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Title: *Permafrost and ground ice composition in connection with coastal morphology for key areas of the Yamal and Gydan Peninsula*

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„Yamal-Arctic-2012“ expedition has brought interesting results of cryolithological observations from several key areas along the coasts of the Kara Sea. Some of those areas had not been thoroughly studied by the scientific community before due to their remote location and hard accessibility.

We have described the types of ground ice for each location, and have analysed the coastal morphology and processes as a function of temperature conditions, permafrost composition, sediment structure, exposition and wave dynamics.

For the key area on the eastern, Yamal, coast of the Baydaratskaya Bay, the territory between the mouths of Liyaha and Niarmayaha rivers has been explored. The high 30-m terrace there is composed of rythmically overlaying silt with little ice content. This allows the cliff to remain steep (almost vertical wall) up to 30 m high. The retreat rate of this abrasion coast mostly depends on the wave energy because of the little ice content in the silt. Cliff destruction is mostly executed during highstands and storms, the waves destroy the lower part of the bluff which causes landfalls in the upper part.

However, in these sediments, massive ice beds occur. According to different hypotheses this ice may be either ground ice or buried glacier (firn, snowfield) ice.

For the eastern coast of Beliy Island, the prevailing feature is the presence of well expressed ice wedges of different generations. The width of the older ones reaches 6-8 m. The 5-8 m high cliff here is frozen from the surface. Due to the northern conditions and low mean temperatures, coastal dynamics develop in a different way: the main controlling factor is the air and water temperature which determine the rate of permafrost thawing, and not the wave energy. The thawing sandy sediments flow on the beach where they are carried away immediately even with small waves. On the contrary, during storms those coasts should be more stable because the frozen cliff is more resistant to wave action.

For the south-western coast of the Eniseysky Bay, inclined undular ice beds have been described. Based on the ice properties and its contact with the sediment, we

came to a conclusion that this could be ground ice formed inside the sediment.

The resistance of the coast to erosion is determined by its northern exposition: even at the end of August, numerous snowfields protecting the cliff from the wave action have been observed. The most intensive distruction supposingly occurs during the Autumn storms.