



AUS
SEABED

Strategic Plan

2030

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1 Introduction

Our 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. This will facilitate collaborations between government, research institutions and the private sector while contributing to the blue economy and opening up new avenues for scientific investigation.

Our mission

Improve the awareness, coverage, quality, discoverability and accessibility of seabed mapping data through coordination and collaboration in the Australian region.

1.1 Overview

Oceans are critical to the health of the Earth's ecosystem, and yet, are poorly understood relative to the terrestrial environment. Australia presides over one of the three largest exclusive economic zones (EEZ) on the planet (1); however, our responsibilities extend beyond this, in terms of search, rescue, and research. The value of our marine estate is huge, with contributions of our *Blue Economy* forecasted to reach \$100 billion per annum by 2025—not including an additional \$25 billion worth of ecosystem services, such as, coastal protection, biodiversity support, and carbon sequestration (2). A multidisciplinary approach to marine science is essential to improve our understanding of the ocean to realise these benefits, particularly at the confining boundaries, where complex interactions between the water column and the seafloor, atmosphere, land surface, ice, freshwater systems, or human activities are concentrated (3).

Accurate knowledge of the shape, structure and texture of our seafloor from the coast to the abyss is fundamental to many applications considered critical to modern society. Safe navigation, hazard modelling, and Defence, are all examples of activities that rely intrinsically on high-quality, high-resolution seafloor mapping data, and there are many others (Figure 1). By enabling these practices, seabed mapping supports the economic and social development of coastal nations. The benefit to cost ratio of seabed mapping has been investigated by a number of studies (4, 5, 6) and estimates give a range of returns, from a conservative 3.9:1 to an extensive 30:1 on a per dollar basis, depending on the nature of direct and indirect benefits assessed and the particular regional economy. In Australia, more than 99 per cent of all import and export trade relies on the maritime transport sector (7), and more than 85 per cent of the population live within 50 km of the coast, making coastal hazards, marine industries and well-informed environmental management of the marine estate important issues in Australian society (2). Accurate bathymetry underpins these and many other coastal and marine activities and challenges (Fig. 1) and therefore we, as a nation, stand to benefit considerably from better data management and infrastructure to support the seabed mapping sector.

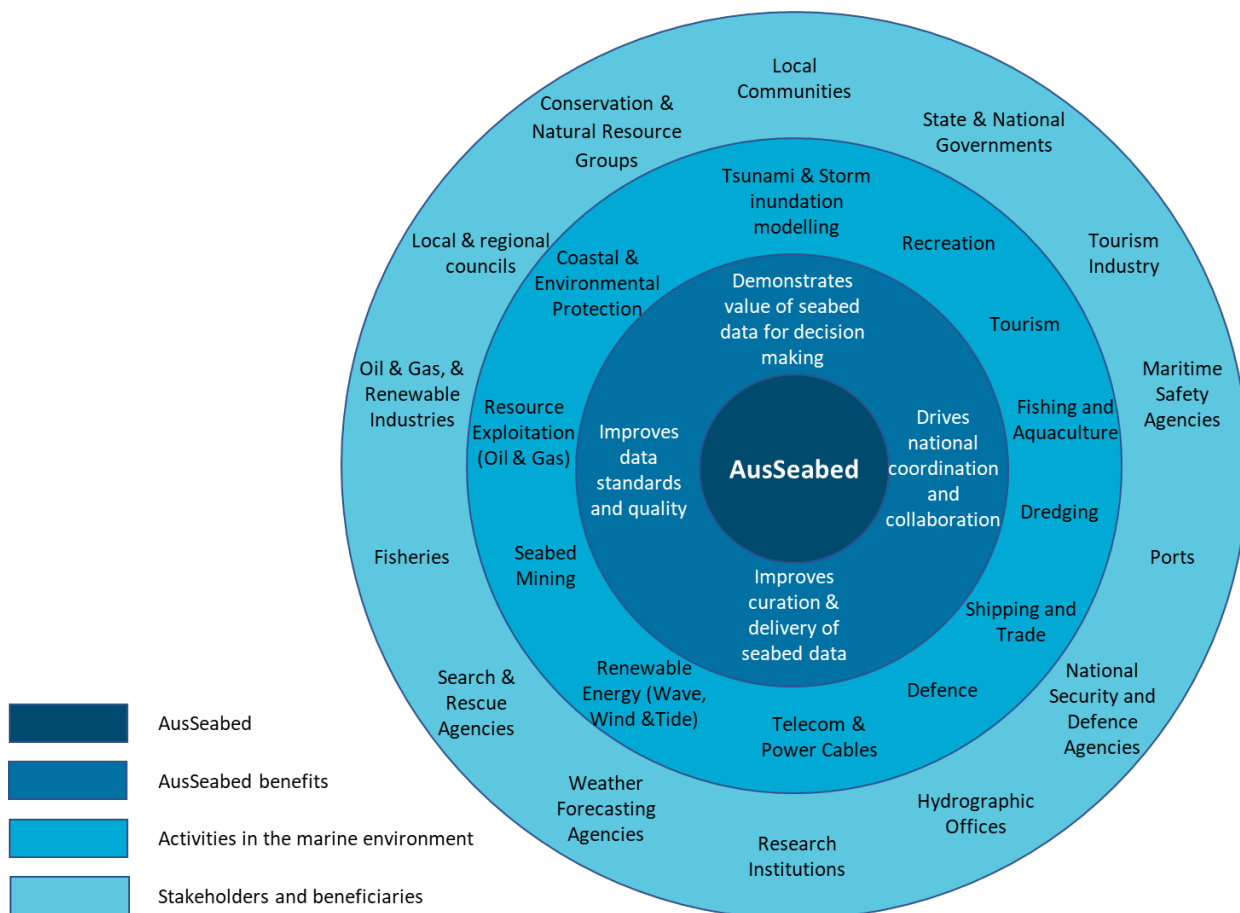


Figure 1. The activities and stakeholder groups that will benefit from having greater seabed information delivered through the AusSeabed program (modified from NMSC, 2015).

Despite the significance of seafloor data, experts estimate that less than 25 per cent of the Earth’s surface below sea level is mapped at adequate resolution for these crucial services (8). Also, data that have been collected reside in a number of disparate holdings, with varying degrees of accessibility, having been collected and processed to various standards. In recognition of this knowledge gap and data management issue, the Australian seabed mapping community banded together in 2018 to form AusSeabed—a national seabed mapping initiative—to coordinate data collection efforts in Australian waters and provide readily available open access to quality-controlled seabed data. AusSeabed will provide an online platform containing a comprehensive set of national seabed data and information, including tools that will support data collectors and users in connecting with the broader marine community, and in the development of new proposals and products. The platform will benefit all members of the Australian community who require information about the seafloor, and complement and contribute to existing national and international marine data initiatives, including:

- the 2016 Defence Integrated Investment Program (9)—by increasing support for the national tasking of marine surveying and charting
- the HydroScheme Industry Partnership Program (HIPP; 10)—by facilitating fit-for-purpose high-quality bathymetric data collection in the Australian EEZ by 2050
- the 2015 Public Data Policy (11)—by liberating otherwise inaccessible government legacy data to an open access portal
- the Australia Ocean Data Network and the Integrated Marine Observing System—by connecting to the national oceanographic data system

- the GEBCO-Nippon Foundation Seabed2030 Project—by streamlining and coordinating Australia’s contributions to the global seabed mapping initiative
- the United Nation Sustainable Development Goal 14: ‘to conserve and sustainably use the oceans, seas and marine resources for sustainable development’ and Decade of Ocean Science for Sustainable Development, proclaimed December 2018 by the General Assembly, where seabed mapping has been designated as one of seven priority areas.

Participation in AusSeabed is open to all interested parties via an open invitation for direct involvement as well as subscription to an AusSeabed mailing list. AusSeabed consists of various state and federal government coastal and marine agencies and departments, academic institutions, and private sector companies, led by an internal representative body: the AusSeabed Steering Committee (ASC). The ASC guides the AusSeabed work program, and as the first step towards unifying our understanding of the sea floor, are focused on making the bathymetry data holdings for the Australian region publicly available and openly accessible. By establishing an open-source data repository and maintaining a register of bathymetry holdings, AusSeabed will facilitate more efficient data discovery, collection, innovation and utilisation of new and existing data, and provide an ongoing commitment to open data sharing, following the Findable, Accessible, Interoperable, and Reusable data principles (FAIR), across the marine community—both, within Australia, and globally.

This Strategic Plan describes the goals and scope of the AusSeabed initiative from 2019 through to 2030 and is a living document maintained by the AusSeabed community (for document control see Appendix 7.3). It informs AusSeabed community members, stakeholders, and other end users of the planned approach for supporting the three program themes. Additional information, such as annual reports and work plans are published on the AusSeabed [website](#).

1.2 Australian seabed data

A number of different groups and programs are committed to mapping the Australian seabed and providing open-access to the data. The entities involved currently perform multiple functions, such as the capture, management, and analysis of data to build knowledge and capacity related to activities in the seabed environment (Table 1). AusSeabed occupies a critical role by bringing the entities together to form a national seabed data community that can provide a comprehensive and united approach to seabed mapping and characterisation (Fig. 2).

Table 1. Functions undertaken by national entities and program operating within the Australian seabed data community

Function	Description
Survey Collaboration	Facilitates survey collaboration by connecting users with similar interests or enabling resource sharing.
Data Capture	Conducts surveys and collects primary sea floor and/or water column data directly.
Data Processing	Processes raw data for various applications.
Community Data Collation and Management	Holds an organised store of data products from third parties and actively manages the growth and distribution.
Open Data Delivery	Provides data products for use under creative commons license.

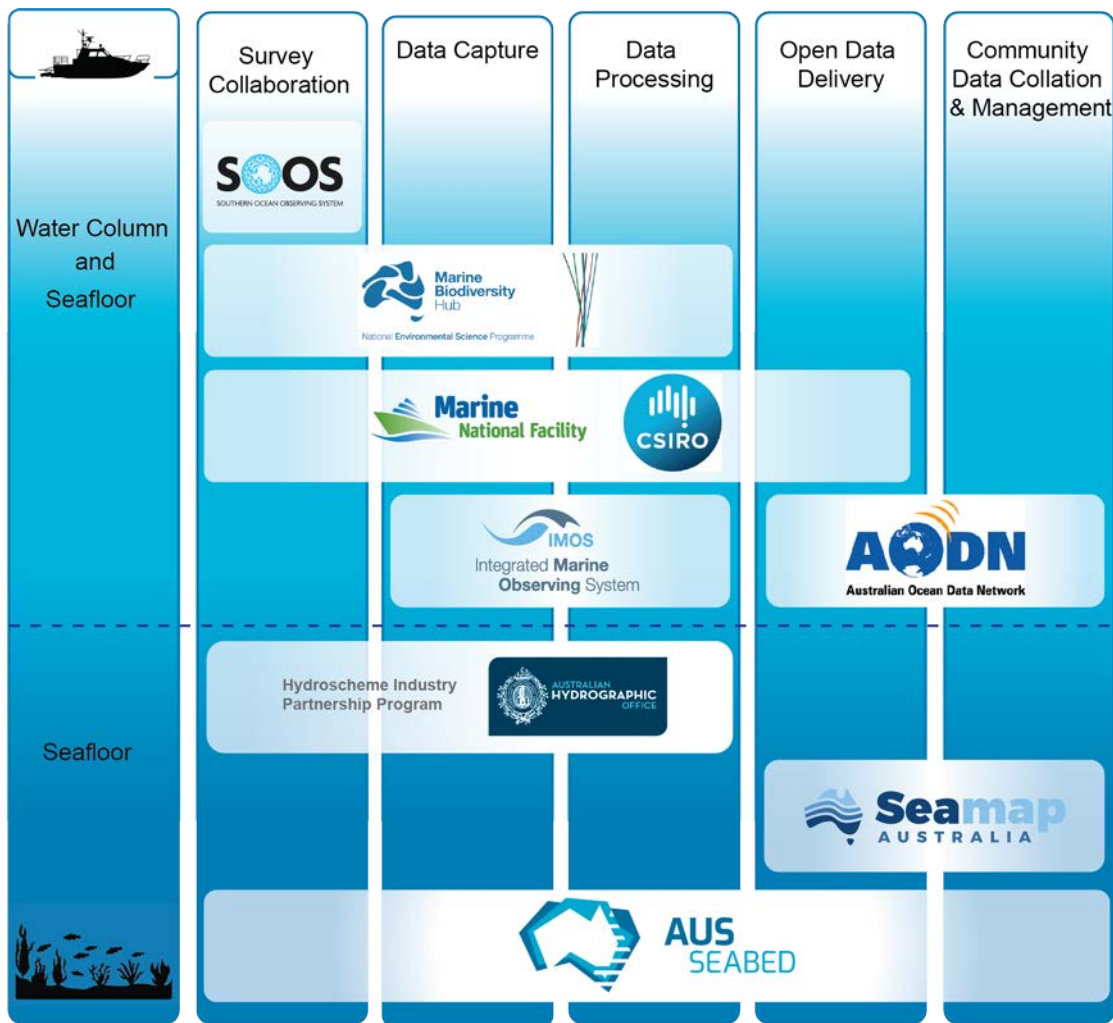


Figure 2. The functions carried out by national entities and programs that engage in the Australian seabed mapping data workflow. The AusSeabed remit extends to all aspects of seabed mapping and helps connect the community.

1.3 Program goals

AusSeabed has four fundamental program goals. These are outlined below, along with the strategies designed to achieve the goals.

1. Improve the curation and delivery of seabed mapping data

This will be achieved by establishing the AusSeabed Data Hub which will leverage open source technologies and data. The Data Hub will include compliant metadata systems, integration into existing national data management infrastructures and international initiatives. This goal will also be realised by ensuring discovery, recovery and reuse of data holdings, and continuity of the program.

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

This will be achieved through the development of new resources, tools, guidelines, methods, and community standards for seabed data. These will be easy to use and increase efficiency in the creation of consistent and standardised outputs. This goal will also be realised by initially focusing on common products and formats, but will be rapidly expanded to facilitate a range of data providers and data types.

3. Nationally coordinate seabed mapping activities and objectives

This will be achieved through the diligent implementation and execution of the program governance, and appropriate coordination of the program activities. It will also be realised by engaging with all sectors to address the range of community requirements and by promoting the values resulting from synergistic seabed mapping efforts.

4. Demonstrate the value of seabed mapping data for decision-making

This will be achieved by facilitating and maximising uptake of the data and products by decision-makers and users from all sectors, including government, private and academic sectors. It will also be realised through coordinated and direct engagement with the relevant government advisory bodies, including influential national ocean research representative bodies such as the National Marine Science Committee, and participation in the development of strategic plans related to ocean health and the blue economy. Engagement with international groups will also ensure that national benefits are derived from relevant collaborative opportunities.

These strategies will be driven through the establishment of three program themes:

- **Data Hub**—Develop a centralised system with links to data contributors that is governed by the data providers, owned by the community and delivers a standard suite of freely available seabed products.
- **Tools, Guidelines, and Standards**—Develop community-ready resources that enhance the quality, consistency, and ease of seabed data acquisition, processing, and delivery.
- **Outreach, Education, and Training**—Raise awareness of the importance of seabed mapping through all levels of society, while building technical capability in the marine sector and facilitating engagement and capacity building through education initiatives.

2 AusSeabed governance

Understanding the requirements of the Australian marine community is integral to the success of the AusSeabed initiative. AusSeabed members have agreed to the establishment of the AusSeabed Steering Committee (ASC), a rotating body made up of representative members of the Australian marine community. The ASC will guide and inform the three program themes (Fig. 3; [Terms of Reference](#)). Each theme has a leader from within the ASC (or appointed from an associated organisation by agreement of the ASC), who is responsible for overseeing the delivery of the theme's objectives and detailing the organisational function and structure of the theme. The ASC will meet three times each year to plan workshops, refine priority focus areas, define specific objectives, and develop detailed work plans.

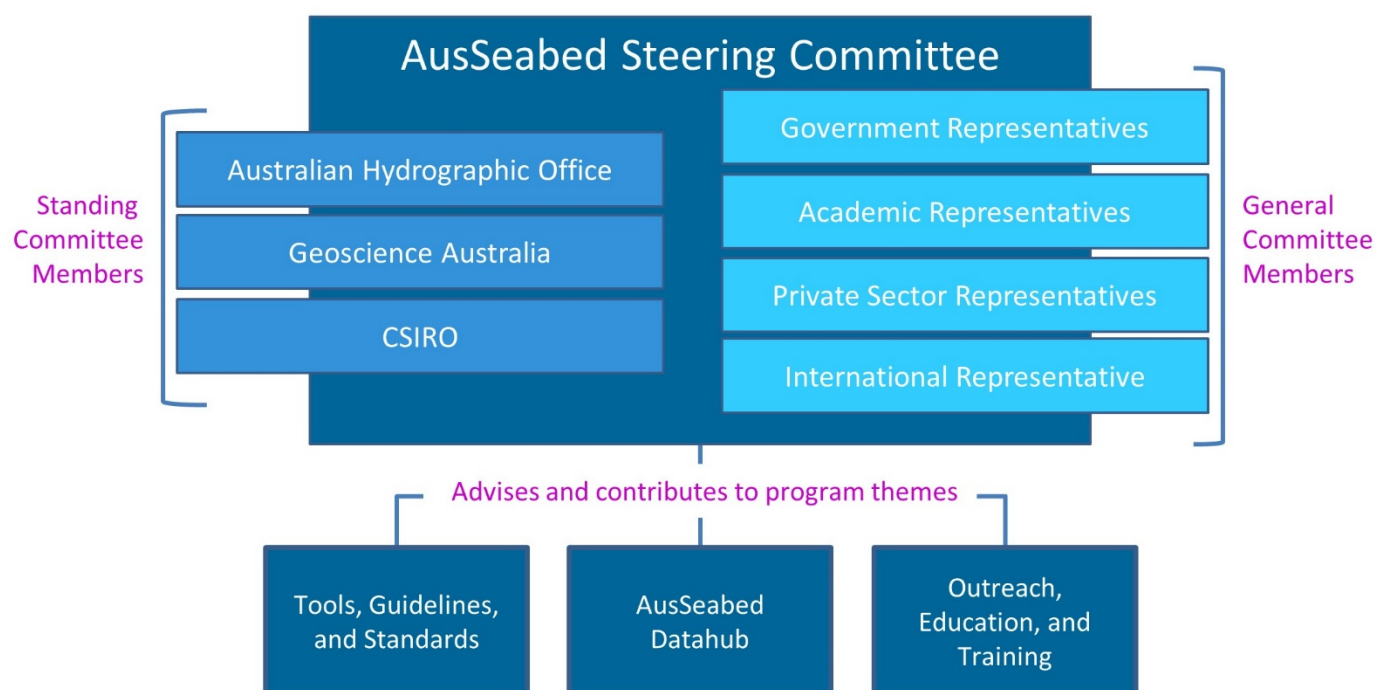


Figure 3. AusSeabed governance structure

2.1 Role of the Steering Committee

The AusSeabed Steering Committee will:

- provide and develop strategic direction based on requirements of the marine community, including the seabed mapping community
- communicate the direction and strategic intent of the initiative to the broader marine community
- propose and endorse objectives and work plans for each program theme
- provide guidance to program theme leaders, who will be directly responsible for the operational implementation of one or more of AusSeabed's objectives as identified at annual ASC meetings
- assist program theme leaders in defining appropriate applications for future project development
- promote opportunities for the application of AusSeabed projects in specific programs within their organisations
- represent the interests of the larger working group members, their organisations, and sectors.

2.2 Theme teams

The leader of each theme will work with their theme members to prepare work plans with integrity and inclusiveness, whilst also ensuring alignment with the AusSeabed mission. Each work plan will be managed by teams who are responsible for detailed project definition and implementation.

Program theme leaders and their implementation teams are free to adopt any methodologies and reporting cadence or management methods appropriate for their activities, while keeping the ASC informed of progress and opportunities, and with a commitment to a biannual showcase of activity progress to support future planning discussions.

2.3 Resources and funding

AusSeabed does not provide a central funding pool for activities and it will be a responsibility of each theme leader to utilise in-kind contributions by team members or to identify and develop specific funding streams for their activities where required.

3 AusSeabed Themes

3.1 Data Hub

Our Mission

Develop a centralised system with links to data contributors that is governed by the data providers, owned by the community and delivers a standard suite of freely available products.

3.1.1 Scope

The AusSeabed Data Hub aims to become the national point for submission, storage, discoverability and accessibility of seabed data from the Australian region of interest (section 3.1.3). The Data Hub will support and complement existing Australian marine data initiatives, such as the [Australian Ocean Data Network](#) (AODN) led by the University of Tasmania (UTAS), the HydroScheme Industry Partnership Program (HIPP) led by the Australian Hydrographic Office (AHO) and [Seamap Australia](#) led by the Institute for Marine and Antarctic Studies (IMAS) (Fig. 4; Table 2). It will also contribute to achieving the [Elevation and Depth 2030 Strategy](#) set by the Intergovernmental Committee on Spatial Mapping (ICSM). The Data Hub will provide a major contribution to the [GEBCO-Nippon Foundation Seabed 2030](#) project, which aims to compile a comprehensive bathymetric map of the global ocean floor by 2030. Development of the AusSeabed Data Hub will ensure that Australia realises the greatest potential from both new and existing seabed data, and meets national and international commitments to open access seafloor data.

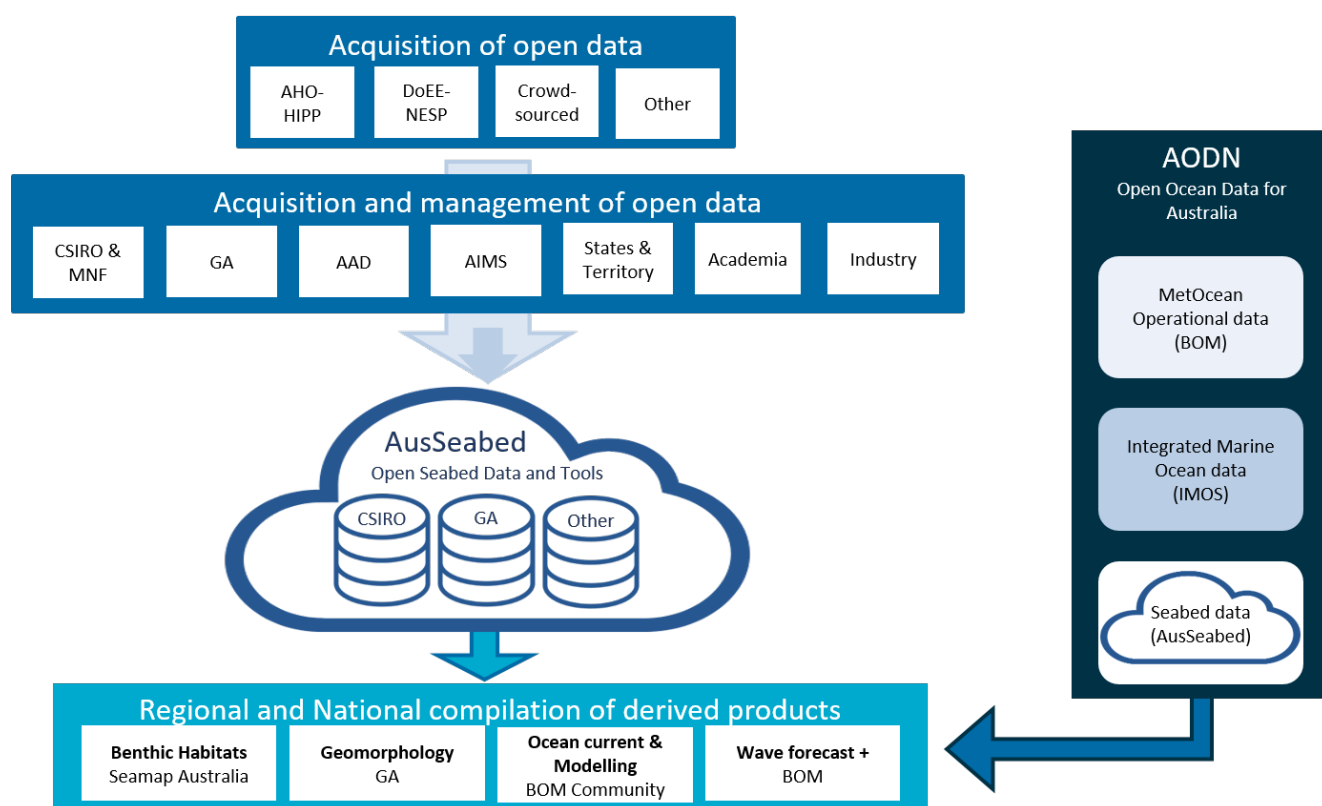


Figure 4. The role of AusSeabed Data Hub within the seabed mapping data pipeline: from data acquisition to management to the development of derived products. The entities, programs and derived products captured here are examples and do not represent an exhaustive list. AODN is displayed as a central portal to access data from the Australian marine data ecosystem, of which AusSeabed will contribute data relating to the seabed (DoEE-NESP: Department of the Environment and Energy – National Environmental Science Program).

Table 2. National initiatives related to AusSeabed

Programs	Description and relationship to AusSeabed
Australian Hydrographic Office – HydroScheme Industry Partnership Program (AHO-HIPP)	Program aiming to acquire survey data for charting purposes using industry model. AusSeabed provides the window by which data acquired through the HIPP can be made openly available to the nation.
Department of the Environment and Energy – National Environmental Science Program (DoEE – NESP)	Program aiming to assist decision-makers to understand, manage and conserve Australia's environment by funding world-class biodiversity and climate science. AusSeabed provides the window by which seabed data acquired under the NESP can be made openly available.
Seamap Australia	A collation of all national benthic habitat mapping data into one location on infrastructure provided by the AODN complete with metadata records, and a syntheses of these datasets into one spatial data product using a newly proposed national benthic marine classification scheme for the Australian continental shelf. AusSeabed provides a source of data openly available to be used by Seamap Australia. The project also uses, but not exclusively, open data from the AODN.
Australian Ocean Data Network (AODN)	A portal providing access to all available Australian marine and climate science data. AusSeabed provides the repository of data related to the seabed.

3.1.2 Product suite

Through the delivery of the Data Hub, AusSeabed will facilitate access to a range of seabed information associated with its identified product suites. These products, listed in order of priority, are:

1. bathymetry
2. backscatter (seafloor and water column)
3. sediment samples
4. sub-bottom profiles.

Each product suite will be stored, managed and delivered through the AusSeabed Data Hub. Following successful completion and integration of bathymetry products in the Data Hub, development of the lower priority data products will begin.

3.1.3 Region of Interest

The region of interest defined for the AusSeabed initiative is relevant mainly to the Data Hub program theme; the other themes have application beyond the region of interest defined here. To account for Australia's jurisdictional and international obligations, the Data Hub will handle seafloor data that meet one or more of the following criteria:

- collected or commissioned by Australian entities
- within the legal boundaries of the Australian Continental Shelf and the Australian Charting Zone
- is considered of value to the Australian marine community.

Following these criteria will also limit duplication of work undertaken by other international repositories, such as the International Hydrographic Organisation Data Centre for Digital Bathymetry (IHO DCDB) hosted by the U.S. National Oceanic and Atmospheric Administration.

3.1.4 Governance

Geoscience Australia, as the nation's custodian of geological and geographical data, leads and manages the Data Hub program theme. Development of the Data Hub will be managed by Geoscience Australia but developed through a

collaboration between multiple entities (Fig. 5). The Data Hub program theme leader will have oversight and responsibility for all activities. Further information can be found in the AusSeabed Data Hub [roadmap](#).

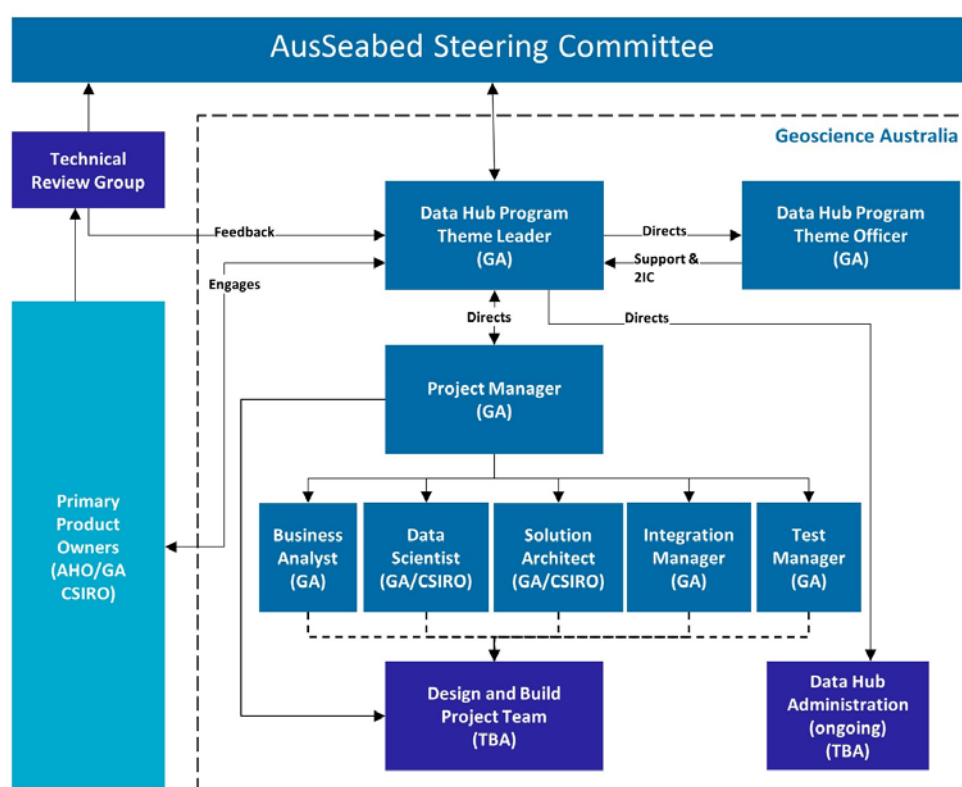


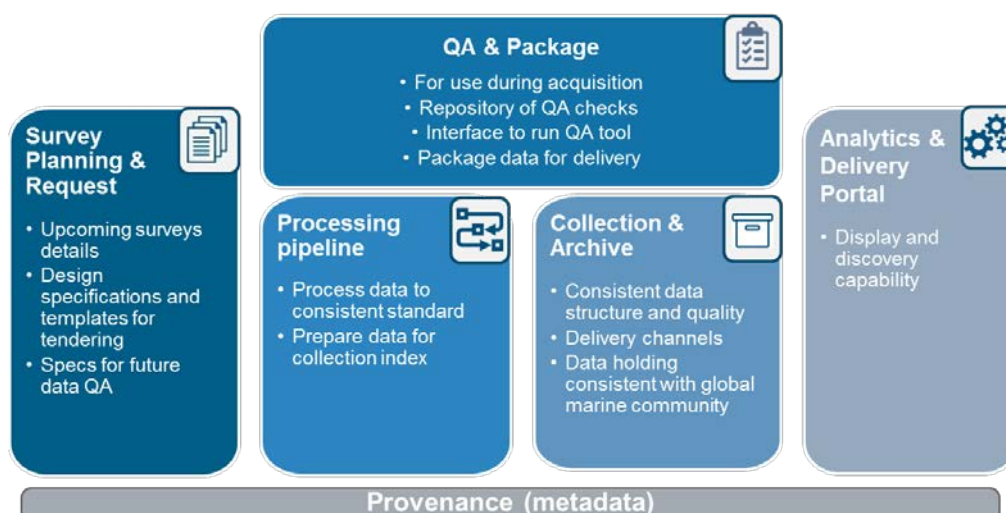
Figure 5. AusSeabed Data Hub collaborative project team structure. Specific role descriptions are outlined in the [roadmap](#).

3.1.5 Development approach

The AusSeabed Data Hub program theme adopts a component-based approach to delivery (Fig. 6; [roadmap](#)).

Each component will be:

- advised and guided by the Technical Review Group
- developed as a discrete project and resourced with the appropriate skill set
- designed to integrate seamlessly with the other components to deliver end-to-end capability
- delivered using an iterative approach, allowing for refinement to design and build as new requirements become apparent.



3.2 Tools, Guidelines, and Standards

Our Mission

Develop community-ready resources that enhance the quality, consistency, and ease of seabed data acquisition, processing, and delivery.

3.2.1 Scope

The initial scope of the AusSeabed Tools, Guidelines, and Standards (TGS) theme is guidance material for all aspects of seabed mapping.

- *Tools*: online tools and databases enabling easier workflows from survey planning through to data processing and analysis.
- *Guidelines and standards*: documentation of best practice for various aspects of seabed mapping, including data acquisition and processing. These will enable the production of high-quality data that is consistent across the marine community.

3.2.2 Structure

The TGS aims will be delivered by a working group comprised of a broad cross-section of AusSeabed community members from the government, industry and academic sectors. Community members will self-select into tasks within the annual work plan ([website](#)) based on their experience and interests. A leader will be assigned to each task for monitoring and reporting purposes. Update reports and meetings will be conducted every two months.

3.2.3 Approach

The current approach of the TGS working group is to acquire nominated tasks from the annual work plan proposed by the AusSeabed Steering Committee.

Each of the outcomes will be made accessible from the AusSeabed website with downloads and links as they become available. The TSG working group expect that additional tools and guidelines will be provided by the community as technology and the industry evolves. The working group will be dependent upon the community's goodwill in terms of both time and the provision of tools. All tools and guidelines donated by AusSeabed members will receive the appropriate acknowledgements and are encouraged to be provided under a Creative Commons licence. Guidelines published as part of AusSeabed will cite all contributing authors.

3.3 Outreach, Education, and Training

Our Mission

Raise awareness of the importance of seabed mapping through all levels of society, while building capacity in the marine sector and facilitating engagement through education initiatives.

3.3.1 Scope

The Outreach, Education, and Training (OET) theme aims to provide a consistent message across Australia and internationally regarding the benefits of the AusSeabed initiative to the nation. The three primary streams to be addressed are:

- *Outreach*: enable engagement of potential contributors to the AusSeabed initiative, by explaining the goals of the program and demonstrating potential benefits that enhance their operations
- *Education*: provide information, raise awareness, and build cooperation and relationships within the marine community
- *Training*: provide user training regarding provision, discovery, and accessibility of bathymetric seabed mapping data, including use of tools developed or provided by AusSeabed.

3.3.2 Structure

The OET aims will be addressed by a working group comprised of a broad cross-section of AusSeabed community members from the government, industry, and academic sectors. Community members will self-select into tasks within the work plan ([website](#)) based on their experience and interests. Each task will be assigned a lead for monitoring and reporting purposes. Updates and meetings will be conducted every two months.

3.3.3 Approach

The approach of the OET working group has been to acquire nominated tasks from the annual work plan proposed by the AusSeabed Committee. For each of the streams, the approach will be tailored as outlined in the following sections.

3.3.3.1 Outreach

The outreach stream will identify and engage with individuals and organisations representing potential AusSeabed collaborators, by demonstrating the benefits of AusSeabed to their operations. Target sectors and entities include:

- | | |
|-----------------------------|--------------------------------|
| • port authorities | • commercial fishing |
| • offshore renewable energy | • maritime trade |
| • operational oceanography | • tourism |
| • marine infrastructure | • marine research |
| • resource exploration | • education (section 3.3.3.2). |

The outreach stream will also develop and maintain communication material for use by the AusSeabed Steering Committee and community members. This material will include, but not be limited to the following topics:

- general information regarding seabed mapping and its benefits
- specific information on the AusSeabed program and progress.

This material will be developed to target a wide spectrum of the Australian community, from experienced marine scientists to non-expert general public members.

3.3.3.2 Education

The education stream will directly engage with tertiary and postgraduate hydrography courses. This engagement will take the form of contribution of content to hydrography courses, helping to arrange research projects for postgraduate students, providing information to students about careers in hydrography, and helping to arrange internships for students. This area therefore has some overlap with the training stream.

Further activities encompassed by the education stream include:

- distributing content regarding AusSeabed or related seabed mapping activities, to complement any existing communications channels used by AusSeabed collaborators
- supporting the development and maintenance of a group of area educators, who will be responsible for delivery of presentations to various stakeholder and end-user groups
- developing and maintain standardised long-term conference presentation themes and guidelines to maximise impact at AusSeabed AGM workshops and symposia
- producing material relevant to both end-members of the seabed mapping community i.e. collectors and users of marine data.

3.3.3.3 Training

The training stream will provide direct training activities, including the establishment and continued support of:

- a national 'mentor team' to assist students of marine science
- a program of industry internships for students
- a dedicated panel of experts available to assist with technical resources on the AusSeabed website
- standard practice for providing evidence to the Surveying and Spatial Science Institute for Continuing Professional Development for contributors involved with AusSeabed activities.
- a panel of educators and industry experts to provide advice regarding education and careers in marine science, including:
 - qualifications available and necessary for a career in marine science
 - university courses relevant to marine science
 - career paths in marine science
 - current internship opportunities
 - research & development advancements and opportunities.

This stream will also encompass provision and maintenance of training material to promote the collection of the AusSeabed data product suite (section 3.1.2), and facilitate use of AusSeabed services and related marine science resources, including:

- marine data loading and retrieval
- the AusSeabed survey management & collection tool
- the broader AusSeabed website.

4 Stakeholders

AusSeabed has a diverse group of stakeholders with various interests in the whole or part of the program (Figure 1). These stakeholders are classified into five broad groups:

- *Collaborator*: entity or individual that actively participates in AusSeabed development initiatives
- *Influencer*: entity that may require consideration and consultation for the development and delivery of projects from any of the program themes
- *Data provider*: entity or individual that may contribute data to the Data Hub program theme
- *Customer*: entity or individual that may download or request data and/or services from AusSeabed
- *Systems contributor*: specific to the Data Hub program theme. Denotes an entity that manages, provides, or has developed a data infrastructure (or service elements) which could influence the build of the AusSeabed Data Hub
- *Subject matter expert*: individual who contributes expert knowledge and advice, or actively promotes AusSeabed.

Appendix 7.1 contains a table listing stakeholders that have already identified the value of AusSeabed to their sector. This table is not exhaustive, but rather represents a known group at the time of writing. It is expected that other stakeholders will also identify with AusSeabed, and the interest or influence of existing stakeholders may vary such that this list will change over time.

5 Impacts and measures of success

5.1 Impacts

AusSeabed will drive efficiency gains within governments, research institutions and the private sector by facilitating ready access to open seabed data, supporting collaboration, and eliminating duplication of effort. By adopting the FAIR and open data principles a broad range of users will be able to access data, leading to better informed management of the marine environment, increased economic benefits, and new scientific investigations and discoveries.

Through the AusSeabed program, accessibility to tools will contribute to standardising, improving and delivering consistent, high-quality seabed data. In turn, this will improve the quality and reduce uncertainties associated with derived science products, such as oceanographic, seabed habitat, and geological models. The endorsement and use of open technologies and formats will encourage different community applications, drive innovation in the field, and potentially reduce marine industry development costs.

AusSeabed will support four of Australia's research priorities (Energy, Resources, Environmental changes and Transport), research communities associated with major programs, such as IMOS and NESF, marine industries, and it will contribute to the United Nation Sustainable Development Goal 14.

By addressing all aspects of the seabed data workflow with a community driven approach, AusSeabed will forge its way as an international model of collaboration in the field and has the potential to set the global benchmark for operational seabed data management.

5.2 Measures of success

To ensure that the program progresses successfully, the AusSeabed Steering Committee will routinely assess the following three performance indicators:

- data acquisition and quality (through collaboration and development of guidelines and tools)
- data availability and accessibility (through sharing of open data and development of distributed Data Hub)
- uptake and use of data (through development of derived products and uptake in research).

To measure the success of AusSeabed, quantitative metrics and qualitative achievements will be defined by the program theme leaders and identified in the work plans ([website](#)), for example:

- *Quantitative metrics*: including availability of new and legacy data, data usage, implementation and uptake of tools and guidelines, scientific publications, conference presentations, input of funding and resources
- *Qualitative achievements*: including presentations to potential new collaborators, new innovations directly resulting from use of AusSeabed products, stakeholder relations.

These measures will be transparent, and published on the AusSeabed website to assist the community in following the progress of the programs.

The AusSeabed Chair, Vice-Chair, and program theme leaders will collate impact data on at least an annual basis. Data will be obtained through stakeholder satisfaction surveys and community engagement, as well as documentation of the

use of AusSeabed products for various end-user applications that contribute to better decision-making and influencing policy in regards to marine environments.

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7 Appendices

7.1 Stakeholders

This table provides a list of currently known stakeholders, and describes their expected role in the program. The 'stakeholder type' column relates to the stakeholder types described in Section 4.

AusSeabed Stakeholders		
Stakeholder Entity/Individual	Stakeholder Type	Contribution/Interest/Influence
Geoscience Australia	National Earth and Marine Observations (NEMO), Environmental Geoscience Division	
	Marine Resource Advice and Information (MRAI)	Systems contributor, Data provider <ul style="list-style-type: none"> Chair and administration of AusSeabed Oversees AusSeabed data hub development
	Digital Earth Australia (DEA)	Influencer <ul style="list-style-type: none"> Digital infrastructure development
	NEMO Operations	Systems contributor <ul style="list-style-type: none"> Data flow and project implementation
	National Location Information, Environmental Geoscience Division	
	ELVIS team	Systems contributor <ul style="list-style-type: none"> Experience with multiple custodian Data Hub
	Maritime Jurisdiction	Customer <ul style="list-style-type: none"> Extension of EEZ based on underwater features
	Resource Division	Systems contributor, Data provider <ul style="list-style-type: none"> Experience working with a distributed data platform (the National Offshore Petroleum Information Management System)
	Positioning and Community Safety Division	Customer <ul style="list-style-type: none"> Earthquake Alerts and Tsunami Warnings
	Intergovernmental Committee on Surveying and Mapping (ICSM)	
Consortium/Group	Permanent Committee on Topographic Information (PCTI)	Influencer <ul style="list-style-type: none"> Strategy for consistent integrated elevation and depth products. Elevation and Depth 2030
	National Marine Science Committee (NMSC)	
	Baseline and Monitoring working group	Influencer, Data provider, Customer <ul style="list-style-type: none"> Advisory science body influencing policy-makers through the National Marine Science Plan Guide and coordinate the development of national baseline and monitoring practices, which include seabed mapping
	Integrated Marine Observation System (IMOS)	
	Australia Observation Data Network (AODN)	Influencer, Systems contributor, Customer <ul style="list-style-type: none"> Provide marine data accessibility. Use established data standards
	National Environmental Science Program (NESP)	
	Marine Biodiversity Hub	Influencer, Data provider, Customer <ul style="list-style-type: none"> Provide scientific information to support decision-making about marine species, marine protected areas and environmental pressures Funds marine surveys
	Department of Industry, Innovation and Science	Customer <ul style="list-style-type: none"> Marine geoscience advice and strategy

AusSeabed Stakeholders

Stakeholder Entity/Individual	Stakeholder Type	Contribution/Interest/Influence
		<ul style="list-style-type: none"> Offshore exploration
Department of the Environment and Energy		
Australian Antarctic Division	Influencer, Systems contributor	<ul style="list-style-type: none"> Antarctic Geoscience Program and data centre
Parks Australia	Collaborator, Customer	<ul style="list-style-type: none"> Provide priorities and funding for NESP projects, including surveys, and Digital Earth Australia – marine and coastal projects
GBRMPA	Collaborator, Data provider, Customer	<ul style="list-style-type: none"> Shallow water bathymetry, habitat mapping, safety of navigation
Department of Defence: Australian Geospatial-Intelligence Organisation		
Australian Hydrographic Service	Collaborator, Influencer, Systems contributor, Data provider, Customer	<ul style="list-style-type: none"> National coordination and acquisition of seabed mapping
Royal Australian Navy	Data provider, Customer	<ul style="list-style-type: none"> Lead the Sea2400 and the HydroScheme Industry Partnership Program
CSIRO		
Marine National Facility	Collaborator, Influencer, Systems contributor, Data provider	<ul style="list-style-type: none"> National coordination and acquisition of seabed mapping, marine research surveys and delivery of data to the community
Oceans and Atmosphere	Collaborator, Influencer, Systems contributor, Data provider, Customer	<ul style="list-style-type: none"> Hydrodynamic modelling, marine research
Data 61	Systems contributor	<ul style="list-style-type: none"> Potential research contribution in developing the data hub
Bureau of Meteorology	Customer	<ul style="list-style-type: none"> Marine and ocean operational forecasts Tidal analysis contributions for AHO
Australian Institute of Marine Science (AIMS)	Collaborator, Data provider, Customer	<ul style="list-style-type: none"> Marine research and advice Carries out marine surveys Potential legacy data contributor
New South Wales state government		
Office of Environment and Heritage (OEH)	Collaborator, Data provider, Customer	<ul style="list-style-type: none"> Collects/requires bathymetry for safe navigation, resource management, marine biodiversity and conservation
Department of Primary Industry	Collaborator, Data provider, Customer	<ul style="list-style-type: none"> Carries out bathymetric surveys from various platforms
Victoria state government		
Department of Environment, Land, Water and Planning	Collaborator, Data provider, Customer	<ul style="list-style-type: none"> Collects/requires bathymetry for safe navigation, resource management, marine biodiversity and conservation Funds bathymetry data acquisition
Tasmania state government	Customer	<ul style="list-style-type: none"> Interested in bathymetric data for safe navigation, resource management, marine biodiversity and conservation
Western Australia state government		

AusSeabed Stakeholders

Stakeholder Entity/Individual		Stakeholder Type	Contribution/Interest/Influence
	Department of Transport	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Collects/requires bathymetric data for safe navigation, resource management, marine biodiversity and conservation, hydrographic modelling
	Western Australian Land Information System (WALIS)–Marine	Collaborator, Data provider, Customer	
	South Australia state government	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Interested in bathymetric data for safe navigation, resource management, marine biodiversity and conservation
	Queensland state government		
	Maritime Safety Queensland	Collaborator, Customer	<ul style="list-style-type: none">Interested in bathymetric data for safe navigation, resource management, marine biodiversity and conservation
	Department of Environment and Science	Collaborator, Data provider, Customer	
	Northern Territory state government		
	Department of Environment and Natural Resources	Collaborator, Customer	<ul style="list-style-type: none">Safe navigation, resource management, marine biodiversity and conservation
	James Cook University (JCU)	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Marine research with a focus on the tropics, seabed mapping is a crucial part of this research
	Deakin University	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Marine research program with a strong focus on seafloor mappingInterests in coordination and collaboration initiatives
	Curtin University	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Marine research focussed on acoustic mapping techniques including data processing and analysis
	University of Tasmania (UTAS)		
Institute of Marine and Antarctic Studies (IMAS)	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Marine research, administrator for NESP, node leader for the south east region of IMOS	
	University of New South Wales	Contributor, Customer	<ul style="list-style-type: none">Backscatter data produced for Sydney Harbour
Commercial/Industry	iXblue	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Marine geophysical and hydrographic expertiseSafety of navigation, nautical charting and data processing
	Fugro	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Marine geophysical and hydrographic expertiseSafety of navigation and marine site characterisation
	Acoustic Imaging	Collaborator, Influencer, Customer	<ul style="list-style-type: none">Advancing the marine science community through marine geophysical/hydrographic survey training and consulting
	EGS	Collaborator, Data provider, Customer	<ul style="list-style-type: none">Marine geophysical and hydrographic expertiseInterest in global and regional seabed mapping strategy and the future of hydrography

AusSeabed Stakeholders

AusSeabed Stakeholders		
Stakeholder Entity/Individual	Stakeholder Type	Contribution/Interest/Influence
Precision Hydrographic Services	Collaborator, Data provider, Customer	<ul style="list-style-type: none"> Shallow water marine geophysical and hydrographic expertise Safety of navigation, maritime trade and supporting protection of the marine environment
Guardian Geomatics	Collaborator, Data provider, Customer	<ul style="list-style-type: none"> Marine geophysical and hydrographic expertise and autonomous underwater Committed to advancing the hydrographic industry
FrontierSI	Collaborator, Systems Contributor	<ul style="list-style-type: none"> Spatial information and data systems Quality assurance and data processing
Individual Subject Matter Experts		
J W Maschke	Subject Matter Expert	<ul style="list-style-type: none"> Advice, feedback, and advocacy for the AusSeabed initiative
International Hydrographic Organisation (IHO)		
GEBCO	Influencer	<ul style="list-style-type: none"> International coordination of seabed mapping Seabed mapping standards
Seabed 2030 — Regional Data Assembly and Coordination Centre	Customer, Data provider	<ul style="list-style-type: none"> Seafloor data collation and product development
UN-Global Geospatial Information Management	Influencer	<ul style="list-style-type: none"> Geospatial information standards
Open Geospatial Consortium (OGC) Marine Domain Working Group (DWG)	Influencer	<ul style="list-style-type: none"> Geospatial information standards
Ocean Data Interoperability Platform (ODIP)	Influencer	<ul style="list-style-type: none"> Open data advocate and facilitator for marine science collaboration
Lamont Doherty Earth Observatory R2R	Influencer, potential systems contributor	<ul style="list-style-type: none"> Real time survey data integration and processing
Multibeam Advisory Committee (MAC)	Influencer	<ul style="list-style-type: none"> Multibeam technical resources
NAVOCEANO	Influencer	<ul style="list-style-type: none"> Oceanography for naval purposes. Built a tool called Data Detective.
National Institute of Water and Atmosphere (NIWA)	Customer, Data provider	<ul style="list-style-type: none"> Marine geophysical and hydrographic expertise
EMODNET Bathymetry	Influencer	<ul style="list-style-type: none"> Open marine data portals (bathymetry, chemistry, biology, habitat mapping, coastal mapping)
Southern Ocean Observatory System (SOOS) DueSouth	Systems Contributor	<ul style="list-style-type: none"> Survey coordination and collaboration in the Southern Ocean

7.2 Glossary

Acronym	Definition
AAD	Australian Antarctic Division
AGM	Annual General Meeting
AGO	Australian Geospatial-Intelligence Organisation
AHO	Australian Hydrographic Office
AHS	Australasian Hydrographic Society
AMSA	Australian Marine Sciences Association
AODN	Australian Ocean Data Network
ASB	AusSeabed
ASC	AusSeabed Steering Committee
BS	Backscatter
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DoEE	Department of the Environment and Energy
EEZ	Exclusive Economic Zone
ENC	Electronic Navigational Charts
FAIR	Findable Accessible Interoperable and Reusable (Data Principles)
GA	Geoscience Australia
GEBCO	General Bathymetric Chart of the Oceans
HIPP	HydroScheme Industry Partnership Program
ICSM	Intergovernmental Committee on Spatial Mapping
IMOS	Integrated Marine Observing System
MBES	Multibeam Echosounder
NESP	National Environmental Science Program
OET	Outreach, Education, and Training
OGC	Open Geospatial Consortium
QA	Quality Assurance
SBP	Sub-Bottom Profile
SOOS	Southern Ocean Observing System
SSSI	Surveying and Spatial Sciences Institute
TBA	To Be Advised
TBC	To Be Confirmed
UNA	User Needs Analysis
WA DoT	Western Australia Department of Transport
WMS	Web Map Service

7.3 Document Control

Version	Author	Comments
0.1	Natalie Lennard (NL)	Initial draft
0.2	NL, Aero Leplastrier (AL), Kim Picard (KP)	Initial draft with MRAI input
0.3	NL, AL, KP	First edit of initial draft
0.4	NL, AL, KP	2 nd edit provided for feedback
0.5	NL	Re-work of existing structure, sectioning content out to develop operational guidelines and Data Hub project documentation.
0.6	NL, AL, KP	GA edits and revisions.
0.7	Ralph Talbot-Smith (RTS), Tim Moltmann (TM), Tim Ingleton, Nathan Quadros, Georgina Falster (GF)	Revisions integrated from ASC review, addition of impact documentation and appendices
0.8	AL, GF, NL	GA edits and revisions
0.9	KP, GF	GA edits and revisions
0.10	Vanessa Lucieer, RTS, TM, GF	Revisions integrated from final ASC review
0.11	Andy Taylor, TM, KP, Hugh Parker	Revisions integrated from community review and steering committee meeting July 19. Added to Overview and Impact sections (1.1 and 5 respectively)
0.12	AL	Stakeholder section (4) and table (7.1) updated
0.13	KP, AL, Brendan Brooke	Final review and edits
1.0	AL	Published 03/10/19