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Submarine Landslides at the Siberian End of Lomonosov Ridge, Arctic Ocean

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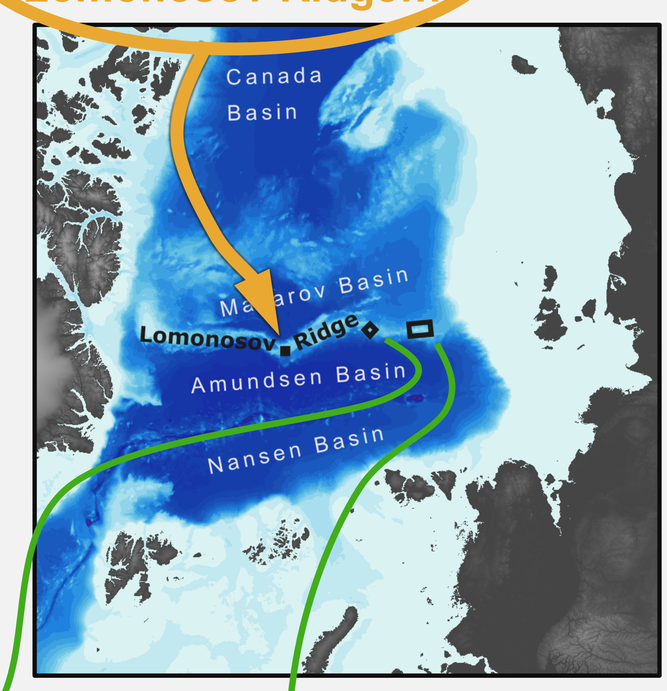
Introduction:

Submarine landslides are known from continental margins worldwide, except for the Arctic Ocean. Due to its extreme ice conditions only sparse high-resolution data exist. Therefore, submarine landslides are rarely known from within the Arctic Ocean and so is their abundance and spacial extent.

During RV Polarstern cruise in 2014, high resolution bathymetric, sediment echo-sounder and multi-channel seismic data was gained at the Siberian end of the Lomonosov Ridge. These data reveal unknown submarine landslides.

Previous submarine landslides on Lomonosov Ridge!!![1]

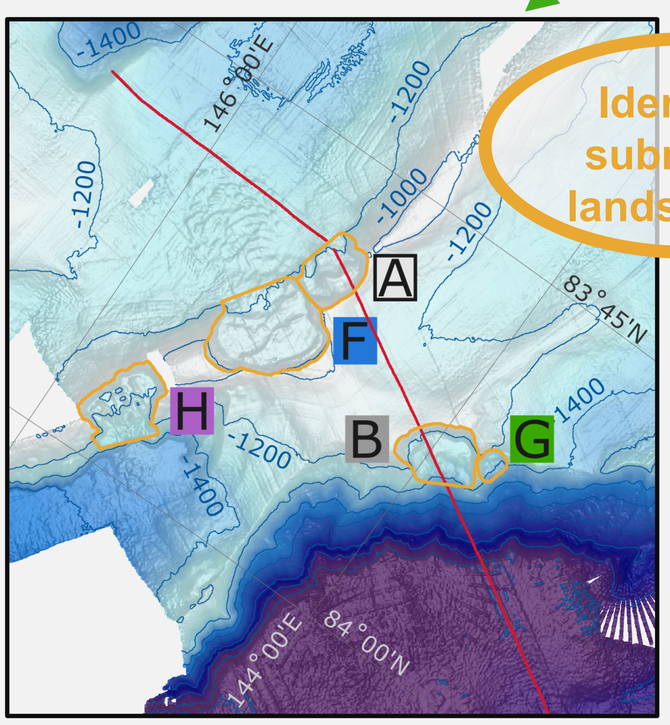


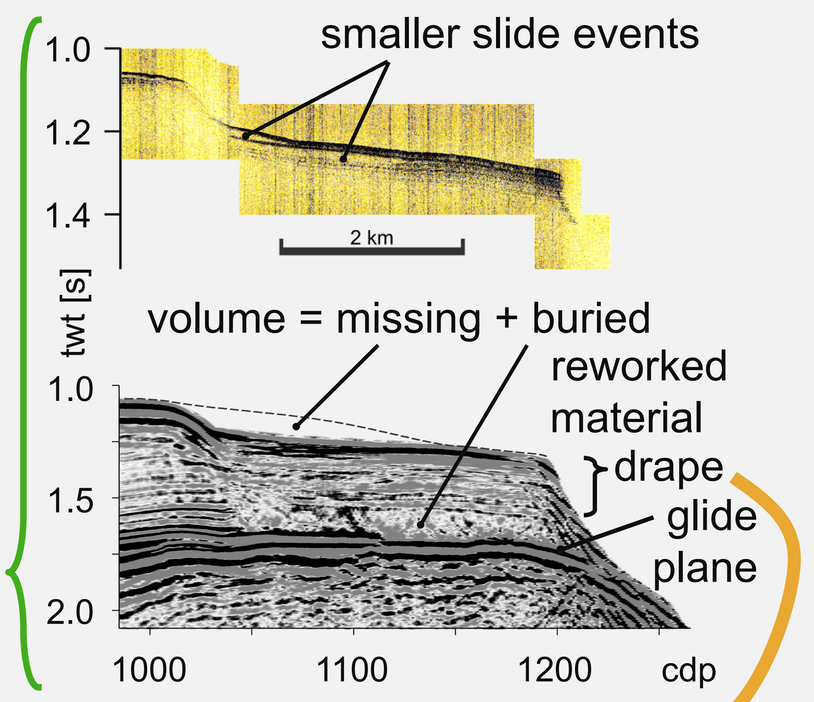
Summary:

Submarine landslides ...

- … occur on both sides of the ridge's crest. They are a few kilometres wide and long, and some hundreds of metres high. The volume of material involved in the slide event ranges up to a few cubic kilometres.
- … with the same order of magnitude in spacial extent are common on Lomonosov Ridge.
- … on Lomonosov Ridge are small.
- … are buried under sediment that needed several million years to accumulate. However, smaller slide events also occurred more recently.

Identified submarine landslides!!!





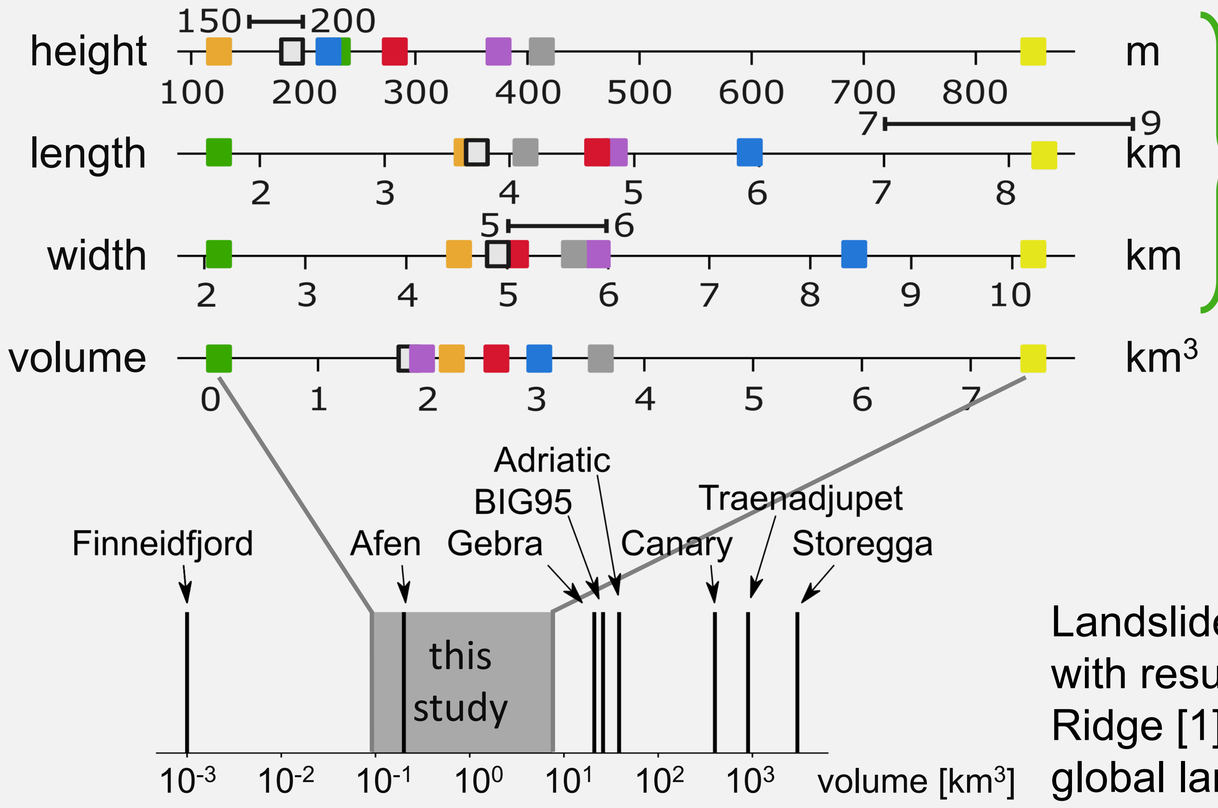
New swath bathymetry data: landslides A – G outlined in orange (–), seismic reflection & sediment echo-sounder profiles (–)

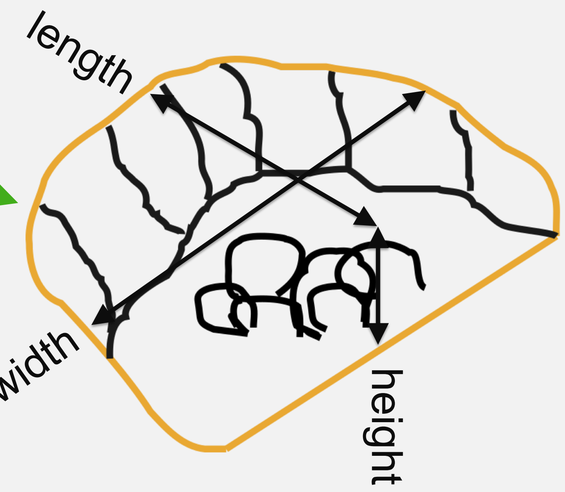
Results:

drape thickness: 300 ms (twt)

2.9 cm/ka

needed ~7 Ma to accumulate





Landslides A (□) to G (■) together with results from central Lomonosov Ridge [1] (⟼) and comparison with global landslides [2] (bottom pane)

References:

[1] Kristoffersen, Y., et al., *Mass wasting on the submarine Lomonosov Ridge, central Arctic Ocean.* Marine Geology, 2007. **243**(1): p. 132-142.

[2] Canals, M., et al., *Slope failure dynamics and impacts from seafloor and shallow sub-seafloor geophysical data: Case studies from the COSTA project.* Marine Geology, 2004. **213**(1-4): p. 9-72.

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