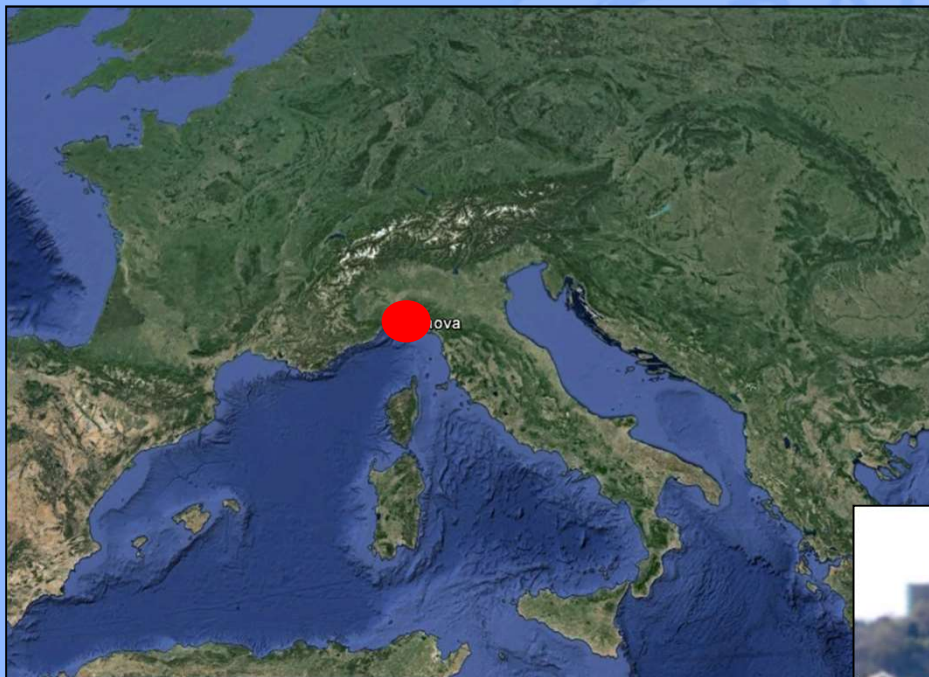


HIGH NORTH PROGRAM

NEW HYDROGRAPHIC DATA IN THE ARCTIC

Maurizio DEMARTE Roberta IVALDI Luigi SINAPI



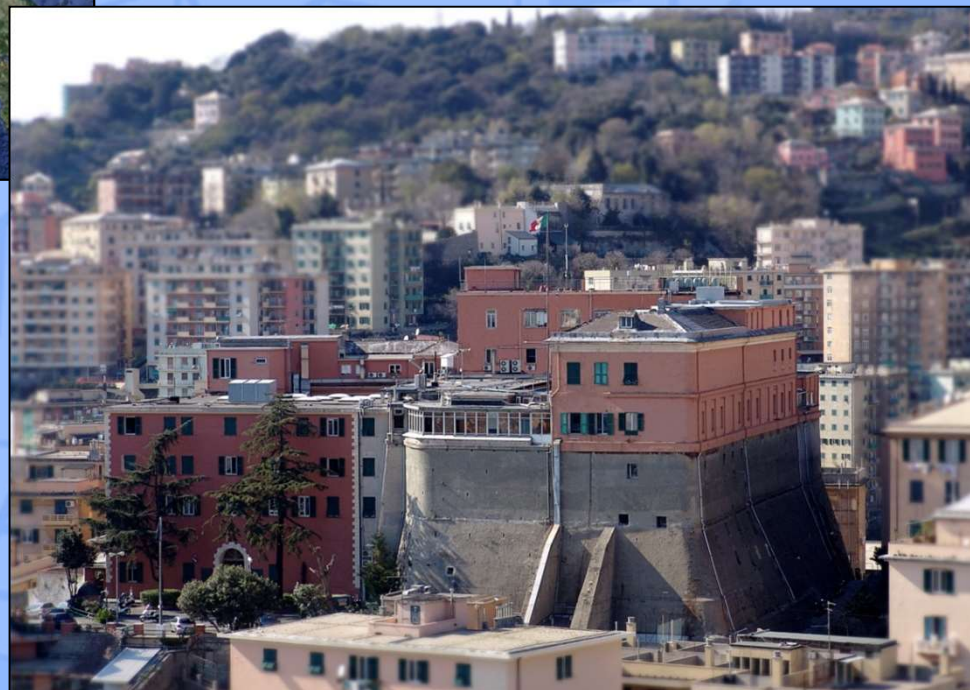
Mission:

... to support and to contribute to the **safety of navigation** and to the National Defence as **National Charting Authority**, to promote the study of all **sea-related matters** and the protection of the **marine environment**.

Activity:

- Charting - 1872
- **Research** - **1887**
- Education and Training - 1907

IHO Standards since 1921





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HOW WE ARE

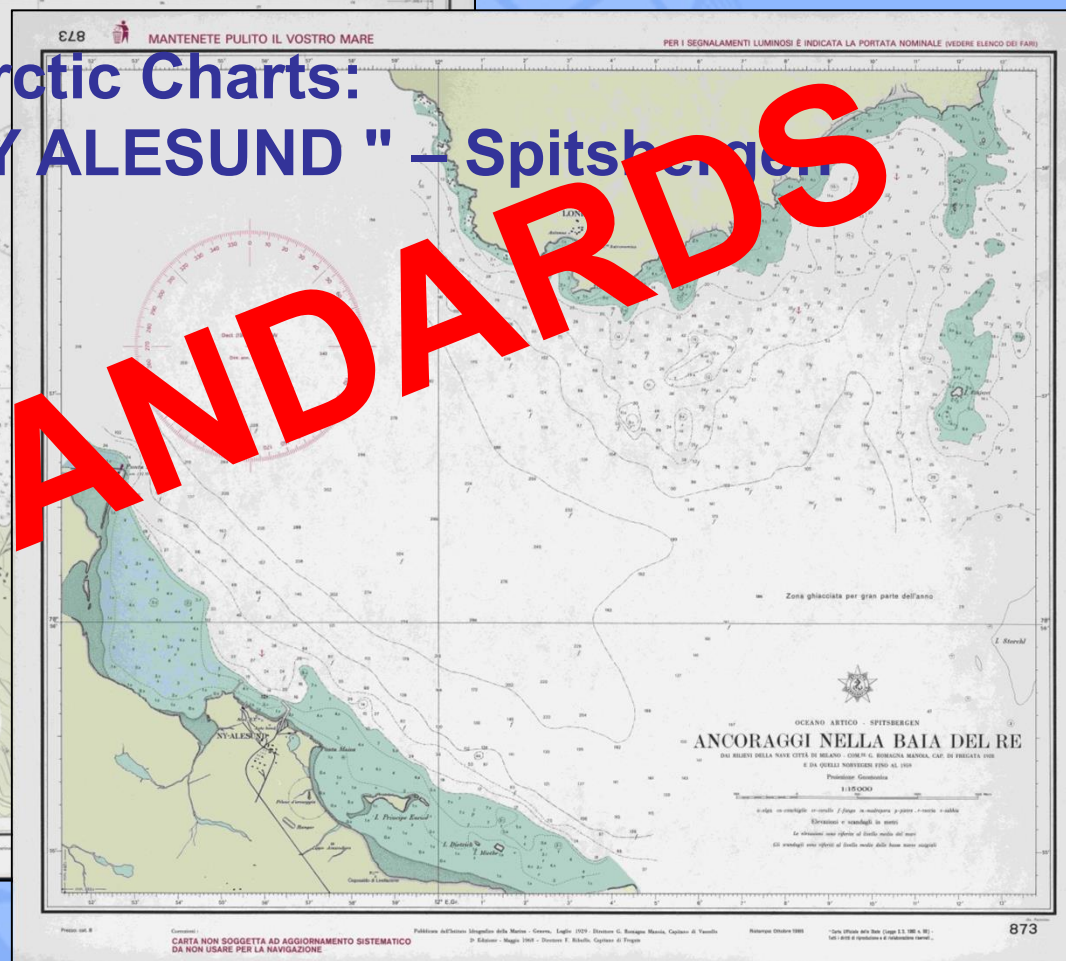
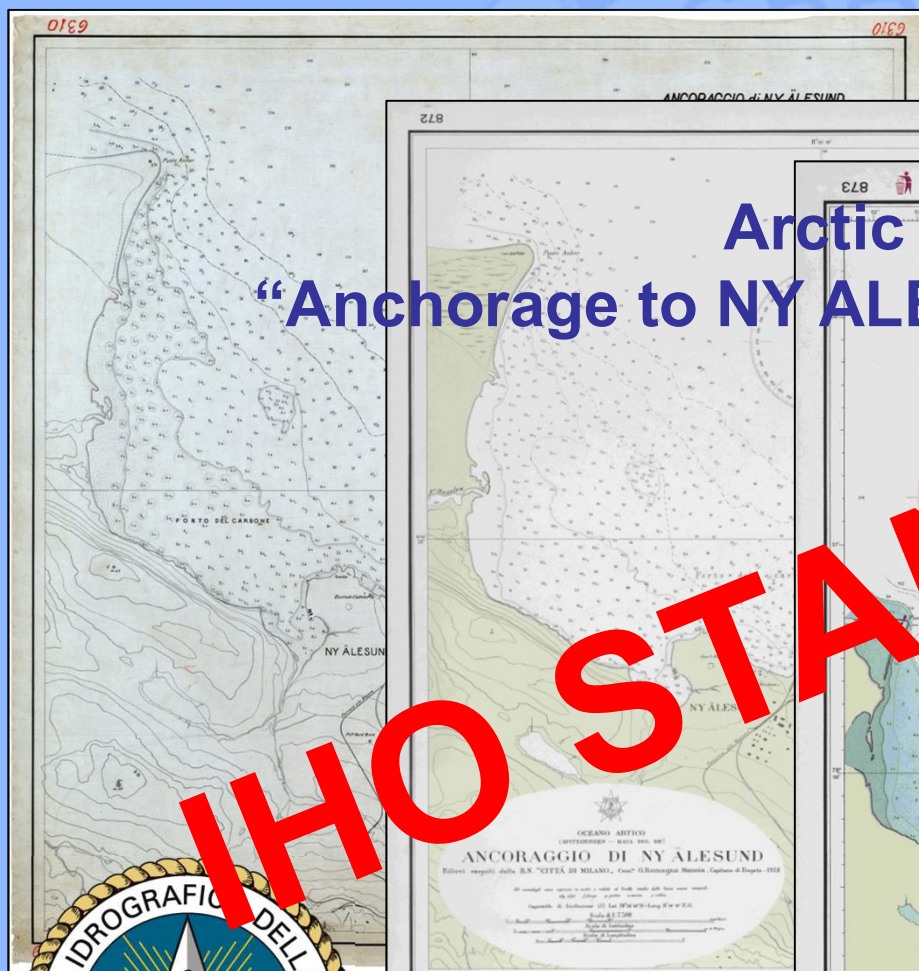
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1928 - 1968

Arctic Charts:
"Anchorage to NY ALESUND" – Spitsbergen

IHO STANDARDS





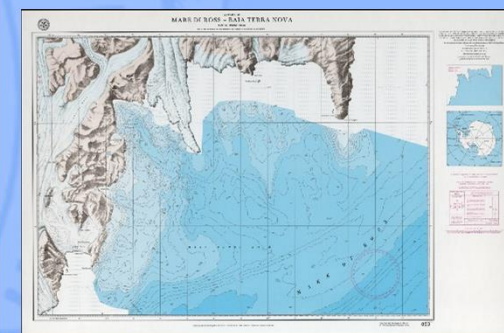
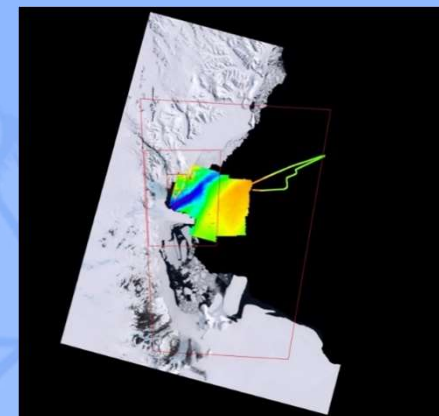
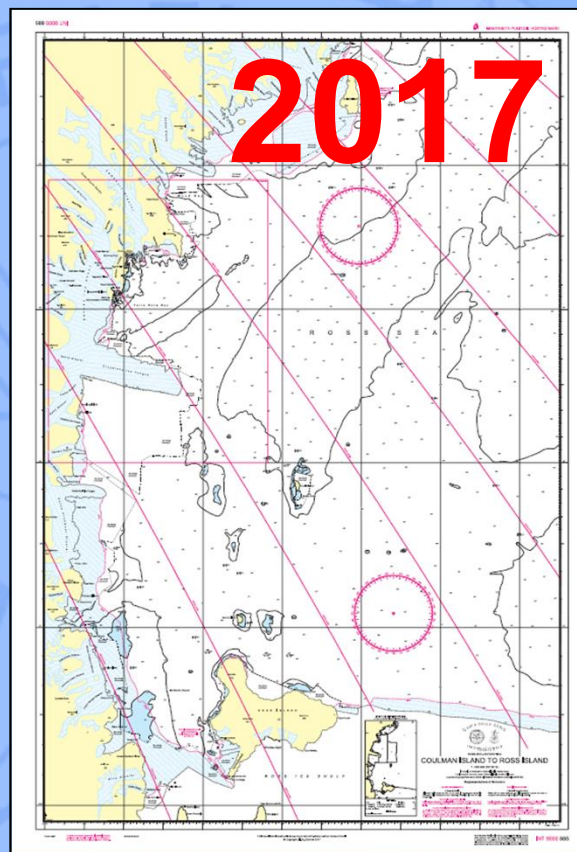
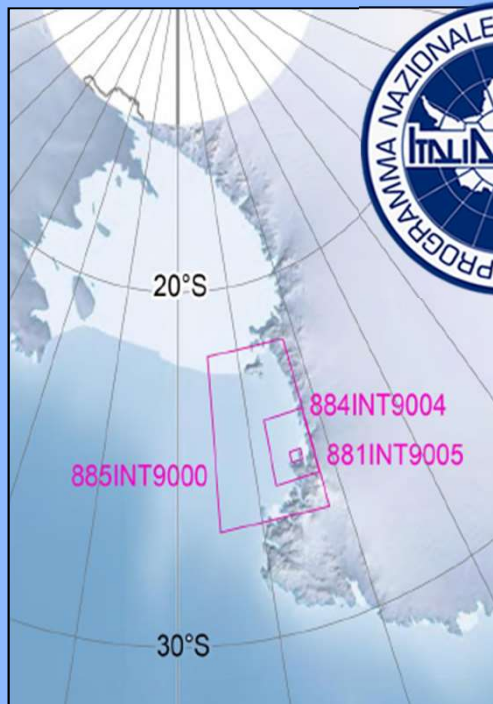
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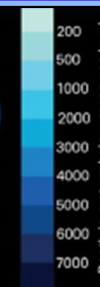
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HIGH NORTH PROGRAM

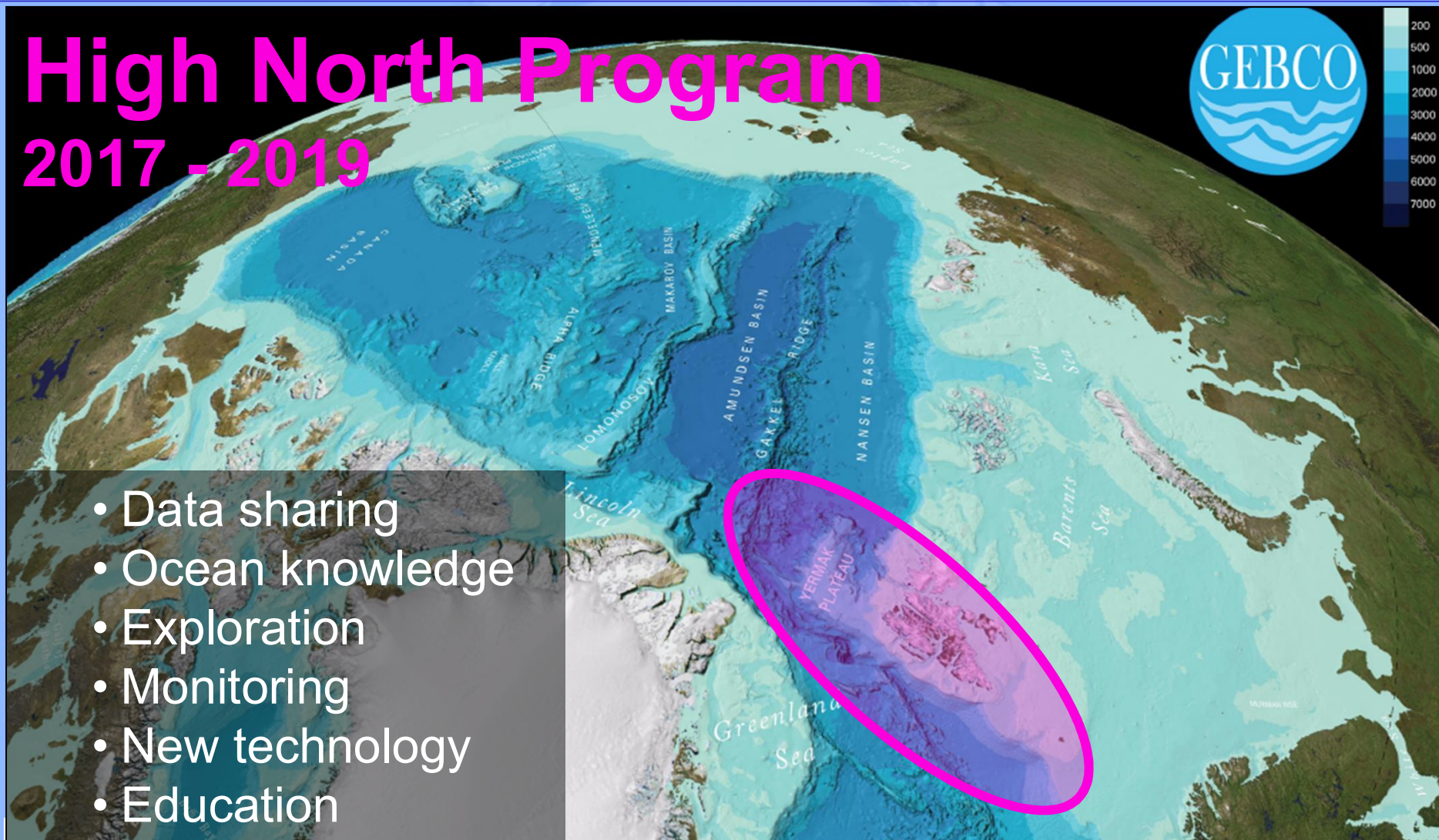
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High North Program 2017 - 2019



- Data sharing
- Ocean knowledge
- Exploration
- Monitoring
- New technology
- Education



ISTITUTO NAZIONALE DI
GEOFISICA E VULCANOLOGIA



FFI Forsvarets
forskningsinstitutt
Norwegian Defence Research Establishment



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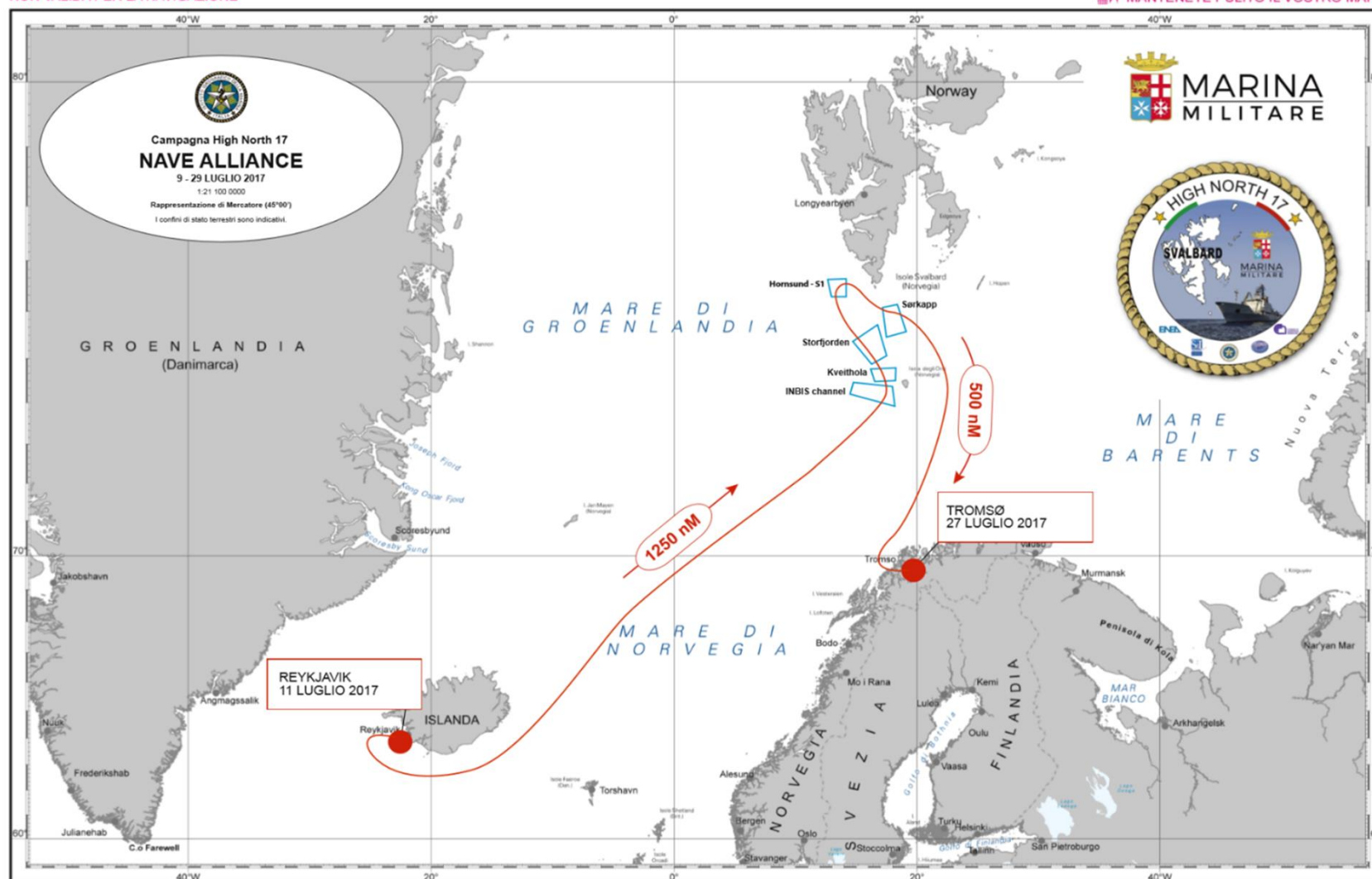
HIGH NORTH17 CAMPAIGN

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NON VALIDA PER LA NAVIGAZIONE

MANTENETE PULITO IL VOSTRO MARE



QUESTA RAPPRESENTAZIONE NON E' UNA CARTA NAUTICA

Pubblicata dall'Istituto Idrografico della Marina - Genova, Aprile 2017 - Direttore L. Sinapi, Capitano di Vascello
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HIGH NORTH18 CAMPAIGN

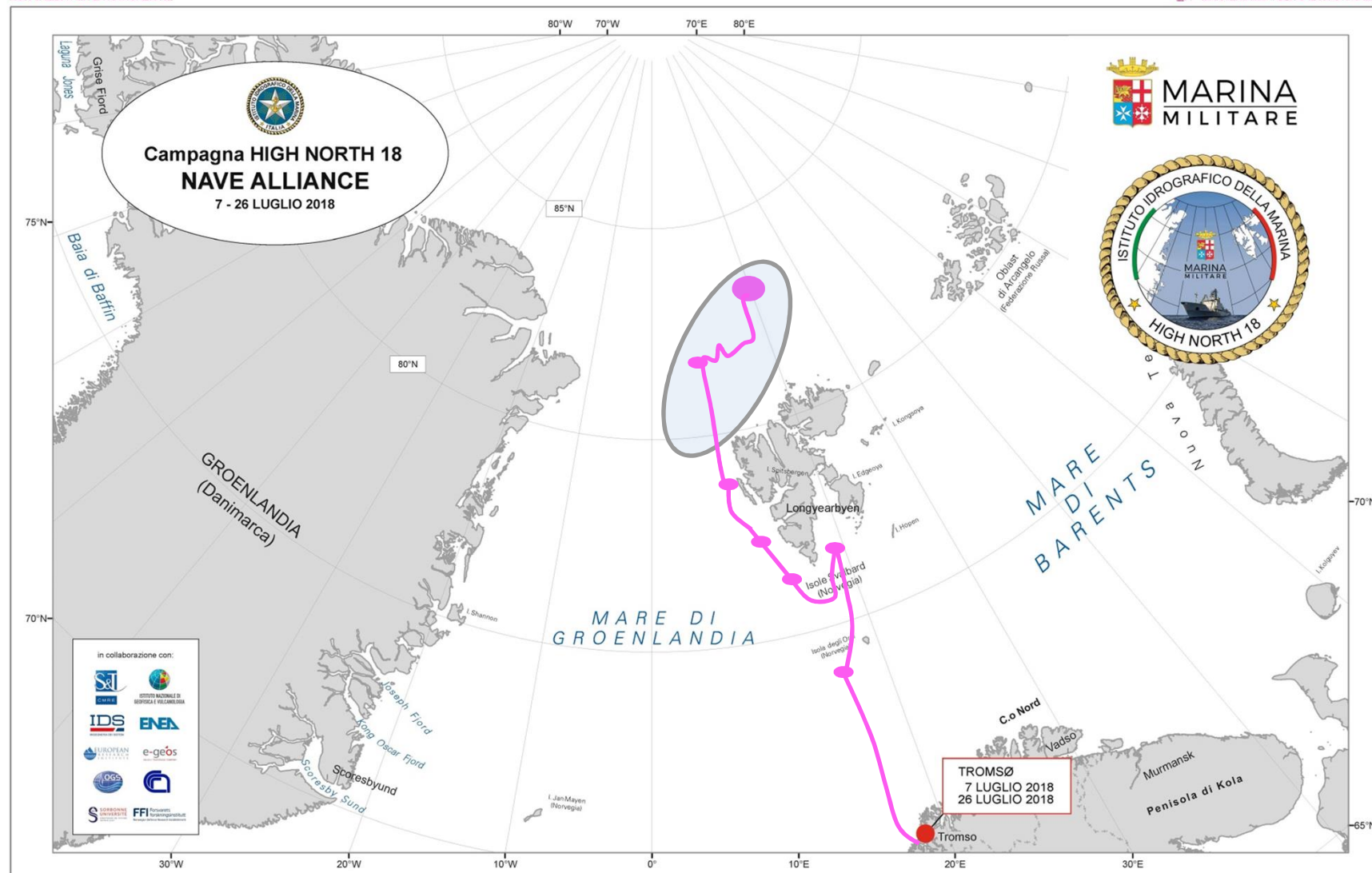
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MANTIENIAMO PULITO IL NOSTRO MARE

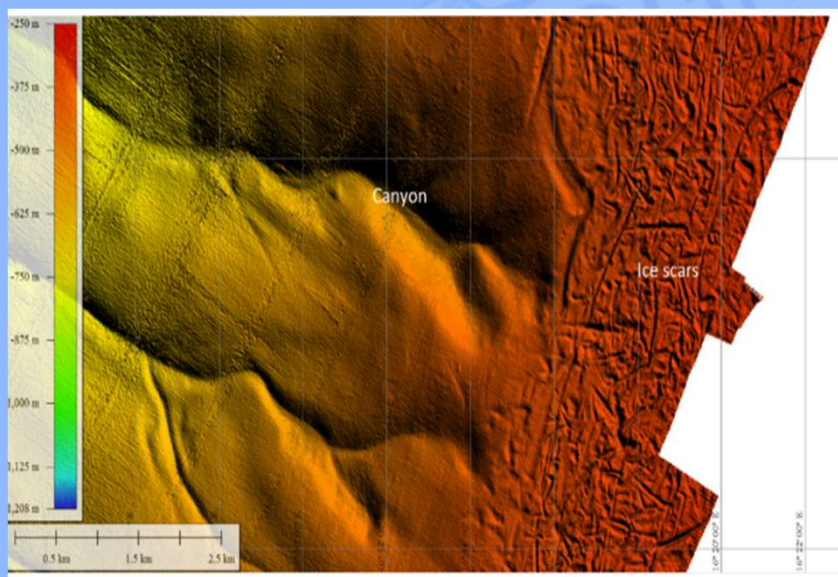


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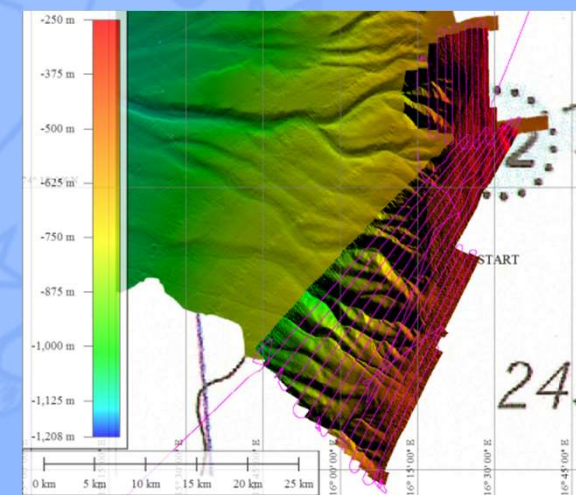
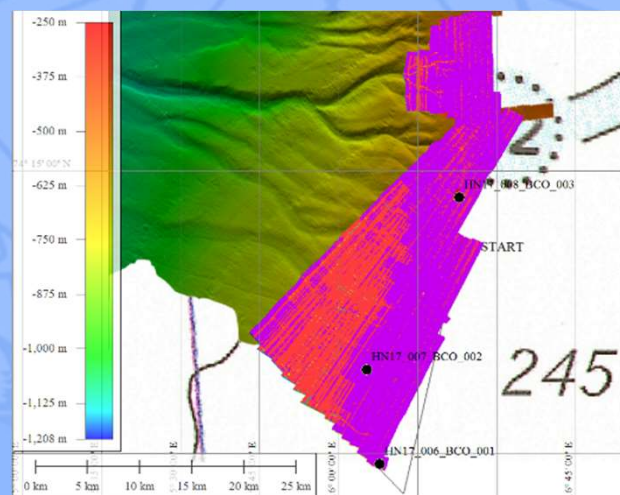
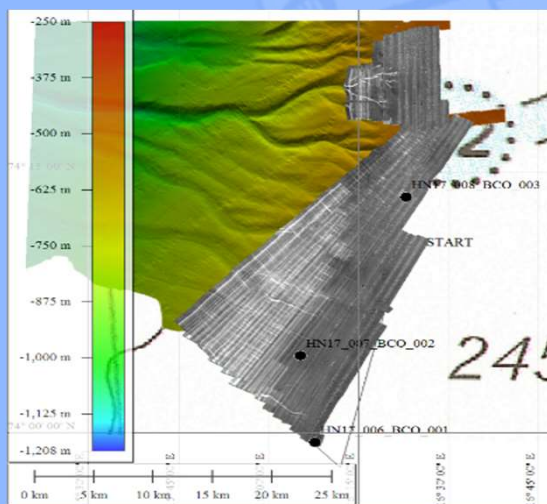
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Inbis Channel



650 km² MBES

- Morphology and seabed nature
 - Water column acoustic features
- DTM and acoustic mosaicing (30m cell)





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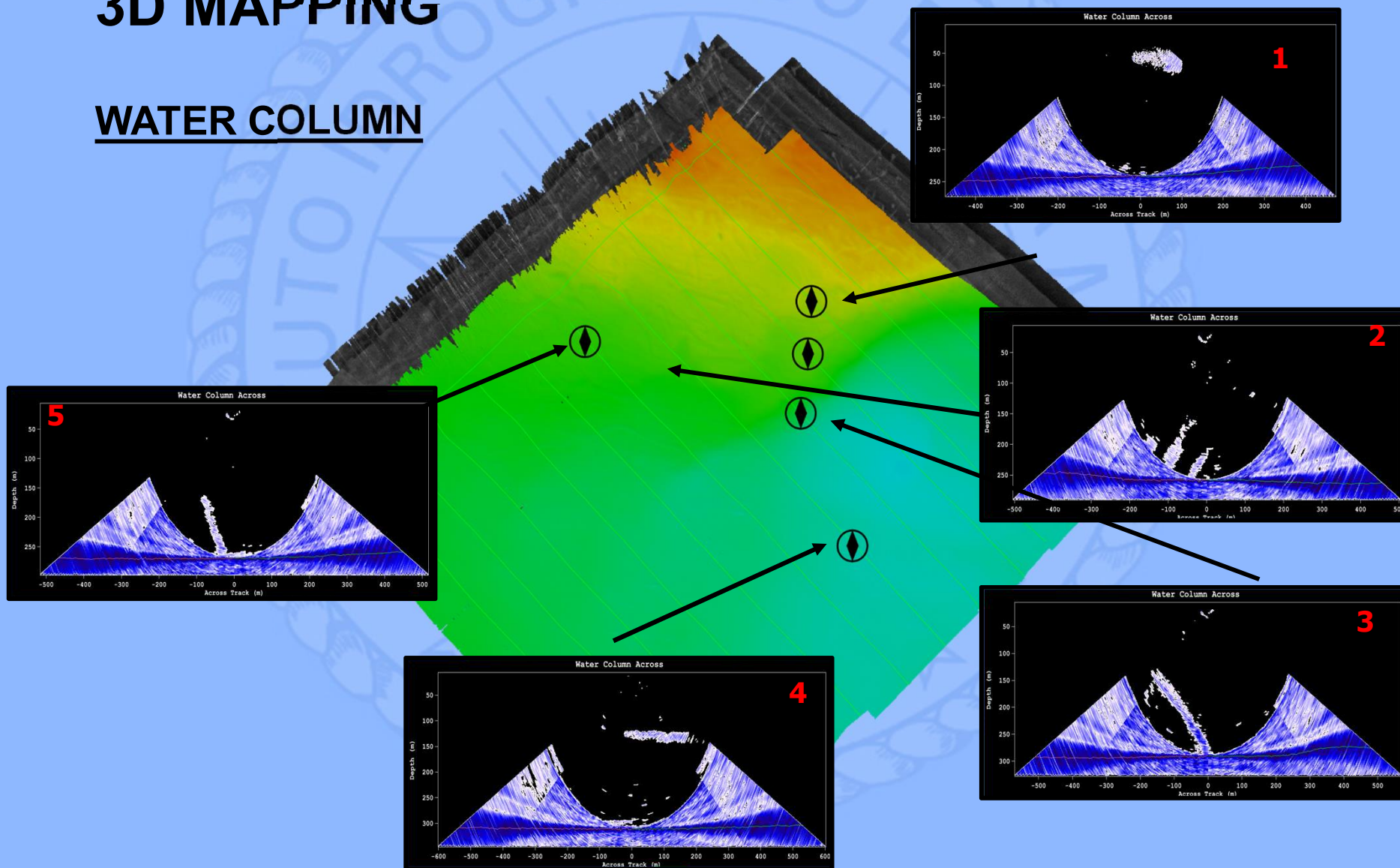
Hydro-Oceanographic activities

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3D MAPPING

WATER COLUMN





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Hydrographic activities

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SEABED MAPPING

- Backscatter mosaic
- Sediment classification
- Seabed classification

FOLK:

- muddy Sand

S-57:

- NATSUR: 4,1
- NATQUA: 2,6

S-4/INT1:

- mS, sM

CRUISE: High North 17
Date: 20/07/2017
Depth: 27 cm

Observer(s): R.G. Lucchi, D.Favuzzi, S.Agosta, V.Ferrero, R.Ivaldi



Very soft, soupy silty clay. Presence of shell debris and tube worms. Gently hummocky surface. The sandy fraction is poorly sorted and contains large rounded pebbles (black shales).

LITHOLOGIC DESCRIPTION

Very soft, soupy silty clay. Presence of shell debris and tube worms. Gently hummocky surface. The sandy fraction is poorly sorted and contains large rounded pebbles (black shales).

NATSUR: 1
NATQUA: 6

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FOLK:

- sandy Mud

S-57:

- NATSUR: 1
- NATQUA: 6

S-4/INT1:

- sM

Sub-sampling:
n. 2 liners ø 8 cm, n. 1 density-cylinder 7.5 cm³
n. 1 sample at 0-2 cm, 1-5 cm, and 2-5 cm
n. 2 samples at 5-10 cm

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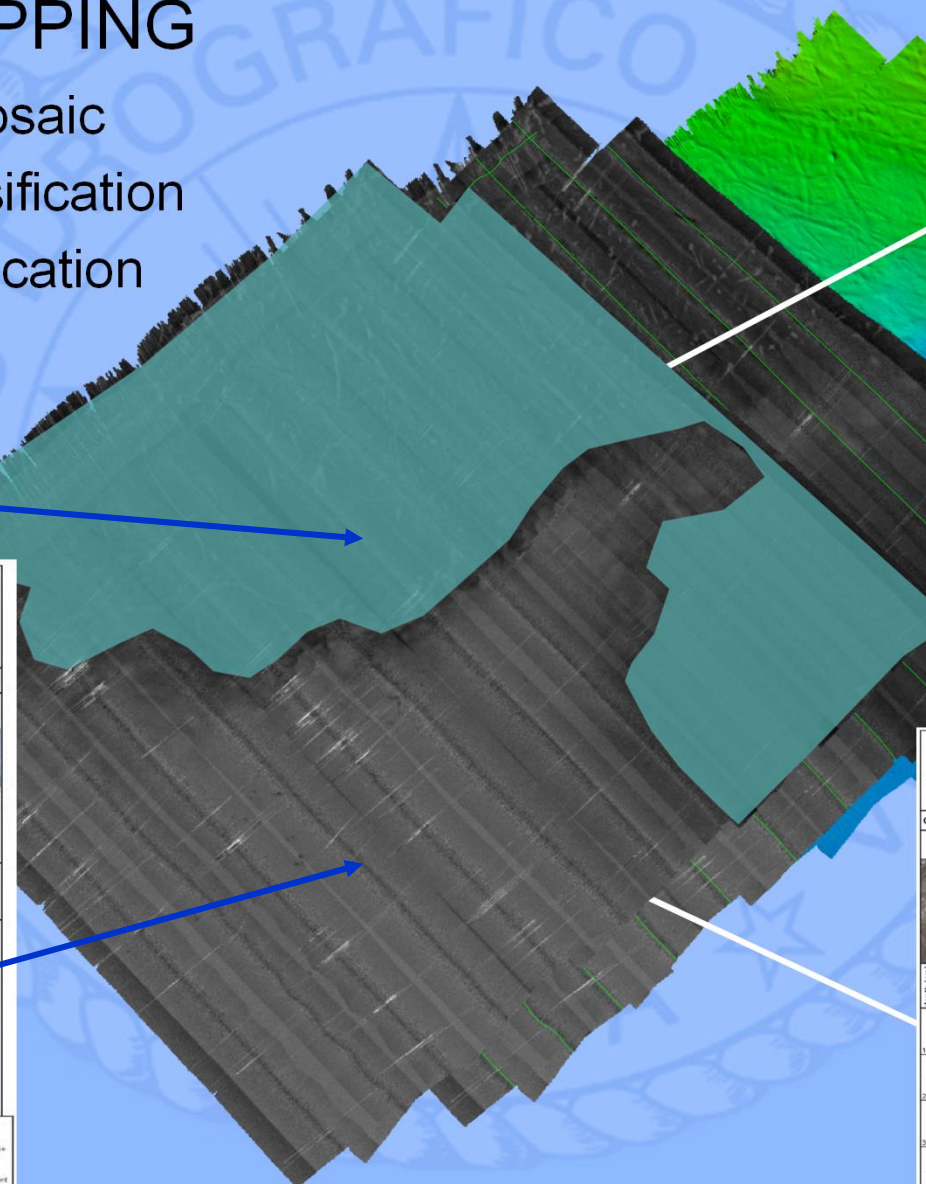
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n. 2 samples at 5-10 cm



CRUISE: High North 17						
CORE: HN17-21BCO-06 Date: 20/07/2017						
Depth: 283 Sediment recovery: 16.5 cm						
Area: KVEITHOLA TROUGH						
Observer(s): R.G. Lucchi, D.Favuzzi, S.Agosta, V.Ferrero, R.Ivaldi						
SURFACE SEDIMENT DESCRIPTION						
Soft and soupy silty clay (less soupy than site 20G055)		Presence of sand and grain-sized IRD at the surface. At 5 cm bsf presence of a layer with rounded pebbles (black shales) at 0-1 cm. Badly sorted sands with black shale fragments, abundant worm tubes, benthic forams (Nonionella, Globobulimina), ostracods.				
Depth (cm)	PHOTO	LITHOLOG	COLOR	SEDI. STRUCT.	WET WATER CONTENT %	LITHOLOGIC DESCRIPTION
0-3			5y 4/2	0-1: 44		0-3 cm, soft and soupy sandy clay. Presence of IRD grains. S57 NATSUR: 1, 4 NATQUA: 6, 2
3-8			5y 3/2	1-5: 32		3-8 cm, firm sandy/silty clay with shell debris and large rounded pebbles (black shales)
8-16.5			5y 3/1	5-10: 36		8-16.5 cm, stiff silt/clay/silt
16.5					0.5 1 kg cm ⁻³	
Sub-sampling:						
n. 3 liners ø 8 cm, n. 1 density-cylinder 7.5 cm ³						
n. 2 liners ø 4 cm						
n. 5 samples at 0-1 cm						
n. 1 sample at 0-2 cm, 1-5 cm, and 2-5 cm						
n. 2 samples at 5-10 cm						



CRUISE: High North 17						
CORE: HN17-20BCO-06 Date: 20/07/2017						
Depth: 298 Sediment recovery: 29 cm						
Area: KVEITHOLA TROUGH						
Observer(s): R.G. Lucchi, D.Favuzzi, S.Agosta, V.Ferrero, R.Ivaldi						
SURFACE SEDIMENT DESCRIPTION						
Very soft, soupy silty clay with hummocky surface. Presence of tube worms. Well sorted very fine grained sandy fraction with abundant benthic forams (Nonionella spp. and Globobulimina). Presence of worms and oxidized terrigenous matrix.						
Depth (cm)	PHOTO	LITHOLOG	COLOR	SEDI. STRUCT.	WET WATER CONTENT %	LITHOLOGIC DESCRIPTION
0-6			5y 4/2	0-1: 63		0-6 cm, very soft, soupy silty clay
6-10			5y 3/1	1-5: 48		S57 NATSUR: 1 NATQUA: 6
10-20			5y 3/2	5-10: 44		10-20 cm, dark silty clay with faint laminations
20-29						20-29 cm, clay/silt faintly laminated with sparse shell debris. Presence of tube worms.
29					0.5 1 kg cm ⁻³	
Sub-sampling:						
n. 2 liners ø 8 cm, n. 1 density-cylinder 7.5 cm ³						
n. 2 liners ø 4 cm						
n. 5 samples at 0-1 cm						
n. 1 sample at 0-2 cm, 1-5 cm, and 2-5 cm						
n. 2 samples at 5-10 cm						





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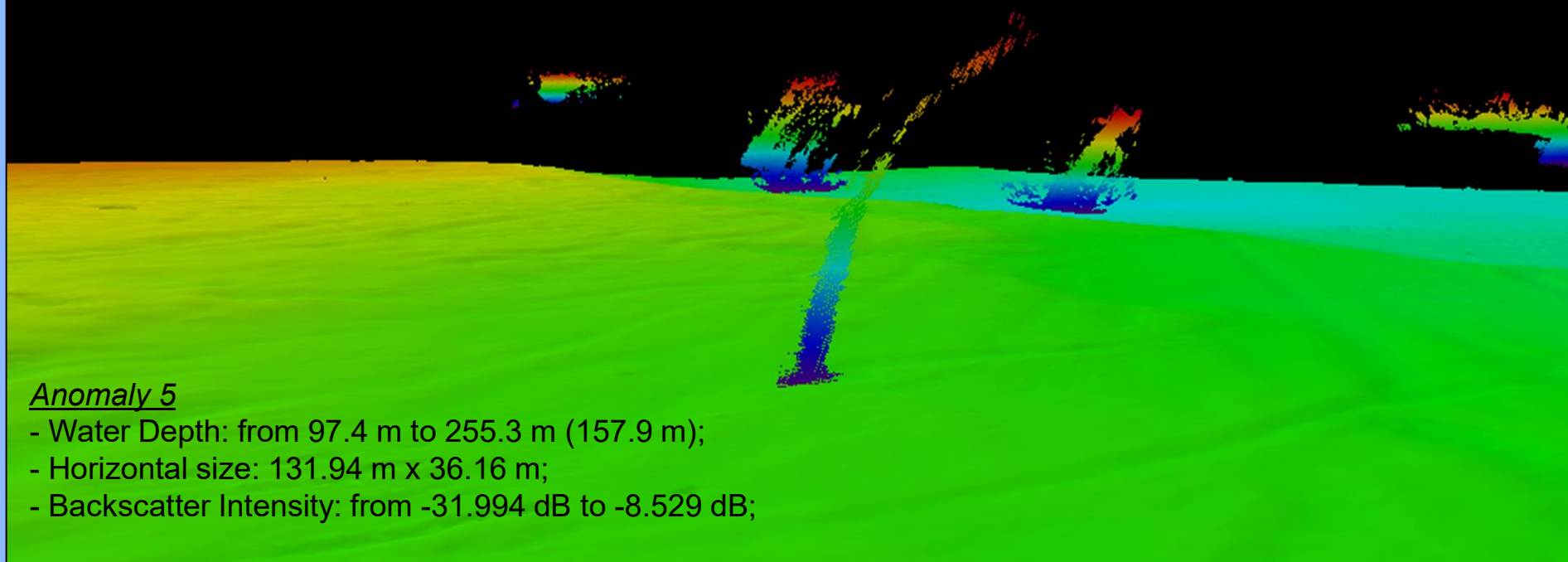
HIGH NORTH17 CAMPAIGN

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3D MAPPING

- WATER COLUMN
- SEABED FEATURES
- TARGET

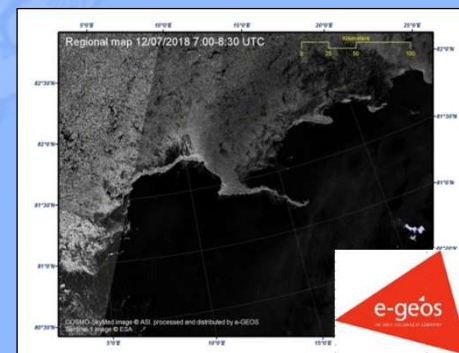
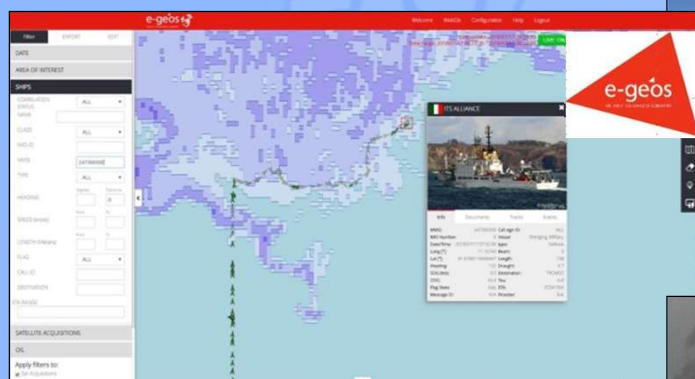


Anomaly 5

- Water Depth: from 97.4 m to 255.3 m (157.9 m);
- Horizontal size: 131.94 m x 36.16 m;
- Backscatter Intensity: from -31.994 dB to -8.529 dB;



ICE-EDGE EXPERIMENTATION

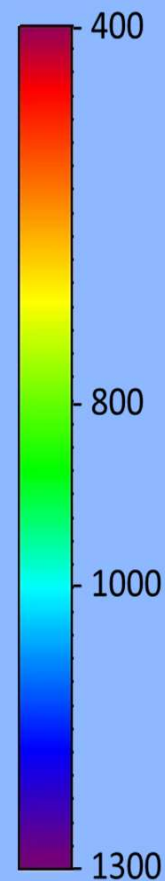
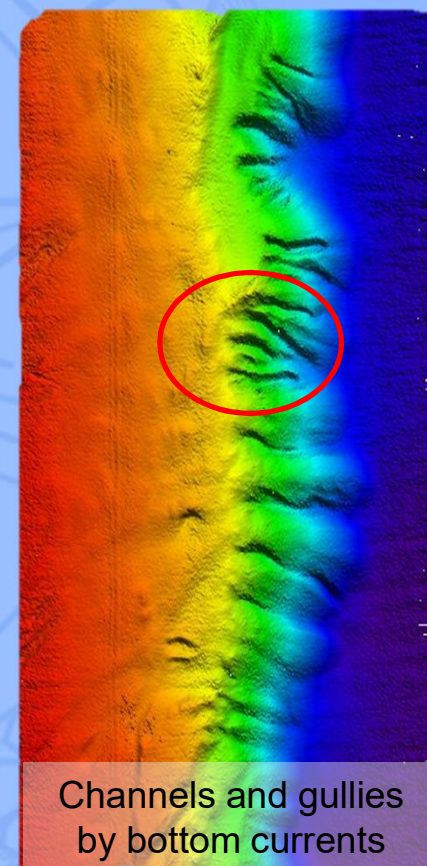
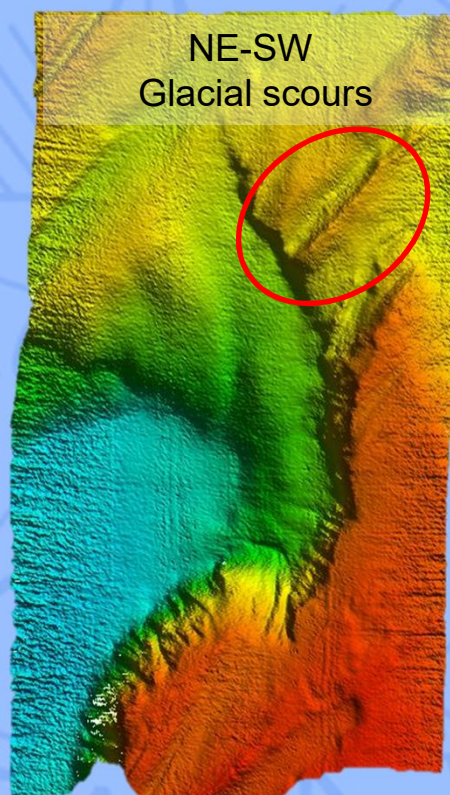
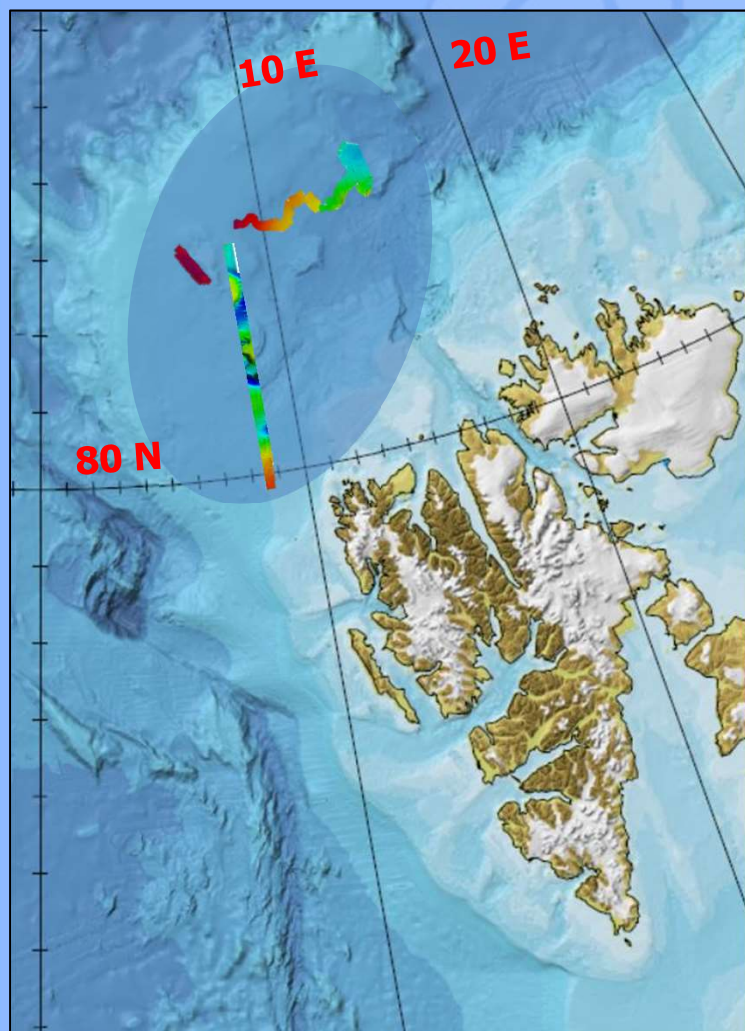




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EXPLORATION

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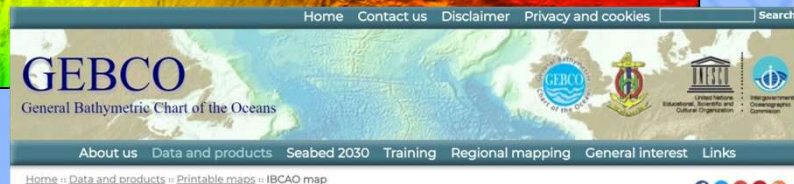
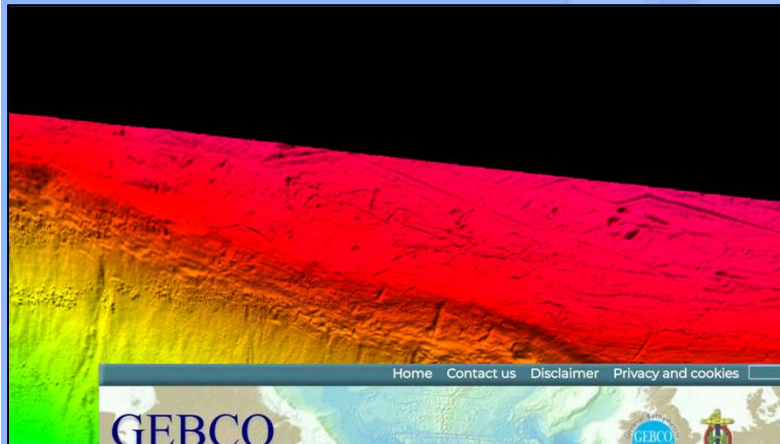
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FULL DATA SHARING WITH:

- NORWEGIAN FFI
- GEBCO/IBCAO
- GEBCO SEABED 2030
- IHO DCDB – ARHC
- ARCTIC SCIENTIFIC PROJECTS



International Bathymetric Chart of the Arctic Ocean (IBCAO)

The aim of the IBCAO initiative is to develop a digital database containing all available bathymetric data north of 64° North, for use by mapmakers, researchers, institutions and others whose work requires a detailed and accurate knowledge of the depth and the shape of the Arctic seabed.



Download t

Please note
than openi

The map is
has a scale
standard p

Nippon Foundation - GEBCO

Seabed 2030

Arctic and North Pacific Ocean Regional Center

Center co-Heads: Prof. Martin Jakobsson (SU) and Prof. Larry Mayer (CCOM)

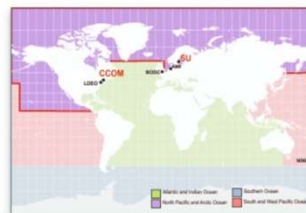
Biographical information

- [Martin Jakobsson](#)
- [Larry Mayer](#)

Center Teams

Stockholm University

- Ms. Caroline Bringsensparr
- Mr. Rezwan Mohammad
- Mr. Björn Eriksson

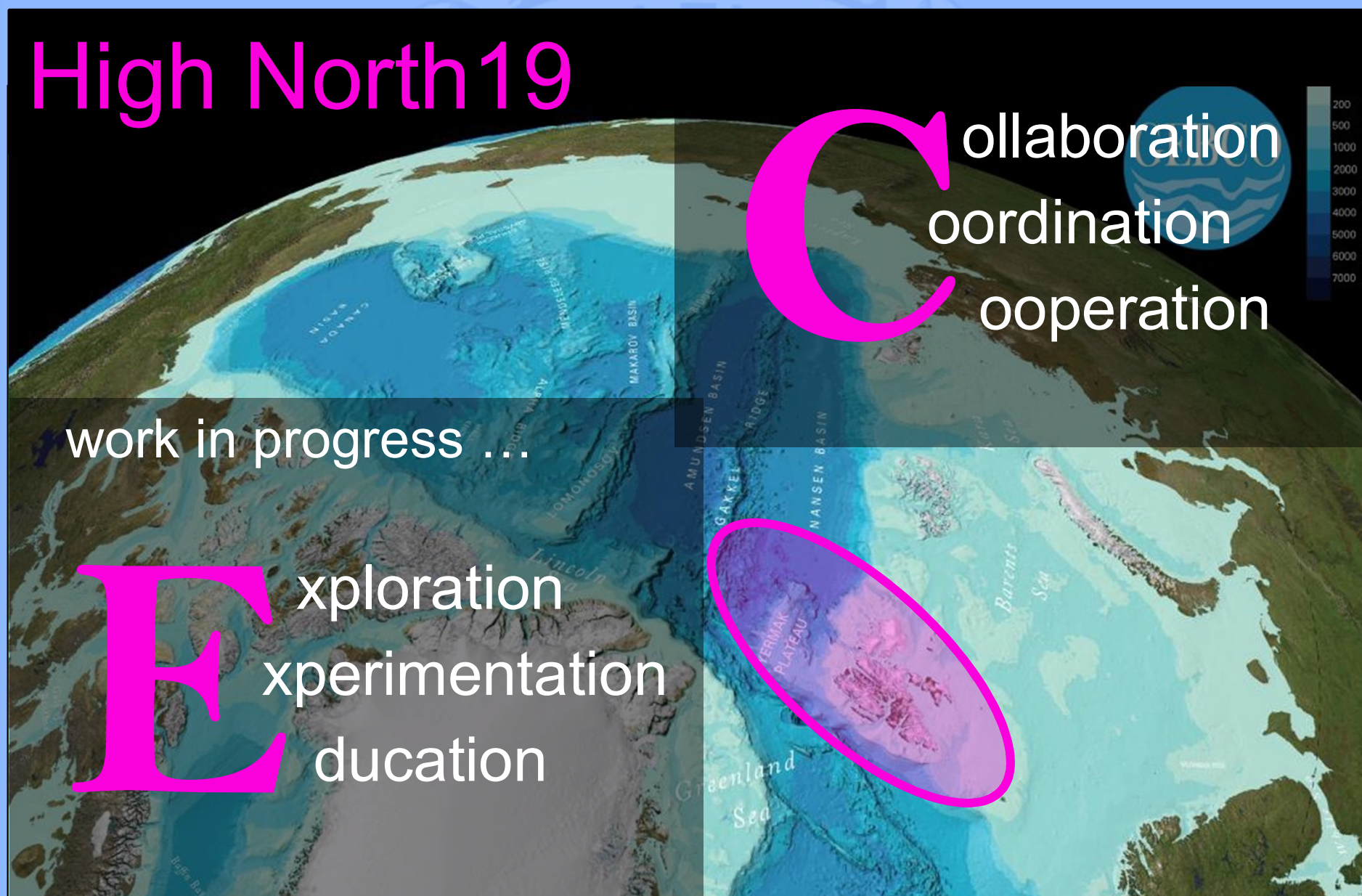


High North 19

Collaboration
coordination
cooperation

work in progress ...

E xploration
xperimentation
ducation





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