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CONFERENCE HANDBOOK

REMOTE SENSING DATA AND FIELD-BASED METHODS OF CRYOGENIC PROCESSES MONITORING ALONG KARA SUB-LATITUDINAL TRANSECT, RUSSIA

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Climatic fluctuations in the Arctic over the past decade significantly affected the increase of cryogenic processes activity in area of continuous permafrost distribution. In particular, central parts of Yamal and Gydan Peninsulas are characterized by tabular ground ice distribution. Deepening of the active layer and exposure of tabular ground ice on some slopes leads to active thermal denudation: thawing of icy permafrost or pure ice and removal of the thawed material by gravitation. Gas-emission craters found in the North of West Siberia in 2014 also occur in an area of wide tabular ground ice distribution. Furthermore, permafrost areas have widespread polygonal relief formed by a system of frost fractures with the formation of ice wedges – another type of ground ice. Peatlands with ice wedges could degrade under the influence of combination of natural and technogenic factors due to ice wedges thaw, especially on the southern limits of continuous permafrost. Study methods of above listed processes are based on combining remote sensing (optical and radar sensors) and field methods of cryogenic processes monitoring. Remote sensing data is interpreted and verified in key sites along the Kara Sub-latitude Transect from the coast of the Yugorsky Peninsula through Yamal and Gydan peninsulas to western Taimyr. These activities are carried out to assess the impact of climatic changes and the associated dynamics of landscapes and thermal state of the permafrost on the activation of cryogenic processes in the Arctic. Observation of processes resulting from climate and landscape changes and thermal state of permafrost aims at the creation of a more general theory of cryogenic processes associated with ground ice thaw along the Kara Sub-latitude Transect, and the changes caused by these processes in the relief of the Arctic plains. This research was funded by RFBR grants ##18-05-60222, 18-45-890013, by RSF grant #16-17-10203 and ESA DUE GlobPermafrost.