

Observations and Modeling of Changes in Permafrost



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Global Terrestrial Network-Permafrost (GTN-P): Thermal State of Permafrost (TSP)

~ 850 stations



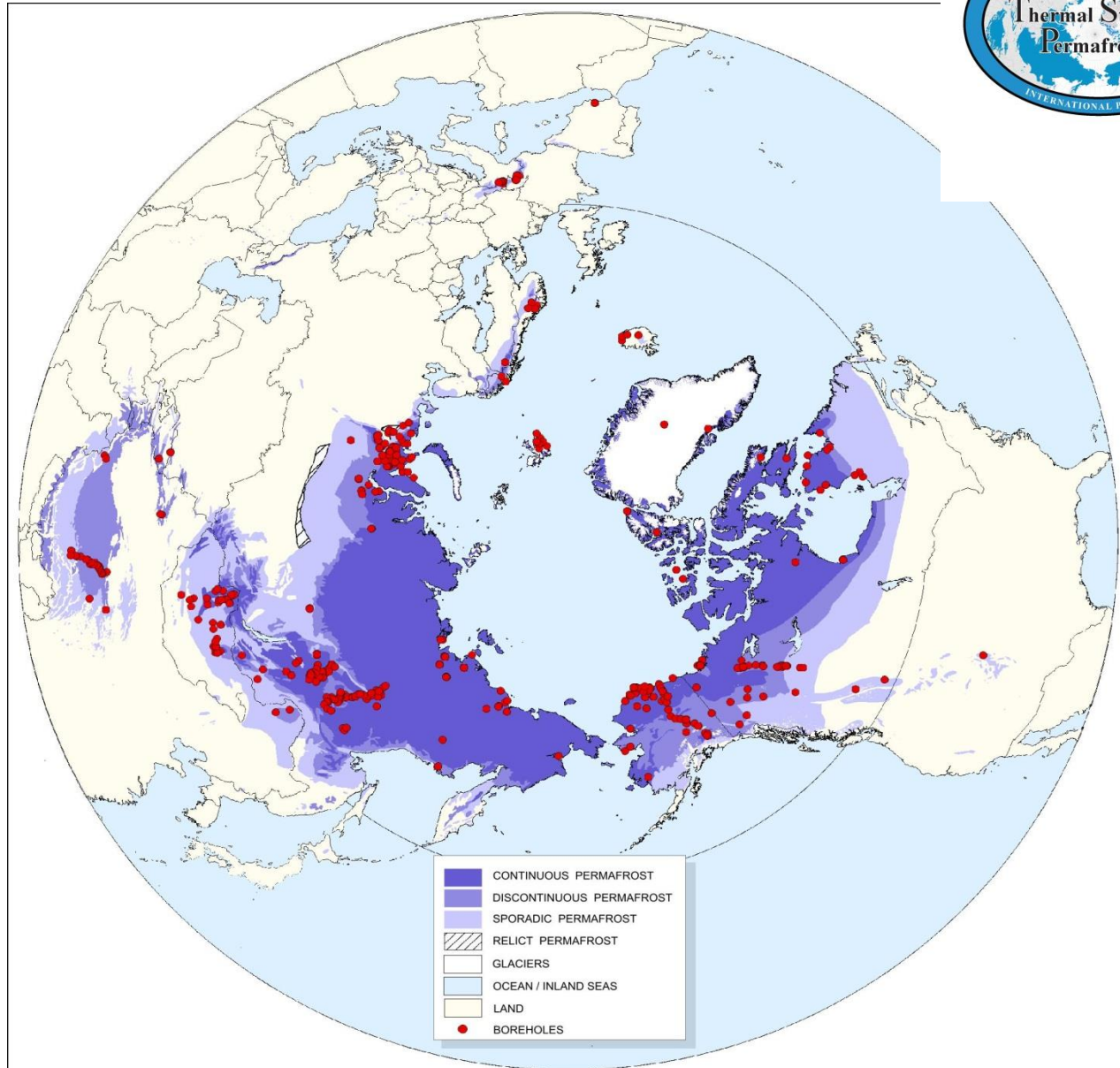
TSP Countries

Canada
China
Denmark (Greenland)
Germany (Russia)
Iceland
Italy
Kazakhstan
Mongolia
Norway (NORPERM)
Poland
Russia
Sweden
Switzerland (PERMOS)
USA

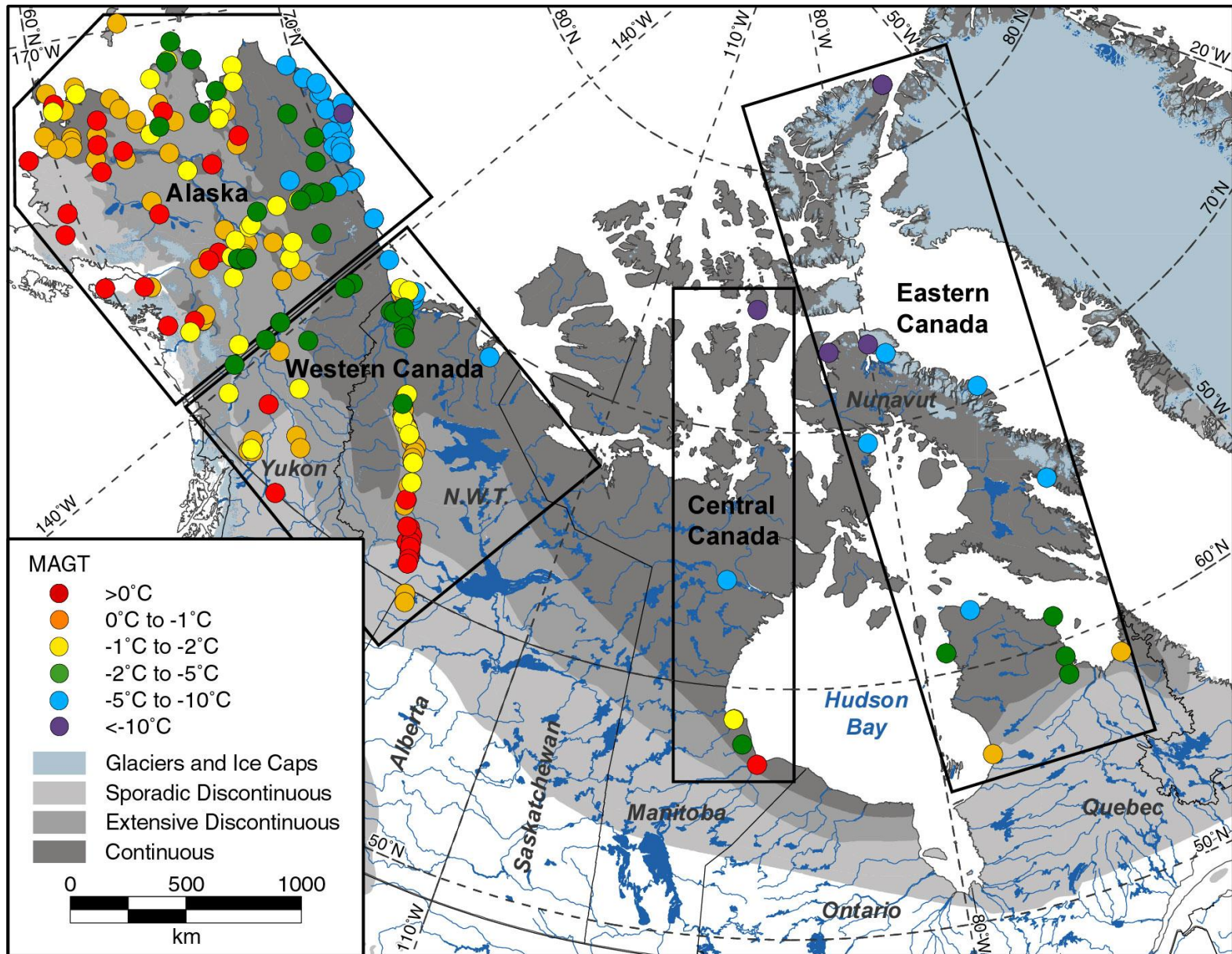
~ 760 stations

Southern Hemisphere

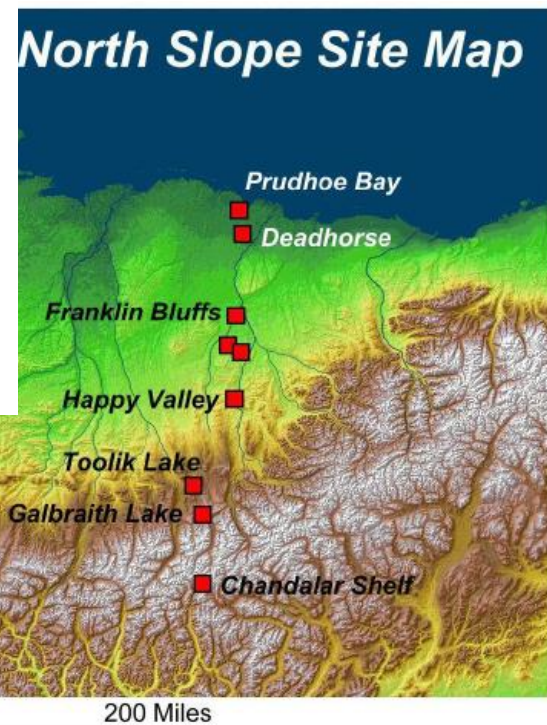
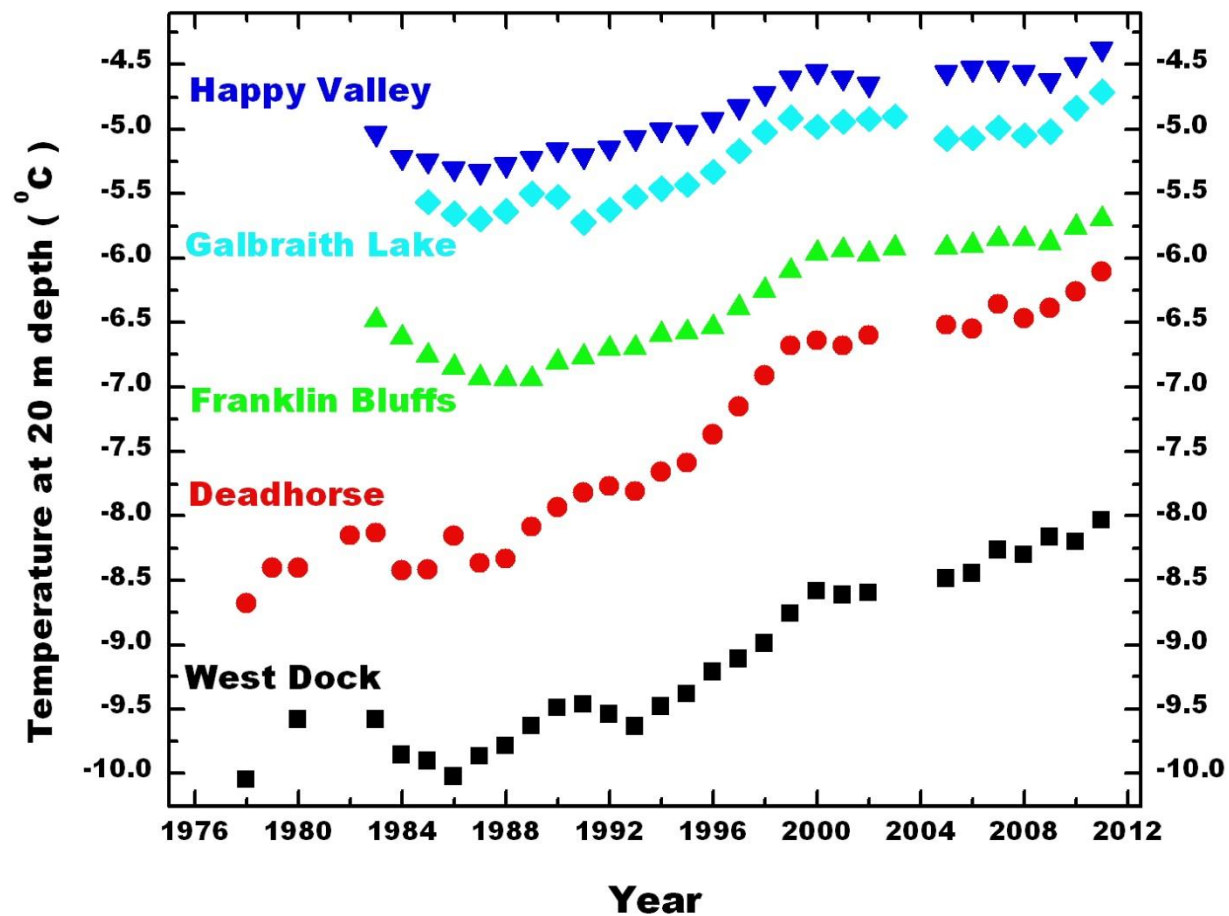
Italy
New Zealand
Portugal-Spain
Russia
USA ~ 90 stations



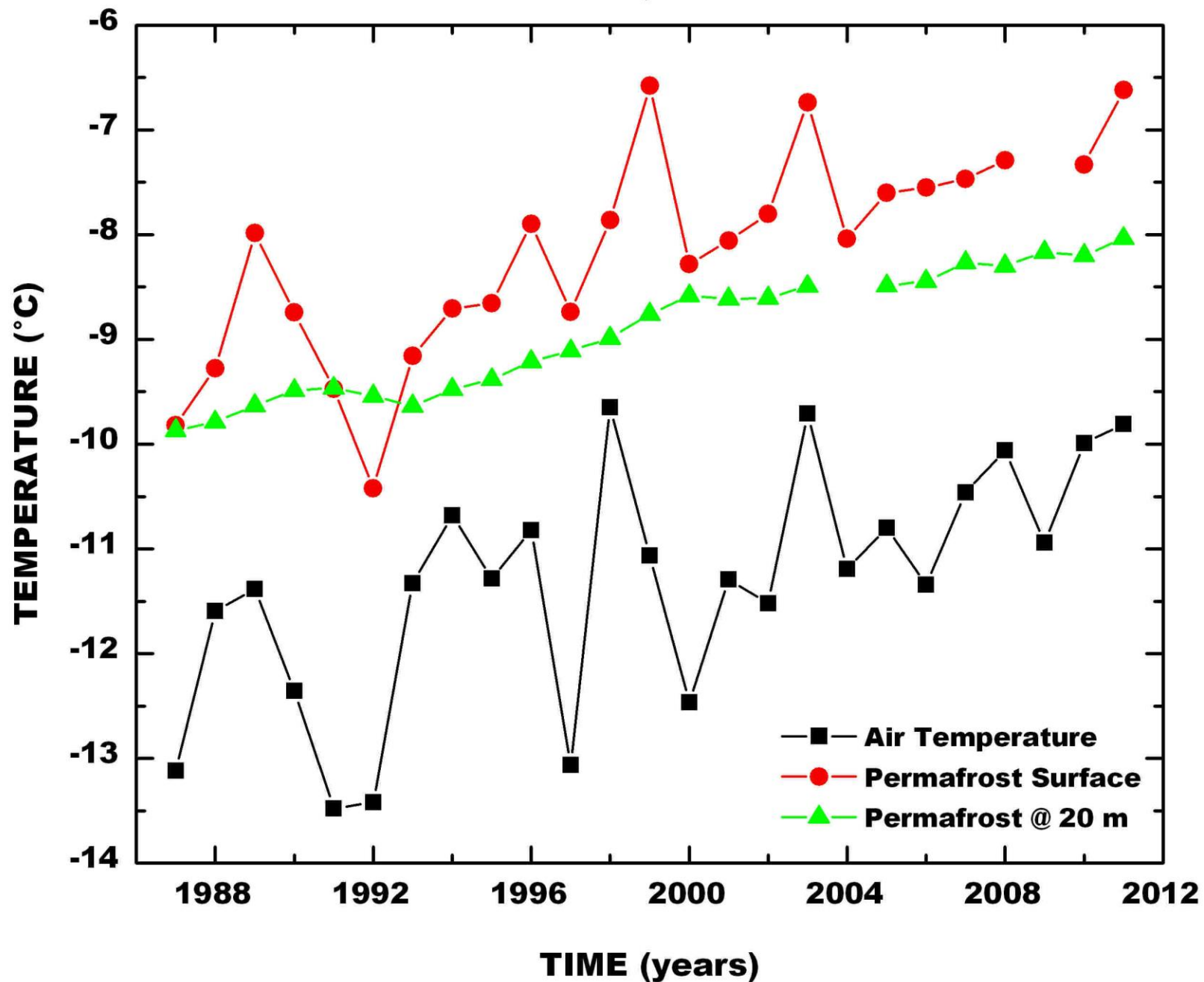
IPY TSP Snapshot



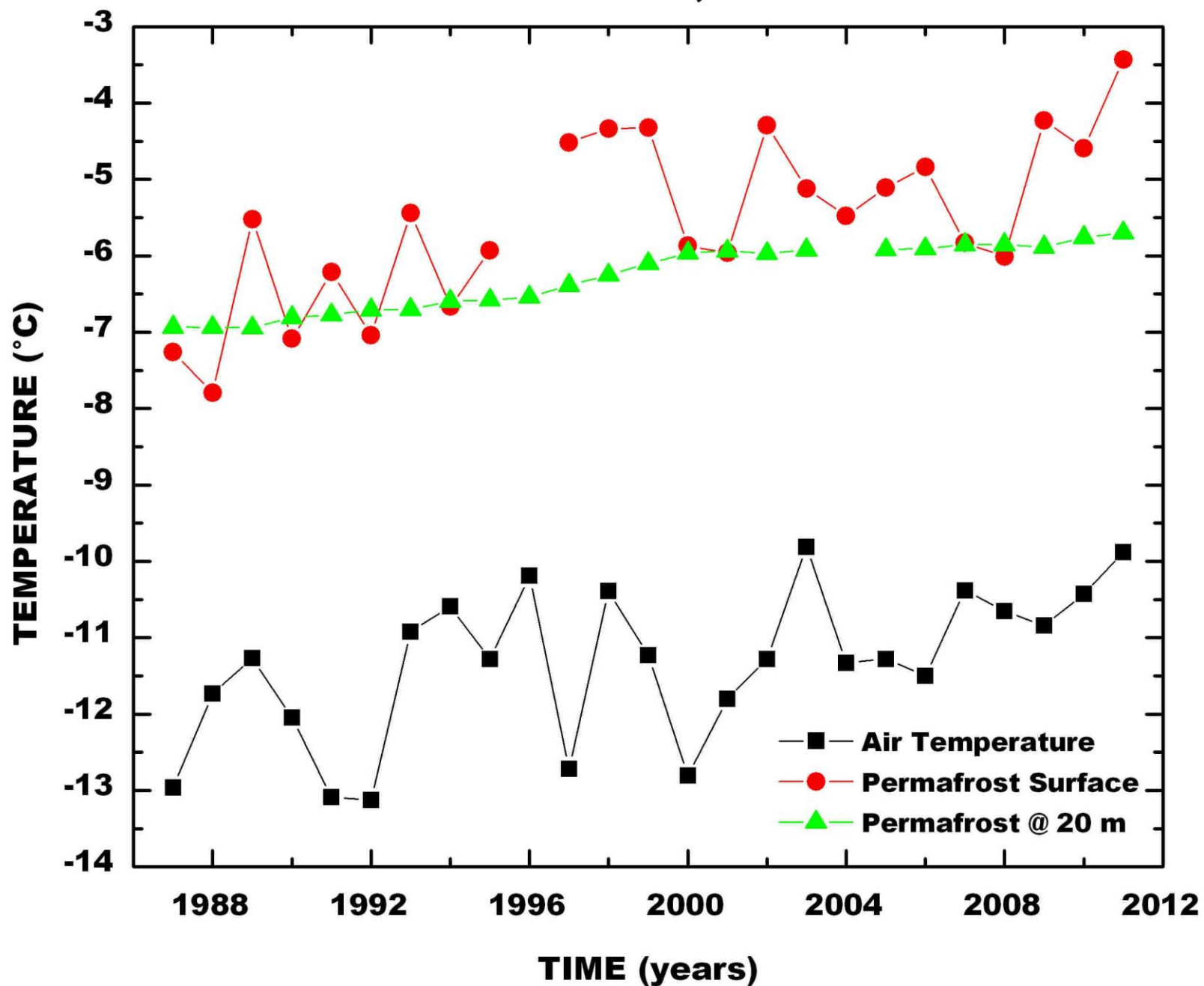
"TSP" Time Series - Northern Alaska
(Romanovsky and Osterkamp)



WEST DOCK, 1987-2011

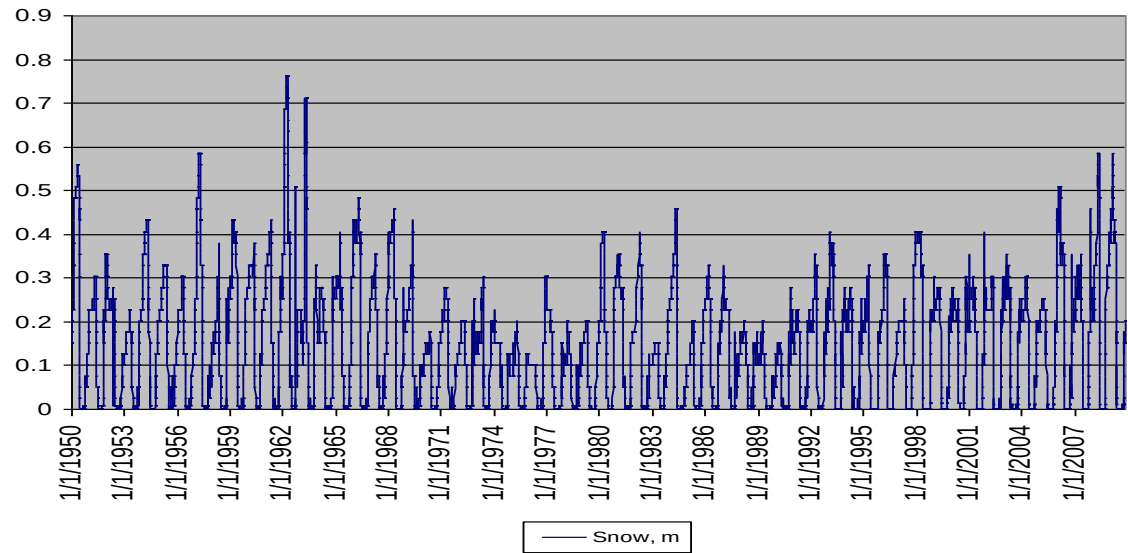


FRANKLIN BLUFFS, 1987-2011

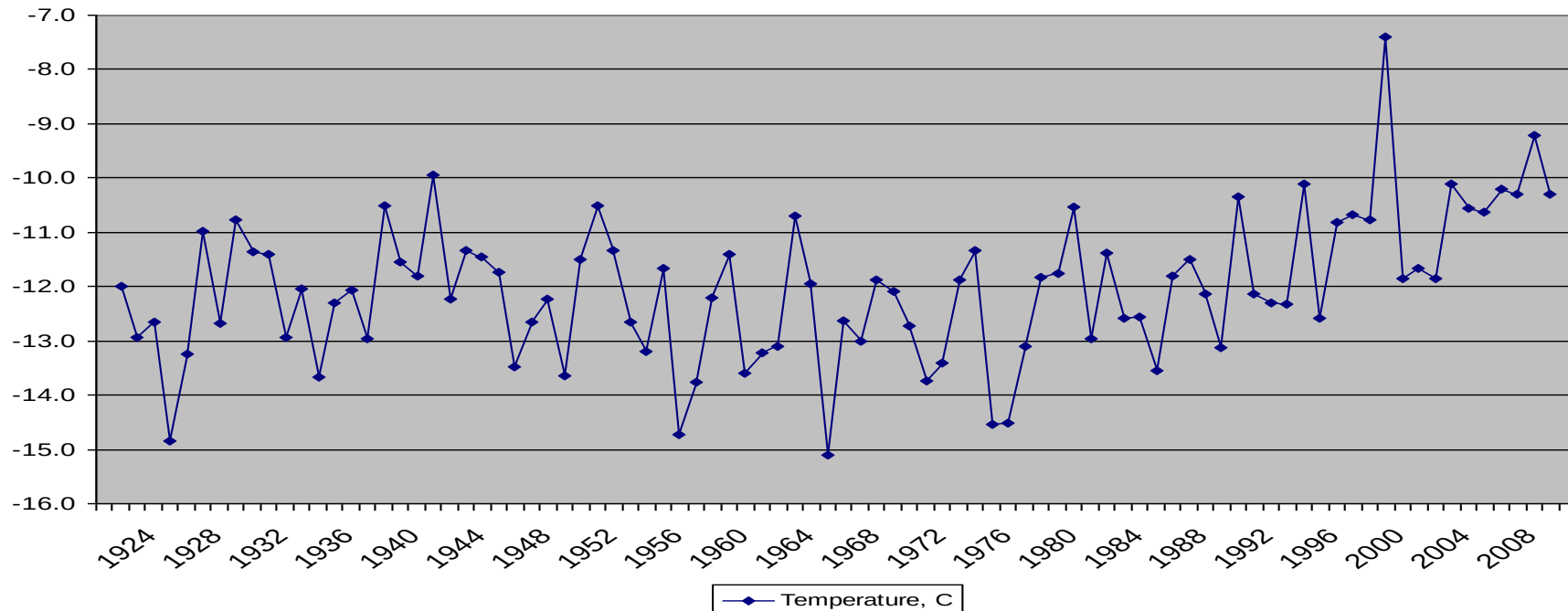


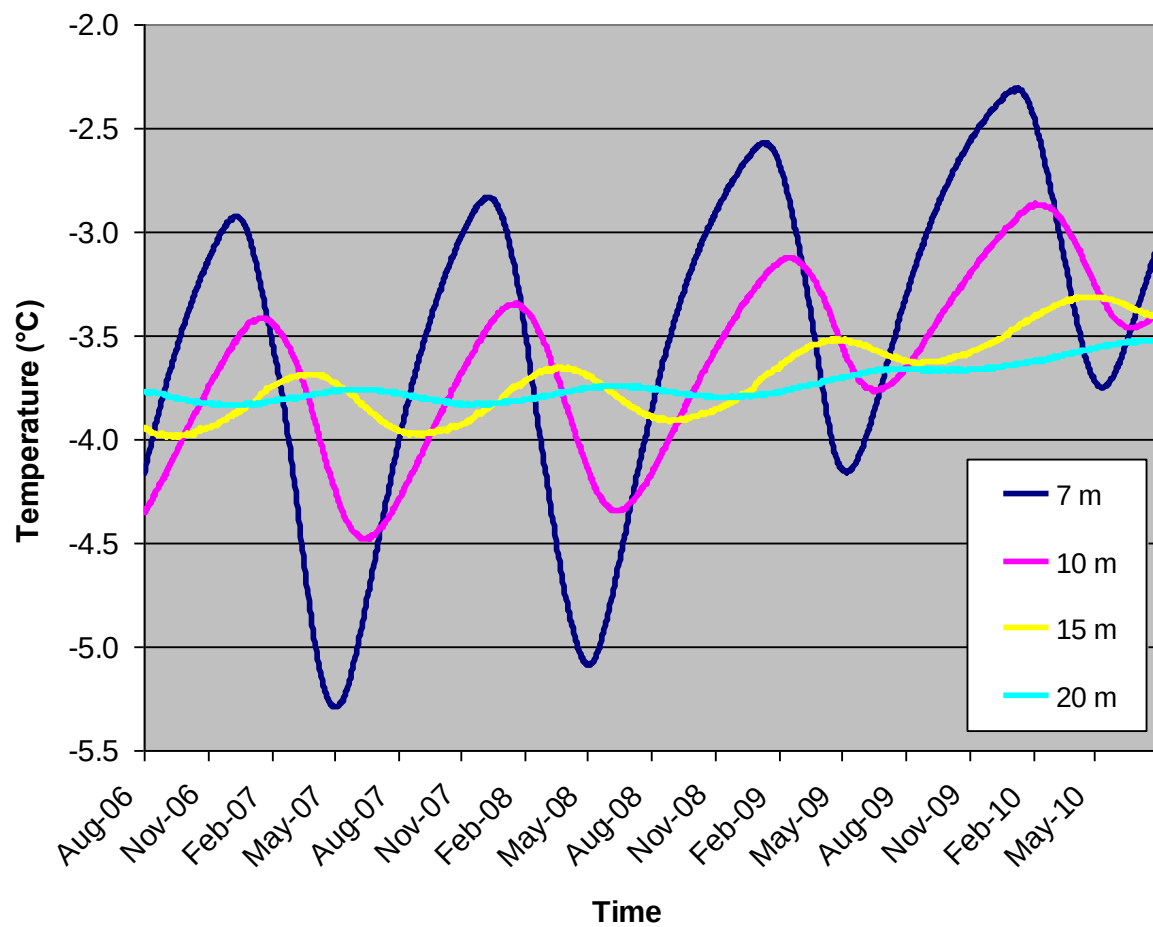
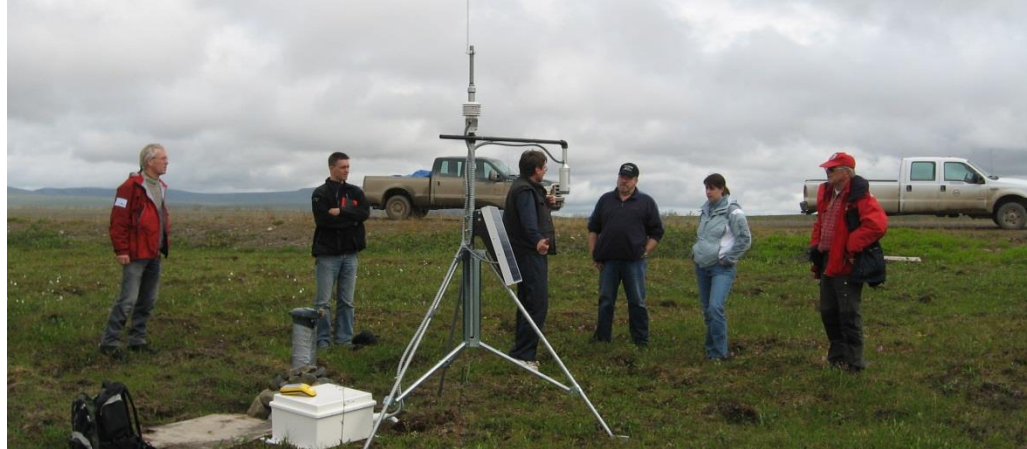
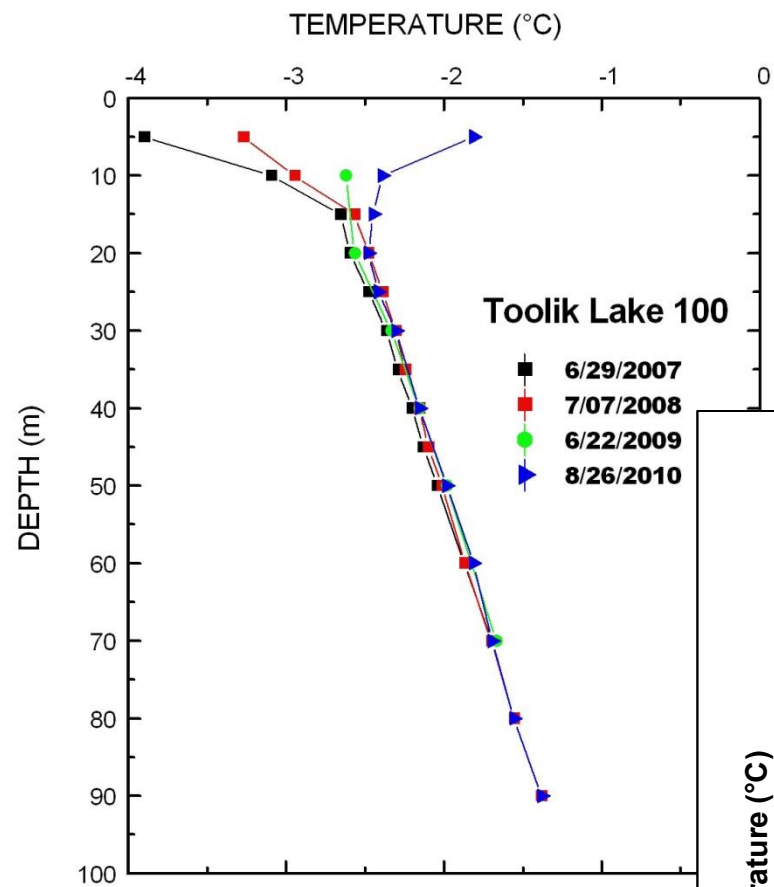
Barrow snow depth and mean annual temperatures

Barrow Snow, 1950-2009

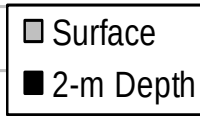


Barrow Mean Annual Air Temperature, 1921-2008

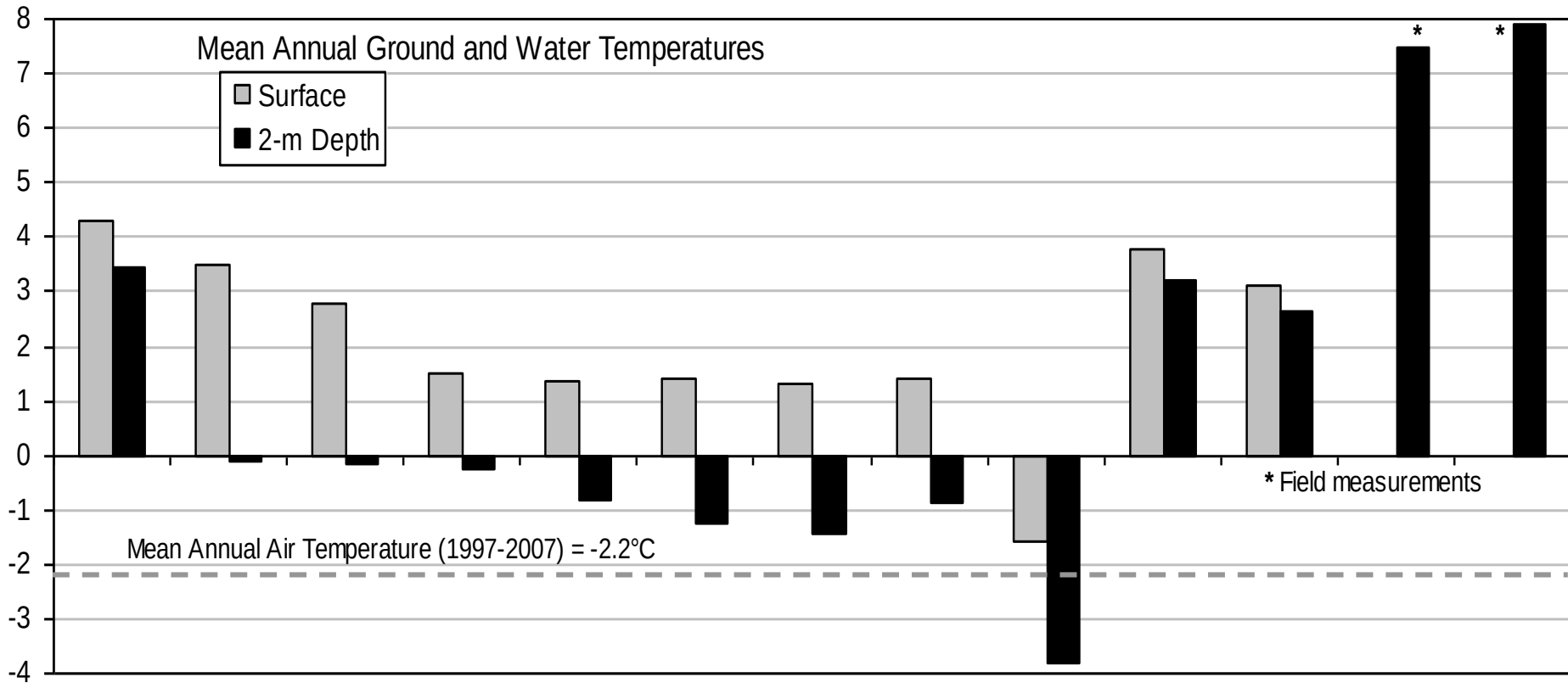




Mean Annual Ground and Water Temperatures



Temperature (°C)

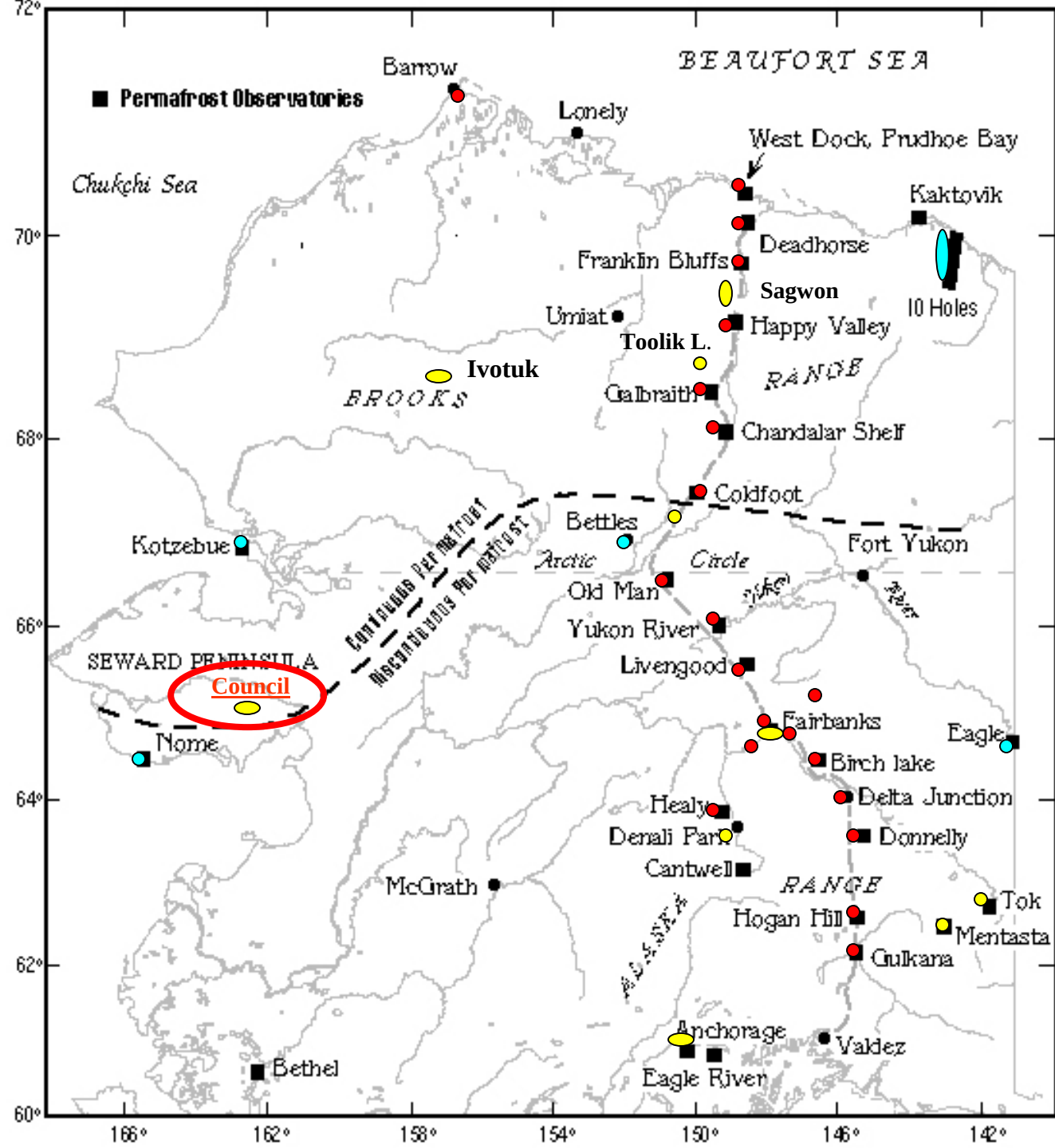


Mean Annual Air Temperature (1997-2007) = -2.2°C

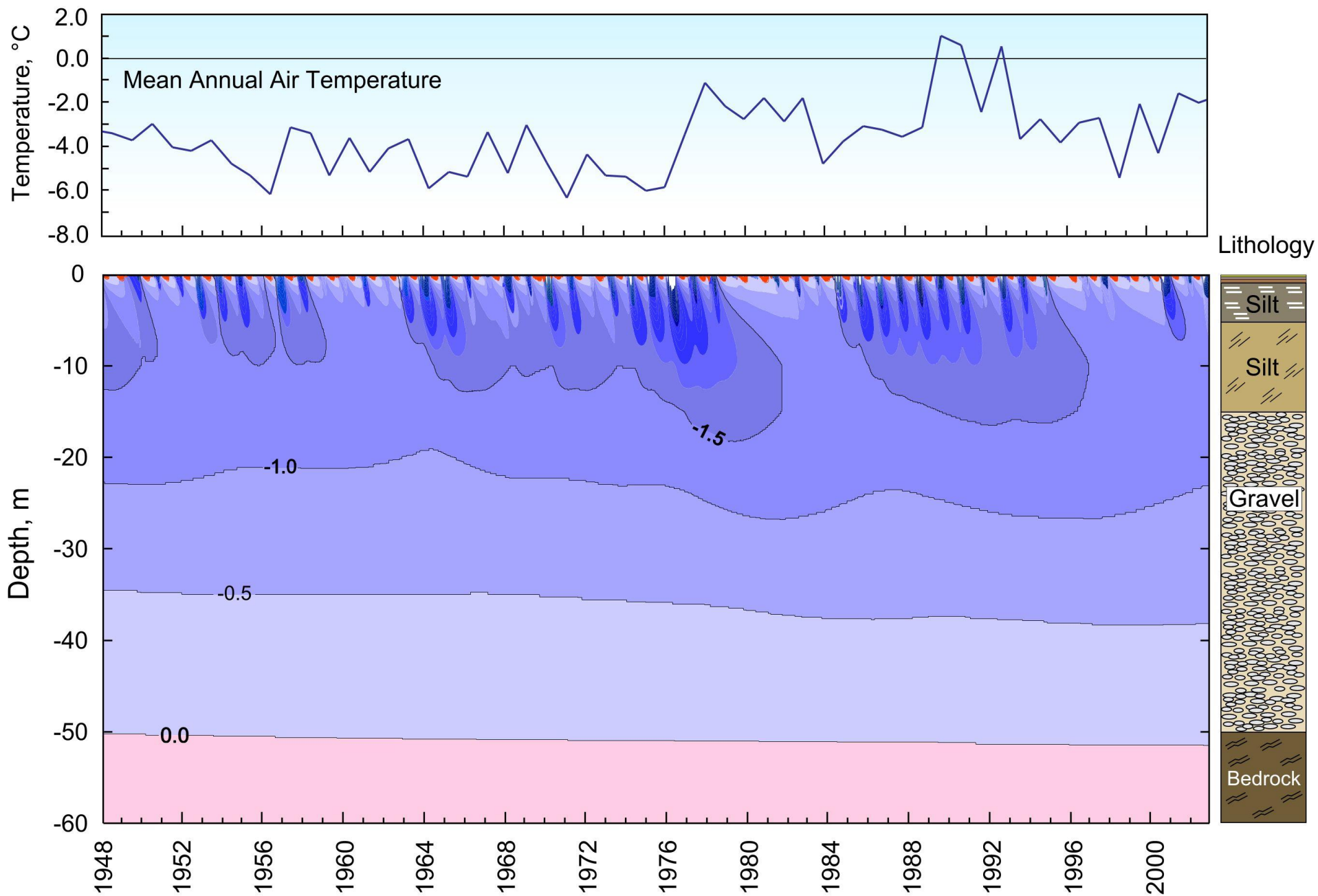
* Field measurements

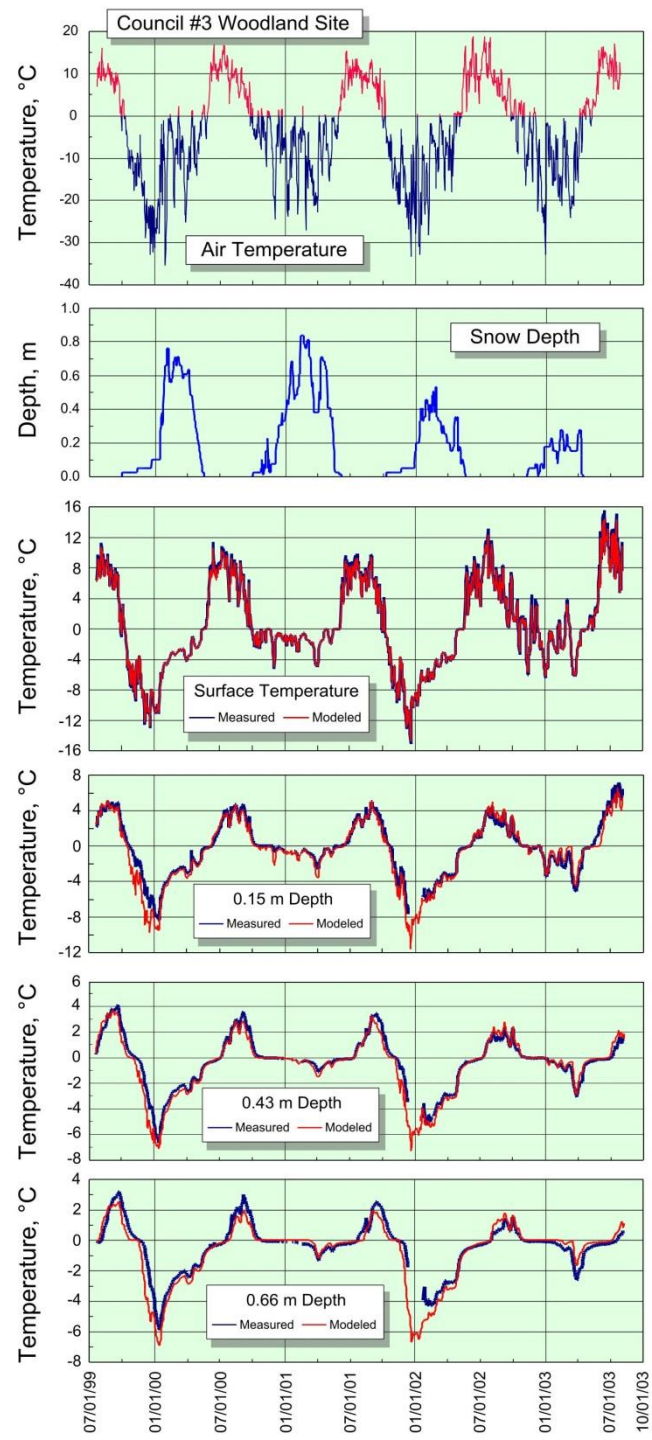
Barren Burned Willow Deciduous Forest Mixed Forest White Spruce Black Spruce Shrub Tussock Bog Sphagnum Bog Herbaceous Fen Water Terrestrial

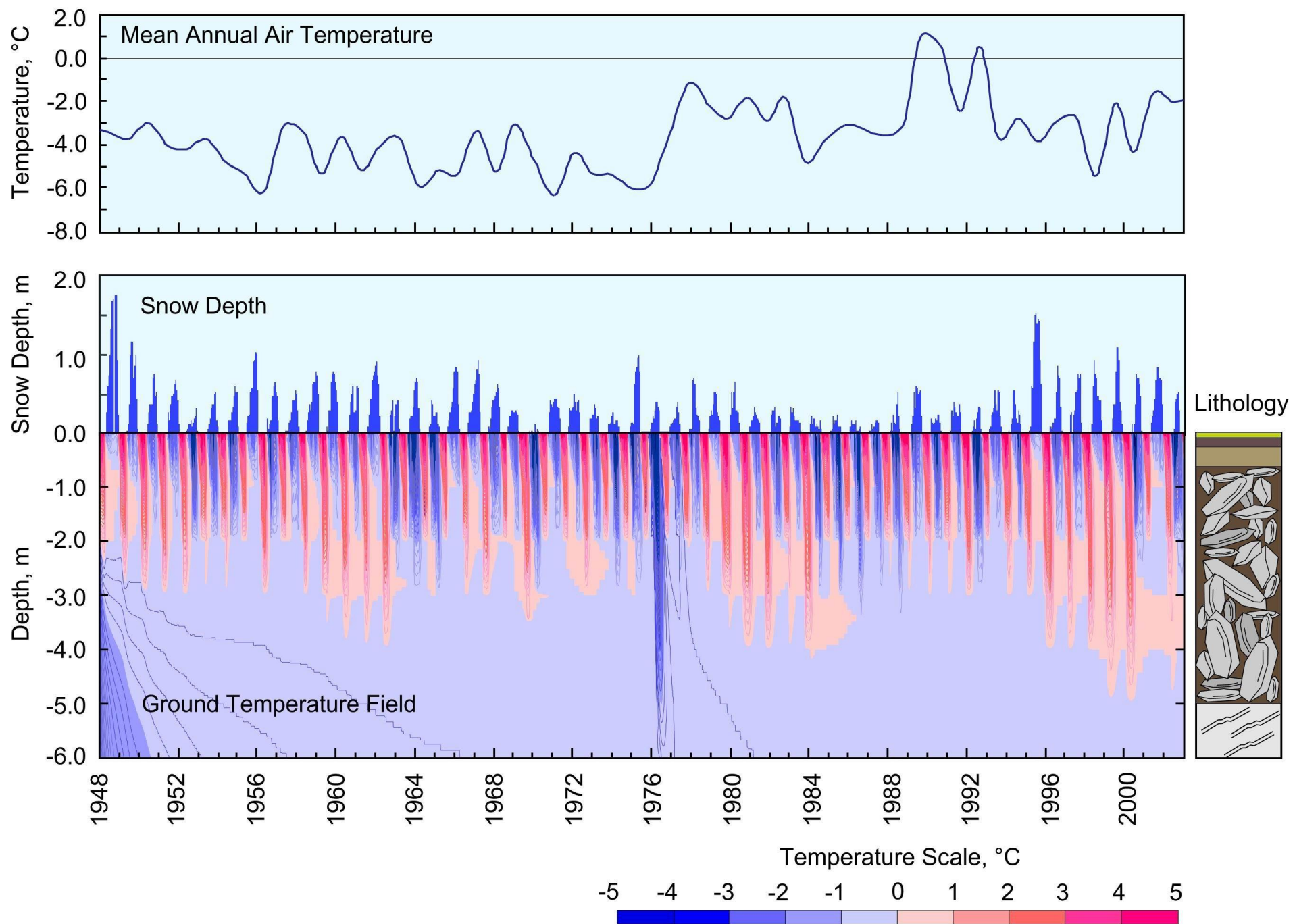
Ecosystem



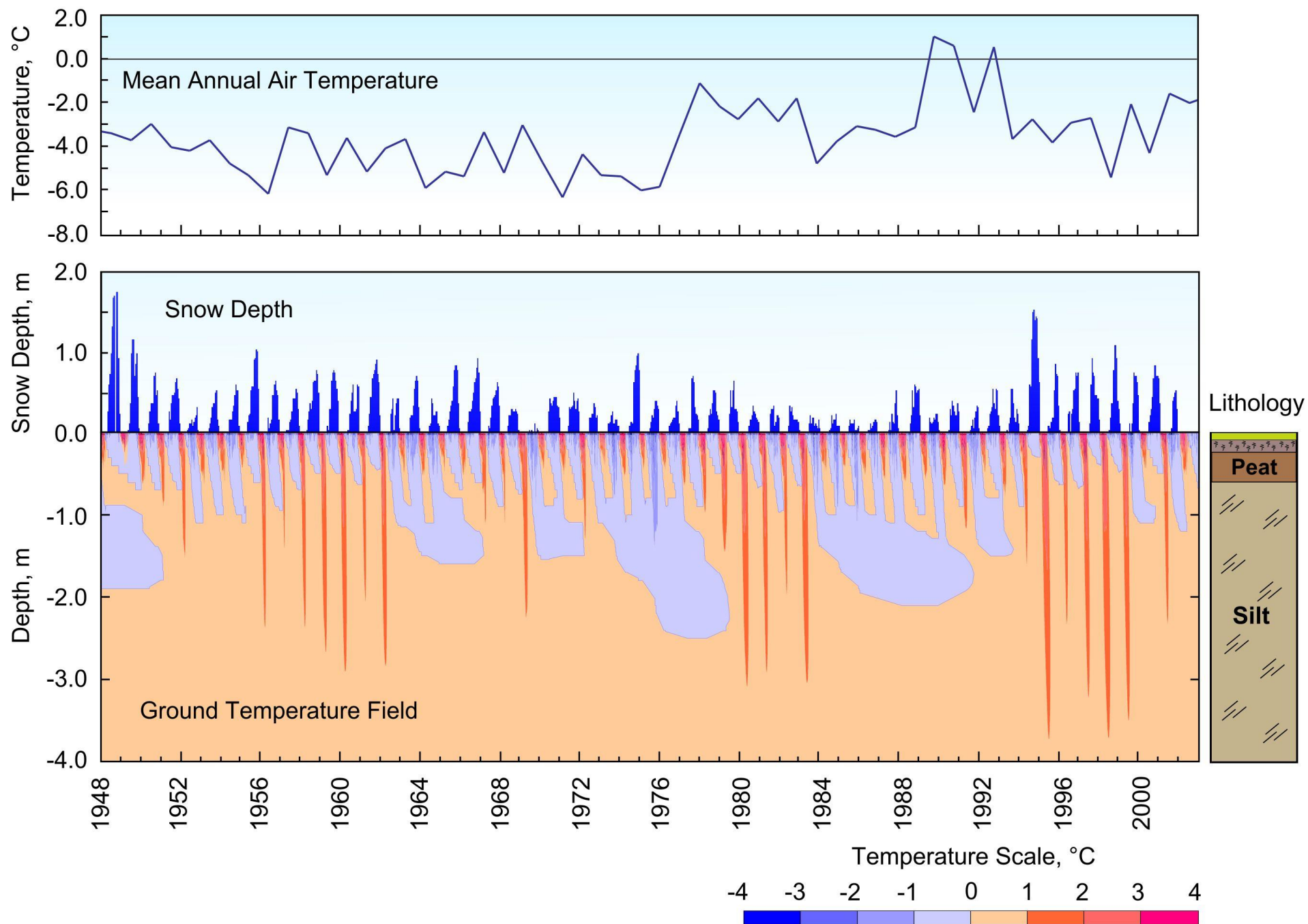


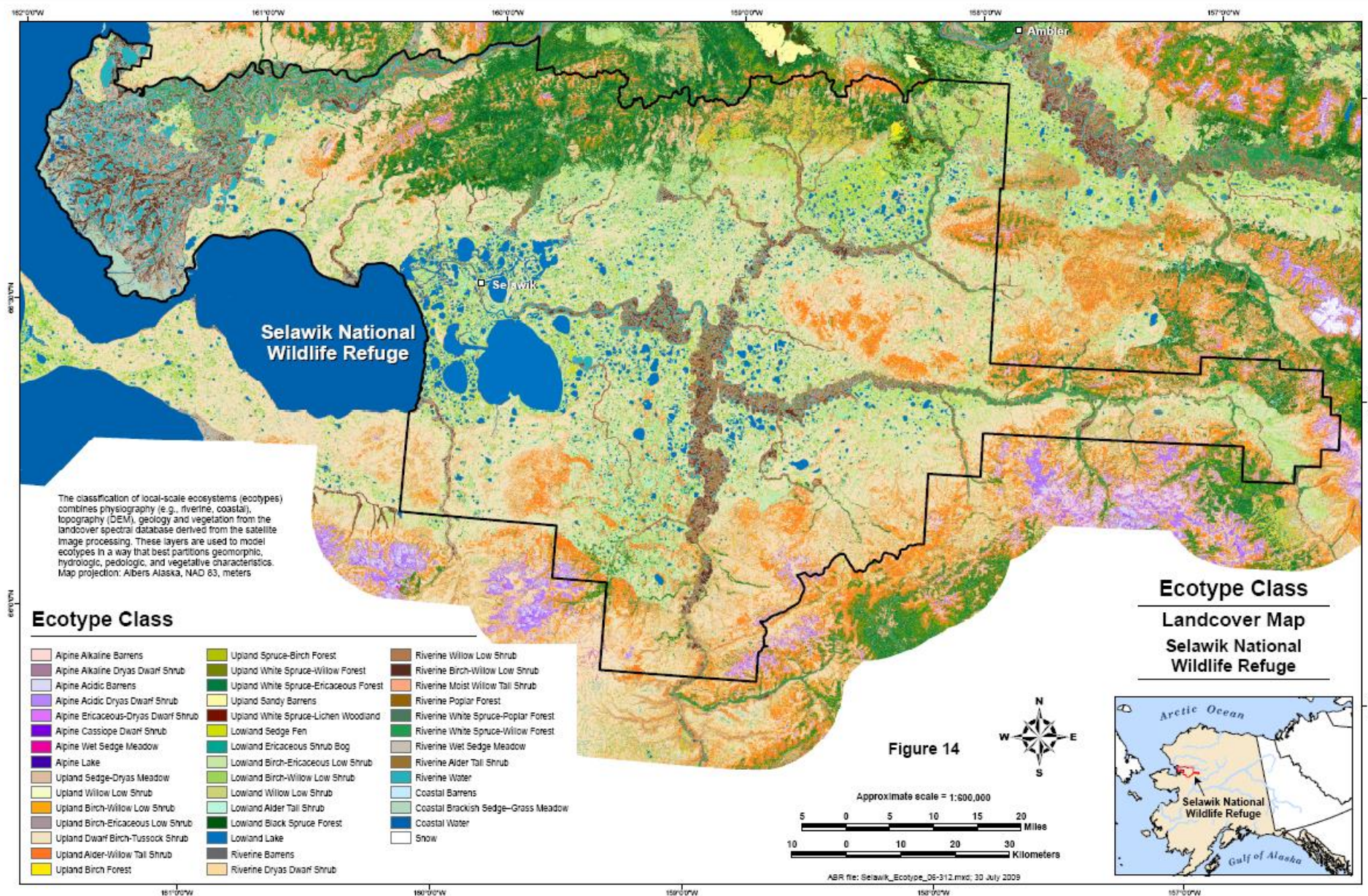












7/29/2012

N

S1-WS

S1-BF

S6-PB

S4-TM
S4-AWS S4-LS

Selawik Village Site

S3-TM
S3-BEW S3-AWS

S3-LSF

Kugurak Cabin Site

S2-PB

Inland Lake

Thaw Slump Site SS-TM SS-WS
SS-AWS

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Google earth

lat 66.654128° lon -158.924799° elev 42 ft

Eye alt 70.28 mi







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MAP LAYERS

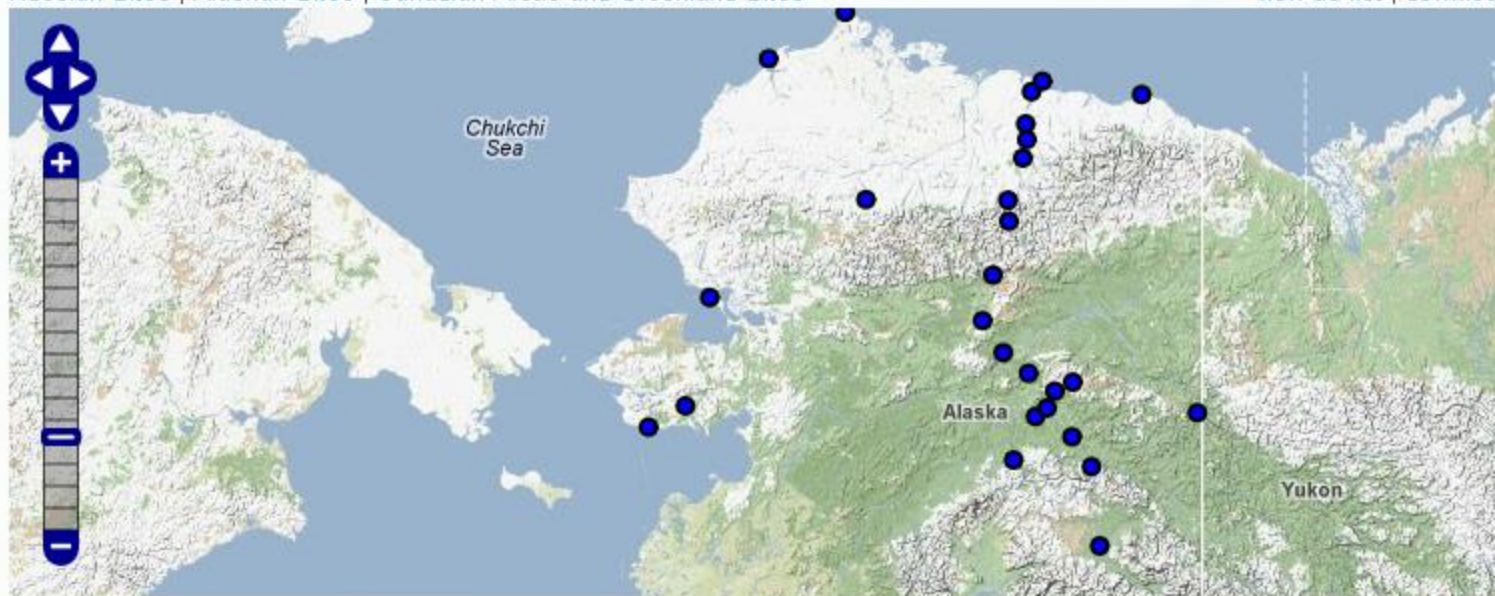
Base layers

- ☐ Google Maps Satellite
- ☐ Google Maps Hybrid
- ☐ Google Maps Normal
- ☒ Google Maps Physical

Data layers

- ☐ Kenji Yoshikawa's borehole sites
- ☐ Permafrost Extent Map
- ☐ Ground Ice

LEGEND







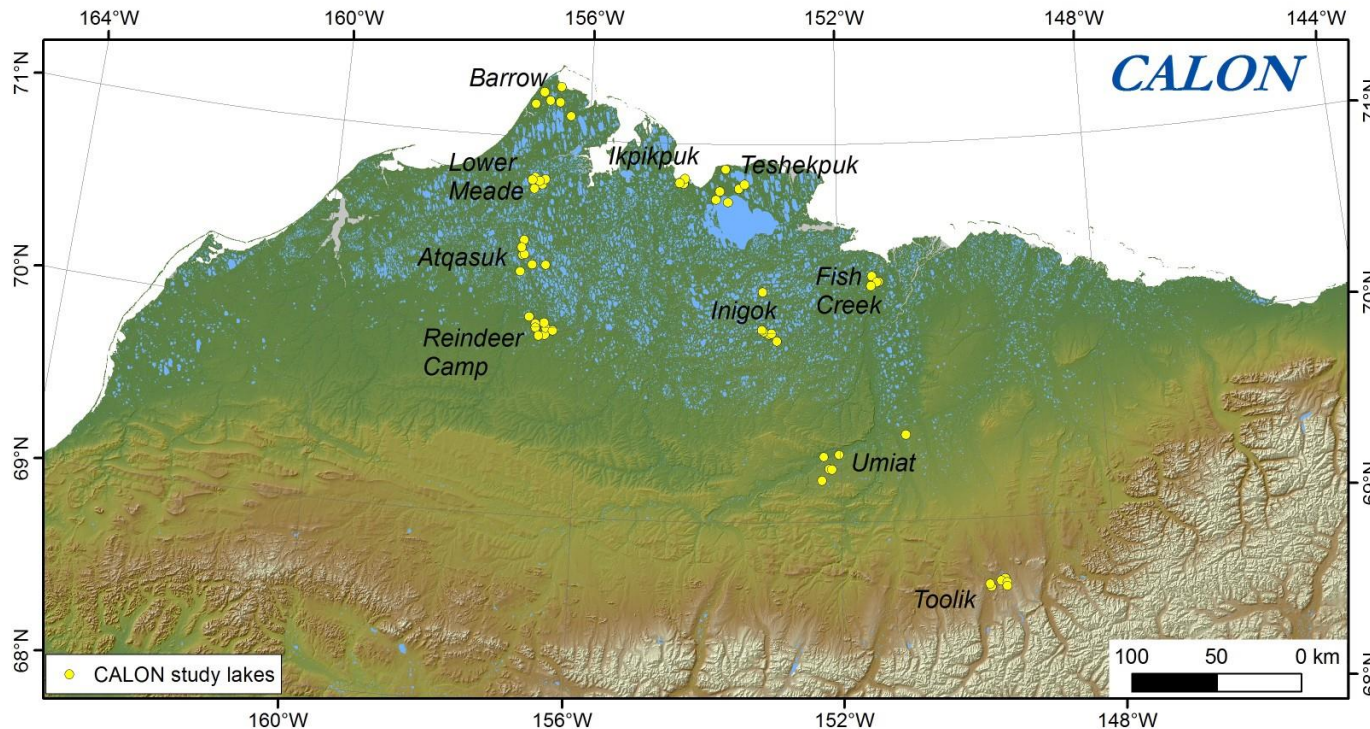


More than ¼ of the world's lakes are found in the Arctic

Climate change is occurring here at a more rapid rate than rest of world

No systematic collection of key lake parameters in the Arctic

Towards a Circumarctic Lake Observation Network (CALON)



New NSF-Arctic Observation Network (AON) project started April 2012 on North Slope of Alaska (U Cincinnati, UAF, USGS, U Nebraska-Lincoln, & Clark U)

Thank you very much !

www.PermafrostWatch.org

