

# NYKOS – WP3 MARINE GEOLOGICAL MAPPING



GEOLOGICAL  
SURVEY OF  
NORWAY

- NGU -

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NYKOS avslutningskonferanse May 14, 2019

## Objectives:

Marine geological mapping of seafloor and stability and dispersal of submarine mine tailings

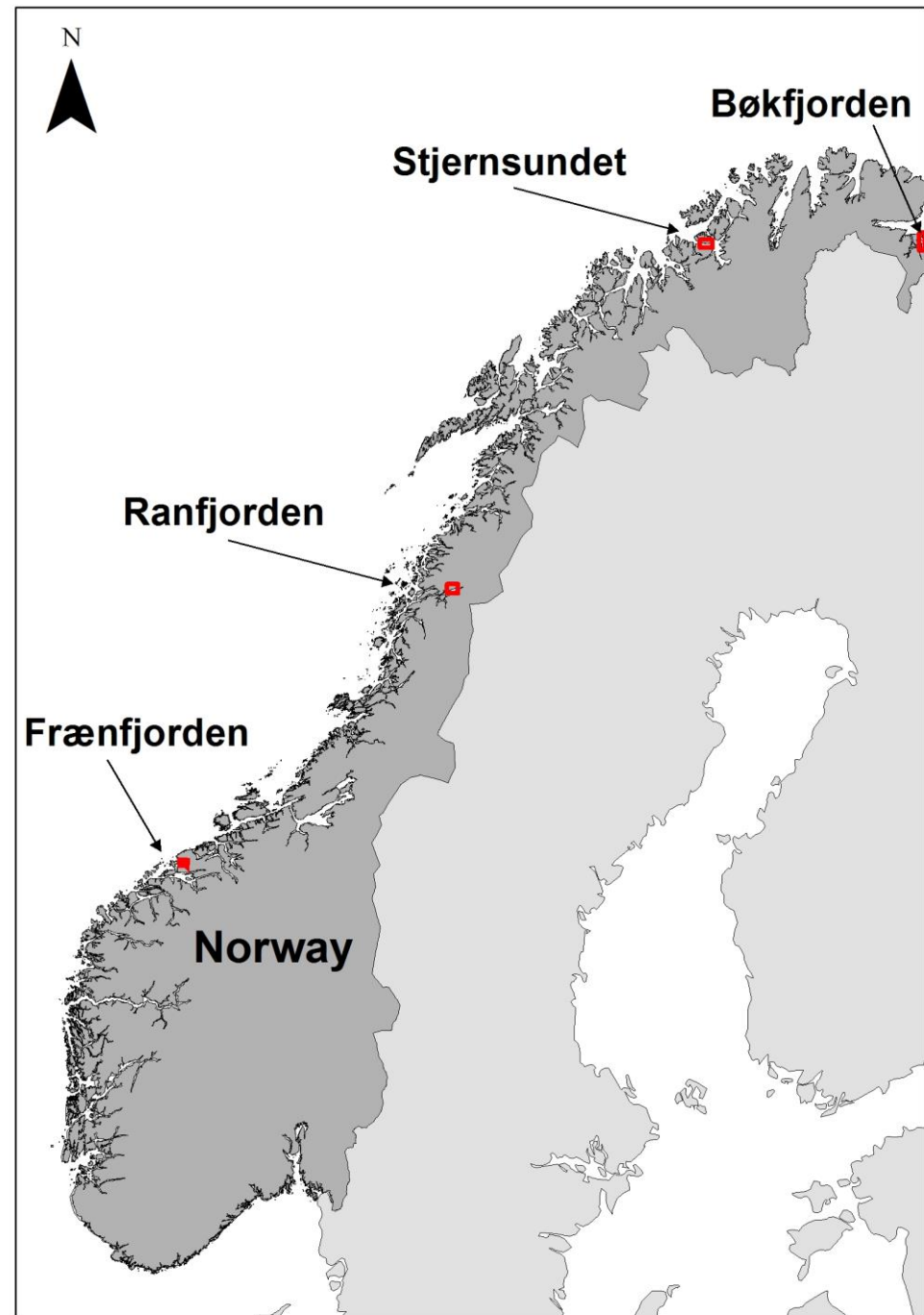
## Methods:

Geophysical, Geological, Geochemical

**Data:** new and existing

## Studied fjords:

Bøkfjorden  
Stjernsundet  
Ranfjorden  
Frænfjorden





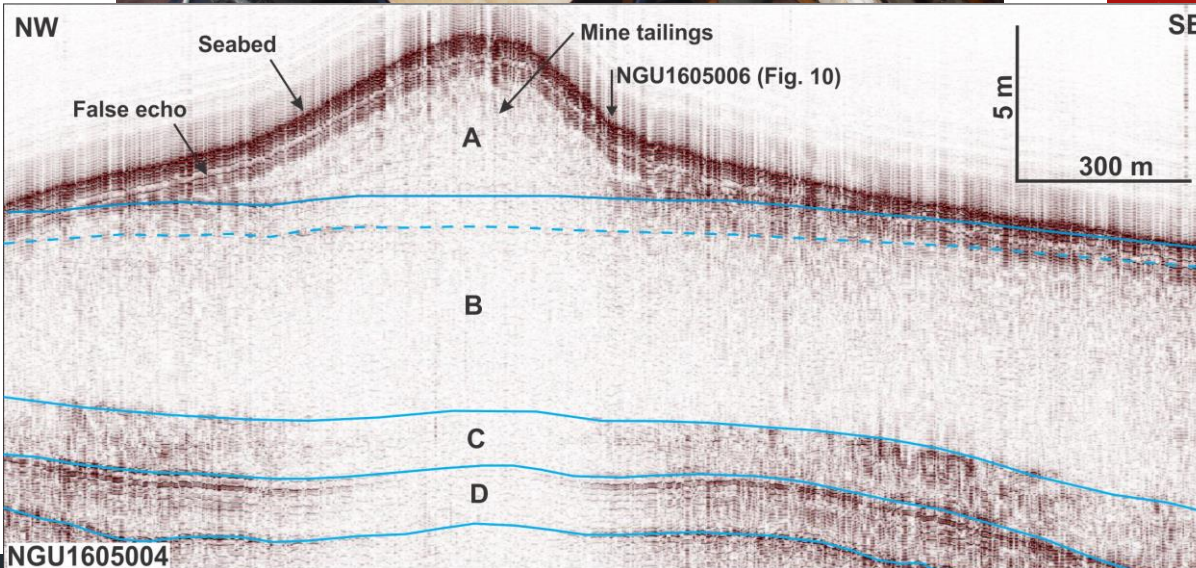
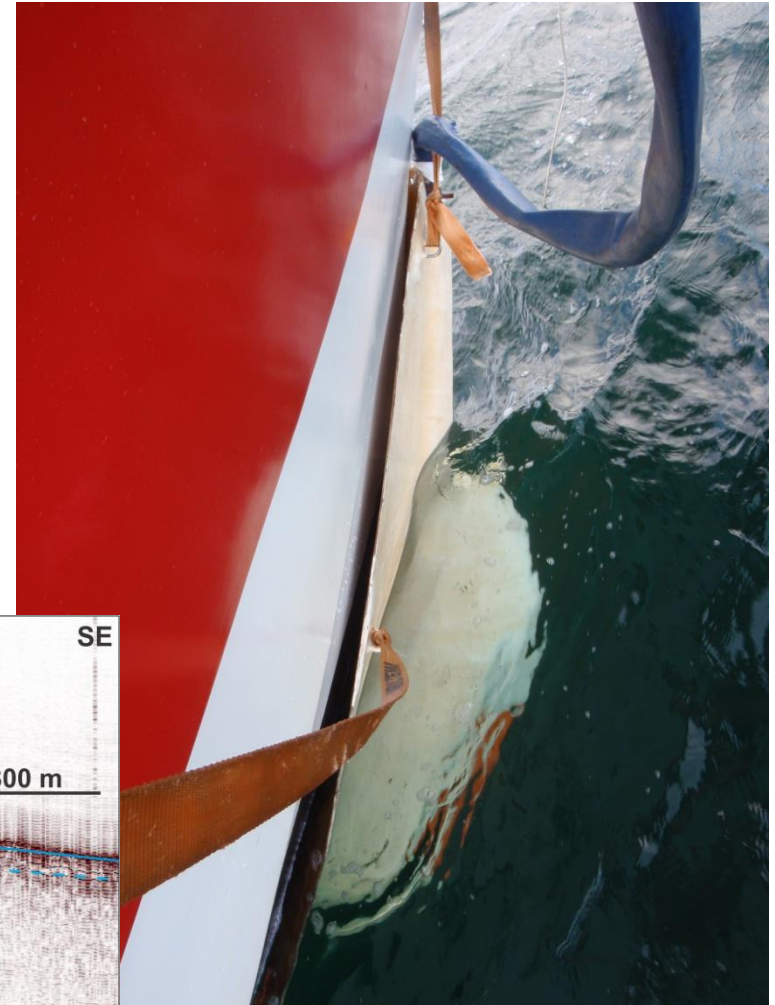
# Multibeam echo-sounder data collection



Multibeam bathymetry



# Sub bottom profiler – TOPAS (high resolution seismic)



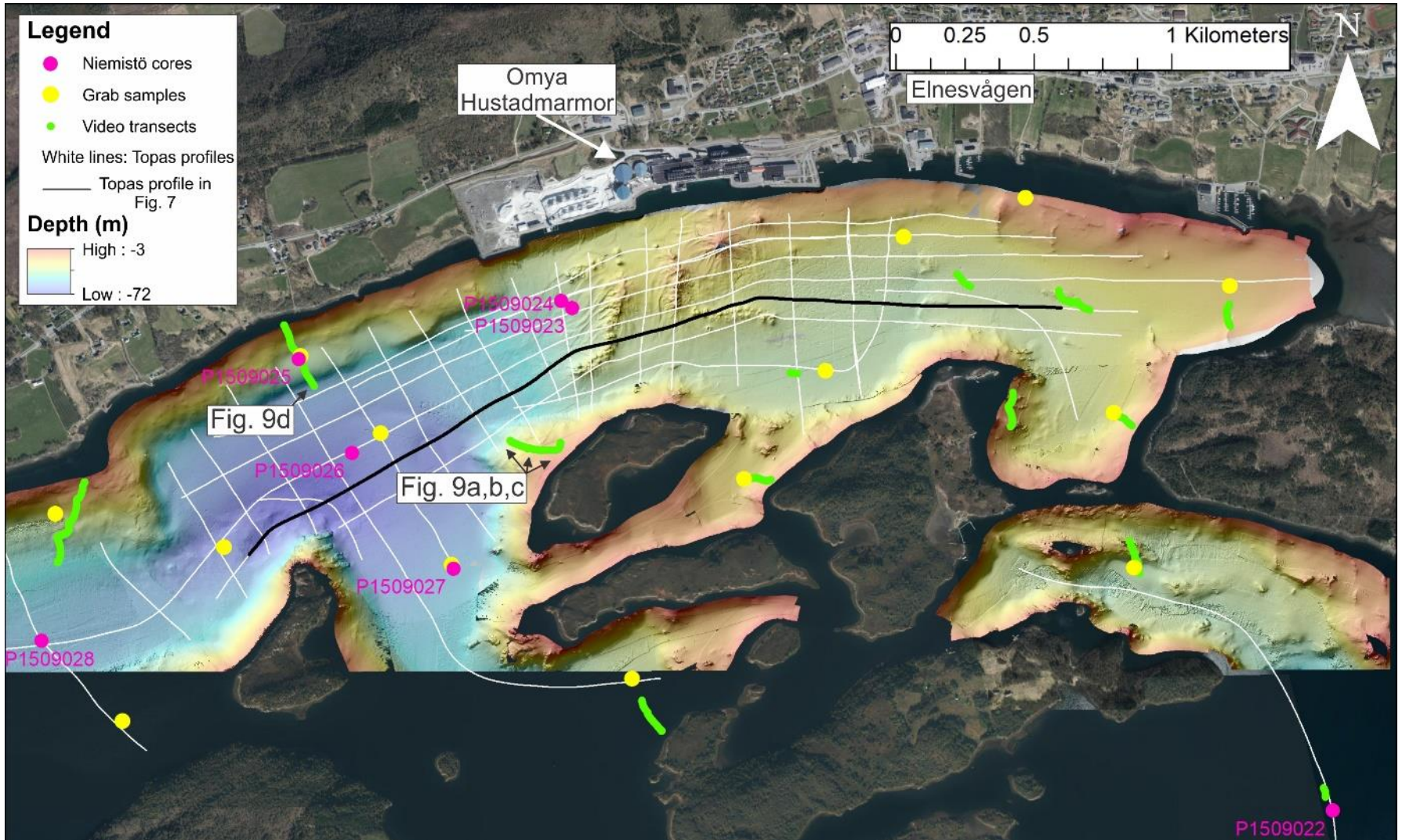


# Sediment sampling





# Frænfjorden STP - data





# Frænfjorden - marine base maps

**mareano** Samler k

Startsiden Kart Data Tema Nyheter Om MAREANO Resultater Bilder/video Kontakt English

Mareano Identifiser Mål Marbunn Gå til koordinat Gå til havområde Koordinater (WGS84): 62°50'46.8"N, 07°02'55.7"E

Slå av alle kartlag Utvid kartlag panel

**Temakart** Layer:

- Bestandsutbredelse andre arter
- Vannmessjer
- Næringsaktivitet
- Andre kart
  - Bunndata fra sjømåling
  - Strandnot
  - Israndavsetninger
  - Skjellsandområder
  - Marine grunnkart
    - Datadekning, MG
    - Dybdekoter, fokusområder
    - Havbunnsterreg, fokusområ
    - Helning over 30 grader
    - Helning
    - Kornstørrelse, detaljert
    - Gravbarhet
    - Ankringsforhold
    - Bunnfellingsområder
    - Biotoper - Sør-Troms
    - Naturtyper - Saltstraumen
    - Skyggerelieff detaljert

**Tegnforklaring**

Datadekning, Zoom inn på ønsket område for å se dataene.

**Kornstørrelse (detaljert)**  
M < 1:50 000

- Leir
- Slam
- Organisk slam
- Slam med rasblokker
- Sandholdig leir
- Sandholdig slam
- Silt
- Sandholdig silt
- Leirholdig sand
- Slamholdig sand
- Siltholdig sand
- Fin sand

[www.mareano.no](http://www.mareano.no) -> Kart -> Andre kart -> Marine grunnkart



NYKOS

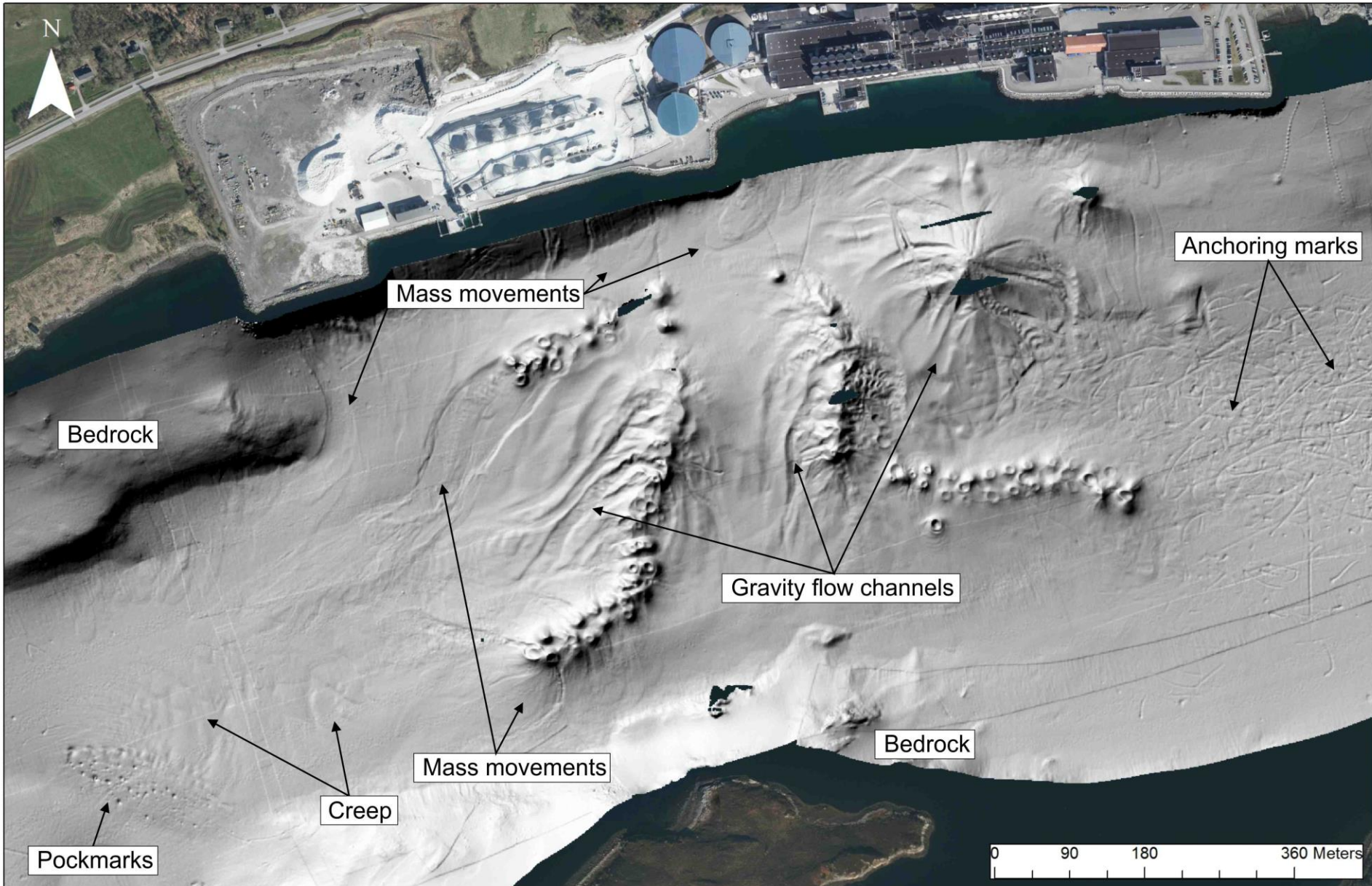


GEOLOGICAL SURVEY OF NORWAY

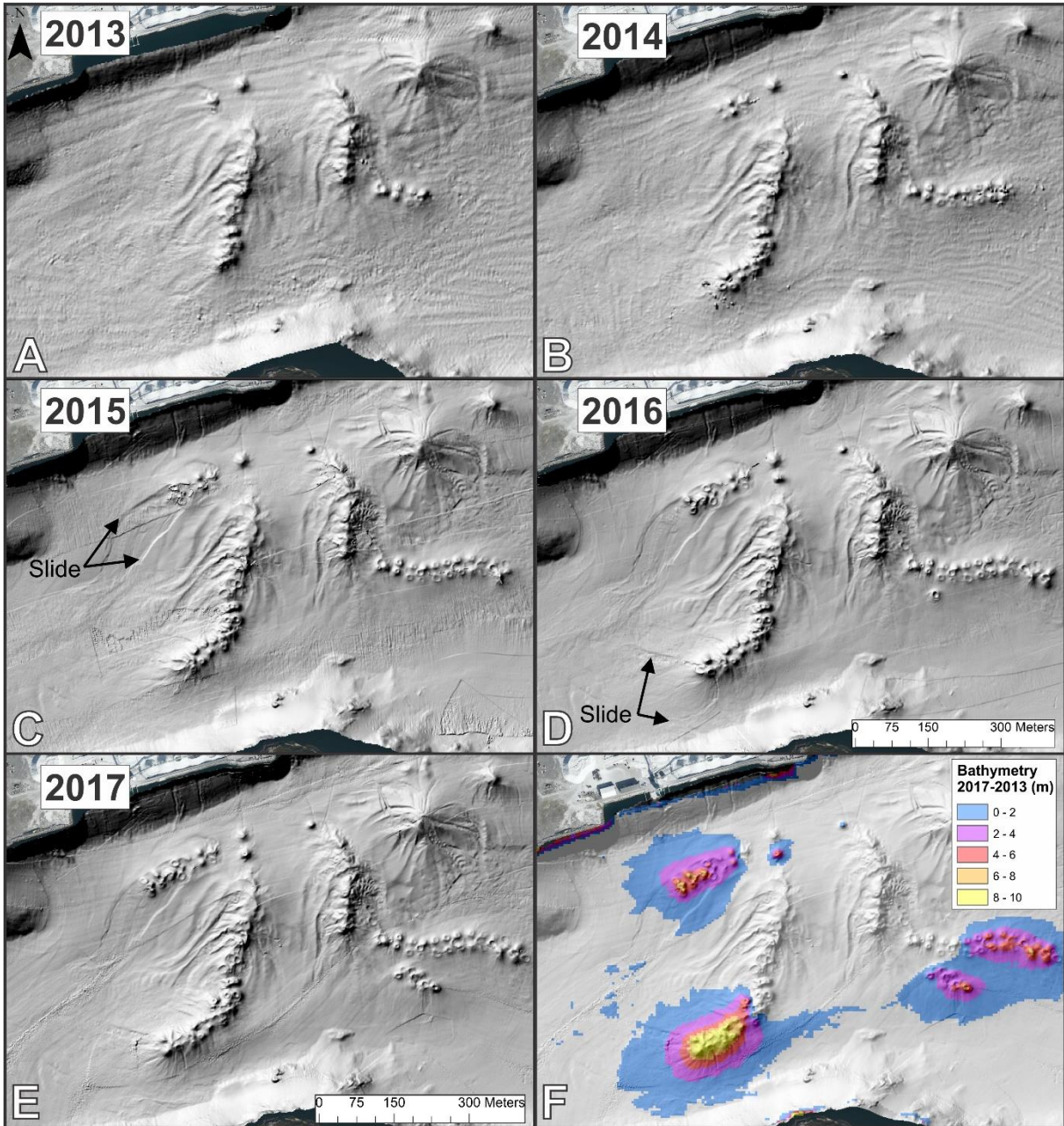
- NGU -



# Frænfjorden STD





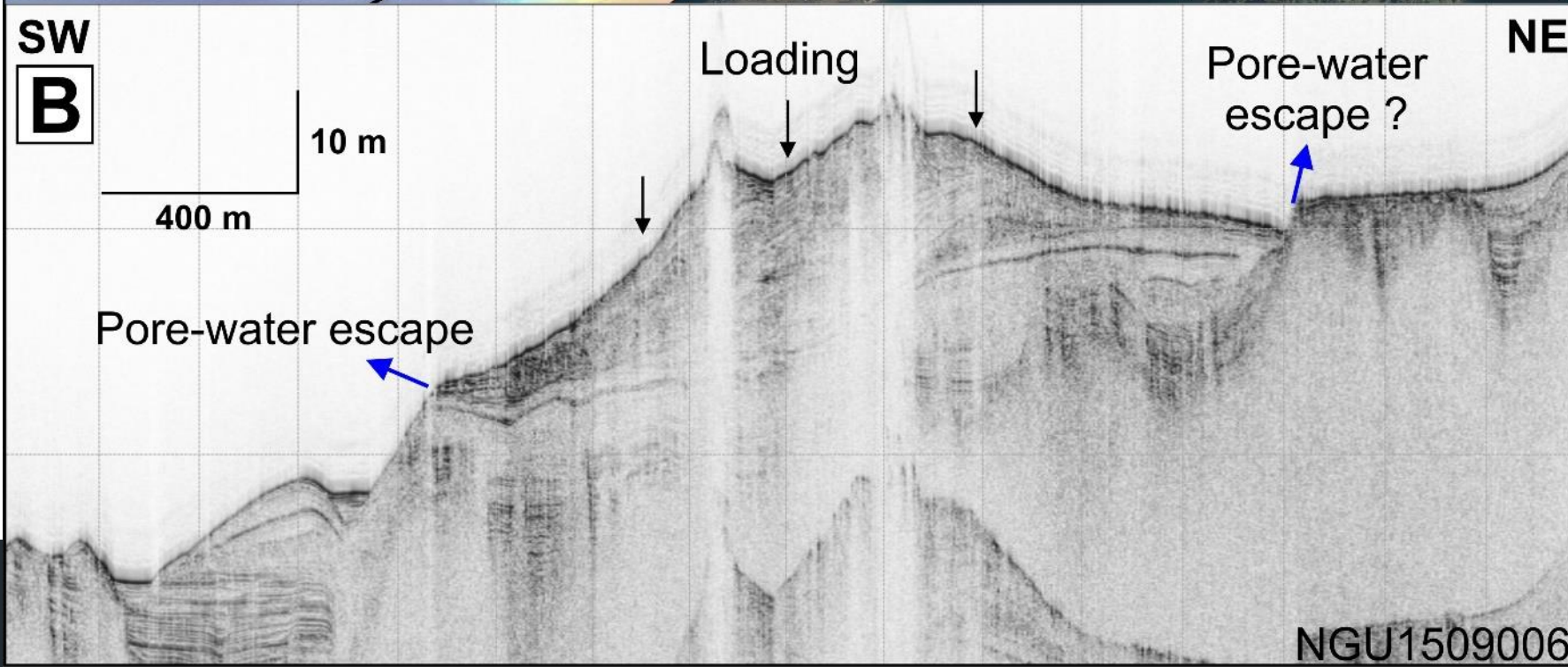


# Frænfjorden: bathymetry changes



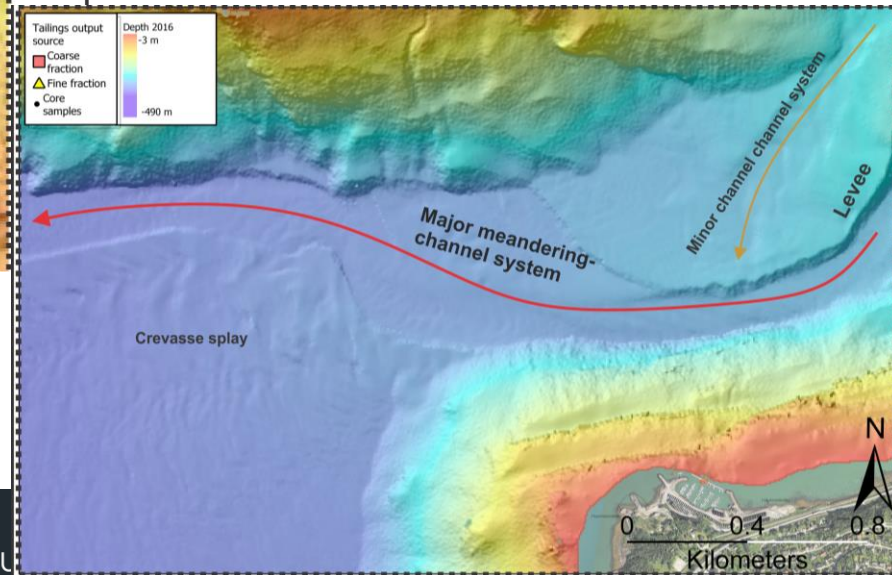
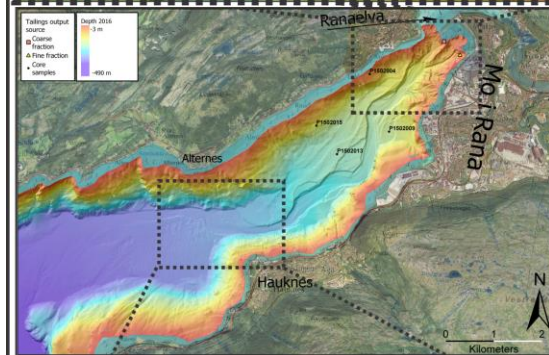
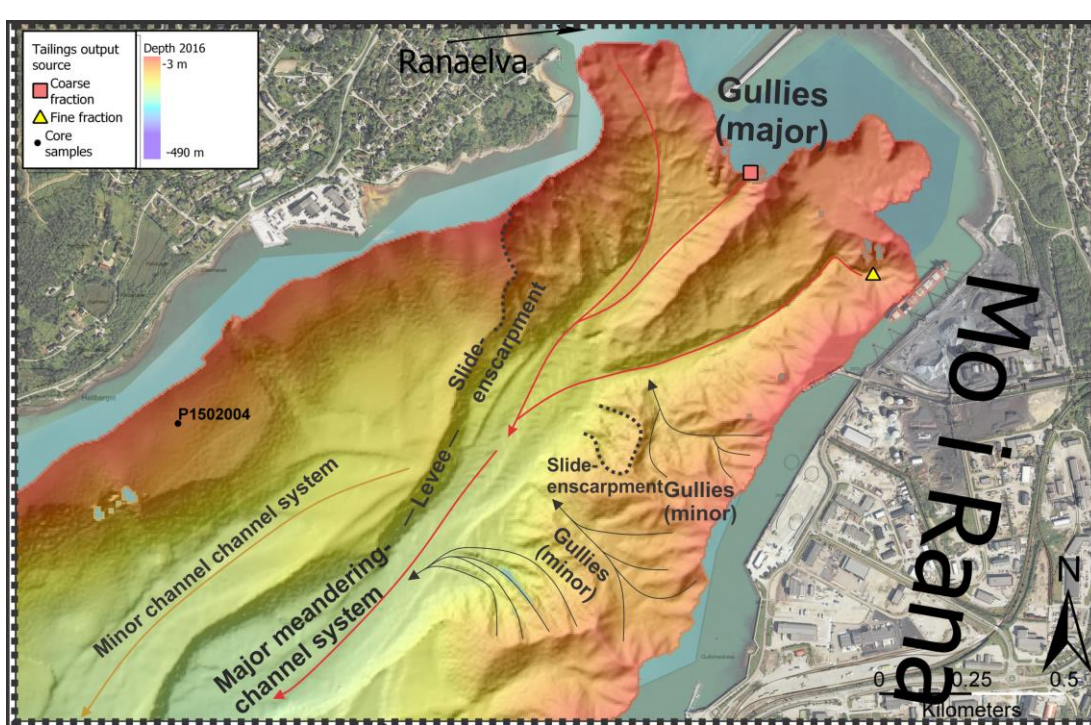


# Loading of STP

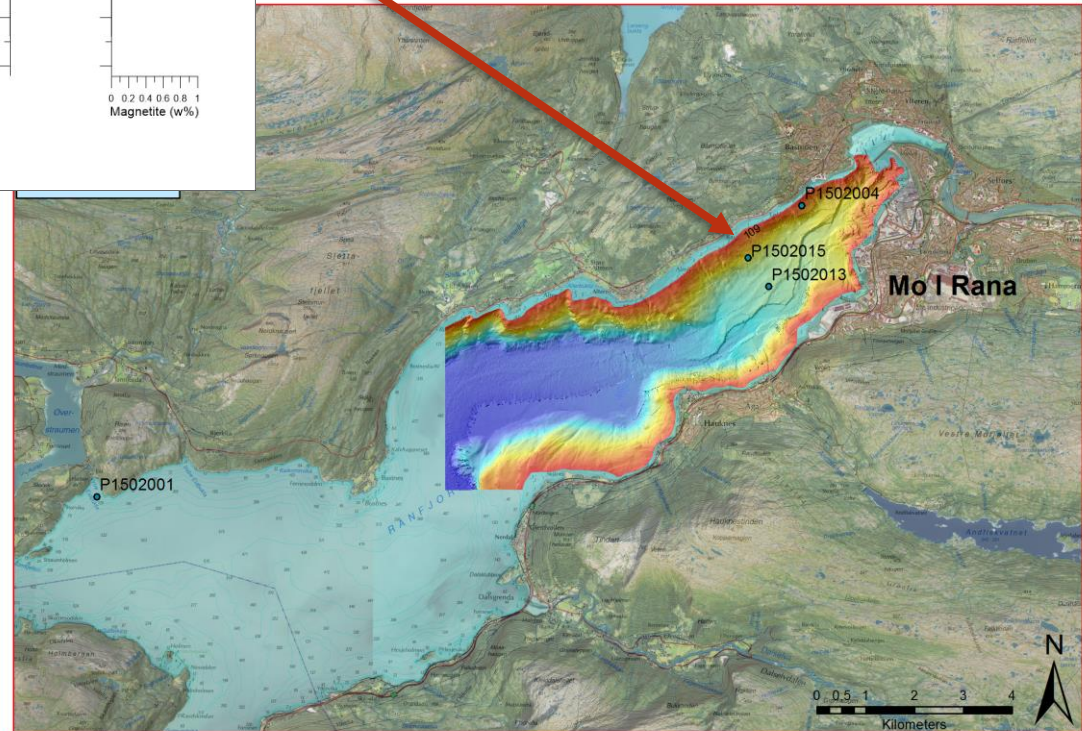
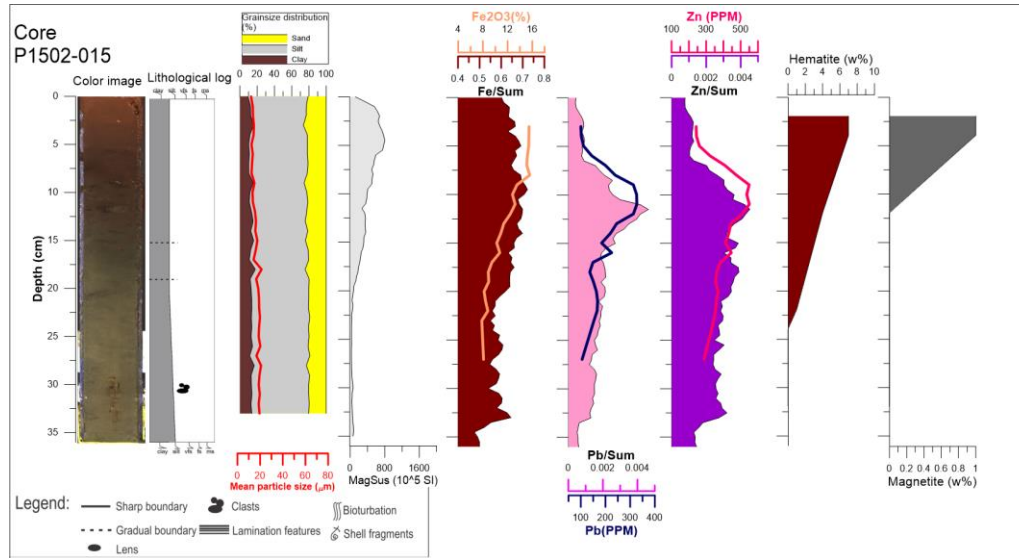




# Bathymetry, Ranfjorden:

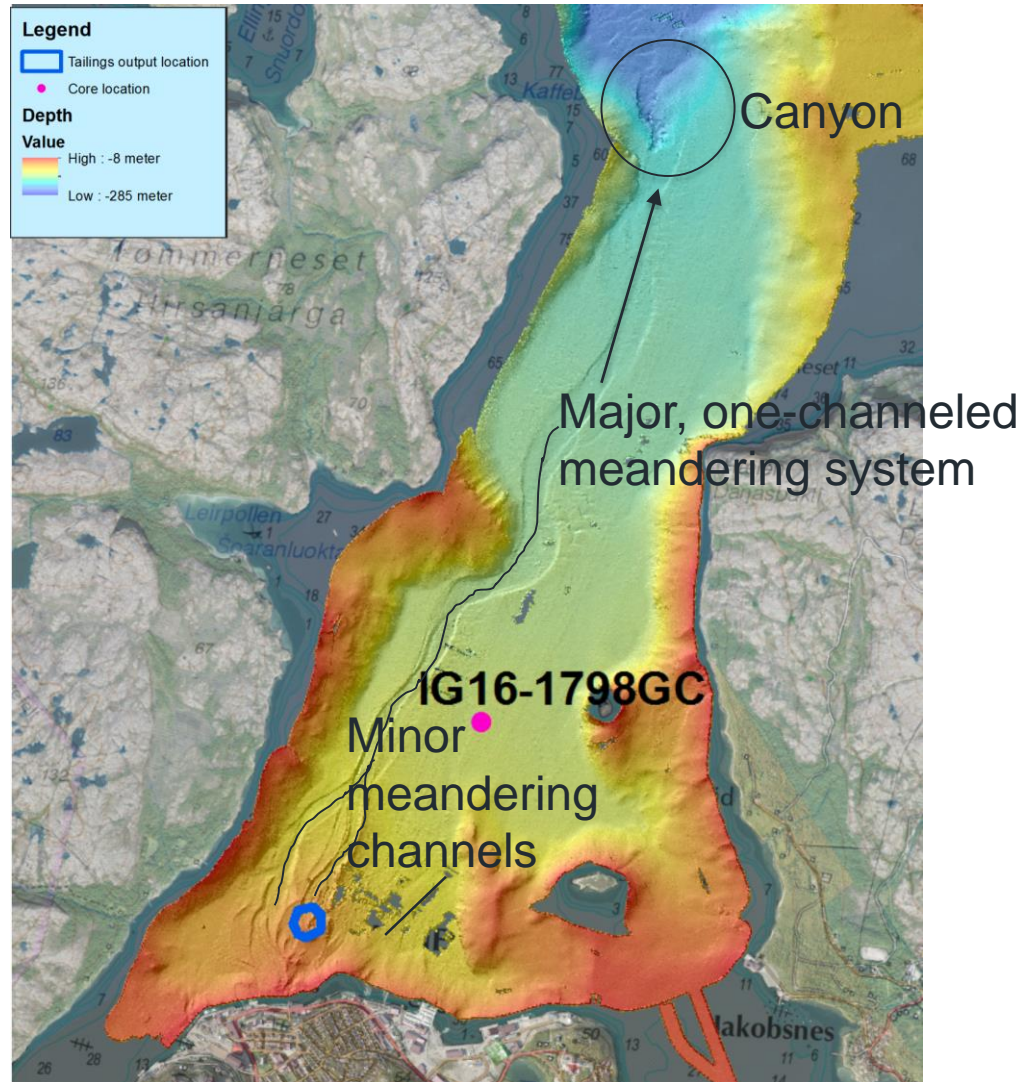


# Sediment cores - Ranfjorden

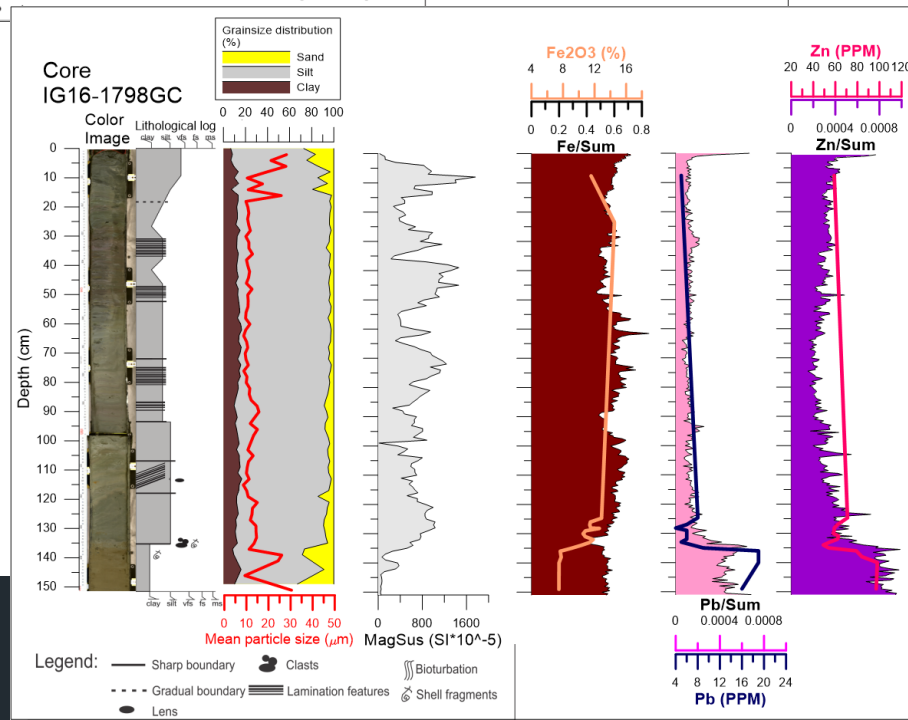
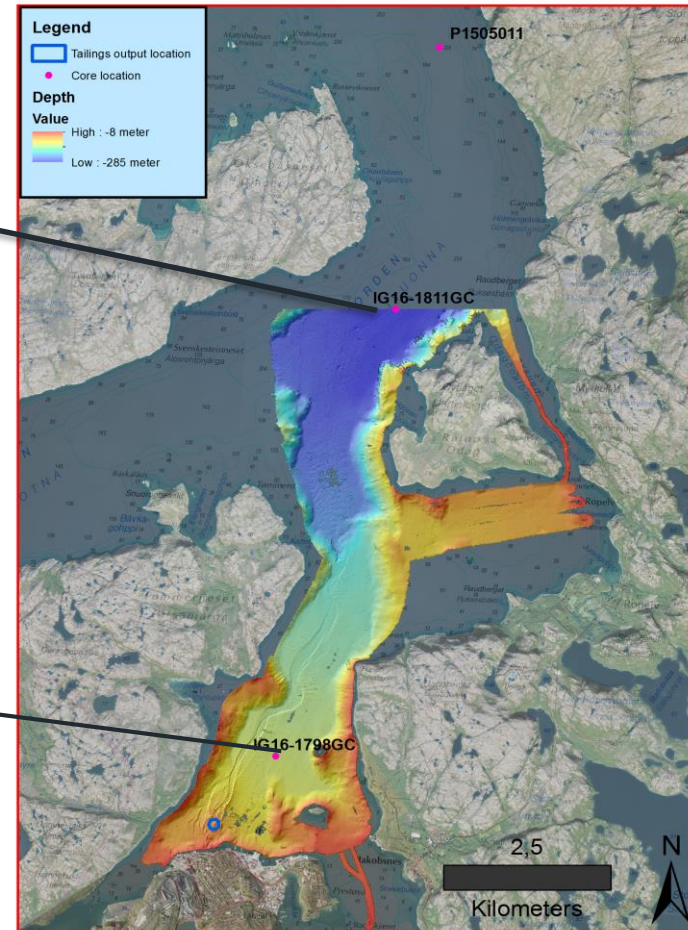
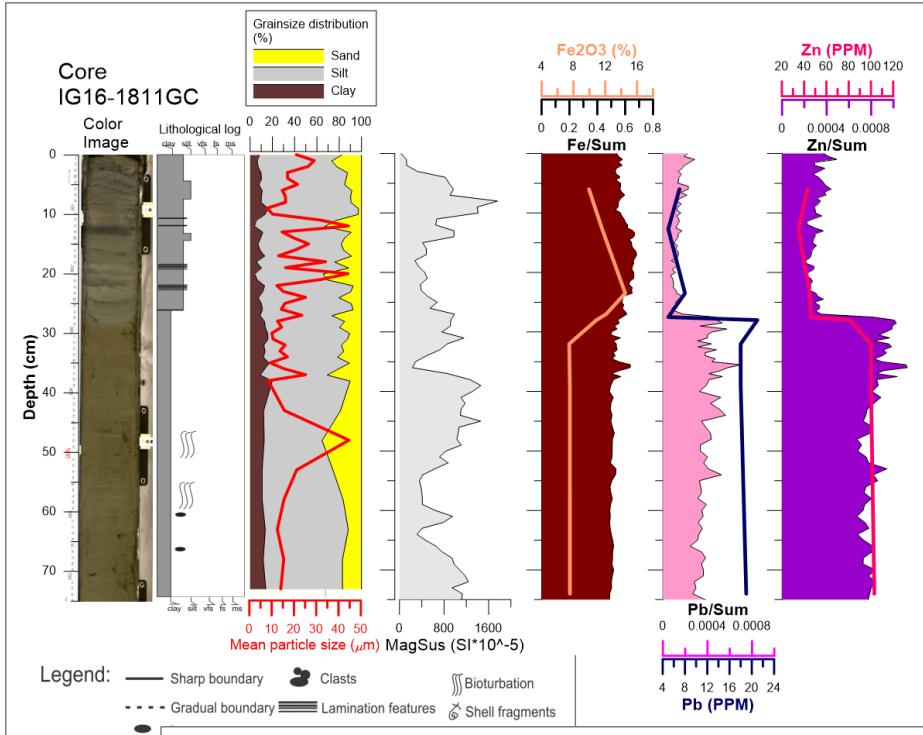




# Bathymetry - Bøkfjorden

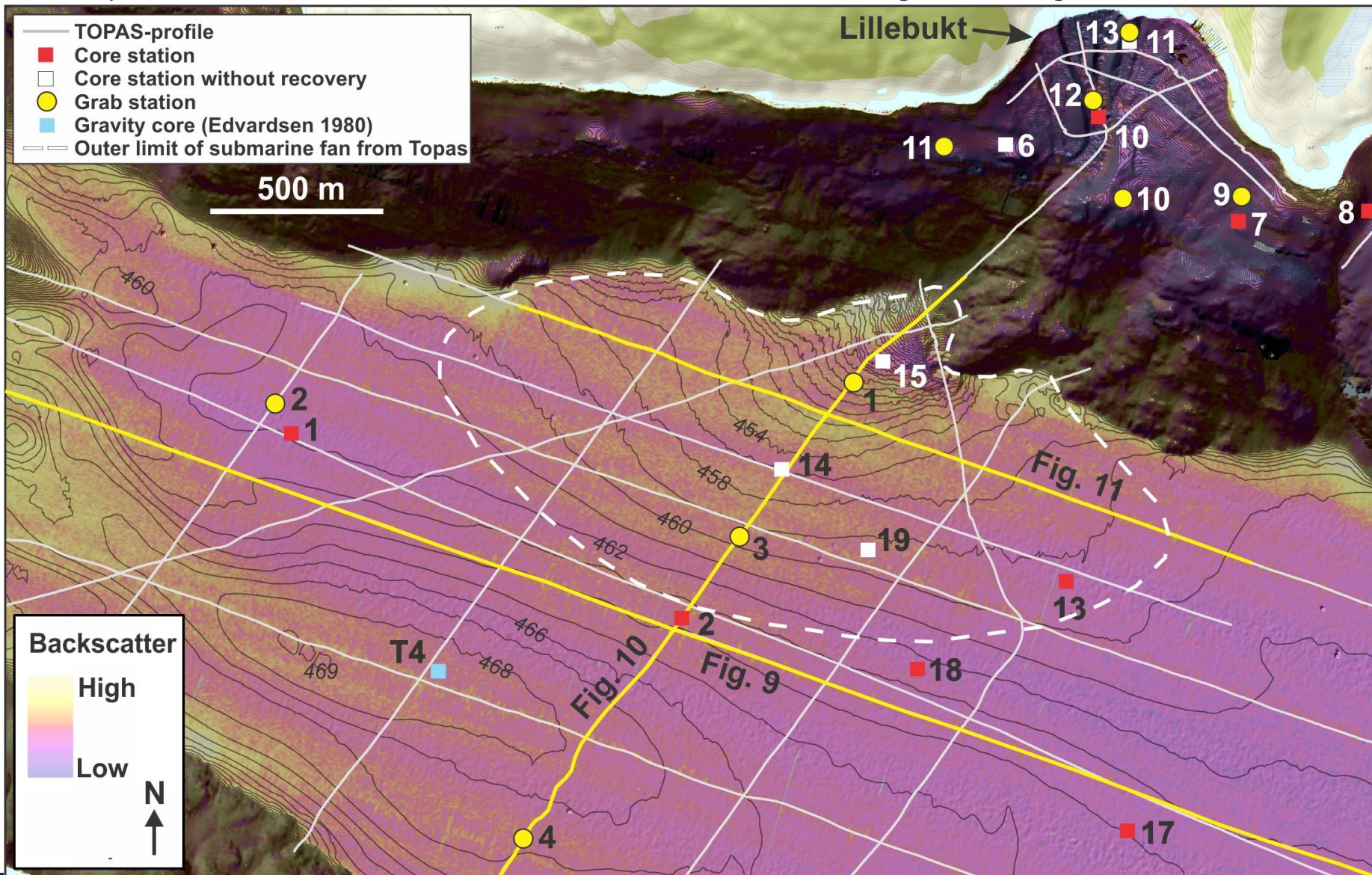


# Sediment cores Bøkfjorden



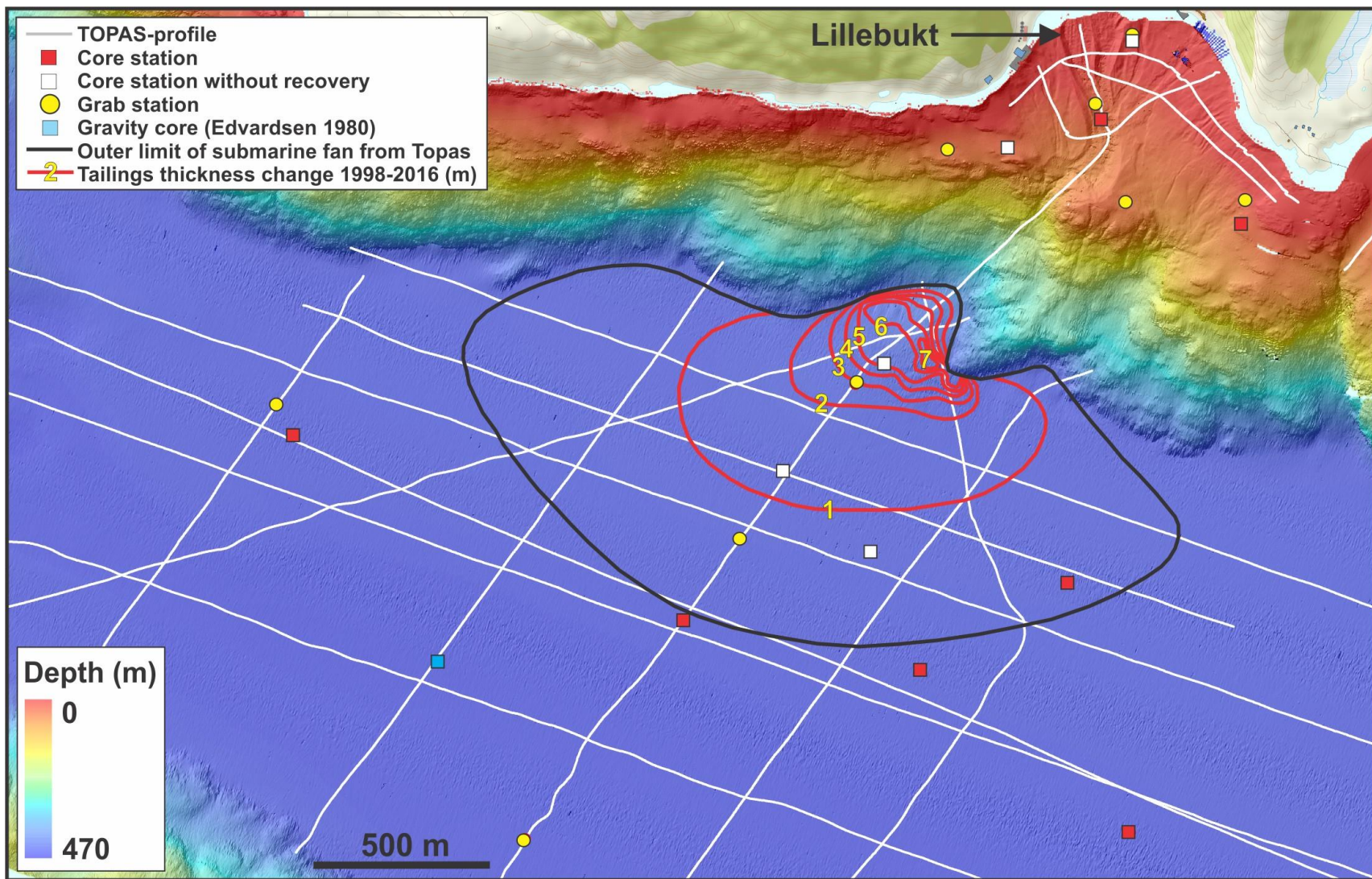


# Stjernesundet: backscatter & bathymetry contours





# Stjærnsundet: Tailings thickness change 1996-2016 (m)





# NYKOS-WP3: Publications/published data

- **3 Master thesis at the institute of geosciences, UiT:**
  - Nikolai Figenschau, May 2018. Interaction of submarine tailings with natural sediments in three northern Norwegian coastal areas: Sedimentological, mineralogical and geochemical constraints.
  - Anette Klev Ladstein, May 2018. Natural and anthropogenic deposition in Bøkfjorden.
  - Anders Eirik Haugen, July 2018. Distribution, deposition and impact of tailing disposal on the seafloor in Ranfjorden, northern Norway.
- **Paper Stjernesundet:** Norwegian Journal of Geology: 2018: 98, 461-482
  - Reidulv Bøe, Roar Sandøy, Nicole J. Baeten, Aivo Lepland, Valérie K. Bellec, Shyam Chand, Oddvar Longva, Martin Klug, Liv Plassen & Jasmin Schönenberger. Marine mine tailings disposal at Lillebukt, Stjernesundet, North Norway: distribution, sedimentary processes and depositional impacts
- **Paper Frænfjorden:** Nicole J. Baeten et al – submitted to Norwegian Journal of Geology, April, 2019
- **Paper Bøkfjorden & Ranfjorden:** Nikolai Figenschau et al – to be submitted soon



## Conclusions:

- High resolution marine base maps integrating bathymetry and sediment data are required for:
  - selection of optimal disposal site
  - monitoring the stability of disposed tailings







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