

# Information Paper

FIVE DECADES OF COOPERATION AND COMMITMENT TO SCIENCE AND ENVIRONMENTAL PROTECTION



XXXIV ANTARCTIC TREATY CONSULTATIVE MEETING - BUENOS AIRES JUNE 20TH - JULY 1ST, 2011

Agenda Item: 4

Presented by: IHO

Original: English

**HCA11-INF3**

**REPORT BY THE INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO) ON  
“COOPERATION IN HYDROGRAPHIC SURVEYING AND CHARTING OF ANTARCTIC  
WATERS”**

## **Introduction.**

The International Hydrographic Organization (IHO) is the competent international organization, as referred to in the United Nations Convention on the Law of the Sea, which coordinates on a worldwide basis the setting of standards for the production of hydrographic data and the provision of hydrographic services to support safety of navigation and the protection and sustainable use of the marine environment. The IHO's mission is to create a global environment in which States provide adequate and timely hydrographic data, products and services for their widest possible use.

In order to concentrate its effort, the IHO has several Regional Hydrographic Commissions and has established a Hydrographic Commission on Antarctica (HCA) dedicated to promoting technical cooperation in the domains of hydrographic surveying, marine cartography, and nautical information within the Antarctic region. This Report provides a brief summary of the key coordination activities since the last ATCM.

The IHO is working closely with different organizations concerned with and interested in Antarctica, aiming at strengthening cooperation to improve safety of life at sea, safety of navigation, protection of the marine environment and contribute to marine scientific research in Antarctica.

### **1.- Key Coordination Activities (in chronological order).**

#### **1.1 IHO/HCA participation in Annual 21<sup>st</sup> IAATO Meeting**

At the 21<sup>st</sup> Annual Meeting of IAATO that took place in Turin, Italy, 21-24 June 2010, the HCA and the HCA Hydrographic Survey Prioritization Working Group Chairmen made a set of presentations under the title "Importance of Hydrographic Activities in Antarctica".

The objective of these presentations was to raise awareness at the operational level of the importance of hydrographic activity in the Antarctica; to achieve a better understanding of IAATO on the existing risks associated to the present status of charting in the region and what IHO/HCA is doing to fill the gaps and, finally, to jointly explore on what and how IAATO can contribute to IHO/HCA efforts to improve the situation.

The first presentation covered IHO and IHO/HCA involvement in Antarctica; the role, priorities and achievements of HCA; SOLAS V Regulation 9 and the Antarctic and IHO/IAATO relationship. A second presentation included a description of the Maritime Shipping Routes (MSRs) and approach to charting priorities; work done and future work plans. Some case studies were offered as well as how hydrographic knowledge reduces the risk. Finally some proposals were considered as they could be put in practice by IAATO to contribute to improve availability of reliable nautical charts of Antarctic waters. Particularly the Guidelines for the Collection and Rendering of Hydrographic Data obtained by "Ships of Opportunity" in Antarctic waters was explained.

Participants appreciated the opportunity to discuss in detail matters concerning safety to navigation and their potential involvement in contributing to improve the hydrographic knowledge of Antarctic waters. Particular interest was expressed with regard to technologies to be incorporated on cruise ships as data collected was felt to be a concrete potential contribution from IAATO to the IHO/HCA, if such data is collected following standards. IAATO confirmed that it stands ready to continue cooperating with and participating in IHO/HCA meetings. In conclusion, the participation of the IHO/HCA representatives in the IAATO Annual Meeting has opened up new opportunities for mutual cooperation and collaboration aiming at improving safety to navigation and protection of the marine environment in Antarctic waters.

## **1.2 The 10<sup>th</sup> Meeting of the IHO Hydrographic Commission on Antarctica.**

The 10<sup>th</sup> Meeting of the Hydrographic Commission on Antarctica (HCA) took place in Cambridge, United Kingdom, 20-22 September 2010, organized by the UKHO and with the support of the British Antarctic Survey (BAS).

Dr. Nick OWENS, Director of the BAS welcomed all participants and highlighted the importance of the work of the HCA. The Chairman, Capt GORZIGLIA (IHB Director), thanked him for his kind words and also welcomed the 16 out of 23 IHO Member States (see **Annex A**) present (Argentina, Australia, Brazil, Chile, Ecuador, France, Germany, India, Korea (Rep. of), New Zealand, Norway, Peru, South Africa, Spain, United Kingdom and USA), as well as 5 international organizations and projects (COMNAP, IAATO, IALA, GEBCO, IBCSO). A representative of the UK Foreign and Commonwealth Office also attended and participated actively in the event.

The Commission elected Commodore Rod NAIRN (Australia) as Vice Chairman of the HCA; reviewed the status of the actions agreed at the last meeting; discussed the progress achieved and realized that almost all actions had been completed. The reports provided by IAATO, IALA, GEBCO and IBCSO as well as those provided by IHO Member States were commented. The reports on the progress made regarding the INT chart scheme; ENC scheme and production; the C-55 status with regard to the Antarctica; and an Antarctic GIS under development at the IHB, were also considered and discussed. Several actions were identified to progress further the actions. The Commission regretted that there were no representatives and no reports from IMO, IOC and AT Secretariat.

The Commission noted with satisfaction the constant support and contribution made by IAATO. At this meeting the IAATO delegation was formed by four representatives in a clear demonstration of interest in the HCA work. The Commission discussed at great length the outcome of the seminar delivered by HCA at the last IAATO Annual Meeting in June 2010, as well as the technical visits paid to IAATO ships before heading to Antarctica, briefing Captains on the procedure to collect and render hydrographic data collected as Ships of Opportunity. With regard to this last topic, IAATO offered to collect and make available all old available bathymetric data collected by IAATO ships; it was agreed to continue the practice of ships' visits and a group was established to study complementary future actions to implement the existing procedure.

A special discussion took place on availability of ENC covering Antarctic waters. It was agreed to include in the IHO report to the next ATCM the status on ENC production and a call to enhance ENC availability as a mechanism to improve safety to navigation and protection of the marine environment in the region. It was also agreed to prepare a paper to be submitted to IMO to report on the real ENC coverage of Antarctic waters by 2012 due to poor bathymetric data availability, datum mis-adjustment and other relevant factors. The IHB, as the coordinator of the INT Chart of Antarctica, was requested to develop and propose a large-scale ENC scheme for consideration by the HCA.

The Hydrographic Survey Prioritization Working Group continues to analyze the needs and its work will be improved with input from a new assessment of Maritime Shipping Routes and survey requirements that will be made by all HCA Members. Input is also awaited from IAATO who agreed to review the HCA survey plans.

Following a kind invitation from the Australian Hydrographic Service, the Commission decided to have the 11<sup>th</sup> HCA meeting in Hobart, Tasmania, Australia on 5 – 7 October 2011.

## **1.3 IHO/HCA participation in the Arctic-Antarctic Seafloor Mapping Meeting**

This meeting - aimed at bringing together key players conducting bathymetric mapping in Arctic and

Antarctic waters - was organized by Prof. Martin Jakobsson (IBCAO) from the Stockholm University, Sweden and Dr. Hans-Werner Schenke (IBCSO) from the Alfred Wegener Institute for Polar and Marine Research, Germany, under the name “Arctic-Antarctic Seafloor Mapping Meeting 2011”, took place in Stockholm, Sweden, 3-5 May, hosted by the Department of Geological Sciences, Stockholm University.

The International Bathymetric Chart of the Arctic Ocean (IBCAO) and the International Bathymetric Chart of the Southern Ocean (IBCSO) are two projects whose objective is to compile the most up-to-date bathymetric portrayals of these two regions. The meeting was identified as a coordination mechanism to improve IBCAO and IBCSO and to discuss the uses and technical requirements of regional bathymetric compilations.

The opening keynote speech was made by the IOC Executive Secretary on “Why do we need to learn more about the Arctic and Southern Ocean?” and the IHO/HCA Chairman reported on the “Status of Hydrographic Surveying and Nautical Charting in Antarctica”. Around 50 people from 15 different countries were in attendance and over 11 oral presentations were given on Arctic Seafloor Mapping and 7 on Antarctic Seafloor Mapping. Also five presentations covered new data compilation methods and the situation regarding IBCAO and IBCSO, followed by separate breakout sessions on Arctic and Antarctic. In addition, a poster session was held.

Both IBC projects got organized and identified Members of their respective Editorial Boards. The coordination between these two IBCs, the Arctic Regional Hydrographic Commission and the Hydrographic Commission on Antarctica, respectively, was considered vital for the improvement of the Sea Floor Mapping of these regions. Technical details and deliverables were also identified and its execution coordinated. The GEBCO parent organizations, the IOC and particularly the IHO, were recognized for the efforts made to provide support to the development of the projects. GEBCO Nippon Foundation Project was identified as a potential support for the development of an Antarctic project, aimed at the continuation of the bathymetric compilation work so far conducted by IBCSO. In order to follow up and gain momentum, it was decided to have the next joint coordination meeting in May 2012, venue to be decided.

#### **1.4 IHO/HCA participation in Annual 22<sup>nd</sup> IAATO Meeting.**

At the 22<sup>nd</sup> Annual Meeting of IAATO that took place in Hobart, Australia, 10 May 2011, the IHO/HCA was given the opportunity to provide participants a follow-up on the actions and outcomes since the last HCA meeting in Cambridge that involves IAATO. The HCA Vice Chair represented the IHO/HCA at this event.

**Action 10/1:** Invites IAATO to make past bathymetric data available, with a view to improving the decision making process with regard to hydrographic survey priority assignment. Data can be provided to the IHB or directly to the HSPWG Chair. Outcome - the contribution from IAATO has started and data has been received at the IHB, allowing the IHB to contact producer nations and make them aware of the existence of such information for the benefit of the INT Charts series. This is something ongoing. In fact data has been passed to the UKHO. This is a positive sign that should be recognized and promoted to encourage further data submissions.

**Action 10/2 :** Develop further complementary future actions to implement ship visits and guidelines on the IAATO ship visit process. IHB to disseminate such procedures to relevant parties. Outcome - the development of the procedure is in progress.

**Action 10/3 :** Coordinate the visit of hydrographic surveyors from Argentina, Australia, Brazil, Chile, New Zealand and UK through HMS Scott to IAATO ships, when calling in ports on her way to

Antarctica, or in Antarctica, to advise on the collection and rendering of hydrographic data, and report experience to HCA11.

Outcome - invite IAATO to consider contacting directly the relevant HCA Member States at all practicable port calls made before and after heading to Antarctica to ensure fluent exchange of information so that the collection of hydrographic data be done in accordance with established protocols and to facilitate the timely delivery of the data and information collected. IAATO ships jointly with relevant HOs are implementing this action.

The presentation given also referred to the concern raised by IAATO that some of the international charts did not contain the most comprehensive information. To overcome this, the following actions have been undertaken:

- a) Specific actions have been placed on Member States to provide their additional survey data to the INT CHART producing nation.
- b) A Catalogue of National Charts in the Antarctic has been compiled and was published in February 2011 on the HCA web site.

As regards to ENC availability, it was indicated that National Hydrographic Offices have been frantically working to complete ENC coverage of their coast waters and EEZs – to meet IHO deadlines ahead of IMO implementation of Compulsory carriage of ECDIS. Now that the initial ENC coverage deadline has passed and most coastal states have completed ENC coverage of their own EEZs, a rapid improvement in the coverage of ENC in the Antarctic can be expected. Nevertheless, it has to be considered that an ENC is only as good as the data that it is based on – if the existing paper chart is inadequate (unsurveyed areas etc), then a derived ENC will be similarly inadequate.

The IHO/HCA representative seeks continuing cooperation with IAATO in particular to:

- (i) Encourage nations with Antarctic programs to collect as much hydrographic information as possible and share that information with the International Chart producing nation (and/or the IHB).
- (ii) Keep pressure on National Governments / Hydrographic Offices to increase the priority of Antarctic Chart production.
- (iii) Encourage all ships navigating in the Antarctic to routinely collect hydrographic information and provide it to the IHO/Charting Authority
- (iv) Seek methods and systems to automate the data collection and simplify the rendering of the information whilst maintaining the necessary metadata to make it assessable and useful.

## **2.- Status of Hydrographic Surveys and Nautical Chart Production.**

### **2.1 Hydrographic Surveys.**

Out of the 13 National Reports submitted to the last HCA meeting, only 6 indicated that some systematic hydrographic surveys had taken place during the 2009/2010 season. Of these, two correspond to surveys conducted by scientific vessels engaged in projects of a wider scope, where bathymetry has been collected and we understand has been rendered to the national hydrographic offices for its use in the improvement of nautical charts. There is no assessment yet with respect to the 2010/2011 season.

It is expected that, with the commission of new survey ships and modern equipment installed on hydrographic survey ships, in the near future there will be improved capacity to conduct surveys in Antarctica.

The contribution made by IAATO ships and other Ships of Opportunity is appreciated and data collected is providing useful information to charting authorities.

The HCA Hydrographic Survey Prioritizing Working Group, with cooperation from COMNAP and IAATO, continues to progress its mandate and the preparation of graphics reflecting the status of hydrographic surveys assets, in the short list priority areas and related INT Charts.

## 2.2 Nautical Chart Production.

Until the early 1990's, nautical chart coverage in Antarctica was limited to that produced by a number of IHO Member States' Hydrographic Offices for their areas of interest. Coverage was inconsistent, with much duplication.

In order to harmonize chart coverage, optimize production costs and better serve the mariner, the IHO adopted an international (INT) chart scheme for Antarctic waters, based on the following criteria:

- Adequate cover for international shipping.
- Conformance to IHO chart specifications.
- Number of charts kept to a minimum.
- Specific coverage for access to permanent scientific bases and those areas most frequently visited by cruise vessels.
- Responsibility for chart production shared by IHO Member States on a voluntary basis.
- Adoption of WGS-84 as the common geodetic datum.

The overall result is a consistent INT chart scheme of some 108 charts with approximately half of them covering the Antarctic Peninsula. The scheme includes a continuous coastal series at small scales (1:10,000,000 and 1: 2,000,000), charts at medium scales (1:150,000 to 1:500,000) in the approaches to scientific bases, and charts at large scales (1:10,000 to 1:50,000) around those bases and in critical passages.

The production of these INT charts is shared by the following 17 IHO Member States: Argentina, Australia, Brazil, Chile, France, Germany, India, Italy, Japan, New Zealand, Norway, Peru, Russian Federation, South Africa, Spain, United Kingdom and USA. As of March 2011, some 65 INT charts have been published; see **Annex B**.

The driving force behind progressing INT chart production is the availability of good quality hydrographic survey data for the areas concerned. In many areas not yet covered, there is either no data or it is old data of unsatisfactory quality. Any significant progress towards completion of production for the whole scheme will therefore depend upon the capability of conducting hydrographic surveys to modern standards.

The remoteness and hostile environment of the area result in high costs for surveys. This fact and the priority given by IHO Member States to surveying their own national waters are both limiting factors to the progression of INT chart production for Antarctica.

Substantial efforts are being made to prepare Electronic Navigational Charts (ENC) of Antarctica. It has been so far defined that volunteering Hydrographic Offices that have assumed the responsibility to produce the paper INT Charts covered in the INT Chart Scheme, will also be in charge of the production of the corresponding ENCs covering that area.

The IHO/HCA has already agreed on a small and medium scale scheme for ENCs covering Antarctic waters and it is working on the preparation of a large scale scheme, based on existing paper charts and other requirements.

Several Hydrographic Offices have started the production of ENC covering Antarctic waters. So far 48 ENCs are available (see **Annex C**) and the production program for the near future looks promising. Nevertheless those areas for which there are no reliable data and information to produce the INT

Charts in paper format will likely face the same problem in its ENC version, so we should not expect the actual gaps to be covered by ENCs in the short or medium term, as the progress will only be possible after new hydrographic surveys are conducted.

### **3.- Conclusions.**

1.- The IHO/HCA continues to be concerned about the extremely slow progress achieved in terms of bathymetric data gathering in the period 2009/2010, due to few hydrographic surveys being conducted.

2.- Several Hydrographic Offices are progressing in the production of ENC covering Antarctic waters, following the ENC scheme agreed by the IHO/HCA. Nevertheless it has to be kept in mind that an ENC is only as good as the data that it is based on.

3.- The IHO/HCA acknowledges and appreciates the cooperation and contribution received from several international organizations, particularly from IAATO and research institutions, who have made ancient collections of bathymetric informative data available, as well as new standardized hydrographic surveying data. This collective effort goes in direct support of the production of INT Charts and ENC covering Antarctic waters.

### **4.- Recommendations.**

It is recommended that the XXXIV ATCM:

1.- Takes note of the IHO Report.

2.- Considers encouraging the Hydrographic Offices of the countries belonging to the AT System to accelerate the production of ENC based on existing information, and to conduct hydrographic surveys of the missing parts of the priority areas identified by the IHO/HCA so that INT charts may be produced and made available at the soonest possible.

Monaco, May 2011.

#### **ANNEXES (IN ENGLISH ONLY):**

A: HCA Membership.

B: INT Chart Present Production Status (May 2011).

C: ENC Production (May 2011)

## ANNEX A

### **HCA MEMBERSHIP**

(May 2011)

#### **MEMBERS:**

Argentina	Korea, Republic of
Australia	New Zealand
Brazil	Norway
Chile	Peru
China	Russian Federation
Ecuador	South Africa
France	Spain
Germany	United Kingdom
Greece	Uruguay
India	USA
Italy	Venezuela
Japan	

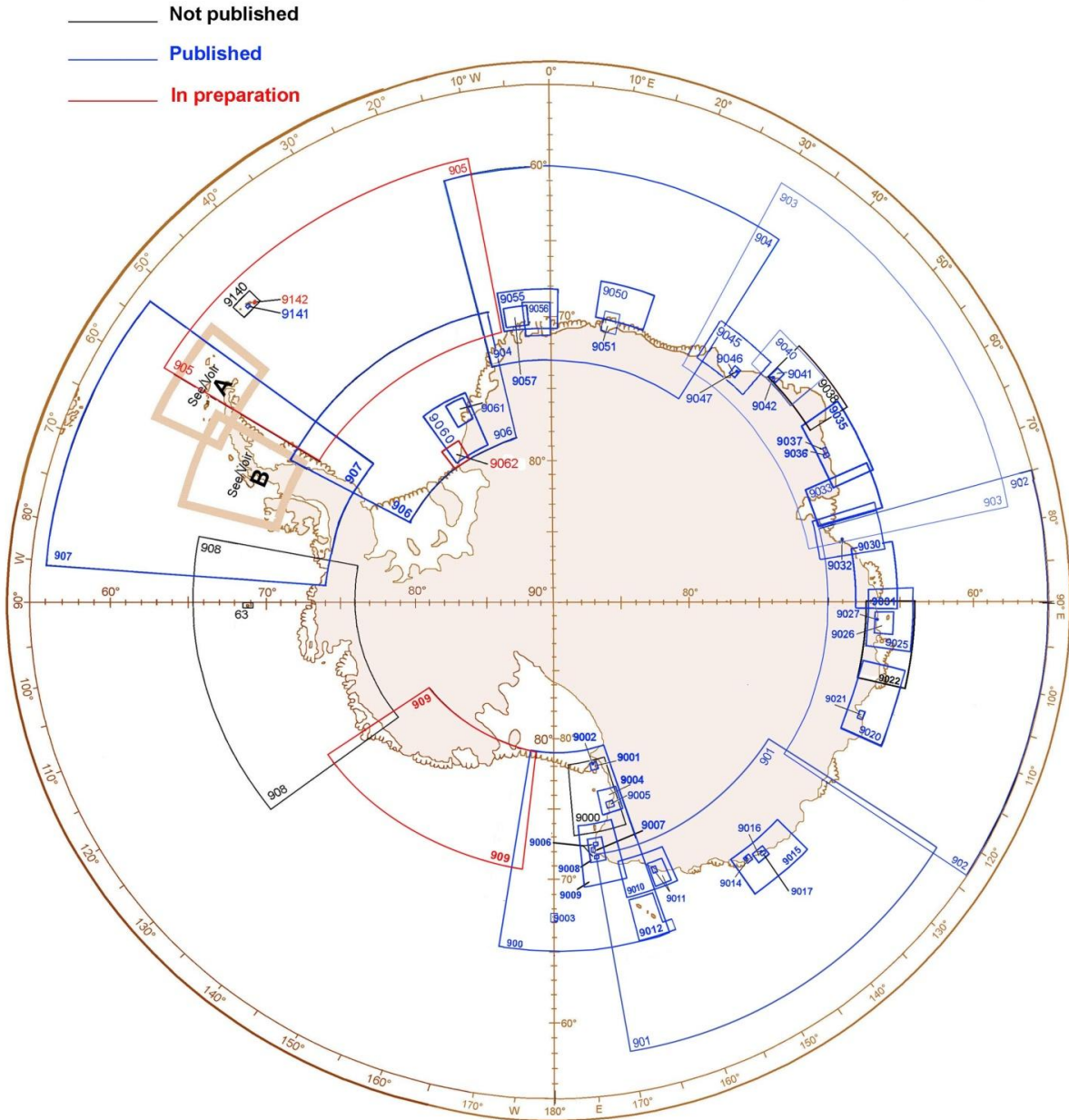
#### **OBSERVER ORGANIZATIONS:**

Antarctic Treaty Secretariat (ATS)  
Council of Managers of National Antarctic Programmes (COMNAP)  
Standing Committee on Antarctic Logistics and Operations (SCALOP)  
International Association of Antarctic Tour Operators (IAATO)  
Scientific Committee on Antarctic Research (SCAR)  
International Maritime Organization (IMO)  
Intergovernmental Oceanographic Commission (IOC)  
General Bathymetric Chart of the Oceans (GEBCO)  
International Bathymetric Chart of the Southern Ocean (IBCSO)  
IHO Data Center for Digital Bathymetry (DCDB)  
Australian Antarctic Division  
Antarctica New Zealand



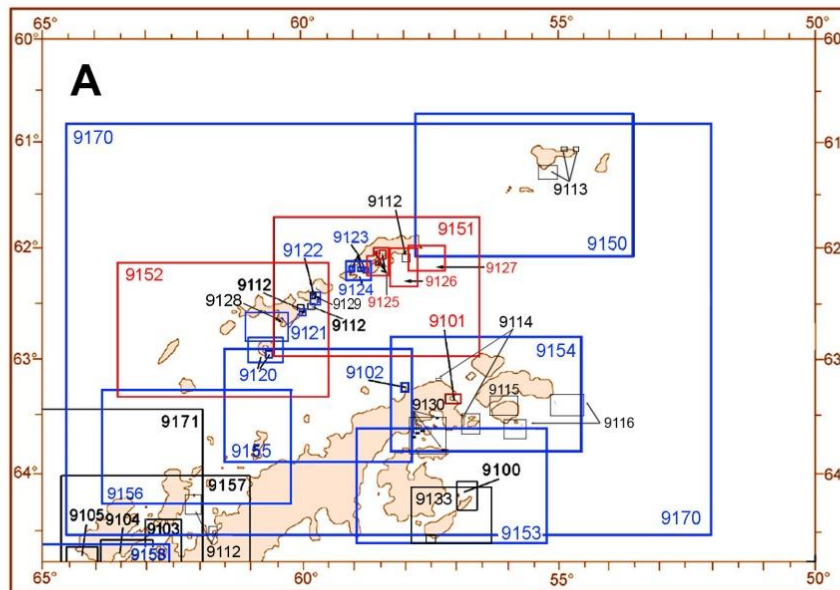
**Annex B**  
**INT Chart Present Production Status (May 2011).**

**STATUS OF INTERNATIONAL CHART PRODUCTION IN ANTARCTICA**  
**(1 of 2)**

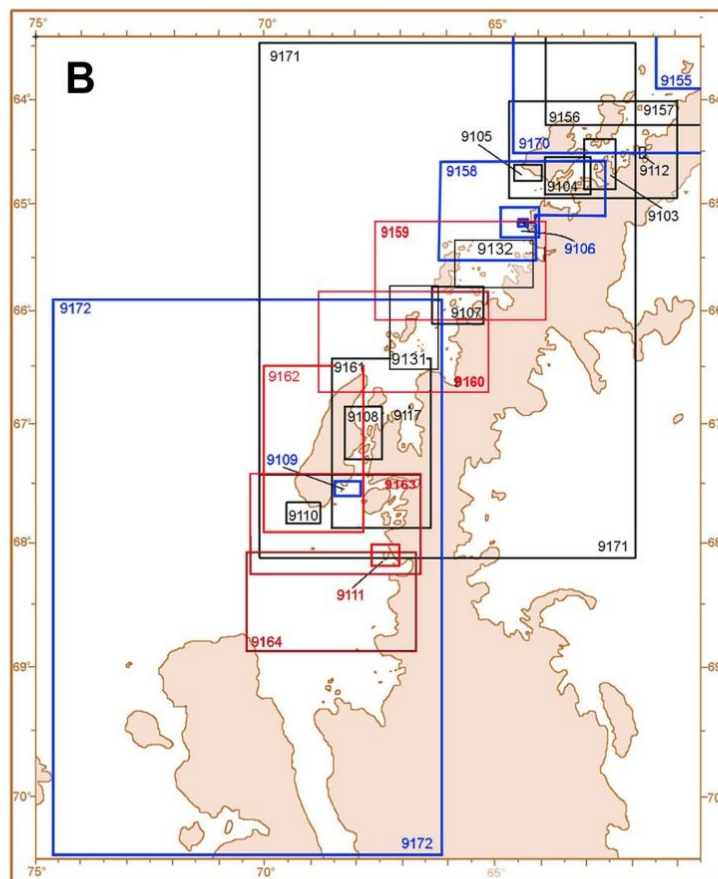


# STATUS OF INTERNATIONAL CHART PRODUCTION IN ANTARCTICA

(2 of 2)



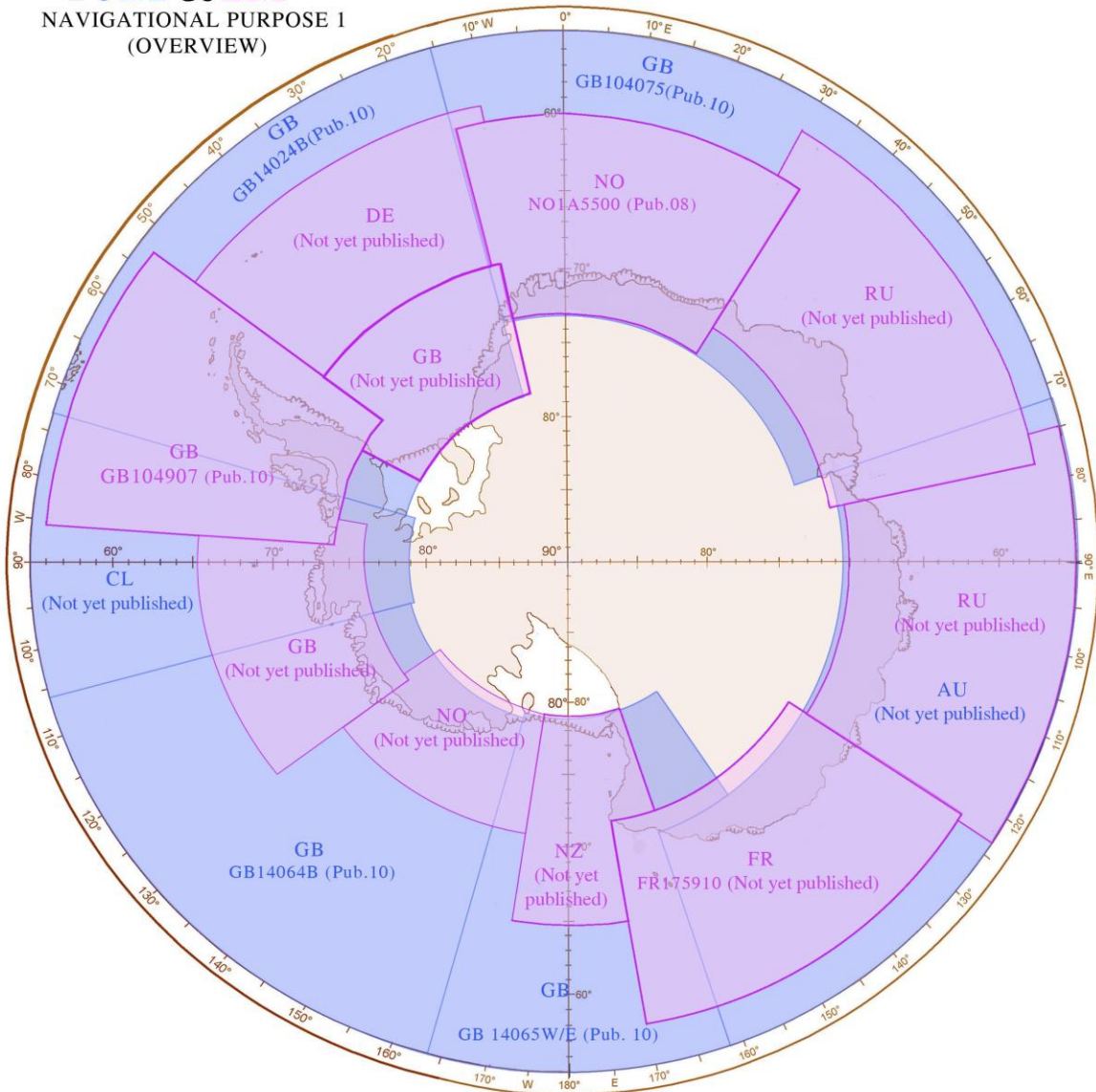
Not published  
 Published  
 In preparation



**Annex C**  
**ENC Production (May 2011)**

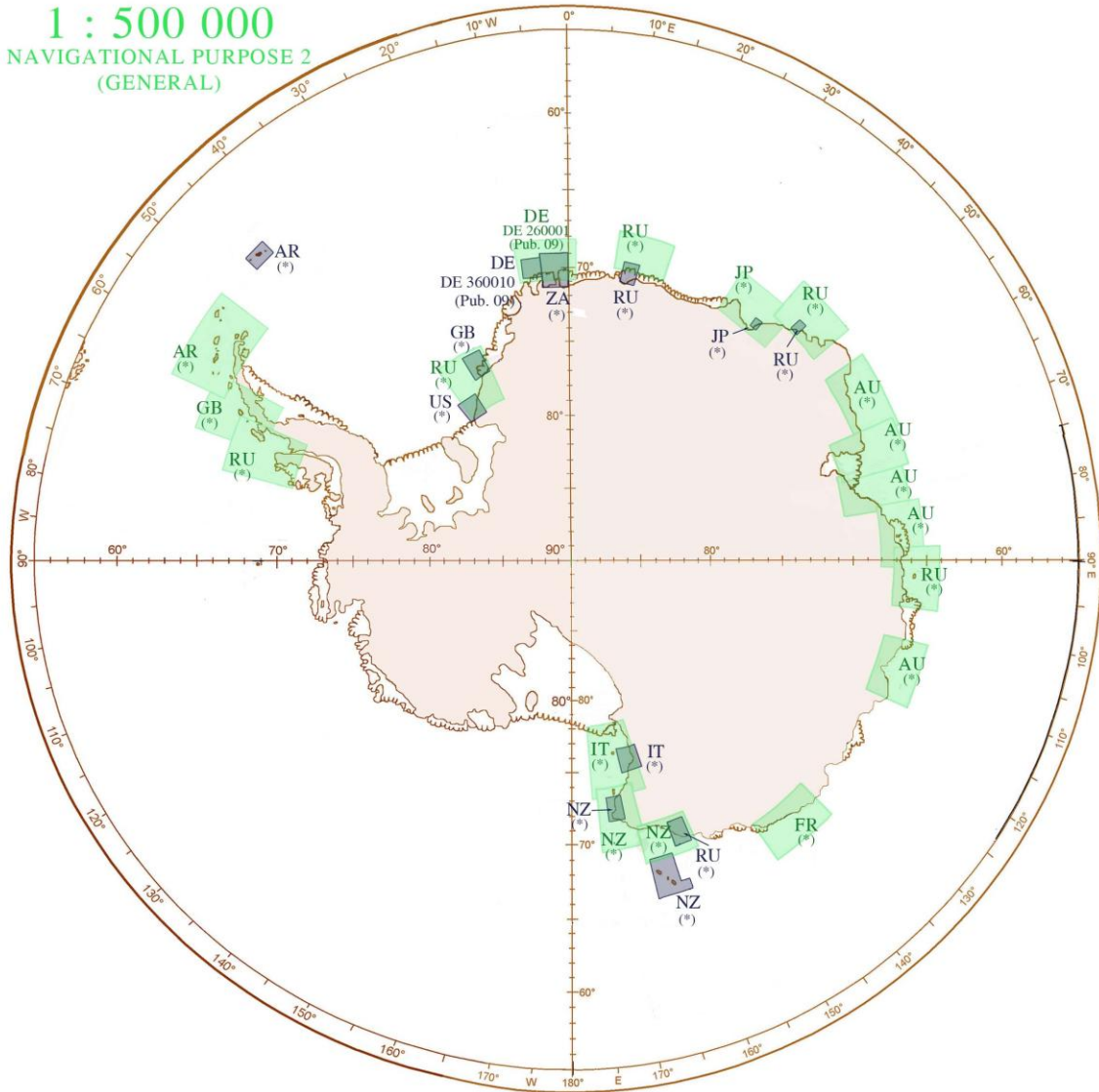
**STATUS OF ENC PRODUCTION IN ANTARCTICA (1 of 3)**  
**SMALL-SCALE «OVERVIEW» ENCs**  
(based on the 1: 10M and 1: 2M INT Chart Series)

**10M & 2M**  
NAVIGATIONAL PURPOSE 1  
(OVERVIEW)



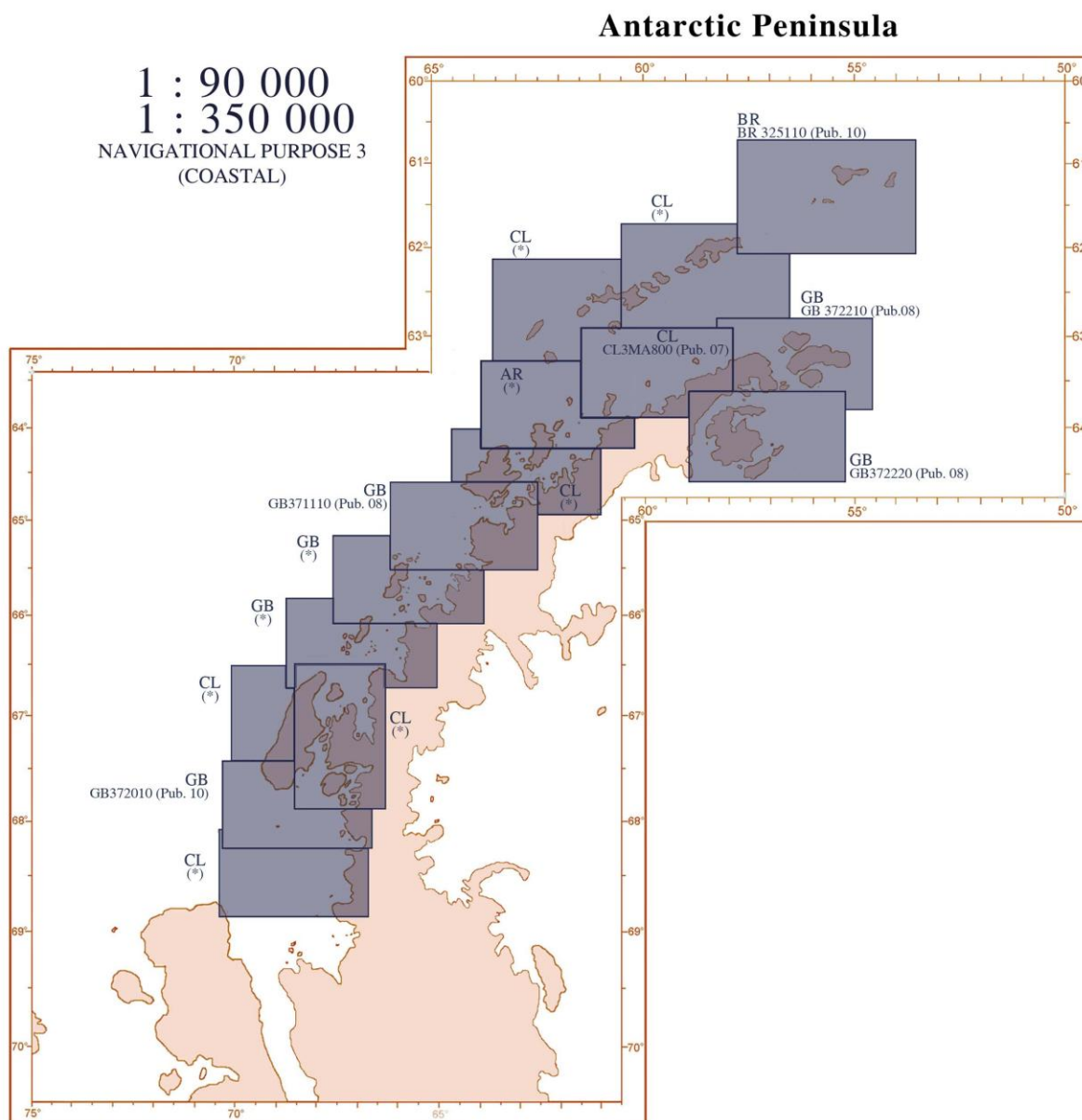
**STATUS OF ENC PRODUCTION IN ANTARCTICA (2 of 3)**  
**MEDIUM-SCALE « GENERAL » and « COASTAL » ENCs**

**1 : 500 000**  
NAVIGATIONAL PURPOSE 2  
(GENERAL)



(\*) Not yet published

**STATUS OF ENC PRODUCTION IN ANTARCTICA (3 of 3)**  
**MEDIUM-SCALE «COASTAL» ENCs**  
 (based on the medium-scale INT Chart Series)



(\*) Not yet published

Note: Additionally, 12 large-scale ENCs have been published by Brazil (2 ENCs), Chile (3 ENCs), France (2 ENCs), Italy (1 ENC) and United Kingdom (4 ENCs), including 9 ENCs in the Antarctic Peninsula.