Submission: T-2020-227-28

Title Activation of dangerous cryogenic processes and methane emission in the tundra as a proxy of permafrost degradation

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Theme 2: Observing in Support of Adaptation and Mitigation

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Poster title (brief) Activation of dangerous cryogenic processes and methane emission in the tundra as a proxy of permafrost degradation

Abstract - text box
The dynamics and nature of permafrost state under rapidly changing climatic conditions can lead to activation of permafrost processes, making them dangerous and catastrophic. Gas (including methane) was found in pores of sediments and in bubbles within the Massive Tabular Ground Ice (MTGI) in north of West Siberia. The lower boundary of ice within the permafrost profile corresponds with the lower boundary of MTGI (-30 asl). Due to permafrost degradation from below, the ice is melting allowing gas and saline water (cryopegs) to migrate and accumulate. In locations where the sediments have the least resistance this can lead to formation of so-called permafrost gas emission craters. We expect to see an increase of number on permafrost gas emission craters. Dangerous permafrost processes and phenomena are mainly due to the reaction of the upper layers to the degradation of permafrost as a result of changes in heat transfer conditions on the surface. These processes lead to formation of vast thermokarst depressions, themocirques (or retrogressive thaw slumps) and erosion ravines. New themocirques appear, as well as a new cycle of activation appeared of previously stabilized forms. It is necessary to implement of the Observing System for dangerous cryogenic processes and methane emissions in the Arctic. This work was funded by the RFBR grants 18-05-60080 and 18-05-00612.