15th ICRSS 2018

Polar Regions in Transformation - Climatic Change and Anthropogenic Pressures

BOOK OF ABSTRACTS

Edited by Frank Günther, Guido Grosse, and Benjamin Jones

15^{th} International Circumpolar Remote Sensing Symposium
10 – 14 September 2018, Potsdam, Germany

15^{th} International Circumpolar Remote Sensing Symposium

Polar Regions in Transformation - Climatic Change and Anthropogenic Pressures

---

Book of Abstracts

Edited by Frank Günther, Guido Grosse and Benjamin M. Jones

Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research

Recommended citation
Günther, F., Grosse, G., and Jones, B. M. (Eds.) (2018): 15th International Circumpolar Remote Sensing Symposium – Book of Abstracts, 10 – 14 September 2018, Potsdam, Germany. Bibliothek Wissenschaftspark Albert Einstein. doi:10.2312/GFZ.LIS.2018.002.

Imprint

Publisher
Bibliothek Wissenschaftspark Albert Einstein
Telegrafenberg
14473 Potsdam
Published in Potsdam, Germany

Editors
Frank Günther
Guido Grosse
Benjamin M. Jones

Relief modification caused by formation of gas-emission craters, remote-sensing and field studies

M. O. Leibman[1,2], A. I. Kizyakov[3], M. V. Zimin[4], E. A. Babkina[1], Yu. A. Dvornikov[1], R. R. Khairullin[5,1], & A. V. Khomutov[1,2,6]

[1] *Earth Cryosphere Institute, Tyumen Scientific Centre SB RAS, Tyumen, Russia*;
[2] *University of Tyumen, Tyumen, Russia*;
[3] *Moscow State University, Faculty of Geography, Moscow, Russia*;
[4] *ScanEx Research and Development Center, Moscow, Russia*;
[5] *St. Petersburg State University, St.-Petersburg, Russia*;
[6] *Industrial University of Tyumen, Tyumen, Russia*

Six gas-emission craters (GECs) were documented in the north of West Siberia. The role GECs formation in the terrain changes is not limited to the crater itself, but also to positive and negative microforms around the GEC (Fig. 1). Positive microforms around GECs are characteristic of all craters and consist of the ejected frozen deposits, later thawed. These deposits either form a single parapet, or isolated piles and ridges 0.2 – 3.5 m in diameter and 0.1 – 0.8 m in height. Negative microforms are found only around three of six GECs, and comprise rounded hollows up to 13 m in diameter and up to 1.5 m in depth, surrounded by an edging of extruded deposits. Origin of these microforms was debatable. We used remote sensing data specifically for interpretation of landform origin, measuring distances and density of material scattering, identifying scattered material through analysis of repeated imagery, and determining the area of the "risk zone" where falling blocks can be expected in case of "eruption".

Data obtained by analysis of imagery, photographs and field survey provides sufficient evidence in favor of the hypothesis that the hollows around GECs are impact microforms associated with a hit from falling large blocks of frozen deposits.

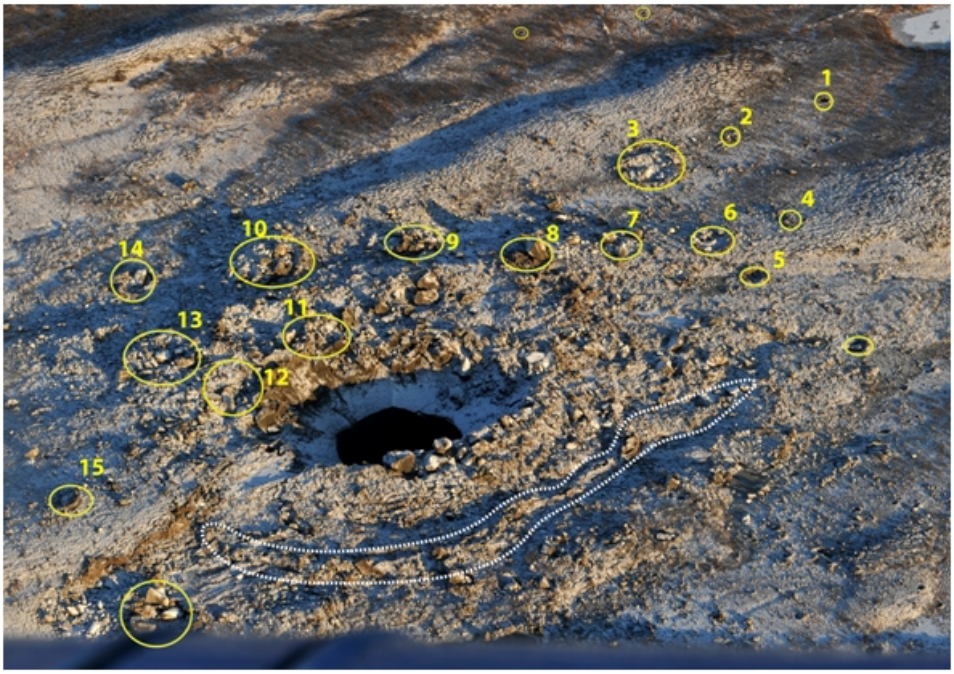

Figure 1: Photograph from the helicopter on 14 November 2012, characterizing the location of blocks of ice and frozen deposits ejected from GEC-2. Numbers indicate impact hollows and blocks of icy deposits reliably correlated with these blocks on imagery.