

Polar Connect: Field Notes from the Arctic

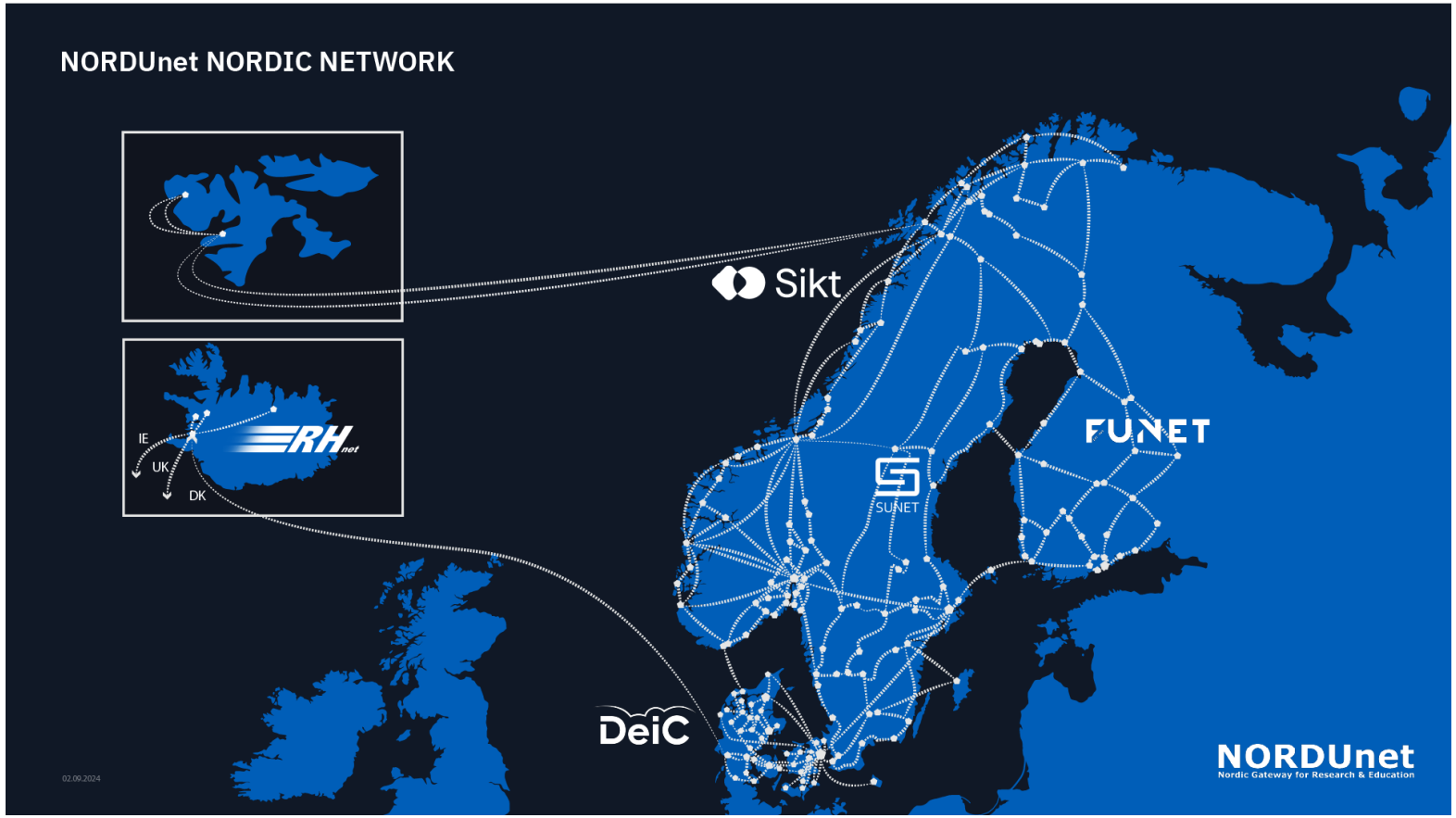
DeiC Conference
28 October 2026
Kolding, Denmark

Co-funded by the European Union

Thomas Frøyland, NORDUnet

About NORDUnet

- Regional network interconnecting the National Education and Research Networks (NRENs) from the Nordic countries



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NORDUnet NETWORK

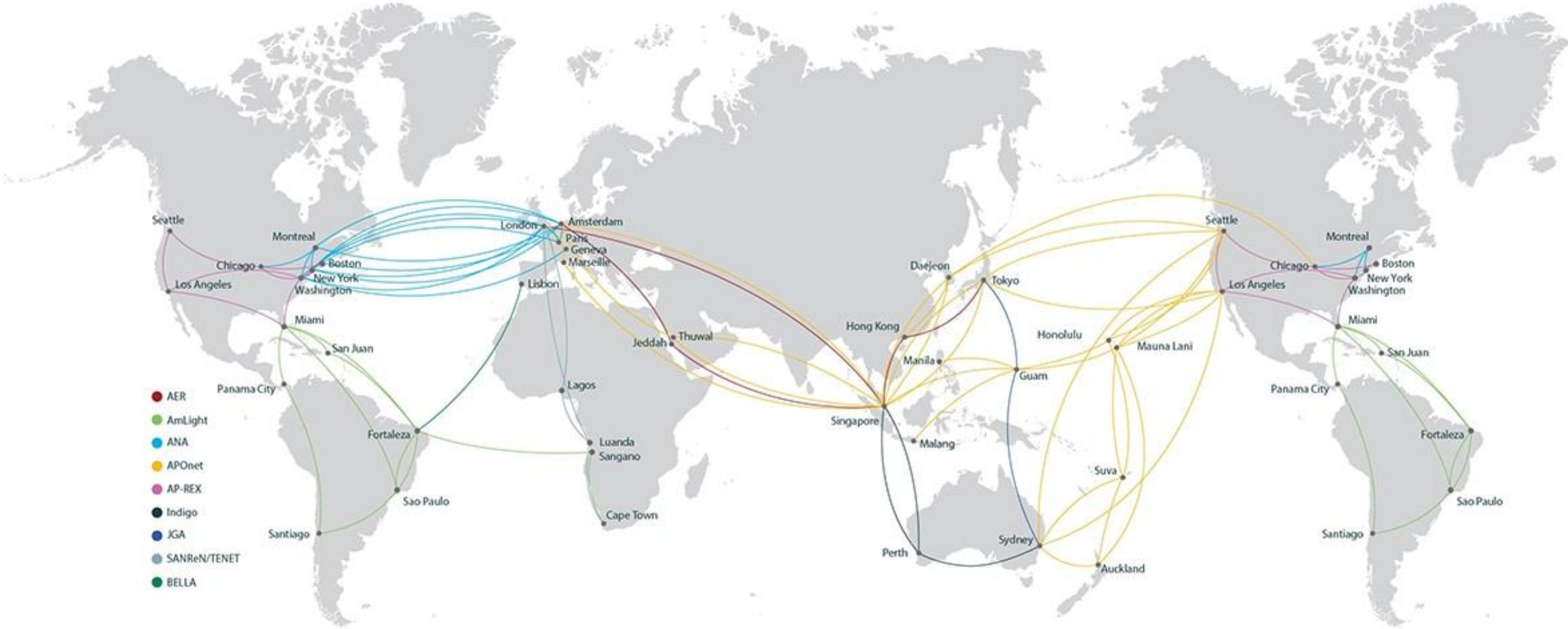
National and international peering

NORDUnet
Nordic Gateway for Research & Education



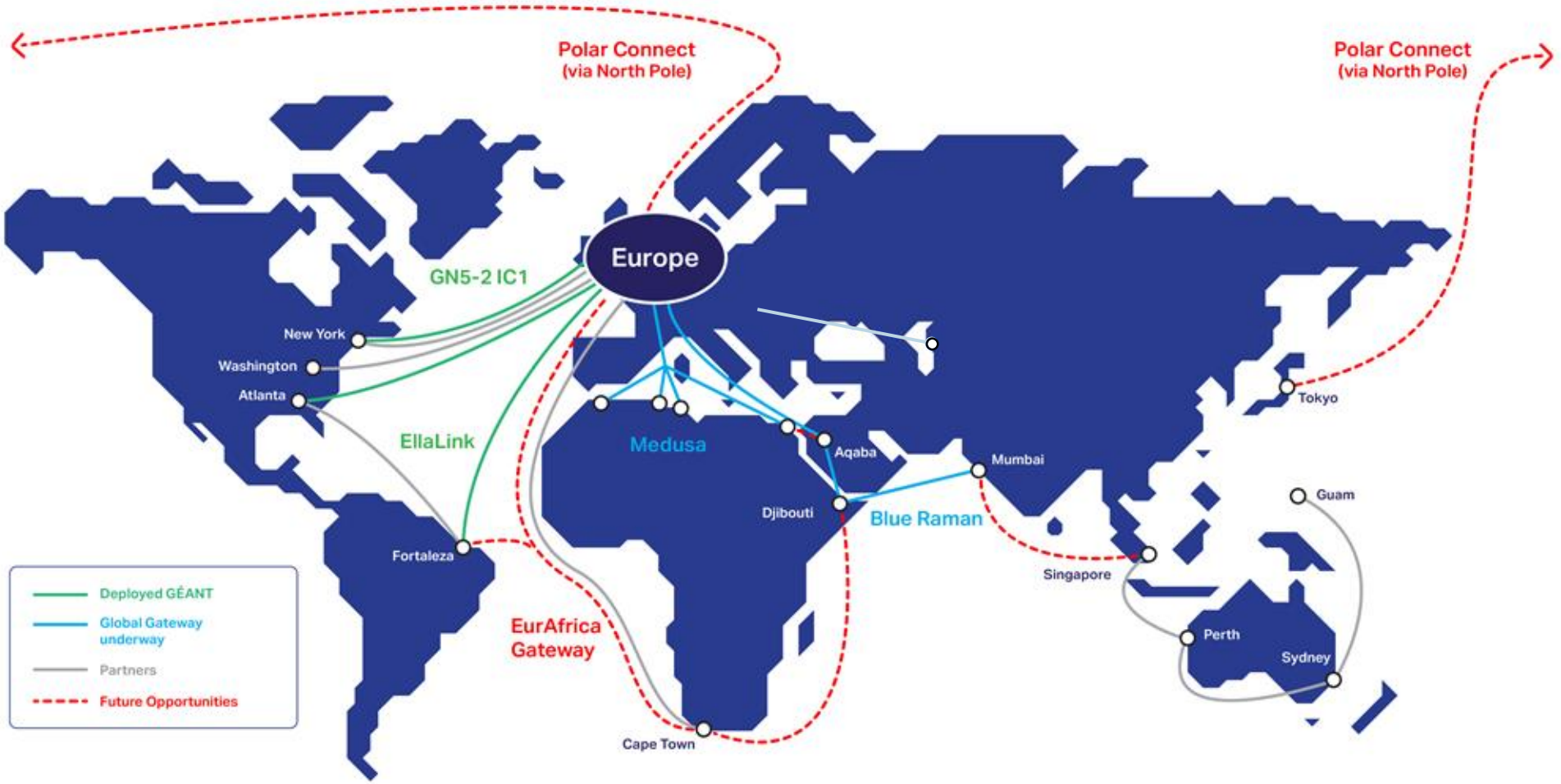
02.09.2024

Global network Advancement Group projects



R&E connectivity value: working with GÉANT

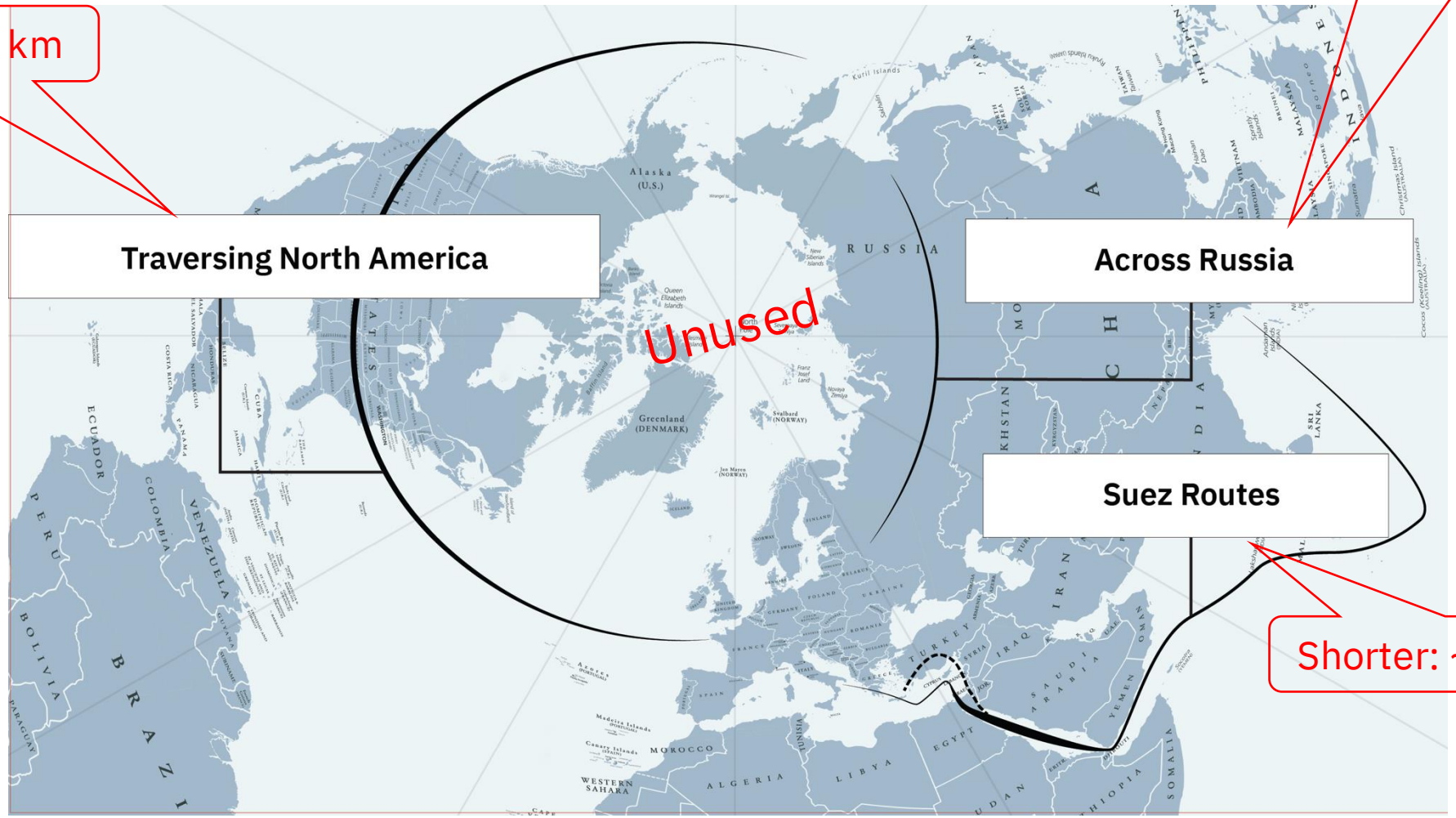
Infrastructure today. Opportunities tomorrow.



Europe – Asia Connectivity Today

Long: ~30,000 km

Unavailable/Unusable



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Polar Connect Initiative: Resilience on a New and Short Route Europe – East Asia



- Developing and de-risking the Arctic route:
  Europe – North America – East Asia
- **Digital Resilience and Autonomy**
- **Shortest possible path,** guarantees reduced latency, improves connectivity for:
  - Europe – Canada & Alaska
  - Europe – Japan
  - Japan – Canada & Alaska

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CPEIs: Arctic region – a priority area for Europe

Figure 3.7: Proposed cable route for Priority Area 2 [Source: Analysys Mason, 2026]



EU Recommendation:

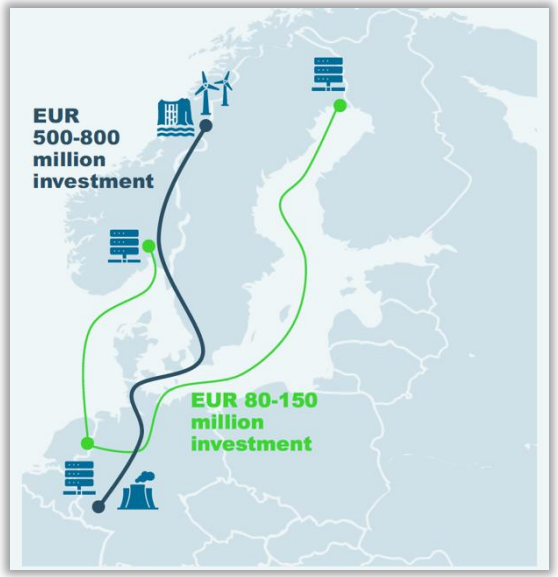
2a) West Arctic passage cable, connecting DE, DK (DK, GL), IE, SE and CA, IS, NO, JP, KR, US

2b) Polar passage cable, connecting DE, DK, SE and CA, JP, KR, NO, US.

Value proposition for the industry



LOCAL EXCESS ENERGY DUE TO LACK OF POWER INFRASTRUCTURE



MORE EFFICIENT AND CHEAPER TO MOVE DATA THAN ENERGY



FREE COOLING AND REUSE OF EXCESSIVE HEAT



FUTURE SOLUTIONS FOR SUBMARINE FIBRE CABLES

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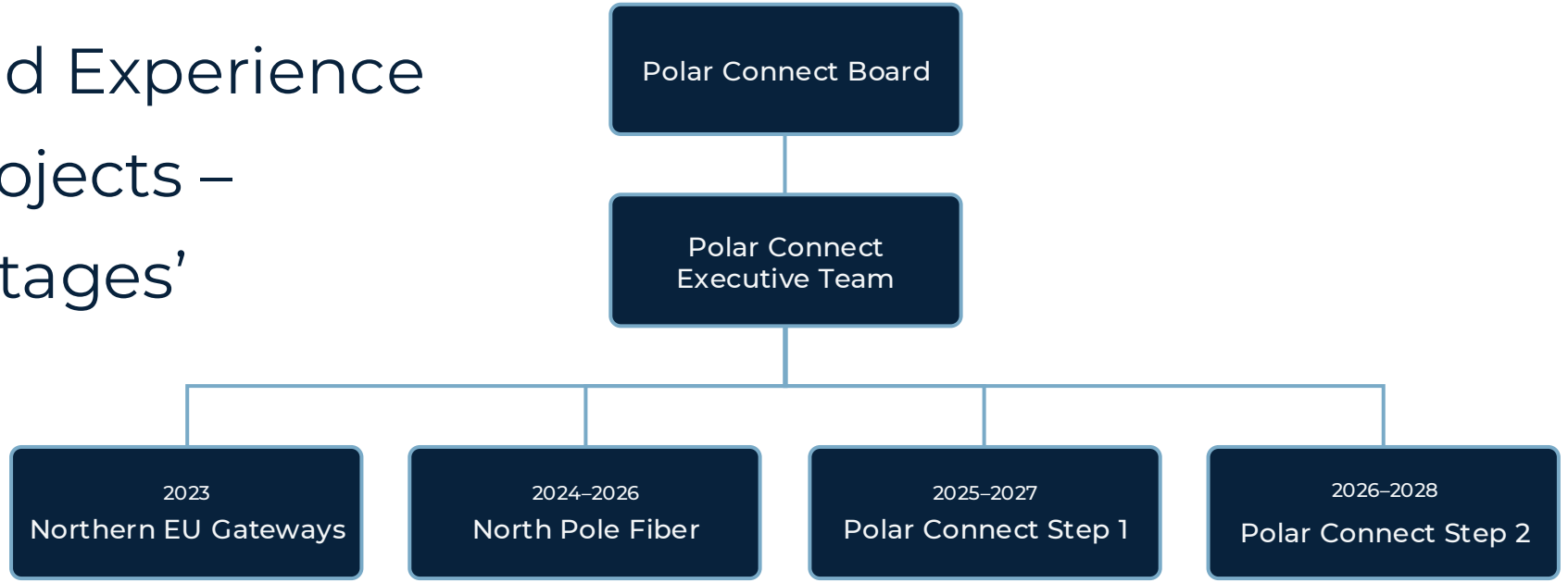
Sensors for Science on Polar Connect



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Polar Connect – a Nordic Initiative

- Partnerships and Experience
- Multiple CEF projects – ‘development-in-stages’



Vetenskapsrådet
Swedish Research Council

SWEDISH POLAR RESEARCH SECRETARIAT
POLARFORSKNINGSSEKRETARIATET

NORDUnet
Nordic Gateway for Research & Education

GÉANT
Associated partner

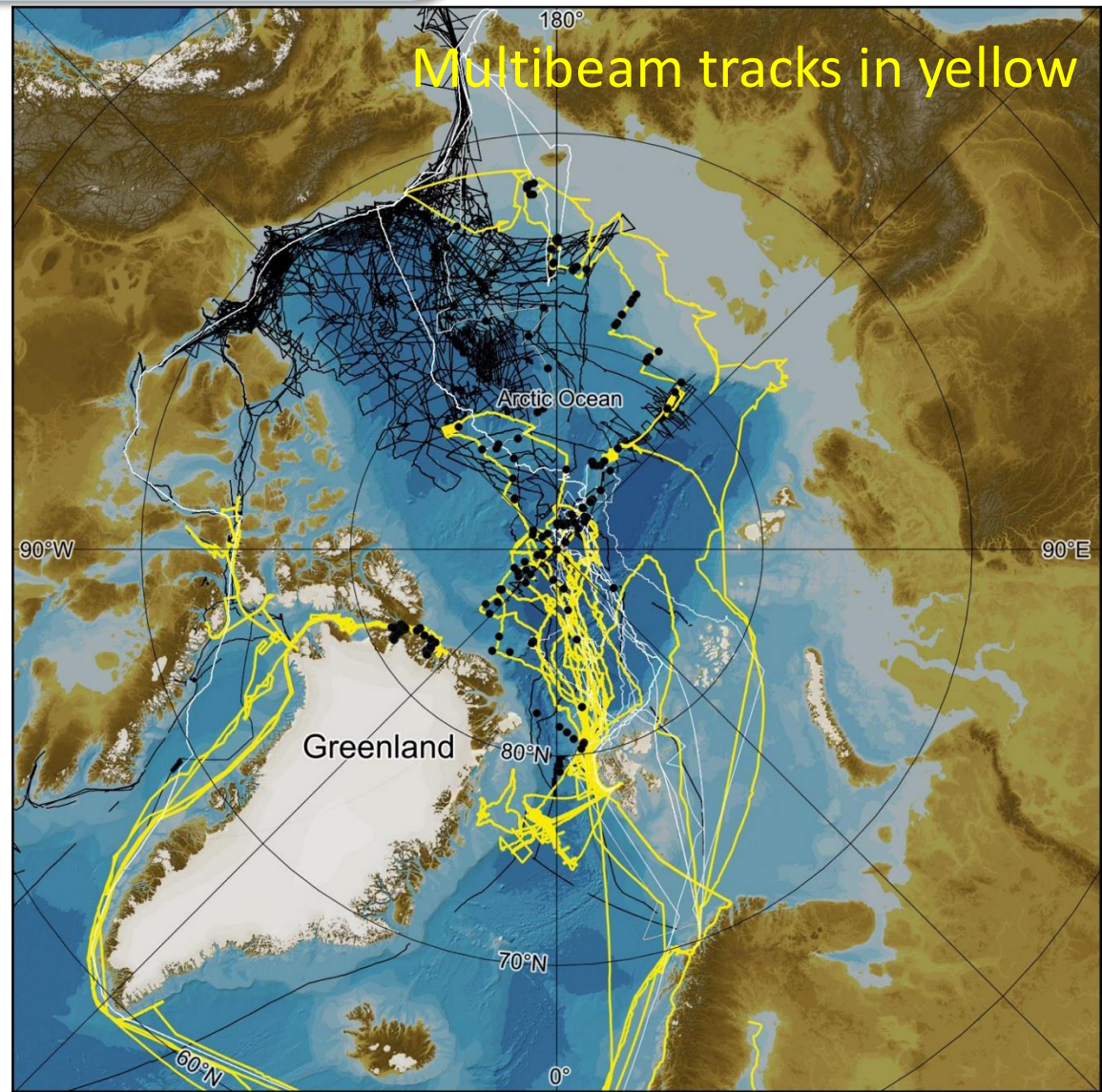
GlobalConnect

DeiC SUNET CSC Sikt RHnet

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Swedish Polar Research Secretariat (SPRS)

- Unique Arctic experience and access to the Polar Class 2 research ice breaker Oden
  - 31 Arctic expeditions with IB Oden since 1991
  - The Oden crew and captains are “ice whisperers”
  - Close collaboration with other countries on Arctic research



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Deploying a submarine cable across the Central Arctic Ocean: 3 vessel approach

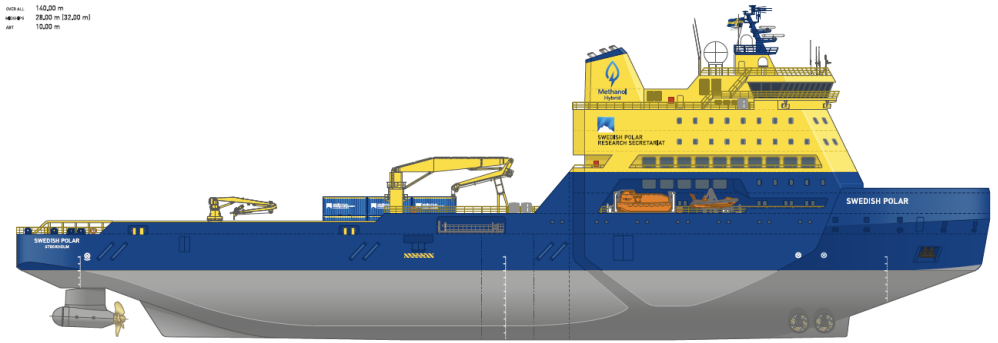




SWEDISH POLAR RESEARCH VESSEL

HIGHEST POLAR CLASS ICEBREAKER

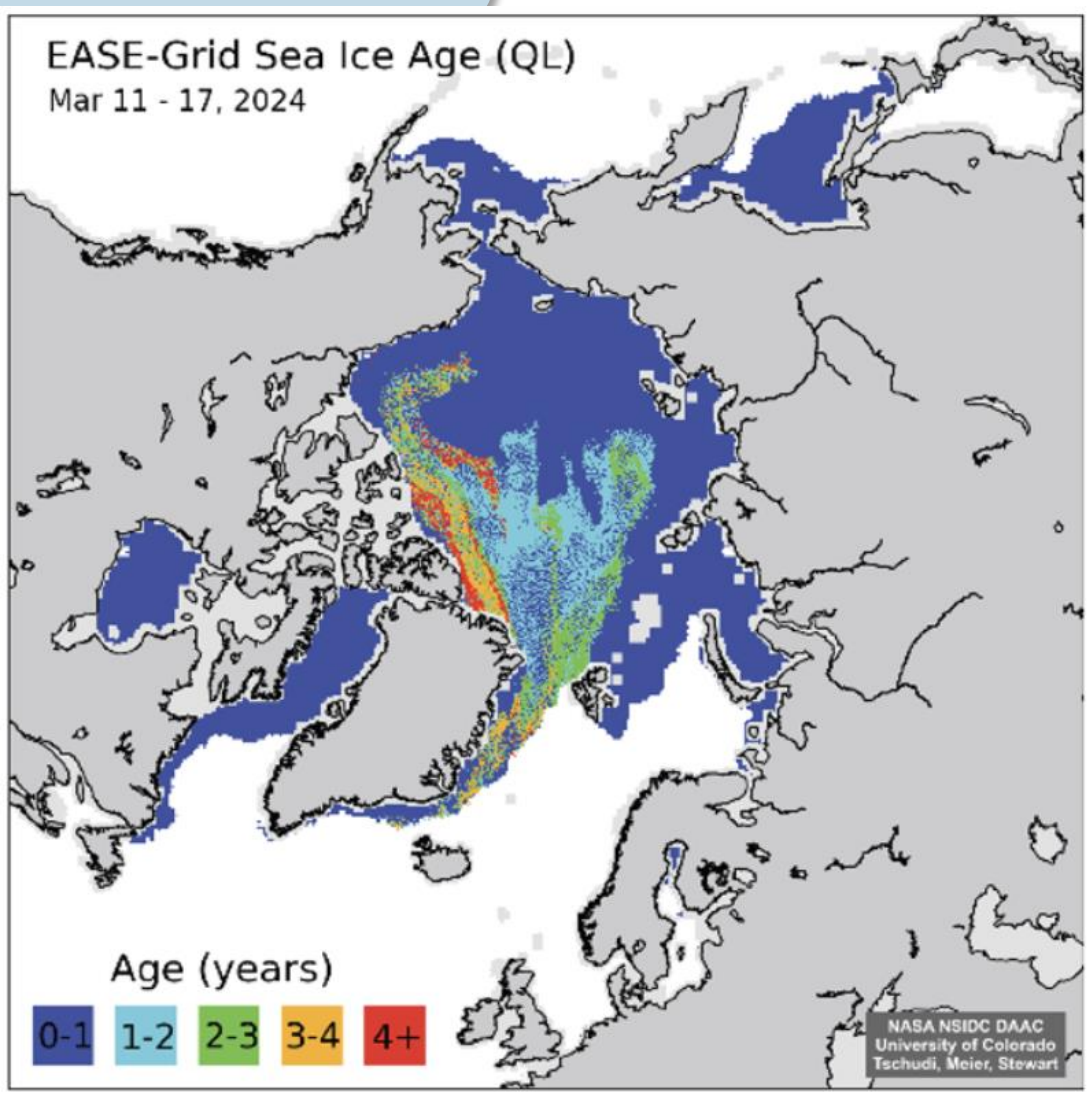
POLARFORSKNINGS SEKRETARIATET



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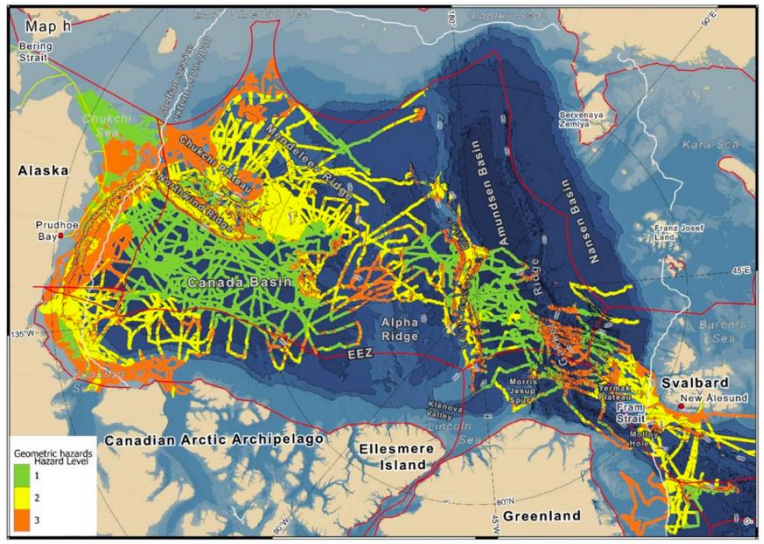
Installation logistics

- Limited availability of cable-laying vessels capable of operating in Arctic conditions
- Multiyear ice is harder than concrete
- Short installation windows due to seasonal ice cover and extreme weather



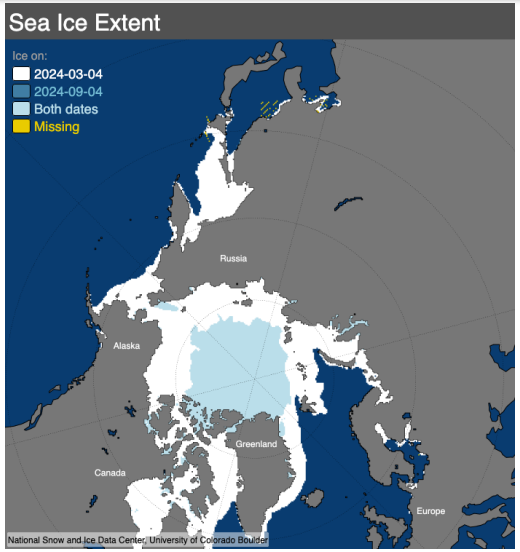
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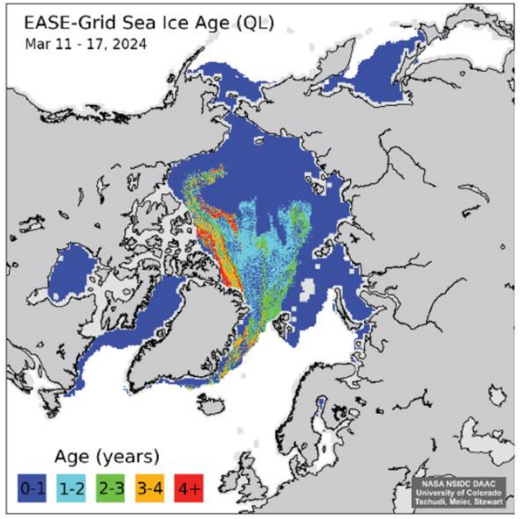
Route options from existing data



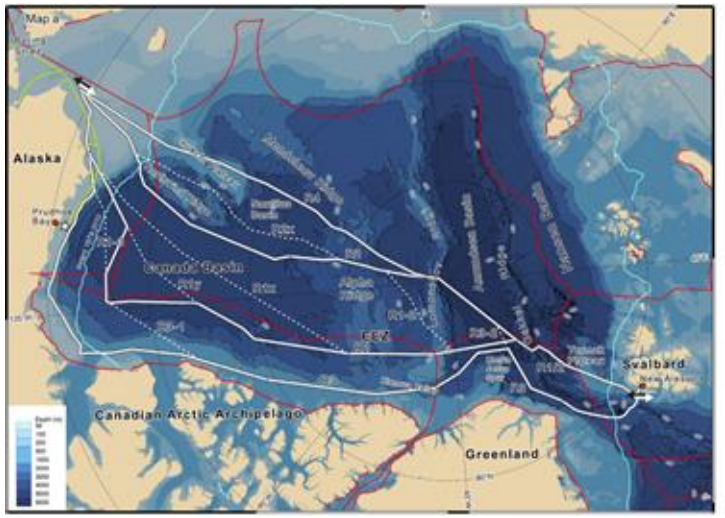
Seabed geo-hazards

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Pre-Marine Survey in the Central Arctic Ocean for Polar Connect



Swedish Research Icebreaker Oden



Canadian Coast Guard Ship Louis S. St-Laurent

- Summer 2025:
  - Swedish Polar Research Secretariat and Natural Resources Canada joint expedition 9 August – 19 September 2025
- Summers 2026:
  - Dedicated Polar Connect 2026 Expedition 24 July – 10 August 2026 with IB Oden, including workshops onboard with submarine cable industry players
  - Swedish Polar Research Secretariat and Natural Resources Canada joint expedition 10 August – 20 September 2026
- Summer 2027:
  - Next planned mission - different areas for mapping

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Polar Connect

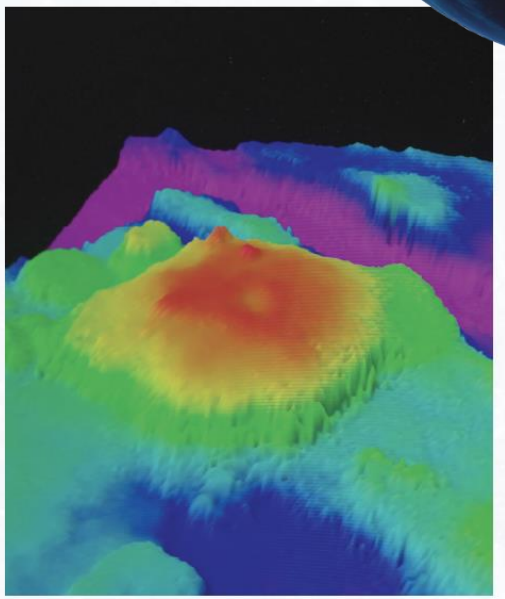


NEW EXPEDITION

Polar Connect expedition 2026

Arctic seabed survey: 24 July–10 August 2026

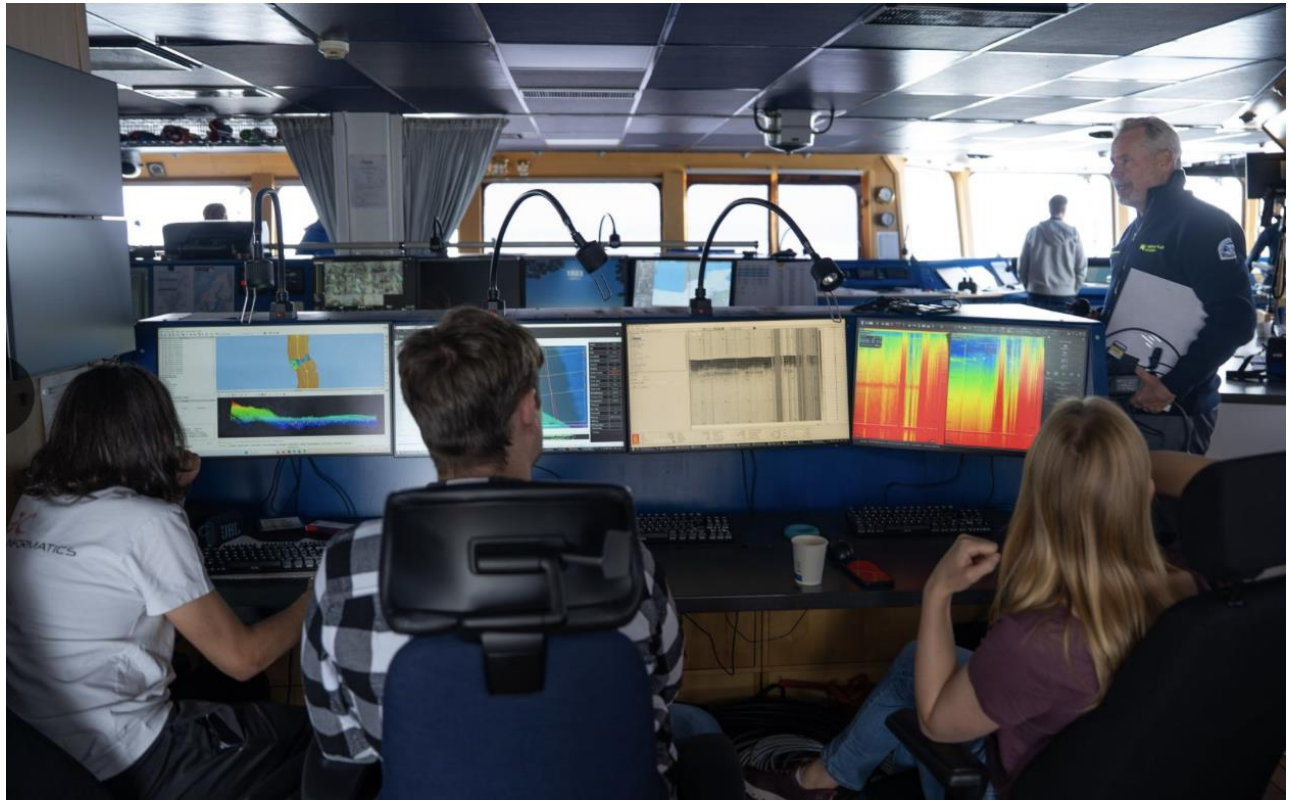






Expedition goals

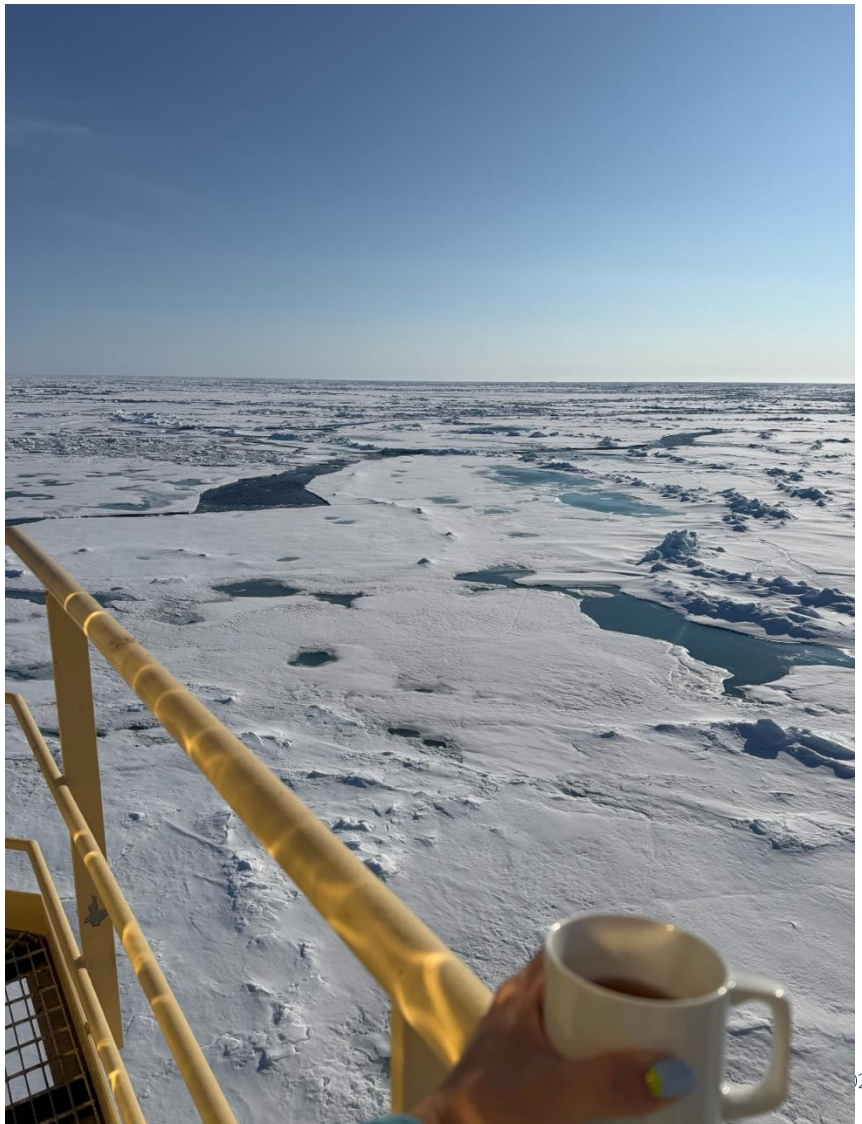
- Mapping and seabed studies for the expected route
- Credibility: technically and operationally feasible
- Timeline assurance: progress alignment with the long-term schedule
- Feasibility in Arctic conditions: what are the challenges to install a submarine cable in ice covered waters.
- Other scientific missions, such as CTD scans



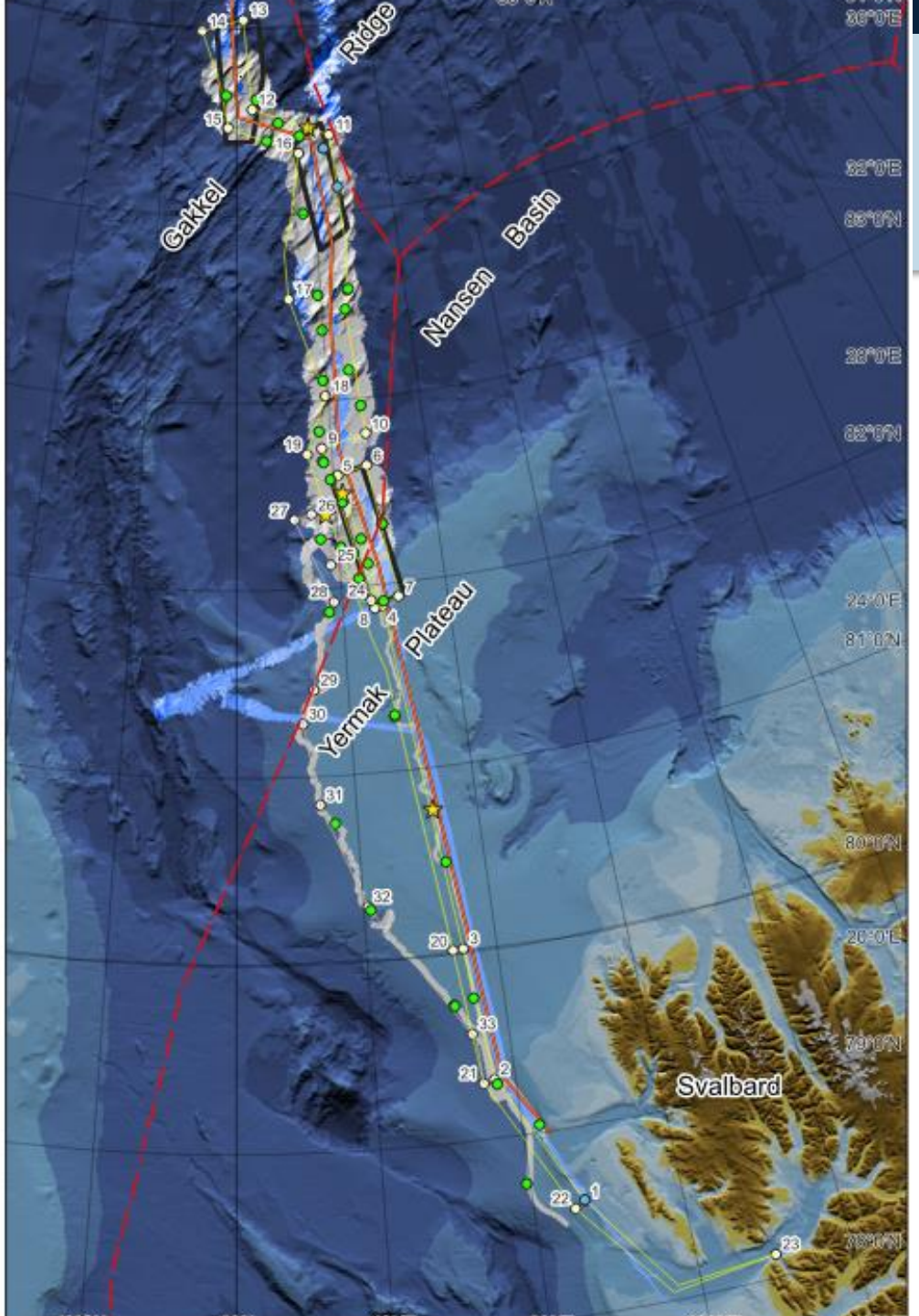
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Key focus areas

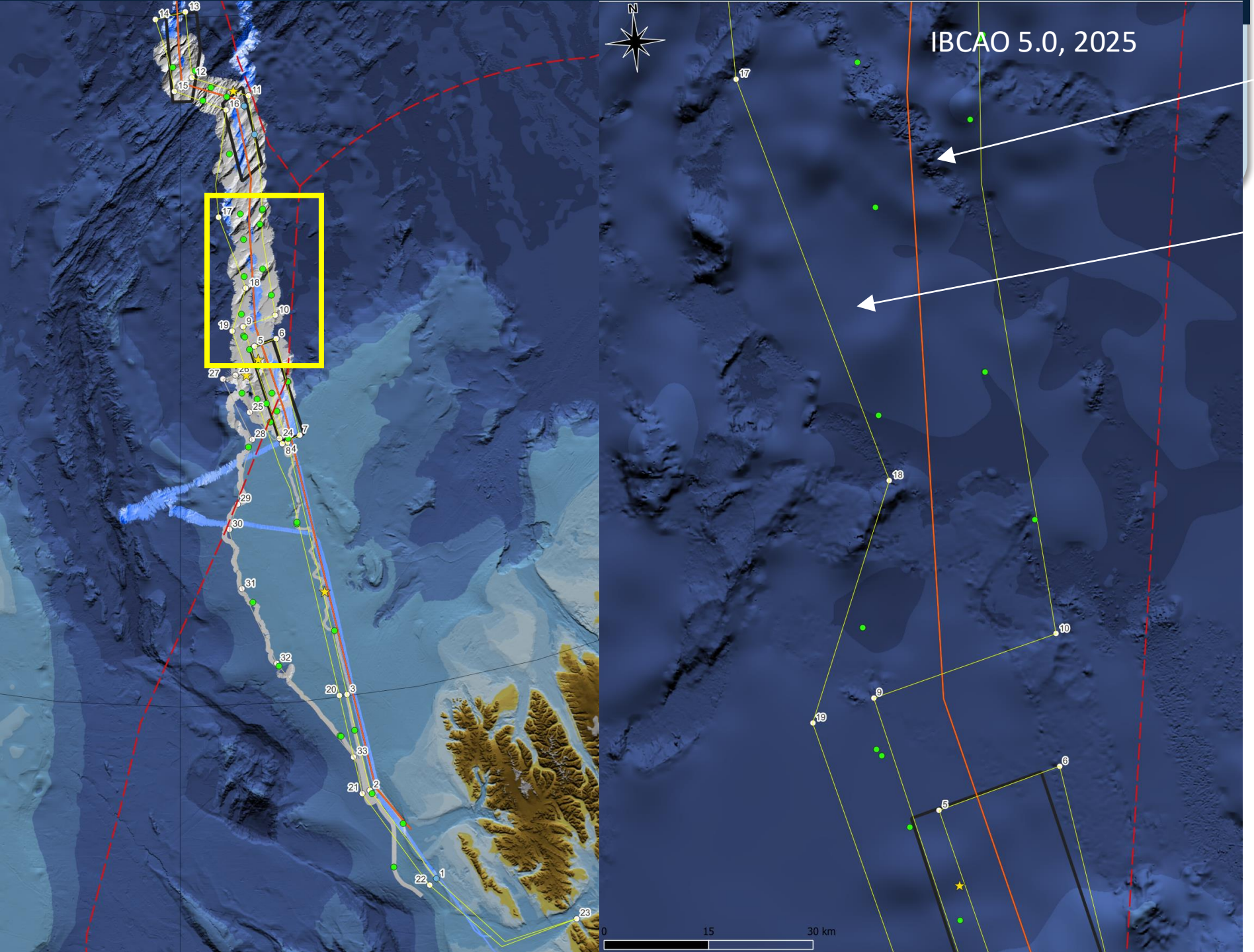
- Arctic Environment and Route Engineering
- Design, Construction and Icebreaker Operations
- Cable Installation in the Arctic Region
- Maintenance, Repair and Resilience
- Cable Technology and Manufacturing
- Geopolitics, Regulation and International Collaboration
- Digital Infrastructure, Sensing and Data Integration
- Overcoming Challenges and Execution Assurance

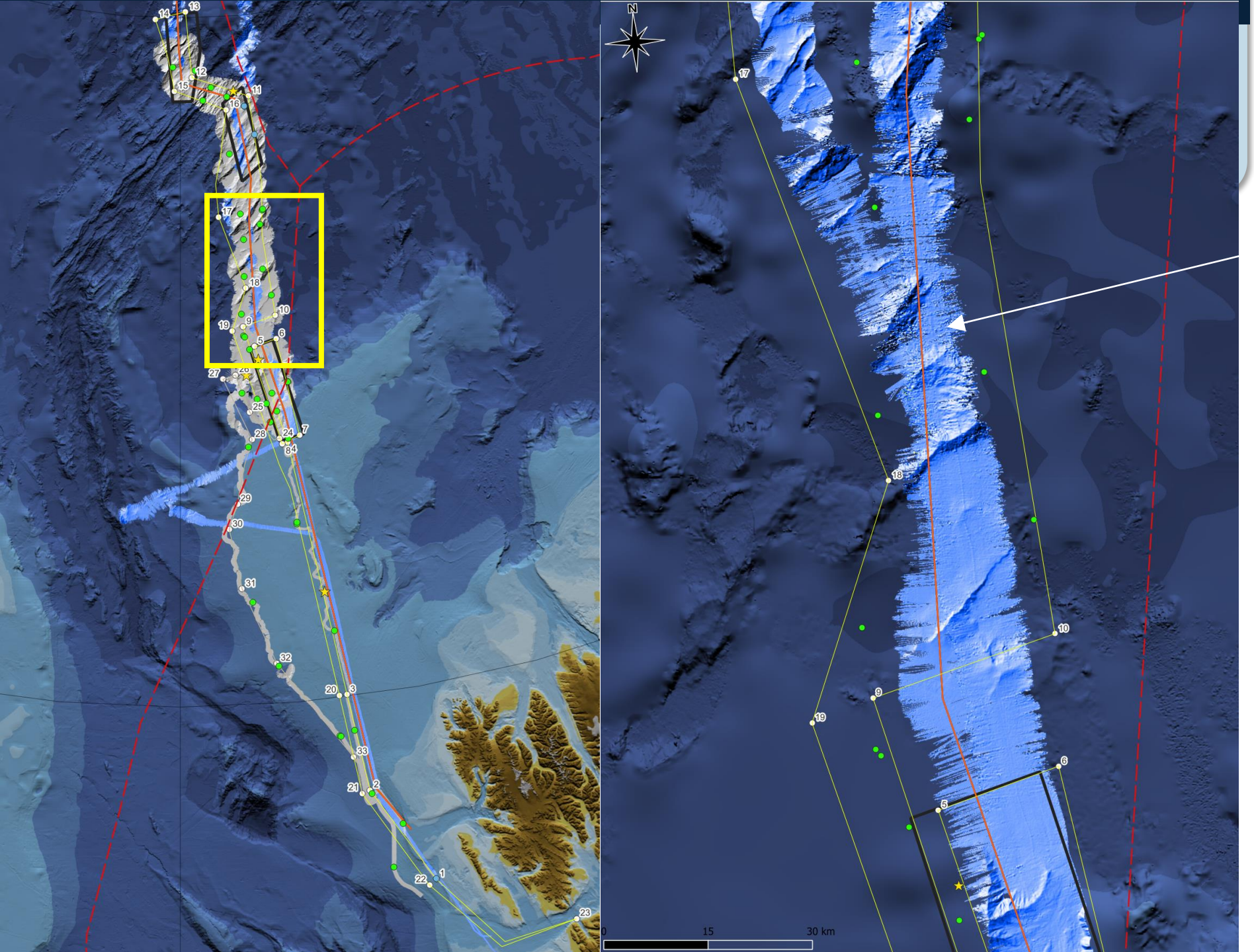


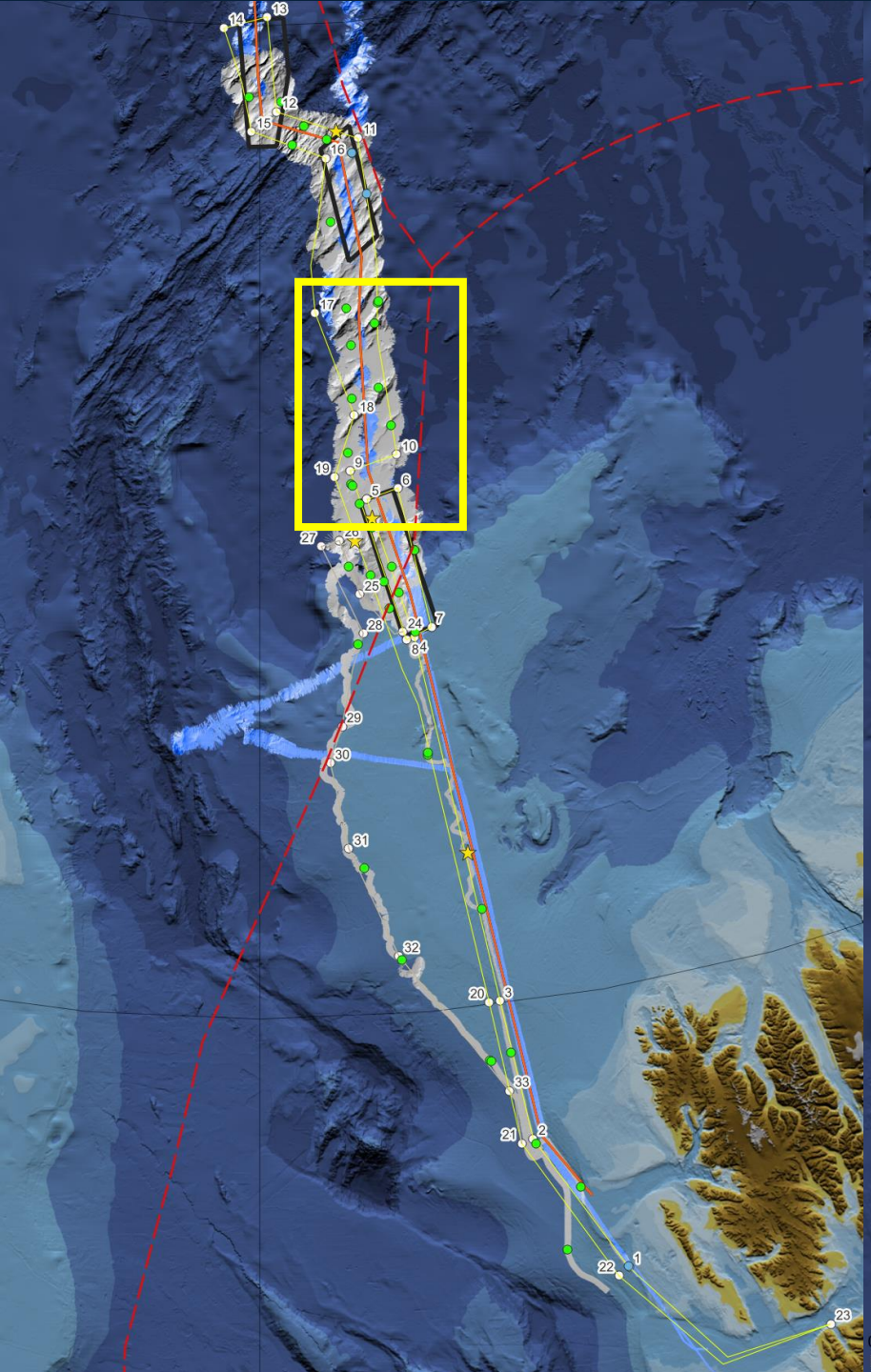
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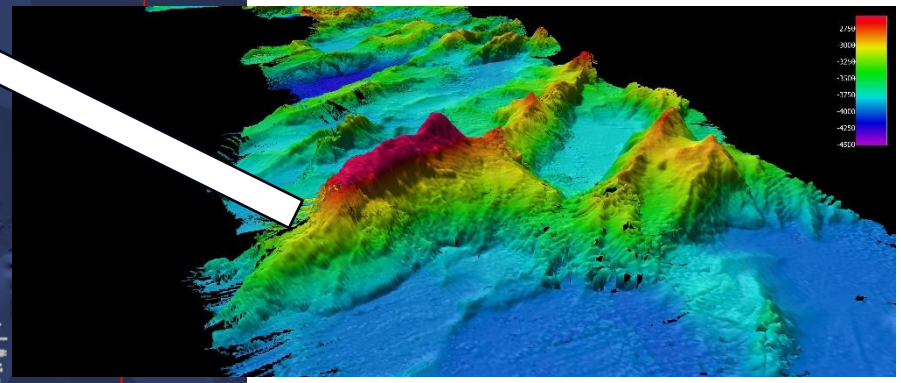


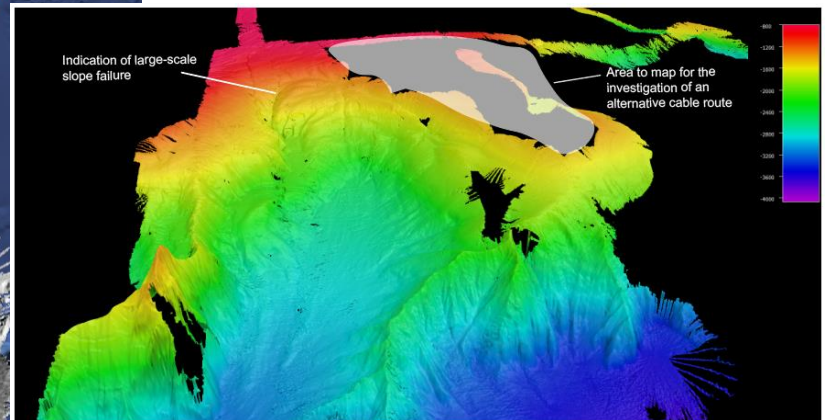
- Mapping acquired during the Polar Connect 2026 expedition. The multibeam bathymetry is shown as a grey shaded-relief image.
- Svalbard is at 78N
- Expedition reached 85N
- Extremely high-quality seabed data

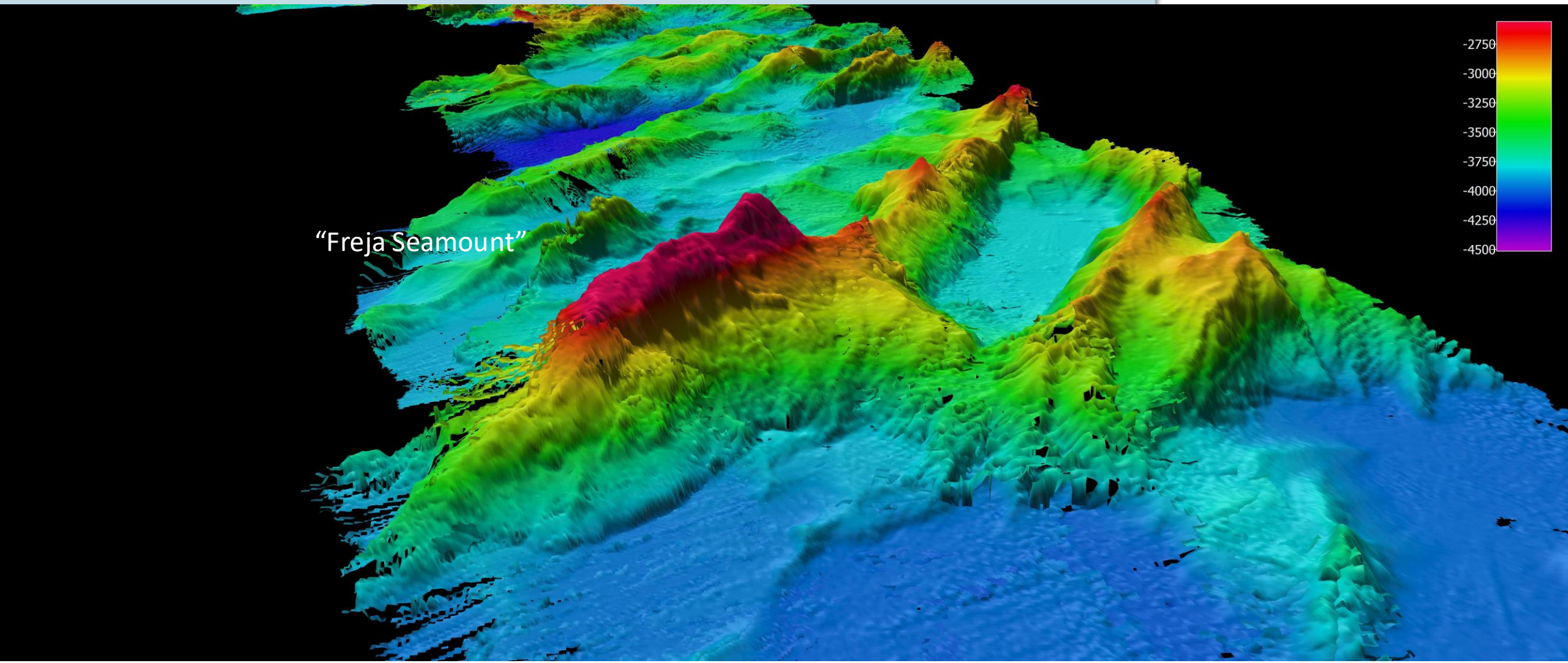

IBCAO 5.0, 2025
N
0
15
30 km


N
0
15
30 km

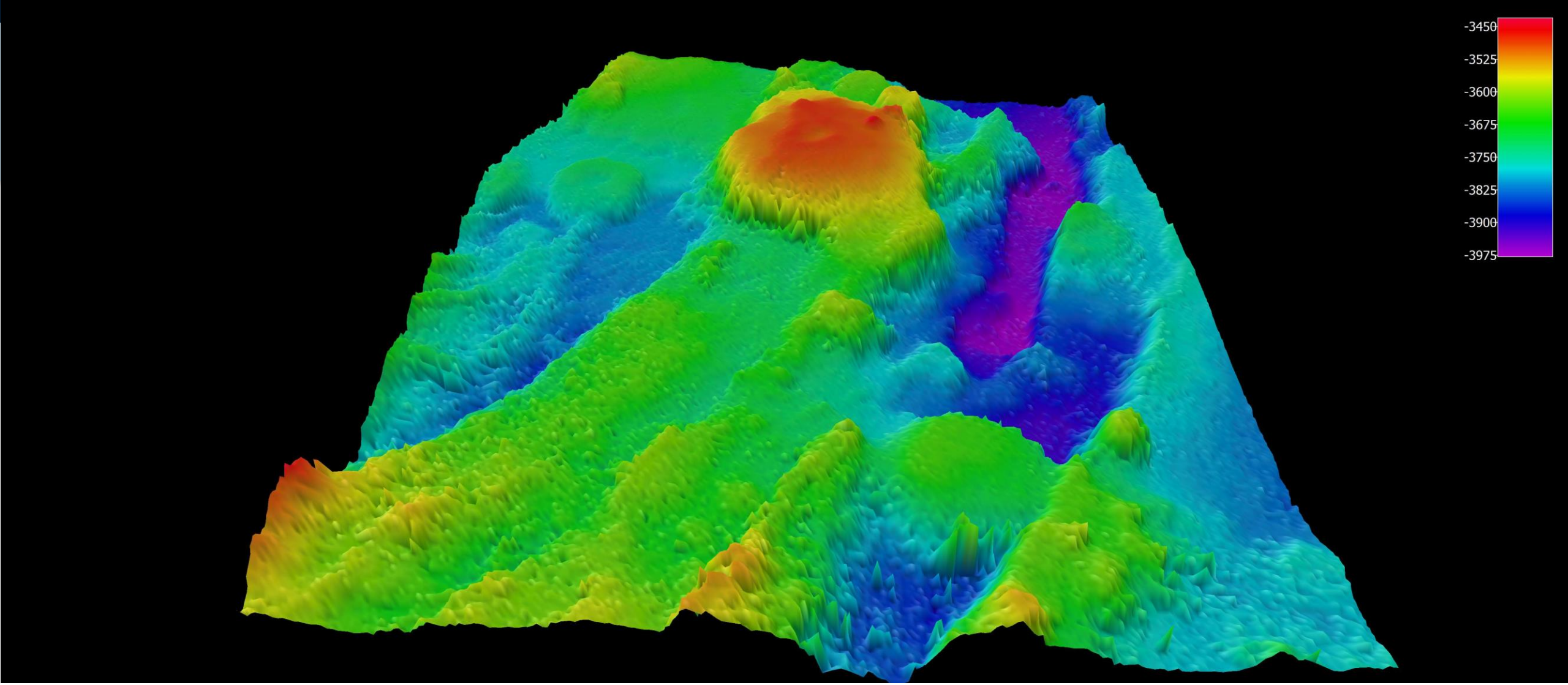




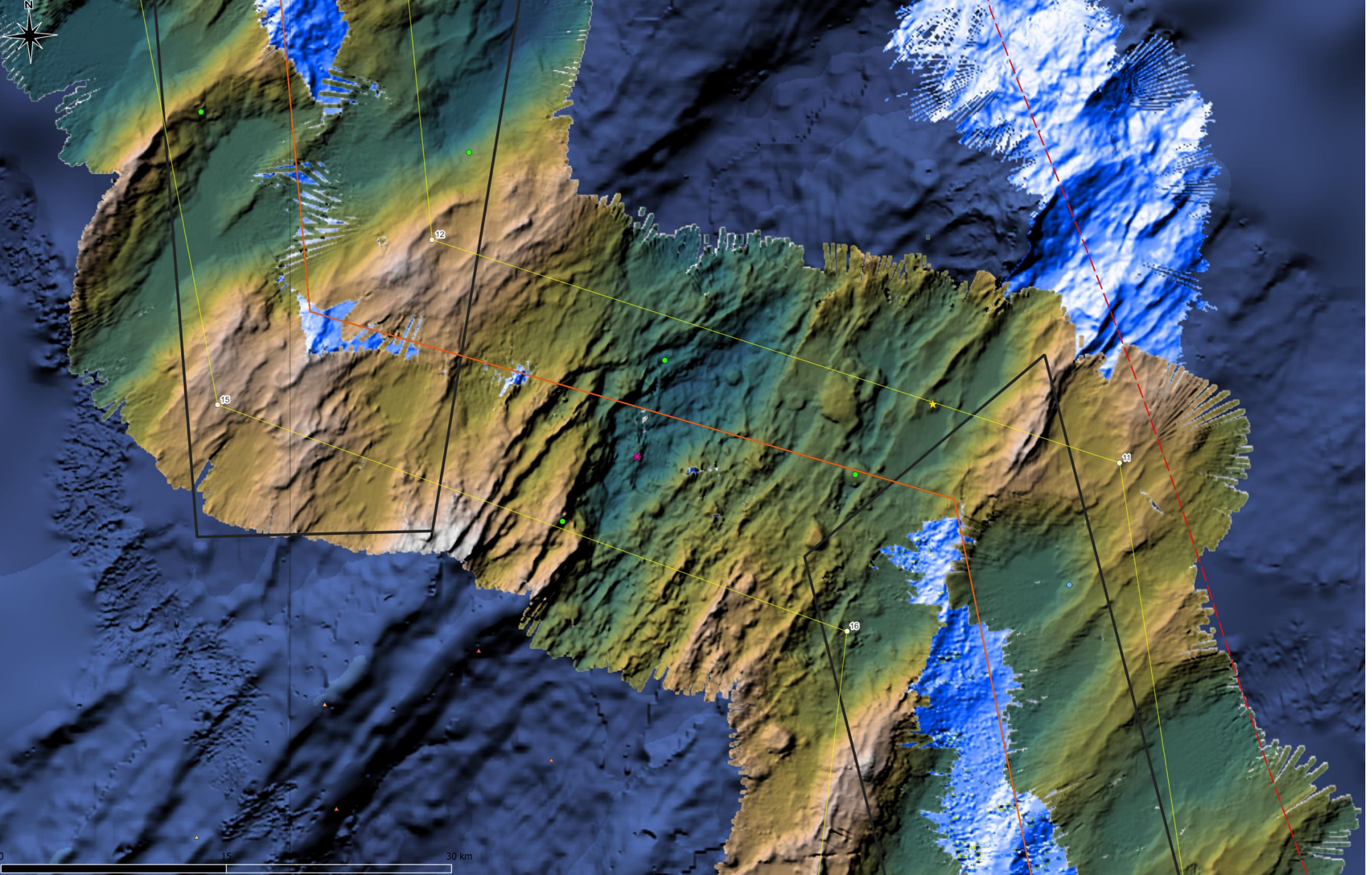

Indication of large-scale slope failure
Area to map for the investigation of an alternative cable route



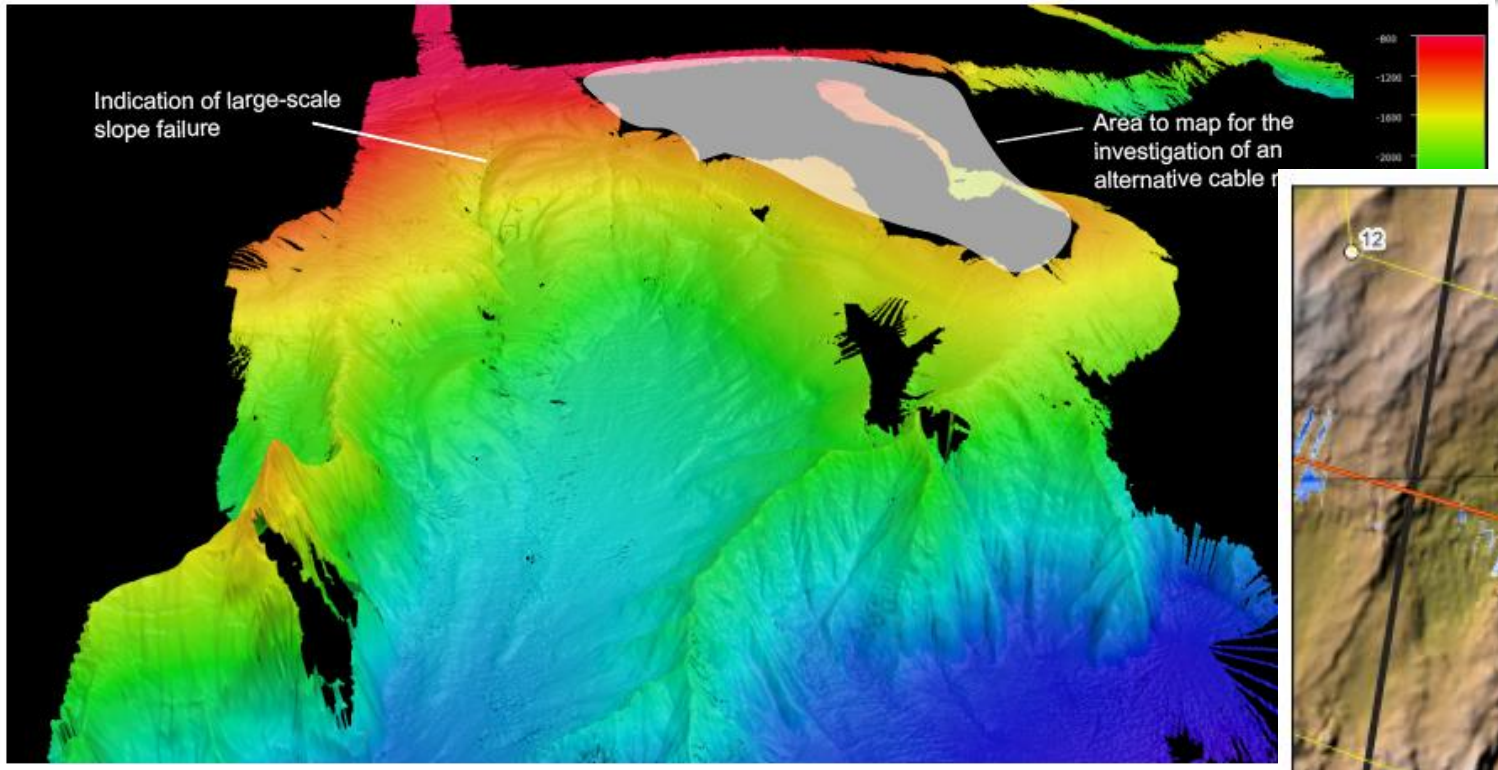
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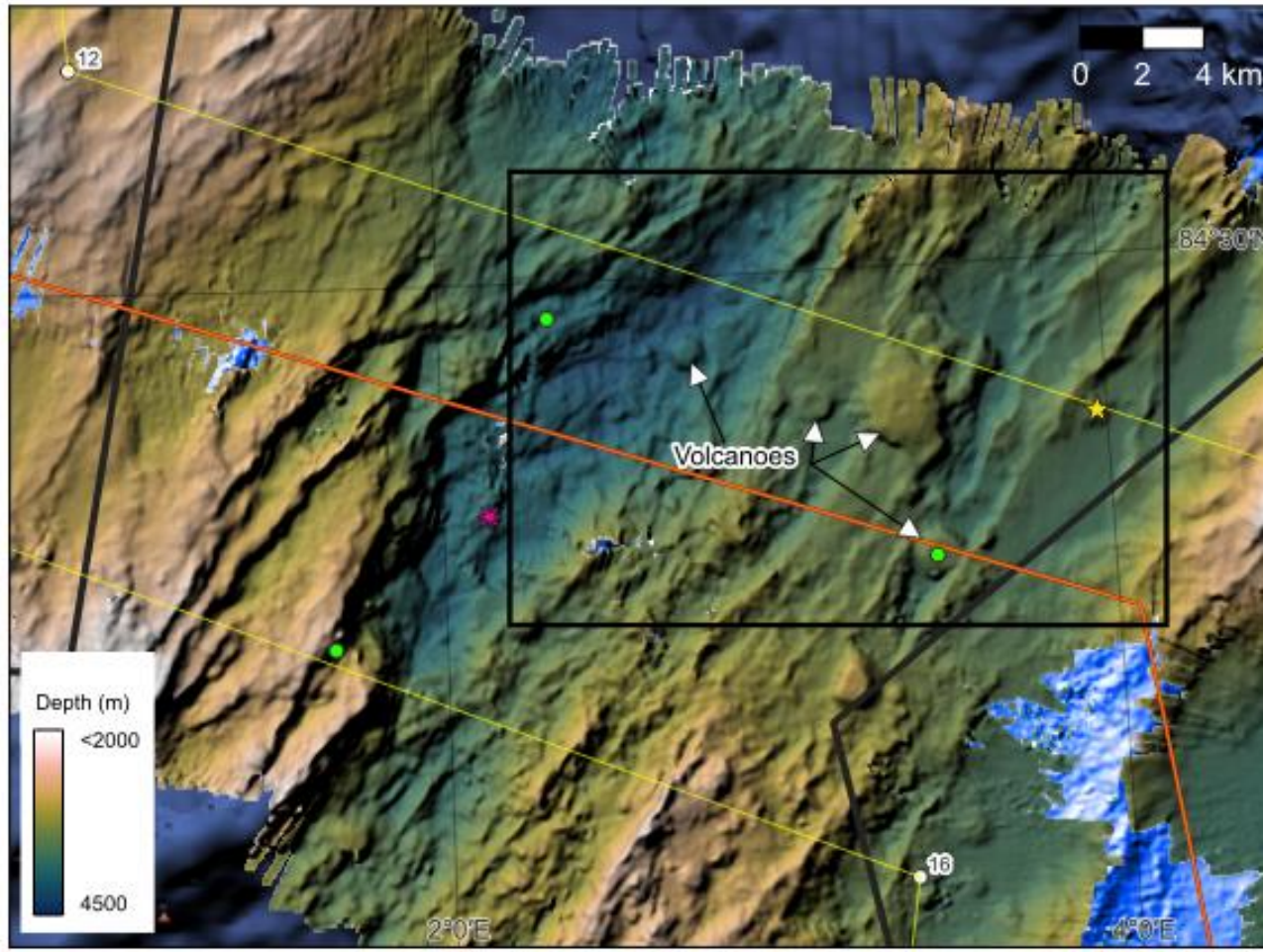


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N
12
15
11
16
0
15
30 km

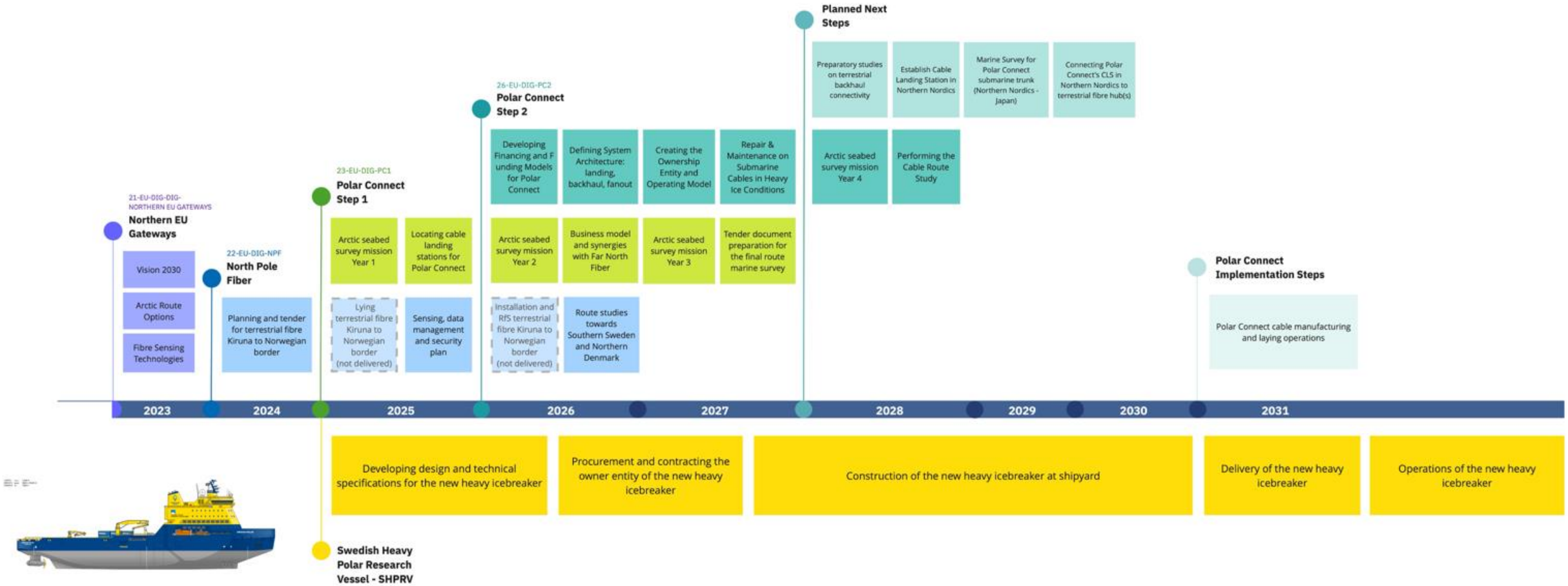
Major Findings from the Seabed Mapping





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High-level Timeline Polar Connect Initiative



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IT DEPENDS...

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Thank you!

Any questions?



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