
NATIONAL REPORT OF ITALY

This report summarizes of the main activities carried out by the Istituto Idrografico della Marina (IIM) in the Arctic Region.

1. HYDROGRAPHIC OFFICE

The Istituto Idrografico della Marina is the Italian Hydrographic Office and is in charge of all the official nautical documentation published in Italy and supports the National Defence. In order to produce updated and accurate charts, the IIM performs regular surveys of the Italian coasts and seas these products, together with nautical information data diffused nationally and internationally.

The IIM has an active role in the study and protection of the sea, from a scientific, technological and environmental point of view. Scientific research has always been crucial for the IIM and we cooperate with primary research centers and universities and take part in national and intergovernmental working groups in the fields of hydrography and oceanography. Among others, the IIM was tasked with the hydrographic surveys and charting of three ENCs and paper charts of the Western Ross Sea – Antarctica.

2. HYDROGRAPHIC SURVEYS IN THE ARCTIC REGION - 2018

The Italian Navy – acting as national marine focal point for Arctic research activities – with the scientific support of the Italian Hydrographic Institute, in 2017 launched the Pluriannual Joint Research Program in the Arctic named «HIGH NORTH», to contribute to oceans knowledge, from a hydrographic point of view and, more generally, to the marine science.

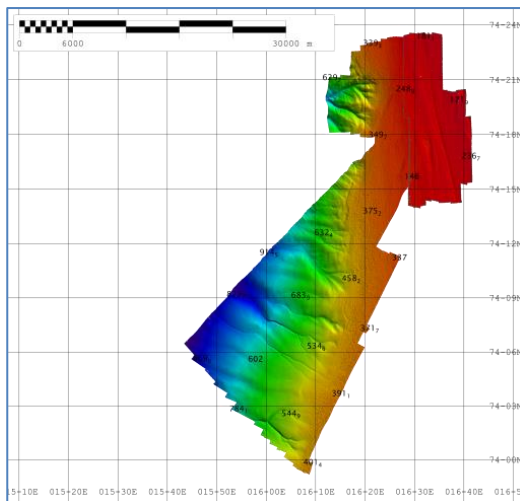
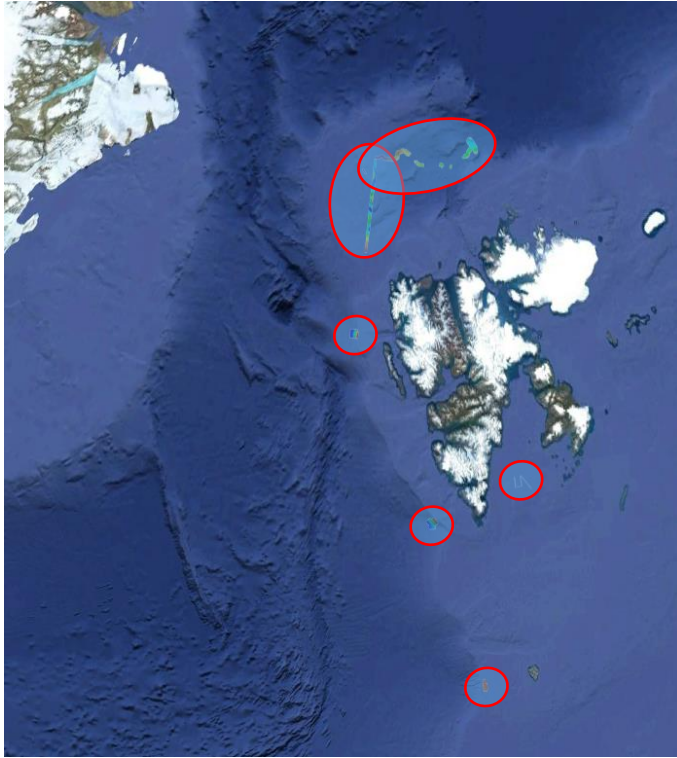
The following six bullets represent the program's main messages:

- data sharing
- oceans knowledge
- exploration
- monitoring
- new technology
- education.

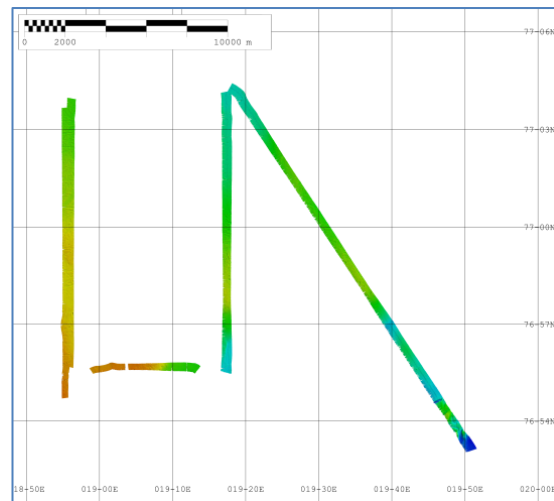
During the High North17 and High North18 campaigns, multibeam data was collected, using a Kongsberg EM 302 installed on board Italian R/V Alliance.

All the hydrographic data were acquired and shared with ancillary information in compliance with IHO standards.

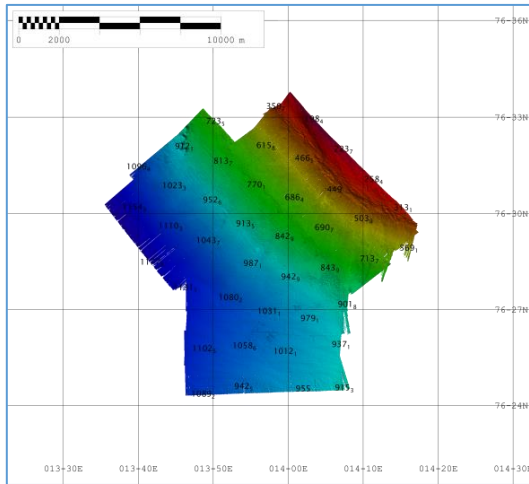
HIGH NORTH 18 hydrographic surveys focused on five main areas: **INBIS channel**, **Storfjorden**, **Hornusund**, **Kongsfjord** and **Yermak Plateau/Ice edge**.



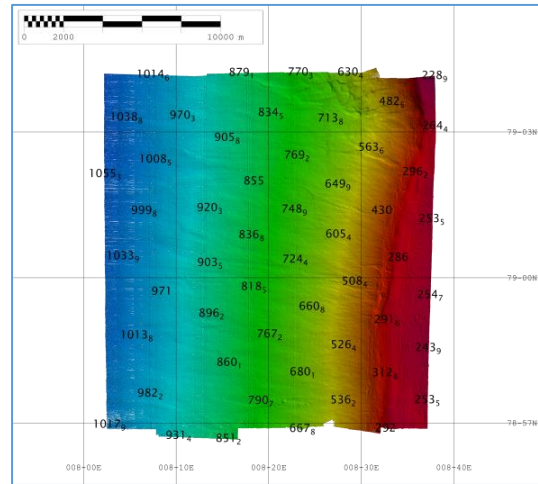
INBIS Channel



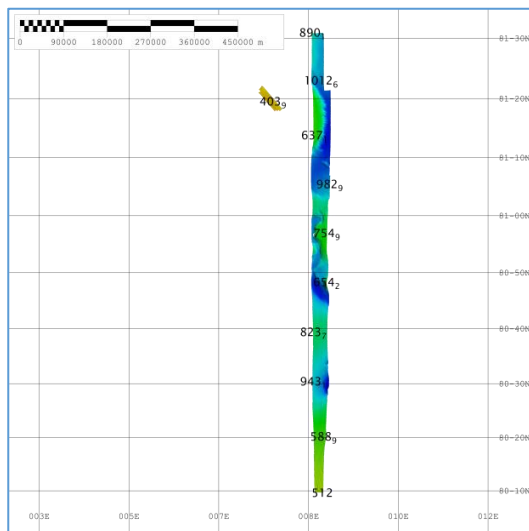
Storfjord



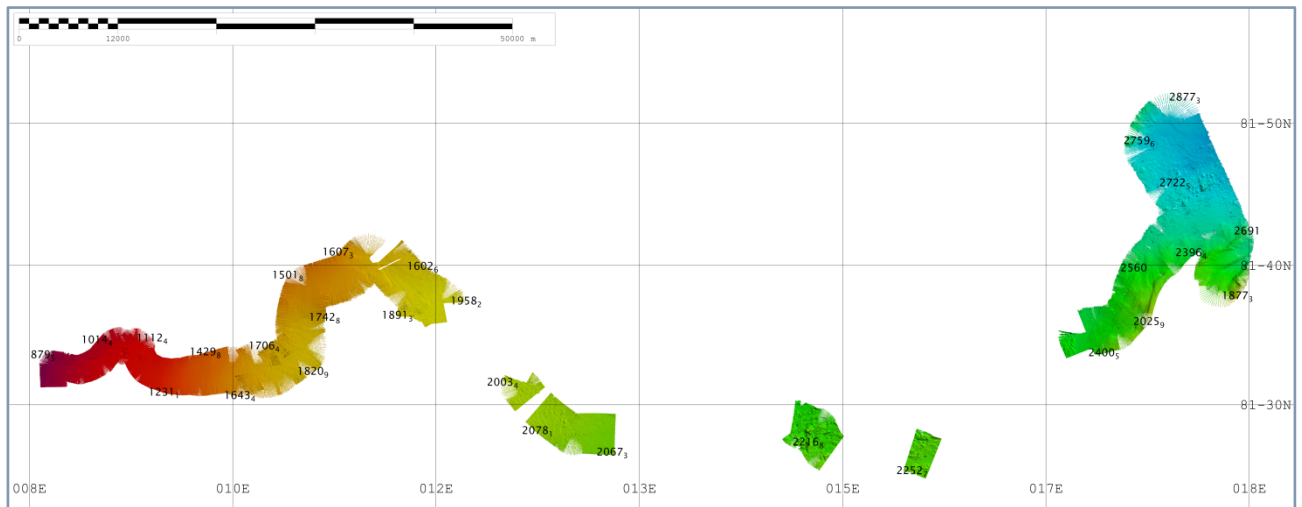
Hornsund



Kongsfjord



YermakPlateau



Ice Edge

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 North 18 campaign was carried out onboard the Italian R/V Alliance between 7 and 26 July 2018. The main goal of the campaign was to investigate the marine geophysical, oceanographic, and geological conditions in 5 different areas: INBIS Channel, South Western Svalbard and Storfjorden, Kongsfjorden and Yermak Plateau. The ship moved northwards up to 81° 50.27" N close to the sea ice edge to investigate the characteristics of the sea ice, water masses and sediment dynamics. The cruise was characterized by 76 stations (hydrological, sedimentological, geophysical measurements) with 553 km² area surveyed by MBES (MultiBeam Echo Sounder) with the purpose of mapping bottom morphology, seabed nature and water column. A new high resolution seabed mapping was obtained for all investigated sites according to the IHO hydrographic standards (International

Hydrographic Organization). Data acquired through the CTD (Conductivity-Temperature-Depth, 33 vertical profiles and Scanfish surveys) probe are being used to define physical characteristics of the water column. A glider mission, was performed with 4 gliders flying at the same time along the West Spitsbergen Current (WSC). Water and sediment samples were also collected. A specific activity to observe and sample plastic pollution at sea surface was conducted during the cruise using a manta trawl. Finally, 4 oceanographic moorings were deployed on the slope of Western Spitsbergen in order to obtain short term observations of water masses and sediment dynamics.

9. OTHER ACTIVITIES

9.1. HIGH NORTH19

This year, the activities will be conducted, as planned, in line with the past campaigns, according to a holistic approach aimed at monitoring a still little known and fragile environment - the rivers in Greenland, the fires in Sweden and Siberia, the migration of cod, rescue actions at sea. Three years of data from satellite to seabottom are a valuable collection of information. These observations over time are fundamental to highlight the dynamics of water masses leading to an Arctic Ocean atlanticization, with migration of fish to the north, melting and shrinking of the pack ice and new water spaces open to seabed mapping. During High North19 an uncharted area around Fram Strait, west of the Svalbard Islands and Yermak Plateau, north of the Svalbard islands, over 80N will be mapped and the edge of the Arctic ice pack will be surveyed, developing and increasing the performance of ARNACOSKY experiment (ARctic NAVigation with COsmo SKYmed).

9.2. ARNACOSKY PROJECT

Thanks to an agreement between Italian Hydrographic Institute and e-GEOS, an Italian Company leader in geoinformation, application and services, in the summer 2018, we started the ArNaCoSky project (Arctic Navigation with COSMO-SkyMed) to distribute information on the state of the ice ahead of the route, and maritime traffic of cooperative and non-cooperative vessels.

E-GEOS acquired and made available COSMO-SkyMed radar images, a system owned by the Italian Space Agency (ASI), also integrating AIS data. ESA Sentinel-1 was also used; data were used to test and develop innovative services supporting the R/V Alliance safety of navigation in the Arctic. Satellite monitoring proved that our mission was respectful towards the Arctic environment. Thanks to the unique characteristics of the COSMO-SkyMed Radar Constellation technology and its polar orbit, offering global coverage (including the Poles), it was possible for e-GEOS to monitor the route every day, both day and night. This autumn the ArNaCoSky project will be focused over the state of the ice and the support for a safety weather/ice routing.

9.3. DATA POLICY

All the collected hydro-oceanographic data were made available to the Norwegian Hydrographic Service and to the International Bathymetric Chart of Arctic Ocean (IBCAO), through the University Centre in Svalbard.

All the hydrographic data were acquired and shared with the ancillary information in compliance with the IHO standards.

9.4. ARCTIC COUNCIL

Italy contributes to the works of the Arctic Council subsidiary bodies, following the prescribed rules for the observers, and participates in the Ministerial and SAO meetings through a senior diplomat of the Ministry of Foreign Affairs and International Cooperation (MFAIC).

The Italian Navy has been representing Italy in the Arctic Council WG Environmental Preparedness Prevention and Response (EPPR) since 2016, contributing to the coordination of the activities by the two subgroups - Marine Environmental Response Expert Group (MER EG) and Search and Rescue Expert Group (SAR-EG). In particular, we have helped fight the worst forest fire in Sweden's recent history, with two Canadair planes from the Italian Civil Defence Department.

9.5. THE ITALIAN SOCIETY FOR INTERNATIONAL ORGANIZATION

On 1st October 2019, the Italian Society for International Organization (SIOI) in collaboration with the High North center for Business and Governance - North University (Bodø-Norway) and the Royal Norwegian Embassy in Italy, will hold a Conference titled "Arctic Connections: A trust-building Arctic cooperation on Energy, Security and Blue Economy", about the geopolitics of resources and transport, Arctic governance and sustainable economic development to strengthen the collaboration between Italy and Norway.

9.6. OTHER SCIENTIFIC CONTEXT

The Italian Hydrographic Institute has been actively involved in:

- Arctic research activities with NATO/CMRE;
- European Geoscience Union;
- Arctic and Subarctic Ocean Fluxes;
- Arctic Science Summit Week – POLAR;
- Arctic Circle;
- Arctic Frontiers;
- International Arctic Forum, held in St. Petersburg last April 2019;
- Museum exhibition: Italian Navy to the North Pole – From Duke of the Abruzzi to the High North expeditions.