AusSeabed AGM and Workshop

No. 5: 12th June 2019, 09:00-16:00, AMSA, WA Port Authority Bldg

Notes prepared by Aero Leplastrier

Workshop Overview

This was the fifth open AusSeabed workshop. Around forty representatives (Appendix 1), both new and existing, from Commonwealth and State Governments, Academic and Private sectors met up to progress the coordination of seabed mapping efforts in Australia. In summary, this meeting resulted in:

- feedback on the proposed changes to the Steering Committee Terms of Reference

- an update of the wider seabed mapping community on the progress made in 2018/19 in the three program themes (Data hub, Tools, Guidelines and Standards, and Outreach, Education and Training).

- the identification of existing data coverage that was missing from the National Coverage map

- feedback on the AusSeabed Data Portal and the Survey Planning and Request tool prototype

- an agreed work plan for 2019

AGENDA

	Responsibility	Action	Time
Meeting Opening			
Welcome and Introduction	RTS	n/a	0905
AGM			
- Overview of AusSeabed and changes to TOR	KP	n/a	
- Strategic Plan Overview	KP	Review	
Activity: AusSeabed planning tool and AusSeabed QC Tool	HP	Action	1010-1050
Break			1050-1120
Activity: Where are we missing Coverage	AL	Activity	1120-1150
Activity: Data portal user requirements	AL	Activity	1150-1230
Activity: Upcoming opportunities for engagement	TI and AJ	Activity	1230-1320
Lunch			1320-1400
Community talks: HIPP Overview and Crowd-sourced Bathy	WS and RB	n/a	1400-1430
AusSeabed Plans for 2019-2020	KP, NQ, RTS	n/a	1430-1500

Action items

Follow up item	Responsible party	Date for completion
Update the terms of reference and republish on the web with the endorsed changes.	GA	September
Update the Strategic plan with the Value proposition table and any last edits	Hugh Parker	September
In the proposed membership of the Executive Board, flesh out the 'Others' box a little more – in terms of how state agencies could become involved in terms of funding and being on that board (Action).	Executive Board and Steering Committee	December (once EB is formed and November Steering Committee has taken place.
Higher level granularity for data download uses by capturing the use when clipping and shipping data.	Contact details for web service	TBC
Think about expanding the multibeam vessel register to include other tools such as Sub-bottom profilers, sediment corers, etc…	TBD	TBC
Develop a Symposium and workshop proposal for AMSA 2019	Tim Ingleton, Alan Jordan, Kam Austine, Wendy Stewart and Scott Nichol	Completed
Develop layer of tide gauges (Ralph says that this already exists)	Investigate need for this layer on the portal. BOM or ICSM might have a listing - Hugh parker to investigate.	November

Use the survey request and planning tool feedbacks to improve the beta product	Nathan Quadros and Frontier SI	September
Take national parks layer from National Maps to show state parks as well as Commonwealth Marine Protected Areas and world heritage (survey request and planning tool)	GA to be pointed in the right direction by Alan Jordan CAPAD and National Map for world heritage maps	October
Use feedback on the Data portal and coverage to improve the online services and the coverage shape file. FIX MISSING DATA LINKS	GA	October
Scope data integration with Seabed 2030	Kevin Mackay	September
Scope Data integration with AODN	GA and AODN (Guillaume and Sebastien)	2020
Finalise the data standards in-line with the results from the workshop. Investigate SSDM attribute fields.	GA and AHO	September
Wrap up the presentations and make those available on the website.	GA	September
Kim's presentation from the symposium will be uploaded to the website	GA	September
Add a check box for data downloads acknowledging that this data is not for navigation purposes.	GA	September
Upload annual report to the website.	GA	September

Follow up with entities that identified missing data during the National Multibeam Data Coverage shape file activity	GA	October

Meeting notes

Welcome and introduction—RTS

RTS: I'd like to acknowledge the traditional owners of the land on which we meet today, and pay our respects to their elders past, present, and emerging.

A general welcome to participants was given along with the housekeeping and evacuation procedures.

Annual General Meeting—KP

Overview of AusSeabed

Vision: By 2030, all available seabed mapping data within the Australian Marine Estate will be readily and openly available, and new data acquisition will take into account the needs of a wide range of users.

Mission: To improve the coverage, awareness, quality, discoverability and accessibility of seabed mapping data for the Australian community.

Goals of Program:

1. Improve the **curation and delivery** of seabed mapping data

2. Improve the **standards and quality** related to seabed mapping procedures and data

3. Nationally **coordinate** seabed mapping activities and objectives

4. D**emonstrate the value** of seabed mapping data for decision-making

Note: There were roughly 6 individuals who had not been at an AusSeabed workshop before and there were no specific objectives that the new attendees had.

Kim summarised the progress on the 2018/19 work plan outlined in the annual report. This will be published on the AusSeabed website.

Strategic Plan overview

An overview of the AusSeabed 2030 Strategic Plan was given, the plan will be available online in August.

DD: I think we need to add a section/paragraph on who benefits from AusSeabed. It would also be good to have a high-level timeline as part of the Strategic Plan.

KP: Yep, good!

RTS: It would be great if people today could push any information on different users and the value/benefits they get from AusSeabed to give this to me.

KP: Feedback on the Strategic plan is currently being collated by Hugh Parker, so send any changes through to him.

Changes to terms of reference—KP

Outcome*: No objections were made to the changes, so they have been accepted in full. New terms of reference will be made available in August.*

Transcript

KP: We also have to consider the Terms of Reference, a few major changes have been proposed to improve the functionality of the Committee in perpetuity. The proposed changes are:

- The Chair position can only be held by an enduring standing member of the committee and the Vice Chair no longer automatically becomes the Chair at the end of the Chair's term.

- General membership on the committee will be for a maximum of two years (with the exception of the inaugural term, where to establish a staggered renewal process half of the general members will serve for one-and-a-half years before the positions are readvertised, and the other half will serve for two-and-a-half years before the positions are readvertised.

- Members on the Committee may withdraw from service at any time provided they notify the Chair in writing as soon as possible.

- In the event that a member of the Committee cannot participate in a meeting, a proxy representative may be nominated with at least one week's notice.

- Some tasks from Secretary's role have been shifted to Vice Chair's role:

    o Help the Chair to plan meetings

    o Organise logistics of the meetings

- In the event of a tie during voting for positions or decisions in the Steering Committee, the chairs vote will count for two. This information will be kept confidential by the secretariat who will be responsible for conducting confidential voting. The Chair's vote will not count for two if the position being voted on is the Chair position.

AL: I seconded the changes.

KP: Are there any objections to the changes as they have been discussed?

Note*: No objections were made to the changes, so they were accepted.*

AJ: AMSA is in Sydney next year, and the Committee might want to have a think about next year's conference and whether any thoughts have been put forward for a symposium session and any other activities that could be used for outreach. By default, the plan is to have the annual workshop at AMSA? Call for symposia will be made in the next 6 weeks for example.

KP: Yes, and good idea. Last year Iain put his hand up to help with the organisation of the symposium – we will have a bit of a talk about that today so think about whether or not you would be in a position to contribute to next year's planning.

Governance Updates—KP

KP: At the last AusSeabed Data Standard workshop (May 2019), the working group raised the need to have a higher level of governance to ensure endurance of the AusSeabed program. As a follow up, representatives from five Commonwealth Agencies (GA, CSIRO, AIMS, AAD, and AHO) met to discuss a business case to form an AusSeabed Executive Board (EB). This case was put forward and endorsed by the Steering Committee during their meeting on 10 July 2019. The EB would initially consist of high-level executives from the 5 Commonwealth Agencies and each would have a standing member on the Steering Committee. The EB would ensure strategic and financial decisions are made responsibly, transparently and are beneficial to the community. The EB will have final say in the approval and endorsement of work plans and funding allocations put forward by the Committee. The members of the EB will be responsible for providing ongoing funding for the AusSeabed Program. The Board also has the potential for other agencies (such as state governments) to become involved down the track under the "other category of members" and an independent industry body representative from one of the large industry bodies would act in an advisory role.

DD: Could you please give an indication of what the investment will fund and roughly what it will be.

KP: Sure, the funding will largely cover the cost of the development and delivery of the data hub. A rough estimation will be around 3 or 4 million with a running cost of our 700 K pa.

DD: Is the data going to be freely available?

KP: Yes, that's right. It will be available similar to the ELVIS (LIDAR data delivery) mechanism where the government absorbs the cost.

The other important thing is that we are aiming to build trust in the system by providing consistent standardised processed data, which means we would save data user time and effort in the individual processing of raw data. At present data users request raw data because they don't trust the processed data delivered or processed data isn't available.

Paula (Frontier SI): Are those executive board agencies the ones who get benefit out of this?

KP/DD/AL/IP: They get benefit out of the mechanism for releasing data in an open, accessible way and using the shared workflow. It ensures efficiency of government through coordination.

We need to ensure that we really address and identify our end users.

Dave: From a practical point of view you need to see data from two points. Publicly funded data needs to be the primary focus and the industry data needs to be a secondary focus.

Wendy: That's why there is that other category on the Executive board – room for development and movement.

IP: Is there a possibility to capture more information about use of the data?

AJ: It would be worth fleshing out the Others box a little more – in terms of how state agencies could become involved in terms of funding and being on that board (Action).

Activity: AusSeabed Survey Planning and Request Tool and QC Tool (Chaired by Hugh Parker)

AusSeabed Survey Planning and Request Tool

HP: Nathan will be running this next session looking at some user testing of the AusSeabed Planning Tool.

NQ: We need to know what specifications are being requested so that we can QC against them. Most of you were at the talk yesterday, so we want this activity to be a little more interactive. I'll give you another brief rundown of how the tool works and Kim is going to go around and make sure each group have a computer that can sign in to the development site.

Participants road-tested the tool.

Feedback:

- It seems like a user can edit other people's surveys and that shouldn't be allowed.

- Voyage track should be allowed for input and not just a polygon (Dave Watts)

- Stats for the survey area are available only in the HIPP side of tools (should be both)

- Add search tool for surveys based on various classifications/agencies/regions as

- Organisation needs the option to put in an organisation (so a blank or other field)

- End date of survey needs to be a captured field

- Layer with existing surveys needs to be able to be cleared without clearing your draft polygons.

- Draft polygons need to be editable, at the moment clearing removes all draft polygons

- Polygon drawing tool sometimes self-selects start point randomly.

- What are the formats that can be uploaded as shape files (e.g. GML, geojson etc.)?

- Review fields that are mandatory and whether it is obligatory to use the tool.

- Explanation of Acronyms/revise usage they currently confuse newcomers.

- Planning timeout needs to be reviewed.

- There needs to be a field for expected quality (with a drop-down menu).

- A setting to allow a restricted view of projects so that it can be used as a local planning tool.

- Specifications/default settings do not follow the Hydro standard chosen.

<u>QA/QC tool</u>

HP: For those of you who weren't at the symposium yesterday Giuseppe has been working with GA for the last month to help start on some automated QA and packaging tools.

KP gave an overview of the AusSeabed Data Pipeline diagram to give context to Giuseppe's QA tools and the role they play in the system.

*GM gave an overview of the QCTOOLS and the AusSeabed development of automated profiles and the underlying processing (**link to presentation on AusSeabed website**).*

GM: We want to be able to standardise and improve the quality of the data that is pushed through the AusSeabed Pipeline.

Future development will focus on:

- Finishing off the new tools

- CCOM Site review Participation of AusSeabed (Kim and GM, July)

- Official release of QA schema 1.0.0

- QAJSON adoption of input/output of QCTools and CA Tools

- Beta release December (?)

HP: Fantastic idea getting GM and NOAA in. GM, can you give an example of how this is used in the NOAA workflow.

GM: We used to have many manual processes and we saw this as a way of reducing the subjective nature of these processes. So we started making a few automated checks, then community was like we want to see this

HP: Will you be putting the HIPP specifications into this Atoll check.

WS: We have already handed over the specs, it's already happening!

HP: From an industry perspective, this is fantastic!

Interest was given from the audience to specifically what checks were in the tool suite. If people would like to know what the checks are, they should look at the documentation for QCTools.

Work activity—Data Coverage and Portal User Requirements (chaired by Aero Leplastrier)

Data Coverage

Last year we agreed that workshop attendees would revise the AusSeabed coverage shape file and if they identified that there were datasets that existed but were missing from the coverage shape file, they would send in the coverage polygons for those absent datasets. Only one or two attendees actually did this, so what we want to do now is just run an identify session on the AusSeabed Data Coverage layer. Look for the coverage of your datasets online and then mark up missing areas on the maps around the room.

Feedback:

- Coverage held by AIMS, EOMAP, WA, NSW OEH, and EGSSurvey was identified to be missing.

GA will be following up with these individual agencies in August.

Portal User Requirements

Feedback:

- Small Island names don't show up on the map

- It would be nice to be able to toggle between shaded bathy and coverage tools

- Ability to turn the fill of polygons off (so you can see what is underneath)

- Not user friendly on an iPad or tablet (really slow and buggy)

- Keep the selection area (either box or polygons) to filter different data

- Depth scale and colour should change depending on window size.

- Need an acknowledgment checkbox before someone downloads data saying that "I acknowledge that this data is not for navigation purposes.

- Many data sets do not have correct or working data links

- Portal is not user friendly (try and develop better UI) chase up Hugh Parker about example portals that work well.

- Planning tool and marine data discovery tool should work together (you should be able to view one with the other.

- Metadata suggestion was that SSDM has a list of metadata

Activity: Opportunities for upcoming Engagement—Tim Ingleton and Alan Jordan

This activity was held to capture the outreach events (conferences and meetings) that AusSeabed should participate in to ensure that we are reaching as much of the community as possible. The following events were proposed:

- FOU (IMOS)

- ACOMO

- AUT (AHS)

- GEOHAB (Venice)

- Shallow Survey (2021)

- Canadian Hydrographic conference

- AOG (Feb March 2020)

- Coast + Ports (Hobart and Perth)

- Australian Coastal Society

- WAMSI events list

- Great Barrier Reef Restoration Symposium

- Coastal Conference QLD 21/8, NSW

- Ports Australia Brisbane 2020

- Ports Working Groups

- Society for Underwater Technology Perth 23rd October

- Australian Society of Fish biology September (annual conference)

- State recreational fishing organisations

- NEN (biannually)

- AMSA State meetings

- Museum (State and National)

- WAVES (Melbourne Uni)

- GEBCO

- ASFB

- SSSI (Locate)

- Earth Observation Australia September 2020

- Australia Maritime safety Authority

- APPEA

- IMOS data discovery workshops – Could come up with a similar quick example

- Australian Maritime Museum (Develop a display for them) Emily Jateff

Curator ocean science and
technology. emily.jateff@anmm.gov.au

AMSA 2020 planning – The Anthropocene

TI, AJ, WS, KA have agreed to co-plan the AusSeabed engagement and events in July 2020.

TI: Emily Jateff was at AMSA 2019 and could potentially assist with the symposium? Some topics that fall under the Anthropocene could be:

- Geology

- Water column

- Sea level rise and risk

- Effects of trawling and using multibeam to help identify bad trawling and how to trawl better.

Community Presentations

Wendy Stuart—The Hydroscheme Industry Partnership Program (HIPP)

The Hydroscheme has typically been a five-year survey rolling plan that consisted of AMSA surveys focused on safety of life at sea.

The Hydroscheme program is changing from 2020 to focus to address the growing realisation that there is a need to better understand our physical environment including the maritime domain. This program will help to deliver a nation building activity by:

- *more effectively contributing to our blue economy and maritime security*

- *enhancing safety and efficiency of marine navigation and commerce*

- *driving innovation in our maritime domain*

- *proactive stewardship of our oceans and seas*

- *greater research, understanding and management of our marine environment*

- *growing and developing a sustainable hydrographic surveying industry as an essential component of our maritime infrastructure*

All data collected by the HIPP will be released publicly. This will require a lot of work and changing the underlying data release policies of the department of defence.

Rob Beaman—Crowd-sourcing Bathymetry (CSB)

Rob has been setting up data loggers on public vessels for the last 6 months. These public boats cover a lot of distance and highlight the potential for CSB to play a big part in filling in the gaps of data coverage. Data is processed using a python script and sound speed. The data received have almost no noise, including almost no navigation spikes.

Since January, there have been data collected over 10,000 km in the last 3-4 months (3 times the distance from Sydney to Perth) with 99 % accuracy. Installation costs around $1000 per vessel for installation and $ 4800 per year for software licenses. These boats cost up to $10,000 per day, so the

notion of enlisting their assistance in collecting survey tracks is savvy. It is crucial that [Rob] gives feedback to the people who provide the boat and also assist with the different parts of the project.

RB is currently trying to become an IHO trusted node (which is taking a long time). The data are currently being submitted to the IHO Data Centre for Digital Bathymetry (DCDB) form, but [he] thinks it would be better to submit this data with AusSeabed.

SC: This doesn't collect Pitch and Roll, how do you see that playing into the uncertainties?

RB: In this situation (shallow water) it isn't so important, in deeper water though it would certainly affect results.

DD: How hard would it be to use the AIS systems that a lot of the commercial systems are operating on?

RB: It's not possible. An AIS is a collision avoidance system and it is limited (it can be turned on and off) the download links are distributed around the globe, but at the moment it isn't possible. A couple of years.

AusSeabed Work Plan Priorities—KP, NQ, RTS

See Appendix 2

Closing remarks

KP: Big thank you to Jay Illingworth, Ralph, Nathan, Iain and Aero for helping organise this workshop and the other AusSeabed activities that we had as part of AMSA 2019. This is a community collaboration, if you don't see yourself using the tools that we are building then we are failing. Just remember there is no us and you in this community—there is just us.

Workshop closed at 3:15

Appendix 1 Attendee List

Name	Organisation
David Crossman	IIC
David Donohue	iXblue
Ronen Galaiduk	AIMS
Tim Ingleton	NSW OEH
Elizabeth Johnstone	iXblue
Alan Jordan	NSW DPI
Michael Kuhn	Curtin
Kevin Mackay	NIWA
Giuseppe Masetti	CCOM
Kathy Murray	DBCA
Hugh Parker	Fugro
Iain Parnum	Curtin
Kim Picard	GA
Nathan Quadros	FrontierSI
Kate Rampellini	Curtin
Justy Siwabessy	GA
Michele Spinoccia	GA
Ralph Talbot-Smith	WA DoT
Emily Twiggs	EOMap
Dave Watts	CSIRO
Mary Young	Deakin
Wendy Stuart	AHO
Kam Austine	EGSsurvey
Mick Hawkins	Fugro
Petra Helmholz	Curtin
Mark Case	AIMS
Matt Boyd	CSIRO
Rodney Hoath	WA DoT
Simon Collings	CSIRO
Ian Eliot	Seashore Engineering
Sira Tecchiato	BMT
Katherine Butcher	Total Marine Technology
Paula Fiévez	FrontierSI
Jay Illingworth	Fremantle Ports
Scott Nichol	GA
Aero Leplastrier	GA
Rob Beaman (online)	JCU

Appendix 2 Work plan 2019/20

The following tables comprise work plan activities identified by the AusSeabed Steering Committee in November 2018 and subsequently refined by program theme working groups. In some cases, steering committee members or organisations have already nominated to take the lead on specific activities; other activities are unassigned at the time of publication of this document. Members of the AusSeabed community are encouraged to lead or propose an activity, and/or join a working group by communicating with the activity lead. Activity leaders are responsible for keeping the program theme leader informed of progress, issues, and any projected shortcomings.

1.1.1 AusSeabed overarching program activities

This table was added since the initial work plan was developed by the steering in November 2018.

Activity	Activity description	Participating Organisations	Intended completion	Update
Secure an ongoing program	Establish a governance model to secure ongoing funding, thus an enduring program	All	Dec 2019	Establish the Steering committee (Nov 2019) Drafted (GA, AHO, CSIRO, AAD, AIMS) business case for the establishment of a high level 'board' to address ongoing funding (June 2019)
Governance	Execute governance model	All	Ongoing	Set up quarterly steering committee meetings (executed Nov 2018, April 2019 and prepared July 2019)

Strategic Plan	Development of the strategic plan for the program	All	July 2019	Drafted plan and distributed to SC and ASB community for comments (April 2019) Finalise plan and endorsement by SC (July 2019)
Annual work plan	Develop and endorse annual work plan for all program themes	Steering Committee (SC)	Jan 2019	Developed work plan and distributed to community (Feb 2019)
Annual reporting	Publish annual program report	Theme leaders (GA / FrontierSI, WA DoE)	June 2019	Developed draft report (June 2019)
Communication material	Development of material to enable steering committee and community members to promote program	GA		Developed generic slide deck Developed video Developed and printed pamphlets and banner Established GovTeams for steering committee communication Developed monthly newsletter template and distribution system (March 2019, GA/EGS). Distributed 4 newsletters

1.1.2 Data Hub (led by Kim Picard, Geoscience Australia)

Activity (Development phase)	Activity description	Participating Organisations	Intended completion	Update
Survey extents coverage (problem scope)	1. Rebuild coverage polygons based on representative grid size. 2. Review attribute information 3. Update/collate other missing coverage	Geoscience Australia & other collaborators	Ongoing	1. In progress 2. TBD 3. Collaborators coverage received, awaiting publication on the web.
ASB communication (problem scope)	Establish data hub working group and set up regular meetings.	Geoscience Australia	Ongoing	Bimonthly meetings established, executed Feb, April, and June 2019.
Metadata standards (problem scope)	Scope existing metadata standards to enable interoperability between Australian and international collaborators.	Geoscience Australia	July 2019	Existing metadata standards in-used and proposed for AusSeabed compiled by GA and distributed to collaborators for workshop discussion (May 2019).
Data formats (problem scope)	Scope existing formats to understand the diversity and develop a plan to facilitate data QA and ingestion into the data hub.	CSIRO/ Guardian Geomatics/ Geoscience Australia	July 2019	Compilation and publication of MBES user-need analysis completed by FrontierSI, GA and Deakin (June 2019). Existing data formats in-used and proposed for AusSeabed compiled by GA, Guardian Geomatics and Australian Hydrographic Office, and distributed to collaborators for workshop discussion (May 2019).
Local portal integration into the AusSeabed Data	Each agency planning to be a local hub to scope the integration to the Data Hub	CSIRO / GA / AAD / AHO / WA DoT		

Hub (problem scope)				
Standards establishment (Plan development)	Establish data format and metadata standards to facilitate data QA and ingestion (Plan development)		July 2019	Data standards workshop held at GA (May 2019) Workshop minutes drafted with proposed standards agreed (June 2019)
Scope integration of all data hub product suites (Plan development)	Develop a plan to integrate all product suites (bathymetry, backscatter, sub-bottom profile and sediment), starting with bathymetry and backscatter products	Unassigned	July 2019	Live data hub roadmap developed and circulated to data hub working group and Steering Committee (March 2019). Roadmap socialised with broader AusSeabed community through various workshops (May 2019)
AusSeabed data hub functionality (Implementation)	Refer to Data Hub roadmap	Geoscience Australia		Live data hub roadmap developed (March 2019) and circulated t Steering Committee (June 2019).
Portal maintenance and layer inclusion (Implementation)	1. Continuously update the portal with new or updated layers and datasets (e.g. marine parks, state shapes, other WMS) 2. Scoping redesign and migration of portal to optimise visualisation and delivery	Geoscience Australia	Ongoing	1. Added EEZ, State boundaries, Marine Parks, Available bathy compilation polygons, NIDEM, 5m CSIRO bathy, 30m GBR and N Aus, 50m, Geomorphology, Sediments) 2. Scoping and transitioning to GA EFTF portal to increase capability and functionalities
ENC S-100 onto portal (Implementation)	Investigate release of ENC and integration on the portal	Unassigned		
Machine learning to optimise data processing and cleaning (Implementation)	Investigate the capability of tools that are available or in development	Geoscience Australia / CSIRO	December 2019	TBD

Antarctic data hub data exchange (Implementation)		Australian Antarctic Division / Geoscience Australia		TBD
Update bathymetry model (Next phase)	Update Geoscience Australia 2009 national bathymetry model	Unassigned	Once hub operational	TBD
Develop functionalities to inform survey planning phase (Next phase)	Enable extraction of data according to survey planning polygon (e.g. existing data in a permit area).	FrontierSI / Geoscience Australia		See TSG for more details
Sediments (Next phase)	1. Develop a standard of procedures (SOP) for sediment sample acquisition and analysis that will be delivered through the GA MARS database 2. Compile existing sediment samples that are not in the MARS 3. Publish MARS as a live layer onto the portal	Unassigned		1. NESP developed and published. SOP implemented with AHO 2. TBD 3. Delivered and analytics built upcoming EFTF portal and in testing
Line planning tool (Next phase)	Make accessible in GitHub then integrate to Survey Planning tool	Guardian Geomatics / Geoscience Australia / FrontierSI		Tool published on GitHub (2019) and being tested for integration in the ASB tools in development
Maintenance/upkeep of website and portal (Next phase)	Review website information and update as required (e.g. Permitting requirements, Licencing, Authorities)	Unassigned		TBD

Upkeep and maintain submitted datasets (Next phase)		Geoscience Australia		Ongoing in the GA established protocol. New collection management in-development See also Portal maintenance and layer inclusion update
Integration into external systems: AODN and Seabed 2030	Develop SOP to integrate / provide data to the AODN and GEBCO			Integrated first bathymetry layers and sediment layers to the AODN portal (March 2019). Review and development of the workflow for AODN in progress

1.1.3 Tools, Guidelines, and Standards (lead by Nathan Quadros, FrontierSI)

Activity (Development phase)	Activity description	Participating Organisations	Intended completion	Update
Priority Map Review	In 2017, a map showing government priority areas for seabed mapping data was published. This activity aims to update these priorities based on the present needs.	Geoscience Australia and Parks Australia	Ongoing	Revised and web update pending resources
Database of Reference Surfaces	The reference surface initiative is a program to create a series of highly accurate vertical surfaces with a known uncertainty around Australia. This initiative will provide a standardized vertical verification capability (and horizontal if possible), which will allow a direct comparison between different survey vessels and between the same systems over multiple survey seasons.	Australian Hydrographic Office	Ongoing	TBD
ASB Planning Tool for MBES data	The MBES ASB Planning Tool will assist the AusSeabed community to develop MBES (and related seabed mapping technology) survey requirements through an assisted online workflow. The workflow will also enable industry to submit survey requests to the Hydroscheme Industry Partnership Program (HIPP).	GA, FrontierSI, AHO, Deakin University	July 2019	Minimum viable product developed and launched at AMSA (July 2019). Completed MBES user-needs survey and analysis. Report published on AusSeabed website (May 2019) Pending: Extraction of upcoming surveys planned using the tool and integration to ASB portal.
ASB QA Tool for MBES data	The QA process for MBES surveys will ensure data products are fit-for-purpose and meet a minimum ASB quality standard. The software will identify and design key metrics to assess	GA, FrontierSI, AHO, CSIRO, NOAA, CCOM	July 2019	Developed prototype QA process (Apr 2019)

	MBES data quality, with the supporting automated algorithms and processes.			Established collaboration with CCOM and NOAA to leverage of existing tools (Apr 2019) and GA hosted two staff for one month (Jun-Jul 2019). Initiated development of automated pipeline and additional checks for Raw (L0) and Gridded (L3) products (June 2019)
MBES Performance Test Compilation	The performance test compilation will look to create a guide on a set of tests for the monitoring of multibeam system performance over time. Mainly aimed at vessels with permanently mobilised multibeam systems it will include a variety of tests and procedures that are designed to best represent the performance of the system as a whole and give a guide on how often these tests should be performed to obtain a reliable understanding of a system's degradation.	CSIRO		TBD
Upkeep of AusSeabed Multibeam Guidelines	The guidelines provide procedures mainly on survey planning, data acquisition and submission i.e. from the presurvey planning phase to the data submission phase, off the ship. They are designed for a range of audiences, from those experienced in seafloor mapping using swath acoustic systems, non-experts who are developing mapping capabilities, and those contracting seafloor mapping surveys using swath systems.	Fugro, Geoscience Australia and IX Blue	July 2019	TBD
Establish an AusSeabed Processing Standard	At present, data is being cleaned and published mainly in an inconsistent manner that is variable depending on the application. This activity aims to produce an agreed bathymetry data processing standard for the products that will be published through the AusSeabed data hub.	GA, CSIRO and NSW OEH	July 2019	Roadmap in development

Australian Guideline for LiDAR Bathymetry	The ALB guidelines will provide recommended technical specifications for the acquisition of bathymetric LiDAR. They will be similar in design to the airborne LiDAR specifications released by ICSM.	FrontierSI, Fugro and IX Blue		TBD
Australian Guideline for Satellite Bathymetry	The SDB guidelines will provide recommended technical specifications for the acquisition of satellite derived bathymetry. They will be similar in design to the airborne LiDAR specifications released by ICSM.	FrontierSI, EOMAP, IX Blue, GA, CSIRO	Ongoing	TBD
Australian Guideline for Crowd-Sourcing Data	Citizen Science Bathymetry (CSB) involves volunteer observers who operate vessels-of-opportunity in places where nautical charts are poor or where the seafloor is changeable and traditional hydrographic assets are not easily available. The AusSeabed vision allows for the opportunity to maximise CSB through engagement with the wider marine community, providing mariners interested in filling the gaps in ocean floor data an opportunity to contribute to AusSeabed bathymetric coverage.	Deakin University and James Cook University		Crowd-source project underway with JCU (Dec 2018)
Australian Guideline for Sub-Bottom Profiling	The SBP guideline will inform best practice for the acquisition of sub-bottom profile data across a variety of substrate types, with an emphasis on the resolution vs depth of signal penetration. Also envisioned is an SBP atlas to inform the community about the application and benefits of SBP for understanding the geological context of bathymetry data.	GA, IX Blue	December 2019	Completed scoping of guideline document through NESP SOP D2 project
Australian Guideline for Backscatter	The work on backscatter guidelines will be focus on refining and augmenting the technical specifications in the Australian Multibeam guidelines to align with the recommendations of the GEOHAB Backscatter Working Group. This	CSIRO, GA, IX Blue, NIWA, Guardian Geomatics		TBD

	work will provide a high-level overview of backscatter current best-practice with links to in-depth technical documentation on both acquisition and processing.			

1.1.4 Outreach, Education and Training (led by Ralph Talbot-Smith, WA Department of Transport)

Activity (Priority)	Activity description	Participating Organisations	Intended completion	Update
Workshop and Symposium Planning (1)	Secure and prepare AMSA 2019 Symposium and Workshop – Perth and the associated steering committee meeting	WA DoT / Curtin / GA	June 2019	Accepted full day symposium and workshop at AMSA (April 2019) Prepared AGM/workshop (June 2019)
Project Management system (1)	Establish a system to manage program projects (e.g. JIRA)	GA	March 2019	GA investigated JIRA licence in-house, but unable to add external members (Nov 2018). Activity put on hold
Education opportunities (1)	Develop relationships and initiatives to educate, train, provide opportunity to expand seabed mapping knowledge and skills. These includes: 1. Secure lecture during HMAS Penguin hydrography training program 2. Develop projects for postgrads and internship opportunities 3. Promote Uni/Education Related Studies to potential community 4. Develop material for career info paths	James Cook University/Deakin University	September 2019 (Navy lecture)	1. GA is in contact with HMAS Penguin to arrange in-principle agreement to have ASB give lecture 2. Connected JCU postgrad with APR internship with CSIRO/MNF DoTWA and Curtin Uni developed work experience program with DoTWA. Led to 5 persons completing program A National Register has been established within the Steering committee Communicated AusSeabed through the CSIRO MNF – Collaborative Australian Postgraduate Sea Training Alliance Network

	5. Encourage establishment of Hydro Training Cat A and B			(CAPSTAN), particularly the April 2019 voyage where hydrography was a focus for training. CAPSTAN program 3. TBD 4. TBD 5. TBD
Outreach activity registry (1)	Establishment and Maintenance of a Central list identifying outreach activities (e.g. meeting, conference) and potential individuals and organisations that should be introduced to ASB	WA DoT	Dec 2019	Created a registry within GovTeams and output that can be viewed in Google Maps
Transit data acquisition for all vessels (2)	Ensure that all vessels with seabed mapping capability collect routinely transit Data and supplies to AusSeabed. This includes improved coordination of the Public Vessel Status (PVS) through DFAT.	GA/CSIRO	Dec 2019	PVS coordination review is in progress (Andrew Carroll, GA &Tony Moates, MNF)
Criteria for Contributors Membership/Recruitment of Contributors/Review of Membership (3)	Establish criteria to define AusSeabed collaborator status	Unassigned		TBD
Newsletter (3)	Set up an automated email system with the website (incl. info on resource innovation, tech events, etc.) Coordinate with AHS and other appropriate marine (NESP, IMOS) newsletters	GA / EGS / AHS	Jan 2019	Established and publication of newsletter since March 2019
Measures of Progress and Success (3)	Establish method to measure progress of the program and successes	GA		Defined in the strategic plan (June 2019)
Analysis of Backscatter Methods (3)	Review the various methodologies used to process seabed backscatter and report.	Unassigned		TBD. Moved to TSG and likely an output for Geohab BSWG.

1.1.5 Additional activities undertaken since the development of this work plan at the Steering Committee establishment meeting in November 2018.

Activity (Program Theme)	Activity description	Participating Organisations	Intended completion	Update
Outreach activities (OET)	Plan a number of opportunities to promote, discuss AusSeabed	All	Ongoing	See table 1.1.6
Communication material (OET)	Development of material to enable steering committee and community members to promote program	GA		Developed generic slide deck Developed video Developed and printed pamphlets and banner Established GovTeams for steering committee communication Developed monthly newsletter template and distribution system (March 2019, GA/EGS). Distributed 4 newsletters
Publication participation	Publication where AusSeabed was mentioned			SSSI POS100 Apr/May 2019 edition written by Stuart Edwards and Matt Boyd, CSIRO (May 2019). https://www.spatialsource.com.au/magazine Wolf et al., 2019. Seafloor Mapping – The Challenge of a Truly Global Ocean Bathymetry, Frontiers in Marine Science. https://www.frontiersin.org/articles/10.3389/fmars.2019.00283/full
Association Recognition	Established recognition pathways with relevant associations	GA / AHO		Surveying and Spatial Sciences Institute (SSSI) are awarding credits to individuals who contribute to AusSeabed events and development

1.1.6 Outreach registry for 2018-2019

What	When	Where	Who	What was presented	Outcomes (where applicable)	Links (where relevant)
Hydro 18	Oct-18	Sydney	Sam Amirebrahimi (FrontierSI)	MBES user-needs analysis results		
GEBCO 35th meeting	Nov-18	Canberra	Kim Picard (GA)	AusSeabed program		
Seabed 2030 Atlantic & Indian Ocean Regional Centre	Oct-18	New York, USA	Vanessa Lucieer	Seabed mapping in Australia from a NESP and AusSeabed perspective		
American Geophysical Union meeting	Dec-18	Washington D.C., USA	Kim Picard (GA)	Side meetings to discuss broader uptake of seabed mapping eg. UN Decades, OceanObs '19. Presented ASB at seafloor mapping session.	Submission of a breakout session proposal "*Seabed mapping, the missing link in OceanObs*". Aim to bring mapping and OceanObs communities to help each other	here
					International acknowledgement of ASB	
Centre for Coastal Ocean Mapping (CCOM)	Dec-18	NH, USA	Kim Picard (GA)	Presentation to NOAA and CCOM	Identified similarity with NOAA proposed program	
National Marine Science Committee (NMSC) quarterly Meeting	Feb-19	Canberra, Australia	Kim Picard (GA)		Awareness and understanding of ASB within the marine landscape leaders	

Open Geospatial Consortium (OGC) Marine Summit	Mar-19	Singapore	Kim Picard (GA)	Presented Data Hub to Marine Domain Working Group		
Australian Ocean Data Network (AODN) Technical Advisory Group (TAG) meeting	Apr-19	Hobart, Australia	Kim Picard (GA)	Data Hub progress update		
Seabed 2030 South and West Pacific (SaWPac) Oceans Regional Mapping Meeting	Mar-19	Wellington, New Zealand	Kim Picard (GA), Vanessa Lucieer (UTas), Robin Beaman (JCU), John Maschke (AHS), David Donohue (iXblue)	Presented AusSeabed and Data Hub update		here
Locate19	Apr-19	Melbourne, Australia	Sam Amirebrahimi (FrontierSI); GA	Progress on QA4MBES tool (Data Hub); Booth display	Upcoming meeting.	here
SDBday	May-19	Sunshine Coast	Kim Picard (GA)	Keynote on AusSeabed. Want to attract SDB crowd to join	Upcoming meeting.	_
APPEA 2019	May-19	Brisbane, Australia	Kim Picard (GA)	Presenting AusSeabed at Geoscience Australia's booth.	Upcoming meeting.	here
AHS/FHS world hydro day in Fiji	Jun-19	Suva, Fiji	John Maschke	Present AusSeabed on behalf of SC (requested by Kim)		_

International Cable Protection Committee (ICPC)	19-Jul	Perth, Australia	Ralph Talbot-Smith Kam Austine	Potentially Presenting to ICPC chairman at AMSA19	Upcoming meeting	
WALIS Marine Group	19-Mar	Perth, Australia	Ralph Talbot-Smith	Presented AusSeabed to State Government Departments	Commitment from group to advance AusSeabed and support AMSA19	
Western Australian Harbour Masters	19-Mar	Fremantle	Ralph Talbot-Smith	Presented AusSeabed and encourage involvement in next AusSeabed Workshop	Positive reaction to contribution of survey shapes. Reluctance to centralisation of Raw and processed data	
AHS		Wollongong	Wendy Stewart, Tim Ingleton	Discussions of priority survey areas NSW coastal waters	OEH complete sections of Wollongong areas for AHS, AHS to include area of interest at Newcastle for OEH + backscatter	
World Ocean Day		Scotts Head NSW North Coast	Tim Ingleton	World Ocean Day - 'Laser beams and sonic waves'	Science talks around LiDAR/LADS and MB for mapping the coast for local primary and high school students	
Hypack conference		Hornsby NSW	Tim Ingleton	Advert for AMSA sessions and AusSeabed Workshop at Hypack conference, hosted by Bruttour Pty Ltd		