Validation of Active Layer Thaw Depth and Related Parameters for EO4PAC

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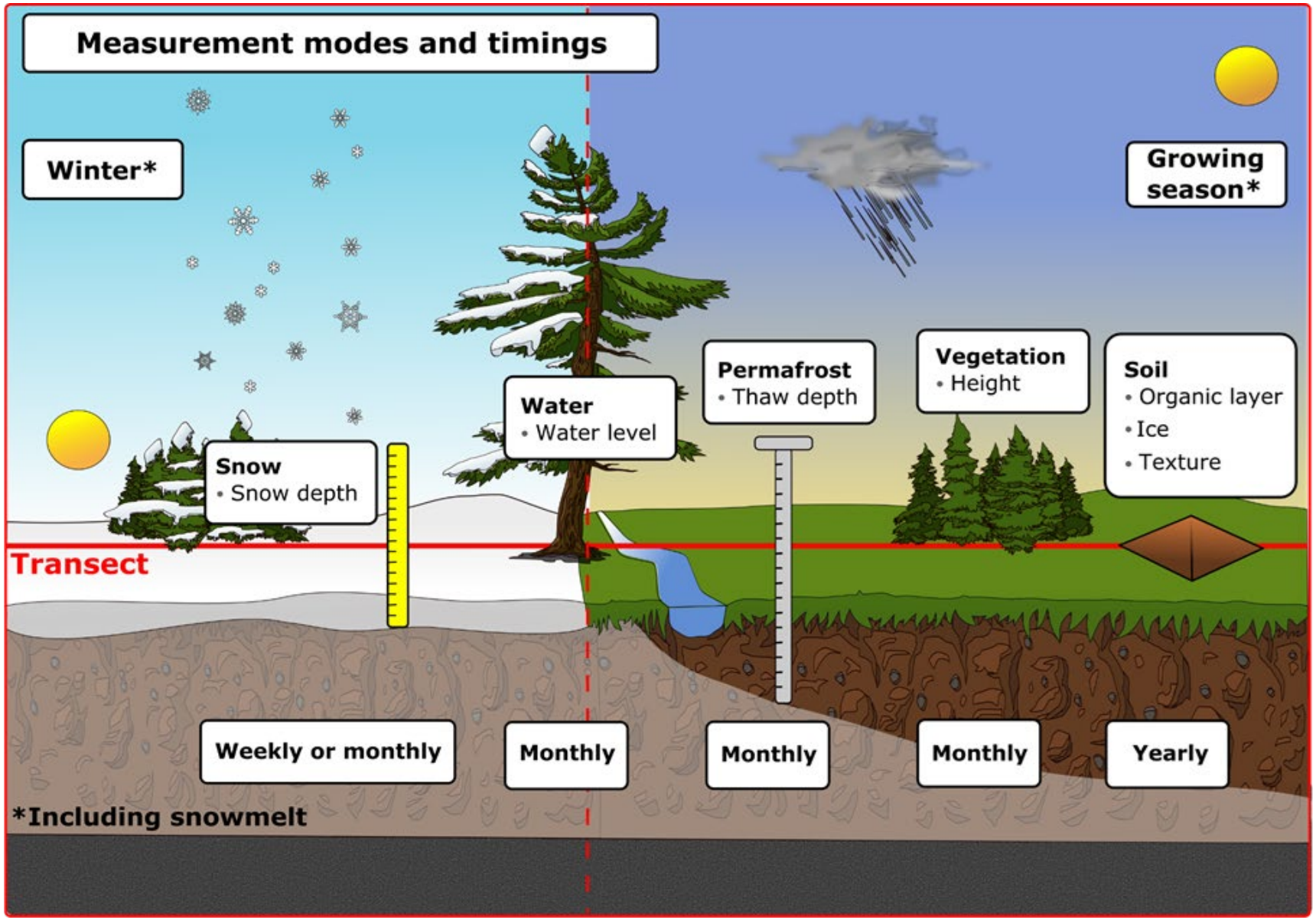
myThaw Dataset

Snow depth, vegetation height, water level and soil properties. (+ metadata)



Boike et al. 2021.
Arctic Science

Thaw depth validation (EO4PAC)

CALM

Averaged end of season thaw depth per year (1997 – 2019)

permafrost cci

modelled end-of-season thaw depth output from the ESA Permafrost Climate Change Initiative (2015-2019)

Earth's Future

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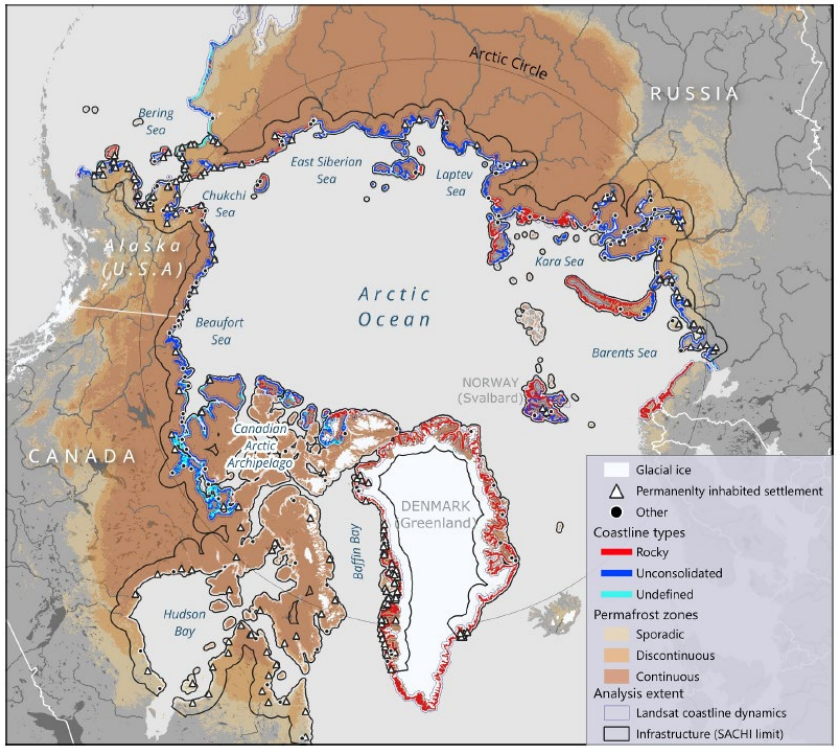
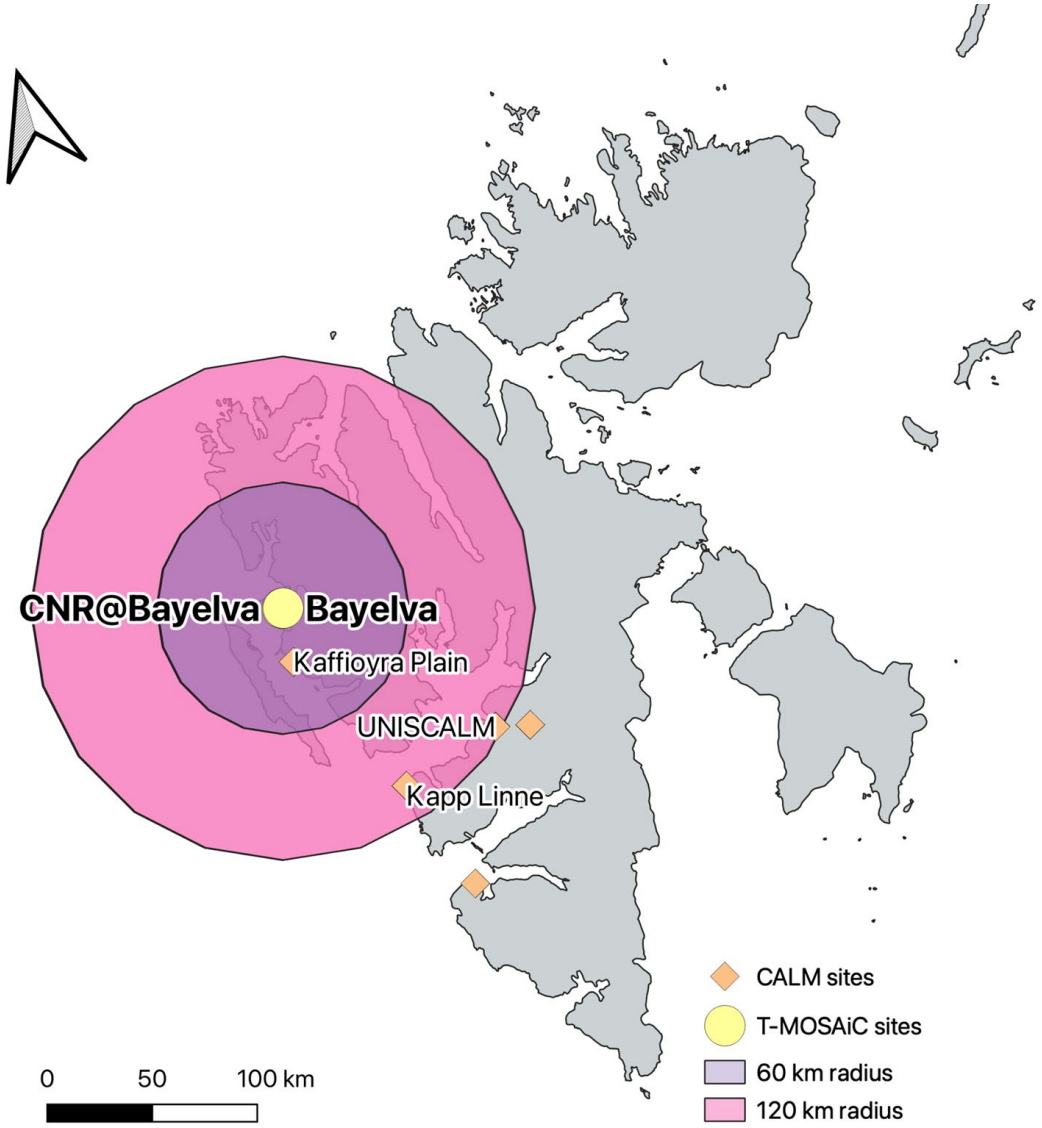
Pan-Arctic Assessment of Coastal Settlements and Infrastructure Vulnerable to Coastal Erosion, Sea-Level Rise, and Permafrost Thaw

Rodrigue Tanguy, Annett Bartsch, Ingmar Nitze, Anna Irrgang, Pia Petzold, Barbara Widhalm, Clemens von Baeckmann, Julia Boike, Julia Martin, Aleksandra Efimova ... See all authors

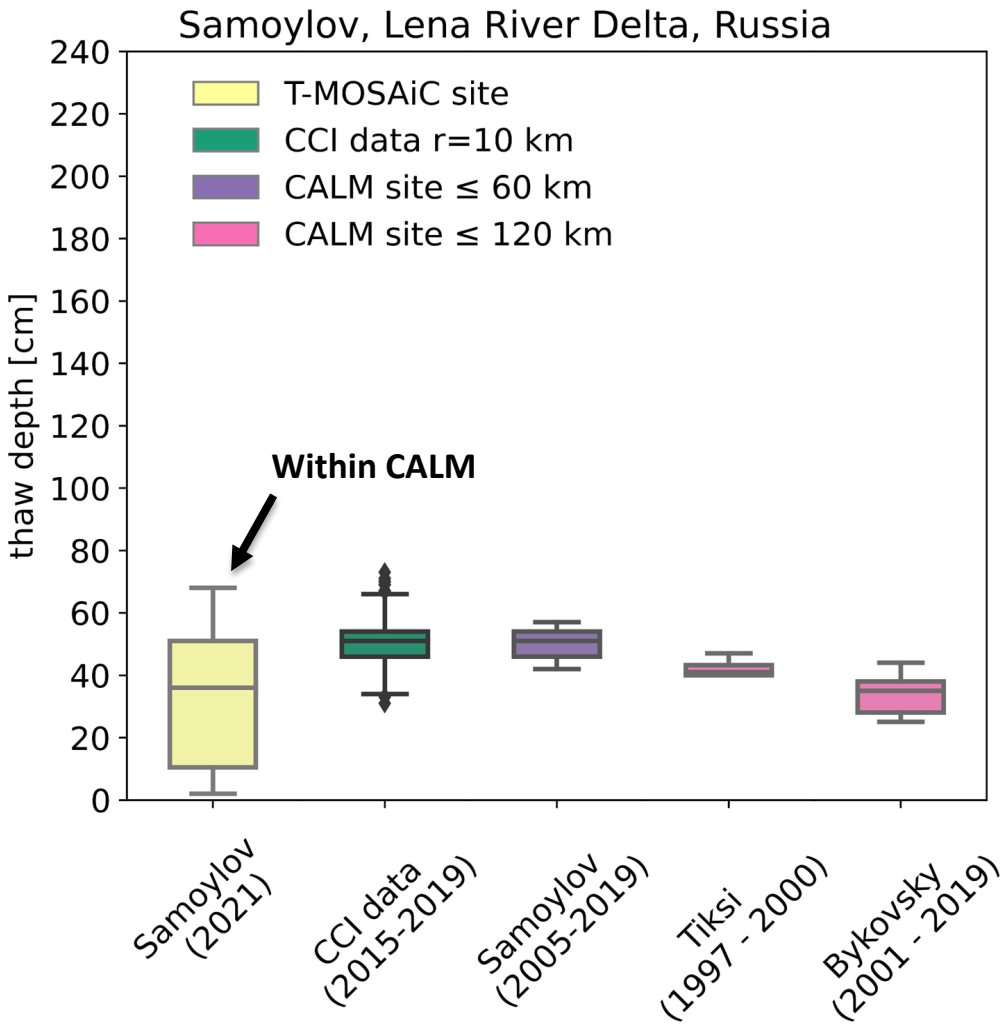


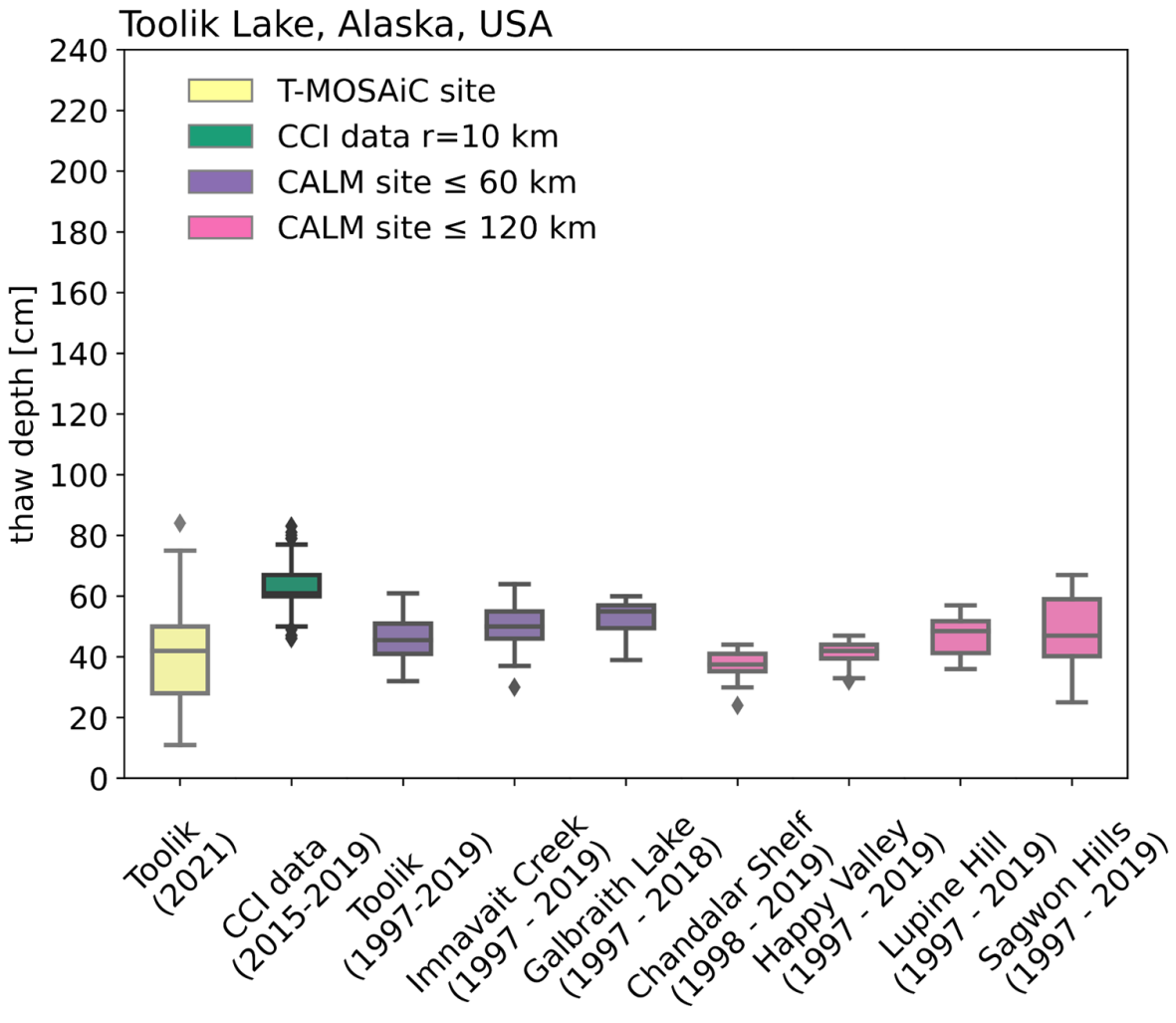
Thaw depth validation-example Svalbard



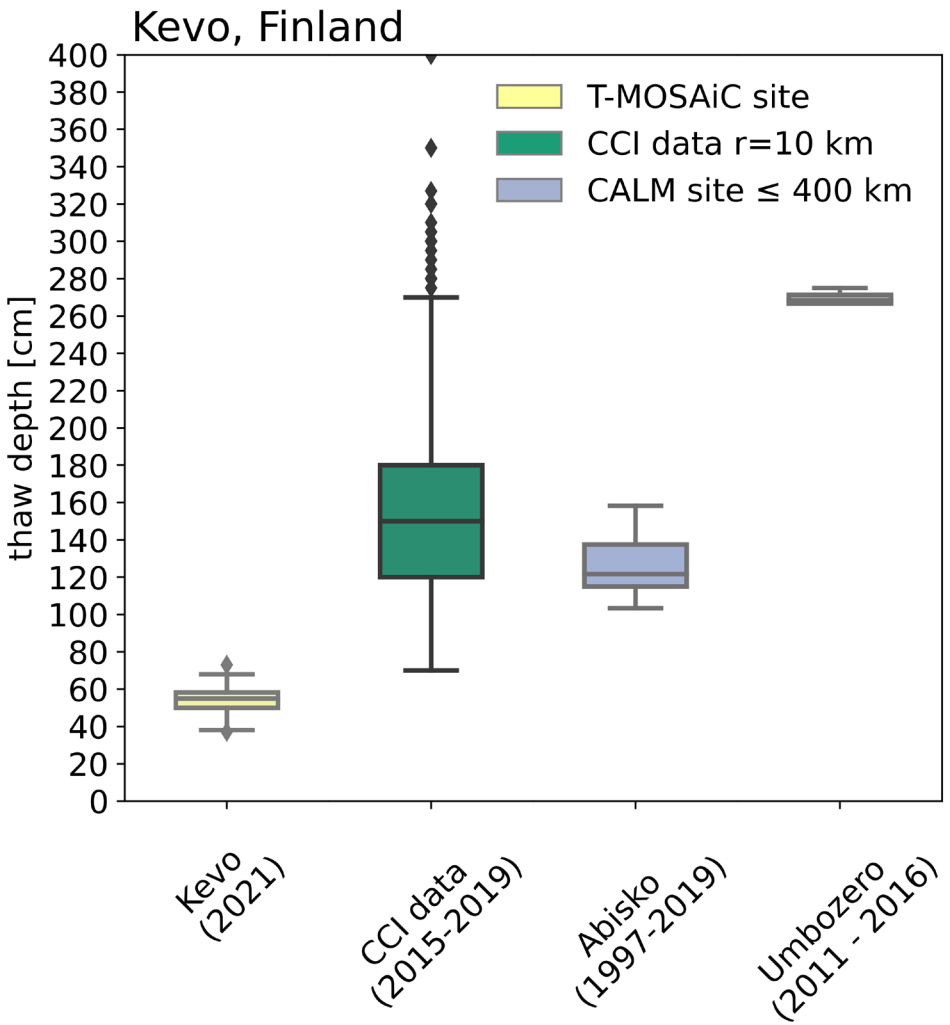
- thaw depth validation for the *Permafrost_cci* Active Layer Thickness (ALT) data set (for eight Arctic sites)
- shows where Permafrost_cci agrees or diverges from field observations

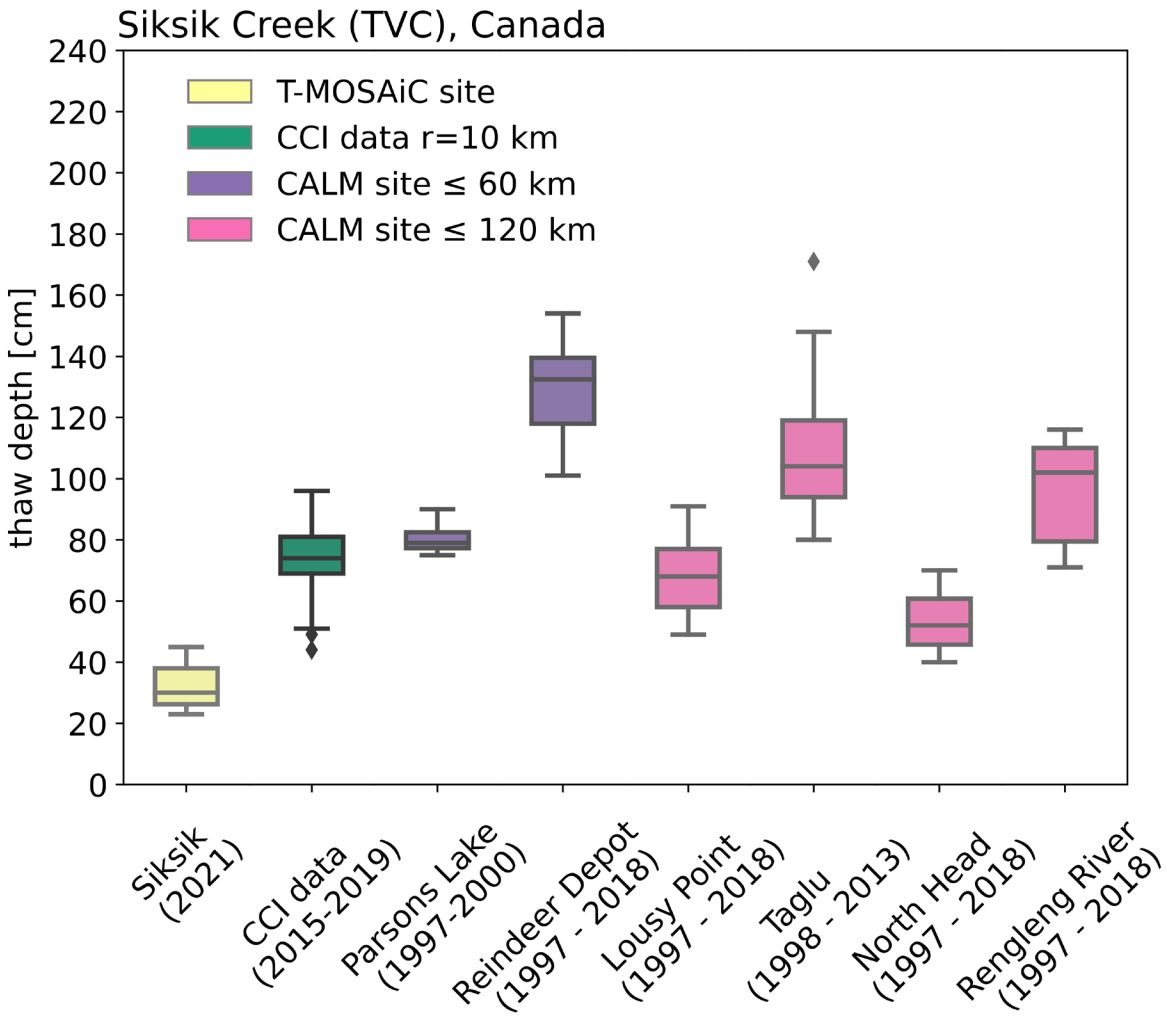
Samoylov (Siberia) and Toolik lake (Alaska) overall high agreement



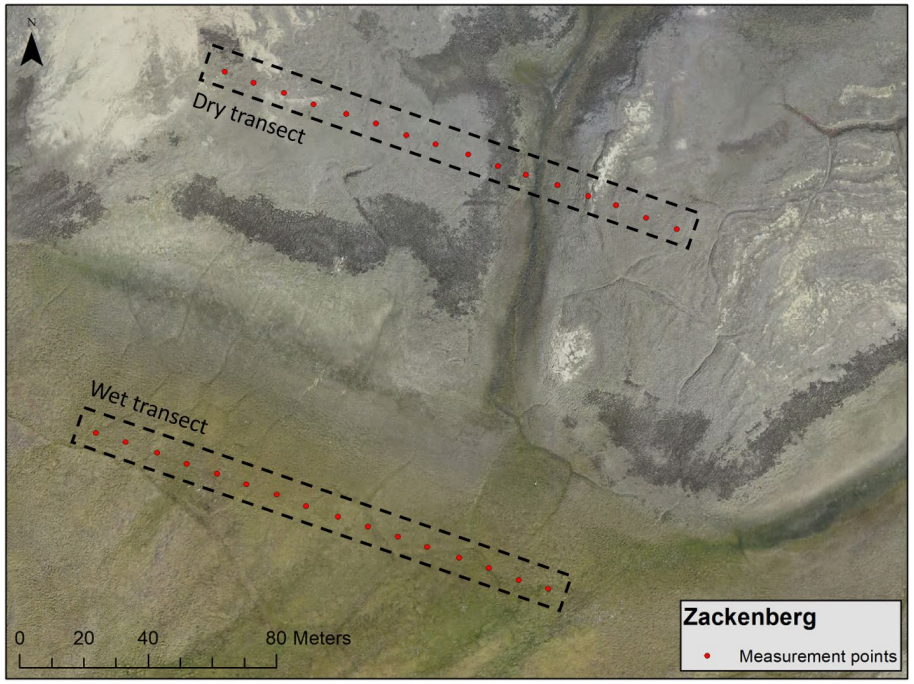


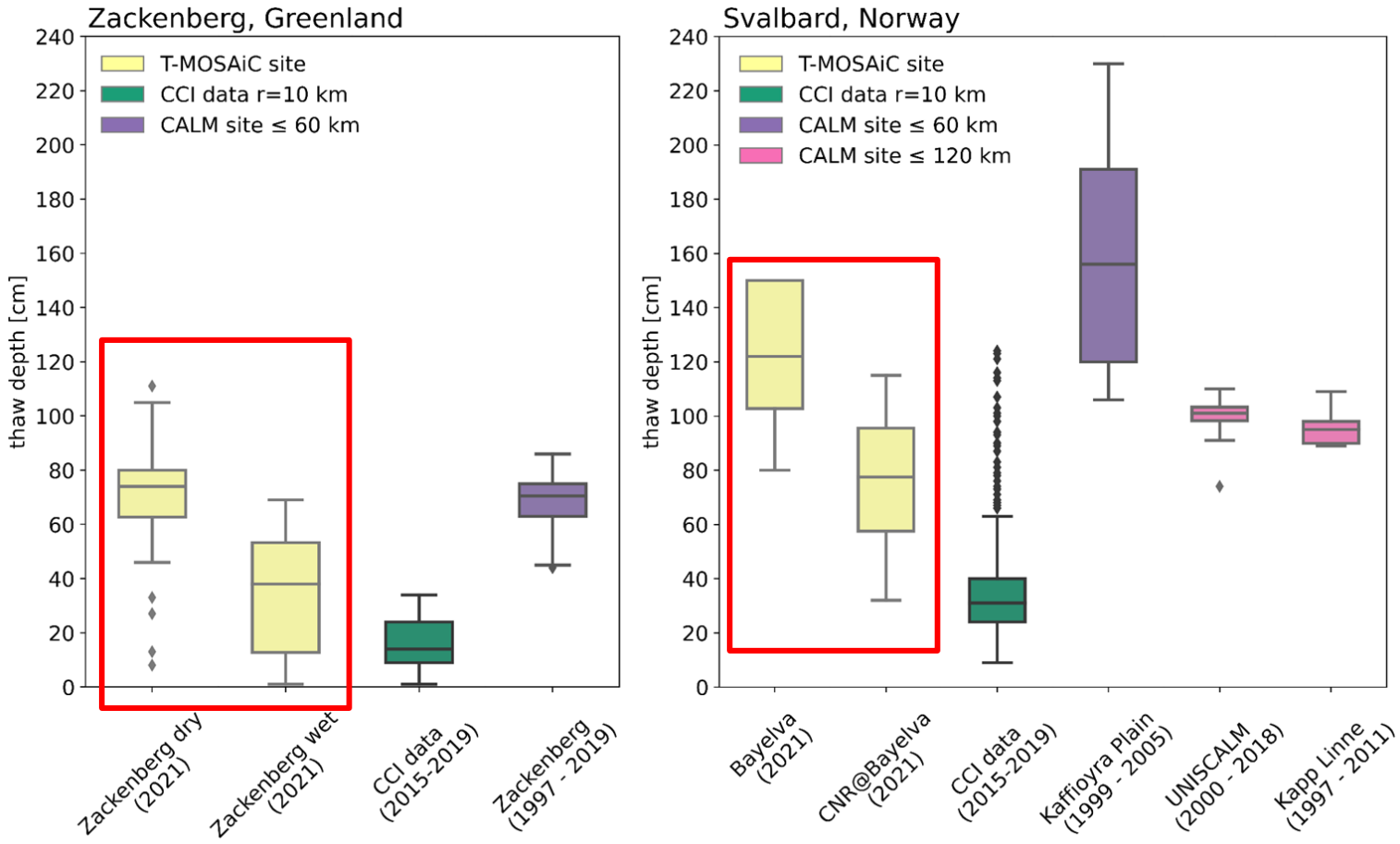
Kevo (Finnland) and Siksik (Canada) overestimated by CCI





Variability between close T-MOSAiC sites

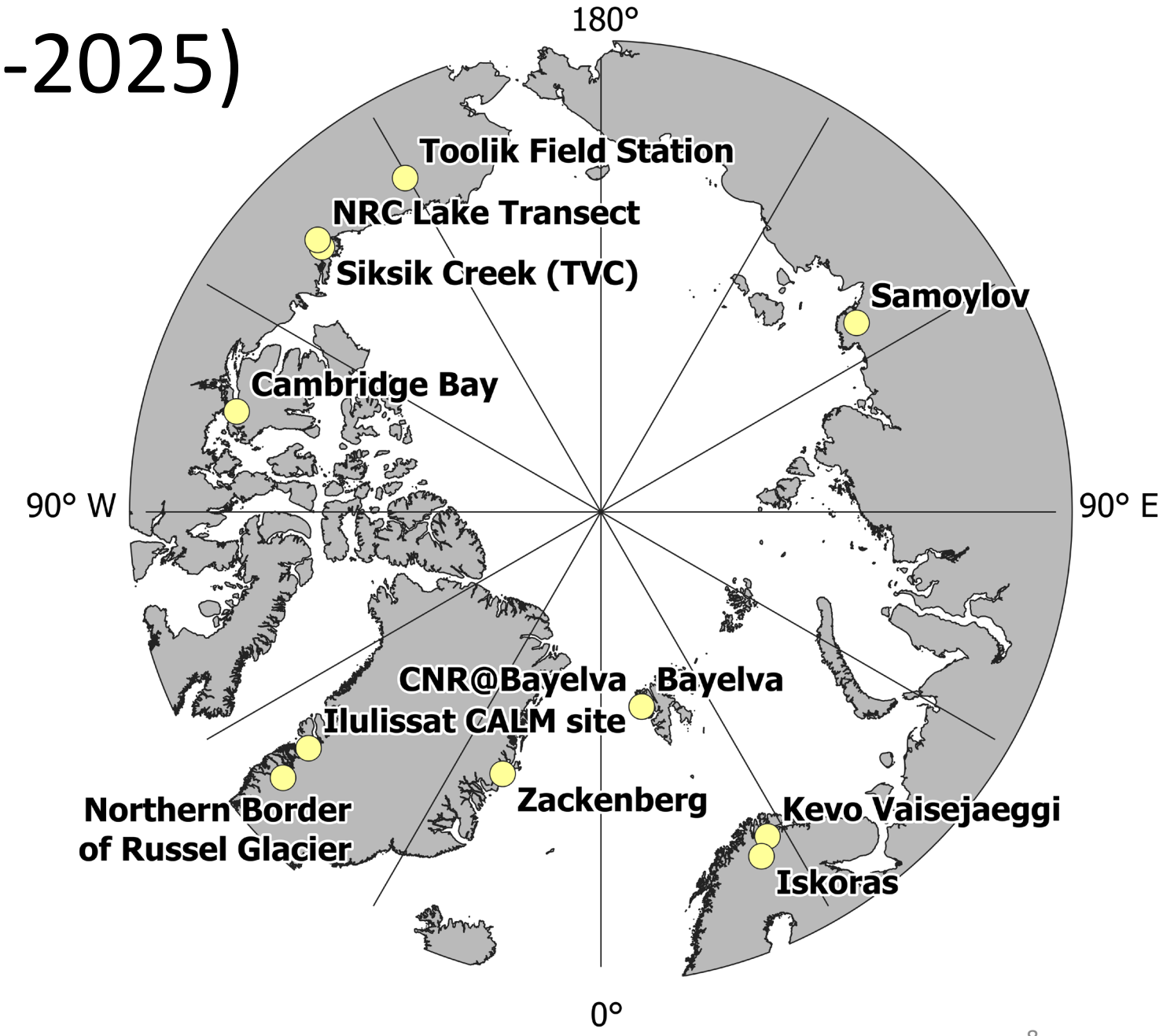




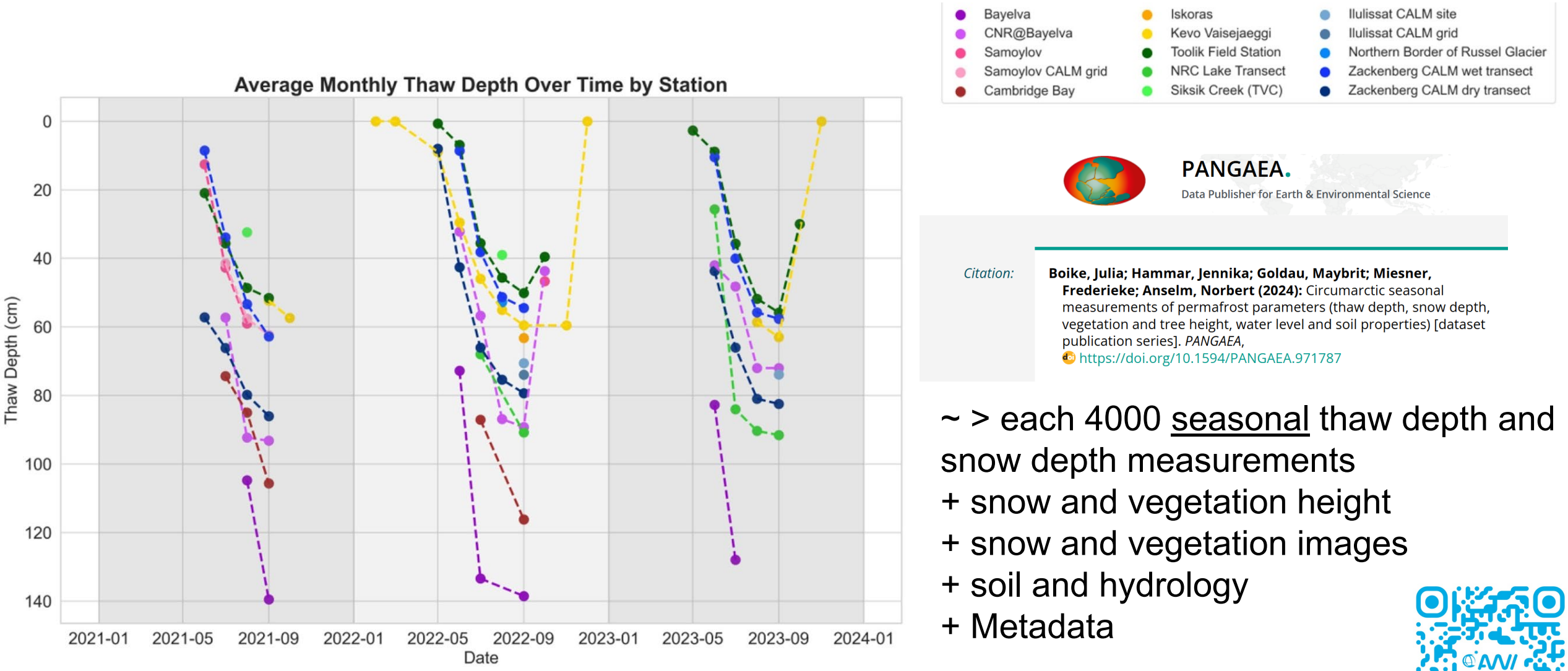
myThaw sites (2021-2025)

~ 4000 thaw depth measurements throughout season 2021-2023

~ 8 new transects (Alaska and NWT, Canada) planned for 2025



2021 -2023 data published



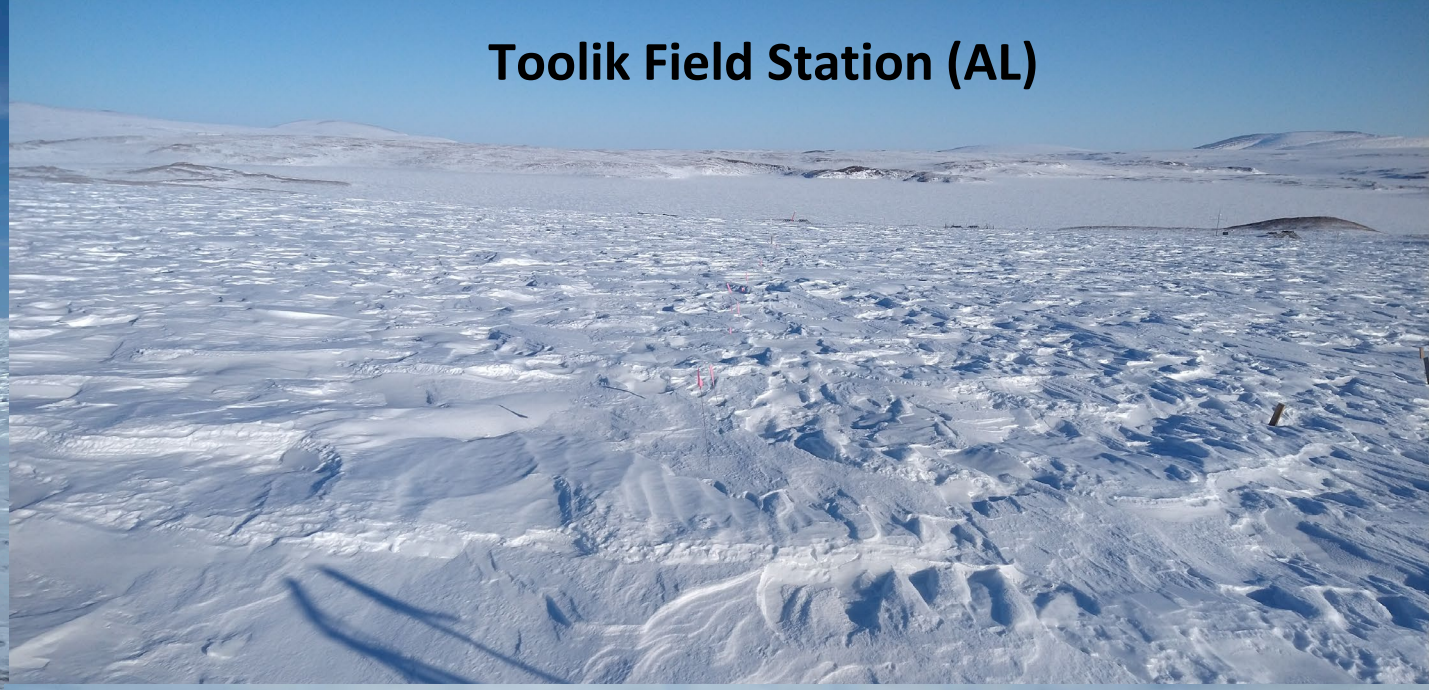
PANGAEA.
Data Publisher for Earth & Environmental Science

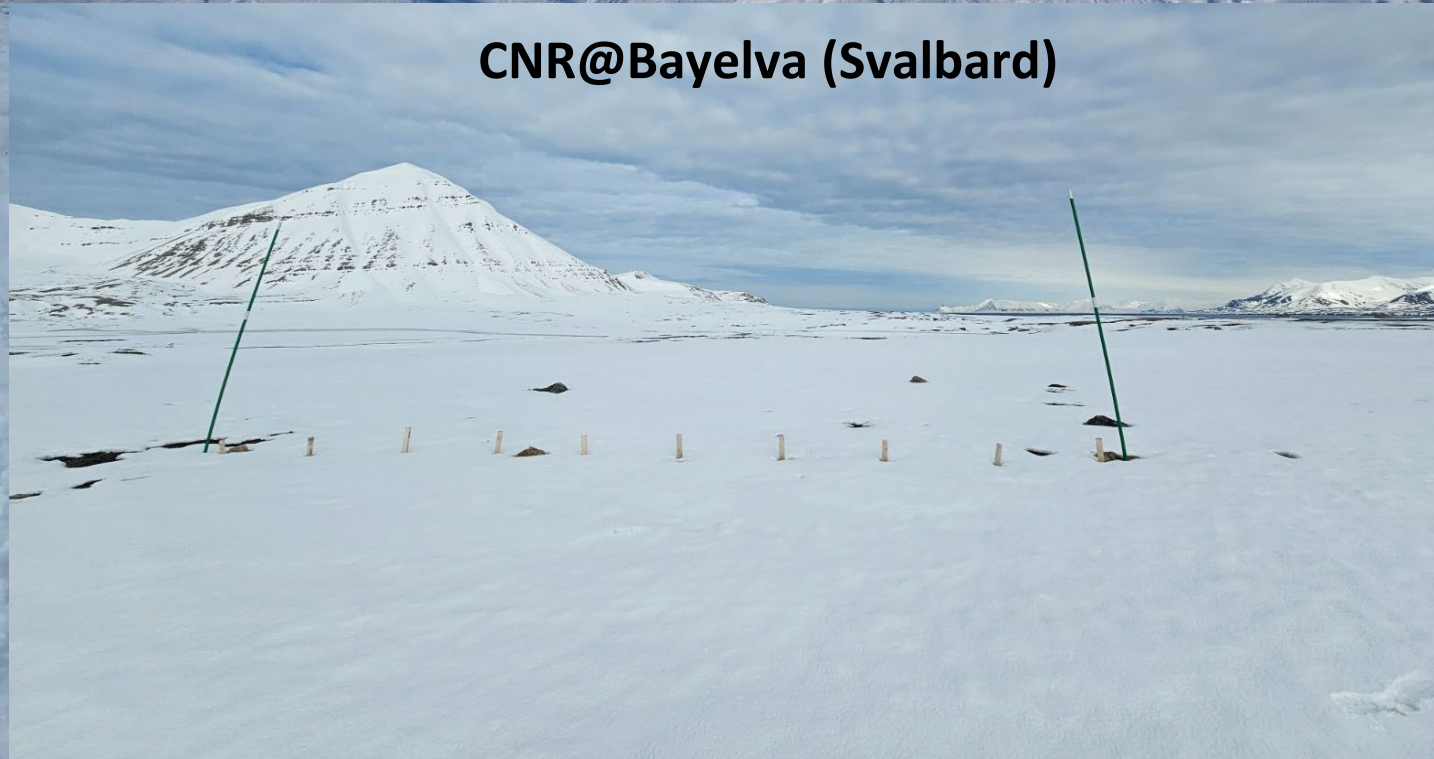
Citation: **Boike, Julia; Hammar, Jennika; Goldau, Maybrit; Miesner, Frederieke; Anselm, Norbert (2024):** Circumarctic seasonal measurements of permafrost parameters (thaw depth, snow depth, vegetation and tree height, water level and soil properties) [dataset publication series]. *PANGAEA*, https://doi.org/10.1594/PANGAEA.971787

~ > each 4000 seasonal thaw depth and snow depth measurements
+ snow and vegetation height
+ snow and vegetation images
+ soil and hydrology
+ Metadata

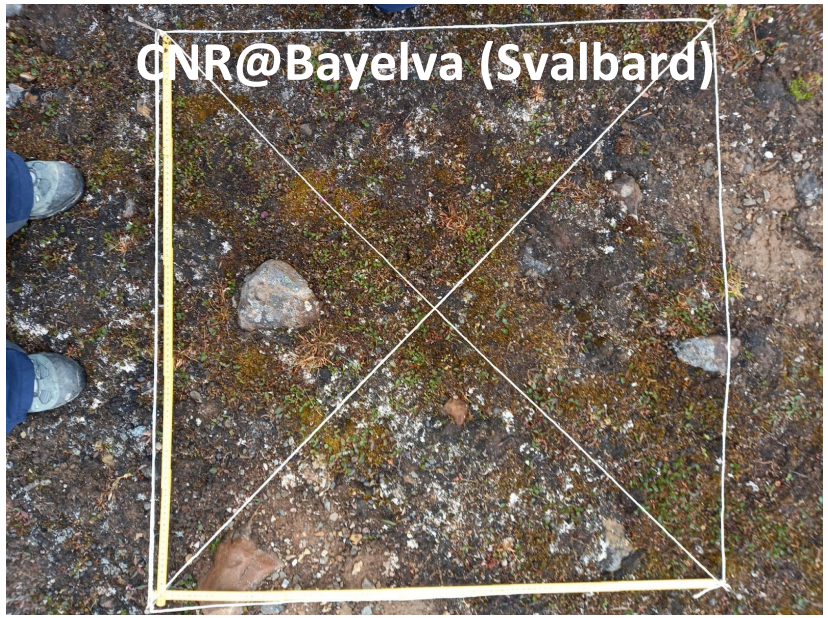
Snow

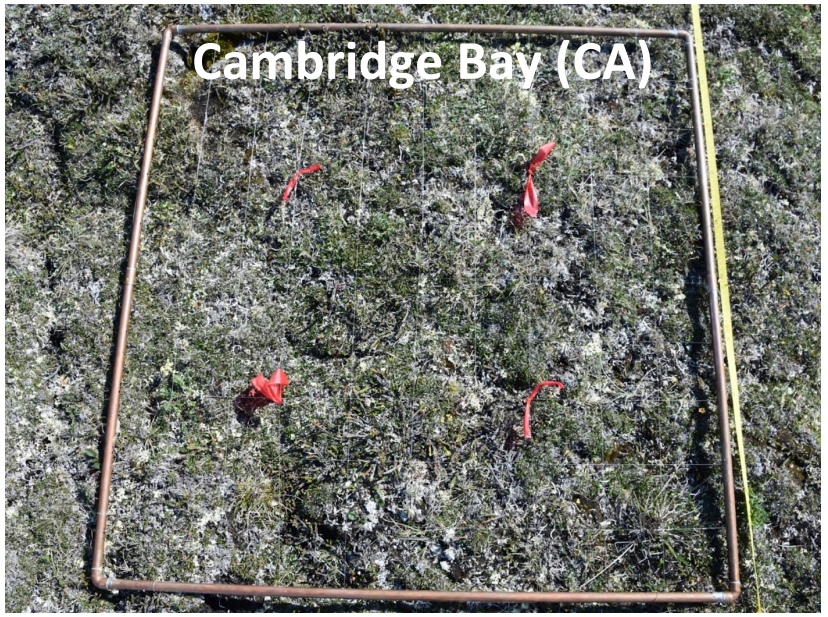

Cambridge Bay (CA)

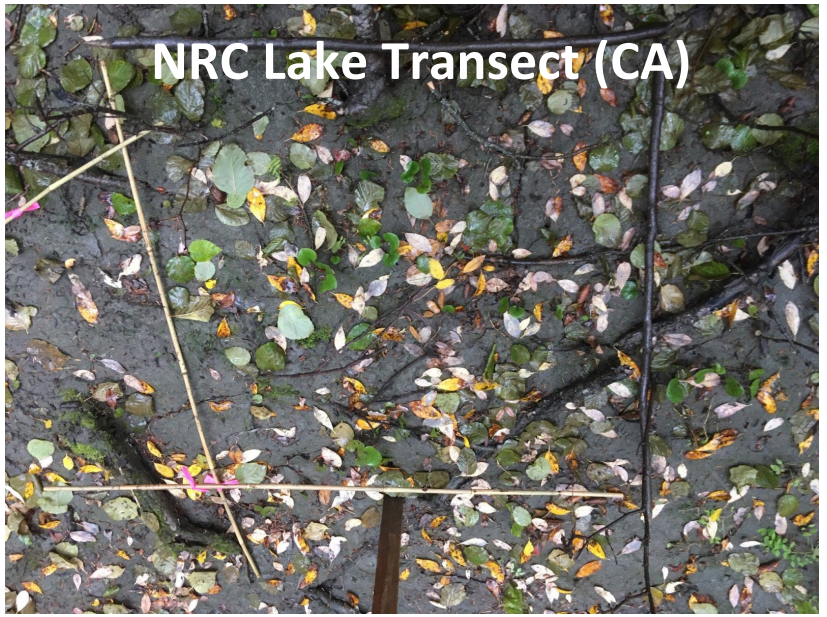

Toolik Field Station (AL)


CNR@Bayelva (Svalbard)

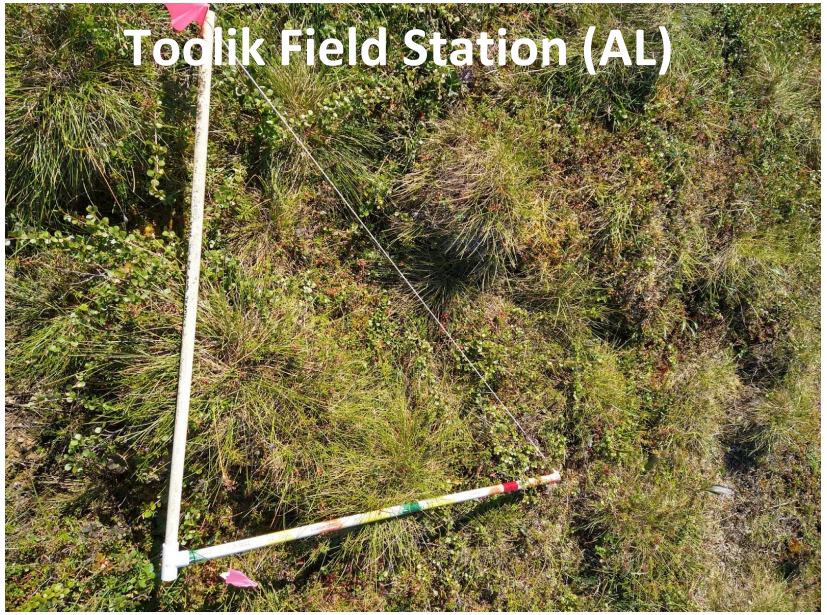
Vegetation


CNR@Bayelva (Svalbard)


Cambridge Bay (CA)


NRC Lake Transect (CA)


Kevo Vaisejaeggi (FIN)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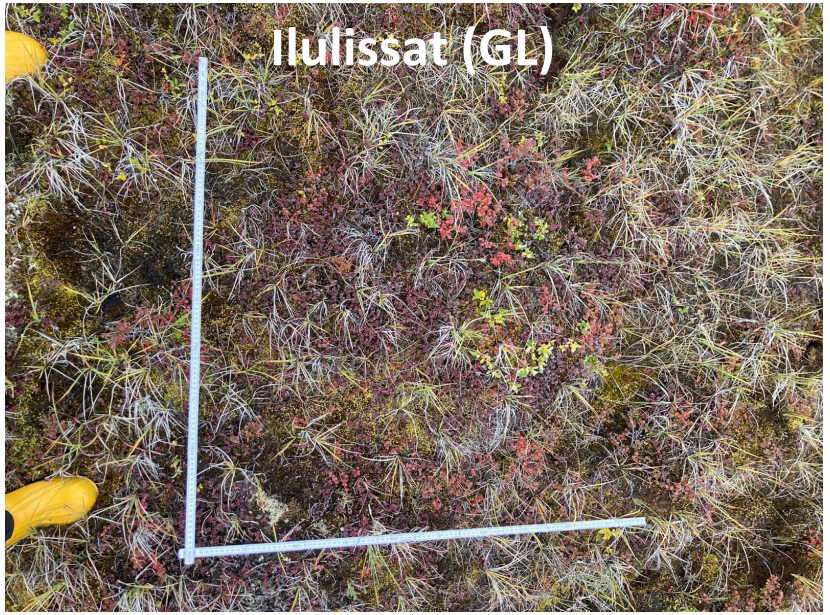
Ilulissat (GL)

→ small scale spatial variability not captured by the model

→ highlights the importance in using suitable site-specific information in models (full myThaw dataset)

→ further (validation) potential for seasonal thaw depth, vegetation, soil, snow (+ site characteristics through metadata); permafrost temperature data