CryoGRID

Thermal Modelling Workshop
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(CLM, WRF-NOAA, Flake, and CryoGRID)
Berlin, Germany
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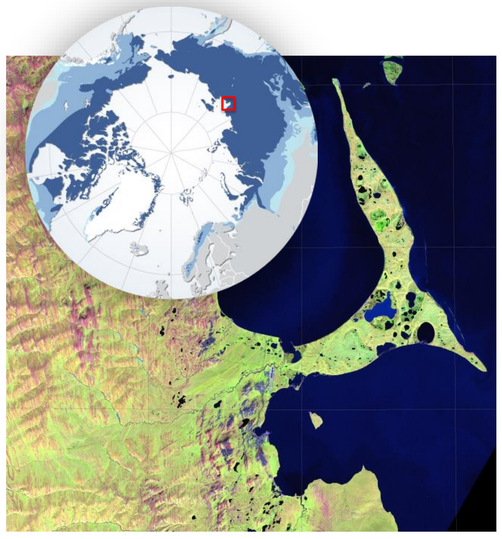
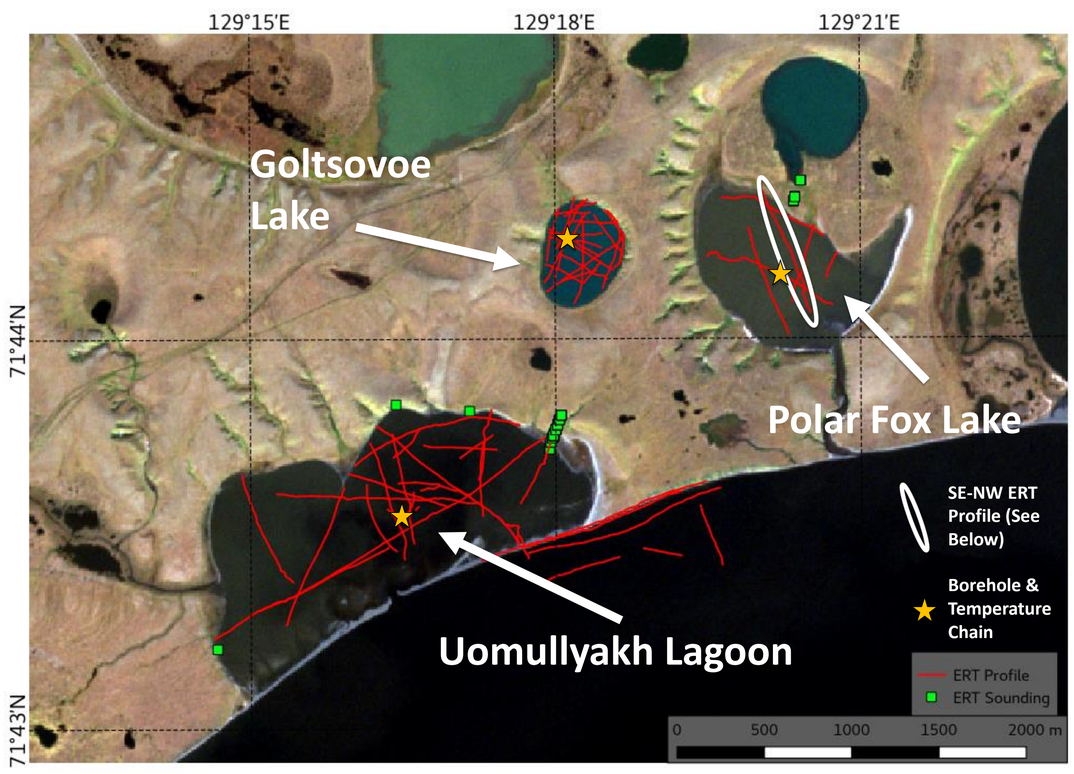
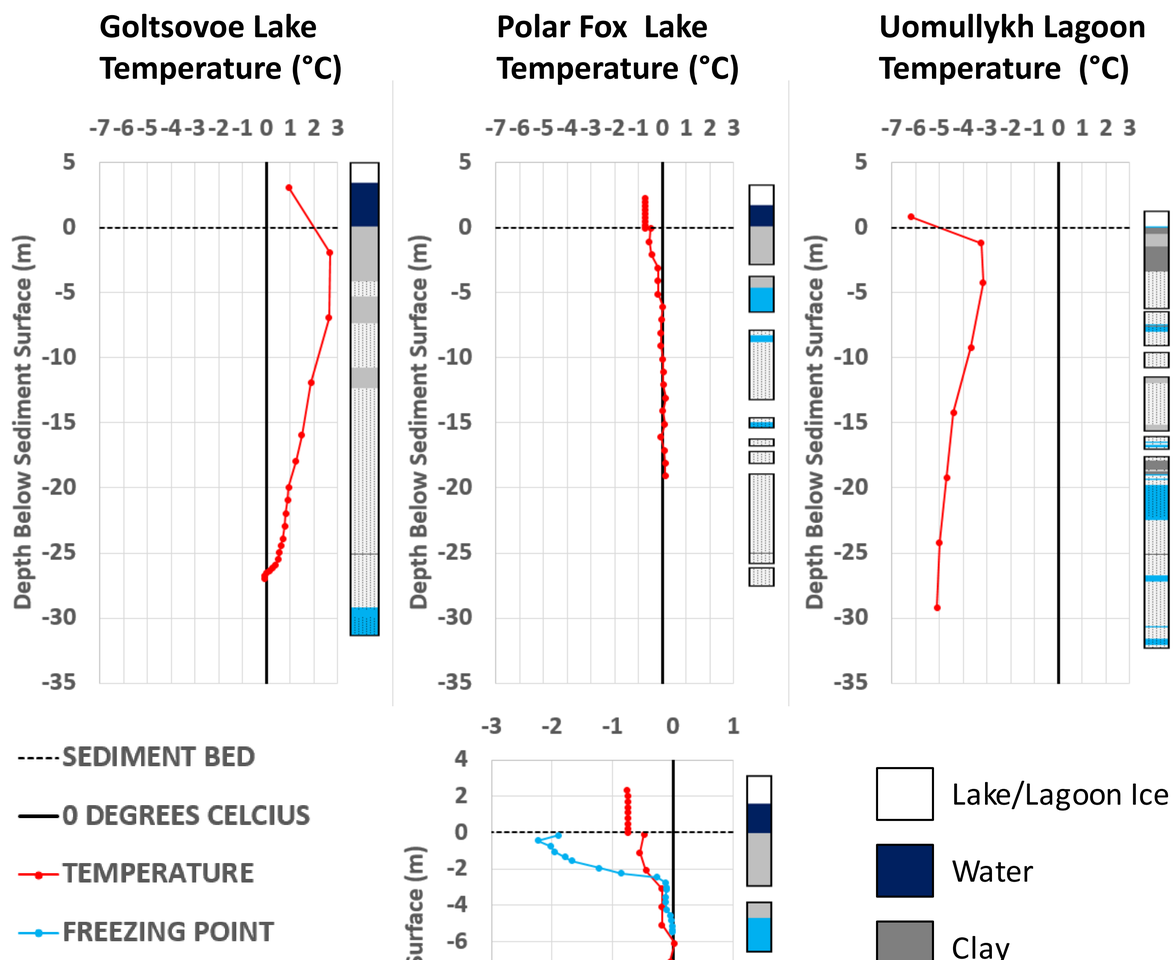
Geophysical surveys of sub-aquatic permafrost: talik dynamics and the influence of saltwater

Scientific Hypotheses

1) After a freshwater lake transforms into a saltwater lake, the underlying talik refreezes below a salty zone in shallow bathymetric areas.
2) After a freshwater lake transforms into a saltwater lake, the underlying talik is subject to deep seasonal freezing and potentially very slow permafrost formation in the lake centre where no grounded ice occurs.



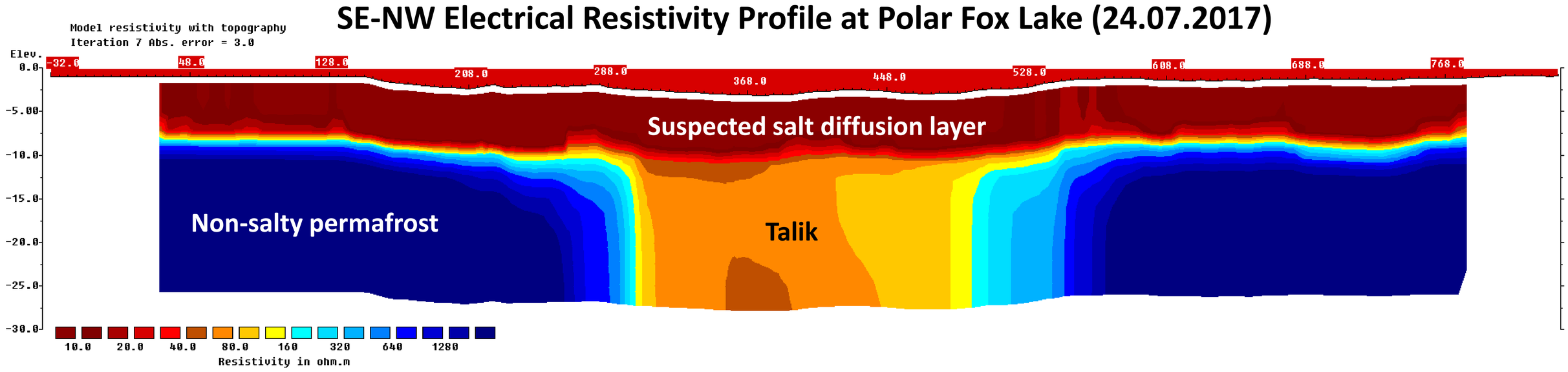




Freezing point derived from electrical conductivity of porewater.

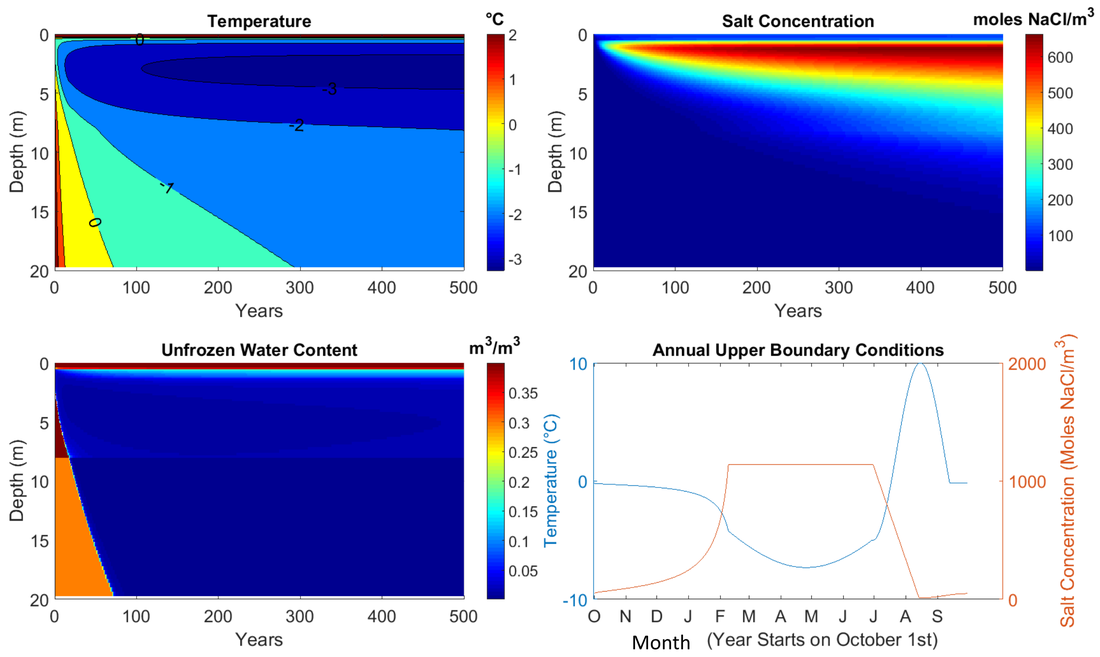
Noe that borehole soil descriptions are preliminary and subject to change upon sample return and laboratory work.

SE-NW Electrical Resistivity Profile at Polar Fox Lake (24.07.2017)

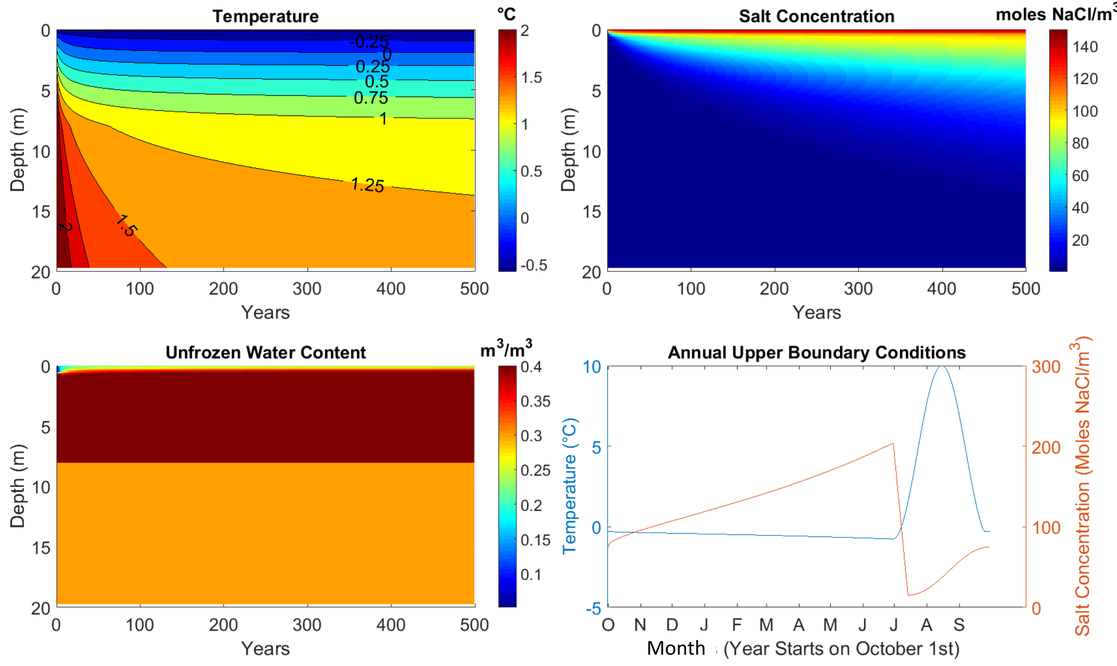


CryoGRID Modelling of Freshwater Talik Submerged by Saltwater at Polar Fox Lake

Grounded Ice Zone (1.2m Depth) – Yearly Model Outputs Every August 1st



Lake Centre (3m Depth) – Yearly Model Outputs Every April 24th



CryoGRID Reference:
Westermann, S., Schuler, T. V., Gisnås, K., & Etzelmüller, B. (2013). Transient thermal modeling of permafrost conditions in Southern Norway. *The Cryosphere*, *7*(2), 719.

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