NGEA 01 2017
PERIGLACIAL ENVIRONMENTS
GLOBAL & NORDIC MOUNTAINS, SVALBARD, SIBIREA, GREENLAND, ICELAND & ARCTIC NORTH AMERIKA

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PERIGLACIAL ENVIRONMENTS

Areas with an important influence of cold air and ground temperatures, in daily, seasonal or annual pattern. Creating frozen ground – temporarily- seasonal frost or permafrost
ALASKA-CANADA
The HIMALAJAS, the ALPS, the ANDES etc.
GREENLAND

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TIBETAN PLATEAU

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Climate change and Increased environmental pressure
- Minerals
- Fishing
- Tourism
- Defence inst.
- Infrastructure

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RAPID PHYSICAL WEATHERING
RAPID CHEMICAL WEATHERING
MELTING OF PERMAFROST

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RAPID SLOPE PROCESSES
STRONG WIND ACTION
SEA AND LAKE ICE

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SENSIBILTY to CLIMATIC VARIABILITY OR CHANGES

Active layer at site AB1. STORFLAKET, 380 m.a.s.l

Depth in cm

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What might be like this at temperatures $< 0^\circ \text{C}$
Even very minor changes might have drastic effects.

Might be like this at temp. $> 0^\circ C$
One of the most characteristic features of the periglacial environment is the presence of permafrost and various types of soil ice.

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Thermokarst

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GCM Projections - Arctic Surface Air Temperature

60N - Pole: Change from 1990-1999 mean

- Canadian Climate Centre (CCC)
- NCAR Climate System Model (CSM)
- Geophysical Fluid Dynamics Laboratory (GFDL)
- Hadley Centre Climate Model 3 (UKMO)
- European Centre, Hamburg (ECHAM)

temperature change from 1990-1999 mean (deg. C)

http://zubov.atmos.uiuc.edu/ACIA/
Flow chart of permafrost model.

List of computed variables:

\( H_{sn} \) - Snow depth;
\( T_s \) – Surface temperature;
\( SFI \) – Surface Frost Index;
\( Z_{th} \) – Depth of seasonal thaw;
\( dZ^r_{th} \) – Relative change of thaw depth from baseline period,
\[
dZ^r_{th} = \frac{Z_{th}(t_1) - Z_{th}(t_0)}{Z_{th}(t_0)}
\]
LET US CHECK SOME OF THE PROCESSES