

# 2000 years of ice wedge polygon development on the Yukon Coastal Plain

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## Introduction

Regional climate variability and associated changes to landscape, permafrost and vegetation during the last 2000 years are still largely unknown for the Yukon Coastal Plain (Fig. 1 shows a map of the region). Plant macrofossils from peat sequences recovered from the active layer of polygon mires are being used to reconstruct polygon development during that time. The present state of the investigated mires provides a reference for the past development.

## Preliminary results

### Komakuk Beach site

### Roland Bay site

#### Polygon morphology

Polygon type	low-centered polygon	high-centered polygon
Polygon dimensions	10x10 m	8x10 m
Active layer depth	26-35 cm	22-33 cm
Max. height differences	29 cm	20 cm



#### Polygon vegetation

**Centre:** *Betula glandulosa*, *Salix fuscescens*, *Ledum decumbens*, *Vaccinium vitis-idaea*, *Empetrum nigrum*, *Rubus chamaemorus*, mosses, grasses, sedges  
**Elevated centre:** *Betula glandulosa*, *Salix pulchra*, *Eriophorum vaginatum*, *Vaccinium vitis-idaea*, *Polygonum bistorta*, *P. viviparum*, *Stellaria longipes*, *Hierochloë alpina*  
**Ridges:** *Betula glandulosa*, *Salix pulchra*, *Eriophorum vaginatum*, *Ledum decumbens*, *Vaccinium vitis-idaea*, *Empetrum nigrum*, *Rubus chamaemorus*, lichens, mosses, grasses, sedges  
**Margins:** *Betula glandulosa*, *Salix fuscescens*, *Vaccinium vitis-idaea*, *Empetrum nigrum*, *Dryas integrifolia*, *Rubus chamaemorus*, *Pedicularis lapponica*, *P. sudetica*, mosses, lichens, grasses, sedges

#### Interpolygonal pond water

pH	5.47 – 5.97	5.38 – 5.40
el. cond.	56.7 – 77.8 $\mu\text{S/cm}$	98.1 – 102.1 $\mu\text{S/cm}$

#### Interstitial water

pH	3.88 – 5.73 (centre to ridge)	3.63 – 4.55 (margin to centre)
el. cond.	75.1 – 212.7 $\mu\text{S/cm}$ (ridge to centre)	90.3 – 464.0 $\mu\text{S/cm}$ (centre to margin)

#### Peat monoliths

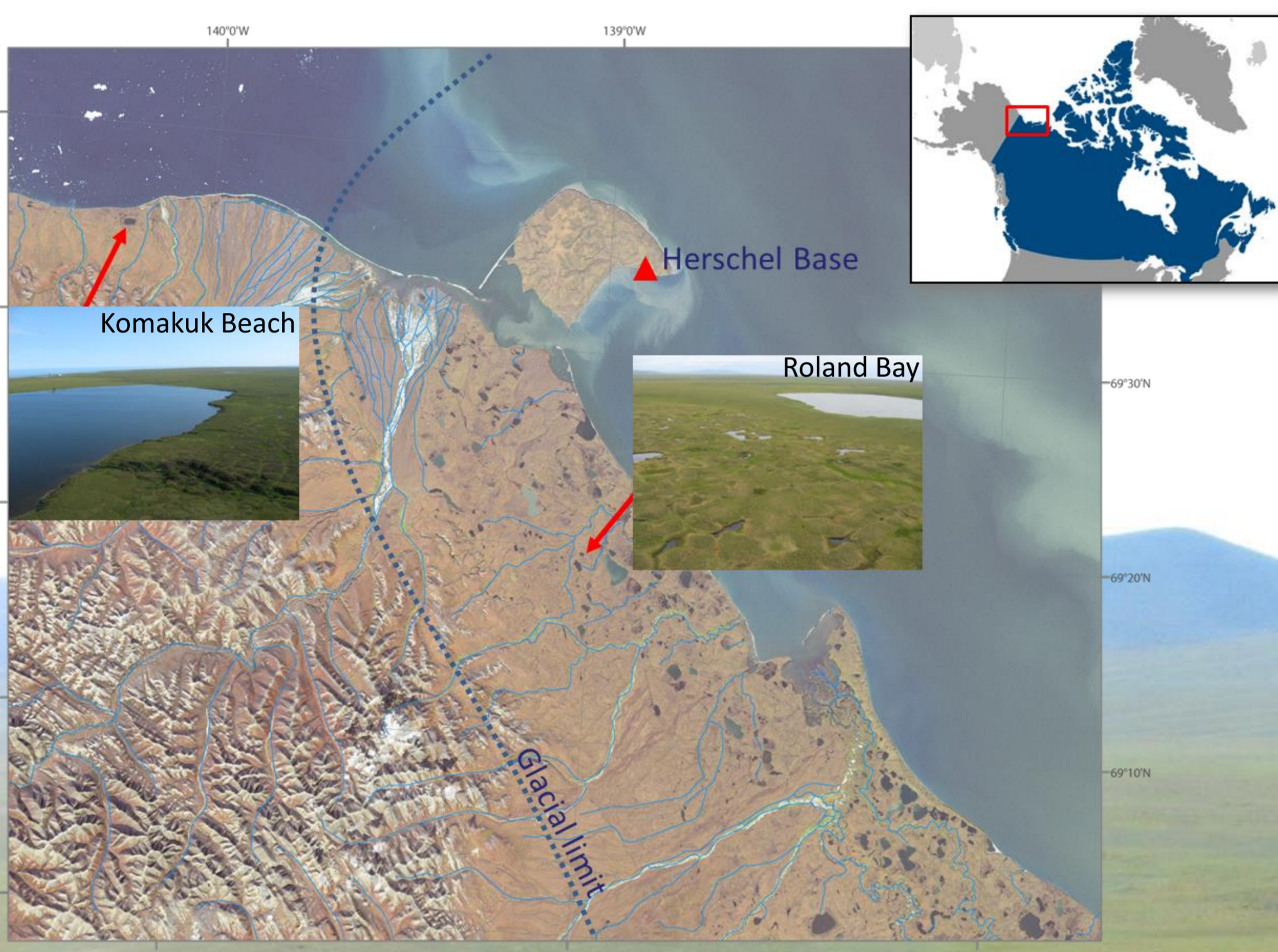


Fig. 1 Map of Yukon Coastal Plain and Herschel Island, showing location of field sites and western limit of former Laurentide Ice Sheet (map base compiled by Lantuit)

## Material and Methods

In August 2012 two sites on the Yukon Coastal Plain in the northwest Canadian Arctic have been visited. At each site a Polygon mire has been surveyed and sampled. Using peat sequences from polygon mires as palaeoarchives gives the opportunity to study the local development of vegetation and permafrost. The method spectrum is illustrated in Fig. 2.

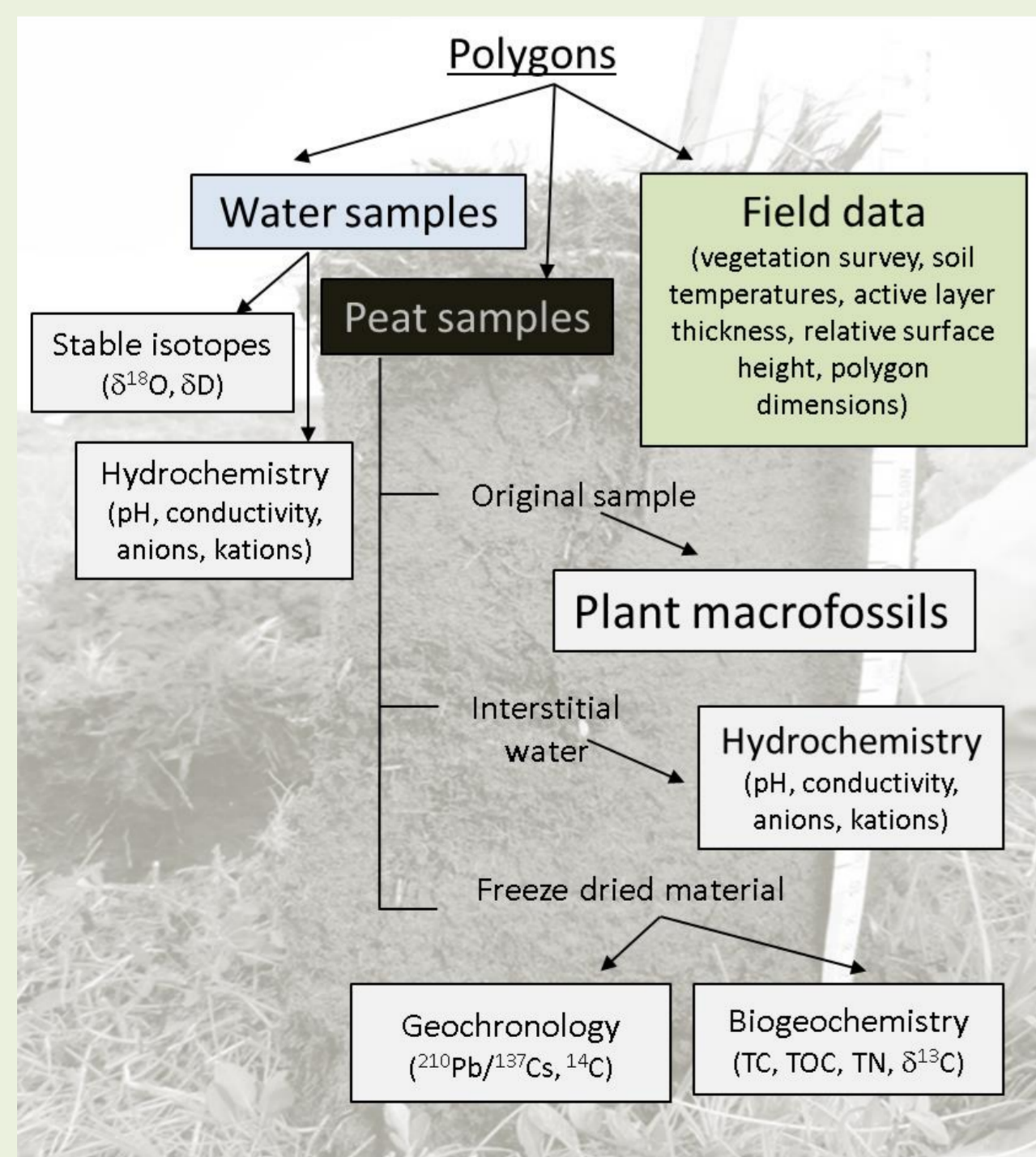


Fig. 2 Summary of sample material types and analyses

