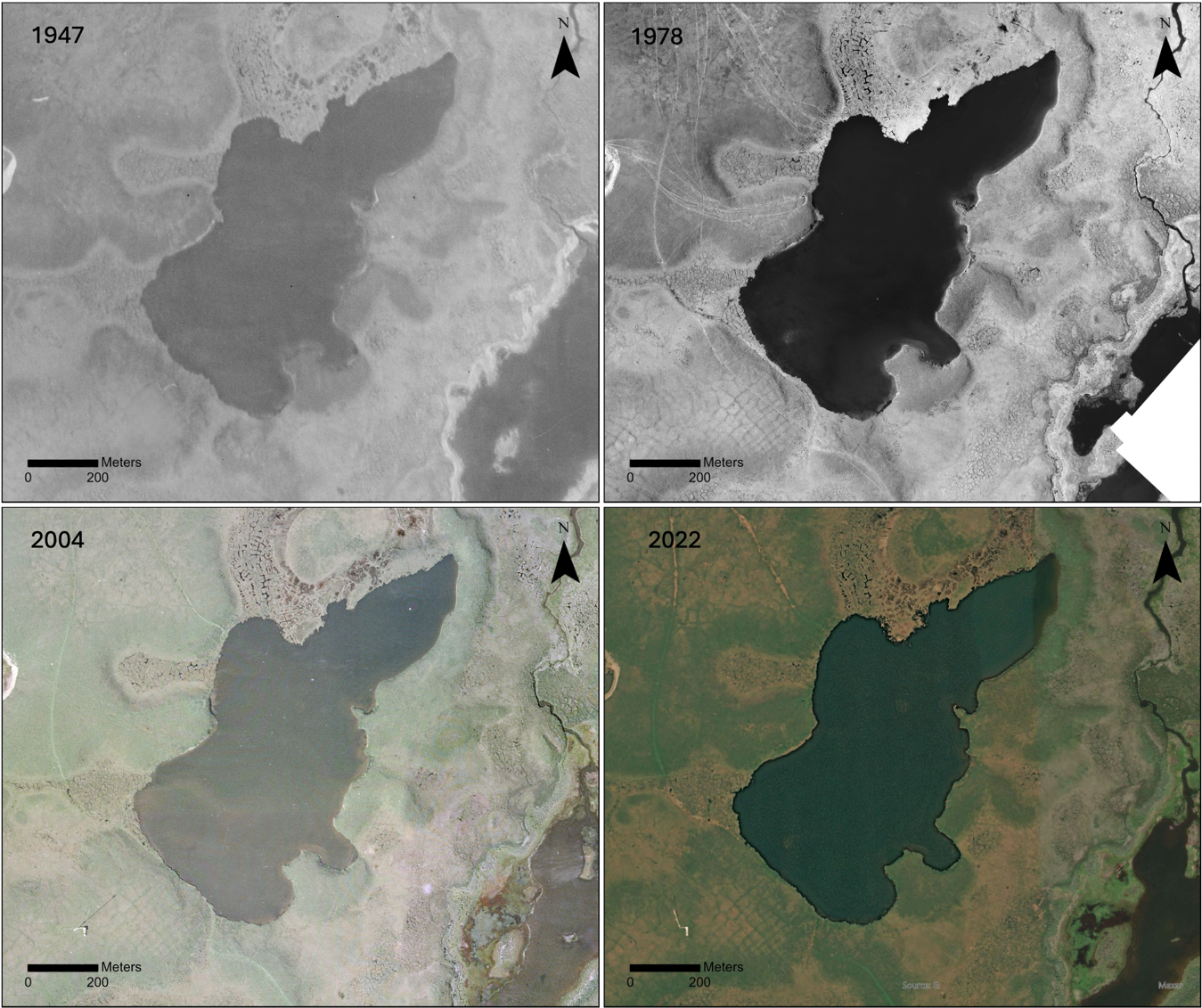
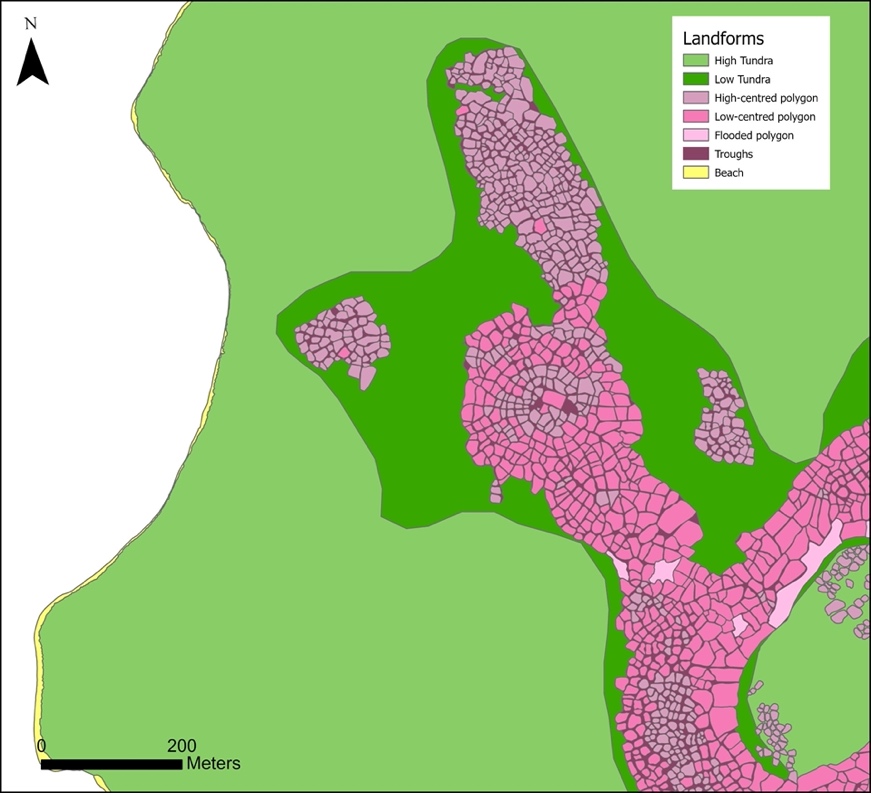
## **Supplemental information**



**Figure S1**. Temporal variability of the lake surrounding RP polygonal ground (North of lake), showcasing stability since 1947. Historical imagery was supplied by Natural Resources Canada Air Photo Library.



**Figure S2**. Map of Reindeer Point sampling site with delimitation of geomorphological polygonal forms. Forms were drawn based on aerial imagery from 2022.

**Table S1.** Total area occupied by geomorphological landforms, calculated based on manual mapping of landforms in QGIS.

|  |  |  |
| --- | --- | --- |
| **Landforms** | **Total Area (m2)** | **Total Area (km2)** |
| Beach | 6015.912428 | 0.006015912 |
| Low-centred polygon | 118900.6299 | 0.11890063 |
| High-centred polygon | 80309.59466 | 0.080309595 |
| Troughs | 36151.97771 | 0.036151978 |
| Low Tundra | 164338.4158 | 0.164338416 |
| High Tundra | 942531.362 | 0.942531362 |

A comparison of a chart

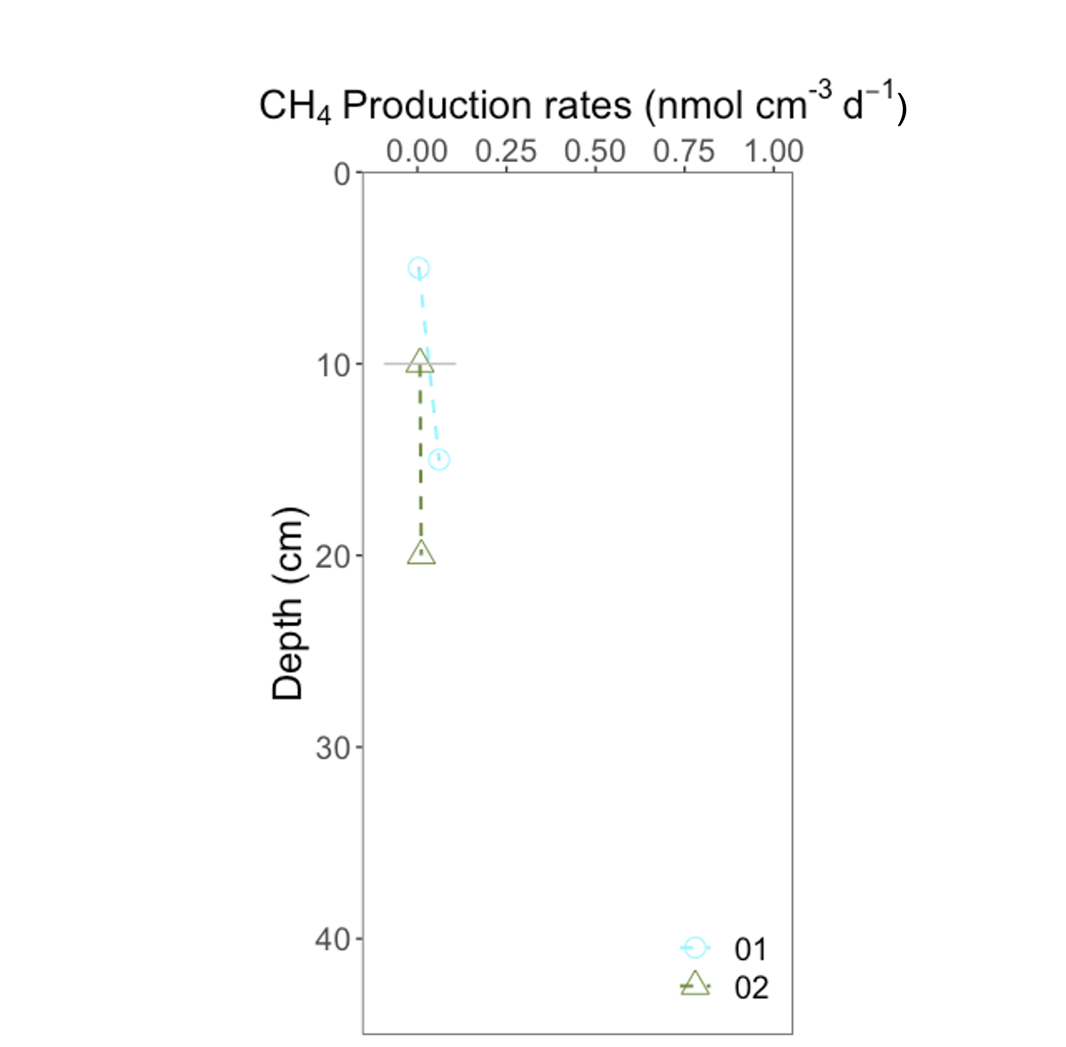
Description automatically generated with medium confidence

**Figure S3**. Cl- concentrations in (a) Harbor + Toker Point and (b) Reindeer Point sediments used in the incubation experiment.

A graph of a diagram

Description automatically generated with medium confidence

**Figure S4**. 13C of (a) Harbor + Toker Point and (b) Reindeer Point sediments used in the incubation experiment. Values measured within the range of terrestrial OM (Fu et al., 1993).



**Figure S5**. CH4 production rates in marine sediments cores collected from the Harbor. The error bar on measured values represents the standard deviation on the mean of triplicates.