IHO HYDROGRAPHIC COMMISSION ON ANTARCTICA (HCA)
11th Meeting - Hobart, Australia, 5-7 October 2011

HCA11-07.4Ab

National Report
AUSTRALIA

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NATIONAL REPORT - AUSTRALIA

1. GENERAL

The key focus of AHS was to achieve initial ENC coverage of Australia's waters by end 2010. Initial coverage was intended to meet the needs of commercial ports, national and international shipping and defence. There are approximately 77 ENCs to go for full coverage (total approx. 800 cells) which is expected to be completed by Dec 2011. These remaining cells cover Antarctica, East Timor, Coral Sea reefs and a small number of plans covering recreational boating needs.

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 2010/11 – Passage Sounding and Mawson Station

The Australian Hydrographic Service (AHS) provided personnel for two of the AAD marine science and resupply voyages for the summer 2010/11. The aim of the 2010/11 summer program was to process previous passage sounding data and conduct a large scale hydrographic survey and environmental assessment in the vicinity of Horseshoe Harbour, Mawson Station (See Annex A). The large scale survey aimed to identify the suitability of the west arm as an alternate ship mooring area or as an alongside position without entering Horseshoe Harbour. Unfortunately the sea ice did not break out from Mawson Station during the 2010/11 season requiring the Aurora Australis to conduct the resupply by helicopter from 35nm to seaward. The ice precluded the AHS from deploying boats and conducting the primary large scale survey. Reconnaissance soundings were taken in the vicinity of the primary survey area by drilling holes in the sea ice and lowering an echo sounder transducer into the hole (See Annex B). The results from these soundings were positive and the large scale survey has been reprogrammed for the 2011/12 summer season.

The AHS processed approximately 100 000nm of passage sounding data during the two voyages from data held by the AAD and onboard the Aurora Australis covering the period 2007 to 2011. The datasets will require additional processing during the 2011/12 season in order to maximize the accuracy of the data in waters <200m.

2.3 Hydrographic Surveys Planned for 2011/12 – Commonwealth Bay and Mawson Station

DGST is scheduled to conduct survey operations in Commonwealth Bay and the vicinity of Mawson Station in the summer of 2011/12. The opportunity to conduct survey operations at Commonwealth Bay coincides with centennial activities for the Mawson Expedition from 1911. The opportunities to conduct hydrographic survey operations at Commonwealth Bay are limited to the infrequent AAD shipping visits.

The survey operations in the vicinity of Mawson Station will focus on the potential alternate mooring area identified on west arm outside of Horseshoe Harbour. The requirement for an alternate mooring area was highlighted when Horseshoe Harbour was blocked by an iceberg several years ago.

It is intended to continue processing passage sounding data both historical and acquired that trip. The survey team will be focusing on processing soundings utilizing the higher frequency echo sounders to provide greater accuracy for depths <200m.

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 2010-2012 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.

47 New Charts and New Editions of the national paper and raster chart series were produced from October 2010 to Aug 2011. Two of these were charts covering the Antarctic – Aus 599 New Chart and Aus 603 New Edition.

Action	Chart	Title	Scale	Published
New Chart	Aus 599 (INT 9037)	Gibney Island to Kista Strait	1:25,000	6 Jan 11
New Edition	Aus 603 (INT 9014)	Approaches to Commonwealth Bay	1:25,000	29 Jul 11

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 448 (INT 9038)	Kirby Island to Magnet Bay	1:500,000 at lat 68
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 12/13		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 11/12	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	Proj 11/12		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 Data required to update INT Chart 9030

In the summer of 2006 a large hydrographic survey was undertaken by the R.V. Akademik Boris Petrov on behalf of the Indian National Centre for Antarctic and Ocean Research (NCAOR). Australia has requested India for bathymetric data of their hydrographic survey of the approaches to Larsemann Hills which is required to update INT Chart 9030 (published in 1992). Copies of this data have also been promised for Australian researchers but till now no data has been forthcoming. In the interest of producing accurate charts and research in this region it would be of interest to know whether the bathymetric data will be shared with IHO members.

3.4 ENCs

Three ENC cells (usage codes 4 and 5) were published in March 2008 to provide equivalent paper chart coverage for Aus600 (INT 9036). These cells are: AU468062, AU468063 and AU5600P1. These cells are maintained for Notice to Mariner activity.

60 New ENC cells and 190 new editions were published by Australia from Oct 2010 to Aug 2011 focussing on Commercial ports, port approaches and major shipping lanes. This took our total number of ENCs to 803. All Australian ENCs are being distributed via the IC-ENC network, with limited direct distribution to selected maritime agencies. The current aim is to achieve full ENC coverage of Australian mainland waters in early 2012. It is expected AUS ENC of Antarctica will be completed in 2011, this includes AU1 and AU2 coverage. Australia will seek access to the adjoining Russian Cells to aid in edge matching of ENC data. It is expected that GB104074 will be withdrawn on publication of the AU coverage.

ENC Cell number	Containing	Comment
AU190060	Aus 4074 (10000000) clipped to avoid overlapping Russian INT 902 (2mill) coverage	GB104074 to be withdrawn on publication of AU cell
AU190090	Aus 4074 (10000000) clipped to avoid overlapping Russian INT 902 (2mill) coverage	GB104074 to be withdrawn on publication of AU cell
AU190120	Aus 4074 (10000000) clipped to avoid overlapping Russian INT 902 (2mill) coverage	GB104074 to be withdrawn on publication of AU cell
AU190150	Aus 4074 (10000000) clipped to avoid overlapping Russian INT 902 (2mill) coverage	GB104074 to be withdrawn on publication of AU cell
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,	Coverage outside Russian INT 9025
AU270090	Aus 452 (500000) Cape Rundingen to Cape Filchner,	Coverage outside Russian INT 9025
AU270100	Aus 454 (500000) Mill Island to Cape Poinsett	
AU270110	Aus 454 (500000) Mill Island to Cape Poinsett	
AU260060	Aus 597 (1500000) Approaches to Heard Island	
AU260070	Aus 597 (1500000) Approaches to Heard Island	
AU260080	Aus 597 (1500000) Approaches to Heard Island	
AU250060	Aus 597 (1500000) Approaches to Heard Island	
AU250070	Aus 597 (1500000) Approaches to Heard Island	
AU250080	Aus 597 (1500000) Approaches to Heard Island	
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	
AU468077	Aus 602 (12500)Approaches to Davis Anchorage	
AU468142	Aus 603 (25000) Approaches to Commonwealth Bay	
AU469077	Aus 602 (12500) Approaches to Davis Anchorage	
AU5601P1	Aus 601 (12500) NewComb Bay	
AU5603P1	Aus 603 (5000) Boat Harbour	

4 NEW PUBLICATIONS & UPDATES

4.1 Australian National Tide Tables (ANTT) and Seafarer Tides

The ANTT and Seafarer Tides 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 lat and long 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.

No new infrastructure is planned.

6. S-55

No additional information to report.

7. CAPACITY BUILDING

No 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:

- 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.
- Vertical datum for maps and charts
- Operational purposes – tidal predictions for shipping, diving and other field operations
- Macquarie Island - coastal access
- Tsunami warning systems

The tide gauge work is in support the Australian Climate & Ecosystems (ACE) Cooperative Research Centre (CRC) Programme which involves five main research programs focused on Antarctic Marine Ecosystems, Climate Variability & Change, Ocean Control of Carbon Dioxide, **Sea Level Rise**, and Antarctic and Southern Ocean Policy.

8.2 Tide gauge programme and achievements summer of 2010/11

Casey tide gauge

The tide gauges in the Casey wharf have operated successfully for the past year. Due to transport problems it was not possible to access Casey in the summer of 2010/11. The bottom mounted pressure gauge will have stopped logging and will be retrieved when divers get to Casey station in the 2011/12 summer. Datum control of both tide gauges will also be done during that period.

Mawson
The existing bottom mounted tide gauge was downloaded in October 2010 and the second bottom mounted tide gauge removed from Horseshoe Harbour. The bottom mounted tide gauge and the onshore tide gauge are operational.
Geoscience Australia surveyors calibrated the tide gauge using a GPS set up on the ice in January 2011.

Davis
The Davis bottom mounted gauge was prepared for downloading over the winter of 2011 when the Deployable Geospatial Support Team deployed the bottom mounted aerial during its visit in Feb 11. The aerial requires perseverance and a minimum of 3 boats to successfully deploy the aerial. The aerial has a diameter of approximately 30m and is difficult and time consuming to position by experienced personnel.

Larsemann Hills / Nella Fjord tide gauge
Tide gauge removed by Geoscience Australia surveyors in December 2010.

Macquarie Island tide gauge
Both the Aquatrak and Druck pressure gauges have functioned successfully for the past year.

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 the tide gauge in the summer of 2010/11.

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 16/11/2008
Davis 22/4/1993 to 28/01/2010
Mawson 5/03/1992 to 21/12/2009
Macquarie Island 31/07/1912 to 7/06/1913, incomplete record from 25/03/1964 to 18/11/1974 and 28/12/1993 to 31/12/2008.

8.3 Tide gauge program summer 2011/12

Mawson – continue to download the tide gauge in Horseshoe Harbour
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. Calibrate tide gauge during Voyage 5 resupply in April 2011.
Boat Harbour – Level between tide gauge bench marks.

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.aad.gov.au/default.asp?casid=33742

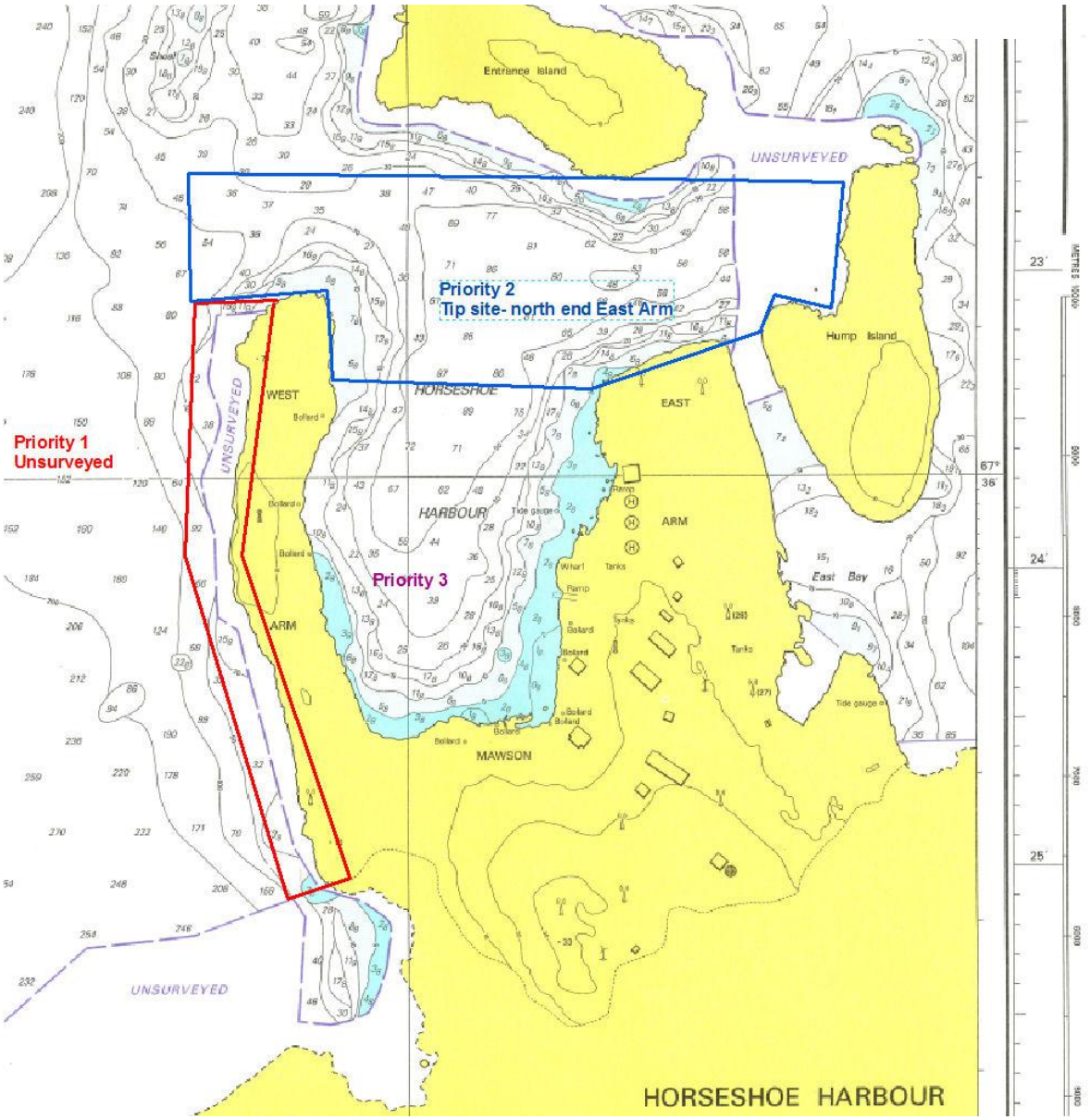
The AAD website (www.aad.gov.au) provides information on Environmental Impact Assessment of activities, Pollution, Quarantine, Navigating near Antarctica, Landing Ashore and the Australian Antarctic Stations.

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

10. CONCLUSION

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

Annex A


Entrance Island
UNSURVEYED
Priority 2
Tip site- north end East Arm
Hump Island
WEST
HORSESHOE
EAST
Priority 1
Unsurveyed
UNSURVEYED
HARBOUR
ARM
Priority 3
East Bay
ARM
MAWSON
UNSURVEYED
HORSESHOE HARBOUR

Annex B

1. Drilling ice holes to take single beam echo sounder reading in the vicinity of Mawson Station, Antarctica

2. Deployable Geospatial Support Team conducting reconnaissance soundings in the vicinity of Mawson Station, Antarctica.