

## APPLYING GIS TECHNOLOGIES FOR AN INVESTIGATING OF BAYDARATSKAYA BAY COASTAL DYNAMICS

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Modern geoinformation technologies are used at studying dynamics of coast of the Baydaratskaya Bay, Kara Sea (Fig. 1). It has allowed to systematize the data received during 18 years, and to deduce researches on essentially new level.

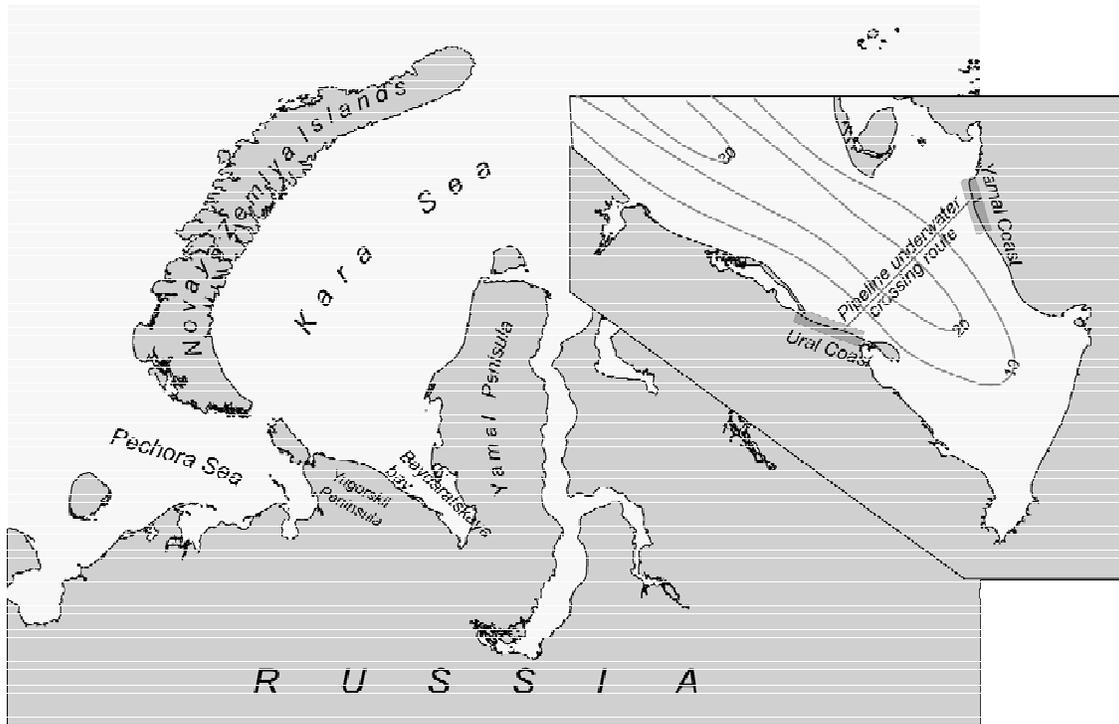


Figure 1. Location of research area.

Monitoring of dynamics of the coast is conducted in transition area of a prospective gas pipelines since 1988. Observations on coastal dynamics are based on the permanent monitoring network which consists from a number of benchmarks. There are 30 profiles on the Ural Coast and 20 profiles on the Yamal Coast.

The significant part of coastal investigations is carried out using reflectorless total station. At first scheduled coordinates and heights of reference points of a network are defined. The received values are compared with last year's ones to control the changes in position of the profiles. The following stage of the work is construction of profiles by a method of trigonometric leveling. In 2006 the network has been incorporated and the thermocirques dynamics monitoring which will be carried out on the basis of repeated construction of 3D models (see Belova et al.) began.

On the basis of long-term research the GIS of dynamics of the coast is developed. GIS is submitted by two levels: actual and synthetic. The first level (actual) is the big data file, collected during 18 years. It includes the data about the site of reference points, the results of leveling on the profiles, the granulometric data for profiles deposits. The second level is based on the allocated homogeneous coastal segments. On the basis of this GIS the maps of coastal retreat rate monitoring have been created. There are maps of dynamics of the coast and maps of litho-dynamic characteristics of coasts (Fig. 2).

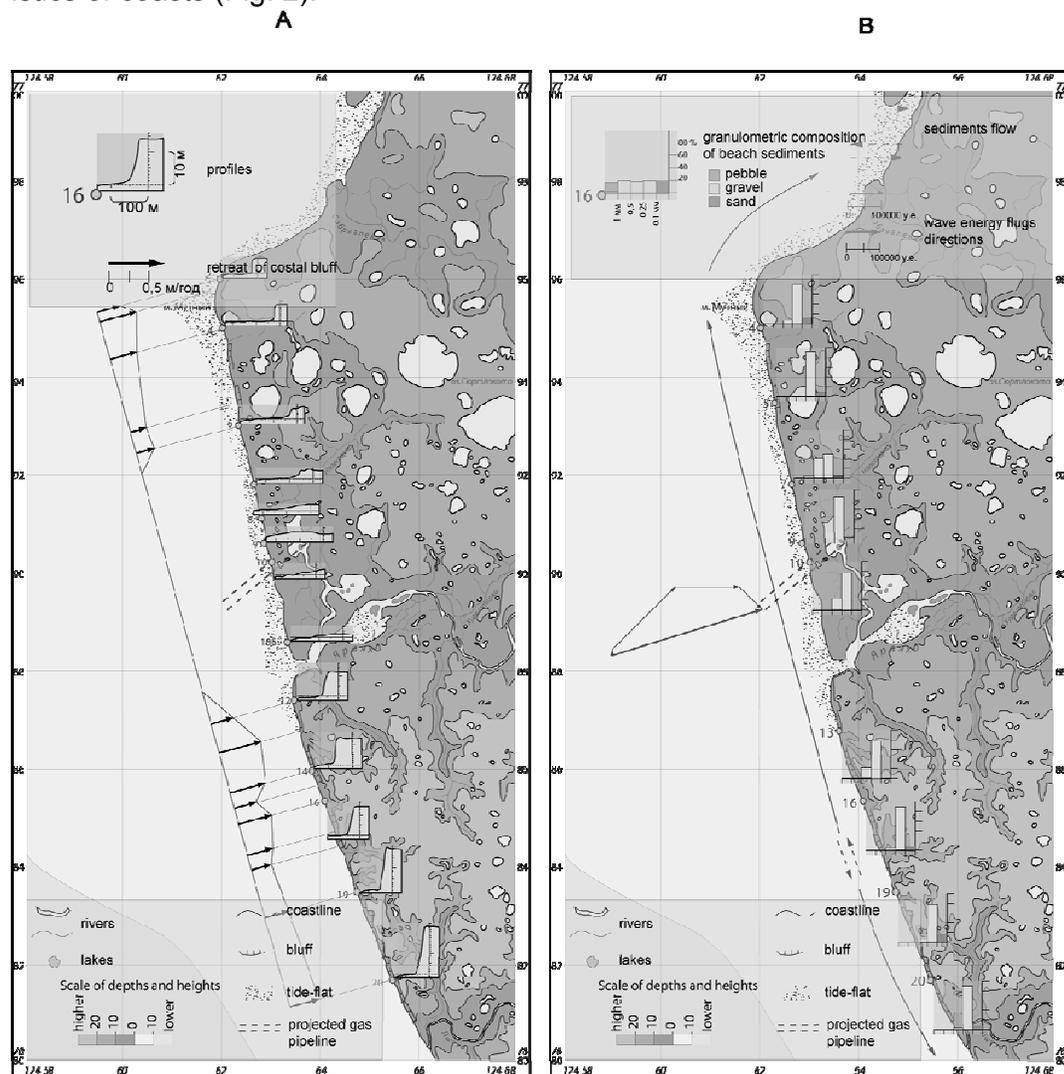


Figure 2. Examples of the maps (Yamal Coast): (1) The map of coastal dynamics, (2) The map of litho-dynamics characteristics.

Thus, on the basis of long-term researches of dynamics of the coast it has been created GIS in which the data were systematized, a series of maps of coastal retreat rate monitoring are created, three-dimensional models of thermocirques are constructed.