



HIGH NORTH21

The Italian Navy – acting as national marine focal point for Arctic research – launched in 2017 the multiyear Research Program in the Arctic, named HIGH NORTH, to be implemented by the Italian Hydrographic Institute.

A new three years' activity, from 2020 to 2022 is in progress with an enhanced overview focusing on the 3D mapping from satellite to seabed.

The HIGH NORTH Program has three fundamental pillars represented by the 3 Es: Exploration, Environment and Education, supported by the 3 Cs: Collaboration, Coordination and Cooperation.

The HIGH NORTH program is the result of a long-lasting cooperation and a strong synergy between the main Italian research Centres (National council for research - CNR, to National Institute of Oceanography and Applied Geophysics - OGS, Energy and Sustainable Economic Development - ENEA and National Institute of Geophysics and Volcanology - INGV), Joint Research Centers - JRC-UE, NATO Centre for Maritime Research and Experimentation - STO-CMRE and the Italian Navy.

In addition, scientists and researchers from the Universities of Tromsø, Sorbonne, Barcelona, the IAEA and the Norwegian Defence Research Establishment, are contributing to the success of the program.

HIGH NORTH is a synergic, multisector and multidisciplinary tool for a holistic approach in many sectors, such as advanced marine technologies, short and long term observations and education to the study of marine dynamics and seabed mapping in the Arctic.

In particular, the HIGH NORTH 2020-2022 Program has as its main objective the improvement of the knowledge of the Arctic Ocean (Svalbard area) and supports efforts of worldwide stakeholders to reverse the cycle of decline in ocean health at the beginning of the UN Decade of Ocean Science for Sustainable Development (2021-2030). This knowledge is based on exploration and study of unsurveyed areas.

In fact, the International Bathymetric Chart of the Arctic Ocean (GEBCO IBCAO) states that about 20% of the Arctic Ocean has been surveyed and mapped so far. Last year, during the High North20 cruise, the seafloor of the deepest point of the Arctic Ocean, the Molloy Hole, was mapped at a very high resolution with a maximum depth of 5567m. The purpose of the HIGH NORTH21 cruise is to perform a 3D-mapping from the satellite to the seabed. In particular, it will lead a hydro-oceanographic campaign and research activities focused mainly on the unsurveyed area close to the ice-edge, maintaining annual mooring as part of SIOS.

Two new yearly moorings (CIO I e CIO II) in joint collaboration with CMRE and ONR will be deployed in the Molloy area to monitor the water masses with in-situ oceanographic short term and long term observations. The data collection is devoting to the bottom mapping, water column and seabed features characterization, acoustic imaging of the seabed, marine optical research and remote sensing data in order to obtain a 3D mapping of the area (Fram Strait and Yermak Plateau, Arctic Ocean).

The research activities will be focused on the study of the seabed and the evolution of observed oceanic process under different climate and environmental conditions to evaluate the variability of bio-geo chemical and physical parameters, marine pollution, speed, depth of Western Svalbard current (surface and depth), the Arctic dynamics and the relationship with changes in the North Atlantic circulation.

High North21 is supporting innovation technology and research for a sustainable ocean with the implementation of the ARNACOSKY project (ARctic NAVigation with COsmo SKYmed), an IIM and e-Geos joint activity, for the best route along the marginal ice and its environment monitoring.

Particular attention will be given to the Ocean Generation with six young researches in the High North21 Team, in order to support the action of the UN Ocean decade with ECOP (Early Career Ocean Professional) engaged in the vision of the “Science we need for the ocean we want”.