Preliminary Analysis of a Retrogressive Thaw Slump Multi-Source Database for the West Siberian Arctic

Nina Nesterova¹,², Ilya Tarasevich³,⁴, Marina Leibman³,⁴, Alexander Kizyakov⁵, Ingmar Nitze¹, and Guido Grosse¹,²

¹Alfred-Wegener-Institute for Polar and Marine Research
²University of Potsdam, Institute of Geosciences
³University of Tyumen
⁴Earth Cryosphere Institute
⁵Lomonosov Moscow State University

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1. Alfred-Wegener-Institute for Polar and Marine Research, Potsdam, Germany
2. University of Potsdam, Institute of Geosciences, Potsdam, Germany
3. University of Tyumen, Tyumen, Russia
4. Earth Cryosphere Institute, Tyumen, Russia
5. Lomonosov Moscow State University, Moscow, Russia

nina.nesterova@awi.de

Background & Study area

Retrogressive thaw slump (RTS) is a cryogenic landform due to ice-rich permafrost thawing or massive ground ice melting:

• Significantly altering the environment: vegetation, topography and carbon emissions
• Vulnerable to the temperature fluctuations
• Polycyclic nature: active or stabilized (or ancient)
• Complex features: multiage zones within one landform

West Siberian Arctic: Continuous permafrost + tabular massive ground ice close to the surface → widespread RTS occurrence

The aim

Further detailed investigation of RTS occurrence and environmental factors

Materials & Methods

• Mapped RTS points by Nesterova et al. 2021, Nitze et al., 2018 and Yang et al., 2023
• Manual collection of RTS points based on: ESRI satellite base map, Google map, Yandex map satellite
• Classification

Results

4390 points collected
• 3150 are morphologically Thermocirques
• 828 combined morphologies and only 160 Thermoterraces
• 2139 complex and 1999 single forms

Most common RTS: single thermocirque at the lakeshore (with thermokarst subsidence and thermoerosion)

Outlook

In relation to data on:
• Geology
• Ground ice content
• Climate
• Landcover
• Other environmental parameters

More figures, statistics & References

How does RTS look in West Siberia?

AI thoughts on RTS in West Siberia

Source: OpenAI