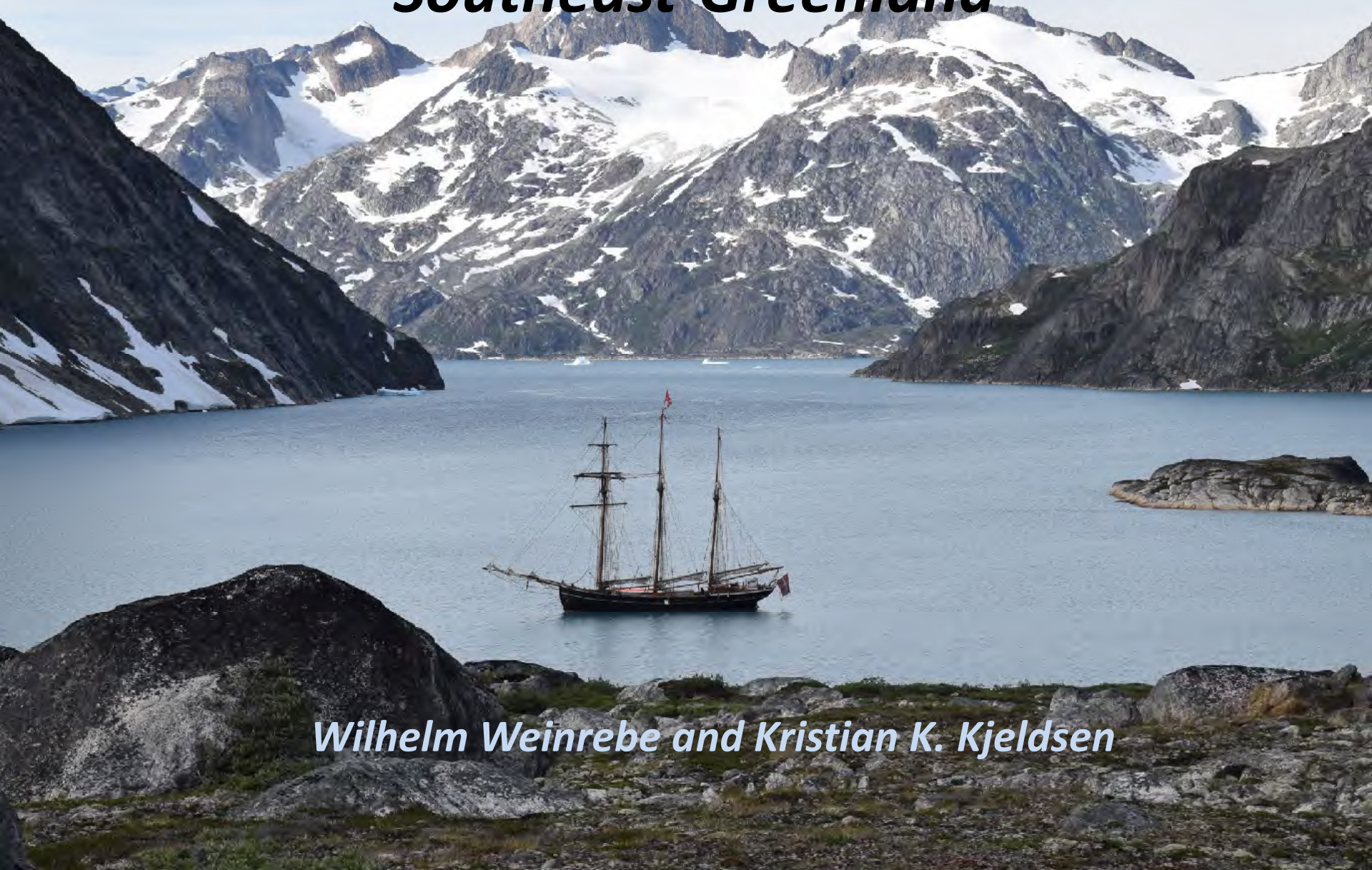


Multibeam Mapping of Remote Fjords in Southeast-Greenland



Wilhelm Weinrebe and Kristian K. Kjeldsen

Thrym Glacier in Inner Skjoldungen Fjord



13. Aug. 1932



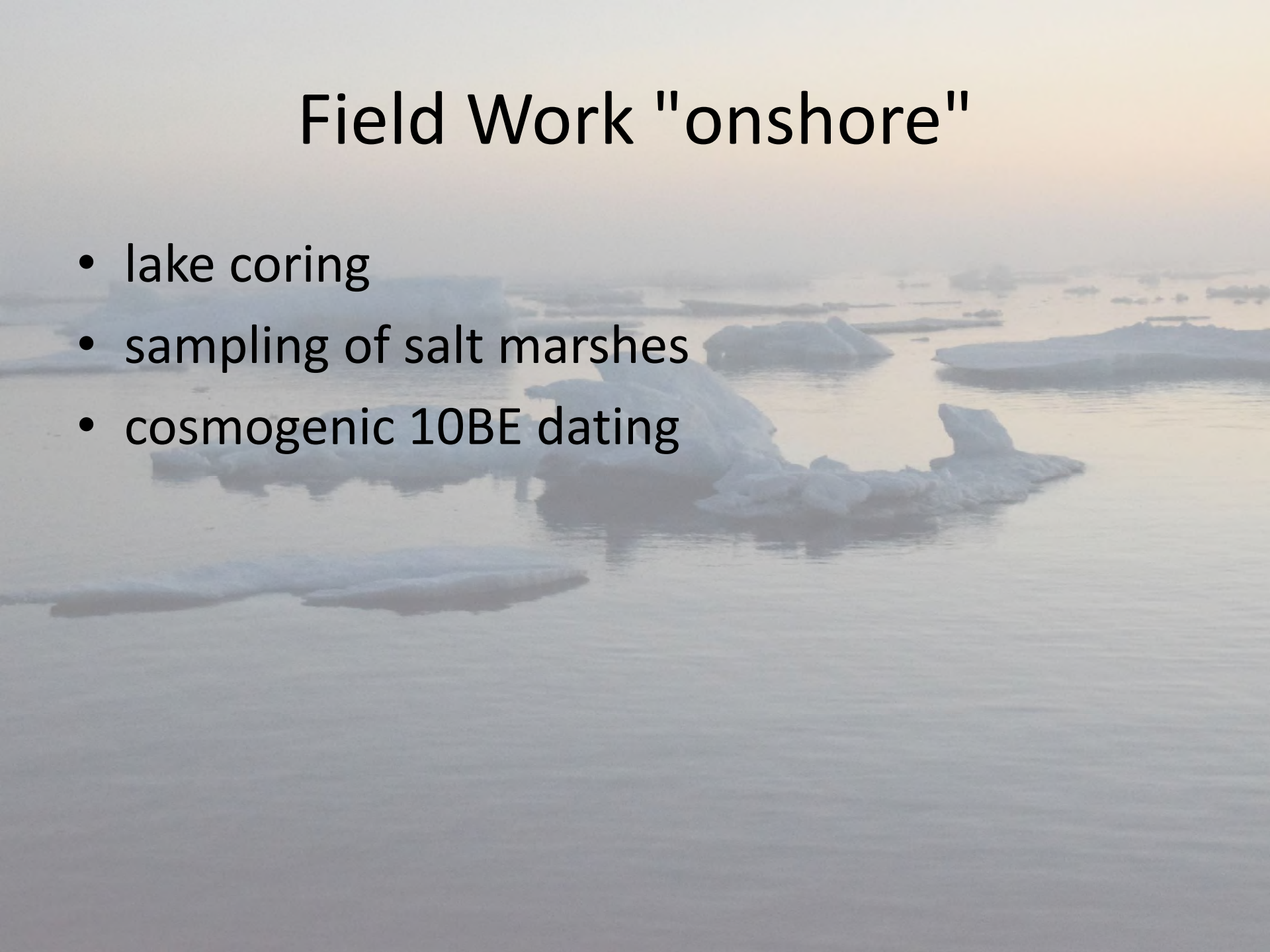
31. Jul. 2013

Project:

- Greenland Ice Sheet over the Past Millennium
PI: Kurt H. Kjaer
- Centre for GeoGenetics
Natural History Museum, Univ. of Copenhagen
- Aim: Better Understanding of Interplay Between
Climate Change and Ice Sheet Dynamics
- funded by:
Danish Agency for Science, Technology and
Innovation

Field Work "onshore"

- lake coring
- sampling of salt marshes
- cosmogenic ^{10}Be dating

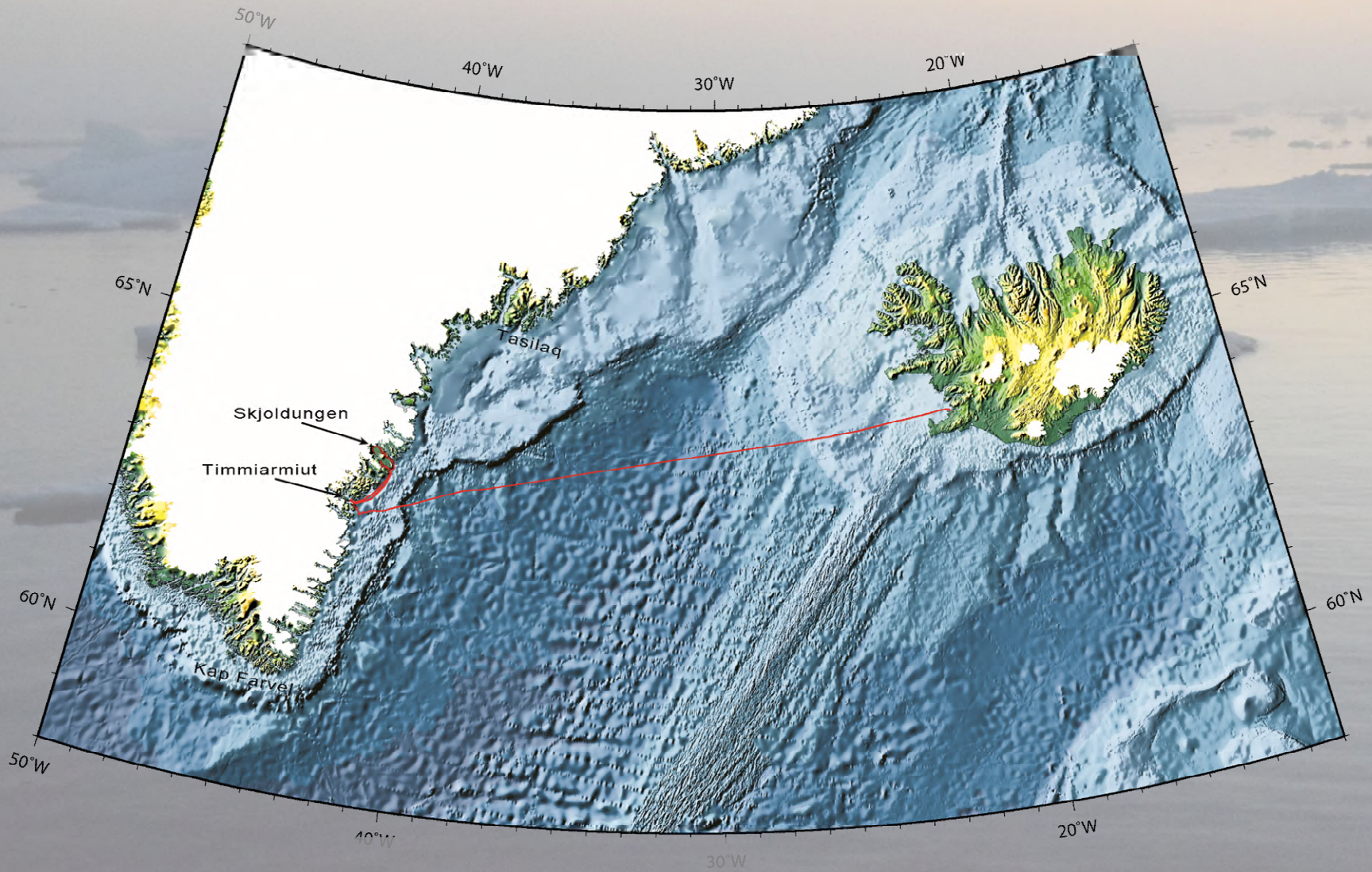


Field Work "offshore"

- atmospheric water vapor isotopes
- environmental DNA
- marine sediment cores
- CTD

Multibeam - Mapping

ACTIV - 2014



ACTIV

- topsail schooner
- built 1951
- length 30 m, over all 42 m
- width 7 m
- draft 3,2 m
- weight 400 t
- crew: 6
- scientists: 11



























VER-DOB AS-SLAV!



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multibeam System

- ELAC Seabeam 1050
- 50 kHz frequency
- 150° swath width (38° transducer-mount)
- pole over the side
- CodaOctopus F180R+ motion sensor
- Sea&Sun CTD48M
- no SSV-sensor!



installation of
multibeam transducer
















multibeam – data acquisition
and control station

A photograph taken from the deck of a research vessel. In the center, a large, clear cylindrical corer is suspended by a metal frame and pulley system. Two crew members are visible: one in a purple long-sleeved shirt is adjusting the corer, and another in a dark jacket stands in the foreground with their back to the camera. To the right, another crew member in a dark jacket and blue jeans stands near the rigging. The vessel's deck is cluttered with ropes, pulleys, and equipment. The background features a vast expanse of blue water and a rugged, snow-dusted mountain range under a clear sky.

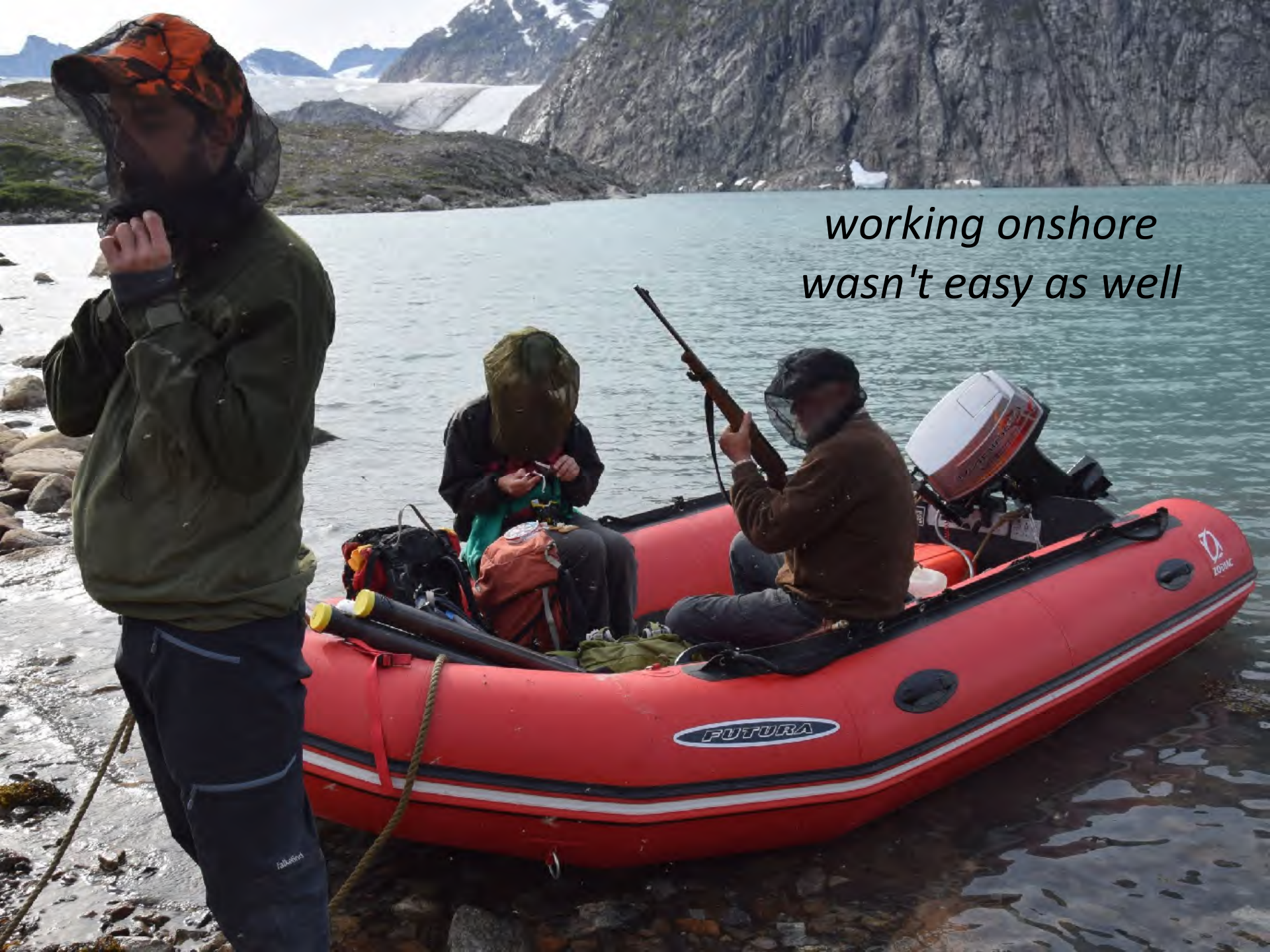
"Rumohr"
- corer





CTD "winch"





*working onshore
wasn't easy as well*



FIB: *"flying inflatable boat"*



<https://www.youtube.com/watch?v=541xY-qRhfl>



<https://youtu.be/CtmUn9HsusA>



<https://youtu.be/CtmUn9HsusA>

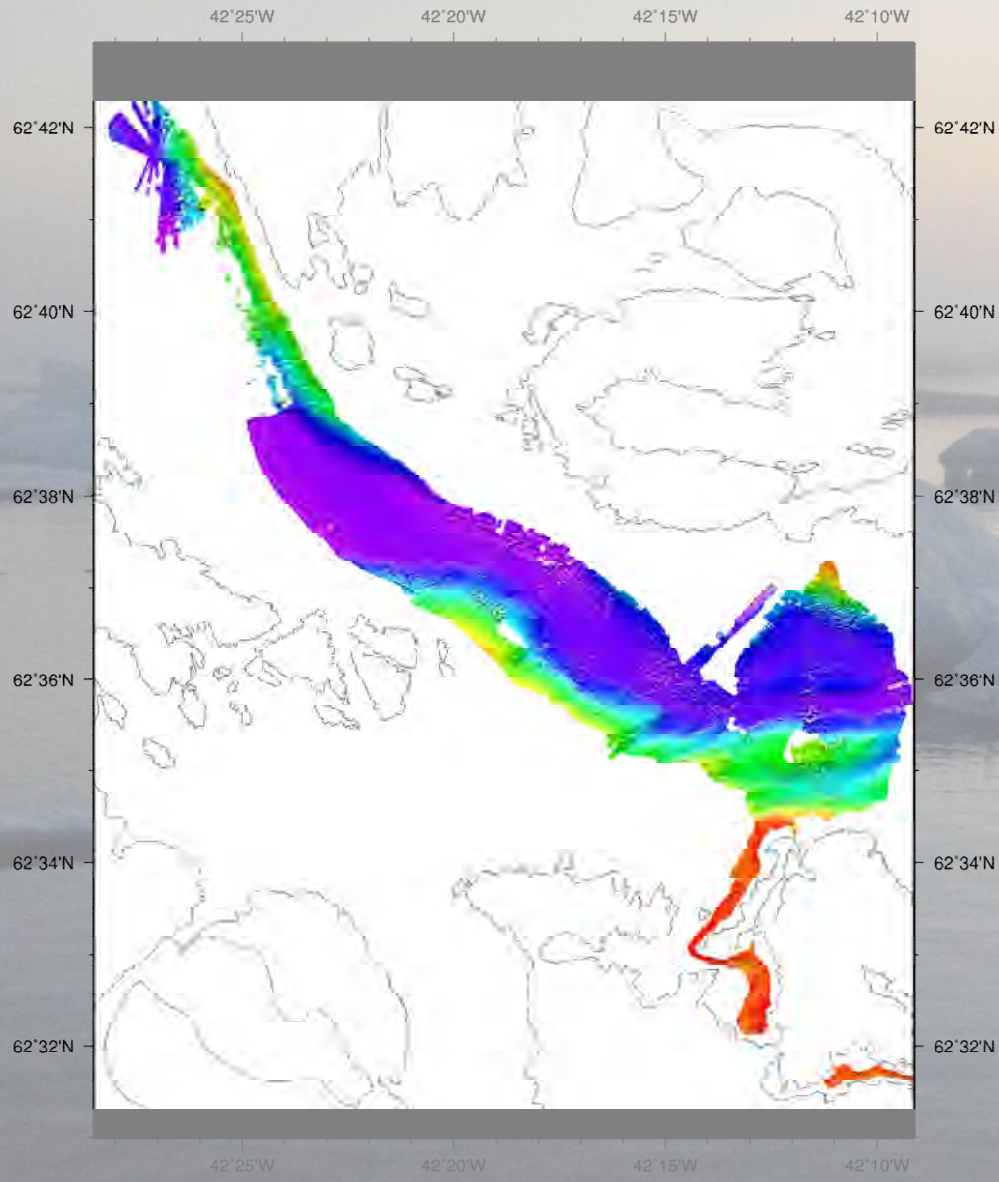


<https://youtu.be/CtmUn9HsusA>

Timmiarmiut
multibeam
survey



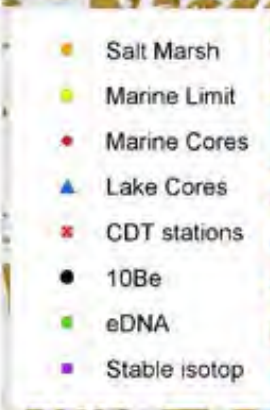




Timmiarmiut multibeam survey



63°N



43°W

42°W

41°W


Skjoldungen

Timmiarmiut

63°N



Skjoldungen - Fjord

A scenic view of a fjord with snow-capped mountains and a rusty metal structure in the foreground. The sky is blue with scattered white clouds. The water is calm and reflects the surrounding landscape. In the foreground, a rusty metal structure, possibly part of a surveying instrument, is visible on the right side.

Skjoldungen
multibeam survey



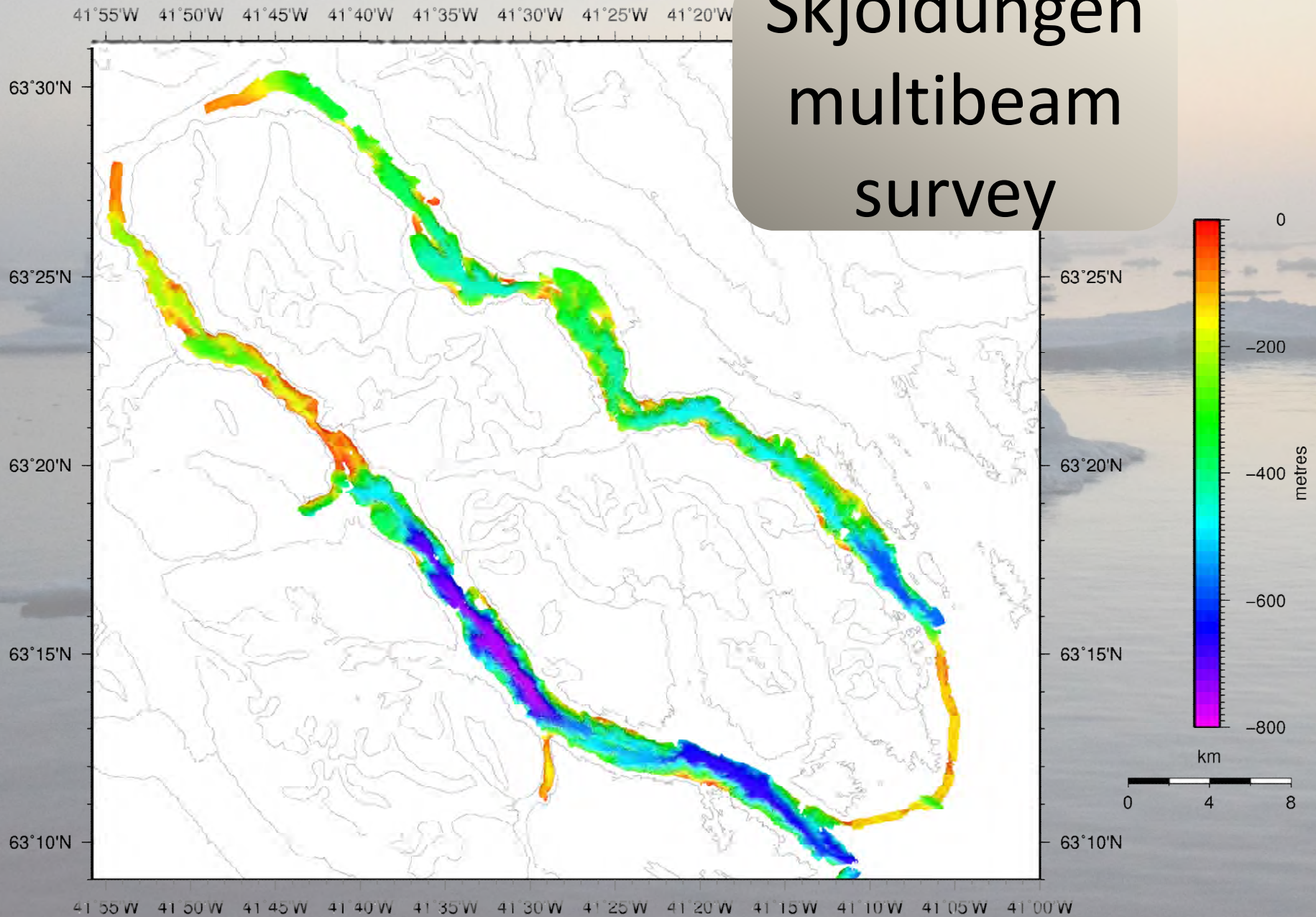




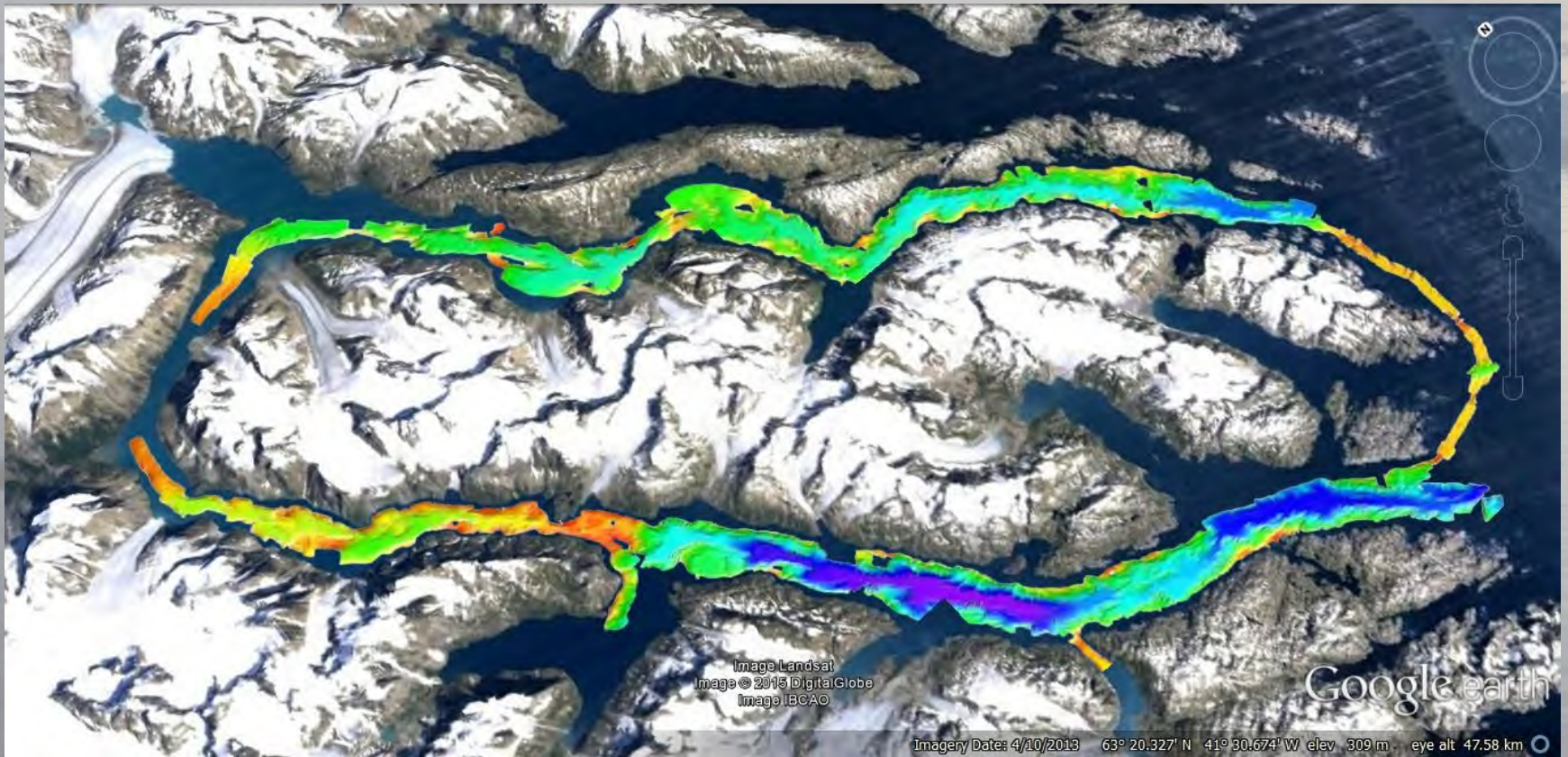




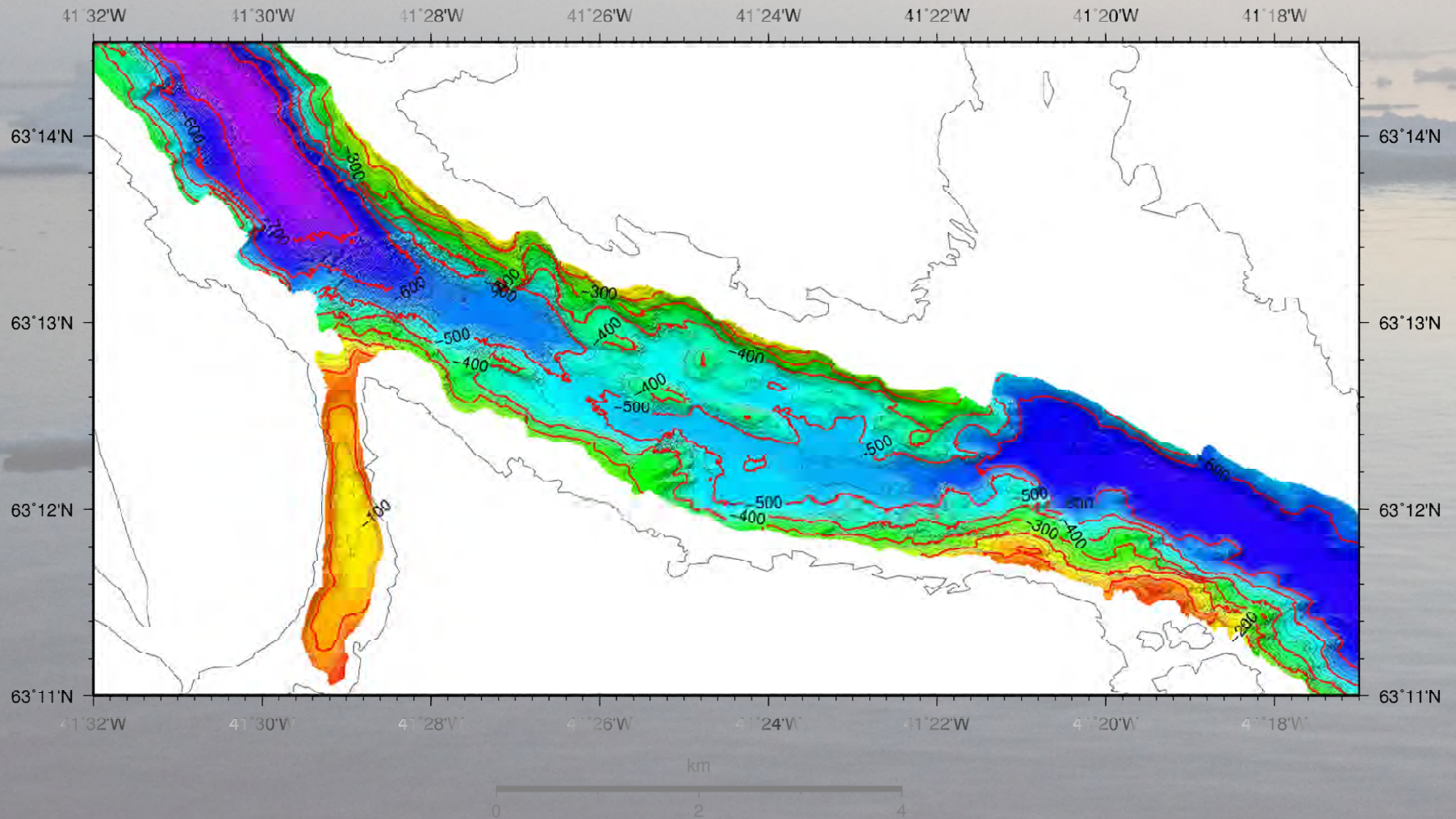
Skjoldungen multibeam survey



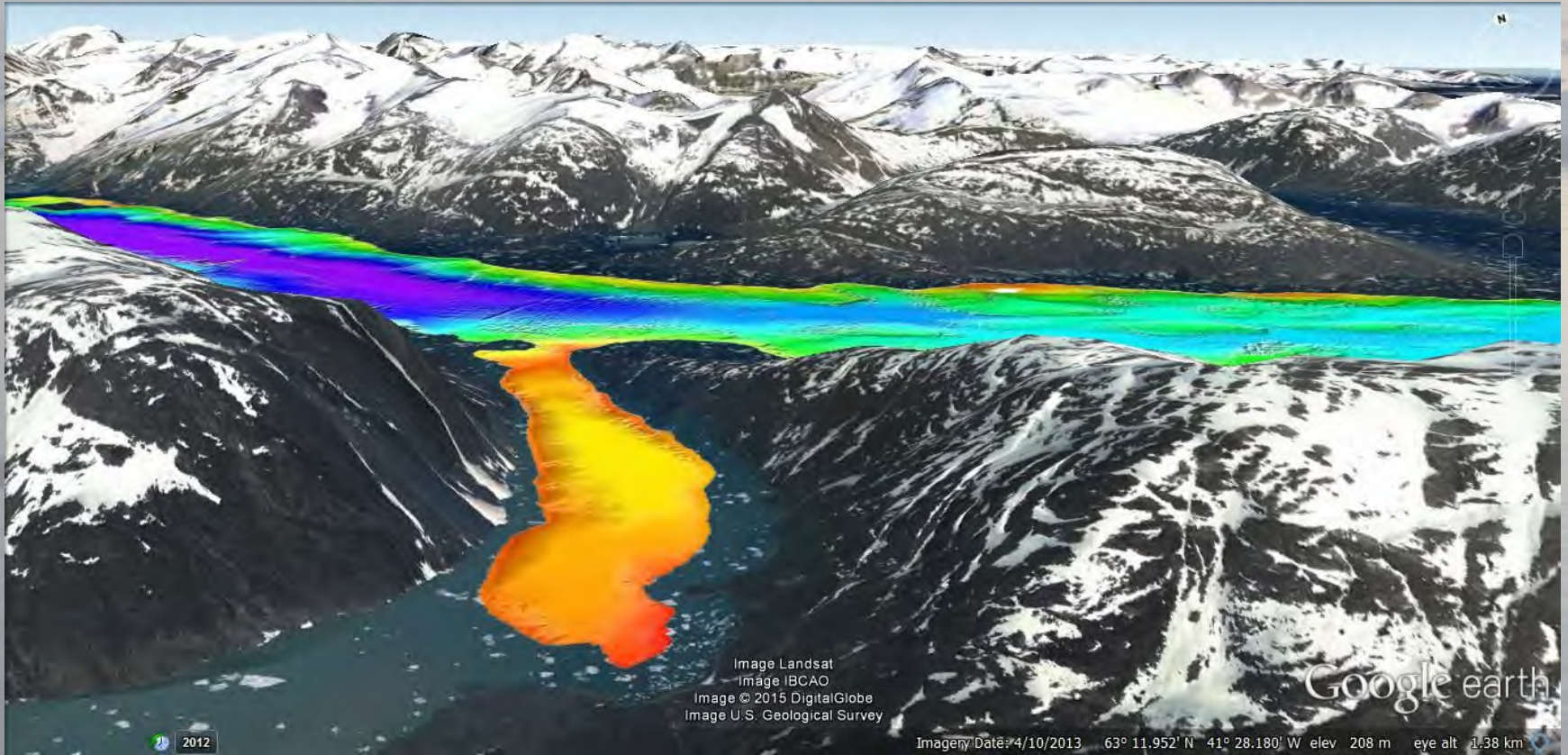
Skjoldungen - Fjord



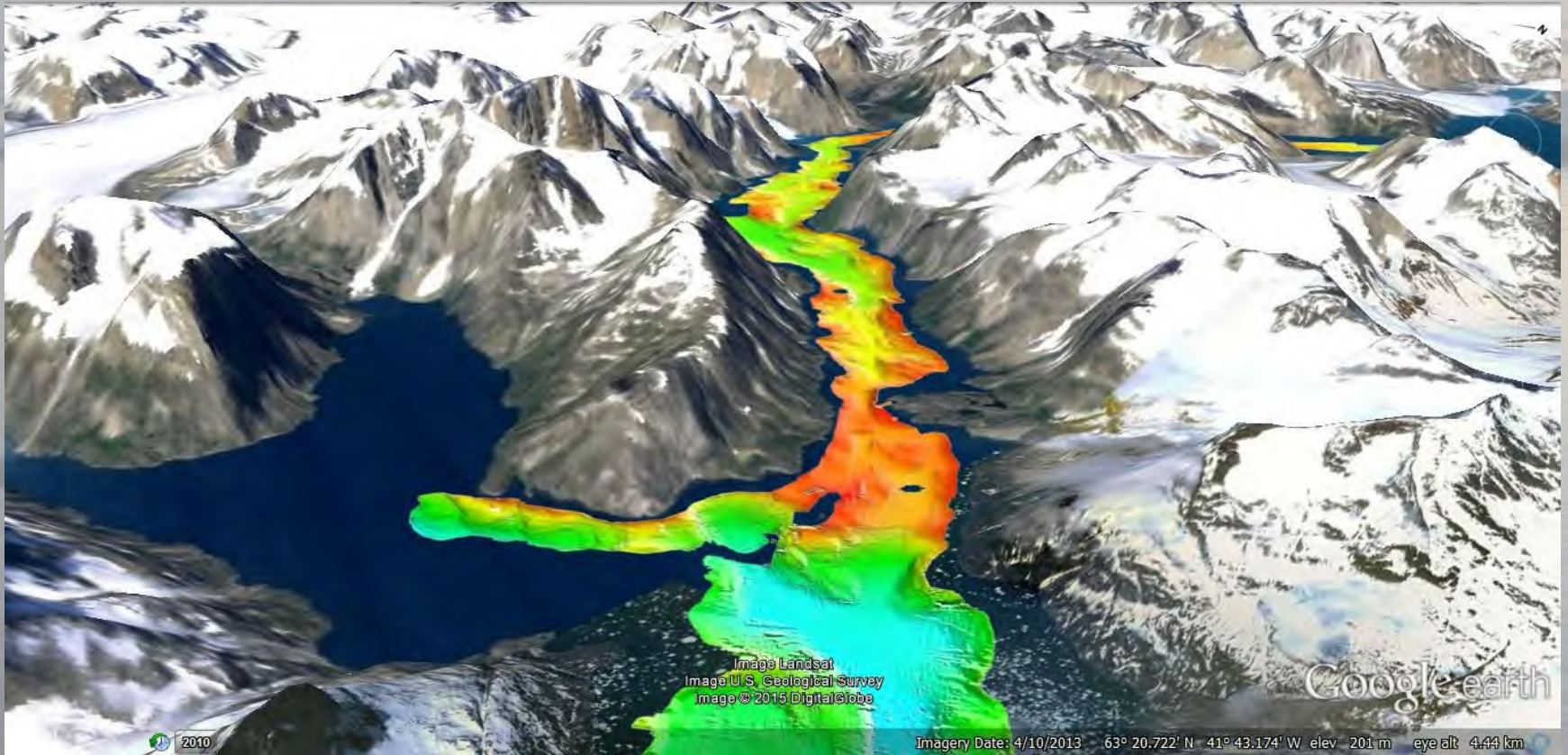
Skjoldungen - Fjord



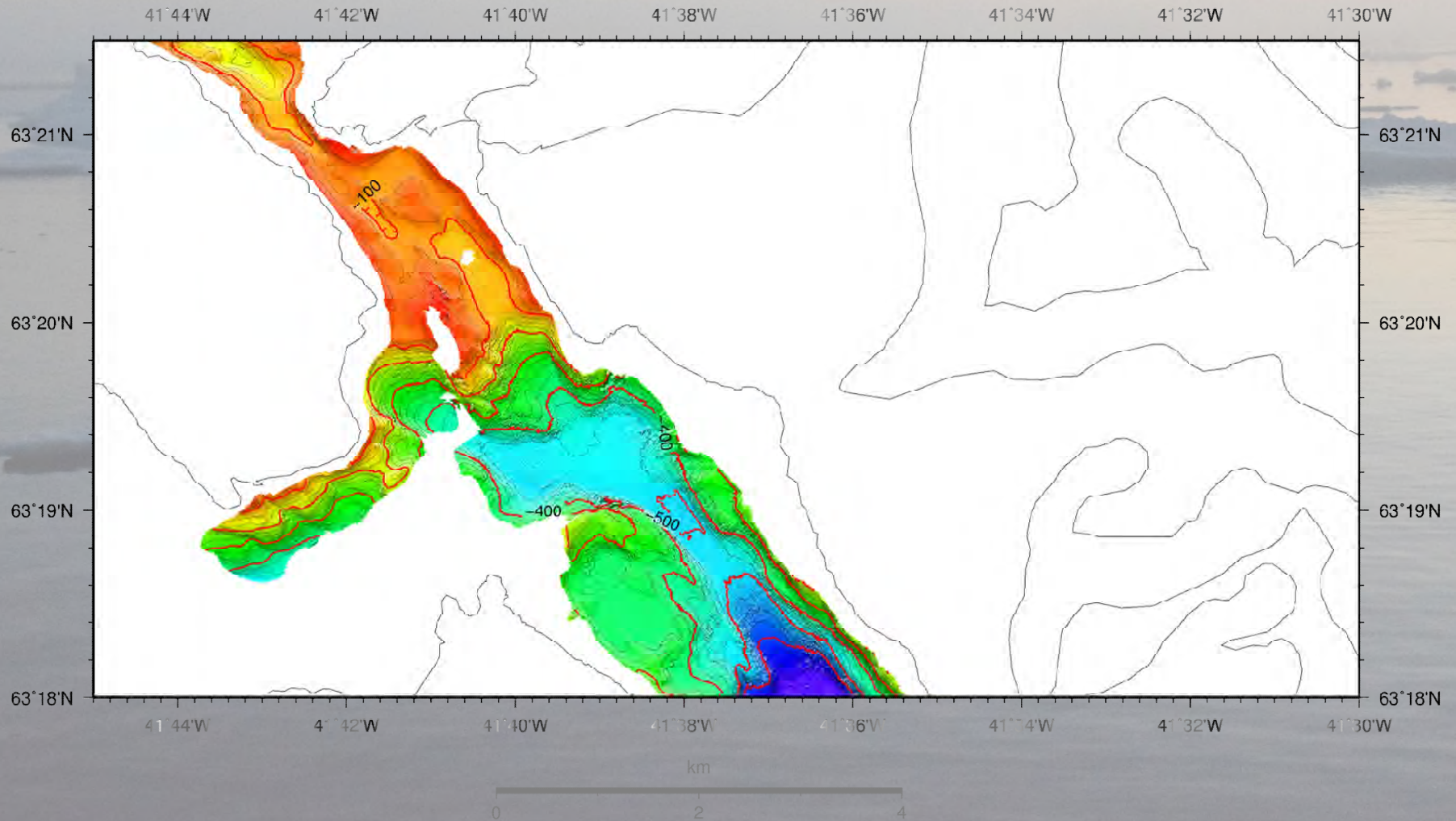
Skjoldungen - Fjord



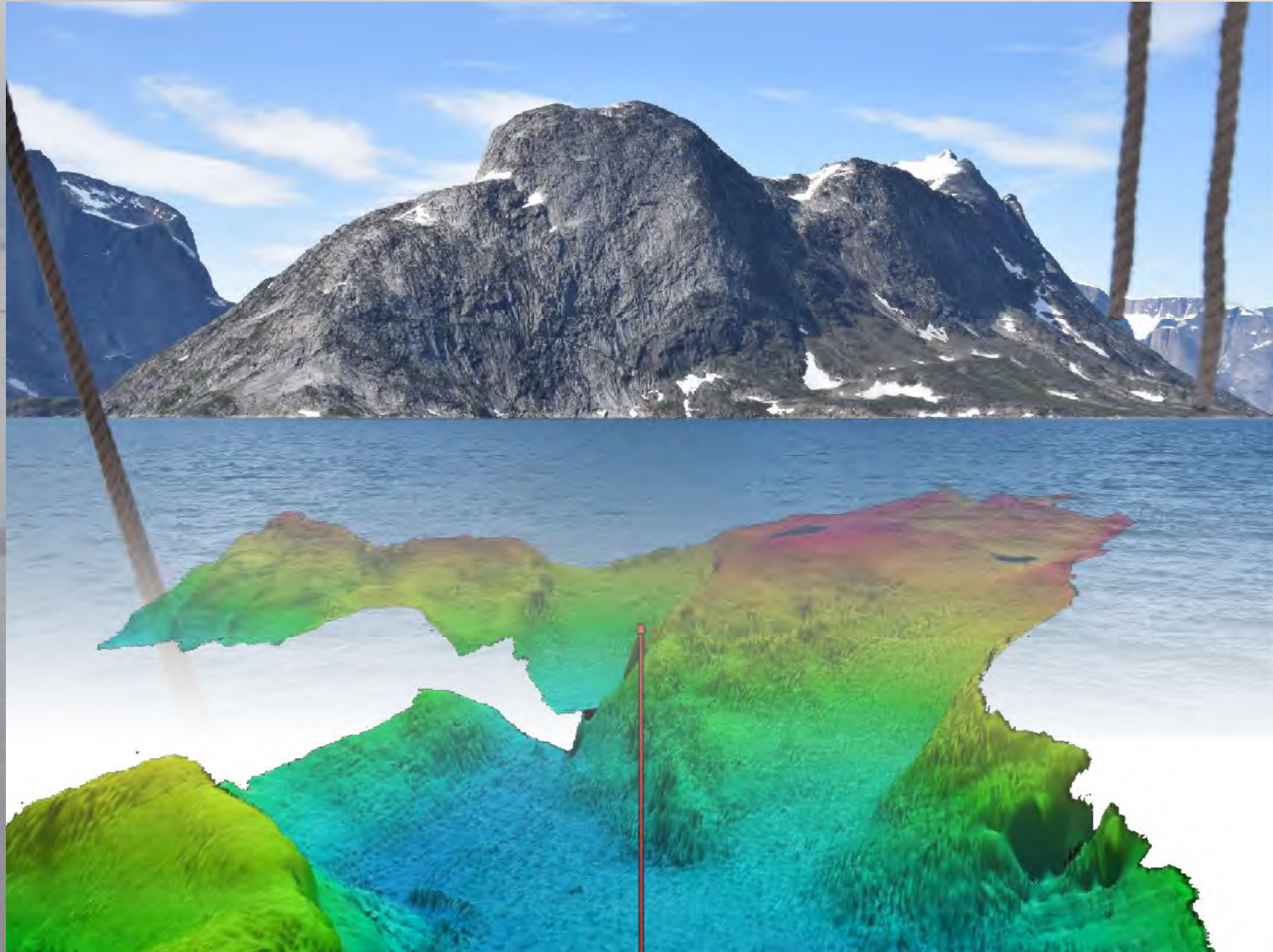
Skjoldungen - Fjord



Skjoldungen - Fjord



Skjoldungen - Fjord



conclusions (1)

- multibeam operation on a vintage vessel
- demanding installation
- floating ice blocks → danger to transducers
- area not suited for roll calibration
- frequent power failures
- GPS interruptions in narrow fjords

conclusions (2)

- really quiet ship
- limited bubble wash down
- multibeam results not perfect
- however: first successful mapping of previously unexplored fjords

conclusions (3)

- interesting and challenging experience
- feeling how field work might have been hundred years ago
- value the "luxury" we enjoy on our modern research and survey vessels
- value the advances in ship technology
 - winches and cranes
 - autopilot and dynamic positioning
 - email and internet



*... thanks for support and help to
Wärtsilä ELAC Nautik GmbH, Teledyne CARIS
and Captain Jonas Bergsoe*

