OVERVIEW OF YAMAL PENINSULA with focus on Laborovaya and Vaskiny Dachi: Climate, zonation, physiography, geology, permafrost



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Climate of Yamal: Air temperature



Freeze index zonation is not latitudinal but rather longitudinal with eastern coast much warmer than western due to effect of Gulf Stream

Thaw index is less affected by warmth advection from the west and eastern coast is only slightly warmer.

Processed were 3-year records at Tyurin-To permafrost station. You can see that coastal freeze and thaw indexes are cooler and warmer inland, respectively, which is in compliance with higher continentality of inland Yamal



CLIMATE OF YAMAL PENINSULA Precipitation

- Average precipitation sum reduces northward from 433 to 258 mm
- Summer precipitation reduces northward from 300 to 170 mm
- (Generalized by S.M.Fotiev, 1999)

PERMAFROST OF YAMAL PENINSULA



Ground temperature

Main watershed of Yamal (inland compared to coastal) is much colder as follows from analyses of air temperature distribution

Interface between areas with continuous and discontinuous permafrost

THICKNESS AND DISTRIBUTION OF PERMAFROST (FUNDAMENTALS OF GEOCRYOLOGY, 1998)



1 >100 m; 2 >300 m; 3 >500 m; 4 >500 m.

Evolution of permafrost



Relation between perennially frozen epigenetic, syngenetic, and cryotic deposits, and thawed deposits along the Yamal transect from Kharasavey southward (after G.I.Dubikov, 2002): 1, syngenetic frozen; 2, epigenetic frozen; 3, epigenetic cryotic; 4, non-frozen.

Zoning of the North of West Siberia (after Dubikov, 2002)

Distribution of saline deposits from the ground surface: Northern geocryological zone

Salinity (upper pane) and Clorine (lower pane) distribution in the North of West Siberia (after Dubikov, 2002)

 modern laida;
I-III marine terraces;
IV (Kazan) marine terrace;
V (Salekhard) marine terrace;
Paleogene deposits at all geomorphic units. **Tabular ground ice and cryopegs** Geological profile at Bovanenkovo gas field (after I.D.Streletskaya, 2003)











Stones heaved up in a vertical position







Vaskiny Dachi Research Location:

Ravines inheriting polygonal pattern, and thermokarst depression





LANDSLIDE ACTIVATION IN CENTRAL YAMAL PENINSULA NEAR VASKINY DACHI RESEARCH LOCATION IN 1989 Aerial photo of 1990, oblique photo of 2005











WHY VEGETATION BENEFITS FROM LANDSLIDE

1.5 m high willow shrubs at the ancient shear surface of a landslide







