

RPAS and Mapping

Fieldwork Process and Analysis

We capture pictures of the sites with drones

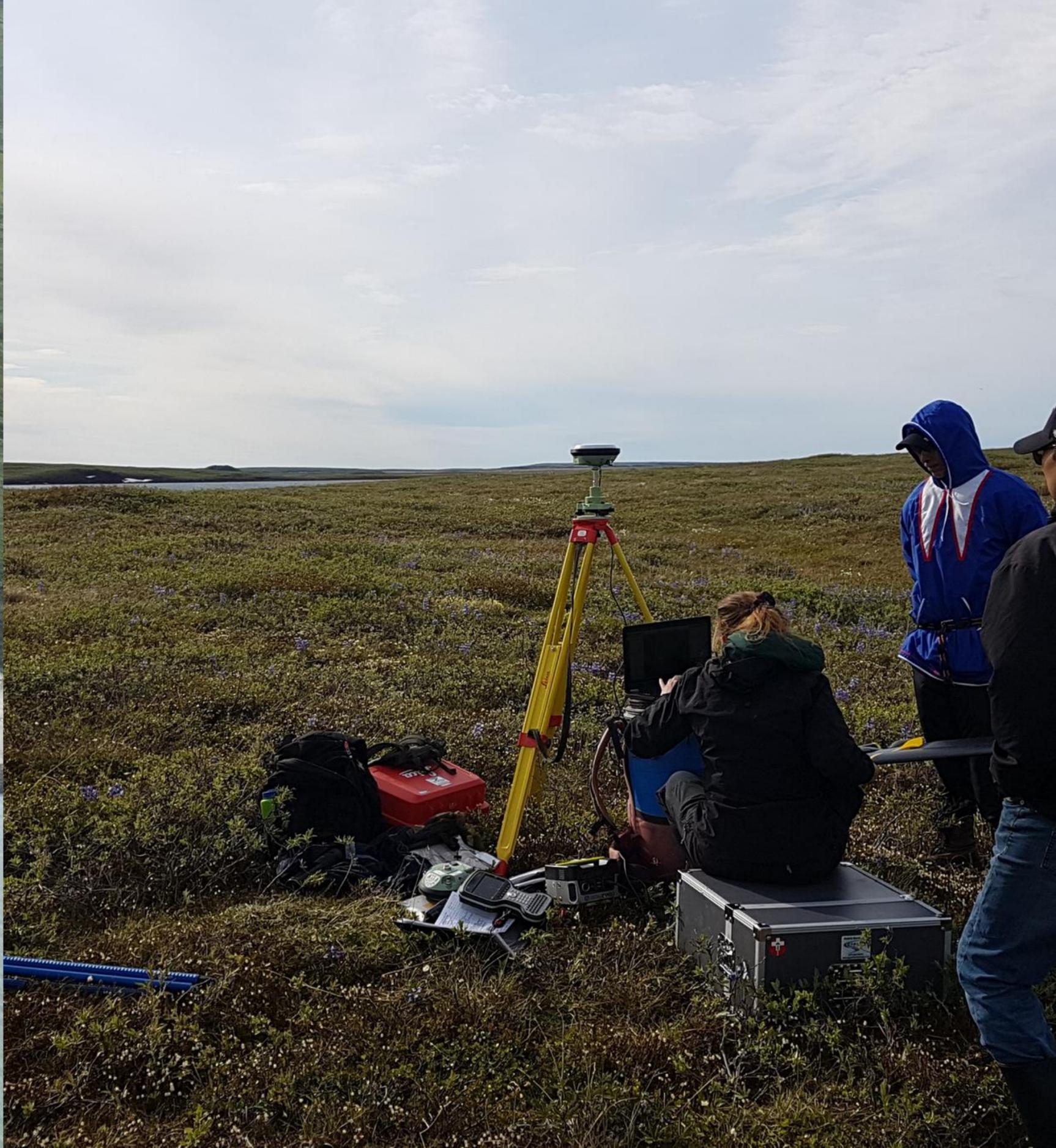
We then use those pictures to create 3D models and maps of the sites

With this we can track change over time





Access sites by helicopter or boat





Fly with multiple drones

We use the multi-rotor drone to capture photos and video

This includes:

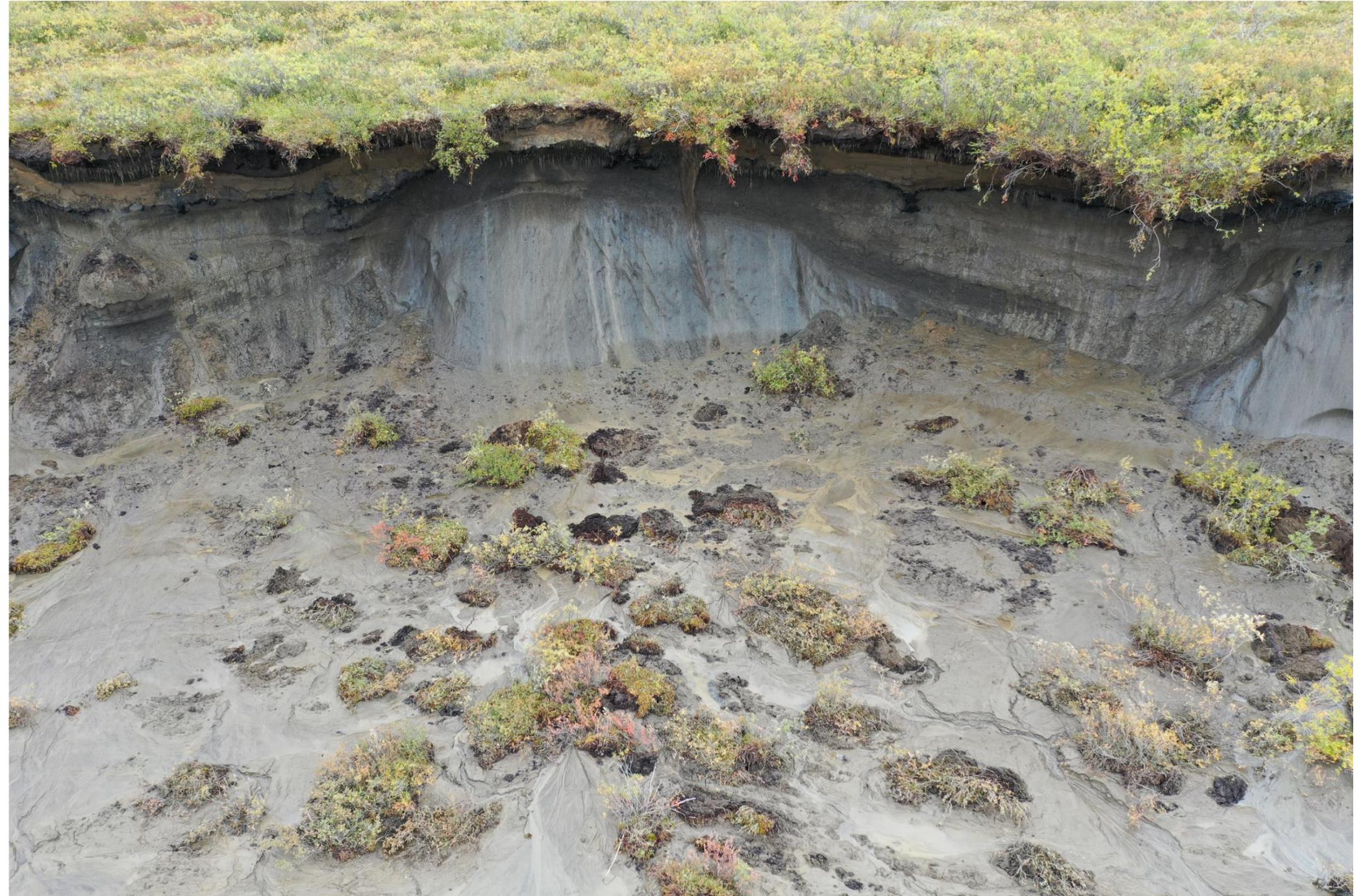
- Small details such as vegetation plots



We use the multi-rotor drone to capture photos and video

This includes:

- Headwall and cliff edge surveys



An aerial photograph showing a coastal landscape. A river flows through a green, vegetated area towards a sandy beach. The beach is bordered by dark, layered cliffs. The ocean waves are visible on the right side of the frame. A few small figures of people are visible on the cliff edge near the beach.

We use the multi-rotor drone to capture photos and video

This includes:

- Oblique landscape or whole site photos

An aerial photograph of a coastal wetland area. The foreground and middle ground are dominated by a vast expanse of low-lying, green and brown vegetation, interspersed with numerous small, shallow pools of water. The terrain appears to be a mix of mudflats and marshland. In the upper right, a wide, sandy beach runs parallel to the ocean. The water is a deep blue, with white foam from waves breaking onto the shore. The overall scene is captured from a high angle, providing a comprehensive view of the landscape's topography and coastal features.

We use the multi-rotor drone to capture photos and video

This includes:

- Fieldwork documentation



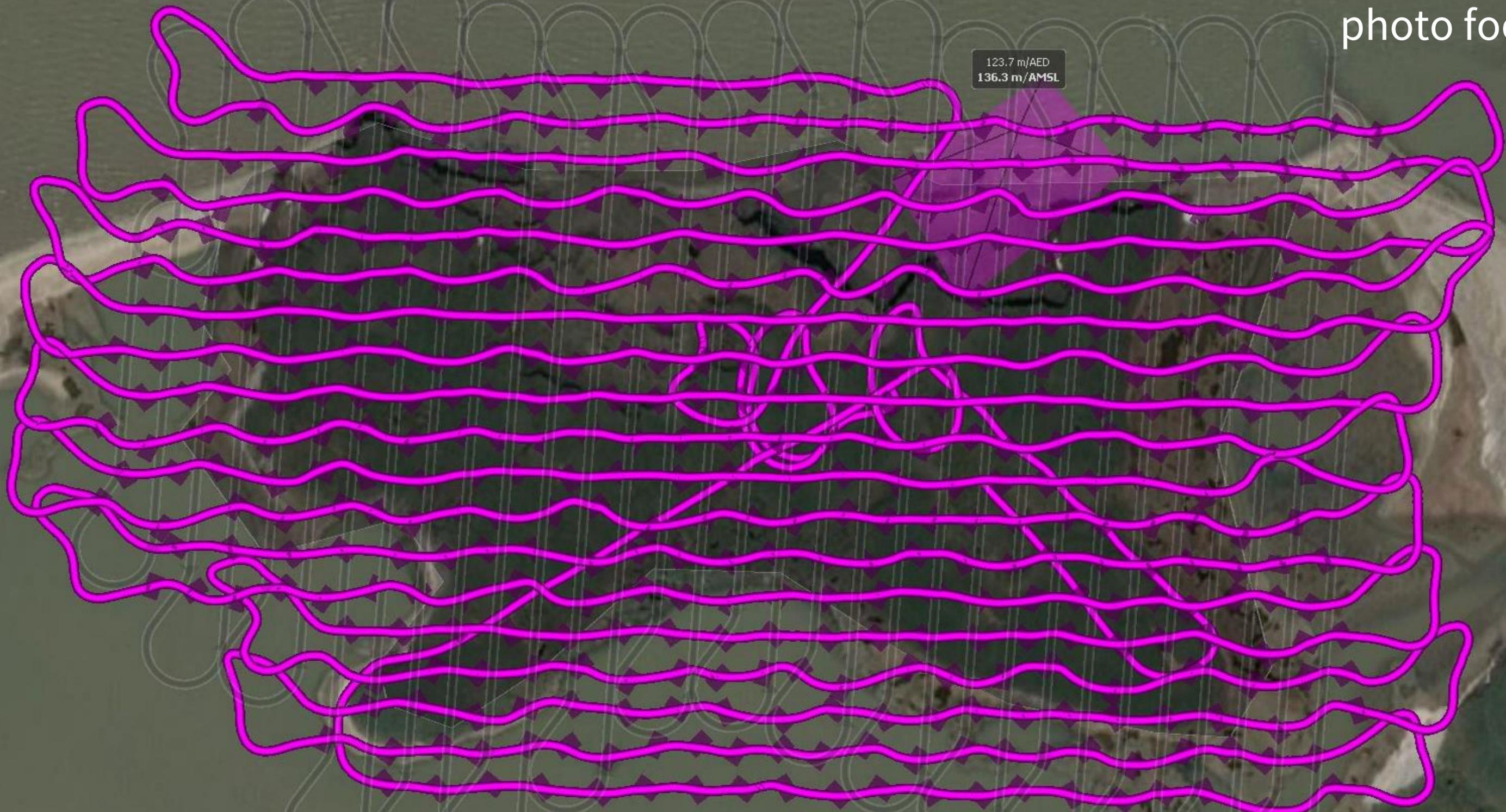
An aerial photograph showing a coastal landscape. The top left corner is dominated by dense green vegetation. Below this, a dark, rocky or sandy area transitions into a wide, light-colored river delta or estuary. The delta features intricate patterns of sandbars and channels. To the right, a sandy beach meets the ocean. The overall scene is captured from a high angle, providing a clear view of the terrain's topography and the interaction between land and water.

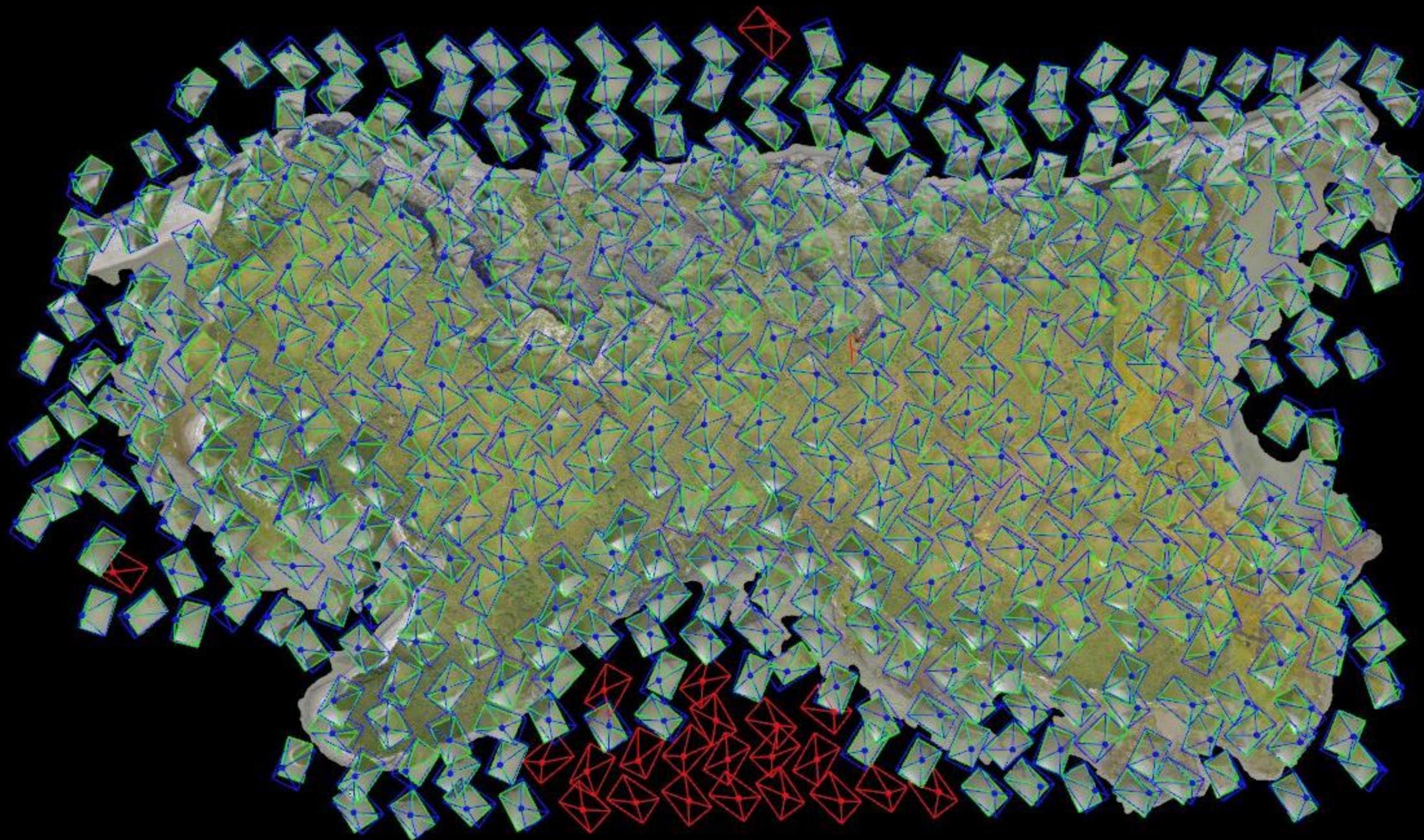
We use the fixed wing
drone to capture photos
straight down

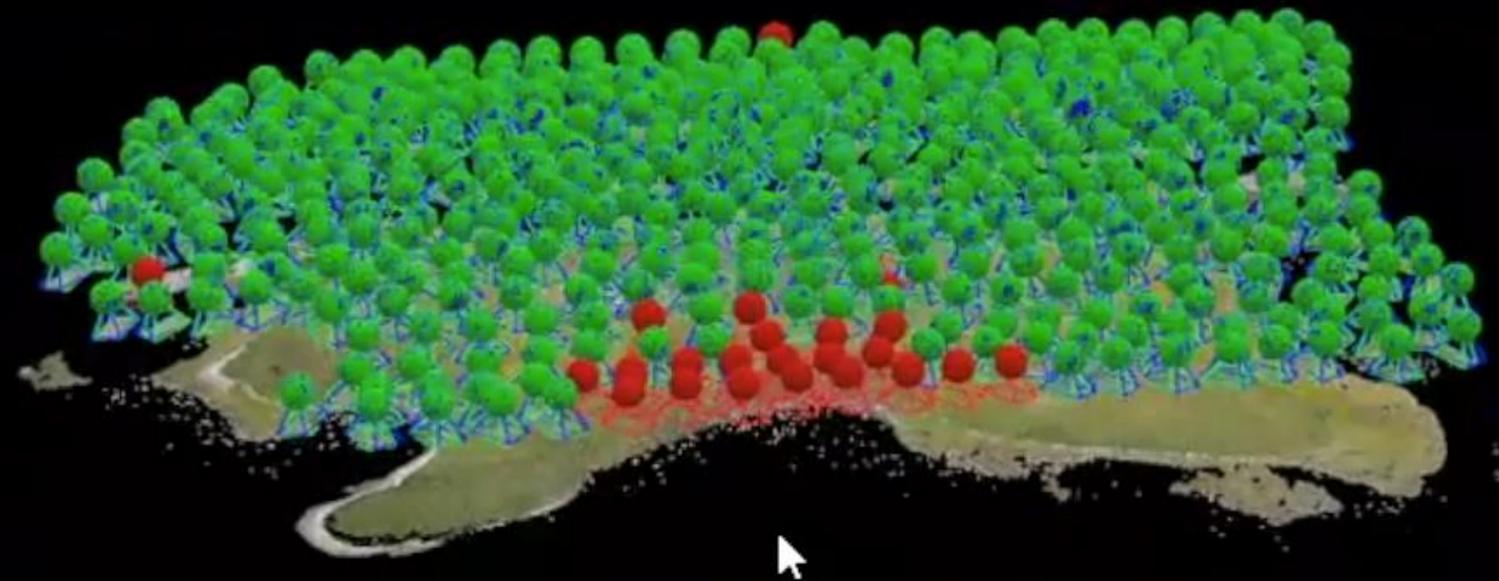
Multiple cameras
includes:

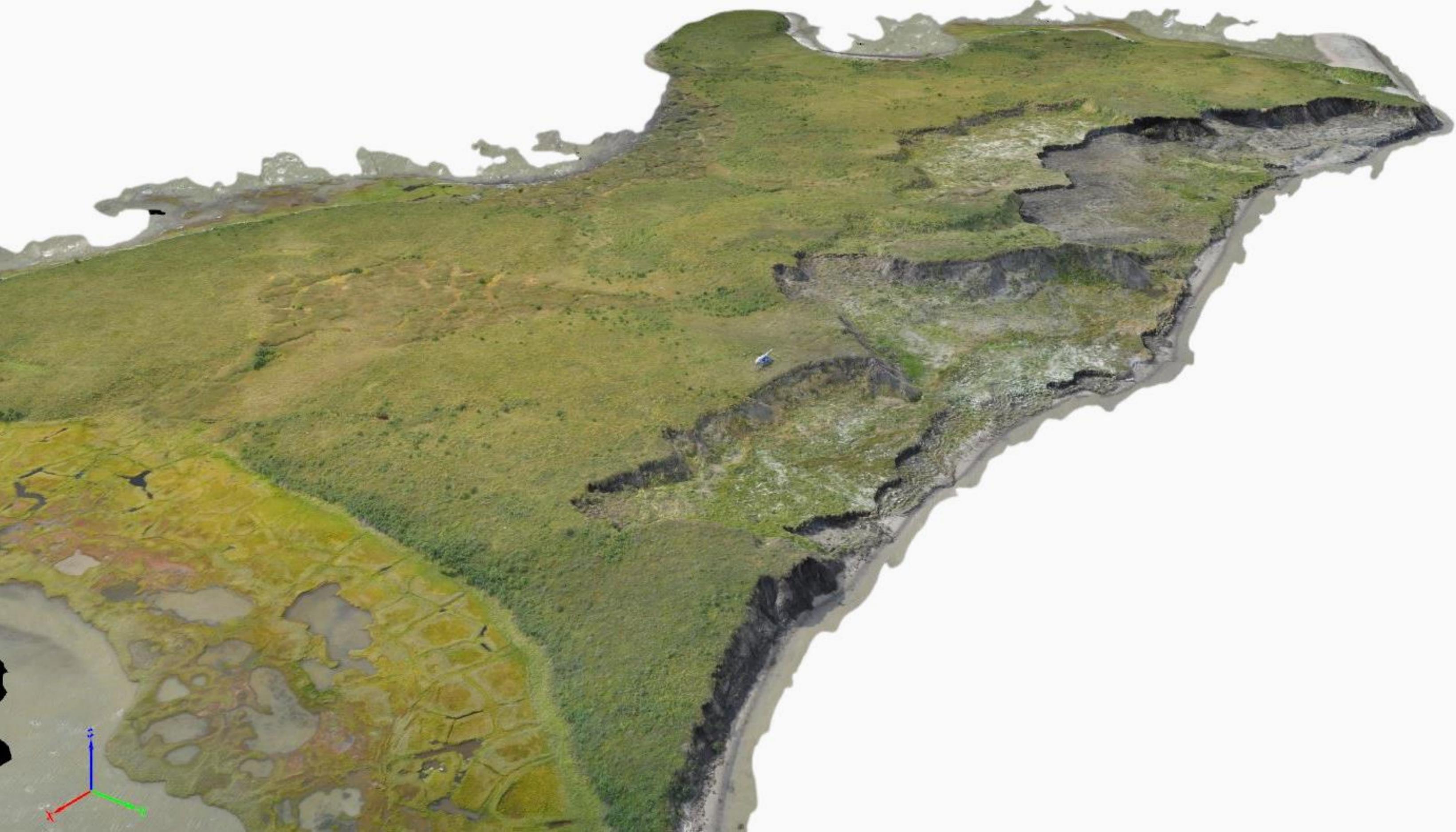
- RGB (what we see)
- Thermal
- Multispectral

Flight track and photo footprints





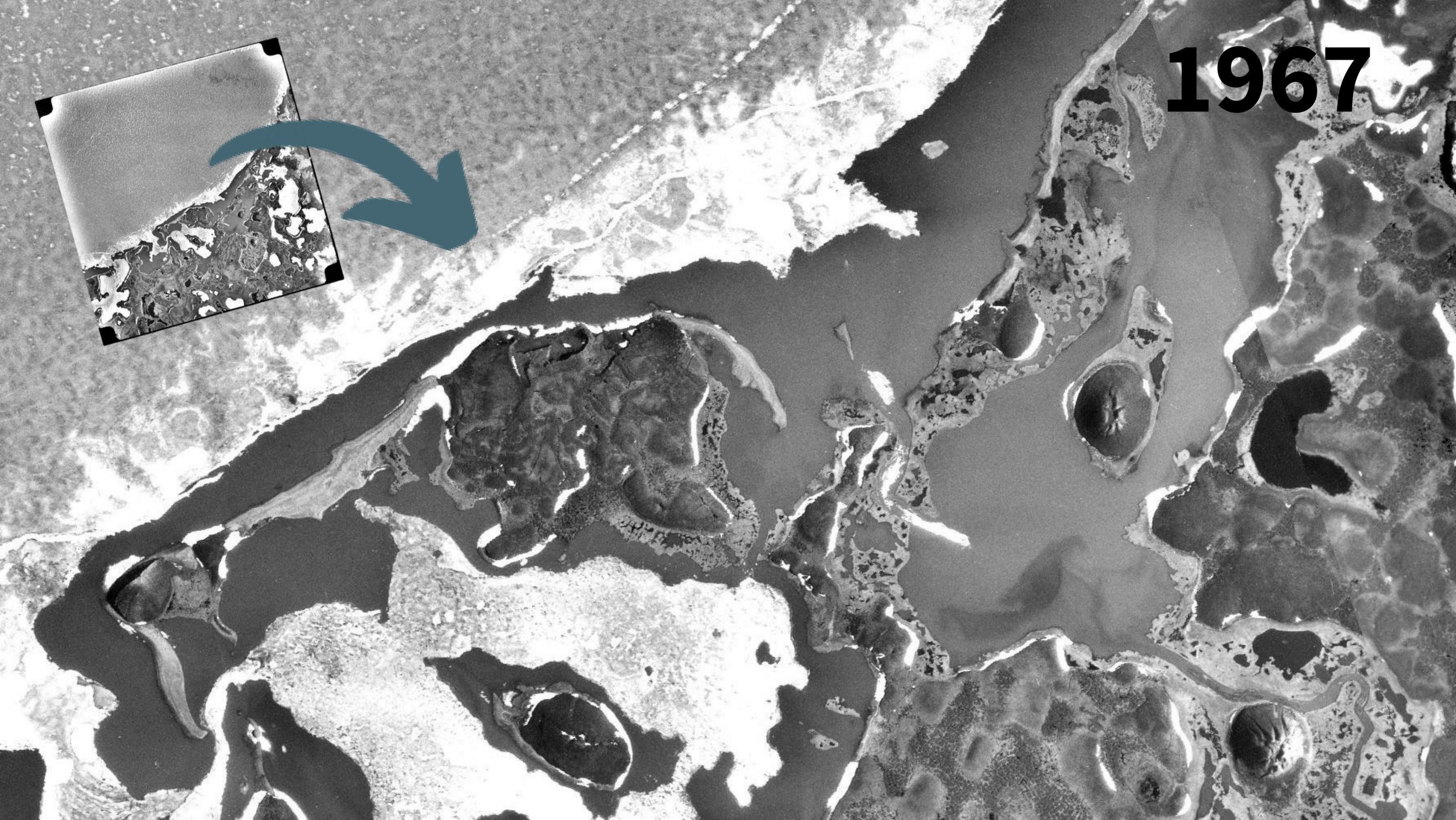
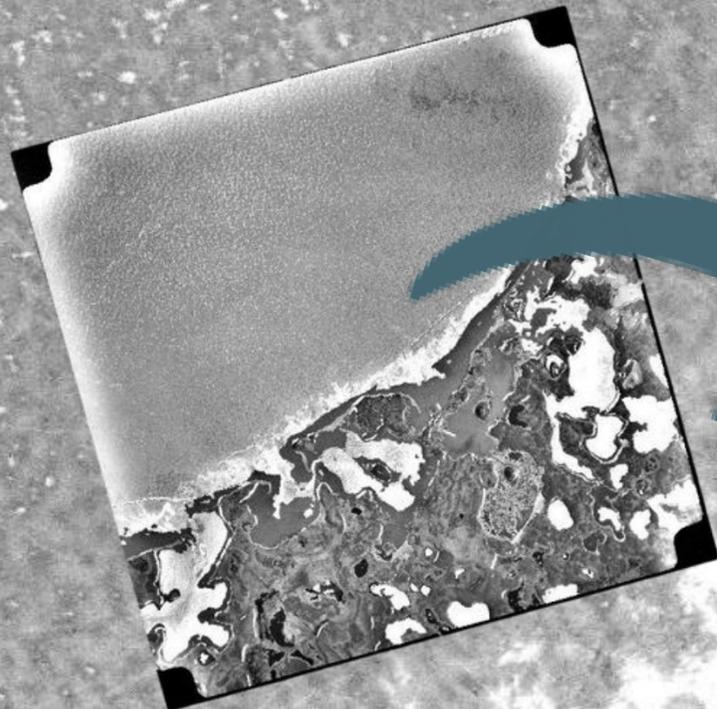




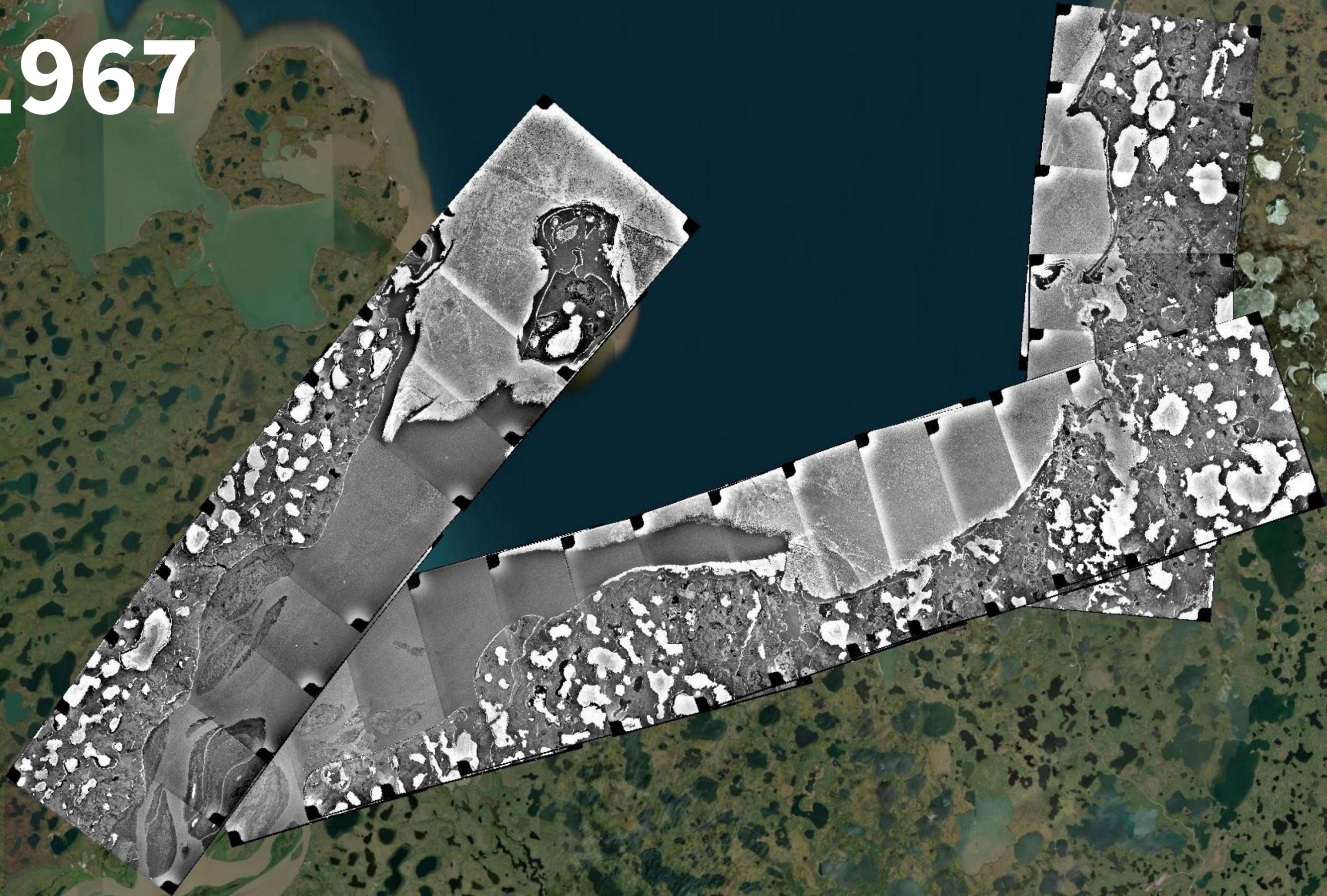
An aerial photograph of a vast, flat landscape, likely a wetland or coastal plain. A wide, winding river flows through the center, surrounded by numerous smaller ponds and channels. In the foreground, a large, prominent conical mound or dune rises above the surrounding terrain. The sky is clear and blue, and the overall scene is captured from a high angle, providing a wide view of the terrain.

COMPARISONS TO HISTORIC IMAGERY

1967



1967



2004



Digitizing the Images



1967 Coastline



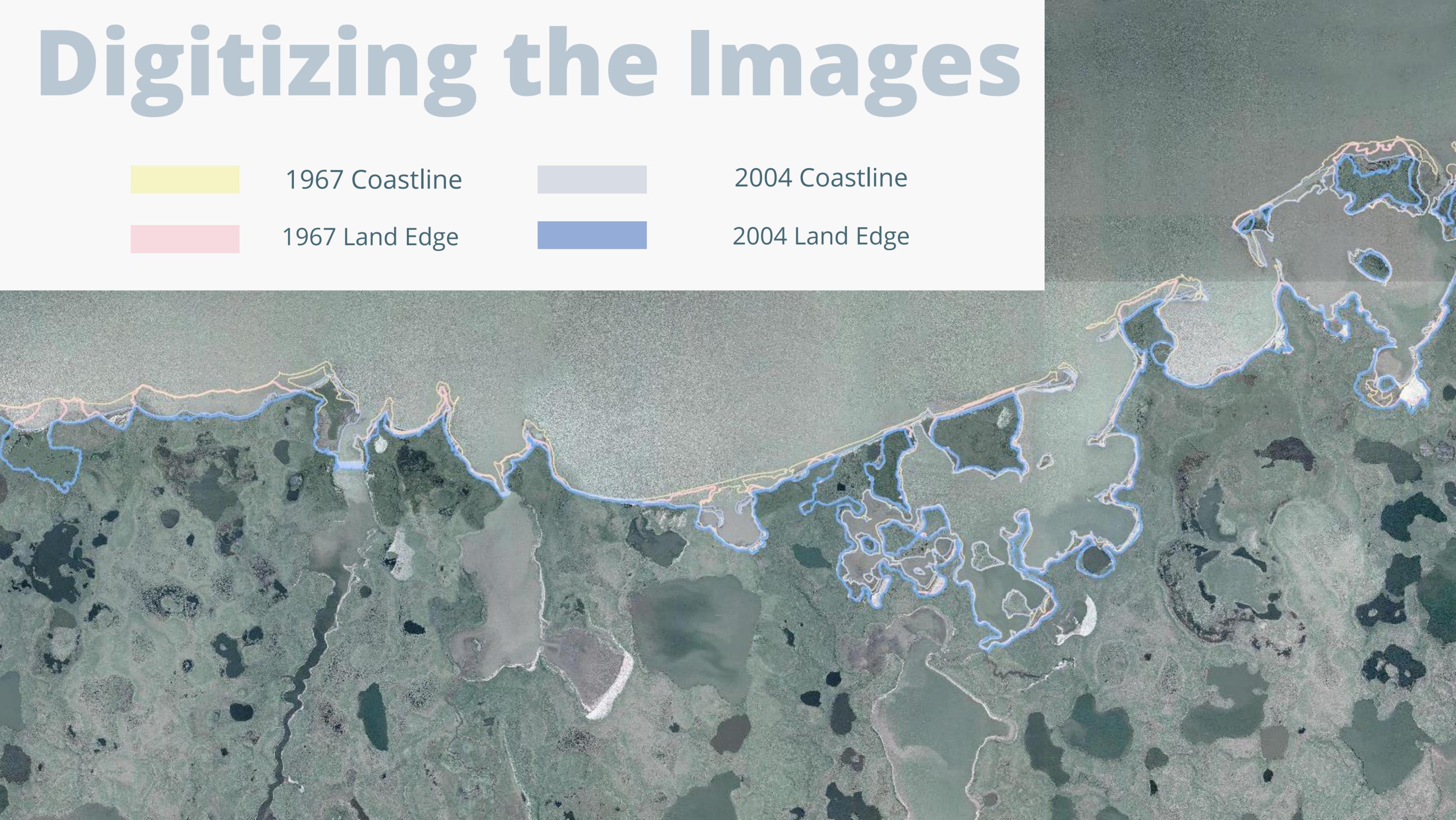
2004 Coastline



1967 Land Edge



2004 Land Edge



Buffer and Intersect



Coastal Change 1967 - 2004

Erosion



Less



More

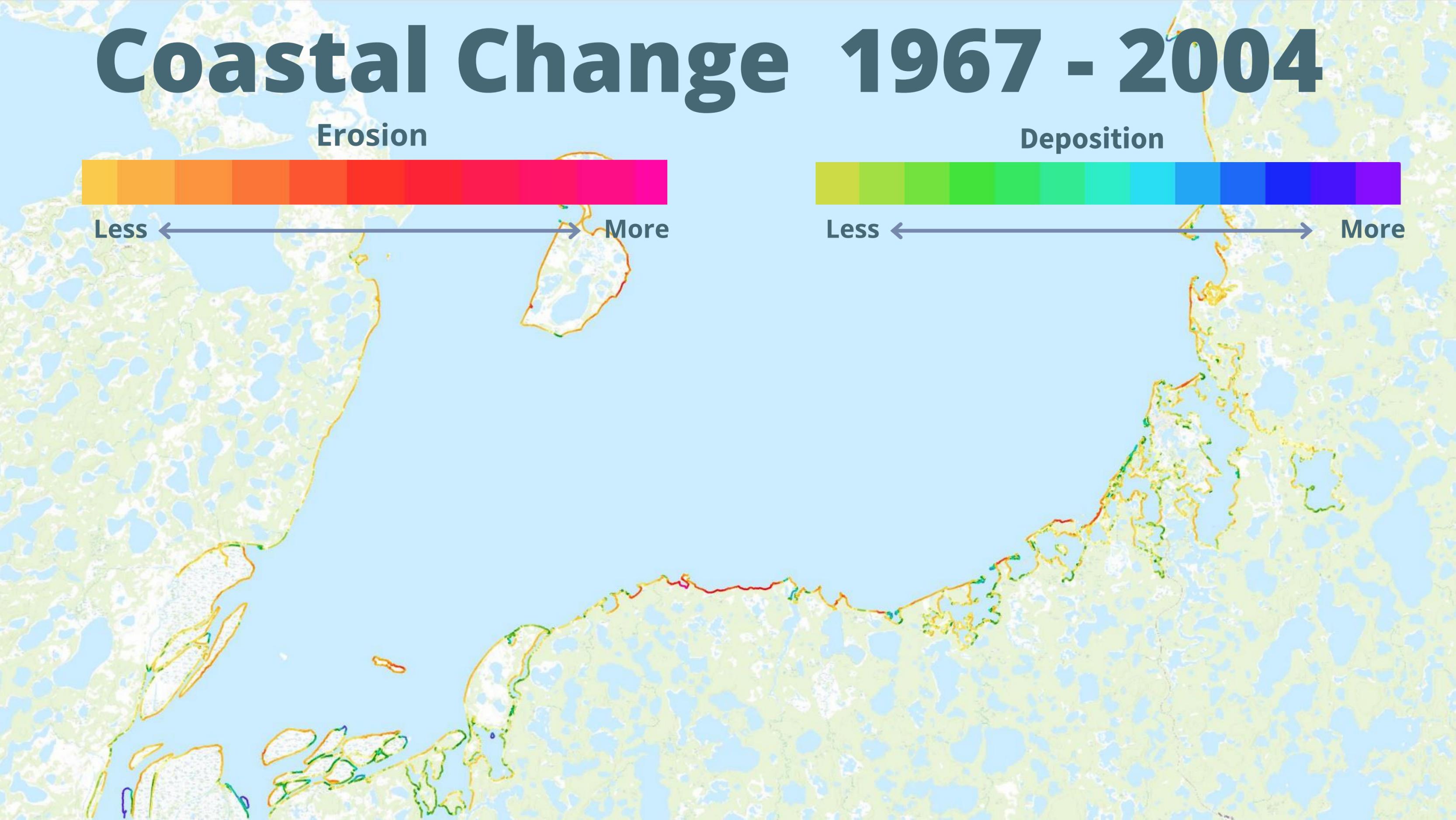
Deposition



Less



More

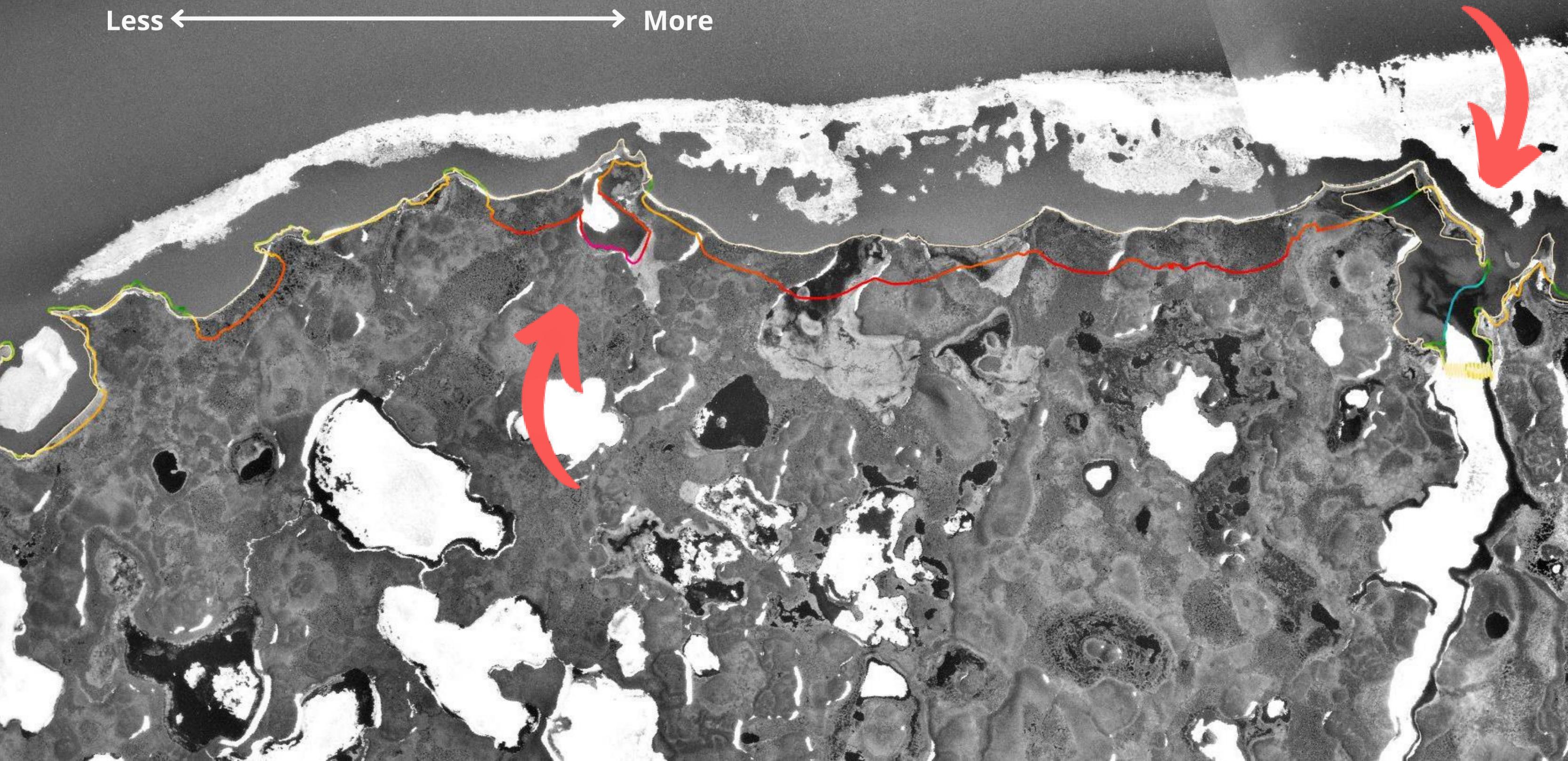


Erosion



Less ←

→ More





Thaw Slumps



Headwall



The active edge of the slump, retreating backwards as material thaws

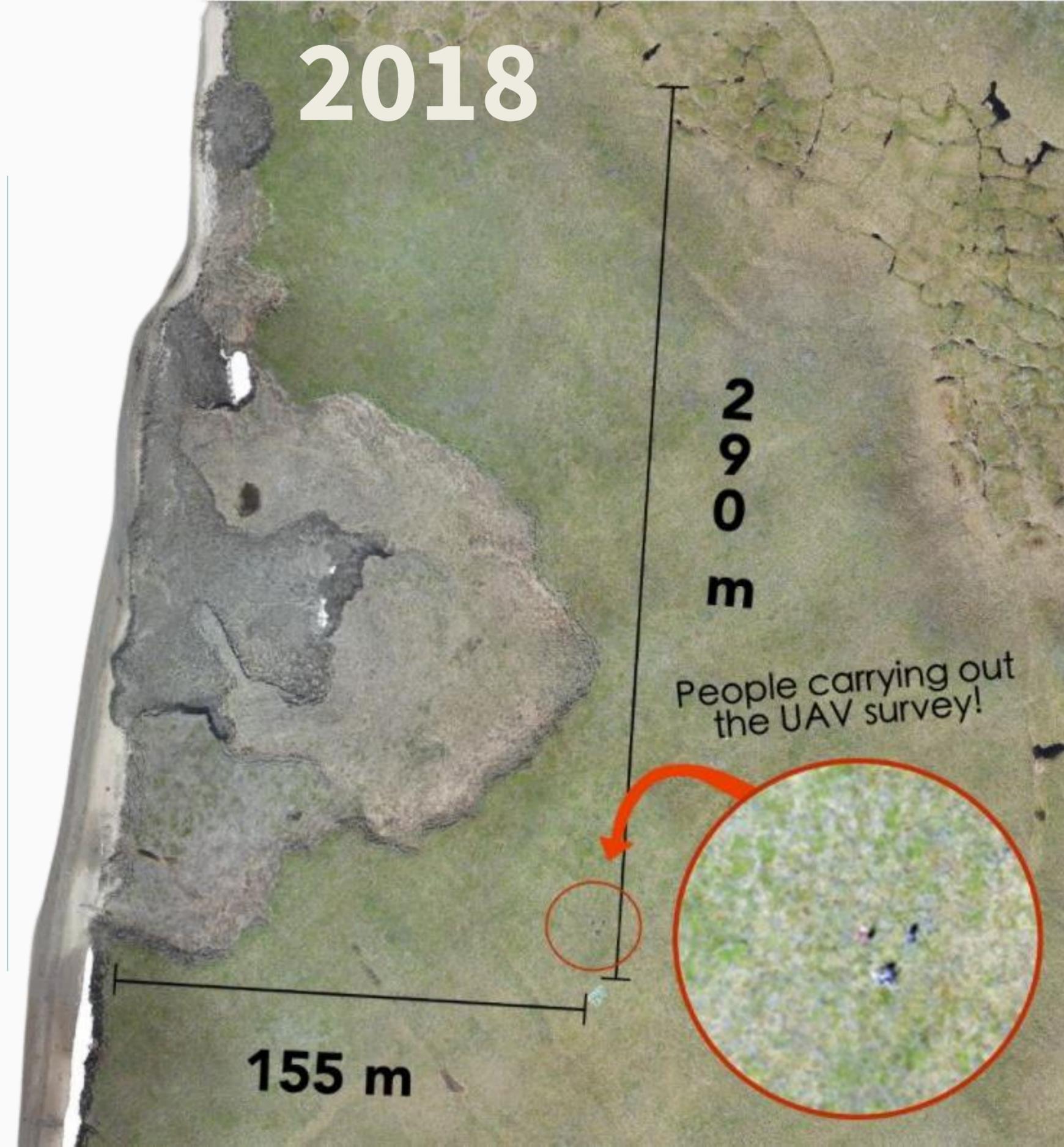
Kugmallit Bay

We have repeated drone surveys each year since 2018*

Galiptut



This slump is to the northeast of Tuktoyaktuk



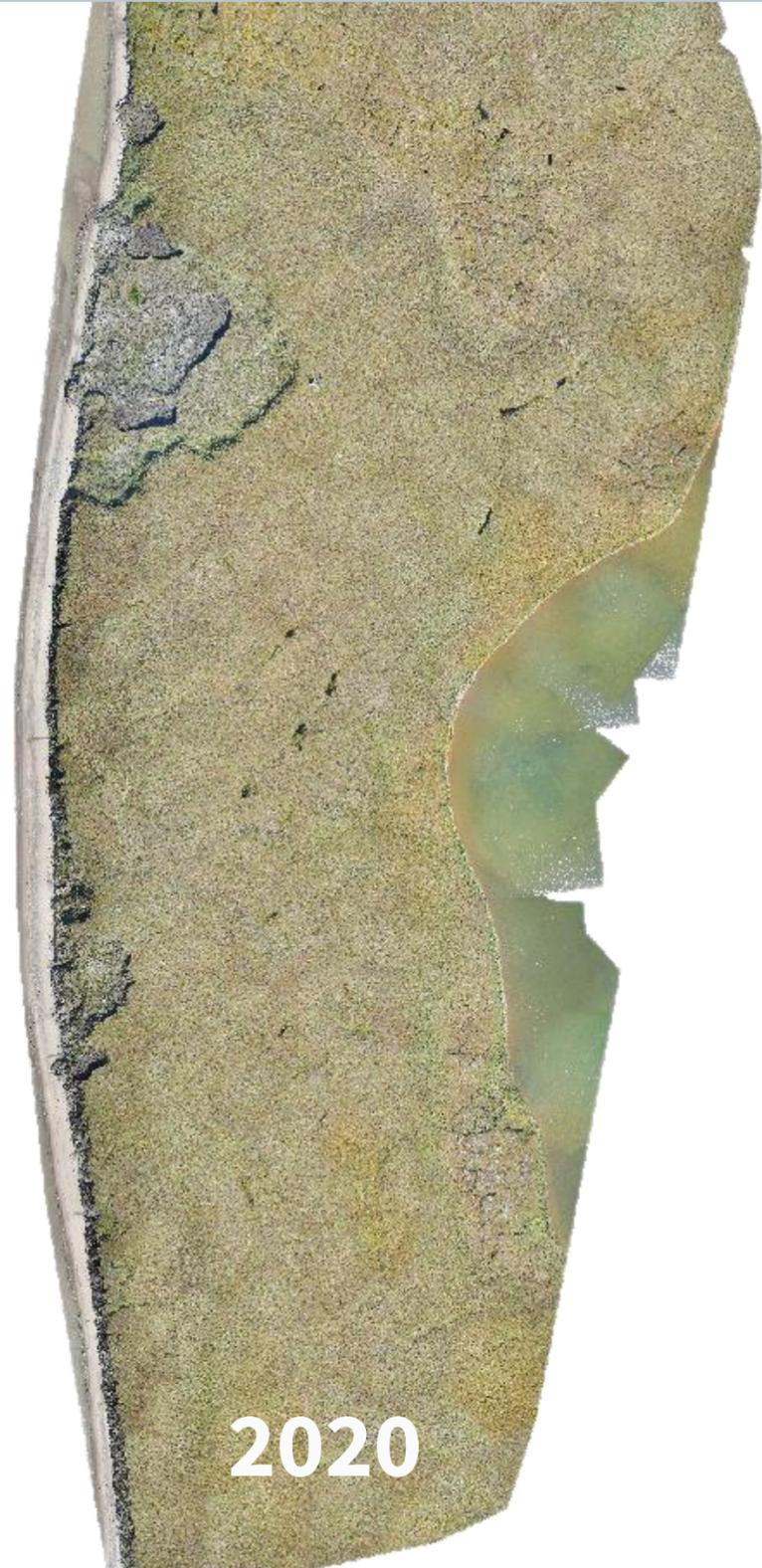
Change Over Time



2018



2019



2020



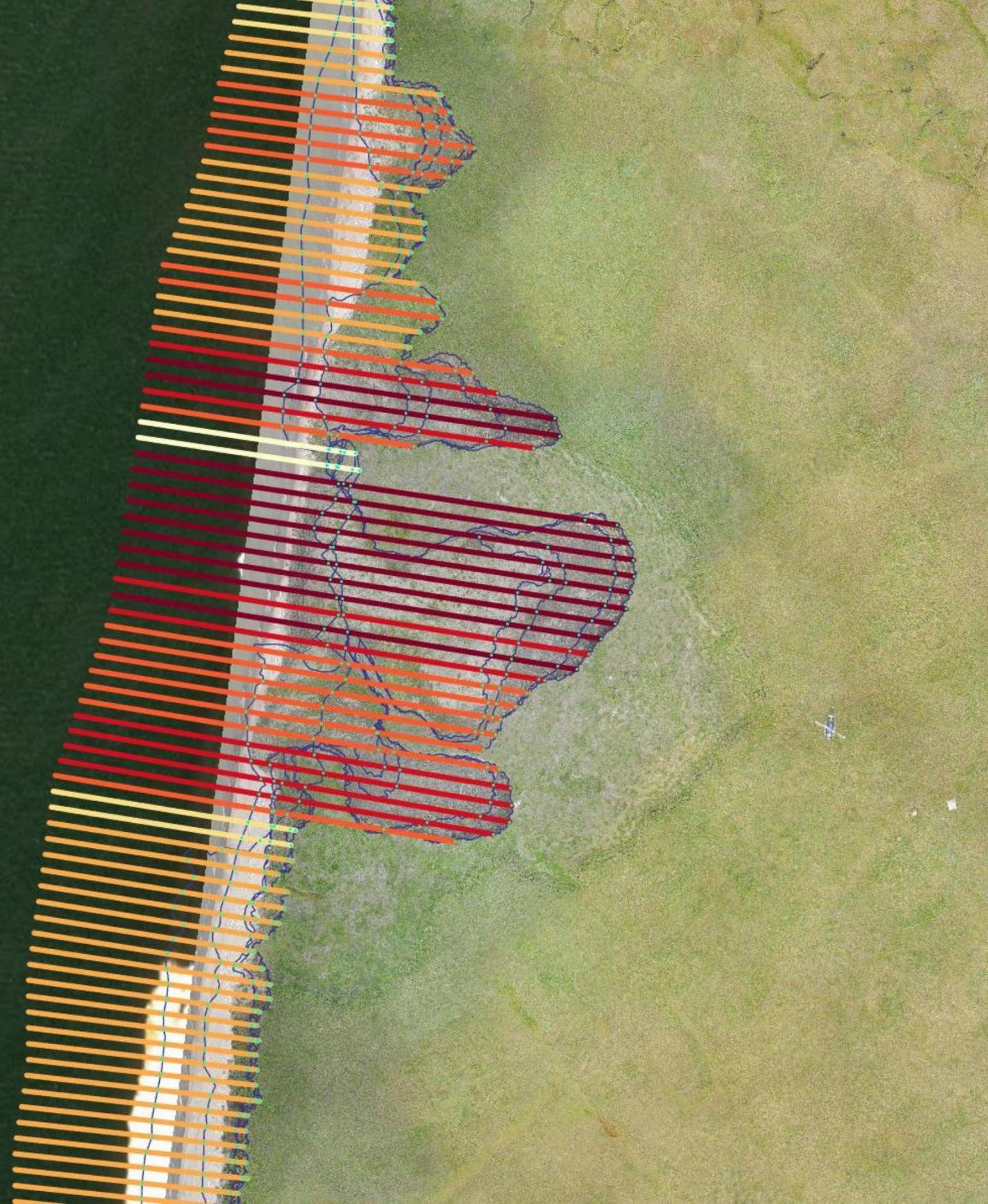
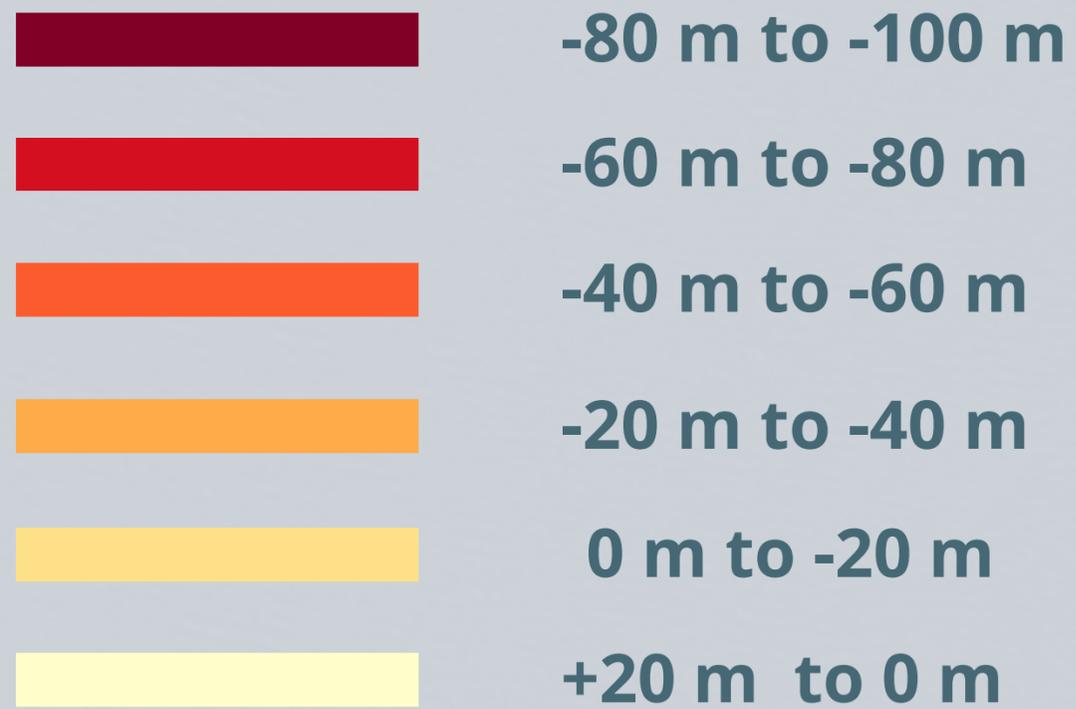
2021

Galiptut Headwall

Legend

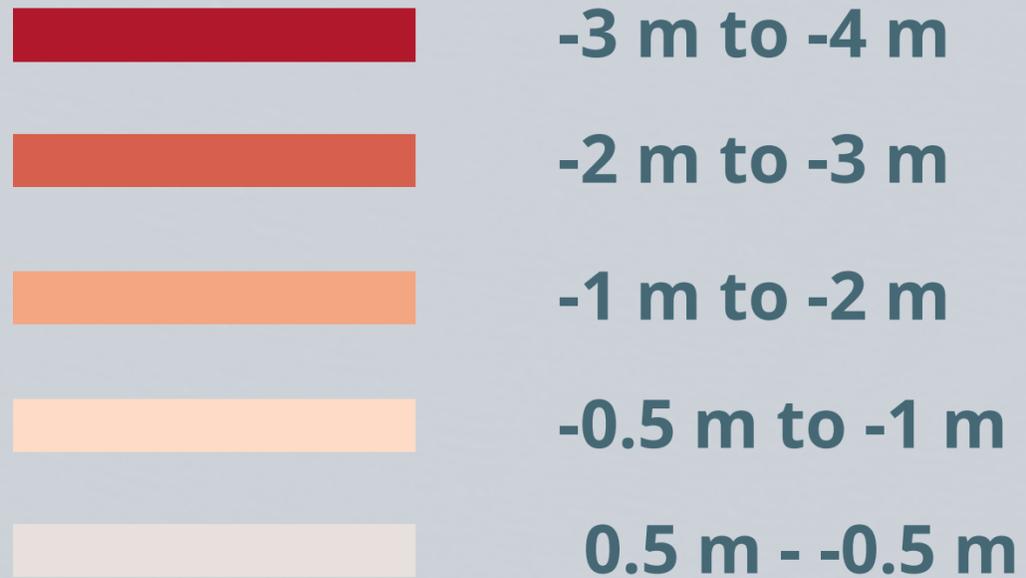


Net Change 1967-2021



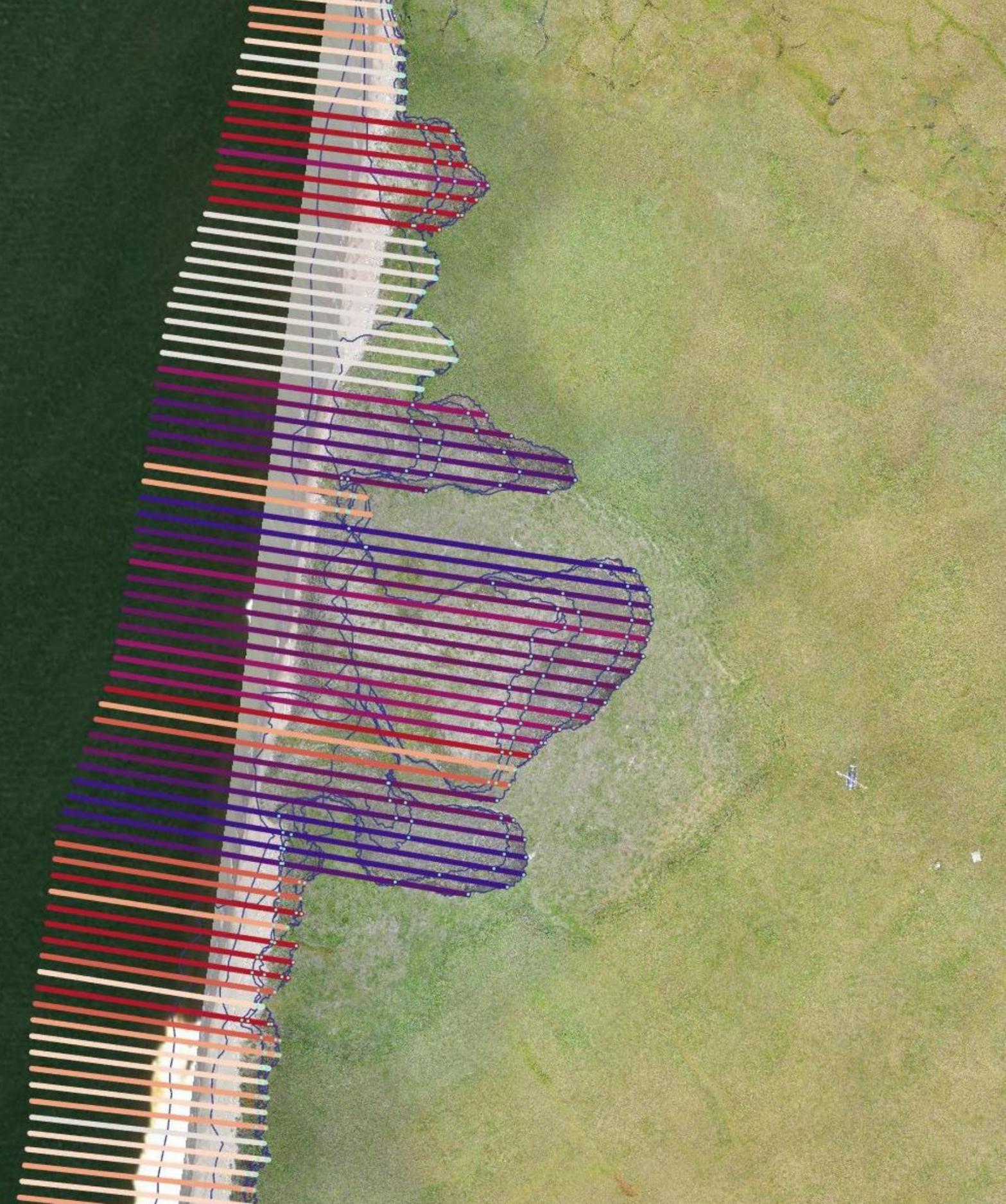
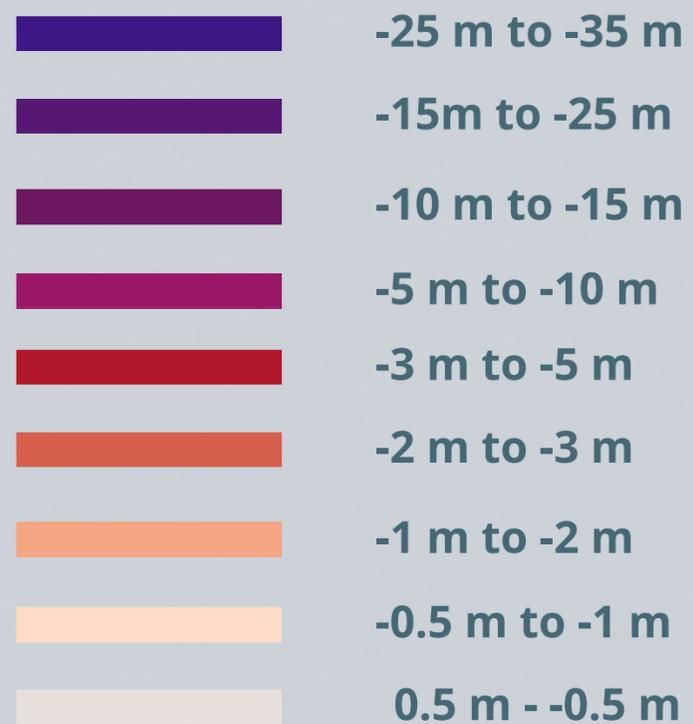
Linear Regression Rate 1967-2021

In metres/year

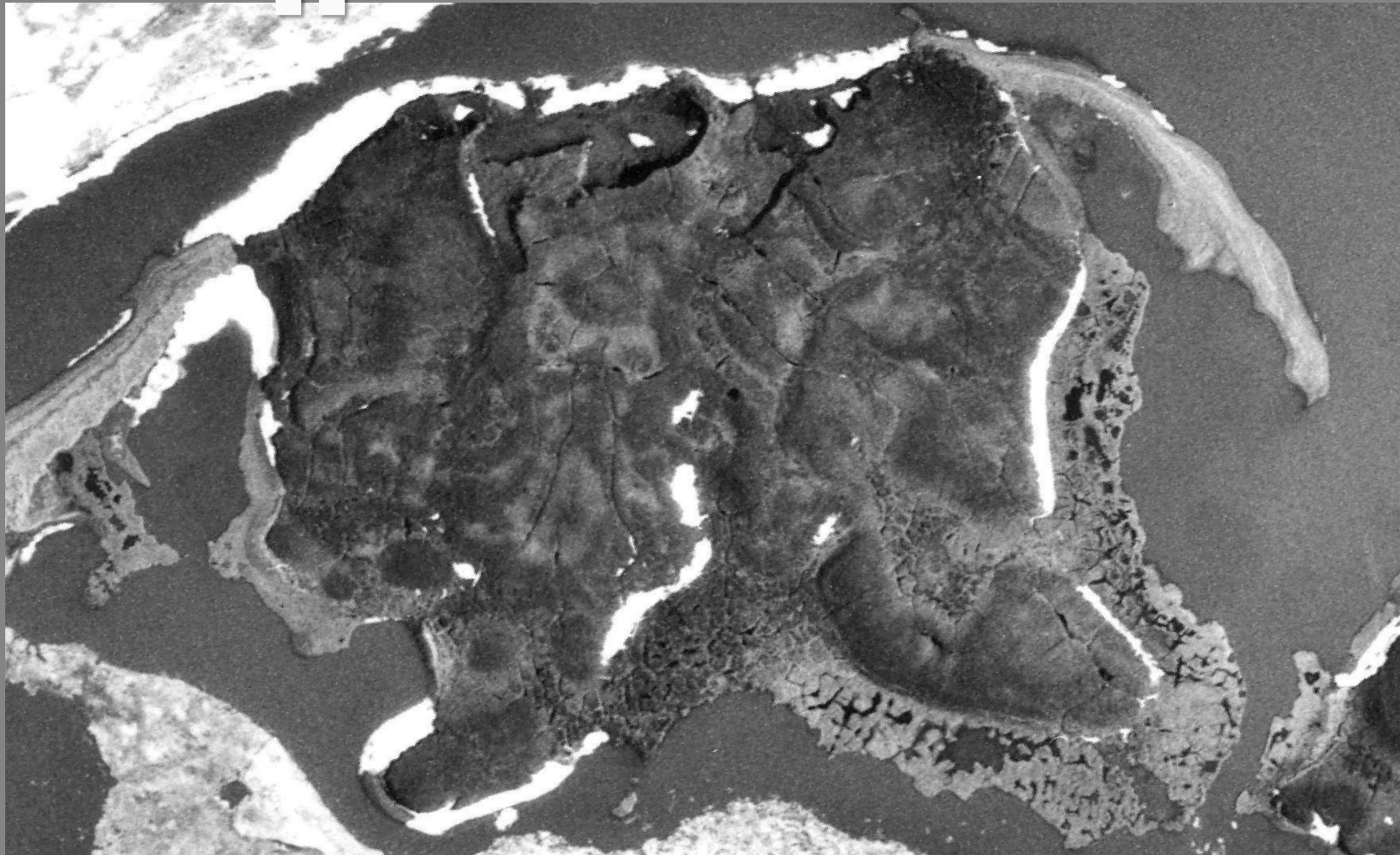


Linear Regression Rate 2018-2021

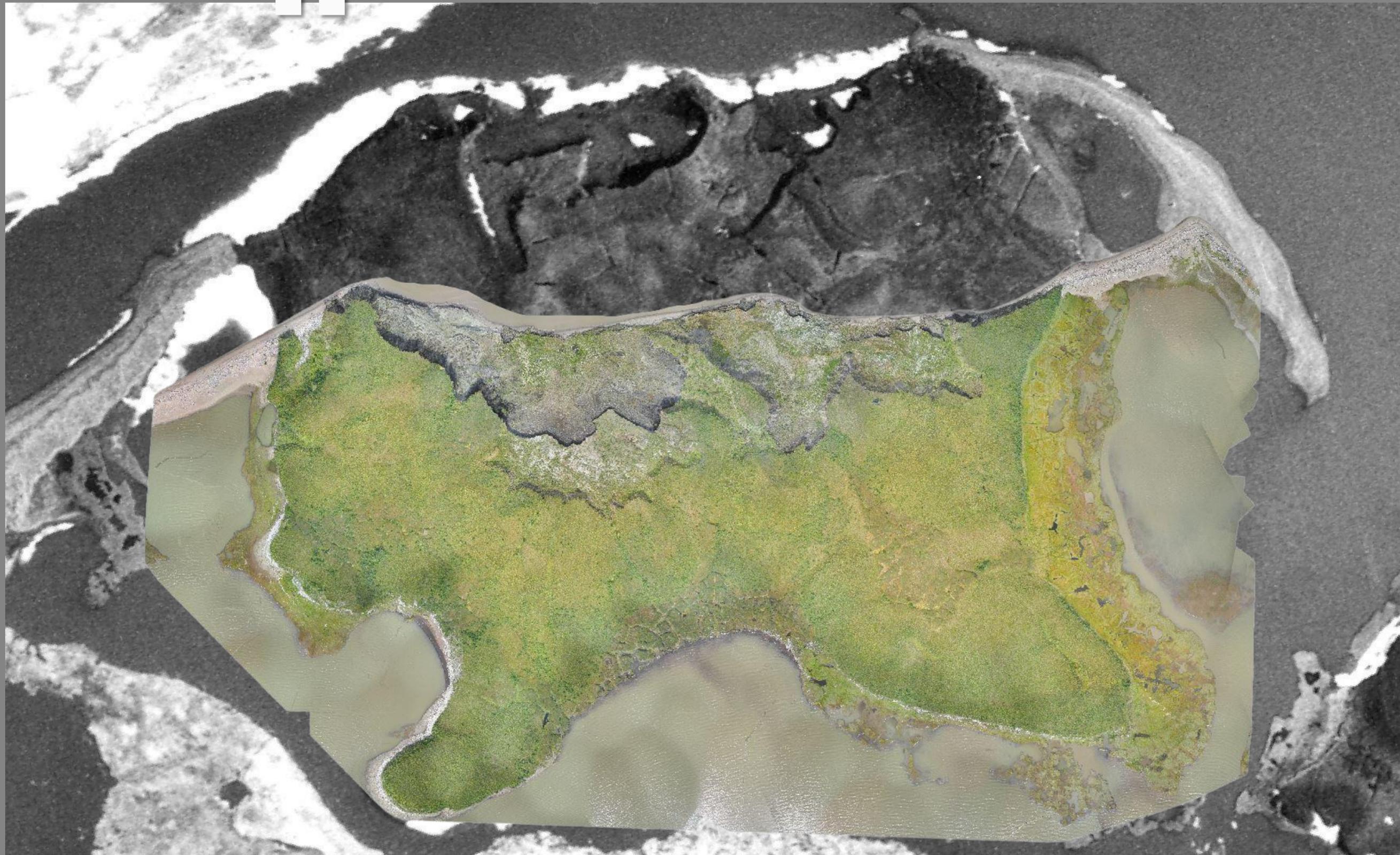
In metres/year



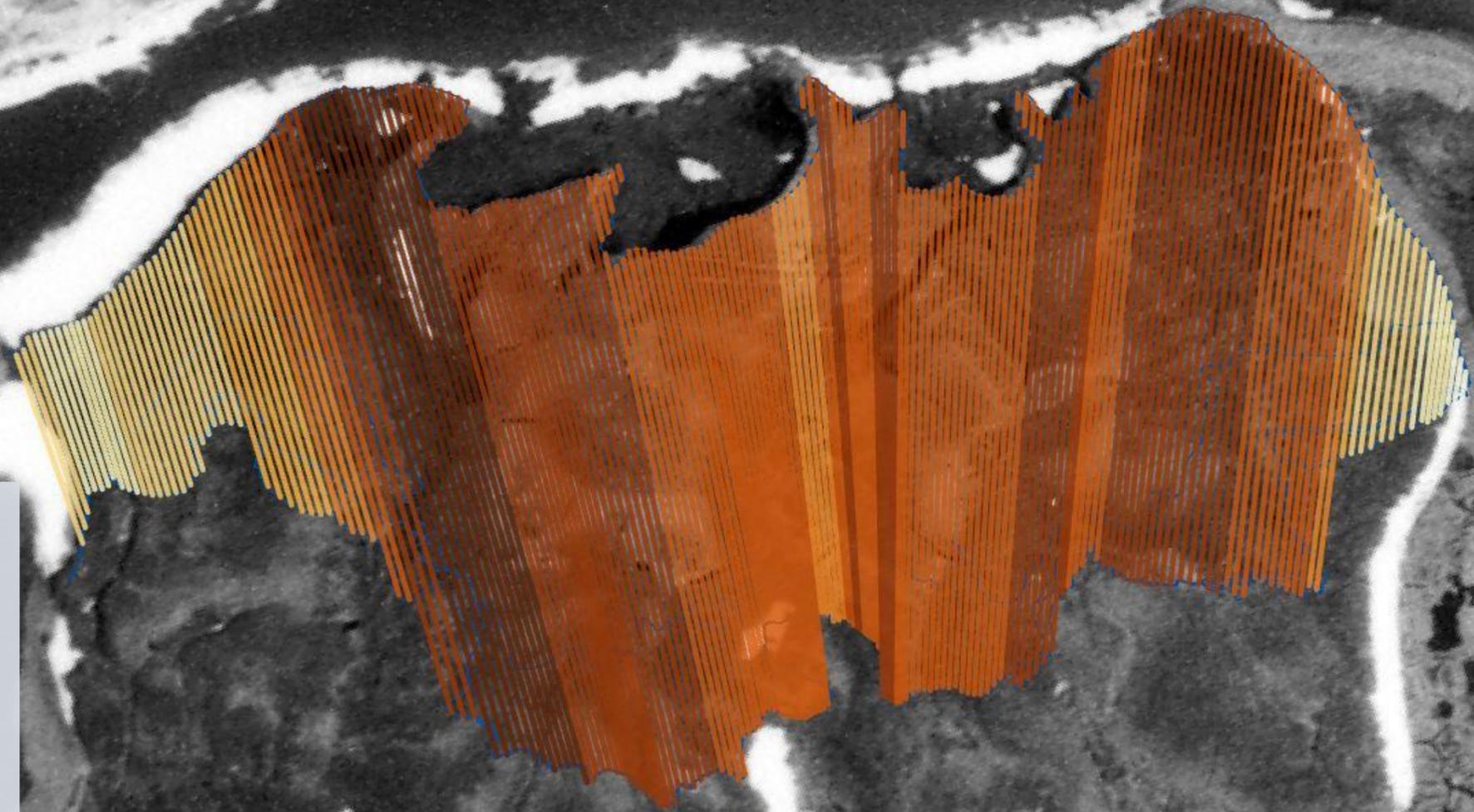
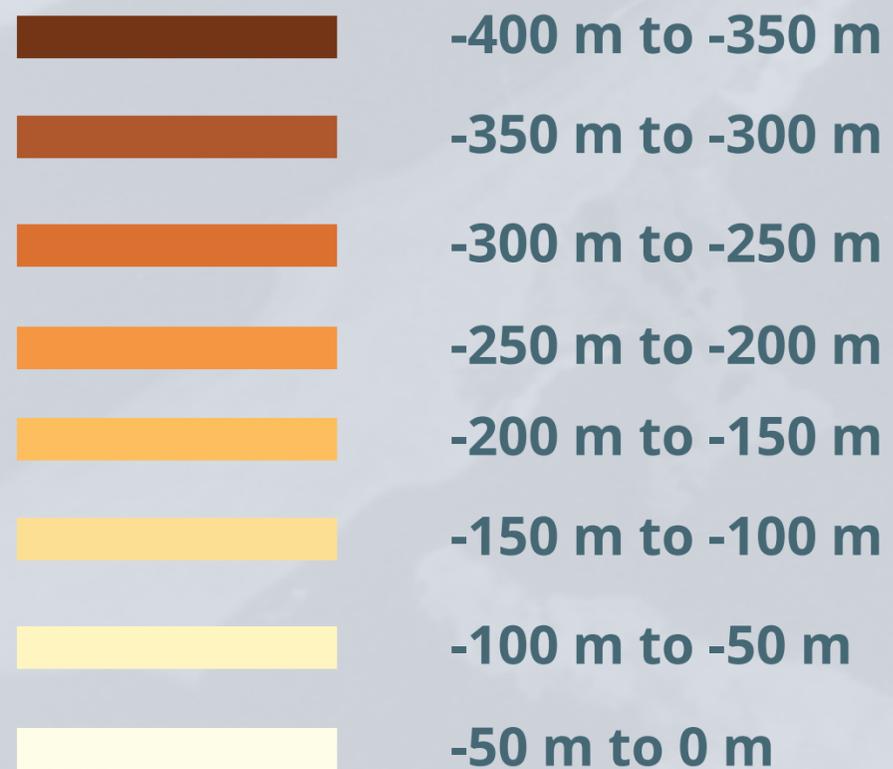
Imnaqpaaluk



Imnaqpaaluk



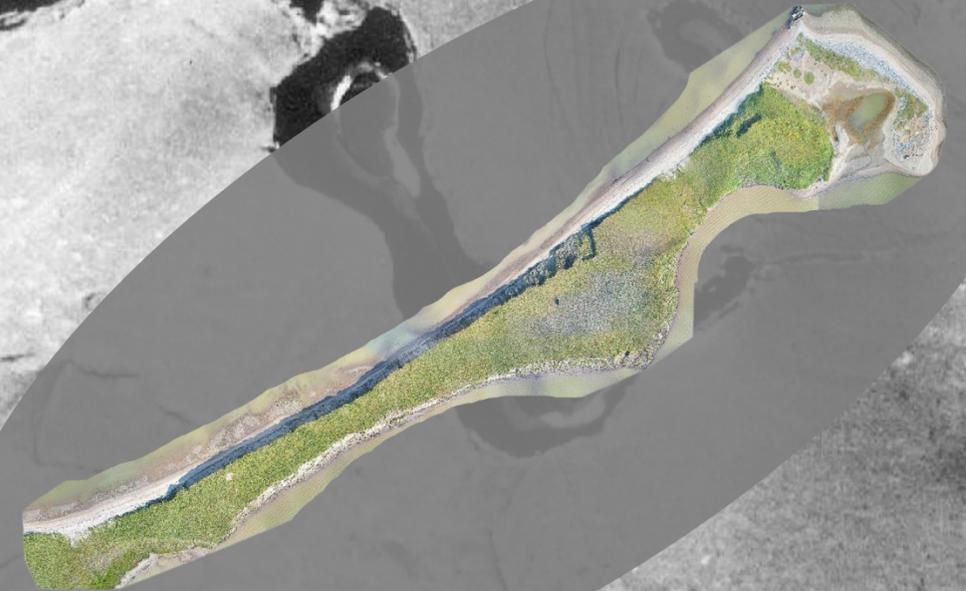
Net Change 1967-2021



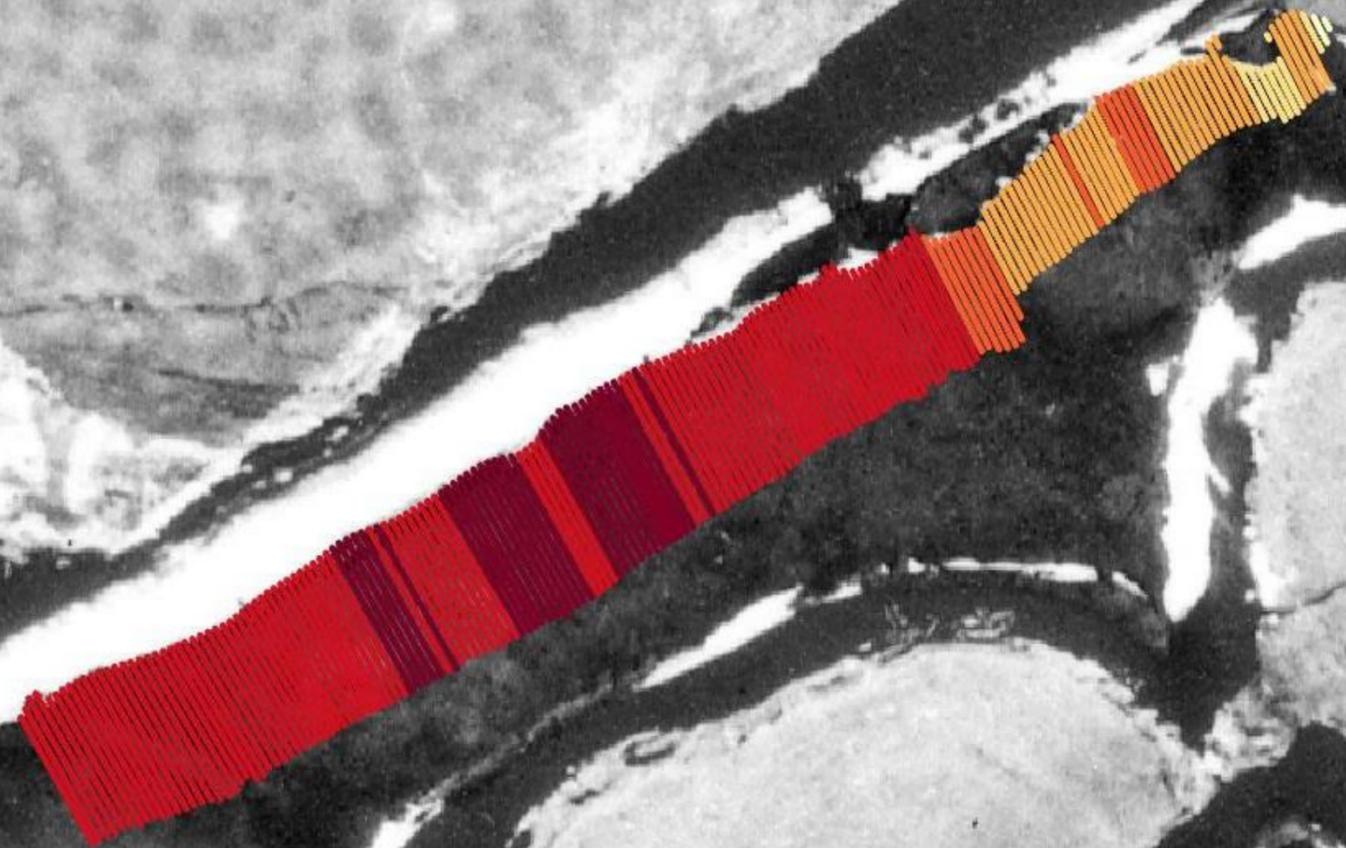
Tuktoyaktuk Island

1967

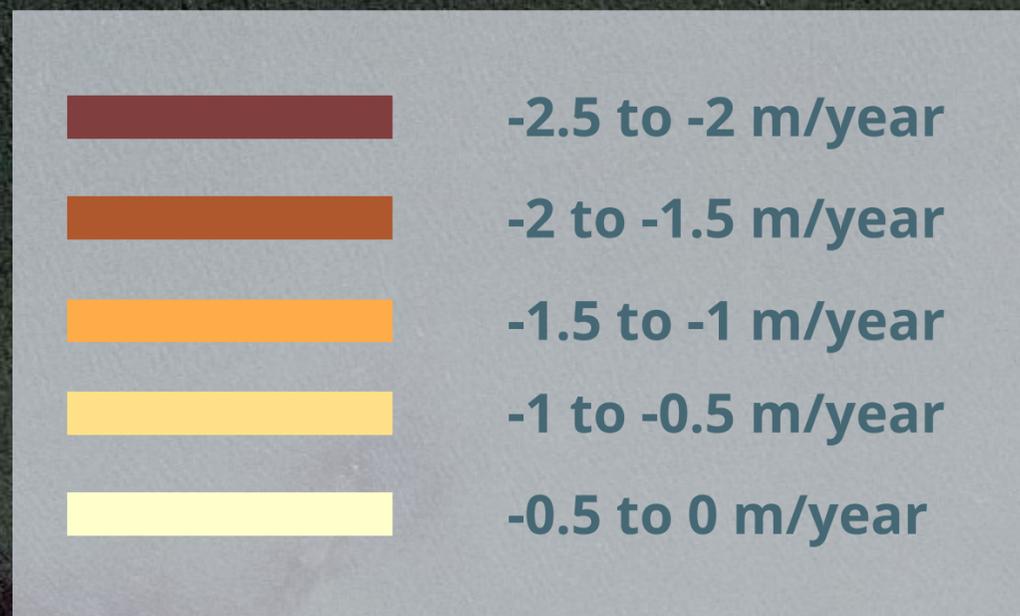
2021



Net Change 1967 - 2021



Linear Regression Rate 1967-2021 & 2004-2021



1967-2021

2004 - 2021



Coastal Change 1967 - 2004

Erosion



Less



More

Deposition



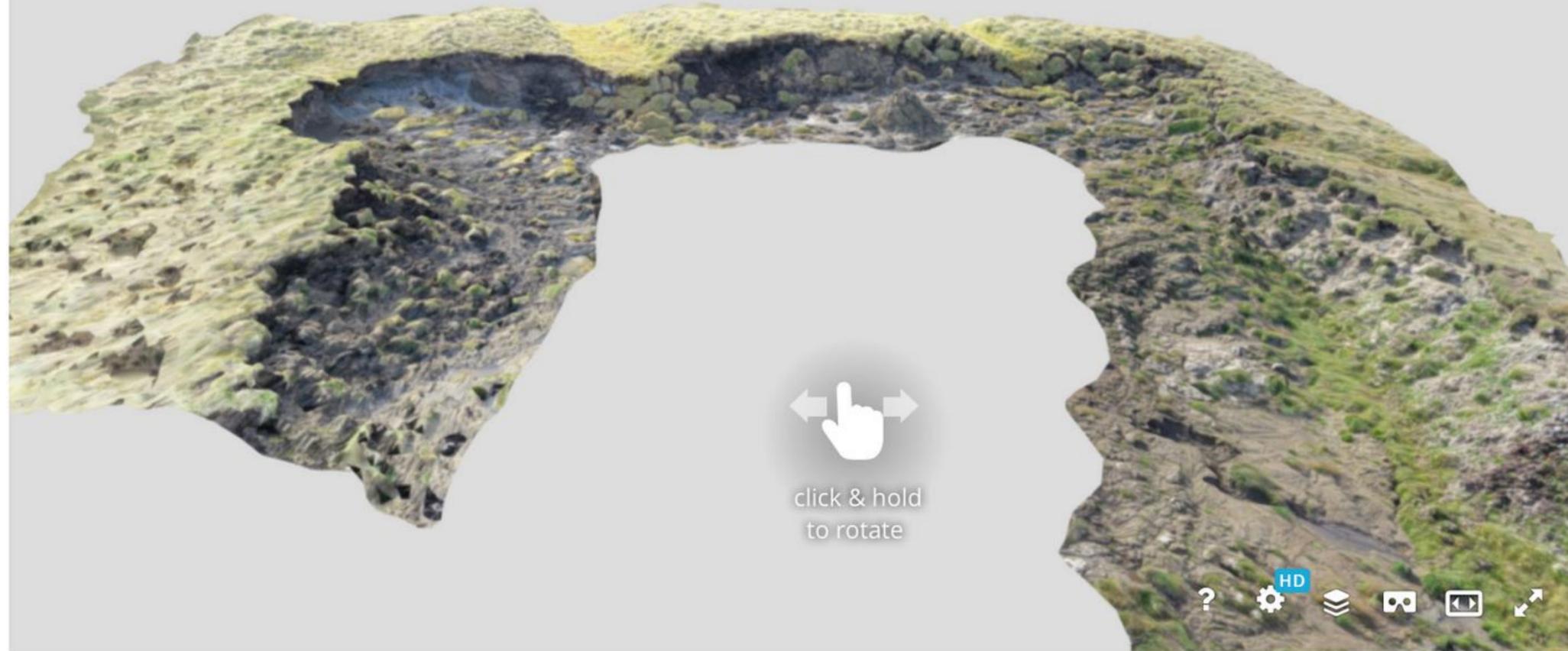
Less



More

<https://arcg.is/9b8TH>

https://skfb.ly/onMBu



Thaw Slump Headwall NWT

3D Model



ARI_GIS

FOLLOW

13

2

+ Add To

</> Embed

Share

Report