
NATIONAL REPORT OF ITALY

This report gives the summary of the activities and events that have taken place within the Italian Hydrographic Institute (IIM) since the last report given at the ARHC12 Conference in St John's, Newfoundland and Labrador, Canada, September 2022.

1. HYDROGRAPHIC OFFICE

The IIM is in charge of all the official nautical documentation published in Italy and supports the Ministry of Defence for all related matters. Our mission is to support and contribute to the safety of navigation and to the National Defence, to promote the study of all sea related matters and the protection of the marine environment.

2. HYDROGRAPHIC SURVEYS IN THE ARCTIC REGION – 2023

The Italian Navy – as the national marine focal point for research activities in the Arctic – with the scientific support of the IIM, at the begin of the 2023, confirmed for a new three-year period the Joint Multi-year Research Program in the Arctic called HIGH NORTH.

A specific role in the HIGH NORTH program is played by advanced training courses with a new generation of young researchers and hydrographers in the field.

HIGH NORTH23 was characterize by the presence of eight young researchers as part of the scientific team in order to support the action of the UN Ocean decade with ECOP (Early Career Ocean Professional) involving in the vision of the “Science we need for the ocean we want”. In order to contribute in exploration and high-resolution seabed mapping, during HIGH NORTH23, hydro-oceanographic data was collected using a multibeam echosounder (Kongsberg EM 302 - 30 kHz) installed onboard Italian Navy R/V Alliance.

HIGH NORTH23 hydrographic survey focused on three main areas: Molloy Hole, Yermak and North-east Svalbard. The image below summarizes the area surveyed last summer and the following image, the area surveyed in all seven years.

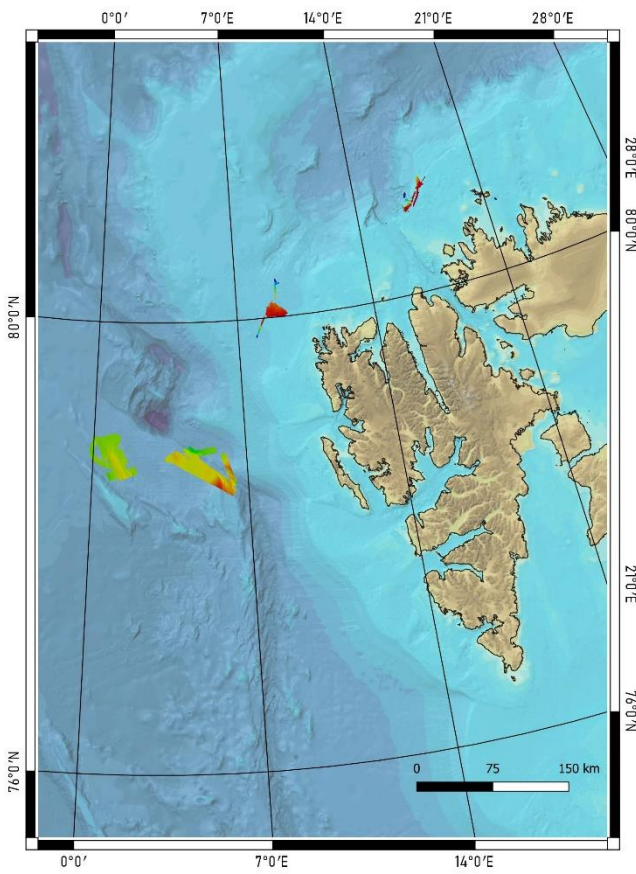


Figure 1 HIGH NORTH23 surveyed area

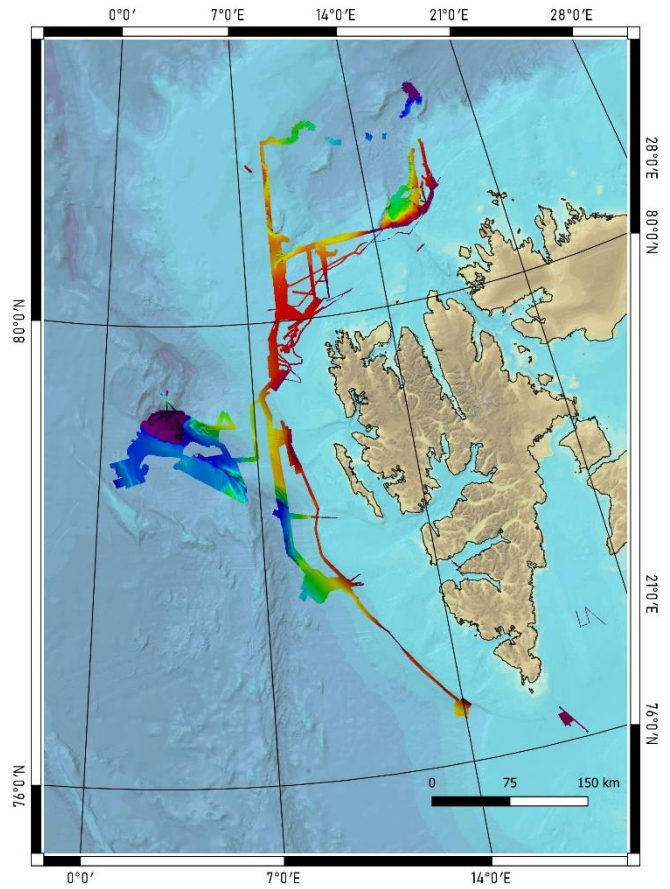


Figure 2 Summary of 2017/2023

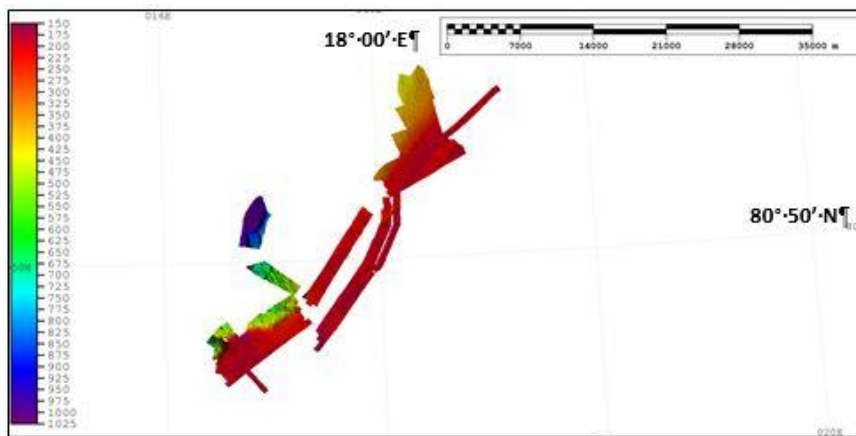


Figure 3 Norskebanken

Depth:	Km ²	%
0 – 500	139,83	86,85
500 – 1000	19,63	12,19
1000 – 1500	1,54	0,96
1500 – 2000		
2000 – 2500		
2500 – 3000		
3000 – 3500		

Min Depth	151,3
Max Depth	1021,4

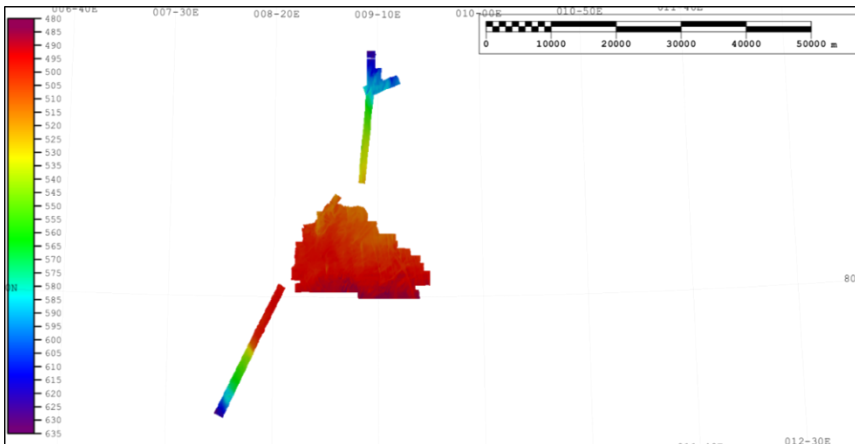


Figure 4 Yermak

Depth:	Km ²	%
0 – 500	115,53	41,52
500 – 1000	162,69	58,48
1000 – 1500		
1500 – 2000		
2000 – 2500		
2500 – 3000		
3000 – 3500		

Min Depth	483
Max Depth	633

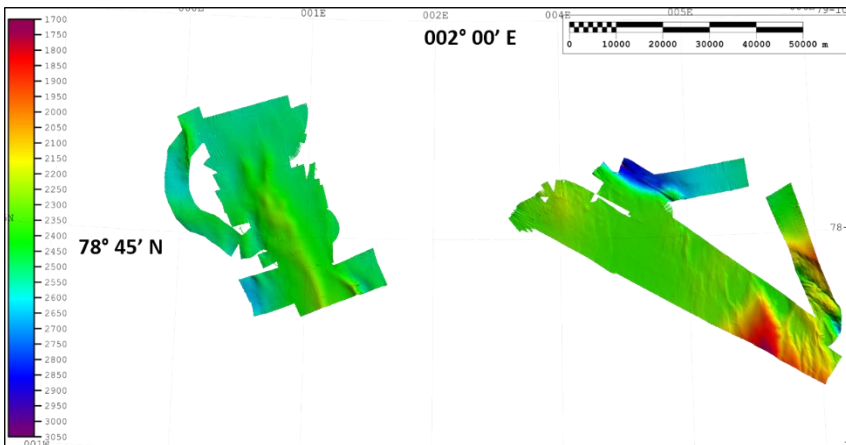


Figure 5 Vestnesa and Molloy South

Depth:	Km ²	%
0 – 500		
500 – 1000		
1000 – 1500		
1500 – 2000	63,97	2,39
2000 – 2500	1883,95	70,61
2500 – 3000	374,79	14,04
3000 – 3500	345,32	12,86

Min Depth	1732,4
Max Depth	3030

3. NEW CHARTS AND UPDATES

Not Applicable

4. NAUTICAL PUBLICATIONS

Not Applicable

5. MSI

Not Applicable

6. C-55

Not Applicable

7. CAPACITY BUILDING

Not Applicable

8. OCEANOGRAPHIC ACTIVITIES

High North23 was conducted from July 15th to August 9th. The main goal was to focus on the unsurveyed area close to the sea ice-edge. The data collected during HIGH NORTH23 are devoted to

the bottom mapping (over 3100 km² surveyed area), water column and seabed feature characterization, acoustic imaging of the seabed, remote sensing data in order to obtain a 3D mapping of the area (Fram Strait and Yermak Plateau, Arctic Ocean). Overall, 174 sampling stations, 24 Oceanographic CTD, 24 ICE-CTD (to evaluate the effect of freshwater), 13 transects of Underway-CTD, and 6 drifters. The research activities were focused to study of the seabed and on the evolution of observed oceanic processes under different climate and environmental conditions to evaluate the variability of bio-geo chemical and physical parameters, marine pollution, sound speed, depth of Western Svalbard current (surface and deep), the Arctic dynamics and the relationship with changes in North Atlantic circulation.

9. OTHER ACTIVITIES

9.1. ARNACOSKY (ARCTIC NAVIGATION WITH COSMO SKYMED)

A joint IT-NAVY Hydrographic Institute (IIM) and the e-GEOS/TELESPAZIO company activity for a sustainable ocean, to find the best route along the Arctic ice margin by using EO data by COSMO SKYmed and Sentinel-1 satellites and pushing through EO Research & Innovation.

The sectors that operates within the maritime domain require capabilities and capacities of space observation, monitoring and numerical modelling. Radar Satellite Observations are key technology for Arctic safety and security. They are reliable sources for continuous monitoring information to observe causes, measures effects, act on impact.

With COSMO SKYMED and COSMO SECOND GENERATION we have the availability of a large radar satellite constellation with polar orbit, continuously expanding and particularly suitable for high latitudes monitoring. With an unmatched, reliable revisit capability, combined with VHR and new Polarimetric capabilities. It is no need for lighting sources, it's able to penetrate clouds, well-characterizing ice, ice extent, and concentration map in order to support Arctic navigation. Good at detecting "things" on sea surface to support Arctic surveillance, environmental monitoring, and risk management.

ARNACOSKY within the IIM HIGH NORTH PROGRAM move to support a safety navigation in critical environments. Since 2018, IIM and e-GEOS develop and test together new services and methodologies to support Arctic navigation, monitoring the ship route, charting the most suitable and safe route, producing the Ice Drift Maps and Ice Concentration Maps. The IceDrift product is obtained from tracking of the ice features. The ice features can be tracked if the images are acquired with short time intervals. Best time intervals are shorter than 1 hour. COSMO-SkyMed Constellation is compliant with this requirement, particularly at higher latitudes.

9.2. DATA POLICY

All the collected hydrographic data will be made available to the Norwegian Hydrographic Service, to the IHO DCDB, to the International Bathymetric Chart of Arctic Ocean (IBCAO) and to GEBCO Seabed2030 project.