Toitū Te Whenua
Land Information New Zealand

Enabling Integrated Marine Management

Part 1: Technical Proof of Concept

Appendix 5:

Use Case Summary: Ministry for Primary Industries

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Te Kāwanatanga o Aotearoa
New Zealand Government

Prepared by

Role	Name	Date
Spatial Intelligence Team Leader (Water) Ministry for Primary Industries	Ryan Hughes	1-09-2022
Senior Geospatial Analyst Ministry for Primary Industries	Juliane Sellers	1-09-2022

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Ministry for Primary Industries: Protected species spatial risk assessment

Use case overview

Ministry for Primary Industries (MPI) and Fisheries New Zealand (FNZ) used the Datamesh to spatially display and manage fisheries impacts across all NZ protected species (e.g., seabirds and marine mammals). To date, fisheries risk has been managed one species at a time, and usually only at the national scale. The datamesh technology allowed evaluation of fisheries impacts across all species simultaneously and empowered users to access data about fisheries risk at whatever spatial scale is required, informing local and regional scale planning processes in harmony with national objectives.

Key Findings

Strategic

- MPI lost key SME at start of project so took a while to come up to speed
- Agile methodology needed some socialisation

Technical

- One developer for four agencies with different needs tricky
- More engagement with dev team on weekly tasks

Other benefits:

- A one stop-shop to view and access all Geospatial data.

Project Outputs

Output 1: connections between existing GIS web services and/or datasets (without replicating the data across to this system) from the four partner organisations supporting faster and lower-cost computation of bulk data than existing systems	**Achieved**

Finding: Oceanum accessed and consumed existing open vector features services easily. Raster image services were built and supplied by MPI infrastructure and were also consumed with some configuration development. The raster image services did prove less efficient to configure and MPI would recommend avoiding this file type if possible.

Only Cetacean species distribution layers were published for proof of concept, despite other species such as sea birds being included in the original use case. These layers were not included due to the complexity in building and consuming raster data and the Cetacean layers were sufficient to test the use case.

Output 2: Interoperability of various data formats, standards, and scales.	**Achieved**

Finding: Vector and raster format rest services were both supplied, these fit under the ESRI rest service "umbrella". The standards are determined by ESRI out of the box delivery mechanisms. These follow the open geospatial services standards from the OGC guide. In 2010, Esri released the ArcGIS REST API (GeoServices REST) as an open specification under the Open Web Foundation.

The scales were tested when utilising the zonal statistics tool, which worked at a variety of spatial extents.

The metadata standard wasn't clearly defined, and this made it difficult to determine what was needed in the data portal UI for searching and informing users of the data background.

Output 3: A web service (conforming to OGC API standards) enabling users to query and stream data into their own GIS systems and analysis platforms.	**Partially Achieved**

Finding: Further work is required to connect ArcGIS to the Datamesh via API. There is currently no obvious mechanism for this function.

MPI users access the data via the web browser and download packages for desktop query and analysis. All the data the MPI supplied is open and can already be consumed by any users of the ESRI suite, both web based and desktop. The proof of concept did allow MPI to test the release of the cetacean raster layers.

Output 4: Safe and secure access to sensitive data repositories.	**Achieved**

Finding: All data MPI provided was open but the concept of providing a mechanism for securing the services was discussed, unfortunately the POC ran out of time to prove this concept for MPI. The security could be tested against any dataset, but it was never carried out.

MPI has agreed that this output was tested somewhat by the Oil Spill Exercise and this is achieved for the POC, we acknowledge that more testing could be done

against this output especially if we were to provide data to data mesh that was not classified as open. MPI protocols and security team would not allow us to proceed with sharing data otherwise.

Output 5: A spatial catalogue viewer with query functionality such as searching and filtering.	**Partially Achieved**

Finding: MPI didn't have any requirements from the use case to match but the spatial catalogue viewer, but noted it needed some fine tuning for usability. Data portals for spatial data normally contain a mapping component that allows users to view data and toggle information on and off, it would have been preferable to see this as a feature.

Output 6: Access to analytical tools (source code) using open formats.	**Achieved**

Finding: The MPI tool requires a spatial licence to operate in a desktop environment, theoretically the python code behind the tool could be imported into another system but this is untested. MPI is restricted by the ESRI platform which has a proprietary format that is restricted, this is not a limitation of the Datamesh but would need to be included in any new requirements.

Output 7: Insights/models from analytical queries run across multiple datasets.	**Achieved**

Finding: The tool was run against MPI's raster datasets, it would provide a complete picture of the system if another agency could test model and analytical functionality against our datasets.

Output 8: Performance of the system meets partners' and users' needs.	**Achieved**

Finding: We tested the zonal statistics tool against 6+ layers, and it seems to run faster in the UI than on desktop, but no further comprehensive load and stress testing were carried out to push the limits of the system.

Recommendations

High Level Recommendation

- As a concept the Datamesh affects several agencies that utilise marine data and should be developed further for said agencies' benefit. The Datamesh could act as a starting point for marine data discovery, especially amongst those are not a part of any government-backed marine entity.
- The business case and scope for a second phase/further development need to be developed and agreed upon before any continued action.
- A lead agency should be confirmed in order to establish a reporting chain back to the marine geospatial information steering group.
- Decisions around the appropriate project management methodology need to be made in the initial stages of any further development as those made during the POC often felt reactive in nature.

Technical Requirements Recommendations

- Data should be previewed on the main map before it is utilised or packaged.
- Contributing agencies need more information on how the search function retrieves datasets based on metadata and information tags. At present the search function relies on specific search terms that may not be the most obvious to new users.
- Initial scope should include a phase where sound and robust use cases are linked to specific testing in order to see if the system has achieved its initial objectives.
- A visible catalogue of selectable data layers to display what information is accessible via the UI, rather than have users search for things specifically. Catalogue could be broken up into different categories/agency sources to help filter them for the user.
- The future version of the datamesh should allow for agency admin to add, modify, or grant access to specific datasets.
- Considerations around ongoing vendor support for the platform should be discussed with agency members at the beginning of any future development so that they are aware of any limitations.