18TH MEETING OF THE SOUTH WEST PACIFIC HYDROGRAPHIC COMMISSION (SWPHC18)
VTC Meeting, 17-19 February 2021

NATIONAL REPORT FROM AUSTRALIA TO THE SWPHC18

1. Executive summary

The Australian Hydrographic Office (AHO) is the Australian Department of Defence agency responsible for the publication and distribution of nautical charts and other information required for the safety of vessels navigating in Australian waters.

Key focus throughout 2020 has been the implementation of the HydroScheme Industry Partnership Program, an innovative government-industry arrangement supporting the collection, assessment and publication of nautical information products in the Australian Charting Area. 2021 will see the continued development of data and information release policies which will underpin the AHO moving towards a modern data and customer-focused organisation.

2020 was the 100th anniversary of the Australian Hydrographic Office, however travel and social restrictions throughout the year unfortunately limited a number of planned celebratory events.

2. Surveys

HydroScheme Industry Partnership Program

As outlined in the 2016 Defence White Paper, Defence is replacing it's hydrographic capability with a more efficient combination of military and commercial hydrographic and oceanographic survey capabilities. This initiative led to the establishment of the HydroScheme Industry Partnership Program (HIPP). Through the HIPP, the Australian Government is partnering with industry to meet the National Survey Function (NSF) obligations that will, over the medium to long term, help drive fundamental change in the delivery of defence hydrographic and oceanographic services and the development and innovation of environmental data collection capabilities.

After a competitive tender evaluation process, seven commercial providers were identified as successful candidates to undertake hydrographic surveys for HIPP and are collectively referred to as the 'HIPP panel' which came into effect on 28 Feb 20. Since implementation 13 survey tasks have been contracted under the HIPP, with two completed and the remainder underway.

Current activity

HydroScheme is the document produced by the AHO to provide a plan of surveying tasks to be undertaken. Traditionally this has covered a three to five year period. The new format is an annual plan to cover the survey activities to be contracted to the HIPP panellists for the next financial year. HydroScheme20 is the current annual plan of survey activities to be undertaken under the HIPP during the 2020/2021 financial year. HydroScheme21 is the annual plan of survey activities to be undertaken under te HIPP during the 2021/2022 financial year. Both are published on the AHO website as ESRI Story Maps at www.hydro.gov.au/NHP.

- Royal Australian Navy Surveys – 2020 Surveys planned for Australia, PNG and Solomon Islands were curtailed by COVID restrictions. RAN survey vessels operated a reduced survey program with a focus on Torres Strait.

3. Nautical Charting

The AHO is the Primary Charting Authority (PCA) for two Pacific Island Countries, as well as the national authority for Australia and its territories. The total portfolio includes:

Nation	Paper Charts	ENCs	Total
Papua New Guinea	78	35	113
Solomon Islands	17	41	58
Australia	340	817	1157
Total	435	893	1328

A project is underway to rebrand PNG charts and ENC with a PNG/ PG prefix. To date all 78 paper charts have been rebranded and published. Phase 1 of the ENC re brand has been completed with all 35 usage band 5 cells renamed to PG prefix, currently rebranding remaining coastal cells.

a) Electronic Navigation Charts

There is a total of 893 ENC cells published by the AHO. These include AU, PG and SB ENC cells. ENC covering Papua New Guinea waters will continue to be progressively updated and reissued as 'PG' ENC. Phase 1 has completed with all the harbour usage cells (5) renamed to PG. The next phase of the PG renaming to conclude in 2021 will include Approach, Coastal, General and Overview cells.

The AHO has moved from a trial program to full production of Navigation Purpose 6 ENC for selected ports. The product is referred to as a High Density bathymetric ENC (HDbENC), reflecting content that is substantially limited to high density bathymetry, and not extensive additional infrastructure detail that is also possible in this layer. Each ENC covers a segment of a dredged channel or manoeuvring area, and aligned to areas with different survey frequencies within the port. This allows for full 'update by replacement' as new surveys are received, without the need to merge new and existing data. Currently the AHO has published 10 HDbENC's for ports of Townsville, Cairns, Sydney Harbour and Botany Bay.

Each ENC is shaped to fit the waterway, clipped to an agreed polygon and includes 1m or sub-1m depth contours. Aids to Navigation and sub-surface infrastructure are then added from the AHO's database. The AHO has developed and refined a business case template that captures specific user needs, and works with individual ports to ensure each HDbENC meets the stated requirement. The resulting ENC is then made available to both port pilots for use in Portable Pilotage Units, and to ships for use in ECDIS. In doing so, the AHO is contributing to effective pilot / crew Bridge Resource Management.

Australia ENCs published since the SWPHC17 Meeting		
Australia	**Solomon Islands**	**PNG**
Total: 952 New ENC: 123* NE ENC: 88 Updates: 741	**Total: 8** New ENC: 0 NE ENC: 0 Updates: 8	**Total: 38** New ENC: 35 NE ENC: 0 Updates: 3

* ENCs created to incorporate the new naming convention for usage code 5 ENCs based on the UN Location code system in lieu of previous naming convention based on large scale paper charts.

b) ENC Distribution

Australia is a member of IC-ENC and distributes all AHO published ENCs through IC-ENC Australia.

View the IC-ENC World Catalogue here:

http://geosig.hidrografico.pt/flexviewers/ICENC/

Australia also has a national ENC service, known as 'AusENC'. This supports vessels operating exclusively within Australian, Solomon Islands and Papua New Guinean waters, and is priced to encourage use by domestic vessel operators, including coastal and port pilots. LINZ published ENC of North and South Island New Zealand was released within the AusENC service on 08 Jan 2021 to support cross-Tasman operations.

For more information visit the AHO website at:

www.hydro.gov.au/prodserv/digital/ausENC/enc.htm

c) Raster Nautical Charts

The AHO does not produce RNC. RNC are derived by the UKHO from UKHO copies of paper charts produced by the AHO. Only those charts adopted by the UKHO are available as RNC.

d) INT paper nautical charts (1:1 500 000 and smaller)

A review is currently underway regarding future requirements for INT paper nautical charts. A number have been identified as suitable for withdrawal without replacement. The intention is that, for most areas, coverage will remain available at 1:3.5M only. One 1:10M and one 1:1.5M chart are likely to remain from within the existing portfolio. The intention is that remaining INT paper charts will be the minimum necessary to:

- Facilitate route planning and monitoring in areas not fully covered by the coastal series (e.g. offshore reefs, neighbouring countries and Antarctica).

- Display maritime claims (EEZ and Continental Shelf limits).

- Small scale ENC project is currently underway to update all overview and general usage ENC's - AU130060, AU130090, AU130120, AU130150, AU160060, AU160090, AU160120 and AU160150 and encompassing AU2 cells.

e) Paper Nautical Charts

There are currently 435 paper nautical charts produced and maintained by the AHO including 4 index charts. Detailed information of the full Australian chart portfolio can be found on the AHO website at

http://www.hydro.gov.au/prodserv/paper/auspapercharts.htm

Medium and large scale paper nautical charts

In August 2019 the AHO held a workshop on the future of nautical charting. This included a wide varity of maritime industry representatives, including representatives from the Australian Maritime Safety Authority and PNG National Matitime Safety Authority. At this meeting it was highlighted that demand for paper nautical charts has fallen to 16% of equivalent annual demand for ENC, yet paper charts absorb 60% of total cartographic effort in keeping ENC and paper charts up to date.

Following this consultation, as well as an online questionnaire to domestic commercial vessel operators and discussions with the yachting community, Australian paper nautical charts will be rationalised based upon the following principles from within the existing portfolio throughout 2021:

- Coastal areas – either 1:150,000 or 1:300,000, but not both

- Ports and approaches – coverage at a single scale for each area, generally in the range 1:25,000 to 1:50,000. Remaining charts will be sufficient for use as a back-up to ECDIS by permitting larger vessels to plan pilotage, and reach a pilot boarding ground, anchorage or place of refuge without assistance, noting that in most ports they are required to embark a marine pilot. Remaining paper charts will carry a note in areas where larger scale ENC coverage is available.

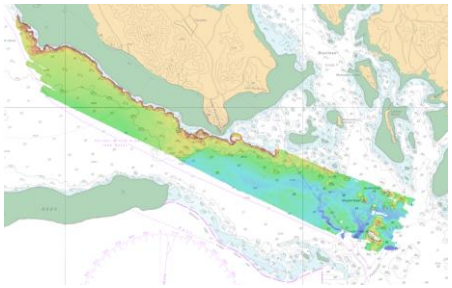
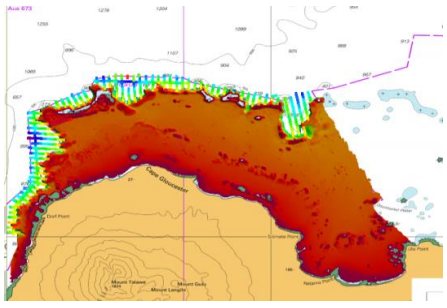
- Over 130 paper nautical charts considered to be no longer required have progressively been withdrawn once any necessary detail has been transferred to remaining charts. Most of those being withdrawn are those that, due to scale and location, require the largest proportion of updating effort – reducing the paper chart portfolio by one third will result in a two thirds reduction in the number of paper Notices to Mariners required. The list of coastal and large scale charts for withdrawal was released to the public via Notice to Mariners on 7 Feb 2020. The chart withdrawal program is scheduled for completion by end of 2021. Intentions regarding INT charts will be announced separately once finalised.

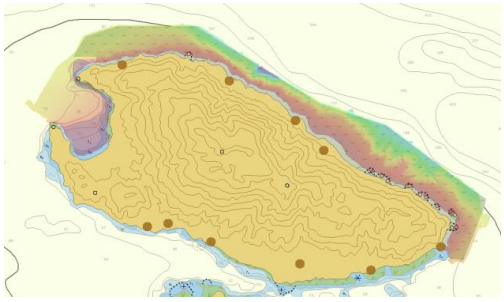
  Paper nautical charts covering Papua New Guinea and Solomon Islands will remain unaffected.

Australia Paper Charts published since the SWPHC17 Meeting				
Australia **Total: 216** NC: 0 NE: 9 Updates: 207	**Solomon Islands** **Total: 9** NC: 0 NE: 4 Updates: 5	**PNG** **Total: 49** NC: 36 NE: 0 Updates: 13	**Antarctica** **Total: 1** NC: 0 NE: 0 Updates: 1	**INT** **Total: 26** NC: 0 NE: 0 Updates: 26

Papua New Guinea

Some of the major updates are shown below:

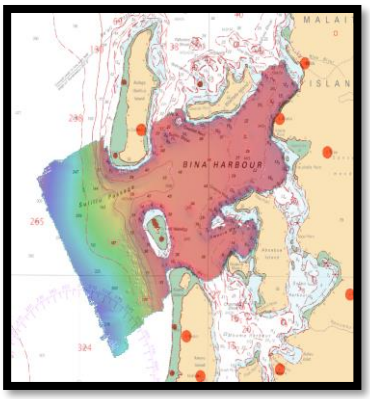
PNG621	Port Moresby, PNG RAN GI 002 **Published – 12th Jun 2020**	
PNG673 / 386	Cape Gloucester Hydrographic Survey 2017-18 - MBES and SBES survey conducted by Fugro on behalf of NMSA between the 10th December 2017 and the 26th May 2018 673 - Published – 24th Jul 2020 386 - Published – 21st Aug 2020	

PNG520	PNG Northern (ORO) Province - Collingwood Bay 2018 - MBES Survey conducted by Fugro on behalf of NMSA PNG between 22nd February and 11th April 2018 Published – 2nd Oct 2020	
PNG651/389	SIRF2018019267 Kairiru Island-VIC Bay Hydrographic Survey 2017 Fugro on behalf of NMSA PNG between 24th November - 22nd December 2017 651 - Published – 21st Aug 2020 389 - Published – 11th Dec 2020	

Australia Paper Charts scheduled for publication in 2021				
Australia	**Solomon Islands**	**PNG**	**Antarctica**	**INT**
Total: 25 NC: 0 NE: 25	Total: 4 NC: 0 NE: 4	Total: 10 NC: 4 NE: 6	Total: 2 NC: 0 NE: 2	Total: 10 NC: 0 NE: 10

Solomon Islands

- New Edition - SLB104, SB5104P6 – Anchorages in the Solomons Islands – Bina Harbour. Estimated to be published June 2021. Incorporate Bina Harbour-Point Cruz Hydrographic Survey (HMAS Leeuwin - 2019)



f) Other charts

Nil.

g) Problems encountered

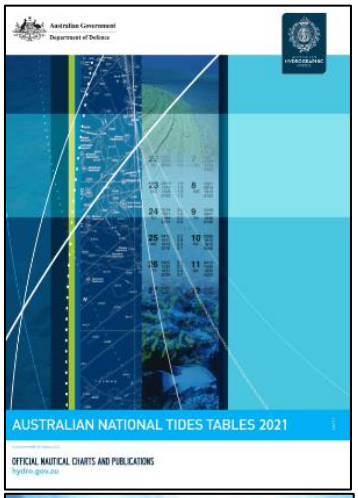
A low level of resistance to withdrawing many large scale and coastal paper charts has been encountered. This is being managed through continued consultation and engagement with stakeholders.

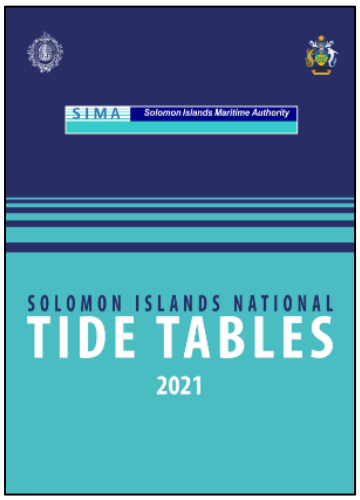
4. New publications & updates

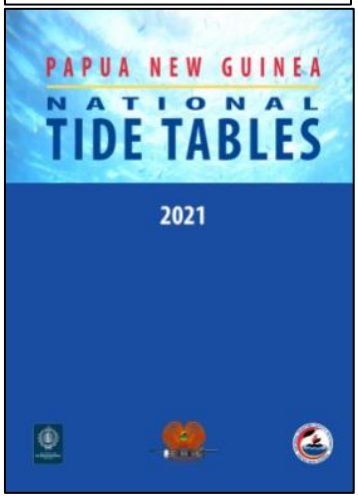
It is anticipated that work will commence on The Mariner's Handbook for Australian Waters AHP20 6th Edition in mid 2021 with publication planned for 2022.

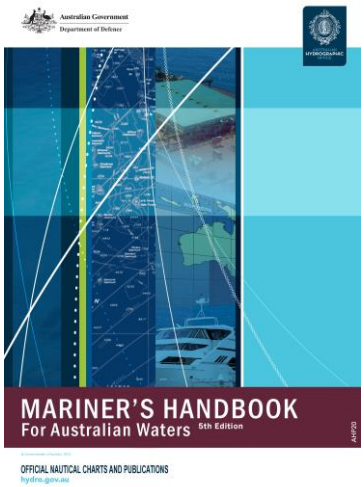
Similarly, the AHO is investigating an upgrade path for AusTides. It considers the most likely area of interest will be localised high density bathymetry, coupled with either real-time transmitted tides, or tidal time and height files generated by a suitable tidal application.

Following a significant revision of the content, Tide tables for 2021 were published in late 2020 for Australia (including Solomon Islands and Papua New Guinea), alongside separate publications for Solomon Islands and, for the first time, Papua New Guinea.









5. Maritime Safety Information (MSI)

Australia is the coordinator for NAVAREA X - outline maps of NAVAREA X are available from the Australian Hydrographic Office (AHO) Seafarers Handbook for Australian Waters (AHP20) publication. Existing infrastructure for MSI dissemination include Inmarsat SafetyNET, HF digital selective calling (DSC) and radiotelephone. Australia is also progressing with implementation of Iridium SafetCast services.

The Self-Assessment report for NAVAREA X for the period July 2019 to June 2020 was submitted to the Twelfth IHO WorldWide Navigational Warning Service (WWNWS) Sub-Committee Meeting (WWNWS12) held virtually on 1 to 3 September 2020.

An update for the period to December 2020, including information specific to the SWPHC, has been submitted for consideration under the SWPHC18 Meeting agenda item 10 (doc. SWPHC18-10B).

Current NAVAREA X MSI can be obtained from the AMSA website at: https://www.amsa.gov.au/safety-navigation/navigation-systems/maritime-safety-information-database

6. C-55

Information shown in C-55 is current (i.e. no updates required).

7. Capacity Building

a) Training received, needed, offered

Maritime Geospatial Training Centre (MGTC)

The RAN Hydrographic School has been renamed the Maritime Geospatial Training Centre (MGTC). It is located at HMAS Penguin in Sydney on the North Shore. MGTC provides training courses in Hydrographic surveying for officers and sailors from Australia and the SW Pacific region under the Defence Cooperation Programme. It also provides meteorological training to the RAN.

The hydrographic training consists of three levels: basic, intermediate and advanced level. The basic and intermediate courses are traditionally attended by Australian sailors while the advanced level course (H2) is attended by sailors and officers from Australia and the region.

In 2020 the advanced level H2 course consisted of students from Australia (8) and New Zealand (2). Participation in the course from other SW Pacific nations could not occur due to COVID restrictions.
Two Basic Courses and one Intermediate Course were conducted for RAN sailors in 2020; where 18 students attended the Basic Courses (14 weeks duration) and 11 students attended the Intermediate Course (8 weeks duration).

8. Oceanographic activities

a) Tide gauge networks

Two permanent tide gauge networks are operated in the region by the Bureau of Meteorology.

The Australian Baseline Sea Level Monitoring Array currently consists of 16 permanent gauges monitoring sea level and ancillary meteorological parameters around the Australian Coastline, including one at Cocos Island. The locations of the gauges are shown in **Figure 1** (below).
Monthly reports are published by the Bureau and can be located on their website at:
www.bom.gov.au/oceanography/projects/abslmp/reports.shtml

The Pacific Sea Level Monitoring Project currently consists of 14 permanent gauges monitoring sea level and ancillary meteorological parameters throughout the South Pacific region. The locations of the gauges are shown in **Figure 1** (below).
Monthly reports are published by the Bureau and can be located on their website at:
http://www.bom.gov.au/pacific/projects/pslm/index.shtml

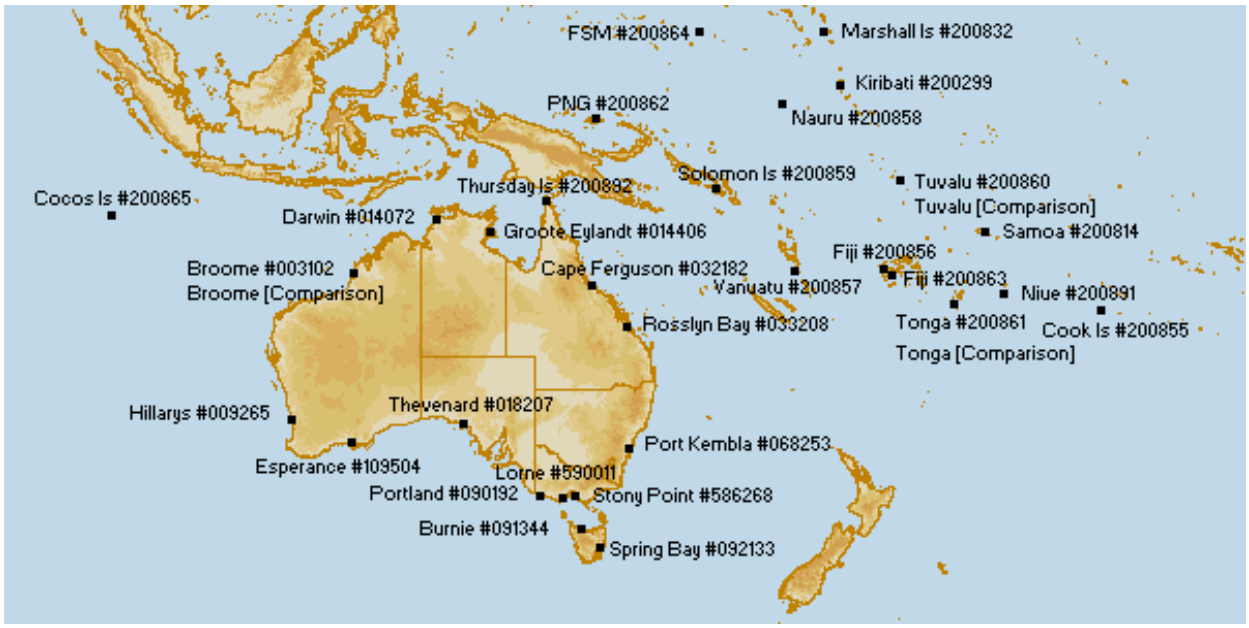


Figure 1: Permanent tide gauge network operated by the Bureau of Meteorology, including the Australian Baseline Sea Level Monitoring Array (16 sites) and Pacific Sea Level Monitoring Project (14 sites).

The permanent tide gauges were upgraded in 2009-2010 (Baseline) and 2011-2013 (Pacific) with modernised data loggers, real-time satellite communications and additional radar-type water level sensors. Co-located comparison stations were installed at Broome and Tuvalu in 2017 and at Tonga in 2018 in preparation for becoming the permanent operational tide gauges at those locations due to wharf refurbishments.

The Australian Tsunami Warning System (ATWS) is supported by the 30 permanent Australian and Pacific tide gauges (**Figure 1**) as well as an additional network of 17 radar-type tide gauges at four Pacific and 13 Australian sites as shown in **Figure 2**. An array of six deep-ocean tsunameters (DART buoys) brings the Australian tsunami-monitoring network to 53 sites in all.
The primary purpose of these additional stations is for the detection of tsunami with real time data made available to support the operations of the Pacific Tsunami Warning System.

Further information about the Australian Tsunami Warning System is available at http://www.bom.gov.au/tsunami/about/atws.shtml

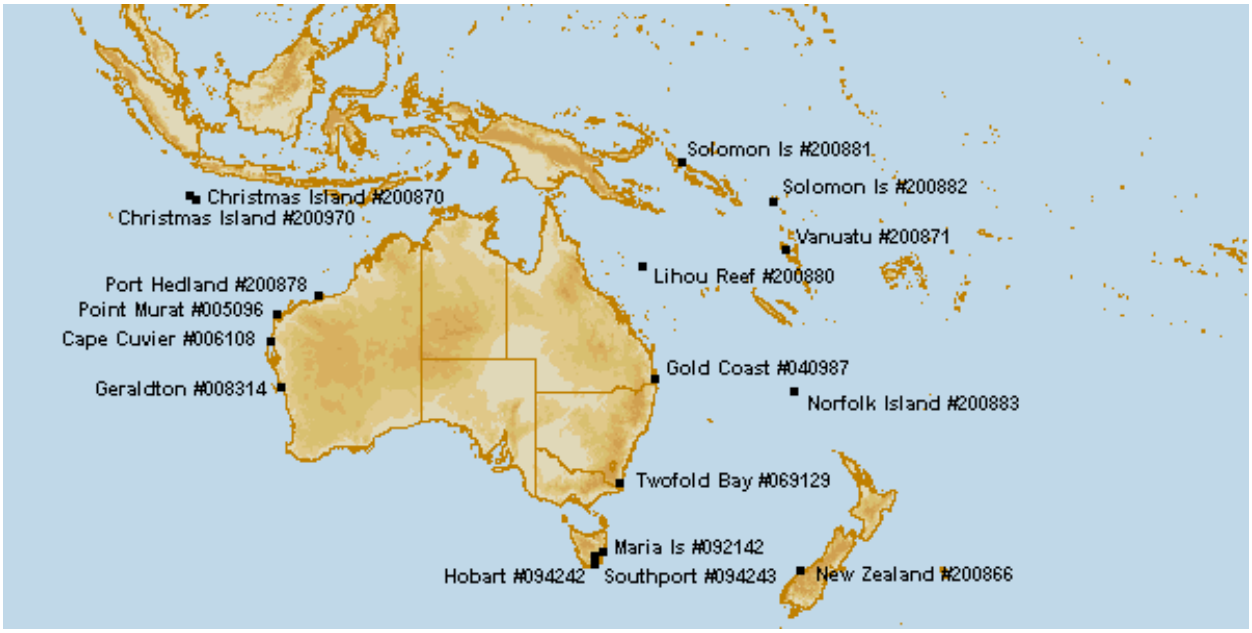


Fig. 2: Additional ATWS radar gauges (17 sites) that used in conjunction with the permanent tide gauge network for monitoring tsunamis in the Australian region.

b) New equipment

Surveyable mounting of the secondary radar water level sensors and integration of mounting pillars for continuous GNSS/GPS equipment on the tide gauge infrastructure are slowly being introduced into the network, while acoustic water level sensors remain the primary sensor at most sites**.**

c) Problems encountered

Generally, the gauges operate autonomously in between calibration and servicing on a routine 18-month schedule, with average data return from the permanent tide gauge network exceeding 95%. The variety of day-to-day problems that do arise include power supply, data logger, data communications and sensor malfunctions, which are managed either remotely, by voluntary first in maintenance support or through contingency field trips.

The Niue tide gauge and geodetic monitoring site was completely destroyed by cyclone Tino which hit on January 17th 2020. Waves were reported to have crashed on to cliff tops between 20-30 metres high.

It was intended that reconstruction of a replacement tide gauge and GNSS sensor together with housings would commence immediately to be completed before the end of 2020. However with the restrictions on travel due to COVID, this will now not happen until 2021.

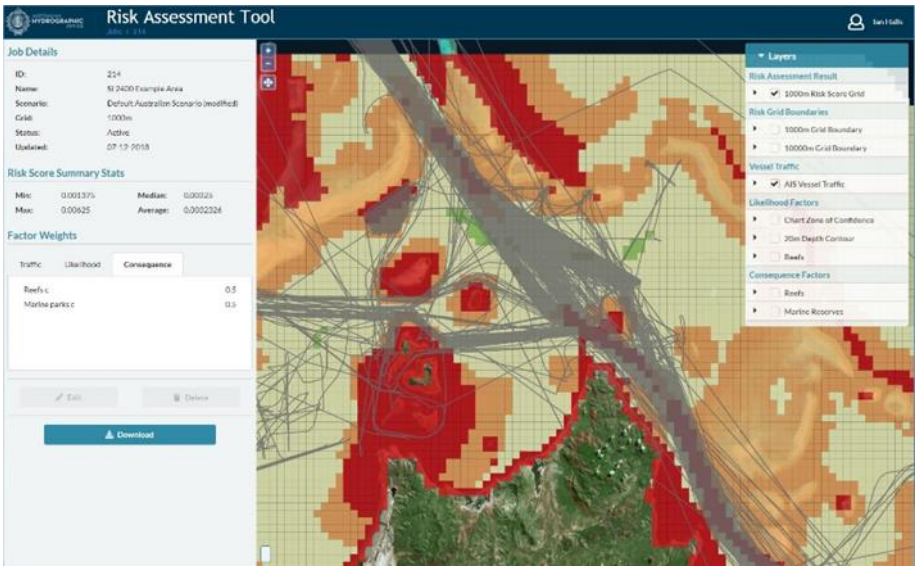
9. Other activities

a) Participation in IHO Working Groups

	Meeting	Chair/Vice Chair	Member/ Associate/ Observer
	Council		M
HSSC	Hydrographic Services and Standards Committee		M
NCWG	Nautical Cartography Working Group		M
ENCWG	ENC Working Group		M
DQWG	Data Quality Working Group		M
MSDIWG	Marine Spatial Data Infrastructure Working Group		M
HSPT	S-44 Hydrographic surveys Project Team		M
TWCWG	Tidal, Water Level and Currents Working Group		M
WEND	Wold-Wide Electronic Navigational Chart Database		M
WWNWS-SC	Wold-Wide Navigational Warnings Service Sub-Committee		M
ABLOS	Advisory Board on the Law of the Sea		O
CSBWG	Crowd Sourced Bathymetry Working Group		O
S-100	S-100 Working Group		M
S-101	Project Team	Vice Chair	M
S-104	Development Group		M
S-111	Development Group		M
S-121	Development Group		M
S-129	Development Group		M
S-412	Development Group		M
HCA	HCA Hydrographic Commission on Antarctica		M
NIOHC	North Indian Ocean Hydrographic Commission		A
SAIHC	Southern Africa and Islands Hydrographic Commission		O
SWPHC	South-West Pacific Hydrographic Commission SWPHC International Charting Coordiantion WG SWPHC Marine Spatial Data Infrastructure WG	 Chair Vice-Chair	M M M
EAHC	East Asian Hydrographic Commission		O
WWNWS	World-wide Navigational Warning Service Sub-Committee		M
IBSC	International Board on Standards of competence for Hydrographic Surveyors and Nautical Cartographers	Chair	M
SCUFN	GEBCO Sub Committee on Undersea Feature Names		M

b) Survey Planning Risk Assessment Tool

The AHO developed a Risk Assessment Tool based on the methodology adopted by LINZ. This operates on an Amazon Web Service cloud instance and was first employed during the survey planning process for HydroScheme21. It uses AIS data (supplied by AMSA) and geospatial data overlays to output a graphic risk display (see image example). The user has the flexibility to alter Traffic, Likelihood and Consequence weightings to develop Use Case Scenarios. Further development work is underway to improve the way AIS traffic data influences the output.



10. Conclusions

AHO continues to implement the introduction of HIPP with upgrades to systems and processes, workflow and data management protocols.

Australian Navy ships will continue to spend considerable time deployed in the South Pacific region.

Input to the IHO Publication P-5 (*Yearbook*)
Country: AUSTRALIA
Organization: Australian Hydrographic Office
(updates shown in BLUE)

Contact information/ Informations de contact / Información de contacto	
-National Hydrographer or equivalent -Directeur du service hydrographique ou équivalent -Director del Servicio Hidrográfico o equivalente	Post: Hydrographer of Australia – Director-General Hydrography, Meteorology and Oceanography (DGHM) Name: Commodore Stewart Dunne, RAN Postal address: 8 Station St, Wollongong, NSW 2500, Australia Tel: +61 (0) 2 4223 6500 Fax: +61 (0) 2 4223 6599 Email: international.relations@hydro.gov.au
-Other point(s) of contact -Autre(s) point(s) de contact -Otros punto(s) de contacto	International.relations@hydro.gov.au
-Web site -site web -sitio web	http://www.hydro.gov.au
Country information / Informations sur le pays/ Información sobre el país	
-Declared National Tonnage -Tonnage national déclaré -Tonelaje Nacional Declarado	Tonnage: 1,684, 678 Date: October 2019
-National day -Fête nationale -Fiesta nacional	26 January
-Date of establishment and Relevant National Legislation -Date de mise en place et législation nationale pertinente -Fecha de constitución y legislación nacional pertinente	Hydrographic Office, R.A.N – Established 01 October 1920 ; Commonwealth Naval Order 275 dated 14 December 1920. Navigation Act 2012

-Date first joined IHO -Date d'adhésion à l'OHI -Fecha de adhesión a la OHI	21/06/1921
-Date ratification Convention -Date de ratification de la Convention -Fecha de ratificación de la Convención	25/11/1968
-Remarks on membership -Remarques sur l'adhésion -Comentarios sobre la adhesión	Included under “British Empire” with the U.K. from 1921.
Agency information/ Information sur l'agence/ Información sobre la agencia	
-Top level parent organisation -Organisme mère -Organización asocieda de nivel superior	Dept of Defence
-Principal functions of the organisation or the department -Attribution principales de l'organisme ou du département -Principales funciones de la Organización o departamento	Hydrographic and bathymetric surveys. Notices to Mariners Nautical charts. Tides, Tidal Streams, Currents Maritime Military Geospatial Products and Services. Australian Hydrographic Data Archive. PCA for Papua New Guinea and Solomon Islands
-Annual operating budget -Budget annuel -presupuesto anual	
-Total number of staff employed -Effectifs totaux -Número total de personal empleado	

-Number of INT charts published -Nombres de cartes INT publiées -Número de cartas INT publicadas	40			
-Total number of paper charts published-Nombre total de cartes papier publiées-Número total de cartas de papel publicadas	342 Aus , 15 SLB and 74 PNG charts = 431 total			
-Number of ENC cells published -Nombres de cellules ENC publiées -Número de células ENC publicadas	817 AU cells, 35 PG Cells and 41 SB cells = 893 total			
-Number of Other charts -Nombre d'Autres cartes -Número de Otras cartas	2 AU and 2 SB Index Charts = 4 total			
-Type of publications produced -Type d'ouvrages produits -Tipo de publicaciones producidas	Product Index – searchable website tool Fortnightly Notices to Mariners (AHP18) Seafarers Handbook for Australian Waters (AHP20) – printed and digital Australian National Tide Tables (AHP11) Australian Electronic Tide Tables ('AusTides' - AHP114) Australian Chart and Publication Maintenance Handbook 4th Edition (AHP24) Maritime Gazetteer of Australia (geographic names as shown on Australian paper nautical charts) – searchable website tool			
-Detail of surveying vessels/ aircraft -Détail des bâtiments hydrographiques / aéronefs	-Name -Nom -Nombre	-Displacement -Déplacement -Desplazamiento	-Date Launched -Date de mise en service -Fecha de botado	-Number of crew -Nombre de l'équipage -Tripulación

-Detalle de los buques hidrográficos / aeronaves	HMAS LEEUWIN	2550	1997	56
	HMAS MELVILLE	2550	1998	56
	HMAS PALUMA	380	1989	13
	HMAS MERMAID	380	1989	13
	HMAS SHEPPARTON	380	1989	13
	HMAS BENALLA	380	1990	13
	Maritime Geospatial Warfare Unit (MGWU)	Vessel of Opportunity	Early 1980s	16
	ASV WYATT EARP	6.3	Handed over to RAN in 1992	
-Other information of interest				

Input to the IHO Publication C-55 (*Status of Hydrographic Surveying and Charting Worldwide*)
Country: ***AUSTRALIA***

Information shown in C-55 is current (i.e. no updates required)

See Separate document SWPHC18-10B (*NAVAREA X Coordinator report*)