



The influence of climate change on the intensity of ice gouging at the Kara Sea bottom by hummocky formations

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Sea ice as a zonal factor is an important passive and active relief-forming agent in the coastal-shelf zone of the Arctic and other freezing seas. The most dangerous process in relation to the hydrotechnical facilities is ice gouging - destructive mechanical impact of the ice of the ground, connected with the dynamics of the ice cover, formation of hummocks and stamukhas under the influence of hydrometeorologic factors and of the relief of the coastal-shelf zone. Underestimation of the ice gouging intensity can lead to damage of the engineering facilities, while excessive deepening increases the expenses of the construction. Finding the optimal variant and, by this, decreasing the risks of extreme situations is a relevant task of the science and practice. This task is complicated by the fact that the oil and gas infrastructure within the coastal and shelf areas of the freezing seas is currently being developed in the conditions of global climate change. In the present work, several results of the repeated sounding of bottom ice gouging microrelief within the area of the underwater pipeline crossing of the Baydaratskaya Bay, Kara Sea, are presented. Based on the results of the monitoring, as well as the analysis of literature sources and modeling it has been established that under the conditions of climate warming and sea ice reduction, the zone of the most intensive ice gouging is shifted landwards, on shallower water areas.