

15th Conference of the Hydrographic Commission on Antarctica (HCA15)
Niteroi, Brazil, 26-28 June 2018



NATIONAL REPORT - AUSTRALIA

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1. GENERAL

As the result of the First Principles Review of Defence, the Navigation Act 2012 was amended to reflect a whole-of-Defence responsibility, rather than just Navy, for providing hydrographic services. The Australian Hydrographic Office (AHO) has merged with the Australian Geospatial-Intelligence Organisation (AGO) and appropriate amendments to the Intelligence Services Act 2001 have been published. The Defence White Paper 2016 indicated the future of Australia's hydrographic surveying capabilities will be 'an efficient combination of commercial and military hydrographic and oceanographic surveying capabilities'.

2. SURVEYS

2.1 General

Hydrographic surveying in Antarctica is carried out by the Australian Hydrographic Service (AHS) on an opportunity basis when resupply ships chartered by the Australian Antarctic Division (AAD) are available to transport and support the AHS Deployable Geospatial Support Team (DGST). The AHS therefore continues to remain fully reliant on the AAD for logistic support and transport to and from the Antarctic continent.

2.2 Hydrographic Surveys in 2016/17 – Passage Sounding and hydrographic survey - Davis Station (HI 590)

The AHS provided DGST to undertake survey operations working in cooperation with the Australian Antarctic Division (AAD) and Geoscience Australia (GA). The team embarked on AAD vessel *Howard Burton* with the primary aim to facilitate improved charting in the area. The survey expanded on a previous 2010 multibeam survey, collecting an additional 111km² of multibeam data. AAD and GA also collected data for assessing the current status of benthic habitat in the vicinity of Davis Station.

2.3 Hydrographic Surveys in 2017/18 – Passage Sounding and Hydrographic Survey - Mawson Station (HI 607)

The AHS provided DGST to undertake survey operations working in cooperation with the Australian Antarctic Division (AAD). The team embarked on AAD vessel *Howard Burton* with the primary aim to facilitate improved charting in the area and to verify minimum depth for the AAD modernization program for operating the new AAD icebreaker RV *Nuyina* expected to be delivered by 2020.

2.4 Sabrina Seafloor Survey 2017

The Sabrina Sea Floor Survey was conducted on the CSIRO's Marine National Facility RV *Investigator* in Jan-Mar 2017, with participants from several Australian Universities, GA and a number of international institutions. Multibeam data was collected across 48,000km² of the continental slope off the Sabrina Coast, adjacent to the Totten Glacier, East Antarctica, surveying depths of 400-3800 m.

2.5 Hydrographic Surveys Planned for 2018/19 – Passage Sounding and Hydrographic Survey - Casey Station

One AHS DGST team will deploy to Antarctica during the 2018/2019 summer season. The AHS program will focus on improving the bathymetric data quality in the approaches to Casey Station.

2.6 Hydrographic Surveys Planned for 2019/20 – Passage Sounding and Hydrographic Survey - Cape Denison, Commonwealth Bay

One AHS DGST team will deploy to Antarctica during the 2019/2020 summer season. The AHS program will focus on improving the bathymetric quality in Commonwealth Bay when approaching Cape Denison.

Ongoing discussions between AAD and AHS may focus survey activities on the infrastructure of the berths at the Australian stations to confirm mooring and berthing capabilities for the new AAD icebreaker.

3. NEW CHARTS & UPDATES

3.1 National Charting Scheme

Hydroscheme is the three year rolling hydrographic surveying and Nautical Chart Production Plan. The current version of Hydroscheme 2017-2020 is available to the public via the AHO website (www.hydro.gov.au). It provides details on our upcoming programme.

Production priorities in the area remain low but charts flagged for action over the next 3 years are:

Action	Chart	Title	Scale
New Edition	Aus 602 (INT 9032)	Approaches to Davis Anchorage	1:12,500
New Edition	Aus 600 (INT 9036)	Approaches to Mawson	1:25,000
New Edition	Aus 599 (INT 9037)	Gibbney Island to Kista Strait	1:25,000
New Edition	Aus 449 (INT 9035)	Magnet Bay to Cape Rouse	1:500,000 at lat 68
New Edition	Aus 451 (INT 9030)	Sandefjord Bay to Cape Rundingen	1:500,000 at lat 68
New Edition	Aus 454 (INT 9020)	Mill Island to Cape Poinsett	1:500,000 at lat 68
New Edition	Aus 601 (INT 9021)	Approaches to Casey	1:50,000
New Chart	Aus 453 (INT 9022)	Cape Filchner to Mill Island	1:500,000 at lat 68

3.2 International (INT) Charting Scheme for Region ‘M’

The current status of the INT charts produced by Australia in Region ‘M’ is as follows:

INT No.	Producer <i>Producteur</i>	National No.	Date		Scale/ <i>Echelle</i>		Format	Printer <i>Reproducteur</i>
			Publication	N.Edition	1:	Latitude		
9030	AU	Aus 451	1992		500 000	68°	A0	
9031	AU	Aus 452	2002		500 000	68°	A0	
9032	AU	Aus 602	2003		12 500		A0	
9033	AU	Aus 450	1991		500 000	68°	A0	
9035	AU	Aus 449	1993		500 000	68°	A0	
9036	AU	Aus 600	1987	Nov 2016	25 000		A0	
Plan: A- Horseshoe Harbour 1:5 000								
9037	AU	Aus 599	2011		25 000		A0	
9038	AU	Aus 448	2011		500 000		A0	
9014	AU	Aus 603	2002	Jul 2011	25 000		A0	
Plan: A – Boat Harbour 1:5000								
9020	AU	Aus 454	1998		500 000	68°	A0	GB
9021	AU	Aus 601	1992	Nov 2015	50 000		A0	
Plan: A – Newcomb Bay 1:12 500								

3.3 ENCs

Australia has achieved its coverage of Antarctica.

AusENC Cell No.	Title	Scale	Edition No	Update No
AU2597P0	Southern Ocean - Approaches to Heard Island	1:1500000	2	0
AU270040	Australian Antarctic Territory - Kirkby Head to Amundsen Bay	1:350000	3	0
AU270050	Australian Antarctic Territory - Amundsen Bay to Magnet Bay	1:350000	3	0
AU270060	Australian Antarctic Territory - Endresen Islands to Cape Rouse	1:350000	2	0
AU270070	Australian Antarctic Territory - Mackenzie Bay to Cape Tvistein	1:350000	2	0
AU270080	Australian Antarctic Territory - Cape Rundingen to Posadowsky Glacier	1:350000	3	0
AU270100	Australian Antarctic Territory - Mill Island to Hatch Island	1:350000	2	0
AU270110	Australian Antarctic Territory - Frazier Islands to Cape Poinsett	1:350000	2	0
AU467142	Australian Antarctic Territory - George V Land - Approaches to Commonwealth Bay	1:18000	2	0
AU468062	Australian Antarctic Territory - Approaches to Mawson Cell 1	1:25000	3	2
AU468063	Australian Antarctic Territory - Approaches to Mawson Cell 2	1:25000	2	0

AU468142	Australian Antarctic Territory - George V Land - Commonwealth Bay	1:18000	2	0
AU5600P1	Australian Antarctic Territory - Horseshoe Harbour	1:5000	2	1
AU5601P1	Australian Antarctic Territory - Wilkes Land - Newcomb Bay	1:12000	2	0
AU5603P1	Australian Antarctic Territory - Commonwealth Bay - Boat Harbour	1:4000	2	0

4 NEW PUBLICATIONS & UPDATES

4.1 Australian National Tide Tables (ANNT) and AusTides

The ANTT and AusTides provide data on eight sites within the Antarctica region. Four are in the Australian Antarctic Territory (AAT) - Casey, Davis, Mawson and Commonwealth Bay; and two on off-lying islands - Heard Island and Macquarie Island. The other two stations listed in the ANTT are Ross Island (New Zealand) and Port Martin (France). All are listed as secondary ports in the ANTT. Casey, Davis, Mawson and Macquarie Island are treated as Standard ports in Seafarer Tides to ensure consistency with information provided to the Antarctica research community. ANTT is released in October each year for use in the following calendar year.

For details see:

<http://www.hydro.gov.au/prodserv/publications/antt.htm>

<http://www.hydro.gov.au/prodserv/publications/ausTides/tides.htm>

4.2 Seafarers Handbook for Australian Waters

The 4th edition of the handbook was published in March 2016. It contains information in respect of the Antarctic region and is maintained by notice to mariners.

For details of the publication see <http://www.hydro.gov.au/prodserv/ash.htm>

Work is in progress on the fifth edition which is planned to be published in early 2019.

4.3 Maritime Gazetteer of Australia

The AHO maintains the Maritime Gazetteer of Australia as a web product. The gazetteer is a listing of all names shown on Australian navigational chart products. The resulting search provides the latitude and longitude of the place, its feature code and the Australian navigational charts on which the place is depicted.

For details see: <http://www.hydro.gov.au/prodserv/publications/mga/mga.htm>

4.4 Australian Chart and Publication Maintenance Handbook

The Australian Chart and Publication Maintenance Handbook (ANP 24) is up to its fourth edition. It describes the process for the upkeep of Australian digital and paper navigational products.

For details see: <http://www.hydro.gov.au/prodserv/publications/cpmh.htm>

4.5 Australia Pilot

The AHO continues to provide updates on for the Antarctic Pilot (NP9) to the UKHO.

5. MSI

Both NAVAREA X and Australia's Search and Rescue Region (SRR) extend to the coast of part of Antarctica. For MSI purposes, the Australian Maritime Safety Authority (AMSA) covers the area with NAVAREA X using Inmarsat SafetyNET. For SAR purposes, AMSA utilises Inmarsat SafetyNET and HF DSC.

6. C-55 (Status of Hydrographic Surveying and Nautical Charting Worldwide)

There has been no significant change to the current C-55 from the work undertaken by AHS.

7. CAPACITY BUILDING

No capacity building activity related to Antarctica has taken place since the last meeting.

8. OCEANOGRAPHIC ACTIVITIES

8.1 General

The AAD continues to operate tide gauges at the 3 Antarctic stations (Casey, Davis and Mawson) as well as Macquarie Island.

8.2 Tide gauge network

Casey

The pressure gauge mounted in the wharf has continued to function normally and data has been regularly downloaded. No further work has been done on data reduction due to lack of resources.

Davis

The bottom mounted pressure gauge was re-instated this summer after spending the 2017 winter in Hobart for calibration.

Mawson

The shore mounted Aquatrak gauge has continued to operate successfully since September 2017. Unfortunately plans to change over the incumbent Aquatrak sensor had to be abandoned when the ice refused to move from the harbour and the hydrographic work was unable to be completed until the last few days of the summer. A calibrated Aquatrak sensor remains at Mawson waiting to be installed (hopefully) next summer.

In April, the new ice had formed sufficiently to allow our wintering Mawson team to download the submerged pressure gauge which provided a continuous time series from late 2016 to April 2018.

Macquarie Island



Tide gauge Inspection at Macquarie Island - March 2018

At Macquarie Island, data from the Druck pressure and Aquatrak acoustic gauges has been successfully collected for the past year. The Aquatrak sensor is well overdue for replacement and AAD purchased a replacement sensor which had to be custom made to fit into the housing on the Island.

An AAD technical team was able to visit the island in March 2018 to assess the condition of the installation and take some critical measurements for replacement parts. It is hoped to revisit the island in early 2019 to replace the sensor and perform maintenance.

We are now streaming live data from the Macquarie Island Aquatrak sensor onto the Macquarie Island network for pickup by BoM (at their request)

8.3 New equipment

The AAD has developed a new GNSS tidal buoy system and is being trialed at Davis over 2018 with a view to deploying similar equipment at Mawson in future years. It is hoped that this will provide some basic levelling data for the submerged pressure gauge and the AAD engineer is currently waiting for the sea ice to thicken up sufficiently to deploy the equipment for a longer period.



GNSS Buoy undergoing trials at Davis – March 2018

8.4 Problems encountered

The logistical issues involved in operating the gauges at all the sites remain challenging.

9. OTHER ACTIVITIES

9.1 Risk Assessment Tool

Land Information New Zealand (LINZ) has completed a hydrography risk assessment of the NZ Sub-Antarctic Area of New Zealand. This will help LINZ to prioritise their future survey and charting programme.

The first phase in the risk assessment process was to design a new risk matrix appropriate for the unique flora and fauna of the Islands and environmental conditions for shipping. LINZ did this with the Department of Conservation and Maritime New Zealand.

The report and risk matrix will be made available to IHO in the near future.

LINZ kindly provided the AHO the code for their Risk Assessment Tool that they have developed to assist with SWPHC capacity building activities. The AHO has re-developed the code to improve processing of Automated Identification System (AIS) data and flexibility in defining risk scenarios. The tool is expected to be operational early 2019. AHO is collaborating with LINZ to determine if the improvements will benefit LINZ capability.

9.2 Hull damage of M/V Ivan Papanin in Quilty Bay, Larsemann Hills, East Antarctica (as reported at ATCM, May 2018)

It is understood that a ship contracted by India struck a submerged object in the vicinity of Quilty Bay in February 2018. As the producer of INT charts in the general area the AHO has not formally been provided details/position of the incident.

9.3 Miscellaneous

The Australian Antarctic Division (AAD) has an air link from Hobart on mainland Australia to Casey station that will integrate with the AAD's existing shipping operations.

For details see <http://www.antarctica.gov.au/living-and-working/travel-and-logistics/shipping-and-air-schedules>

The AAD website (www.aad.gov.au) provides information on Environmental Impact Assessment of activities, Pollution, Quarantine, Navigating near Antarctica, Landing Ashore and the Australian Antarctic Stations.

Information on the Antarctic and Southern Ocean weather can be found on the Australian Bureau of Meteorology website (www.bom.gov.au).

The AHO and AHS DGST consults with AAD to compile a priority survey list to be progressed on an annual basis.

10. CONCLUSION

The Antarctic region remains an isolated region difficult to readily access and thus progress remains slow.
