

Observing local permafrost change



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What can we observe?

- Changes in the ground surface
- Changes in the infrastructure or infrastructure foundations
- Changes in permafrost temperatures
- Changes in the summer thaw depth

Changes in the ground surface



Changes in the ground surface



Changes in the ground surface



Changes in the ground surface



Changes in the ground surface







Changes in the ground surface

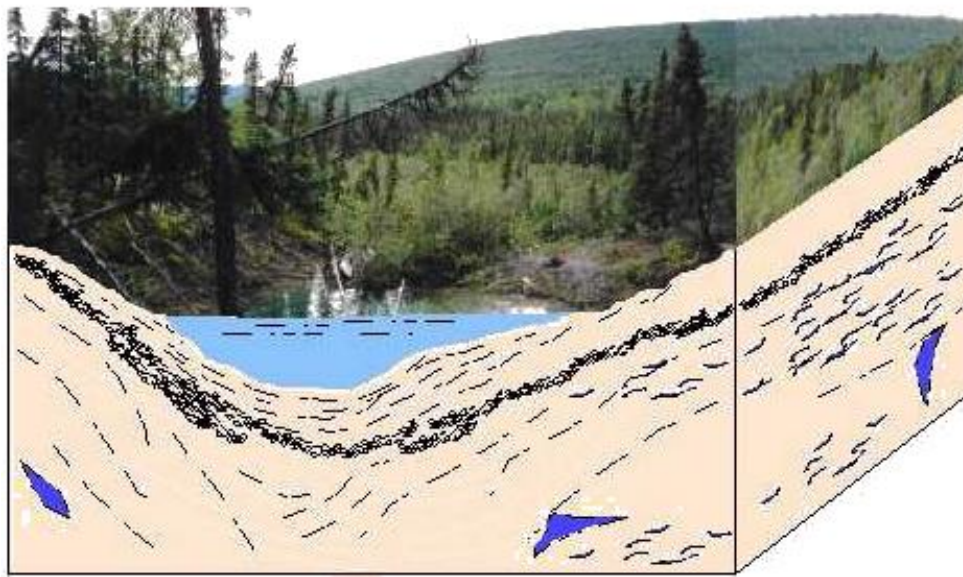
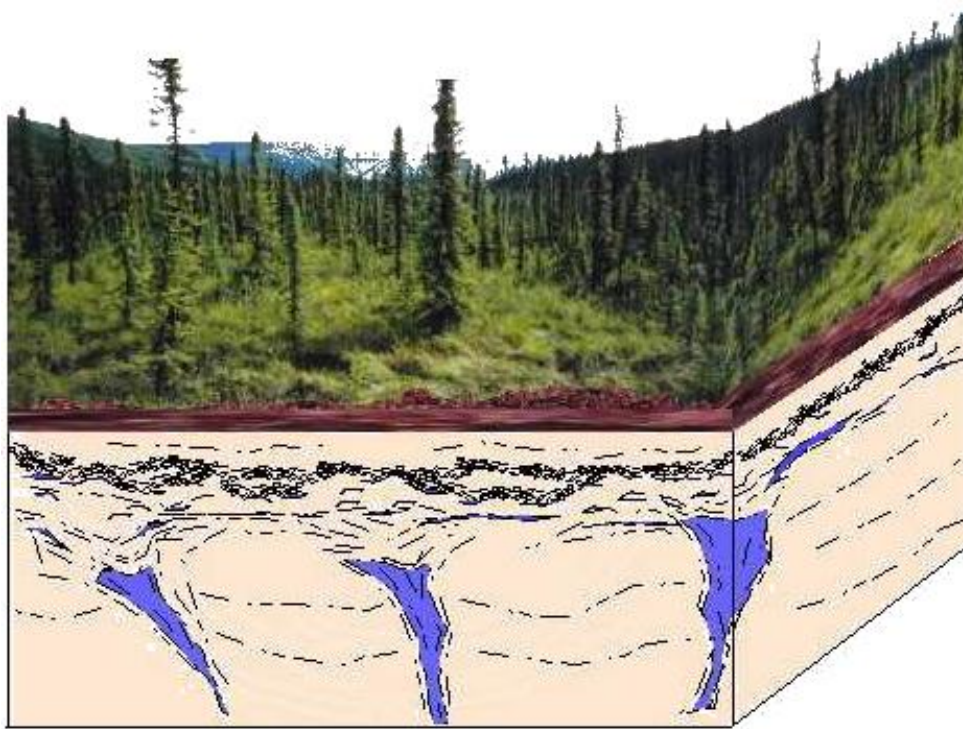


Changes in the ground surface





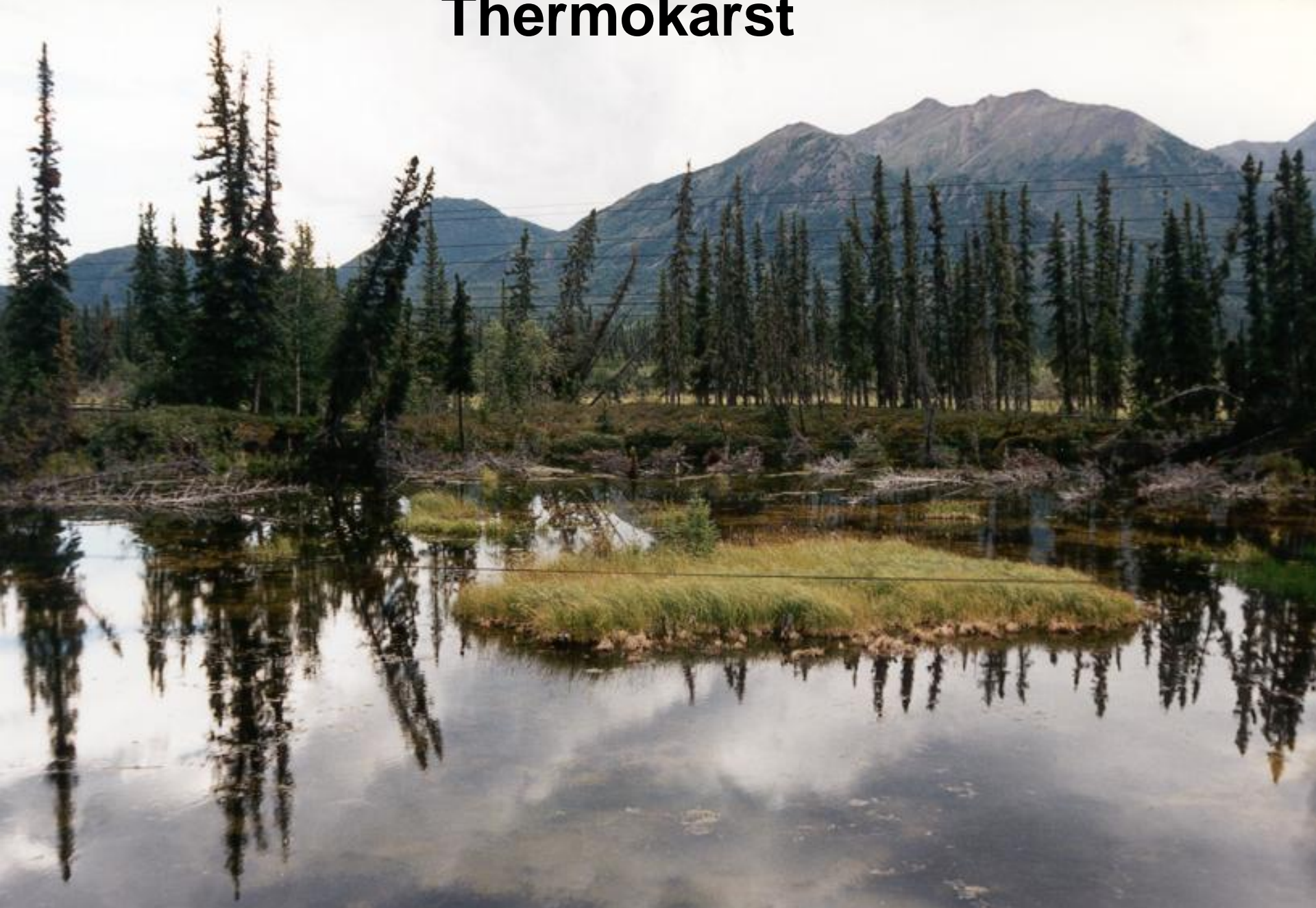




Courtesy of Kenji
Yoshikawa



Thermokarst





Kunitsky et al., in prep. 2013
Grosse et al., in prep 2013



Photo: V.V. Kunitsky, Permafrost Institute Yakutsk



Changes in the ground surface





Impact on Infrastructure





Changes in the infrastructure or infrastructure foundation



Changes in the infrastructure or infrastructure foundation



Changes in the infrastructure or infrastructure foundation













Living on Permafrost



Living on Permafrost



What to measure/report?

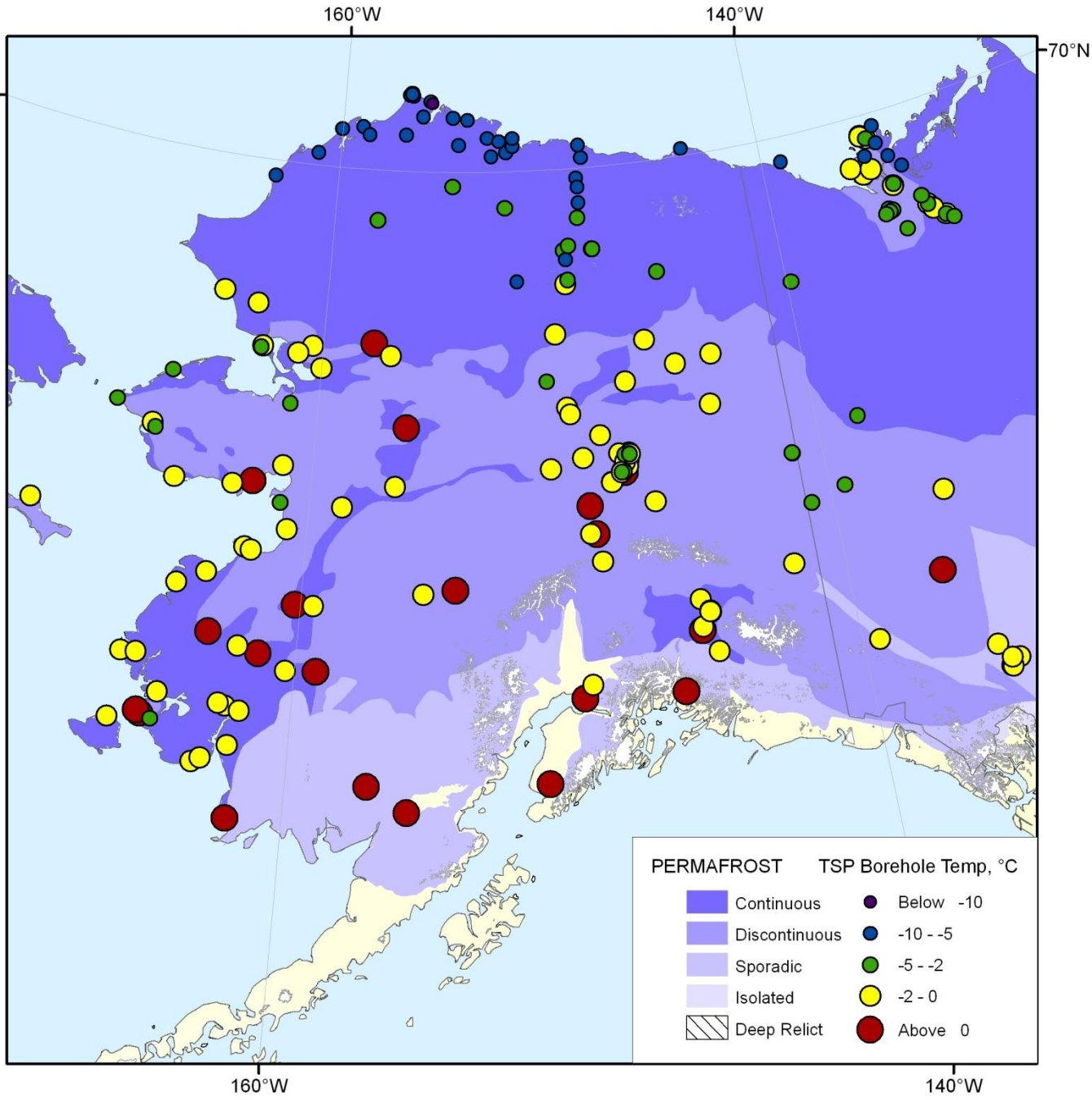
1. Location of the NEW and increasing in size Old features (coordinates or just a description of the location)
2. Description of the feature itself (take some photos)
3. The size of the NEW feature
4. The changes in size of the EXISTING features
5. Any potential hazards related to these new or increasing in size existing features

Changes in permafrost temperatures

IPY TSP

Snapshot

2007-2009





3 m ●
5 m ●
10 m ●
15 m ●
20 m ●
25 m ●
30 m ●



120 m



10026265



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

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

Inland Lake

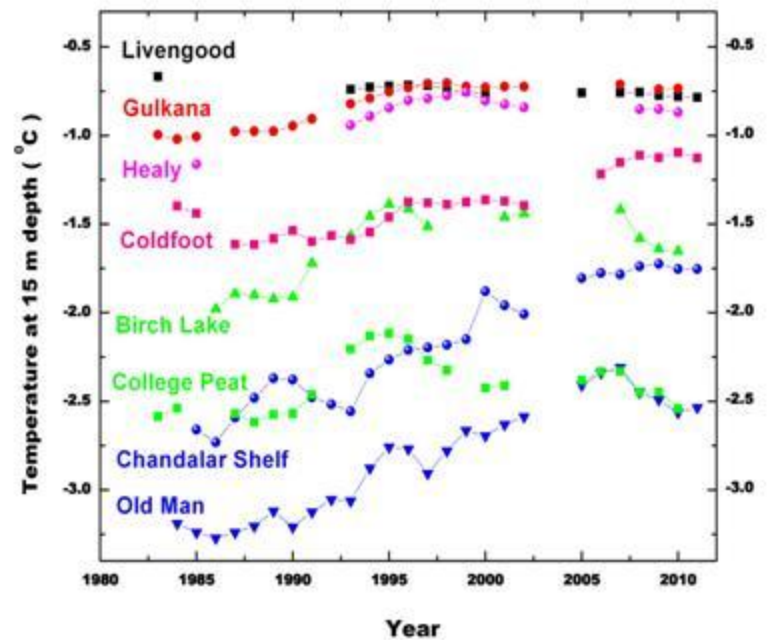
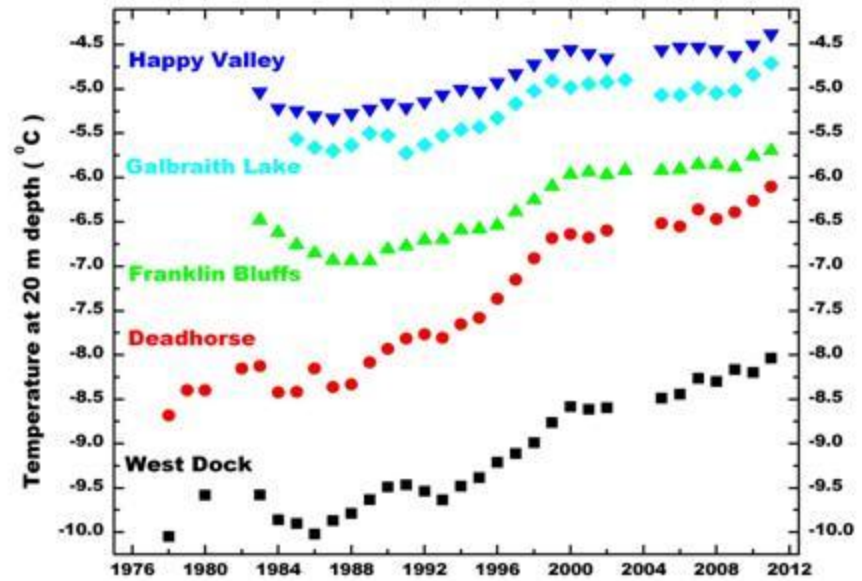
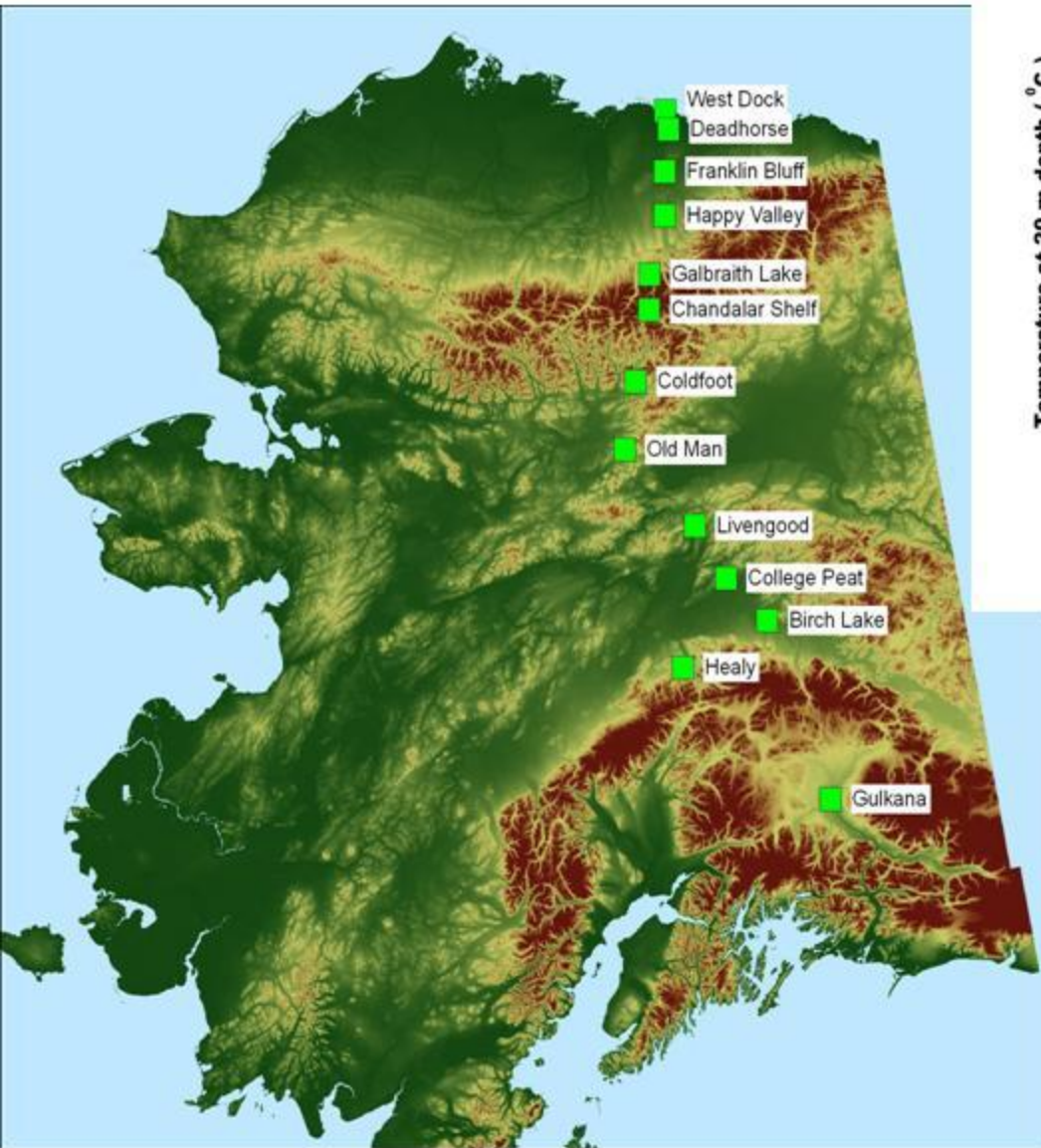
© 2012 Google
Image © 2012 TerraMetrics

Google earth

lat 66.654128° lon -158.924799° elev 42 ft

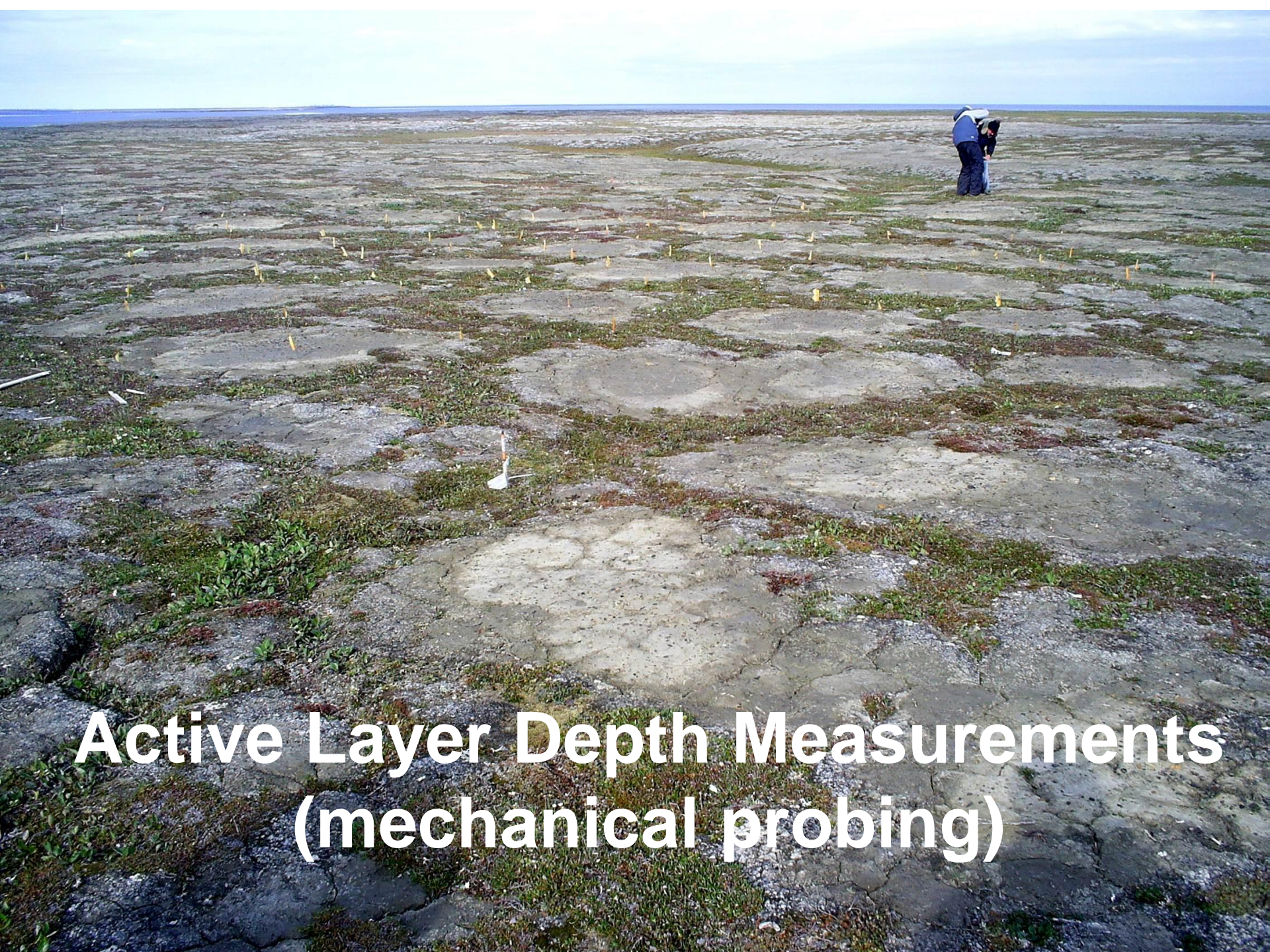
Eye alt 70.28 mi



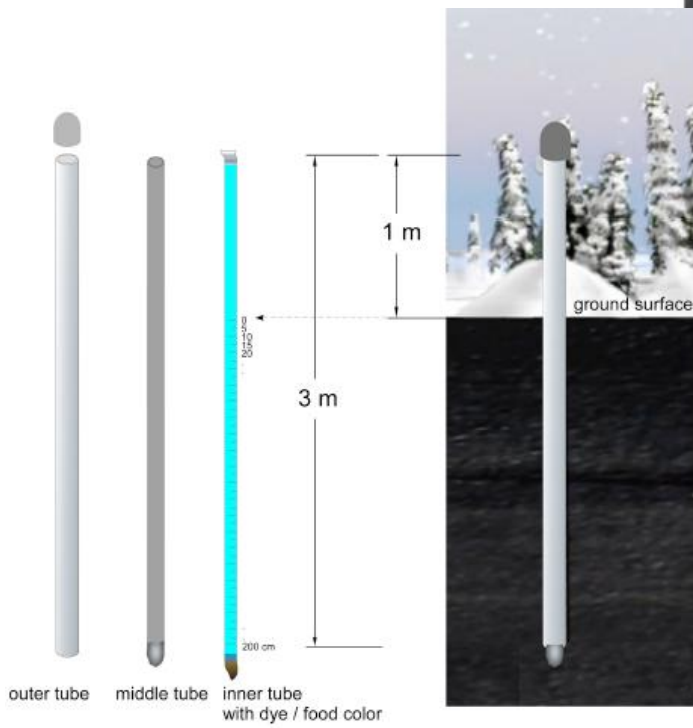
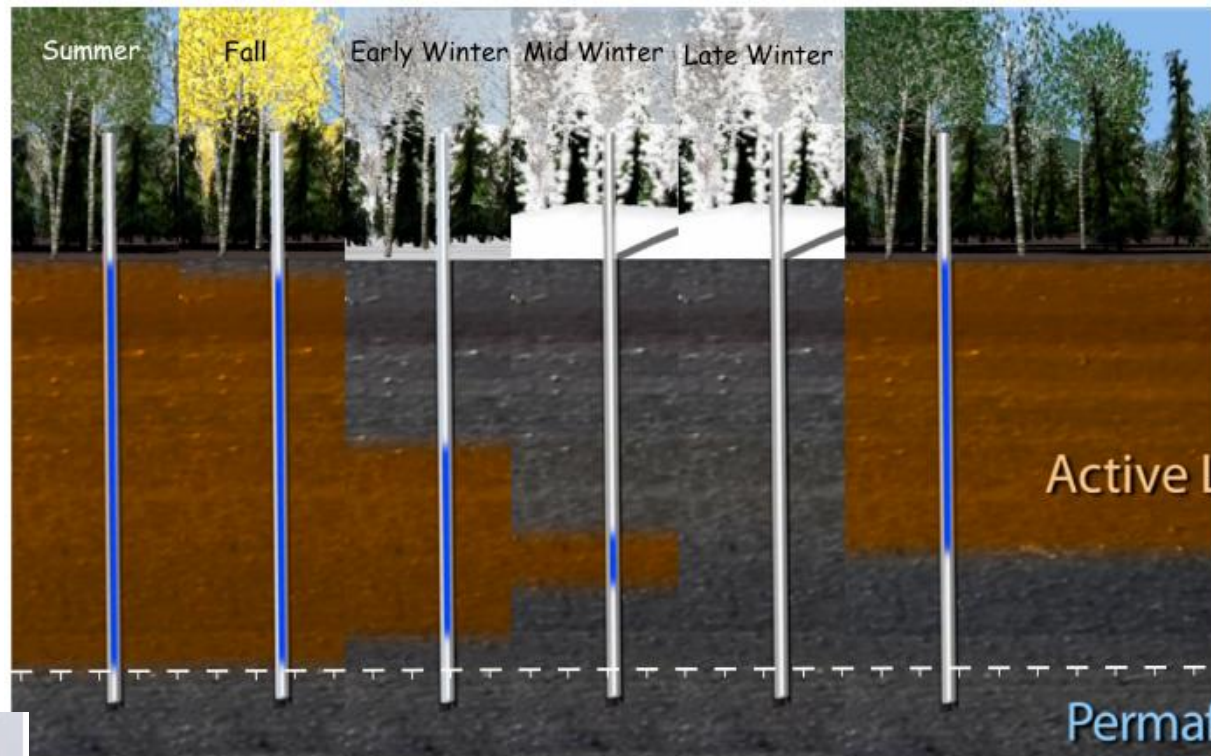
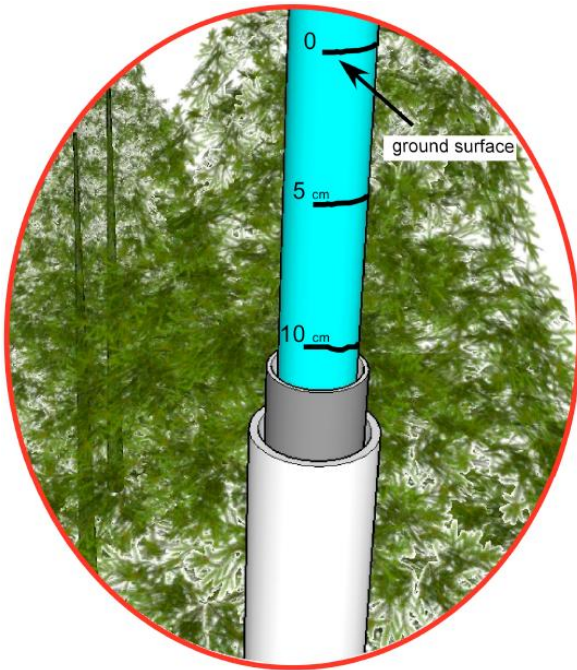


Romanovsky et al, 2012

Changes in the summer thaw depth



Active Layer Depth Measurements (mechanical probing)



Active Layer Depth Measurements using Frost Tube Method

Frost Tube Protocol, Kenji Yoshikawa, 2011

Thank you very much !

www.permafrostwatch.org

