



AusSeabed Newsletter No. 33 December 2022

Dear AusSeabed Community

Merry Christmas and A very happy New Year for 2023.

As I return to the office after a whirlwind field trip to close out the year, I cannot help but reflect on how amazing our profession is, how huge our task is, and most of all how fortunate I am to work with such a talented, professional and passionate group of seabed mappers, surveyors and geospatial professionals. I would like to thank all those who have contributed throughout the year, the ASB team in Geoscience Australia, the members for the Steering Committee and the Executive Board, and all of you who are collecting and submitting data to AusSeabed.

The last few months has seen a hectic rush of governance and data processing. We now have an endorsed and published the [AusSeabed Strategy](#), the [AusSeabed 2025 Activities Roadmap](#) to put that strategy into effect, a [First Nations Position Statement](#) published on the website, and [updated Terms of Reference to the Steering Committee and the Executive Board](#). We have our newly updated [National Areas of Interest Tool](#), which is now widely used for the planning and coordination of seabed mapping. The team continue to publish bathymetry datasets on the portal with the first [RSV Nuyina dataset](#) now available, and [the northwest shelf 3D seismic-derived bathymetry dataset](#) also published.

I wish everyone a great and refreshing holiday season and look forward to seeing you all in the New Year.

CMDR Nigel Townsend,

AusSeabed Steering Committee Chair

Newsletter in a nutshell...

- Update on AusSeabed
- New data on the Data Portal
- New AusSeabed Strategy and First Nations Position Statement
- Contribute your National Areas of Interest
- HALO voyage shallow-water mapping and vibro-coring capability on RV Investigator
- Coastal Capture WA
- AusSeabed International
- World-first survey of marine biodiversity in Cocos (Keeling) Islands Marine Park
- Backscatter Working Group (BSWG) Workshop
- New QAX Release
- New bathymetry compilation from seismic data
- Australian Hydro Society awarded Education Award to a Curtin student
- Schmidt Ocean Institute awarded Hydrographic Excellence Award for 2021
- Visit to the Centre for Coastal and Ocean Mapping – Joint Hydrographic Centre (CCOM/JHC)
- Reading corner
- Upcoming Events
 - AusSeabed Quarterly Showcase: 9th February 2023
 - Association of Public Authority Surveyors Conference 2023: 20-22 March, Coffs Harbour NSW
 - EGU Annual Meeting 2023: 23-28 April, Vienna Austria
 - GeoHab 2023: 8-12 May, La Réunion island
 - Locate 2023: 10-12 May, Adelaide SA

Update on AusSeabed

Our full [Annual Highlights Report](#) and most recent [Quarterly Report](#) are now available to read online. Notable annual highlights for the 2021/22 financial year include:

- 38 new bathymetry datasets published to the Data Portal
- 27 new bathymetry surveys acquired by 8 organisations to be made available on the Data Portal in the near future
- 9 000 users of the AusSeabed Data Portal
- 5 300 visitors to the website
- Visible survey priorities from 25 organisations submitted through the updated Survey Coordination Tool
- New Data Portal features, including dynamic colour ramps and a desktop launcher
- \$16 Bn in economic value is added through direct and indirect use of seabed data, as revealed by a Deloitte Economic Access report.

In October, we held our Annual Update/Webinars. The recording is available to view on our [AusSeabed YouTube playlist](#) and includes an overview of our annual progress.

Our quarterly showcases provide a chance for us to show the AusSeabed community what we have been working on in the last quarter and reflect on what was. Based on our progress we offer the community our goals for the next quarter against our project objectives. The **next AusSeabed Quarterly Showcase will be held on the 9th of February at 11am AEDT.**

New data on the Data Portal

- [Peterborough to Port Fairy 2018 2m](#)
- [Apollo Marine Park Bathymetry 2020 2m](#)
- [Southeast Tasmania and Southern Macquarie Ridge \(AUSTREA2\) Bathymetry 2000 120-440m](#)

A new AusSeabed Strategy

After three successful years in establishing the AusSeabed Program, the Steering Committee undertook its first significant review of the initiative. This process has led to the release of a new [AusSeabed Strategy](#) and [2025 Activities Roadmap](#), providing clear direction for the program over the coming years. Thank you to all who contributed to the development of the new Strategy and 2025 Activities Roadmap.



Products

All seabed mapping data and products in the Australian region are guided by F.A.I.R principles and meet the needs of users



Coverage

Seabed data is collated and collected in areas of the Australian region to provide maximum benefit to users



Awareness

The mission of AusSeabed is widely understood, valued and used across Australian Governments and the community

First Nations Position Statement

As a result of the review of the AusSeabed Program, the Steering Committee is committing to actively engage with First Nations Traditional Custodians of Sea Country in-line with a [First Nations Position Statement](#).

The AusSeabed mission will guide the development of a First Nations Strategy, whereby we will engage with First Nations Australians in the co-design of a strategy using a phased approach. We will undertake this process through consultation, community building, and the identification of representative groups to consult with.

Through this process, the AusSeabed community is committed to:

- Genuine collaborative engagement
- Embedding the cultural knowledge of First Nations Australians
- Respecting cultural and intellectual property of First Nations Australians

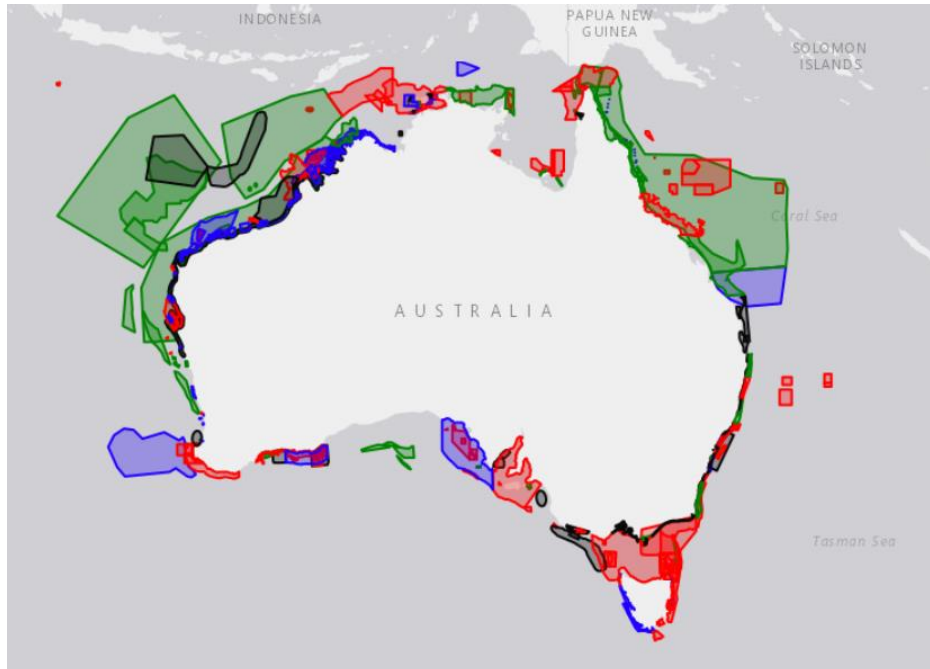
We invite First Nations Australians and Traditional Owners who would like to contribute to AusSeabed to contact us.

Contribute your National Areas of Interest

We thank those who have contributed to the AusSeabed National Areas of Interest tool by submitting prioritized polygons. The usefulness of the AusSeabed National Priorities map as a central location for planning of mapping activities is dependent on up-to-date information. For that reason, we are reaching out to contributors to ask that you review your prioritised mapping polygons, make changes to polygons that need updating, or are no longer valid, and review the priority assigned. Please also add new polygons for areas that have been identified as priority areas by you or your organisation.

The process of revising an area of interest is relatively simple and is conducted through the Survey Coordination Tool on the AusSeabed website. The link to the SCT User Guide is under the Query (?) icon on the upper right side of the Survey Coordination Tool page. Instructions for revising a polygon can be found on page 28 of the user guide.

If an area of interest has been covered by another organization, we encourage you to submit your own polygon for that same area. We ask that updates are finalised by **end of February 2023**. Please reach out if you'd like help in updating your polygons or have additional questions.



National Areas of Interest submitted to the Survey Coordination Tool are available to view on the Data Portal.

HALO voyage shallow-water mapping and vibro-coring capability on RV Investigator

An international team of researchers recently completed an expedition to the northern section of the Great Barrier Reef, to investigate the enigmatic [Halimeda algal bioherms](#) that are found on the outer continental shelf in 20 to 60 m water depth.

The mission of [Project HALO](#) (*Halimeda* bioherm **O**rigins, function and fate) is to understand how these *Halimeda* bioherms have formed over the Holocene, their importance as sedimentary deposits, modern benthic habitats, and their role in biogeochemical nutrient cycling.

Systematic bathymetry mapping using a 200 to 400 kHz Kongsberg EM2040C multibeam echosounder was combined with the simultaneous collection of over 500 line km of acoustic sub-bottom profiles. Additionally, the team acquired camera imagery, CTD profiles and water samples, multi-cores, surface grabs, cross-shelf underway water, conducted sediment incubation experiments, and collected over 1000 specimens of biota.

This voyage was a first for RV *Investigator*, as it was an opportunity to deploy Geoscience Australia's shallow-water vibrocoring system from the vessel. The integration and commissioning of the vibrocoring system represented months of collaborative effort between GA and the MNF. This activity enabled the safe and successful collection of over 175 m of new core, some up to 6 m in length, which will provide valuable sub-surface information to piece together the geological and environmental history of these unusual seafloor features.

The homeward voyage track took the team off the continental shelf to deep water (2000 m) to collect long sediment cores in submarine canyons that connect with the continental shelf, using the MNF's giant piston-corer.

The samples and data collected on the HALO voyage are informing numerous student and collaborative projects. For more information please contact voyage chief scientist Professor Jody Webster jody.webster@sydney.edu.au or co-chief scientist Dr Mardi McNeil mardi.mcneil@ga.gov.au

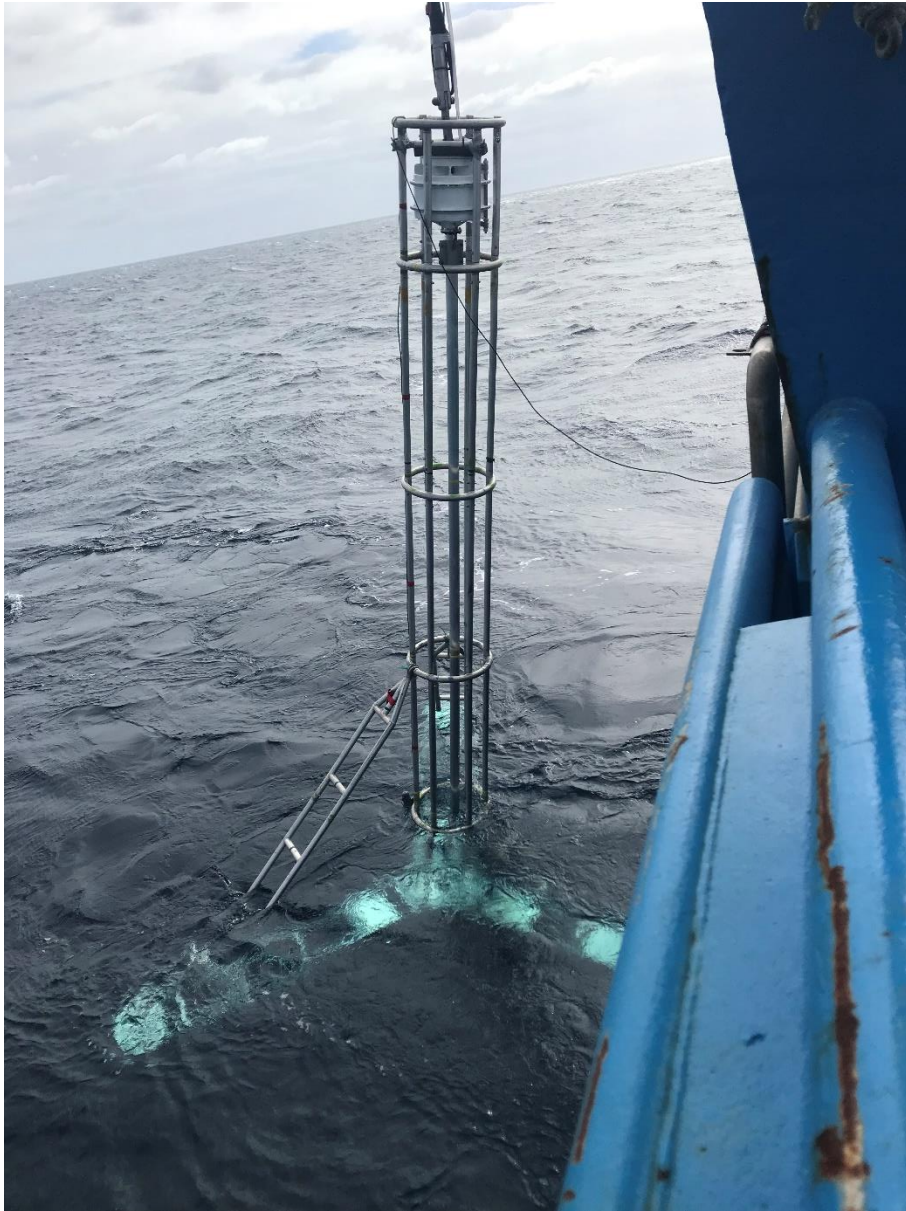


Image credit: Lisa Woodward - CSIRO

Read more about the voyage highlights from [ABC Science News](#) and [Geoscience Australia](#).

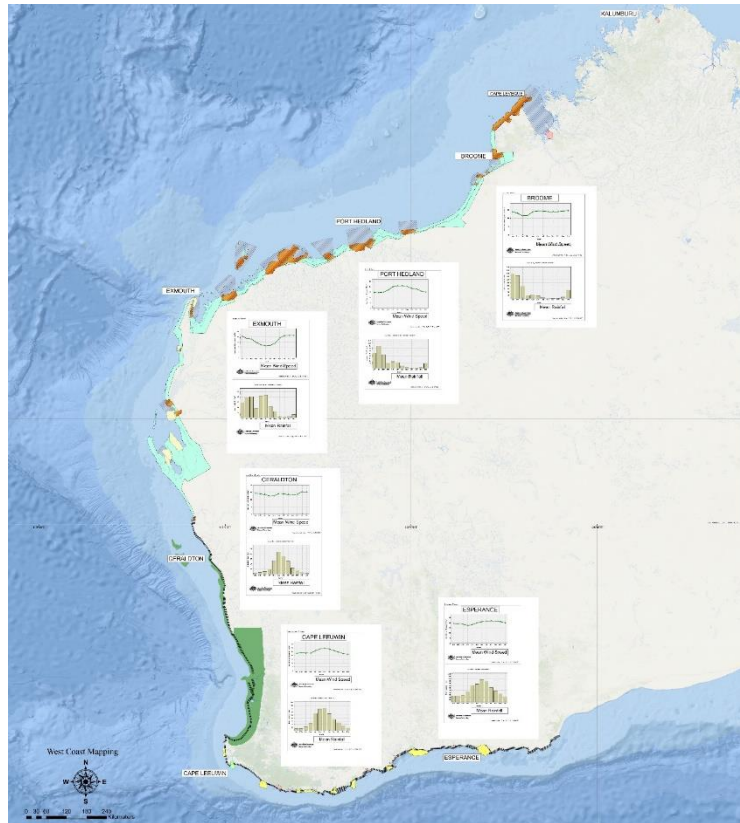
Coastal Capture WA

Western Australia is a big place and to put that into context you can fit 10 United Kingdoms within its borders. It has a long coastline that includes an abundance of offshore islands and reefs making near shore navigation a challenge. WA is also highly productive, with its economy heavily export oriented, seeing around half of Australia's total exports, by mass, of goods each year leaving from WA ports.

Due to the sheer size of Western Australia's coastline, a large portion including the adjacent seabed has not been accurately mapped. To enable better management and sharing of the coastline data resources, the Western Australian State Government formed the WALIS Marine Group (WMG) initially in 2009 and reconvened again in 2016. The Group remains active, having collaborated to co-fund the Bathymetric Lidar projects "*Cape Naturaliste to Two Rocks*" (2009) and "*Hillarys to Horrocks*" (2016). Since then, it has been instrumental in co-funding the "*Southern Coast Run*" which is an Aerial Imagery project capturing the coast from Kalbarri to Israelite Bay every 5 years since 1960. The last Southern Coast Run was completed in 2019 and captured vegetation lines, erosion scarps, dune blowouts, infrastructure layout (groynes etc), vehicle tracks and the zero AHD contour. These WMG capture programs also looked at the threat of coastal inundation with 20% of WA's dwellings and 30% of commercial buildings located within 1 km of the coast. To better understand this threat WMG aims to support investigations by producing high-resolution Digital Elevation Models (DEM) of the coastal strip.

In 2021 a proposal to focus on the "*Northern Coast Run*", a big missing part of the WA coastline, which covers the area from Kalbarri to Cape Leveque, a total distance of 2100 km's, including the large intertidal flats of the Pilbara and the near shore islands was considered.

It wasn't until earlier this year the WA Department of Fire & Emergency Services (DFES) approached DoT Maritime to prepare a competitive Grant submission for Federal Government's Coastal and Estuarine Risk Mitigation Program to better understand coastal hazards and their impacts. The total funds available was \$50 million with a maximum of \$10 million per submission and a required 30% in-kind contribution. WMG saw an opportunity to access much needed funds to complete the proposed "*Northern Coast Run*".



Bathymetric data availability and yearly timing and weather windows around the Western Australian coastline.

Dark Green = Existing Bathymetric Lidar and Topographic Lidar

Light Green = Coastal Aerial Photography and Digital Elevation Model (1m Resolution) creation

Orange = High Resolution Bathymetric Lidar (to 5m) and topographic Lidar for inundation modelling

Yellow = High Resolution Bathymetric Lidar (to 20m) and topographic Lidar

Shaded areas = Areas we would like to capture with combination Lidar and Multibeam survey.

Extending these areas seaward would allow more advanced Wave modelling.

To ensure the grant outcomes were met frantic activity then ensued to identify significant infrastructure, population centres, environmental areas and areas of cultural significance that could be affected by these coastal hazards. Key hazards were inundation caused by tsunami, storm surge caused by cyclones that primarily impact the northern coastal areas and intense low-pressure systems impacting coastal communities in the south and southwest of the state. The resolution needed to ensure accurate numerical modelling of the threat and the requested funding meant several things:

- The Northern Coastrun could be funded and would ensure a 1m Resolution DEM
- The Bathymetric Lidar resolution areas had to be identified and the WMG members would have their say as to any special considerations needed.

- All of the data captured was to be classed as “Open Data” meaning data will be freely available to all users. Data management processes had to be expanded and resources needed to be allocated. In October 2022, DoT Maritime were advised through the Coastal and Estuarine Risk Mitigation Program as having successfully secured funding.

Now the work begins in identifying the next phase of the Coastal WA Capture project, through consultation with the WMG members to prioritise the state’s coastal and marine areas. Plans to start working with the HIPP (Hydrographic Industry Partnership) team at AHO are on the way to ensure that there is no duplication of data capture for Western Australia.

AusSeabed International

AusSeabed plays an important role in the coordination of dissemination of Australia’s bathymetric data. But its impact is wider than Australia alone. Australia is a major maritime nation, with an exclusive economic zone of over 8 million km². As such, AusSeabed plays a critical role in the mapping of the global seafloor. AusSeabed is an especially vital contributor to bathymetric mapping in the Pacific and Southeast Asian regions where Australia is an important neighbour.

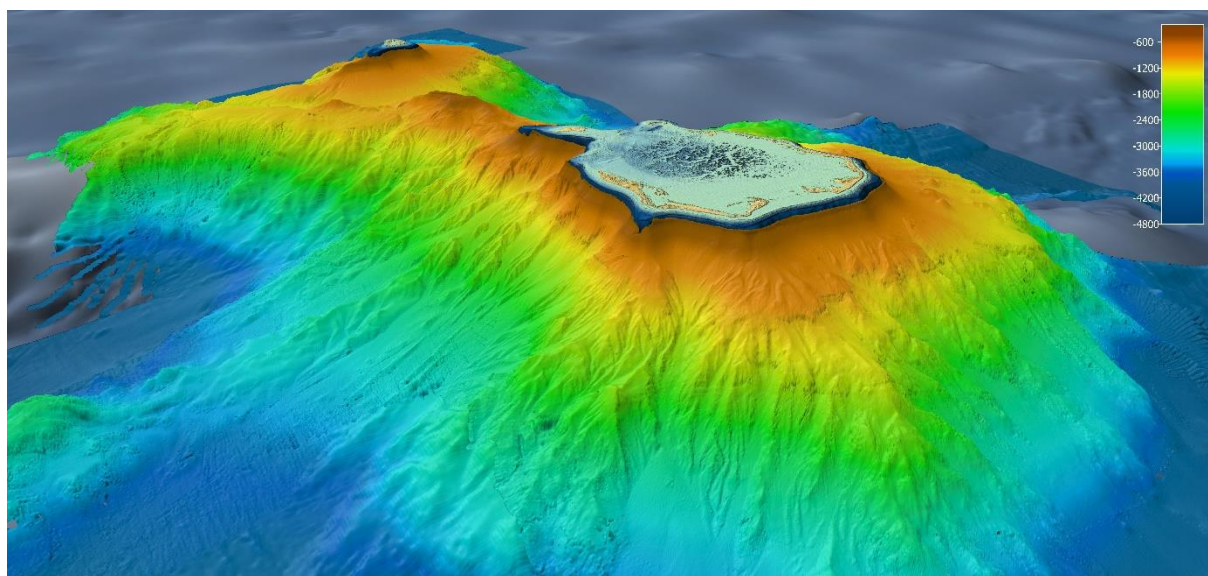
To date, just 24% of the global seafloor has been mapped based on the latest GEBCO_2022 release. Using the GEBCO criteria of what “mapped” means, Australia is doing well at 32% mapped – of which 29.6% comes from multibeam sources. When looked at through the local lens where meter or sub-meter resolution of bathymetry is required, this percentage of “mapped” dramatically reduces.

However, a percentage mapped does not show the whole story. While deep-sea surveys can map large swaths of seafloor, it is the coastal and nearshore surveys that have the most impact to society. This is the zone where humanity usually interacts with the ocean and it is critical that there is continued involvement by state and local government, educational institutes, and port authorities in AusSeabed.

Developments in technology and collaborations in data gathering suggest we are on the brink of knowing much more about size and shape of the ocean. As we look ahead to international programmes such as Seabed 2030 and the [UN Decade of Ocean Science for Sustainable Development](#), the AusSeabed will continue to share data with our domestic and international partners that supports safe, secure and thriving oceans.

World-first survey of marine biodiversity in Cocos (Keeling) Islands Marine Park

The 35-day voyage, led by the Museums Victoria Research Institute, has also enabled the team on board to capture the first high-resolution bathymetry of the new marine park, revealing in incredible detail the ancient underwater mountain that lies beneath these idyllic tropical islands.



The first high-resolution bathymetry of the new Cocos (Keeling) Islands Marine Park.

Read more here: <https://www.spatialsource.com.au/world-first-bathymetry-of-indian-ocean-marine-park/>

Backscatter working group (BSWG) workshop

A three-day international workshop on multibeam sonar backscatter was held (Oct. 25-27, 2022) at Dalhousie University (Halifax, Nova Scotia, Canada), coordinated by the Backscatter Working Group (BSWG) and with support from the Ocean Frontier Institute - Benthic Ecosystem Mapping and Engagement project (OFI BEcoME project – www.ofibecome.org).

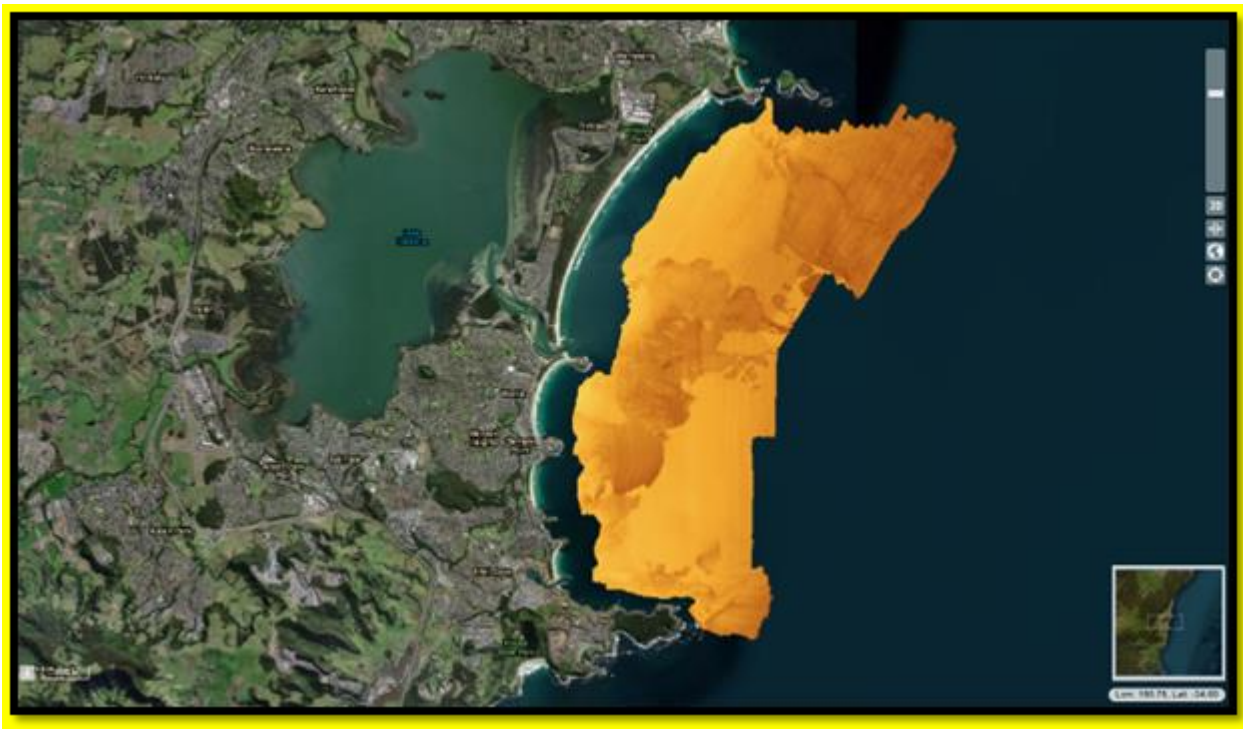
The workshop was attended by 57 delegates: 20 delegates attending onsite and 37 delegates online. The workshop served to continue and expand the BSWG activities, which aim at supporting improvements in the quality and consistency of multibeam backscatter data products. The overarching goals of the workshop were to:

- Present and share information on current backscatter research activities and projects that are underway
- Discuss the objectives, organization, and structure of the BSWG II – and how this group can help to progress the field of backscatter research
- Identify new research opportunities
- Develop a roadmap for future coordinated BSWG activities

Several actions have been decided for the future of the BSWG. This report provides a summary of the workshop, including main discussion items and future direction of the BSWG.

The agenda, presentation PDFs, collaborative notes, and event photos can be found in [the public BSWG Dropbox folder](#) (sub-folder “MEETINGS/BSWG workshop Halifax, Oct 2022”).

The recorded presentations can be found on [the BSWG YouTube channel](#).



Multibeam backscatter image of the Shellharbour Tharawal marine survey collected by the NSW government (Department of Planning and Environment – DPE) during the period 25 May – 30 November 2017 onboard the RV Bombora using DPE's R2Sonic 2022 multibeam sonar. Light colours indicate relatively softer substrate, while darker colours indicate harder substrate.

Direct link to the data on the AusSeabed Marine Data Portal [here](#)

New QAX release

QAX has been updated to allow users to load outputs from gridded file checks into CARIS, change the default checks to IHO 1a specifications and to integrate with the latest version of GDAL. These changes have all been implemented based on end-user feedback and can be [downloaded from GitHub](#). If you have feedback on the QAX tool, please contact ausseabed@ga.gov.au.

New bathymetry compilation from seismic data

Over the past year, the University of Western Australia, Norwegian Geotechnical Institute, UniLasalle and Geoscience Australia have been working together on a project to turn archived 3D seismic data into bathymetric compilations.

These datasets can assist with enabling large scale seabed analyses across currently data-poor tracts of seafloor. The first to roll-out is the Bonaparte and Browse basins bathymetry compilation which will provide significantly more bathymetric coverage to the North West Shelf at 30 m resolution. [The grids have now been published on the AusSeabed data portal](#).

For more on the methods used see: Lebrech, U., Paumard, V., O'Leary, M. J., and Lang, S. C., 2021, Towards a regional high-resolution bathymetry of the North West Shelf of Australia based on Sentinel-2 satellite images, 3D seismic surveys, and historical datasets: Earth System Science Data, v. 13, no. 11, p. 5191-5212 <https://doi.org/10.5194/essd-13-5191-2021>, 2021.

Australian Hydro Society awarded Education Award to a Curtin student

"Daniel Adams, Curtin Masters student and Curtin HIVE team member, is the winner of the 2022 Australasian Hydrographic Society (AHS) Education Award!

Read more about his work here:

<http://www.ahs.asn.au/Education.html>

Schmidt Ocean Institute awarded Hydrographic Excellence Award for 2021

Congratulations to the Schmidt Ocean Institute for being awarded the SSSI Hydrography Commission's 2021 Hydrographic Excellence Team Award, in recognition for the 2020-21 RV *Falkor* Australia campaign.

The Hydrographic Excellence award recognises those individuals or teams working across the various hydrographic disciplines who have made an outstanding contribution to the science of hydrography and industry best practice.

The RV *Falkor* expeditions were a testament to the endurance in overcoming challenges brought on by the pandemic, allowing sustained mapping in remote Australian waters using advanced technologies, innovative crewing practices, data sharing, and excellent outreach communications.



Dr Robin Beaman from James Cook University received the award at the 2022 NSW & ACT Asia-Pacific Spatial Excellence Awards dinner, on behalf of all the SOI team, RV *Falkor* crew, and science teams.

Visit to the Centre for Coastal and Ocean Mapping – Joint Hydrographic Center (CCOM/JHC)

Last week, I visited with US colleagues from the National Oceanic and Atmospheric Administration, CCOM-JHC at the University of New Hampshire and the Lamont Doherty Earth Observatory to discuss existing and potential new collaboration, as well as to hear about the progress that has been done in ocean mapping while we were all hunkered down during COVID. Lots has happened and while I am digesting the information we exchanged, I wanted to draw you to some exciting views I was exposed to at CCOM/JHC. Check the work the [Data Research Visualisation Lab](#) has to offer. Amongst, is what we, hydrographers and seabed mappers, would know as ‘Killing dots’ or data processing, but using [Virtual Reality](#) (VR). I didn’t feel sick doing it in the lab, but couldn’t imagine doing it while at sea. The lab researchers assured me they had done tests on a raft in a wave pool and they didn’t last long before deciding to add some automated motion into the VR to emulate the wave action. Certainly a technology to keep an eye on! As for a summary on the rest of the trip, this will come in the next newsletter. Stay tuned!

Kim Picard, Geoscience Australia



Credit to the VisLab is part of the Center for Coastal & Ocean Mapping/Joint Hydrographic Center at the University of New Hampshire.

Reading corner

Grab a cuppa and have a read of some new relevant material published in the community:

- [AusSeabed Strategy and 2025 Activities Roadmap](#)
- [AusSeabed First Nations Position Statement](#)
- [AusSeabed Annual Highlights Report](#)
- [GEBCO Map the Gaps Symposium](#) took place on Oct 27-28th in Southampton. The recordings of the presentations have been made available [here](#). Please keep in mind that we had a fire emergency on the first morning of the event and so the hosts rapidly found an alternative solution, but to the detriment of online recordings.

Upcoming Events

Stay up-to date on upcoming events [via the AusSeabed website](#). Please contact us if we have missed any, or you are running events or workshops that you would like to make the community aware of.

AusSeabed Quarterly Showcase: 9th February 2023

Our quarterly showcases provide a chance for us to show the AusSeabed community what we have been working on in the last quarter and reflect on what was. Based on our progress we offer the community our goals for the next quarter against our project objectives. The **next AusSeabed Quarterly Showcase will be held on the 9th of February at 11am AEDT.**

Association of Public Authority Surveyors Conference 2023: 20-22 March, Coffs Harbour NSW

APAS hosts an annual conference in the first half of each calendar year which is open to both members and non-members. The conference incorporates a theme each year and traditionally covers a wide range of topics relevant to the surveying and spatial information community. The 2023 theme is "Pirates of the Cadastre". Submissions close on Friday, 23 September 2022. See more information [here](#).

EGU Annual Meeting 2023: 23-28 April, Vienna Austria

The General Assembly 2023 of the European Geosciences Union (EGU) will take place 23-28 April 2023 in Vienna, Austria.

The purpose of the EGU General Assembly 2023 will bring together geoscientists from all over the world to one meeting covering all disciplines of the Earth, planetary and space sciences. It aims to provide a forum where scientists, especially early career researchers, can present their work and discuss their ideas with experts in all fields of geoscience. See more information [here](#).

GeoHab 2023: 8-12 May, La Réunion island

The GeoHab 2022 annual conference will be held in La Réunion Island (Indian Ocean) from May 8 to 12th 2023. Abstract submissions open on December 1st. See more information [here](#).

Locate 2023: 10-12 May, Adelaide SA

Each year, the Locate conference attracts national and international delegates from within and outside the spatial & surveying industry. As Australia's premier spatial & surveying conference, Locate provides guests with a unique opportunity to learn about the latest trends and applications in geospatial technologies. See more information [here](#).

Share your work with the AusSeabed community

Finally, a reminder as always that anyone with an interest in AusSeabed can sign up to the newsletter mailing list on our website, where you can also check out past issues. And please send any items for the next newsletter to AusSeabed@ga.gov.au