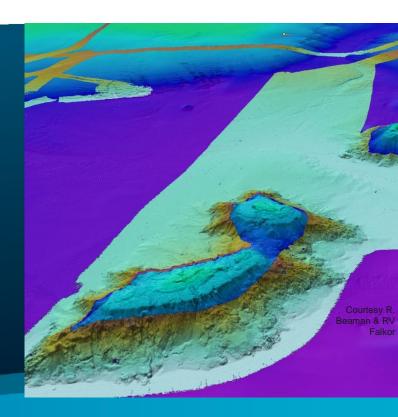


AusSeabed Quarterly Showcase

Nov – March 2021

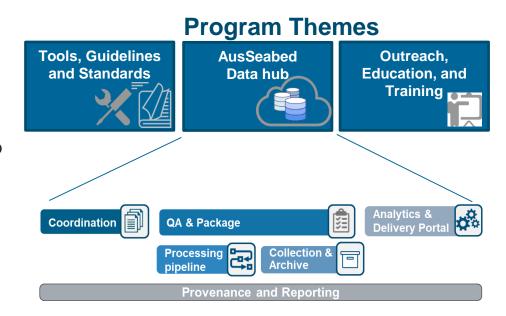
Kim and everyone

09 March 2021



Agenda

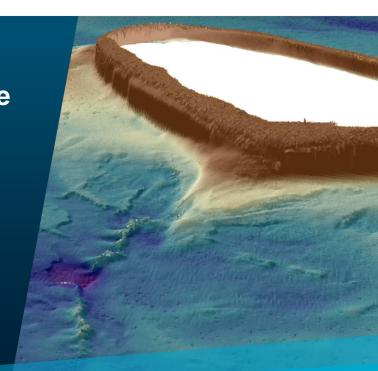
- 1. Welcome and Introduction Kim
- 2. ARDC and Partnerships Kim
- 3. Economic Benefit Analysis Andrew
- 4. What has been published Maggie
- 5. Data Warehouse AHO Natalie & Ghalib
- 6. Contributing hubs Cisco & Maggie
- 7. QA Tool (QAX) Lachlan & Matt
- 8. Automated reporting James
- 9. Portal UX Design Wireframe Kim
- 10. Program vision for next PI Kim
- 11. Open Discussion (10 minutes)





More Data from Everywhere and Everyone Linking contributing hubs

AusSeabed Quarterly Showcase - Nov 20 to Feb 21



Program objectives

Expand the number of bathymetric products openly accessible through the AusSeabed platform.

Deliver products and services focused on the needs of key stakeholders and end-users Improve the curation and delivery of seabed mapping data

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

2030 Program Goals

Demonstrate the value of seabed
mapping data for
decision-making

Nationally coordinate seabed mapping activities and objectives

Improve coordination of activities relating to seabed mapping.

Secure an enduring AusSeabed program to continue realising benefits to the community relying on seabed mapping.

Program Increment Goals – Nov to March 2021



Program Objectives	PI Goals	Status
Improve coordination of activities relating to seabed mapping.	Engagement plan in place to progress Aus-US collaboration (GA, CSIRO, NOAA) National Prioritisation Framework workshop delivered	
Expand the number of bathymetric products openly accessible through the AusSeabed platform.	 Finalise CSIRO hub integration Two new contributing hubs underway (1. IMSA-PAWSEY; 2. TBD) Continue data publication of Falkor ongoing surveys in Aus GA fully transitioned to cloud-based processing (workstation) Operational Cloud Automated Processing Pipeline for key data levels 	
Secure an enduring AusSeabed program to continue realising benefits to the community relying on seabed mapping.	 Collaborative agreement between EB signed Key agreements signed between AHO and others Communication and Engagement Strategy published 	
Deliver products and services focused on the needs of key stakeholders and end-users.	 QA tools (QAX) in testing with volunteered HIPP contractors Portal wireframe report delivered and socialised with key stakeholders 	

Brendan - Update

Schmidt Ocean Institute

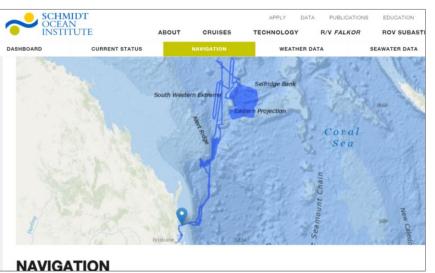
- Final SOI Australian Coral Sea survey completed
- Largest Australian seabed mapping program?
- Dozens ECR trained in seabed mapping
- ->150,000 km² data acquired/rapidly published!
- More SOI data to come?

Sustainable Funding

- Key priority for NEMO is better ongoing funding for marine geoscience (ASB)
- High-level proposal to Gov needed
- Economic Value of Seabed Data study a key element

GA Marine Program Board

- High-level governance for marine activities across GA
- Marine work in 4 Branches/2 Divisions
- Improve communication and co-ordination
- Advise on priorities



GMRT AusSeabed PL019

Kim Picard, Marine Geoscientist Kim.Picard@ga.gov.au







COLUMBIA UNIVERSITY | EARTH INSTITUTE









Australian Government Bureau of Meteorology









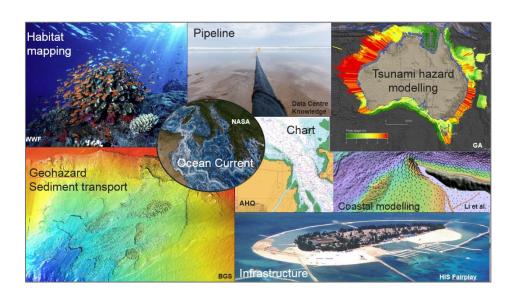
Australian Research Data Commons



This GMRT AusSeabed PL019 project received investment from the NCRIS-enabled ARDC infrastructure under investment identifier https://doi.org/10.47486/PL019

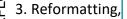
The problem

Authoritative and standardised bathymetric models are fundamental to a wide range of applications.





2. Processing,



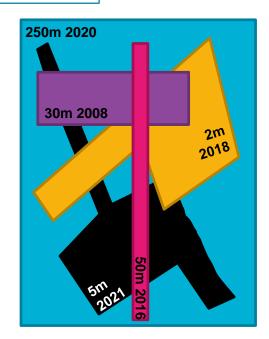
4. Merging,

5. Gridding

6. etc



Time \$\$\$ Frustration















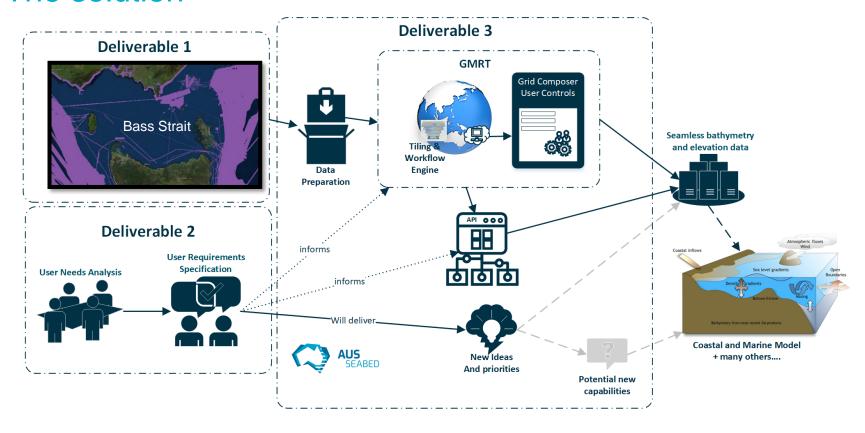








The solution

























Progress so far

Deliverable 2: User-need analysis

AIM: provide guidance in the development of the system

15/12/20: Survey sent to 800 people.

02/02/21: Survey closed, **95 responses**



Preliminary Business Decisions:

- Rich-metadata to enable user-controlled grid creation
- Multi-formats delivery available (incl. editable formats). Storage-cost compromise
- Gridded format (not point cloud)
- Ensure link to raw data points
- Uncertainty and other descriptive file delivery
- Include only open data
- Private data input out of scope











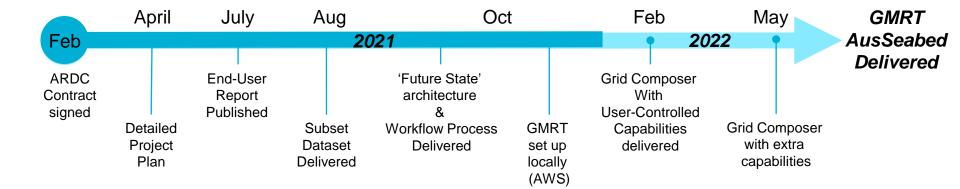








Next Steps



What is GMRT now? Check AusSeabed Aug 2020 Webinar or GMRT Webinar on YouTube





DEAKIN







AUSTRALIAN RESEARCH DATA COMMONS



Mapping Australia's Seabed

Expanding the Blue Economy

Economic Study into the current and future value of seabed mapping to Australia's blue economy

Managing Australia's marine jurisdictions



Deloitte.



The value of Australian seabed mapping data to the blue economy

Geoscience Australia



Purpose and context

In today's economy, **data is the currency of productivity**. Data can broadly be defined as any information that is collected or created through observation. It can be directly captured, purchased or generated.

Leveraging data can help governments, businesses, scientists and individuals to better understand their industries and create a competitive advantage. It can inform decision-making, optimise solutions and enable innovation.

In the blue economy, there exists a wealth of untapped data that is yet to be captured, analysed and applied in innovative ways.

Three-quarters of the Australian seabed is yet to be mapped to an adequate resolution to assist businesses and governments in decision making. This data deficit is constraining economic activity and needs to be unlocked to enable Australia's blue economy to thrive.

It is in this context that we aim to understand the potential economic, environmental and societal benefits that can be associated with a more comprehensive understanding and application of Australia's ocean resources as informed by seabed mapping.



What is seabed mapping data?

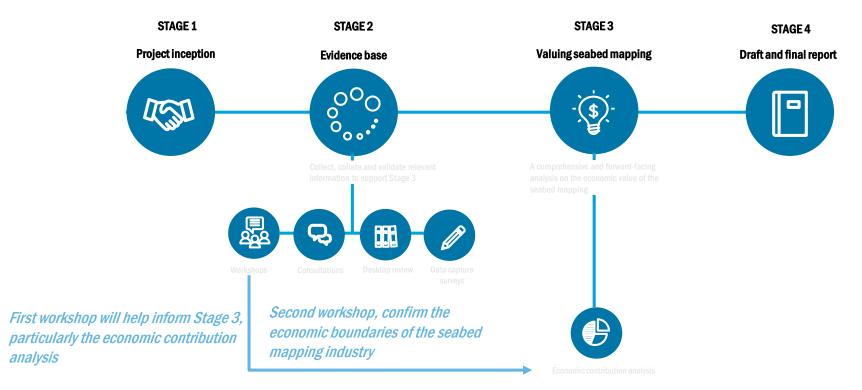
Seabed mapping data includes bathymetry, acoustic backscatter, sediment samples, sub-bottom profiles and seafloor imagery.

The process of "seabed mapping" comprises the collection, compilation, analysis and interpretation of information on (and below) the ocean floor.

Seabed mapping provides comprehensive data and information needed to understand seafloor characteristics.

Analysis and interpretation of seabed mapping data to generate information and knowledge is key to advancing understanding of our oceans, improving decision-making across all marine sectors and supporting a sustainable blue economy.

Overview of our approach





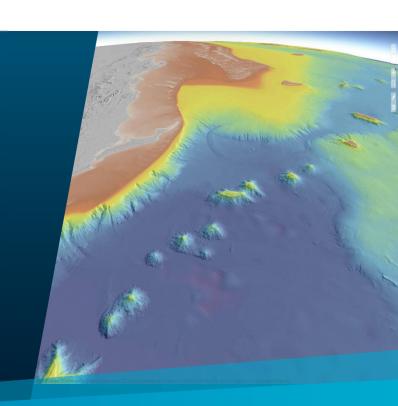


Data Delivery Processing and Publication

AusSeabed Quarterly Showcase

Maggie Arnold, Michele Spinoccia, Justy Siwabessy, Nat Lennard, Kim Picard, Dave Penton

March 2021



Overview

Key highlights that were achieved during the last PI November – February

- New datasets on the AusSeabed Marine Data Portal
- Internal Marine Operations handover
- New tool available on the Portal

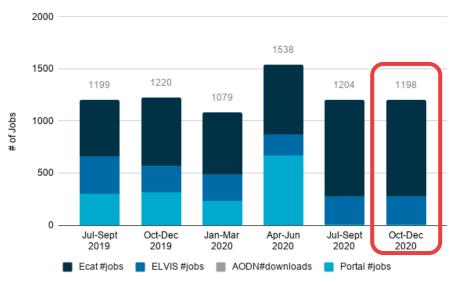


AusSeabed Marine Data Portal – New Data

The stats:

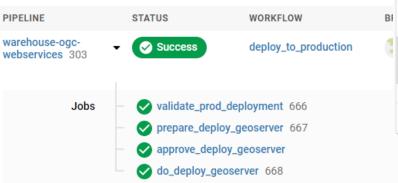
- 13 surveys published: 5 from CSIRO, 2 from SOI, 1 from NSW DPIE, 5 NESP/GA
- 2 compilations: 2020 v6 Great Barrier Reef, Otway Basin
- Area: 151,514 km2 (surveys only)
- Total Area: 3,019,247 km2 (not including CSIRO surveys) including Compilations
- Downloads:

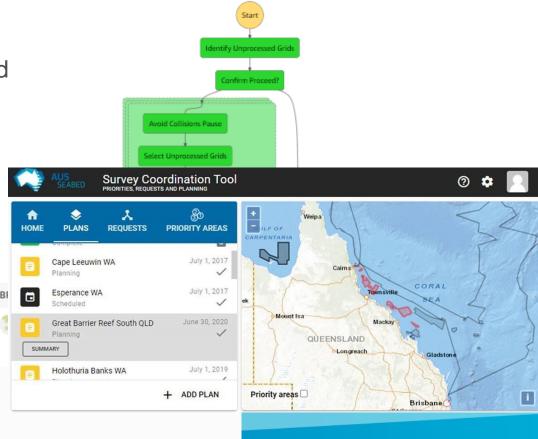




Operations Handover

- Mapping end to end AusSeabed platform for data delivery
- Handover of running pipeline
- Survey Coordination Tool user registration
- Client services email/help

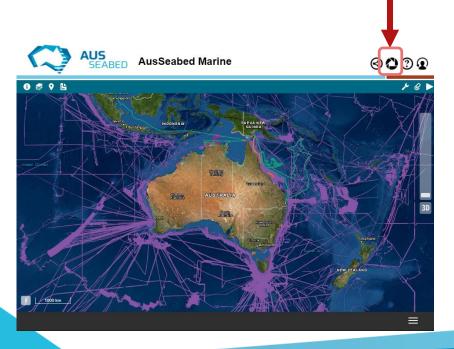




March PI Showcase 2021

AusSeabed Marine Data Portal Updates

Auto Save



Purpose: When activated, will automatically open the layers from your previous session

Impact:

 Improved user experience, responding to user feedback

Future:

- Interactive AI Chat Box (voice/text activated)
- Visualising large-scale point clouds



AHO AWS Clearing House

AusSeabed Quarterly Showcase

Natalie Lennard, Ghalib Ahmad

March 202



Overview

What began as "we could create you a cloud store".....became:

- 4 different AHO user types (roles)
- 3 different bucket policies
- 9 different buckets
- Evolving data management practices
- CARIS network server supporting windows virtual machines
- Multifactor authentication across all
- Detailed user guides
- 3 different incoming data channels have been explored, and two are being utilised (to suit the technical expertise of the supplier)
- Direct replication into Defence's network for archiving
- Delivery of a persistent store for data retention until defence infrastructure is ready

Key learnings for AusSeabed

We learned A LOT along the way:

- Identified that our own "prototype" cloud environment could be vastly improved and made more performant and more cost effective = Goal for next PI
- 2. Strengthened our relationship with AHO further and gained a great deal of satisfaction in supporting this partner.
- 3. Fell down the rabbit hole with data acquisition specialists and realized (again) the complexity of the task ahead of us!!

What this means in the short term

- 1. We will be moving off AWS Workspaces in preference for an EC2/Windows virtual machine combination. This will:
 - 1. Provide a significant cost savings
 - 2. Improve performance (due to local storage being more flexible)
 - 3. Allow for solid data management practices to be implemented and reflected in reporting and costs.
- 2. We will continue to support our partners in AHO, and learn along the way.
- 3. We will reap the benefits as more of our partners move into the cloud and we are already positioned to accept data via this pathway.



CSIRO Data Partner & Contributin

AusSeabed Quarterly Showcase

Francisco Navidad | CSIRO/GA March 2021



Overview

<u>AusSeabed Data Management Documentation - Confluence (atlassian.net)</u>

Much needed clarification on processed datasets at L2 & L3 level was achieved over the last PI!

Agreements included portal metadata fields, naming conventions (structure) for data files and layers, vertical height datum consistency (EGM2008) for L2 & L3 products, whilst remaining custodians of own data storage and internal workflows.

Data Partners and Contributions -

- AusSeabed gold standard!
- Publication of CSIRO Geoserver Layers to AusSeabed marine portal
- Integrating Layers for consistency e.g. in2019_e01
- CSIRO Data Access Portal e.g. bf2018_v01

AusSeabed gold standard!

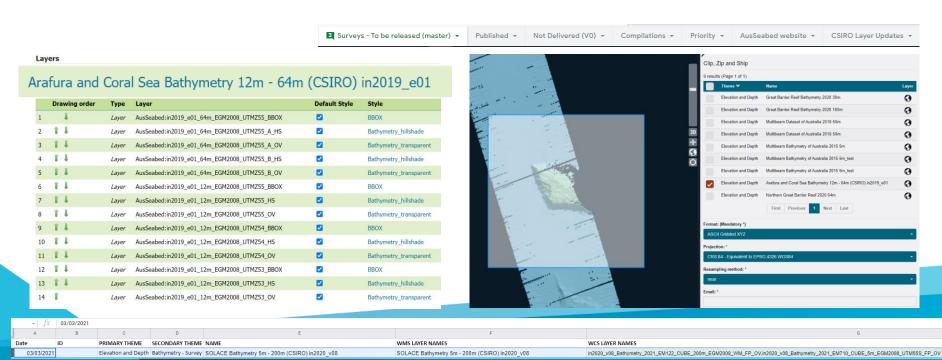
The contributing hub must provide three services:

- Publication of ISO19115-3 metadata through a catalogue service E.g. CSIRO Marlin (GeoNetwork) -https://marlin.csiro.au/geonetwork/srv/eng/catalog.search#/search
- Publication of Web Mapping Service (WMS) and Web Coverage Service (WCS) according to AusSeabed protocols – Mainly Naming of Layers, Bathymetry, Hillshade, and extent Polygon (Geoserver).
- Direct download of Local Hub products through HTTP protocol e.g. CSIRO Data Access Portal

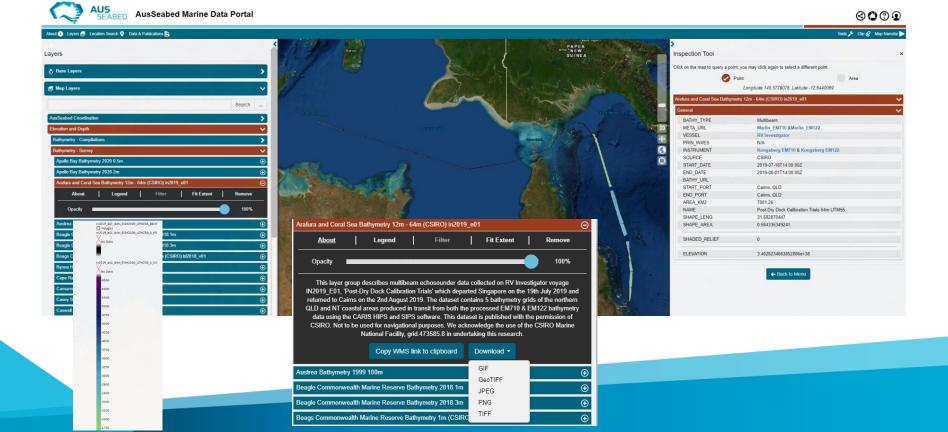
Publication of CSIRO Geoserver Layers to AusSeabed

For consistency, Each L3 product served through a Web Mapping Service (WMS) must be presented as a group layer.

Data Development Proposal (GA) - The Graphical User Interface will contain a form that will allow external users to push layers to the Non-Production Portal for GA-review, then once approved by GA and external users, push those layers to the Production site..

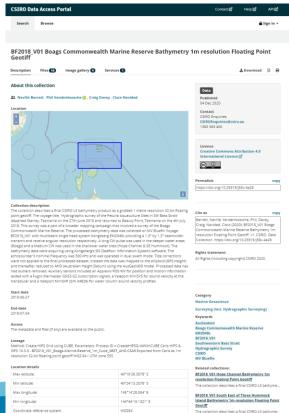


Integrating Layers to AusSeabed

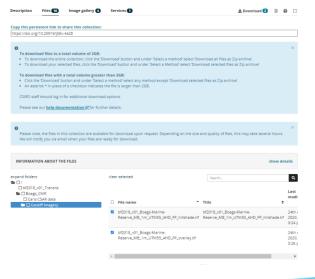


CSIRO Data Access Portal





BF2018_V01 Boags Commonwealth Marine Reserve Bathymetry 1m resolution Floating Point Geotiff





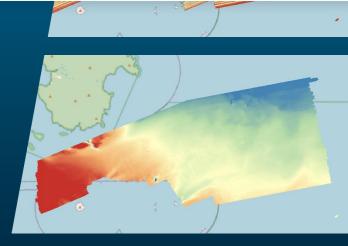


QAX – MBES Grid Checks

AusSeabed Quarterly Showcase

Matt Boyd | Lachlan Hurst

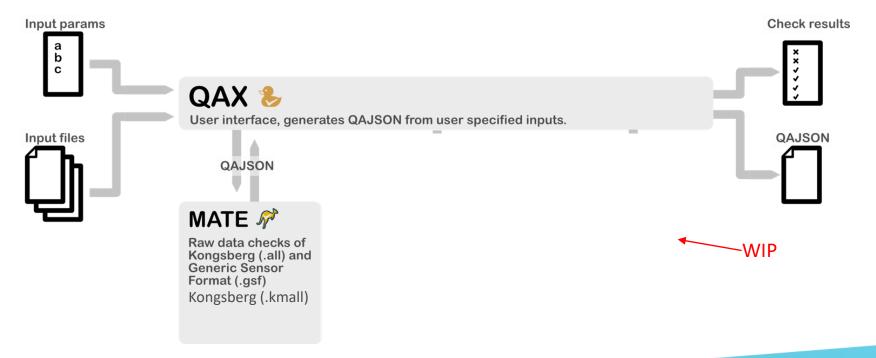
March 2021





Quality Assurance tools

Overview



Quality Assurance tools

Check implementation - MBESGC

- MBES Grid Checks (MBESGC)
 - Checks on processed bathymetry data
 - GeoTiff (.tif)
 - Bathymetry Attributed Grid (.bag)
 - Assumes grid data meets AusSeabed spec
 - Command line application
 - QAX plugin
 - Checks
 - Density check *
 - Total Vertical Uncertainty check
 - Resolution check ▲







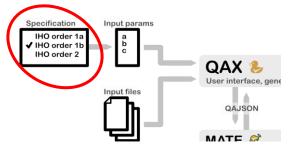


Demo

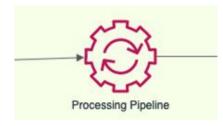
Quality Assurance tools

Next Steps

- Real world use
- Look to obtain feedback from users
- Check to specification
- Further automation scoping especially relating to processing pipeline



Support user input of specification



Integration of QA tools into processing pipeline



Automated Reporting Platform

AusSeabed Quarterly Showcase

James Miller

March 202



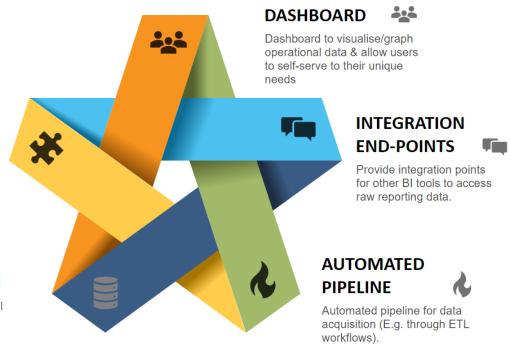
Automated Reporting Platform - Overview

BUSINESS ** INTELLIGENCE

Ability to perform analytics (BI) on operational reporting data (E.g. forecasting, usage, infrastructure availability, storage requirements).

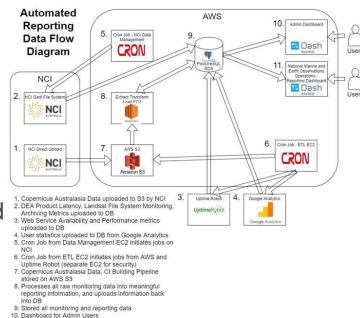
DATA **STANDARDISATION**

Standardisation of operational reporting datasets/schemas.



New Updates

- Monitoring of AusSeabed Services & slack/email notifications
- Design refresh of AusSeabed reporting dashboards
- New automated ETL workflows to collate and aggregate reporting data
- Custom report dashboard



11. Dashboard for DEA and Marine Program Users

Live Demo

Automated Reporting Design Refresh

Reporting

https://reporting.nemo.ga.gov.au/

Monitoring

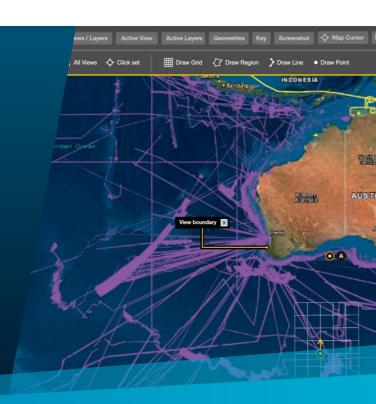
https://monitoring.ausseabed.gov.au/

Impact





AusSeabed V2 Data Portal



Presentation Sections

Customer-Driven Design Process

Feature list & Screen Designs

Why was a Customer-Driven Design Process undertaken?

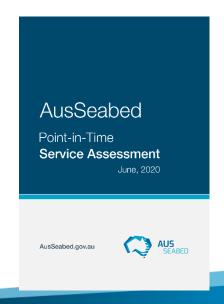
- AusSeabed is a collaborative program with a broad range of stakeholder and end-users
- AusSeabed has been delivering data and information through a Website and a Data portal
- These are thus the core points of communication and engagement with the community.
- Are these tools serving the needs of the AusSeabed community?

Evidence based insights and paths forward

Portal and Website Portal

Nine Interviews 130 Insights 150 Recommendations

31 Feature Ideas 40 Screen Designs





Presentation Sections

Customer-Driven Design Process

Feature list & Screen Designs

Features List

- 1. Portal design that assumes and **integrates multiple applications** especially non-map applications
- 2. Preservation of value currently enjoyed by **Guest Visitors** (non-authenticated)
- Authentication, Registration & User Account Management
- 4. General Feedback Submission to team and ability to view Contact Information
- Powerful **Desktop Launcher** to discover and launcher applications within portal
- **6. Map application** similar to current GA Portal with extensions to support **Views and Annotations**
- 7. Formal **extensive management tools** for Layers, Views and Annotations in Card, List and Tree formats
- 8. Inbox to receive **notifications**
- Formal management & Maintenance Window notification
- 10. Promotion of Events
- 11. Promotion of **Recent Changes** to the Portal
- 12. Comprehensive extensible Administration Interface
- **13.** User Profiles (aka Personas) to allow filtering of portal content and applications to user roles
- 14. Advanced screenshot tools
- 15. Map-location specific feedback

- **16.** Data Download to cloud drive destinations
- 17. Uploading of **private data layers** from cloud drive sources
- 18. Support for **savable map view** configurations (Views)
- 19. Ability to **add annotations to Maps** and save them in Views (Grids, Voyage Lines, Polygon regions, Points)
- **20. Automatic alerts** when there are changes to Layers, Views and Annotations
- **21. Dynamic color ramps** (raster)
- 22. Polygon coloring
- 23. Private Layers that can be kept private or shared publicly
- 24. Views can be kept private or shared publicly
- 25. Easy access to Licensing and other metadata
- 26. Ability to **email in-portal objects** to other users (like layers, views etc)
- 27. 2-Factor Authentication (2FA/MFA)
- **28. Ecommerce support** for chargeable items and services, Billings and Payments
- **29.** Support for accounts for both Individuals & Organizations
- 30. Capacity to **add sub-users to accounts** that are for Organizations
- 31. Multiple Data Hubs support



2H Screenshots Tab of Map Application

Map Cursor Tab of Map Application

5C User Account App - Address Book /

Notifications / Standing Orders

5D User Account App - Current orders /

Payment methods

4 Views 5 User Account App

Administration App - Activities

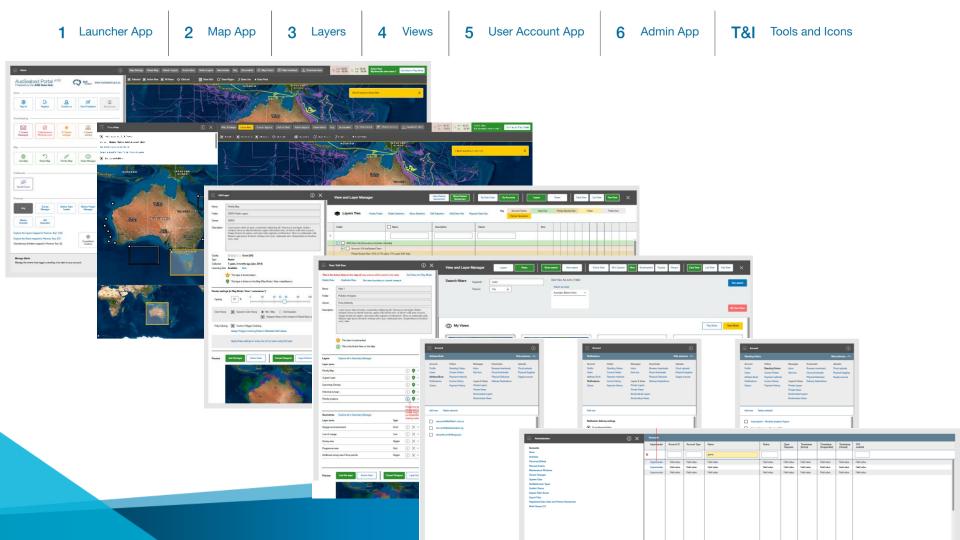
6E Administration App - Personas (Roles)

T&I Tools and Icons

Administration App - Work Queue

T&I Tools and Icons

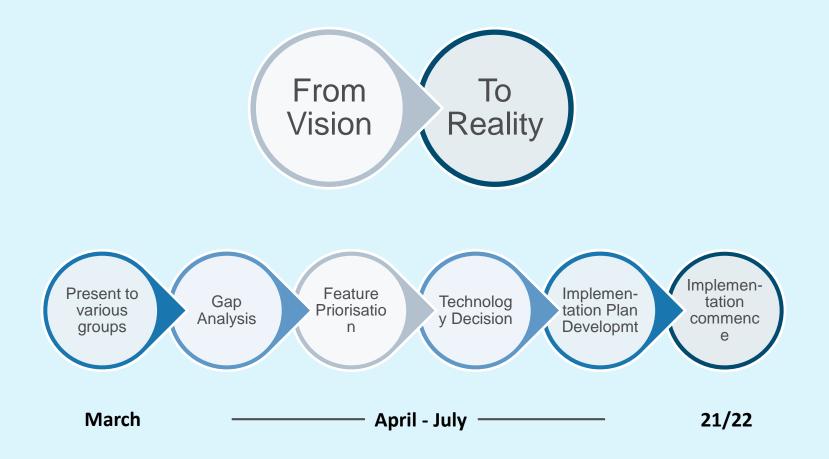
1	Menu / Home (signed-in) / Home (not signed-in) / Default view / Map toolbar	2K	Map Feedback Tab of Map Application	5E	User Account App - Invoice history / Payment history	6F	Administration App - Planned Events
2A	Map Settings tab of Map Application	2L	Download Data Tab of Map Application	5F	User Account App - Inbox / Sent box	6G	Administration App - Maintenance WIndows
2B	Views tab of Map Application	3A	Search Layers in View / Layer Manager (Card View)	5G	User Account App - Browser downloads / Cloud downloads / Physical Deliveries	6H	Administration App - Recent Changes
2C	Views / Layers button of Map Application	3B	Search Layers in View / Layer Manager (List View)	5H	User Account App - Delivery destinations / Cloud uploads / Physical Supplies	6J	Administration App - System Data
2D	Active View tab of Map Application	3C/D Search Layers in View / Layer Manager (Tree View)		5J	User Account App - Supply sources / Layers and Views	6K	Administration App - Notifiable Item Types
2E	Active Layers button of Map Application	4	Edit View / Search Views	6A	Administration App - Accounts	6L	Administration App - System Queue
2F	Geometries Button of Map Application	5A	Launcher App - Contact us / Send feedback / Sign-in / Register	6B	Administration App - Appearance of popup editor	6M	Administration App - Export Files
2G	Key Tab of Map Application	5B	User Account App - Profile / Profile (impersonated) / Users	6C	Administration App - Store	6N	Administration App - Data Hubs
				1			



Presentation Sections

Customer-Driven Design Process

Feature list & Screen Designs

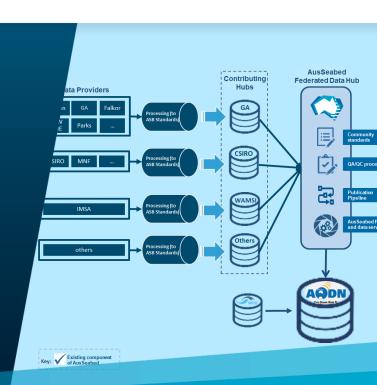




More Data, More Complete

Focus Data partners and Contributing Hubs

AusSeabed Quarterly Showcase - March to June 2021



Program Increment Goals – March to June 2021

Program Objectives	PI Goals				
Improve coordination of activities relating to seabed mapping.	 National Prioritisation Framework development proposal completed Australia-US collaboration (GA, CSIRO, AHO, NOAA) agreement drafted 				
Expand the number of bathymetric products openly accessible through the AusSeabed platform.	 Solid foundations underway for the ARDC GMRT AusSeabed Two new contributing hubs connected (1. IMSA-PAWSEY; 2. TBD) Prototype Data Hub for all bathymetry data levels delivered. Continue data publication of R.V. Falkor ongoing surveys in Australia Operational Cloud Automated Processing Pipeline for key data levels 				
Secure an enduring AusSeabed program to continue realising benefits to the community relying on seabed mapping.	 AusSeabed 2021/22 work plan final draft Collaborative Head Arrangement between Executive Board members executed Key Project Agreements executed (EB members and ARDC partners) 				
Deliver products and services focused on the needs of key stakeholders and end-users.	 QA tools (QAX) refinement plan underway based on feedbacks Development plans for Portal v.2 underway AusSeabed Satellite Derived Bathymetry (SDB) Guidelines drafted 				

Thank you













































































