

**Hydrographic Commission on Antarctica (HCA)
Discussion on addressing climate change
for Preparation of the Revision of the IHO Strategic Plan**

Submitted by: HCA Chair, Vice Chair & IHO Secretariat

- References:**
- A. C7/36 and C7/37 Preparation of A-4 (IHO Strategic Plan)
 - B. HCA 18/14 HCA to consider Reports Delivered by SCAR and the Southern Ocean Action Plan
 - C. *Southern Ocean Action Plan*, UN Decade of Ocean Science for Sustainable Development
 - D. *Antarctic Climate Change and the Environment*, Scientific Committee on Antarctic Research (SCAR)
 - E. Resolution 6 of the 42nd Antarctic Treaty Consultative Meeting (2019)

PROPOSAL

The Hydrographic Commission on Antarctica (HCA) to consider how the future provision of hydrographic information for the region can assist to detect and to mitigate the regional impact of climate change, and how this assistance could be considered within the 2027-2032 IHO Strategic Plan.

BACKGROUND

A recent assessment has suggested that if the Paris Climate Agreement targets are exceeded, rapid and unstoppable sea level rise as a consequence of a changing Antarctic Ice Sheet can be expected.

The consequences of sea level rise and melting ice (sea, land and shelves) around Antarctica's coastline will present significant risks to society. The need for, and outcomes from, research on sea level in the Antarctic should be communicated by the Antarctic Treaty parties and observers (including HCA): to international agreements, governments at all levels, the economic sector, and to civil society, as these entities will largely have to plan for, manage, and endure the impacts of sea level rise and its associated costs.¹

The Antarctic governance of science and regional operations operates under the Antarctic Treaty System (ATS) provisions. According to Article III "*scientific observations and results from Antarctica shall be exchanged and made freely available.*" This approach to data accessibility, data management and governance are unique within the IHO Regional

¹ Antarctic climate change and the environment – a decadal synopsis and recommendation for action, SCAR 2022

Hydrographic Commission structure and mandates HCA members to share their hydrographic data assets under the same legal regime. Sea level observations and estimates as well as all observed natural processes causing changes are of particular importance for the future conduct of hydrography in the region and the greater society. This should be reflected in the future agenda of HCA.

At HCA 18, Dr Chandika Nath, SCAR Executive Director, presented the Southern Ocean Action Plan (SOAP), and the Antarctic Climate Change and the Environment (ACCE) documents for consideration. After a robust discussion, the HCA Members agreed to an open brainstorming session at HCA 19 to consider the potential involvement of the IHO in general, and HCA in particular, on scientific matters in relation to climate change in the region with sea level changes as the critical impact.

At ATCM 45 in June 2023, the HCA Secretary presented the IHO Report to ATCM and highlighted the following statement: *“In both Polar Regions, due to climate change effects, new unsurveyed and uncharted large areas are becoming ice-free and therefore potentially open to navigation. The HCA requests ATCM to keep the IHO informed on their geographical priorities to map these new areas, if appropriate. New strategic performance indicators have been recently implemented by the IHO to assess the adequacy of surveys and chart coverage over the world, Polar Regions included.”*²

IHO Council 7, action item C7/36 and C7/37 identified the need to revise the Strategic Plan for 2027-2032, and tasked the IRCC and subordinate bodies, to provide inputs regarding directions and evolutionary pathways for consideration.

Based on these discussions and directions, the HCA is requested to consider how the provision of hydrographic information for the Antarctic region, within the context of the ATS (free and open), can address regional effects of climate change and how this could be considered within the IHO 2027-2032 Strategic Plan.

Select Southern Ocean Action Plan (SOAP) Challenges

SOAP #2 Crossing Boundaries:

“Expanding the international collaborative community in the Southern Ocean region To achieve efficient transnational cooperation, aligning national and international research programmes and implementing standardised data management is required.”

- Current HCA Governance:

- The HCA Objectives state the promotion of the technical cooperation of hydrographic information as the focus of the commission.

² See IHO Report to ATCM 45 and ATCM 45 Final Report (298) and (299).

- Data repositories are in place such as the IHO Data Centre for Digital Bathymetry (DCDB)
- Data Standards such as the S-100 Universal Hydrographic Data Model are in development that will expand the data useful for maritime traffic
- Data sharing is by request/exception rather than defaulting to open for sharing and collaboration.

Proposed actions on HCA:

- 1) Concerted implementation and maintenance of S-101 ENC's for the region according to the burden sharing for INT charts among HCA members.
- 2) Establishment of amending S1xx services for the region – in particular for tides, waters level and currents (S-104, S-111), ice and ocean weather.
- 3) Establish closer collaboration with organizations who operationalize global observation like Mercator Ocean in order to create a digital twin of navigable waters of the Southern Ocean.
- 4) Invite GEBCO / IBCSO to provide HCA with the relevant survey coverage and S-102 data, over all coastal waters of Antarctica (depth up to 40 m).

SOAP #3 Identifying and connecting stakeholders:

“In polar research, there already exists a constructive and iterative engagement between science and policy-makers.”

- Current HCA Governance:

- HCA Statutes Article 3, section 3.4: To stimulate the Full Members, Associate Members and Observers forming the HCA to widen hydrographic activity in the region in accordance with relevant Antarctic Treaty Consultative Meeting (ATCM) Resolutions (Appendix C). Encourage them to seek technical advice and assistance from the IHO Secretariat in establishing and strengthening their hydrographic capabilities and policies, including the acquisition of scientific, commercial and crowdsourced survey resources and all types of advancing technology designed for systematic survey.

Proposed actions on HCA:

- 1) Encourage Member States with the capacity for to establish S-1xx based amending data services for tides, water level and current, sea ice and ocean weather for the Antarctic region.
- 2) Encourage Member States with the capacity for making available tide gauges measurements and statistical data of Mean Sea Level for the Antarctic region.

Linking the industry with research, infrastructure and logistics - Strengthening engagement with, and input from, industry partners and business operators working in the Antarctic and Southern Ocean region is necessary for broadening and maintaining collection of long-term time series of data relevant for ecosystem monitoring.”

Proposed actions on HCA:

- 3) Pursue the concerted transition of all S-57 ENC's available for the region into S-101 format and liaise with RENCs in charge of their distribution.
- 4) Proactive approach of shipping companies and research vessels to invite them for the installation of S-100 ECDIS once such devices are readily available.
- 5) Identify, by simulation, new ice-free areas, where adequate surveys should be required.

“Ensuring societal needs are reflected and addressed through research”

Proposed action on HCA:

- 1) Teach IAATO on the observed and expected changes in sea level, the effects for draughts and accessibility of sea areas which has been covered by ice in the past.

SOAP #4a Data, observations and modelling - Improving Spatial and temporal knowledge:

“Informed decision making to achieve the oceans that we want relies upon appropriate scientific input, which itself relies upon scientific data. Therefore, data, observations and modelling are closely intertwined and integral parts of all societal outcomes for the Ocean Decade.”

- Current HCA Governance:

- HCA Statutes Article 3, section 3.5: To facilitate the exchange of information between Hydrographic Authorities and with other organizations concerning surveys, research or scientific, technical and operational developments regarding marine information broadly, and, to aid in the planning and organization of hydrographic activities in the widest sense of the term.
- HCA Statutes Article 3, section 3.10: To facilitate the provision and wide dissemination of information for scientific purposes and to consider the potential of Marine Spatial Data Infrastructure (MSDI) concepts for regional implementation.

Proposed action on HCA:

Provision of those S-1xx based data for tides, water level and currents via SCAR/Mercator Ocean to enable the simulation of effects for sea level.

SOAP #4b Data, observations and modelling - Ensuring data and information are fully utilized:

“Open access can be defined as the practice of providing online access to scientific information that is free of charge to the end-user and reusable.”

- Current HCA Governance:

- HCA Statutes Article 3, section 3.5: To facilitate the exchange of information between Hydrographic Authorities and with other organizations concerning surveys, research or scientific, technical and operational developments regarding marine information broadly, and, to aid in the planning and organization of hydrographic activities in the widest sense of the term.
- HCA Statutes Article 3, section 3.10: To facilitate the provision and wide dissemination of information for scientific purposes and to consider the potential of Marine Spatial Data Infrastructure (MSDI) concepts for regional implementation.

Proposed action on HCA:

Strive for Member States agreement to provide any S-1xx based data service provisions free of charge via the RENCs.

Scientific Committee on Antarctic Research (SCAR)**SCAR Antarctic Climate Change and the Environment (ACCE)** Context and Approach #1.6 Policy Recommendation:

“The Antarctic Treaty Parties (ATPs) and observers to the Treaty should communicate to governments and to civil society the urgency of, at the very least, meeting the Nationally Determined Contributions (i.e., country greenhouse gas emissions reduction targets) of the Paris Climate Agreement to ensure that Antarctic and Southern Ocean environments are maintained in a state close to that known for the past 200 years, and in so doing help ensure achievement of the Sustainable Development Goals.”

- Current HCA Governance:

- HCA Statutes Article 3, section 3.12: The HCA may establish committees or working groups as appropriate, to advance regional priorities. If created, subordinate bodies will have approved Terms of Reference, and progress work under the direction of the HCA. Participation within the subordinate bodies will be open to participants of the HCA and other Subject Matter Experts (SME)s as decided by the Full Members.
- ATCM Resolution 6 was approved in 2019 and recommends “Parties to endeavor to find additional resources put towards improving hydrographic surveying and charting in the Antarctic region.”

Proposed actions on HCA:

- 1) Present HCA activities and ambitions in the course of international conferences such as the UN Ocean Conference series.
- 2) HCA to create materials (such as ESRI story maps, Quantarctica, HCA GIS) to communicate and illustrate how accurate navigation charts allow tourism and expose the public to the diverse and fragile Antarctic landscape. Acquire funding or in-kind support for the production of the materials from the commercial actors within the region.

SCAR Antarctic Climate Change and the Environment (ACCE). 4.4.2 Antarctic Ice Shelf Projected Changes and Risks

“Under all Socio-Economic Pathways, it is likely that the AIS is committed to lose mass throughout the 21st century due to ocean warming and ice shelf disintegration (medium confidence) [IPCC AR6 WGI 9.4.2.5].”

- Current HCA Governance:

- HCA Statutes Article 3, section 3.10: To facilitate the provision and wide dissemination of information for scientific purposes and to consider the potential of Marine Spatial Data Infrastructure (MSDI) concepts for regional implementation.
- HCA Statutes Article 3, section 3.12: The HCA may establish committees or working groups as appropriate, to advance regional priorities. If created, subordinate bodies will have approved Terms of Reference, and progress work under the direction of the HCA. Participation within the subordinate bodies will be open to participants of the HCA and other Subject Matter Experts (SME)s as decided by the Full Members

Proposed action on HCA:

- 1) HCA's Hydrography Priorities Working Group adopts a work item to proactively identify options for new routes if released from ice sheet. HCA contacts its members who are committed to ENC production of the affected area to highlight that new navigable areas call for expansion in survey and charting.

ATCM XLV Multi-year Strategic Work Plan #9. *Promote enhancement of hydrographic surveying in Antarctica. Parties to inform their geographical priorities to map uncharted areas. Parties, IAATO and IHO to report on progress in hydrographical products.*

- Current HCA Governance:

- ATCM Resolution 6 was approved in (2019) and recommends "Parties to endeavor to find additional resources put towards improving hydrographic surveying and charting in the Antarctic region."

Proposed action on HCA:

- 1) HCA will propose to ATCM to let give their members a firm commitment for data sharing for transiting and operating research vessels via GEBCO/IBCSO.

EXPLANATORY NOTE

- Member States to consider the proposed action and other statements as potential changes to the Work Plan and IHO Strategic Plan 2027-2032.
- Member States are invited to take note of this Proposal and to take action as considered appropriate.