Comparing the last fifty years of erosion in the Canadian and Russian Arctic

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Arctic coasts

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Bykovsky Peninsula

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Alas edge

R_{mean} = 0.59 m/yr
Bykovsky Peninsula – spatial distribution of erosion

- Rate (m/yr)

- Retrogressive thaw slump

- Alas

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Storminess – a driver for erosion??

Topography
Sea ice
Geography
Shoreface profile

Bykovskaya Channel
Cape Bykovsky

Study sites
Study sites used for multitemporal analysis
Weather stations

Area not covered by 1951 imagery

Kharaulakh Ridge

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Coastal erosion of the Bykovsky Peninsula

- Average erosion: $0.59 \text{ m/yr} \neq 2.4 \text{ m/yr}$
  Strong in relation to temperate regions comparable to other Arctic shorelines

- No significant temporal trend in erosion - fits the global picture

- Erosion trends, and relationship to storminess are subdued by local variability in cryolithology, geography, subaerial and subaqueous topography
Ice-rich and culture-rich coast
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Using orthorectified airphotos from 1952 and 1970 and an Ikonos image from 2000 corrected with control points collected by kinematic differential global positioning system and processed using softcopy photogrammetric tools, mean coastal retreat rates of 0.61 m/yr and 0.45 m/yr were calculated for the periods 1952–1970 and 1970–2000, respectively.

Elsewhere

Mars and Houseknecht, 2007
Northern Alaska

Solomon, 2005
Southern Beaufort Sea Coast
Canada

Vasiliev, 2005
Kara Sea

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No significant temporal trend in erosion in the Arctic

- Erosion trends, and relationship to storminess are subdued by local variability in cryolithology, geography, subaerial and subaqueous topography

- Should we go towards a comprehensive arctic coverage?

- Currently, not enough data to
  Reduce the weight of local variability
  Provide boundary condition parameters
A step further

How do those relations translate at different scales?

upscaling / downscaling validation at observatories