IHO HYDROGRAPHIC COMMISSION ON ANTARCTICA (HCA)
12th Meeting – Montevideo, Uruguay, 10-12 October 2012

HCA12-07.4Ab

National Report
AUSTRALIA

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NATIONAL REPORT - AUSTRALIA

1. GENERAL

The key focus of the Australian Hydrographic Service (AHS) has been to achieve full ENC coverage of Australia's waters. Initial coverage to meet the needs of commercial ports, national and international shipping was achieved in the first half of 2011. There are approximately 22 ENCs still required for full coverage (total approx. 870 cells) and their completion has been delayed due to resource constraints. These remaining cells cover Antarctica and a small number of plans covering recreational boating needs.

The AHS ISO 9001:2008 Quality Management System was re-certified in 2011. A program of competency mapping of specialist skill sets is currently in progress and arrangements have been made for regular Nautical Cartography training.

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 2011/12 – Commonwealth Bay, Mawson Station and Passage Sounding

The Australian Hydrographic Service (AHS) provided two AHS DGST teams for the AAD marine science and resupply voyages for the summer 2011/12. The AAD celebrated the centenary of Sir Douglas Mawson's expedition to Antarctica in 1911/12 with a visit by the RSV *Aurora Australis* to Commonwealth Bay in Dec 2011. The AHS intended to use this rare opportunity to conduct survey operations in the poorly charted and predominately unsurveyed anchorage to the west of Cape Dennison. Unfortunately the sea ice was late in breaking out from the Cape which stopped the Aurora Australis approaching closer than 20nm from Cape Dennison. This same sea ice stopped the intended smaller boat sounding operations within the anchorage area. The team embarked on *Aurora Australis* continued the ongoing project to process passage sounding data. The team processed the hydrographic data for 21 voyages completing the historical data block covering the period 1996-2011. The project will now focus on processing data gathered on a yearly basis by the *Aurora Australis*. To date the teams have processed approximately 250,000nm of hydrographic passage sounding data. (See Annex A)

The second team for 2011/12 season embarked the RSV *Aurora Australis* in Fremantle, WA in mid February to undertake a large scale hydrographic survey and environmental assessment in the vicinity of Horseshoe Harbour, Mawson Station (See Annex B). The team completed the areas indicated on the chartlet which was an impressive achievement under the restrictive station resupply schedule. One of the primary aims of the large scale survey was to identify the suitability of the west arm as an alternate ship mooring area or as an alongside position

without entering Horseshoe Harbour. The hydrographic data from the 2011/12 season will require further assessment to determine the suitability of this area as a potential berthing position.

2.3 Hydrographic Surveys Planned for 2012/13 – Passage Sounding Processing

Two personnel from the AHS DGST will embark the RSV Aurora Australis to continue the processing of hydrographic passage sounding data.

DGST is programmed to recommence small boat sounding in the vicinity of the Australian Antarctic Stations in 2012/13 summer season. The location and duration of the hydrographic survey season will be dependant upon the ability of the AAD to resupply schedule.

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 2012-2014 is available to the public via the AHS website (www.hydro.gov.au). It provides details on our upcoming programme. The Antarctic area remains of low priority in the current Hydroscheme.

33 New Charts and New Editions of the national paper and raster chart series were produced from Oct 2011 to Sep 2012. One of these were charts covered the Antarctic

Action	Chart	Title	Scale	Published
New Chart	Aus 448 (INT 9038)	Kirby Island to Magnet Bay	1:500,000 at lat 68	16 Dec 2011

Production priorities in the area remain low but charts flagged for action over the next 5 years are:

Action	Chart	Title	Scale
New Edition	Aus 602 (INT 9032)	Approaches to Davis Anchorage	1:12,500
New Chart	Aus 453 (INT 9022)	Cape Filchner to Mill Island	1:500,000 at lat 68
New Chart	Aus ??? *	Nilsen Bay to Point Williams	1:150000
New Chart	Aus ??? *	Point Williams to Point Darwle	1:150000
New Chart	Aus ??? *	Approaches to Vessvol Hills and Rauer Group	1:150000
New Chart	Aus ??? *	Larsemann Hills	1:150000
New Chart	Aus ??? *	Sanson Is to Randvik Bay	1:150000
New Chart	Aus ??? *	Approaches to Casey	1:150000
New Chart	Aus ??? *	Approaches to Commonwealth Bay	1:150000
New Chart	Aus 460 (INT ????)	Slava Bay to Belousov Point	1:500,000 at lat 68
New Chart	Aus 459 (INT ????)	Buckley Bay to Slava Bay	1:500,000 at lat 68
New Chart	Aus 458 (INT ????)	Commonwealth Bay to Buckley Bay	1:500,000 at lat 68
New Chart	Aus 456 (INT ????)	Mavry Bay to Davis Bay	1:500,000 at lat 68
New Chart	Aus 455 (INT ????)	Cape Poinsett to Paulding Bay	1:500,000 at lat 68

* A request has been received by Aurora Australis, the Australian Antarctic Division vessel, for better scaled coverage of Antarctica in several locations as Approach charts to Australian Stations. The new charts are proposed to be 1:150,000 and will be schemed over the next few years as data becomes available and processed. It is undecided at this stage as to the impact on the INT series charts produced by Australia.

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 *Producteur*	National No.	Date		Scale/*Echelle*		Format	Printer *Reproducteur*
			Publication	N.Edition	1:	Latitude		
9022	AU	Aus 453	Proj 13/14		500 000		A0	
9030	AU	Aus 451	1992		500 000	68°	A0	
9031	AU	Aus 452	2002		500 000	68°	A0	
9032	AU	Aus 602	2003	Proj 12/13	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		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	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		50 000		A0	
	Plan: A – Newcomb Bay 1:12 500							

3.3 ENCs

60 New ENC cells and 154 new editions were published by Australia from Oct 2011 to Sep 2012 focussing on Commercial ports, port approaches and major shipping lanes. This took our total number of ENCs to 844. All Australian ENCs are being distributed via the IC-ENC network, and AUS ENC service. The current aim is to achieve full ENC coverage of Australian mainland waters in late 2012. It is expected AUS ENC of Antarctica will be completed in 2012. Status follows:

ENC Cell number	Containing	Status
AU270050	Aus 449 (500000) Magnet Bay to Cape Rouse,	
AU270060	Aus 449 (500000) Magnet Bay to Cape Rouse, Aus 450 (500000) Cape Rouse to Sandefjord Bay	
AU270070	Aus 450 (500000) Cape Rouse to Sandefjord Bay, Aus 451 (500000) Sandefjord Bay to Cape Rundingen	
AU270080	Aus 451 (500000) Sandefjord Bay to Cape Rundingen, Aus 452 (500000) Cape Rundingen to Cape Filchner,	
AU270090	Aus 452 (500000) Cape Rundingen to Cape Filchner,	
AU270100	Aus 454 (500000) Mill Island to Cape Poinsett	
AU270110	Aus 454 (500000) Mill Island to Cape Poinsett	
AU2597P0	Aus 597 (1500000) Approaches to Heard Island	Expect to publish Oct 2012
AU468061	Aus 599 Gibney Island to Kista Strait	
AU468060	Aus 599 Gibney Island to Kista Strait	
AU466110	Aus 601 (50000) Approaches to Casey	
AU467110	Aus 601 (50000) Approaches to Casey	
AU367142	Aus 603 (25000) Approaches to Commonwealth Bay	published
AU4602P0	Aus 602 (2500)Approaches to Davis Anchorage	published
AU468142	Aus 603 (25000) Approaches to Commonwealth Bay	published

AU468062	Aus 600 (25000) Approaches to Mawson	published
AU468063	Aus 600 (25000) Approaches to Mawson	published
AU5600P1	Aus 600 (5000) Horseshoe Harbour	published
AU5601P1	Aus 601 (2500) NewComb Bay	
AU5603P1	Aus 603 (5000) Boat Harbour	published

4 NEW PUBLICATIONS & UPDATES

4.1 Australian National Tide Tables (ANTT) 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.
For details see:
http://www.hydro.gov.au/prodserv/antt.htm
http://www.hydro.gov.au/seafarer/tides/tides.htm

4.2 Australian Seafarers Handbook

The second edition of the handbook was published in December 2009. 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 third edition which is planned to be published by end of 2012.

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/tools/mga/mga.htm

4.4 Australian Chart and Publication Maintenance Handbook

The Australian Chart and Publication Maintenance Handbook (ANP 24) was published in April 2011. It describes the process for the upkeep of Australian digital and paper navigational products.
For details see: http://www.hydro.gov.au/prodserv/cpmh.htm

4.5 Australia Pilot

Under the United Kingdom Hydrographic Office / Australian Hydrographic Office Sailing Directions Cooperation Project, revision of the UKHO Admiralty Sailing Directions - Australia Pilot NP 13 (2011), NP 14 (2010) and NP 15 (2009) have been published as new editions under dual UKHO and AHO badging.

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)

The AHS provided the IHB with updates to C-55 in February 2012.

7. CAPACITY BUILDING

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

8. OCEANOGRAPHIC ACTIVITIES

8.1 Sea level determination

Measuring sea level in the Antarctic region is important for a number of reasons which include:

- Monitoring Sea Level Rise;
- Study of inter-annual variability of the circum-polar current and links with inter-annual climate variability, such as the El Niño-Southern Oscillation phenomenon;
- The study of tides - particularly cross-shelf transport of heat;
- Refining Vertical Datums for maps and charts;
- Operational purposes – tidal predictions for shipping, diving and other field operations;
- Macquarie Island - coastal access; and
- Tsunami warning systems

The Antarctic Climate & Ecosystems (ACE) Cooperative Research Centre (CRC) Program has five main research programs which focus on the Antarctic Marine Ecosystems, Climate Variability & Change, Ocean Control of Carbon Dioxide, **Sea Level Rise**, and Antarctic and Southern Ocean Policy. The current tide gauge work supports this entire program.

8.2 Tide gauge programme and achievements summer of 2011/12

Casey tide gauge

The tide gauges in the Casey wharf have operated successfully for the past year. Due to a power failure to the wharf, the tide gauges ceased operation for four months from August to November 2011. The tide gauges are now operational.
A tide gauge calibration, using the floating GPS method was completed in early January 2012.

Mawson
The existing bottom mounted tide gauge was downloaded in July 2012.
Both the bottom mounted tide gauge and the onshore tide gauge are operational.
It is intended to calibrate the tide gauge in February 2013.

Davis
The Davis bottom mounted tide gauge has a lot of weed growing on it and is very difficult to locate so it has not been downloaded in 2012. An attempt will be made in November / December 2012.

Macquarie Island tide gauge
Both the Aquatrak and Druck pressure gauges have functioned successfully for the past year.
A tide gauge calibration using the GPS float method was completed in April 2012.

Boat Harbour / Cape Denison / Commonwealth Bay
A tide gauge operated by the French has operated successfully for four years. Unfortunately it was not possible to calibrate or download the tide gauge in the summer of 2011/12 due to the vast amount of ice blocking access to Cape Denison. This was due to the grounding of two huge icebergs holding the fast ice in place.

Processing data – BoM National Tidal Centre
The Bureau of Meteorology (BoM) National Tidal Centre personnel in Adelaide process the tidal data and calculate tidal predictions which are available from the BoM and Australian Antarctic Division station website pages. Tidal data is available on request to the Australian Antarctic Division. (henk.brolsma@aad.gov.au)

National Tidal Centre Antarctic data holdings:
Casey 8/3/1996 to 16/11/2012
Davis 22/4/1993 to 28/01/2010
Mawson 5/03/1992 to July 2012
Macquarie Island 31/07/1912 to 7/06/1913, incomplete record from 25/03/1964 to 18/11/1974 and 28/12/1993 to 31/08/2012

8.3 Tide gauge program summer 2012/13

Mawson – continue to download the tide gauge in Horseshoe Harbour and calibrate the tide gauge in February 2013
Mawson East Arm – shore based tide gauge - continue to stream data to Australia. Calibrate the tide gauges using a dual frequency GPS receiver.
Davis – download the tide gauges. Calibrate tide gauges using GPS on ice technique.
Casey – continue streaming of data to Kingston. No field activities anticipated.
Macquarie Island – continue streaming of data to Kingston. Maintain tide gauge infrastructure and calibrate tide gauge during Voyage 4 resupply in March 2013.

9. OTHER ACTIVITIES

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.

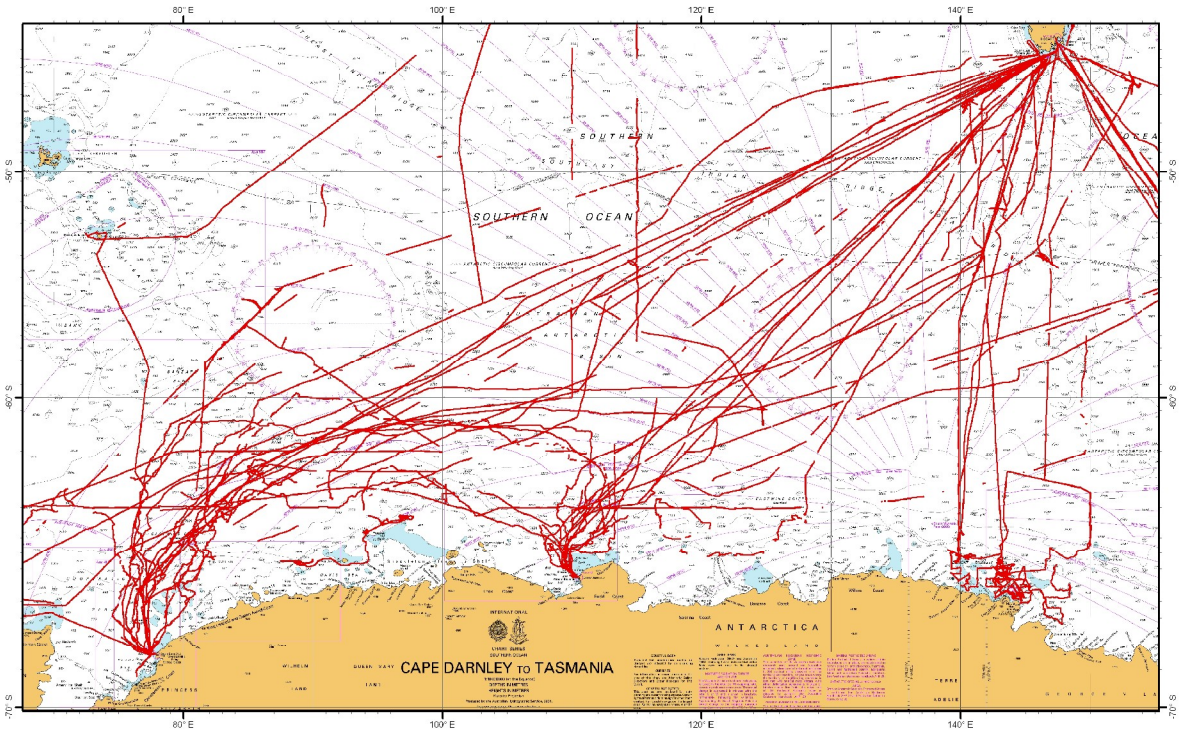
Information on the Antarctic and Southern Ocean weather can be found on the Australian Bureau of Meteorology website (www.bom.gov.au).

The AHS DGST in consultation with AAD and Master AURORA AUSTRALIS compiled a priority survey list to be progressed on an annual basis.

10. CONCLUSION

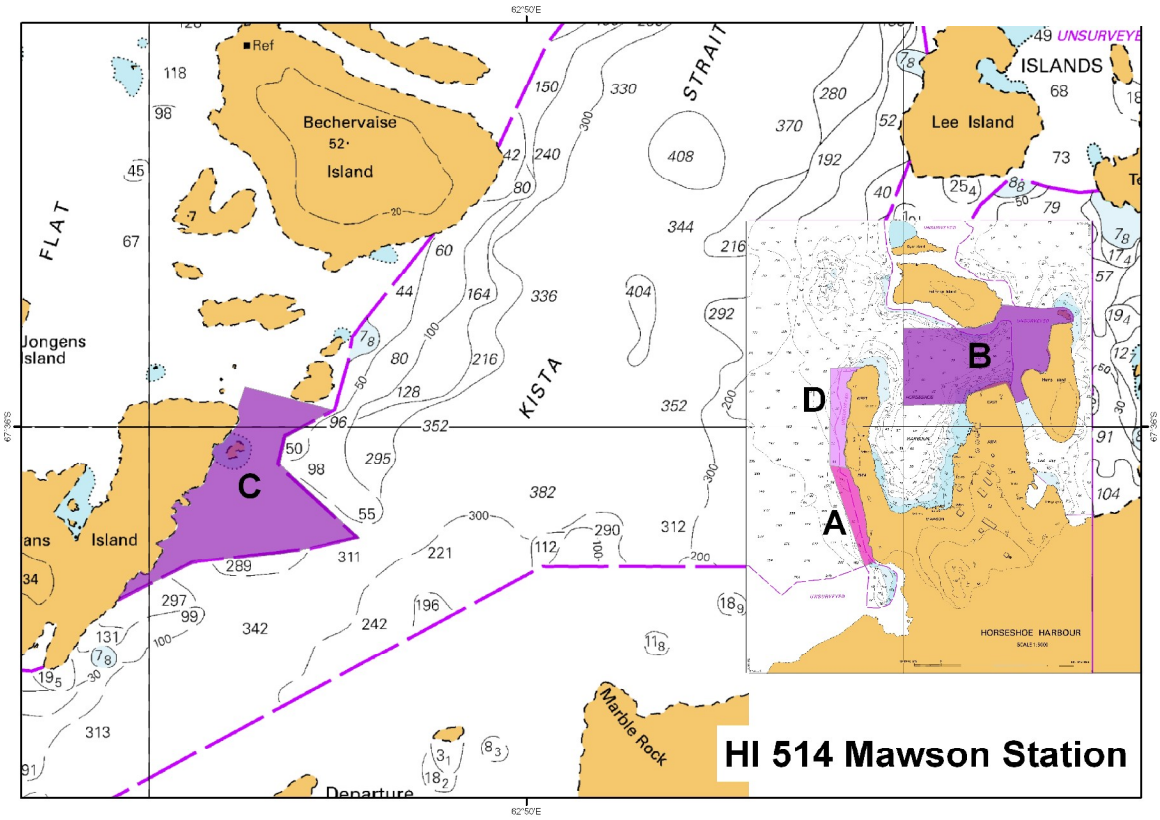
The Antarctic region remains an isolated region difficult to readily access and thus progress remains slow.

Annex A



PASSAGE SOUNDING
RSV Aurora Australis 1996 - 2012

Annex B



Completed hydrographic survey areas in the vicinity of Mawson Station Antarctica for 2011/12 season.