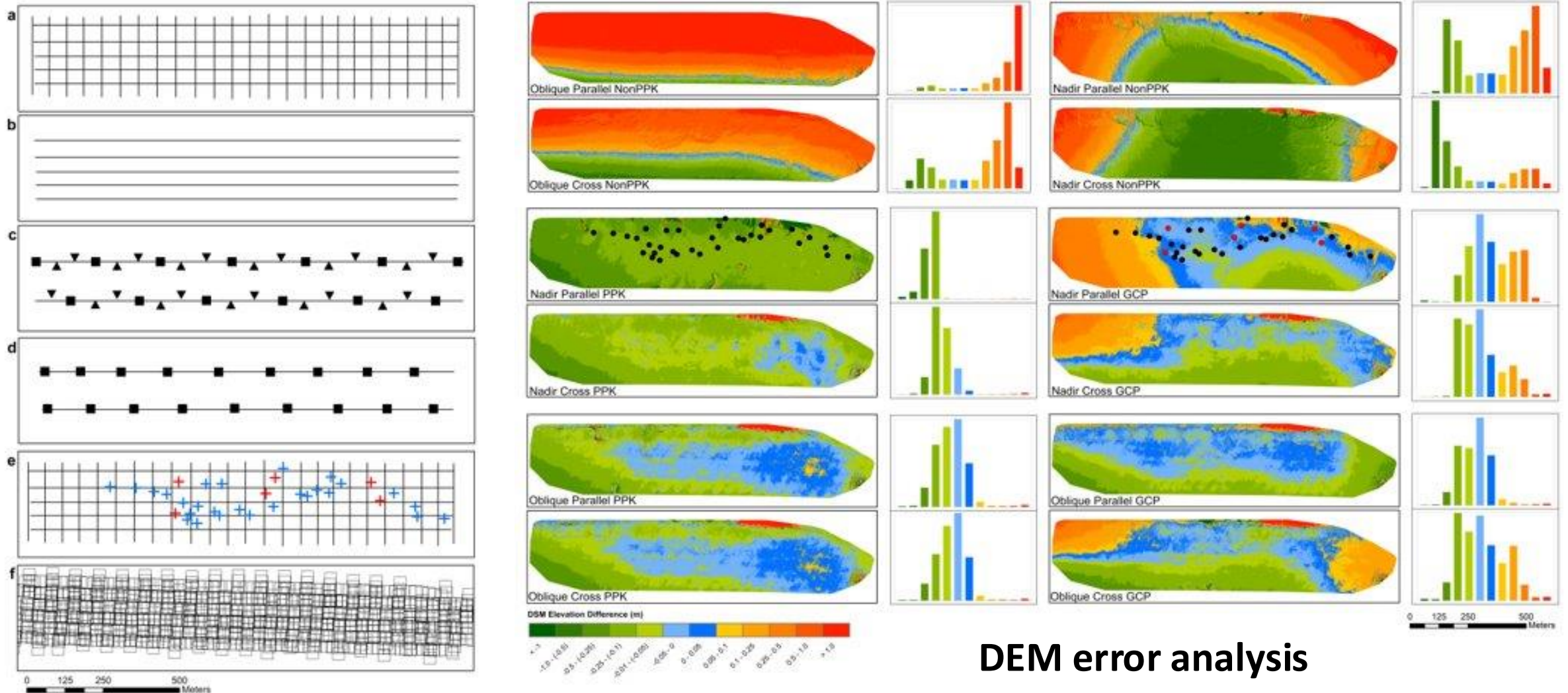
Andrew Clark





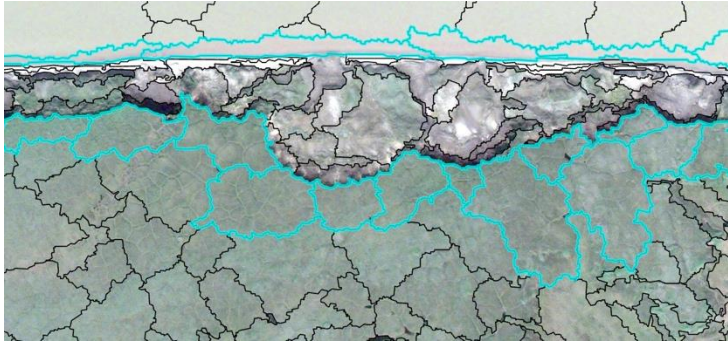
Permafrost coastlines can be complex environments

What is the most effect way to collect and process UAV data?

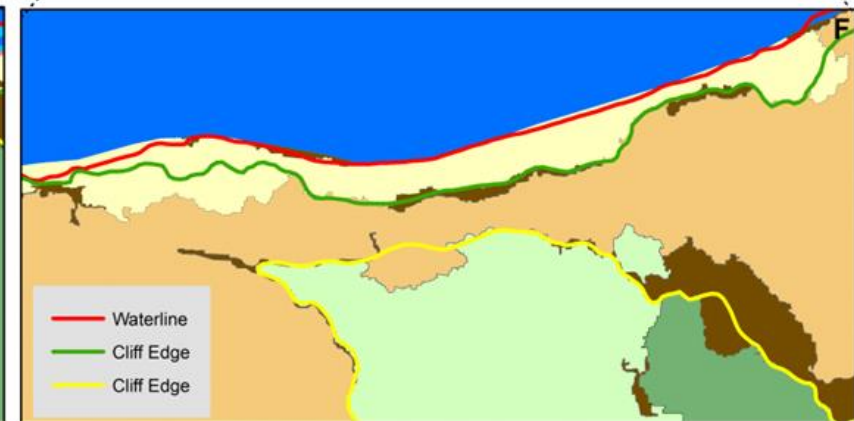
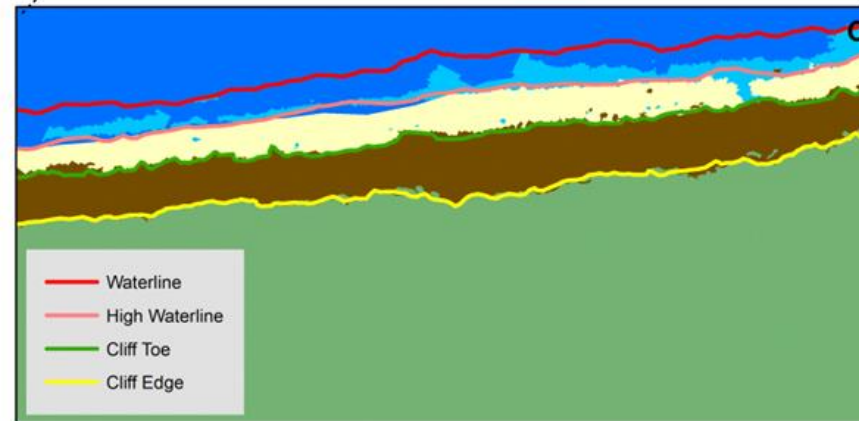
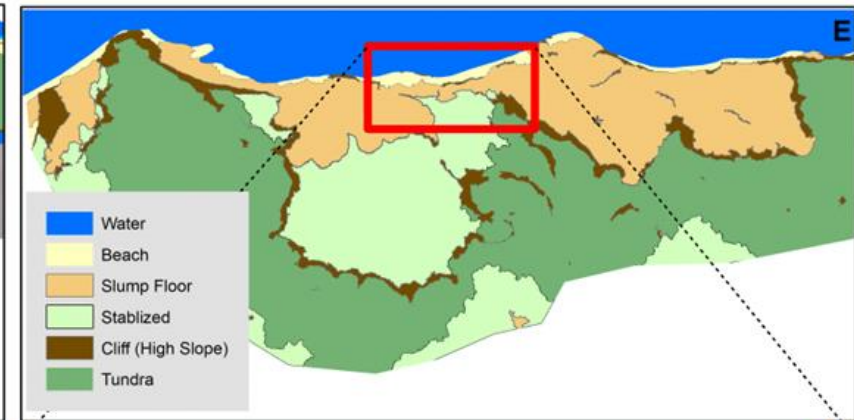
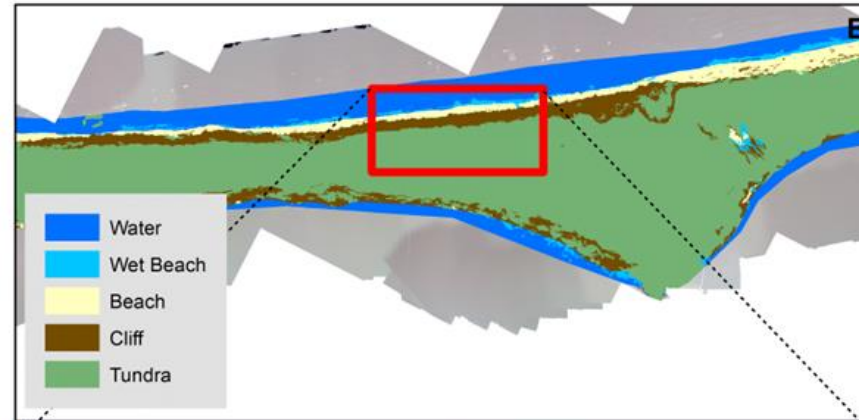
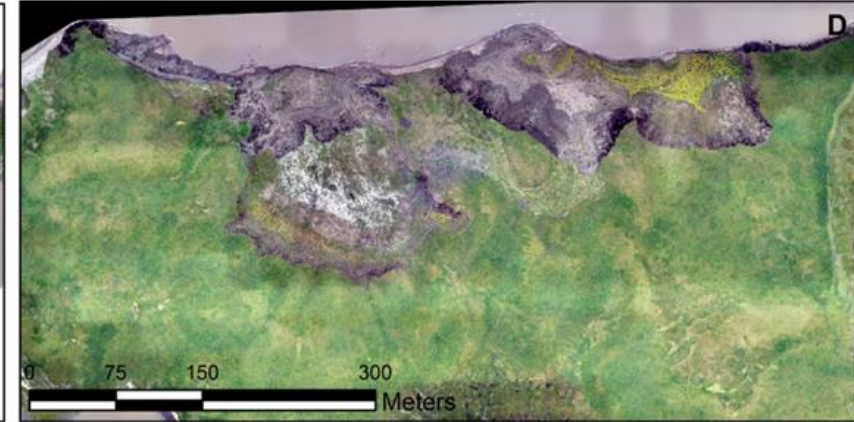
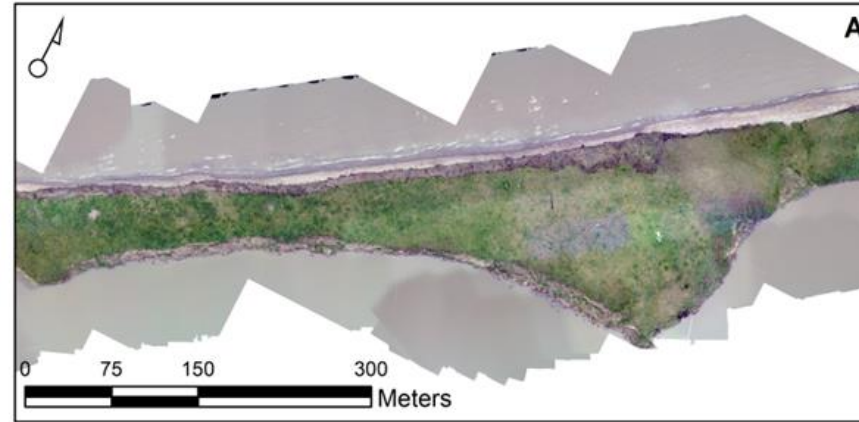


DEM error analysis

High resolution object-based image analysis



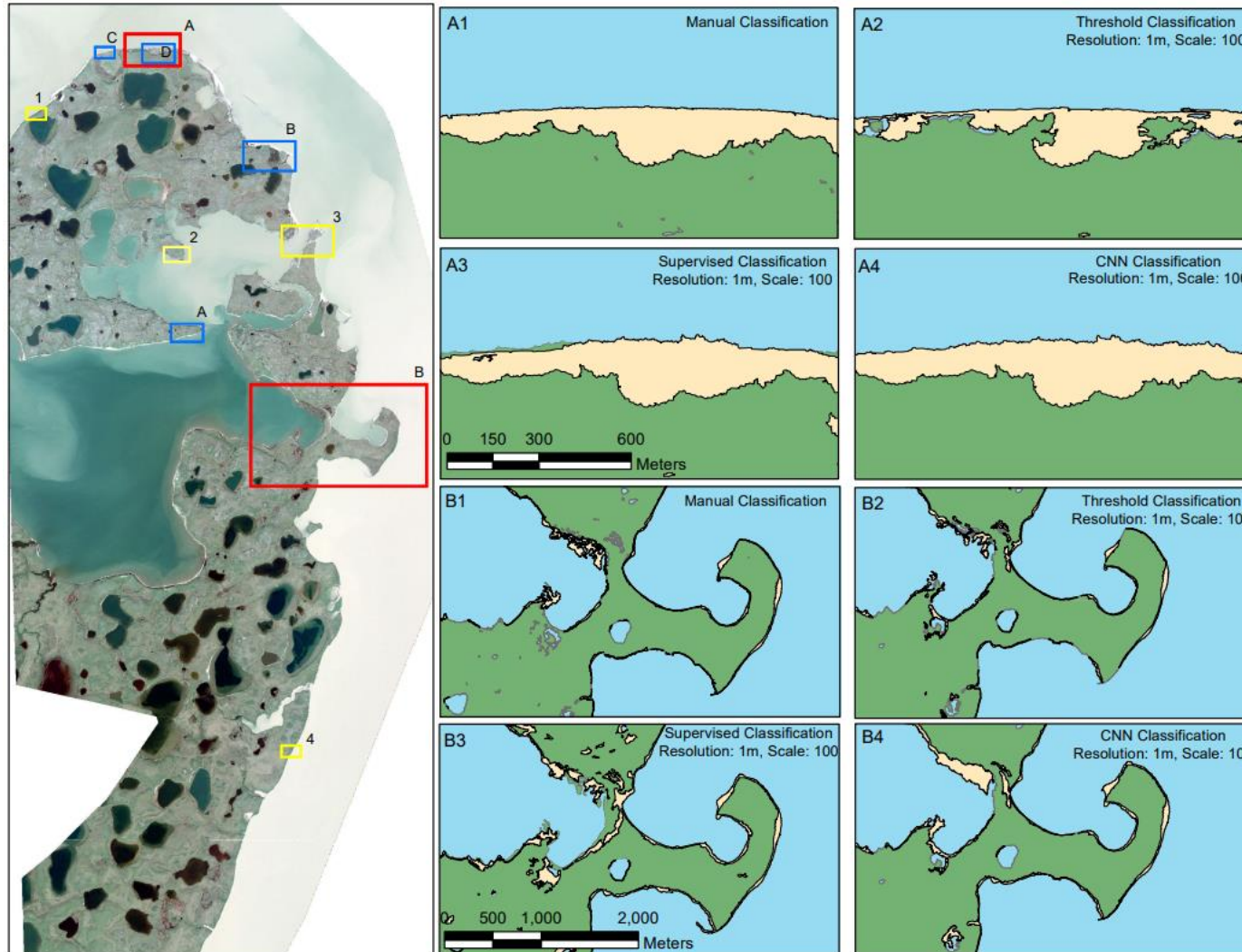
- Turning pixels into objects, with attributes
- Increasing classification accuracy
- Partially automating the process

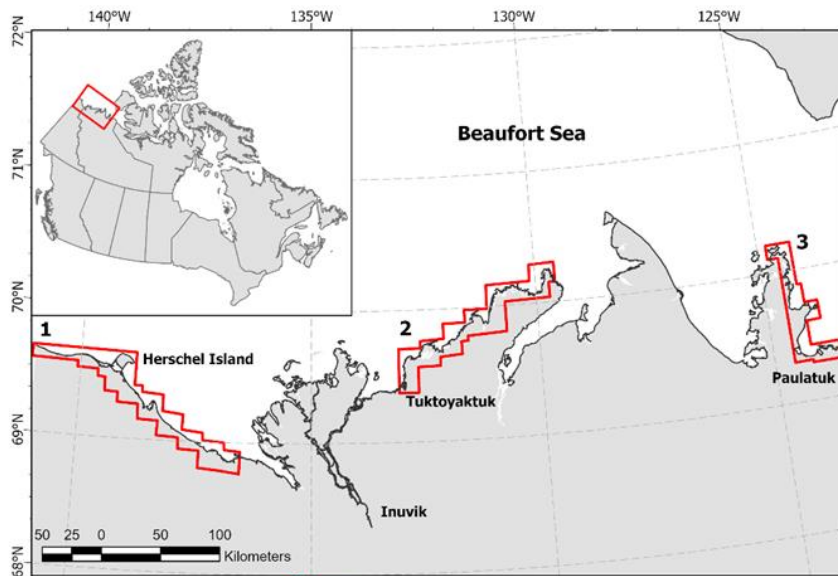


What is the best scale to do this at in different situations?

Determining what will work where and how well it works

Developing analysis efficiencies

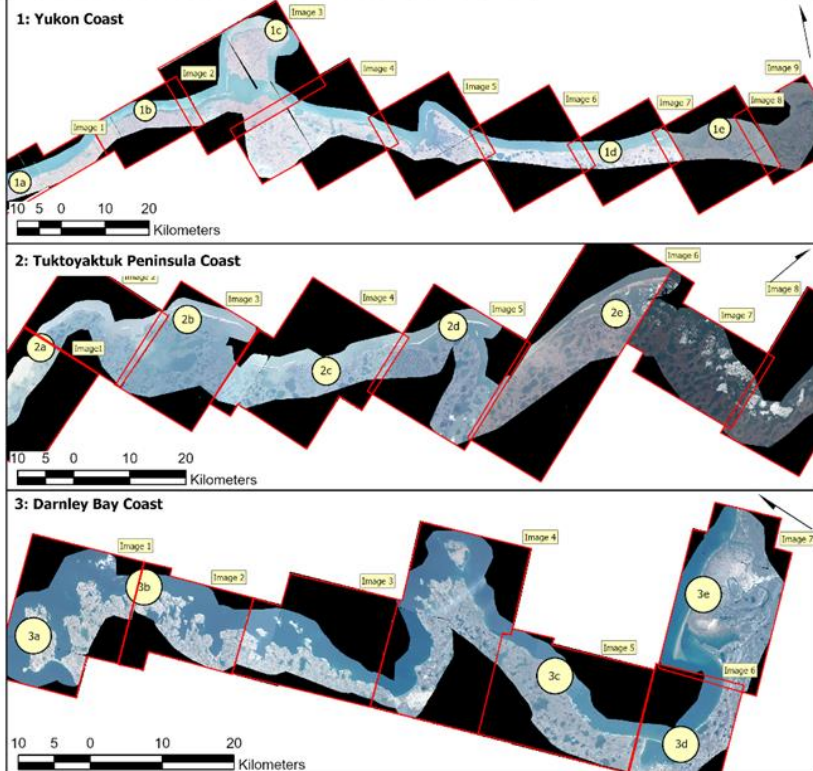




Implementation on a large scale

Assess accuracy against manually delineated tundra and waterlines and validation points and across varying coastal types

Working up processes to monitor entire coastlines

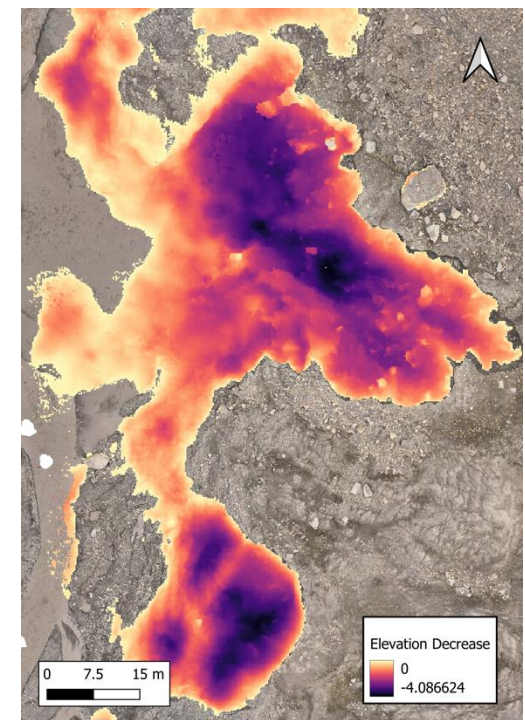
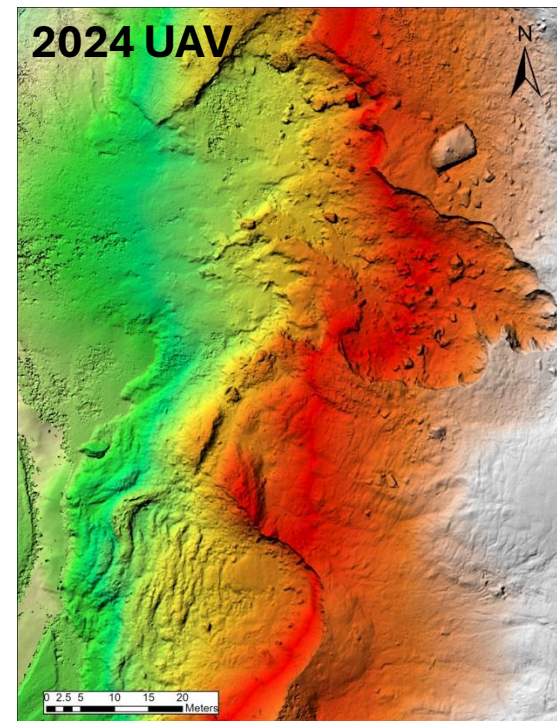
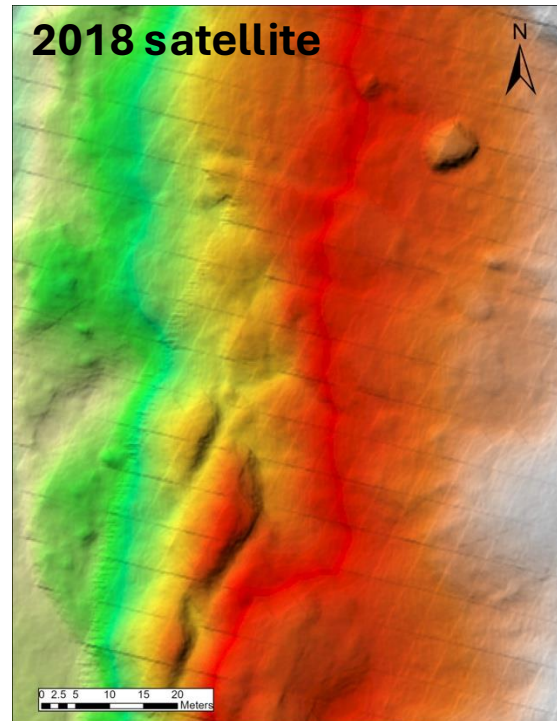


Bringing it to different environments

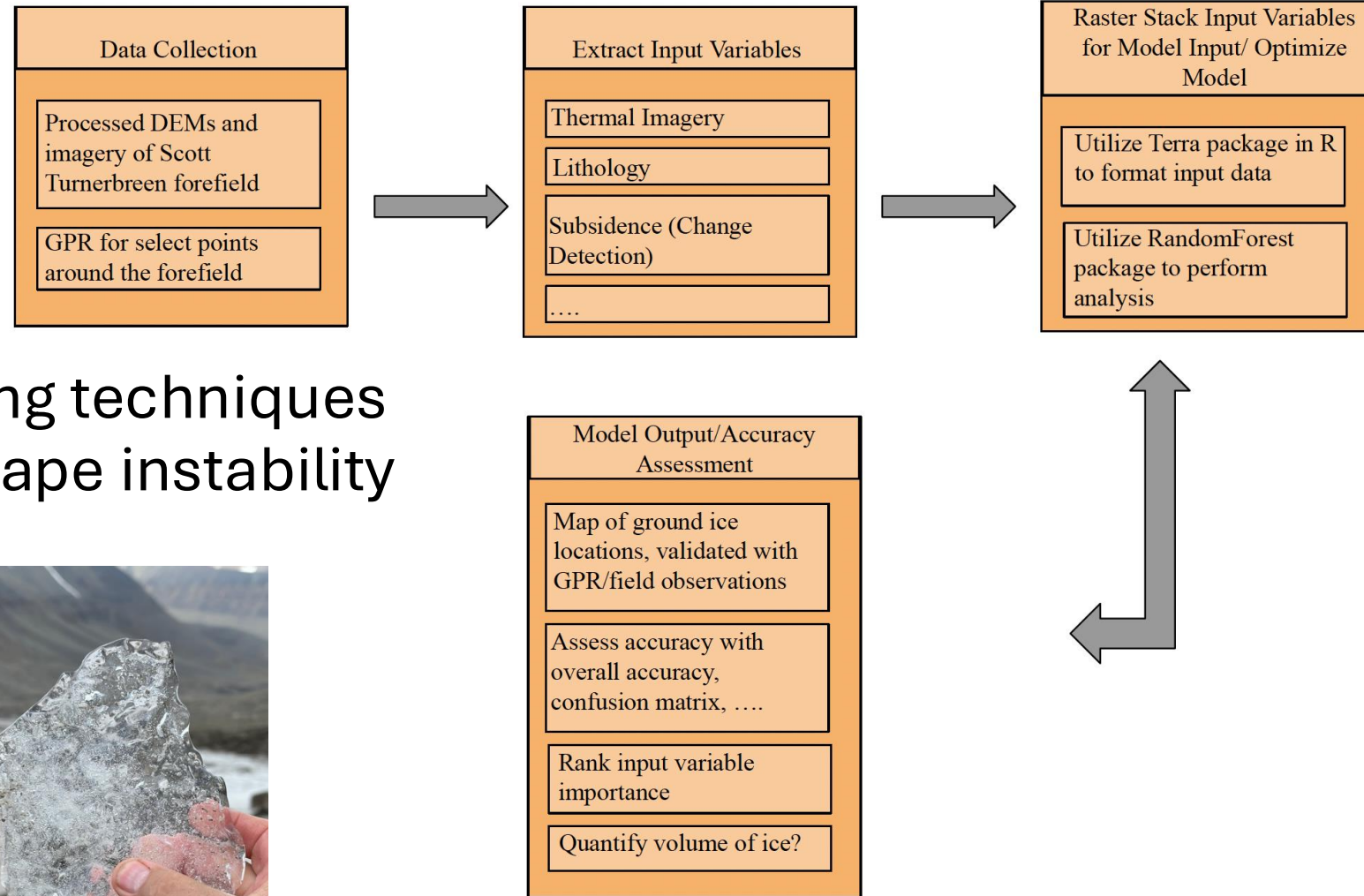
Use of high resolution remote sensing to quantify landscape change in the paraglacial/periglacial environment



Liam Carson



Taking it to the next level



Developing machine learning techniques for predicting future landscape instability



Lucas Fuertes



Bringing it all together

- Collaboration
- Cross fertilization
- Providing early career researchers with important experience

