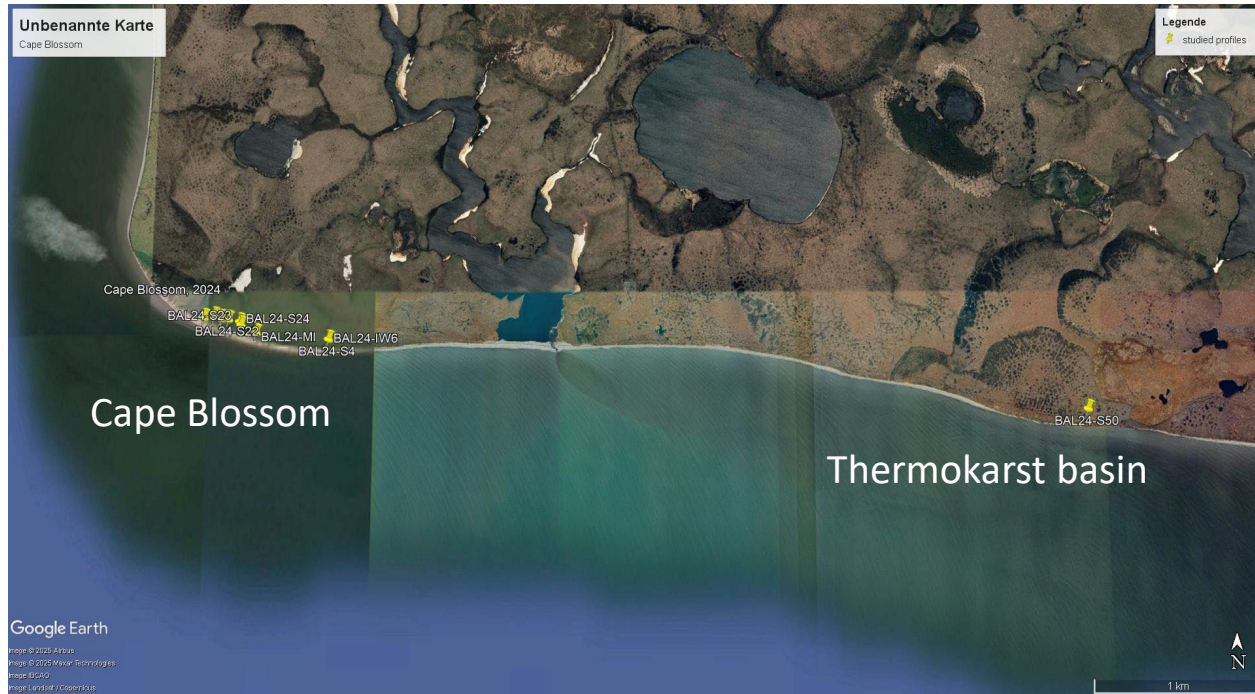


# Sediment and ground-ice studies on the Baldwin Peninsula (West Alaska) during spring and summer 2024

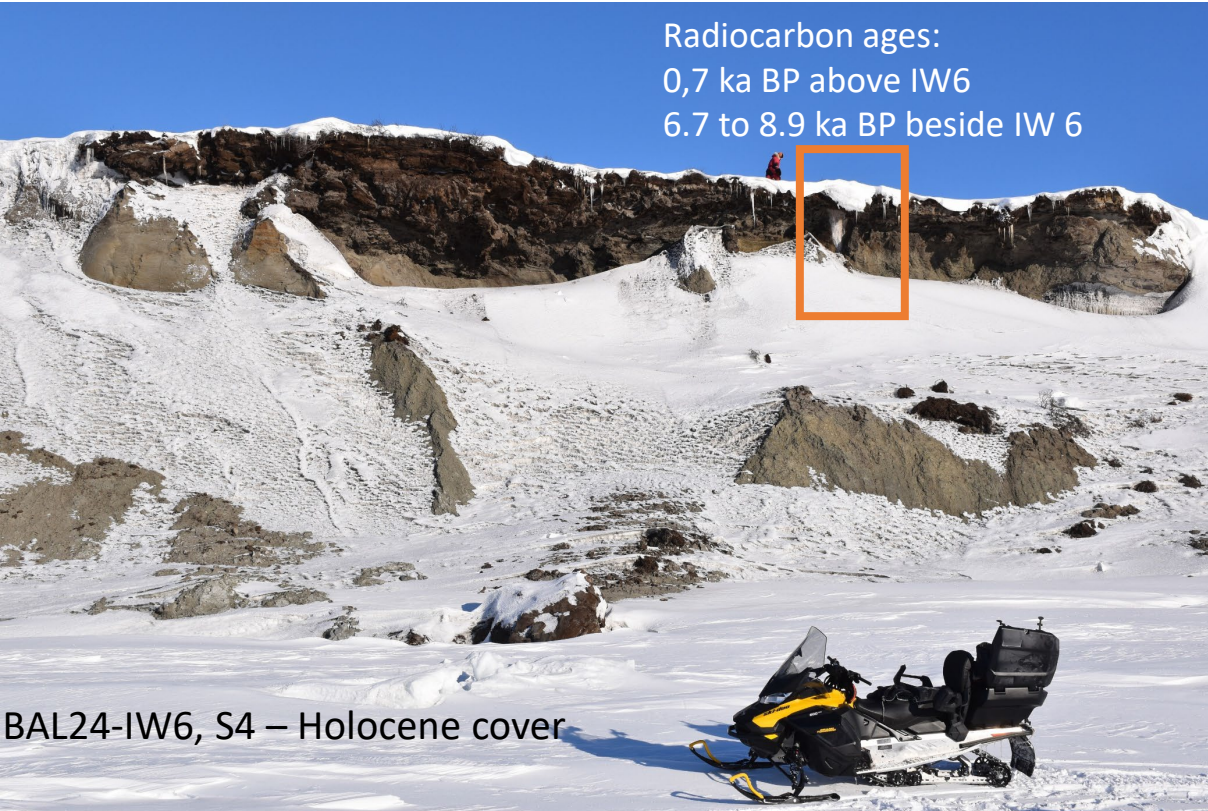
Lutz Schirrmeister, Hanno Meyer, Thomas Opel



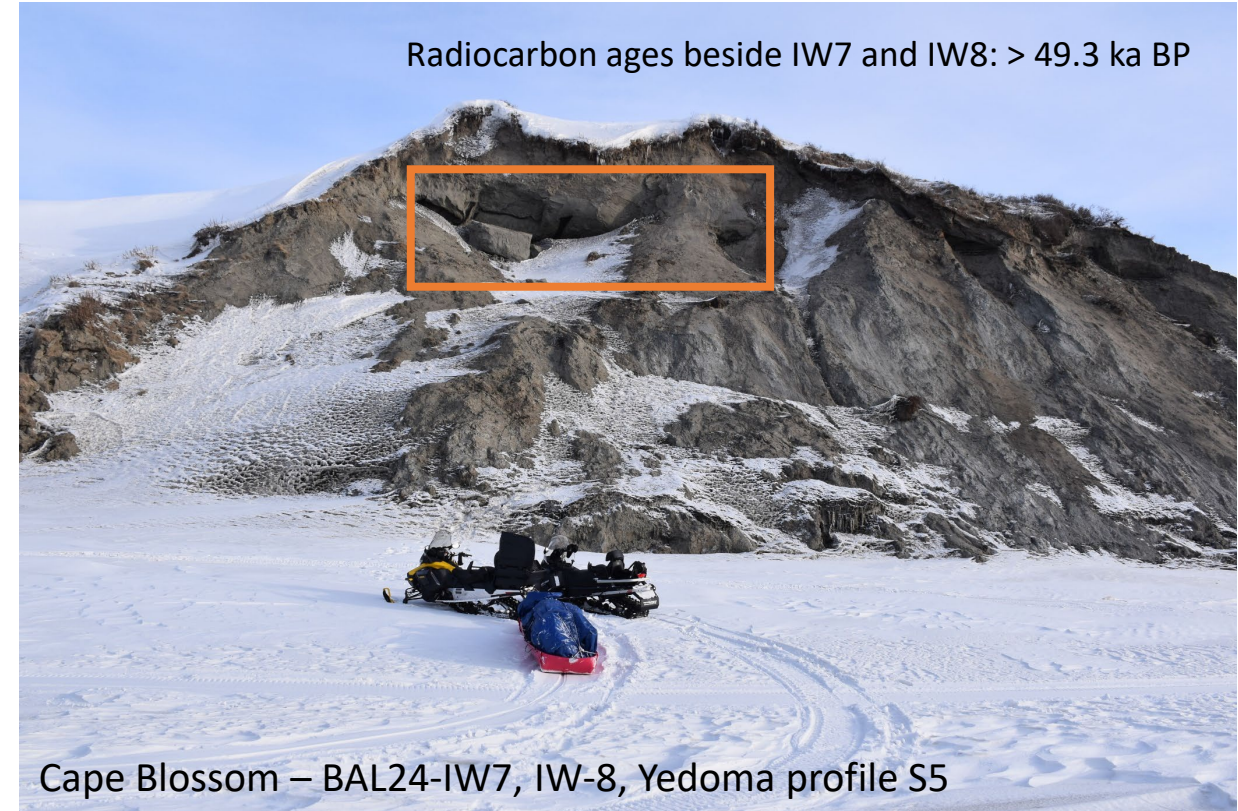
## Study areas



# Studied profiles at the Cape Blossom site during spring 2024



BAL24-MI (clear massive ice below glacial till, glaciofluvial sediments)

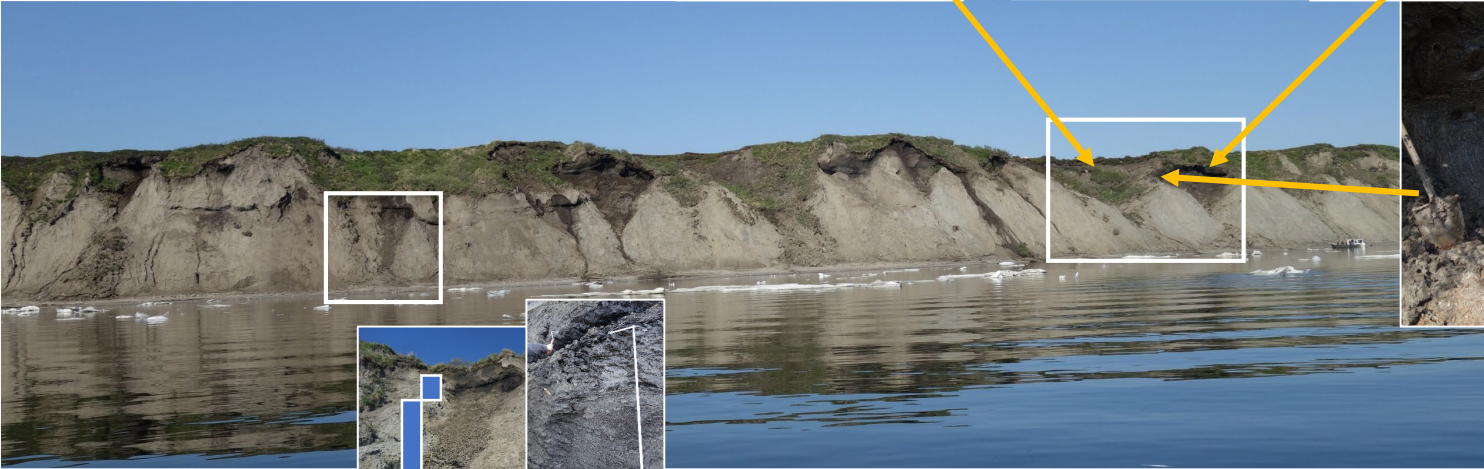


# Studied profiles at the Cape Blossom site during summer 2024

The uppermost Yedoma profile BAL24-S22, ice wedges IW-20, IW-21



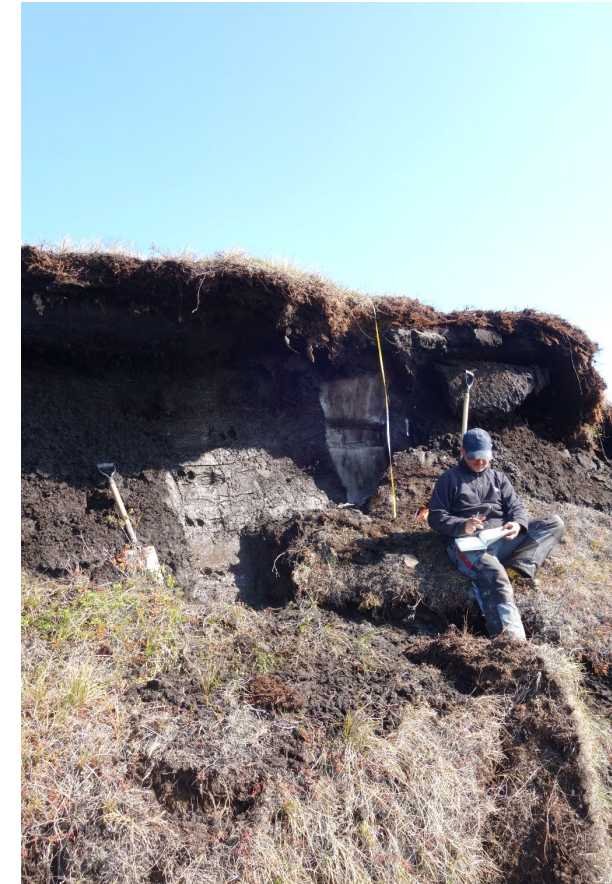
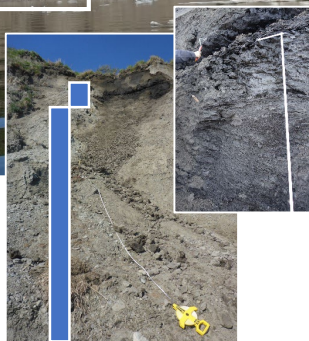
The middle Yedoma profile BAL24-S24 and the ice wedges IW-22, IW-23



The lowermost Yedoma profile BAL24-S23 and ice-wedge IW-24

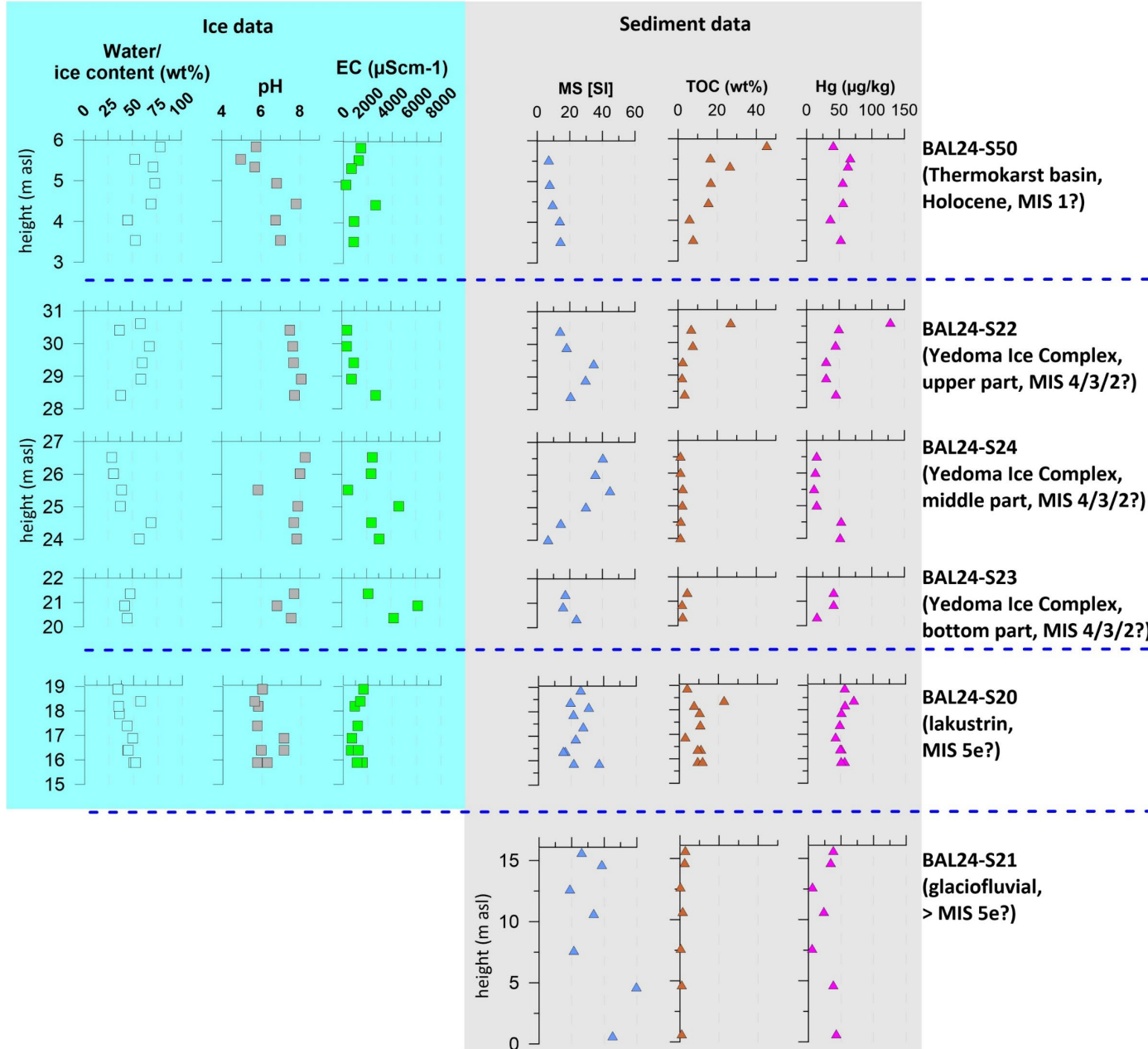


The assumed Last Interglacial (MIS 5e?) site BAL24-S20 and the pre MIS 5e (?) glaciofluvial site BAL24-S21 below



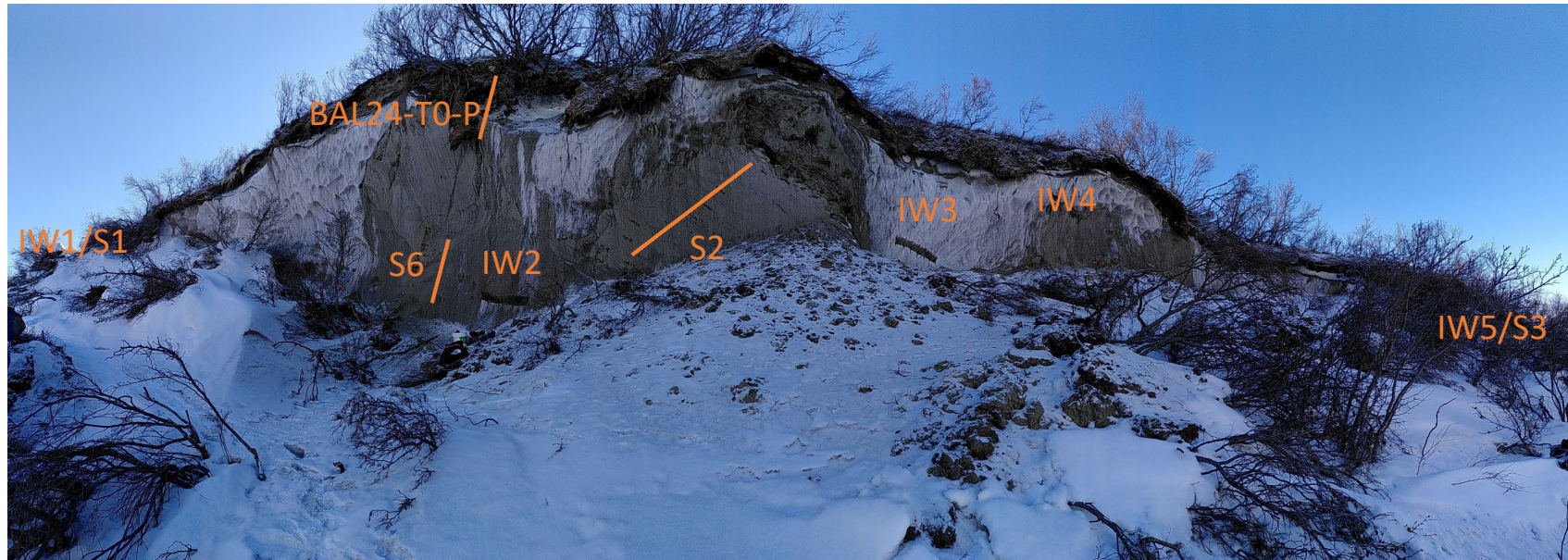
The thermokarst profile BAL24-S50 and ice-wedge IW-50 about 5 km east of Cape Blossom

# First analytical results from the Cape Blossom profiles (summer 2024)



- Ice content, pH values, and electrical conductivity (EC) data of segregation ice
- Mass specific magnetic susceptibility (MS) shows the content of magnetic minerals
- Total organic carbon (TOC) content and Mercury (Hg) content of the sediment
- the Cape Blossom thermokarst basin profile BAL24-S50 has the highest ice contents and the lowest magnetic susceptibility (MS) values
- pH of segregated ice is different between interglacial thermokarst (MIS 5e, MIS 1) and stadial-interstadial (MIS 4/3/2) deposits

# Profiles and ice wedges at the Schaefer Lake drainage gully studied in spring and summer of 2024

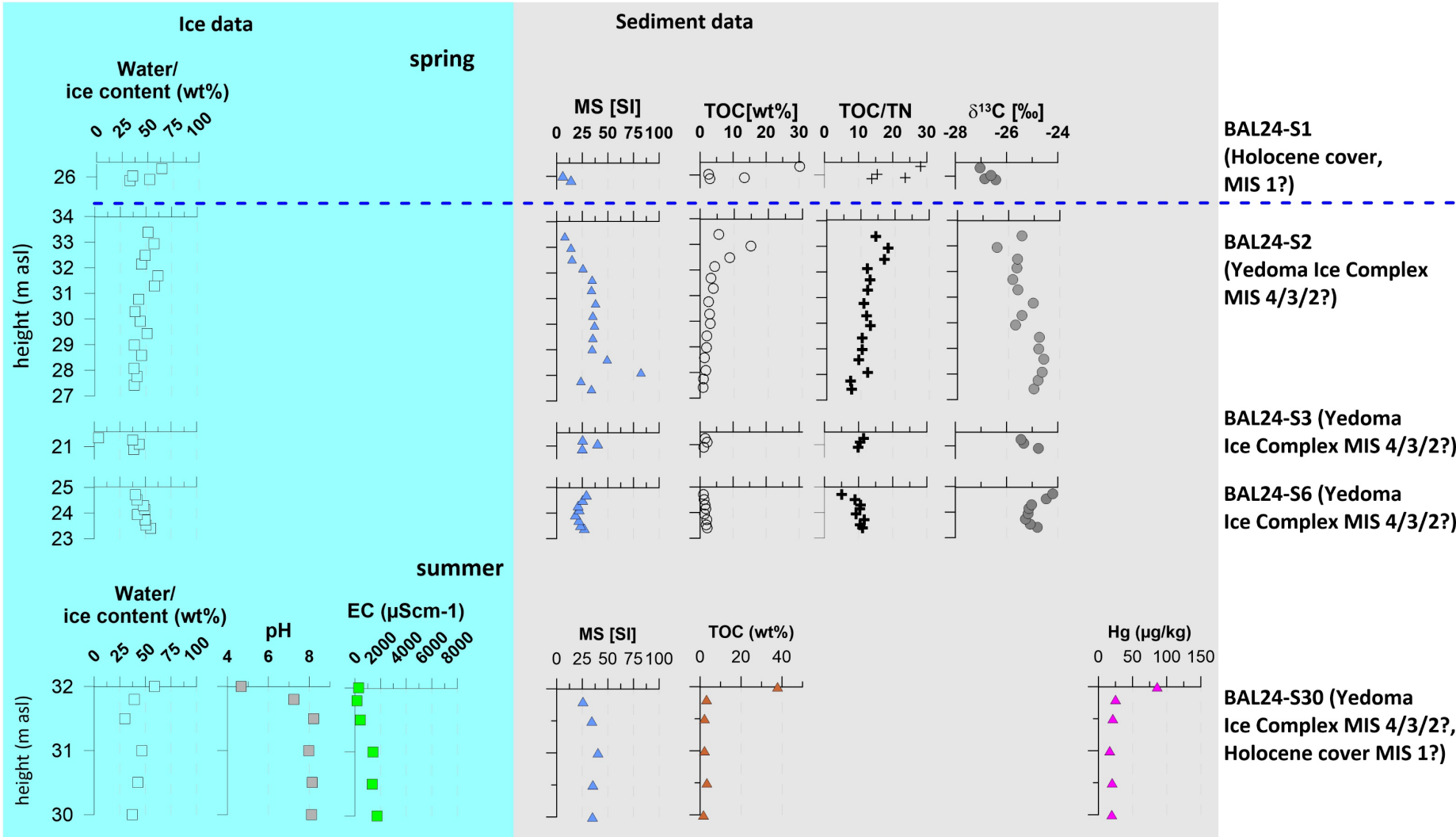


Radiocarbon dates from drill cores in the bottom of the drained Schaefer Lake are infinite (between > 38.1 and > 52.8 ka BP)

Thermokarst lake 3 km south of the Schaefer site, Yedoma and Holocene profile BAL24-S40 + IW40



# First analytical results from the Schaefer site profiles (spring and summer 2024)



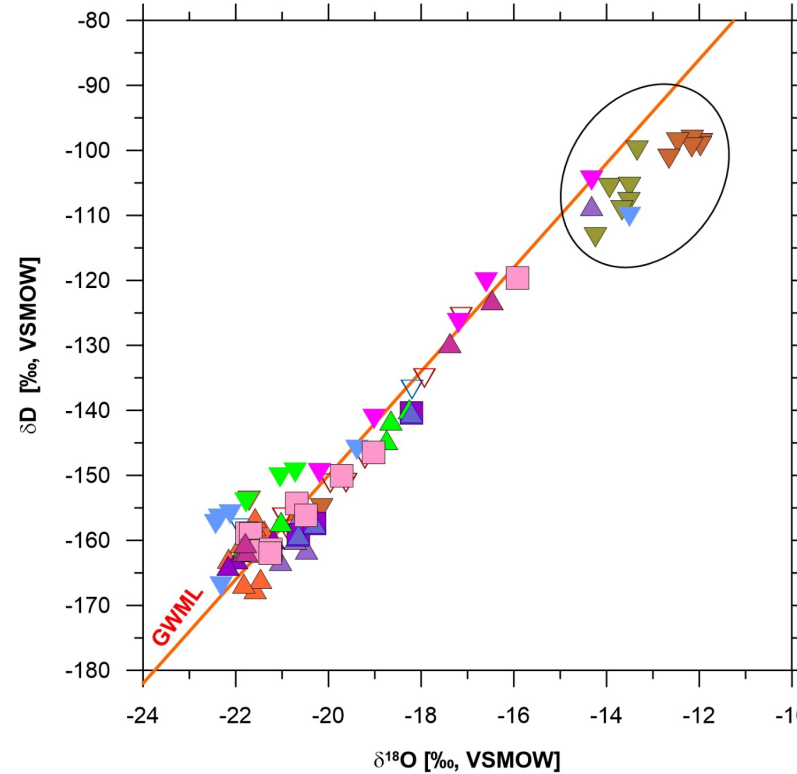
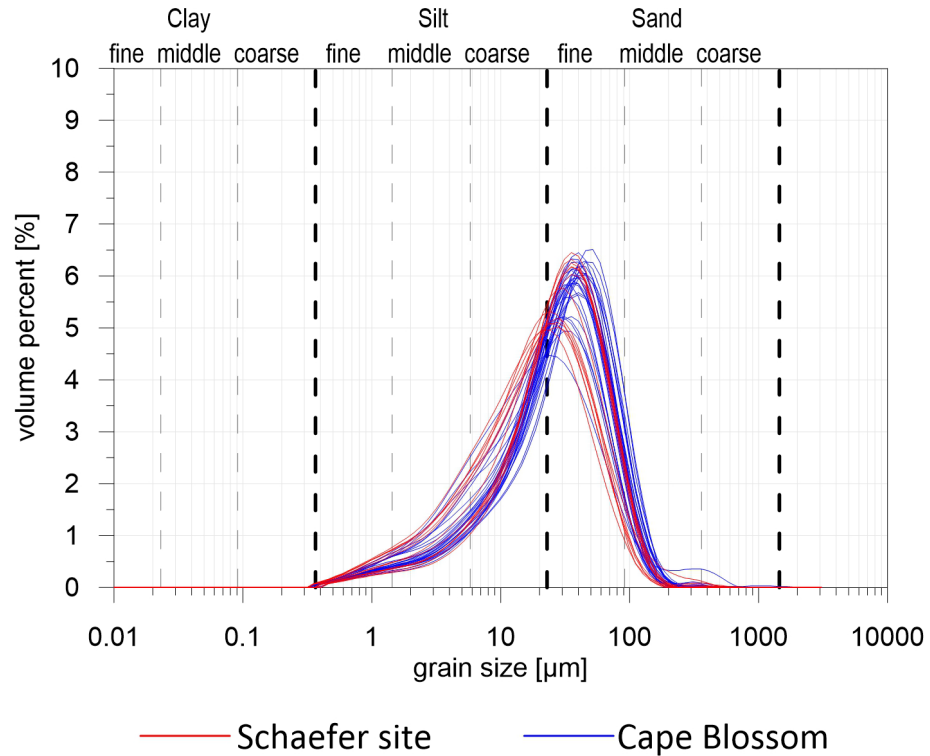
The highest ice and organic carbon contents characterize Holocene samples.

There are some shifts in the magnetic susceptibility values in Schaefer site Yedoma profiles. That could be results of changing source material

# Grain-size and stable water isotope studies

Grain-size distributions of 41 samples from Yedoma Ice Complex exposures of both study areas and their Holocene cover (spring 2024)

First results of stable water isotope studies in a co-isotope plot from both sites, segregation (texture) ice and two ice wedges



- ▼ texture ice BAL24-S50 (C. Blossom thermokarst, MIS 1?)
- ▽ texture ice BAL24-S5 (Cape Blossom, MIS 4/3/2?)
- ▽ texture ice BAL24-S4 (Cape Blossom, MIS 1?)
- ▼ texture ice BAL24-S20 (Cape Blossom, MIS 5e?)
- ▼ texture ice BAL24-S22 (Cape Blossom, MIS 4/3/2?)
- ▼ texture ice BAL24-S23 (Cape Blossom, MIS 4/3/2?)
- ▽ texture ice BAL24-S24 (Cape Blossom, MIS 4/3/2?)
- ice wedge\_BAL24\_IW40 (near Kotzebue, MIS 4/3/2?)
- ▲ texture ice BAL24-S40 (near Kotzebue, MIS 4/3/2?)
- ice wedge\_BAL24\_IW30 (Schaefer site, MIS 4/3/2?)
- ▲ texture ice BAL24-S30 (Schaefer site, MIS 4/3/2?)
- ▲ texture ice BAL24-S6 (Schaefer site, MIS 4/3/2?)
- ▲ texture ice BAL24-S3 (Schaefer site, MIS 4/3/2?)
- ▲ texture ice BAL24-S2 (Schaefer site, MIS 4/3/2?)
- ▲ texture ice BAL24-S1 (Schaefer site, MIS 1?)

Grain-size curves of Yedoma profiles are unimodal in both study sites (mean grain size  $37.1 \pm 5.3 \mu\text{m}$ ) suggesting dominant aeolian transport

- The MIS 5e(?) and MIS 1 thermokarst segregated ice have the highest stable water isotope values, suggesting warmer climate conditions

## Conclusions

- Yedoma Ice Complex deposits on Baldwin Peninsula are similar to other Yedoma sites of Beringia.
- The thickness (10-15 m) is lower as in western Beringia
- Cape Blossom contains a long Late Quaternary paleoenvironmental archive (< MIS 5 to MIS 1) with a large variety of depositional settings suggesting strong regional shifts in landscape dynamics
- Radiocarbon and Optical luminescence dating are in progress
- More laboratory analyses are also in progress
- Paleoenvironmental studies are planned in future

