# Improving connectivity with distributed partners in the Australian Ocean Data Network

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The Australian Ocean Data Network (AODN) is an interoperable online network of marine and climate data resources. It is a collaboration between six major Australian Commonwealth agencies, the Integrated Marine Observing System (IMOS), and a growing list of universities, state government offices and others organisations in Australia, New-Zealand and the Pacific.

AODN data collections cover a large geographic area (from coast to open ocean, from equator to Antarctica), a wide range of observed parameters (physical, chemical, biological) and are obtained using a variety of platforms and technologies (e.g. ships, autonomous floats and vehicles, gliders, moorings, satellites, animal tags, coastal radar). The end users include researchers, students, managers, policy makers, consultants, sailors and fishers. All data products contributed to the AODN are made freely and openly available to the public via the AODN Portal (https://portal.aodn.org.au/).

In 2016, the AODN Portal underwent major improvements in order to focus its functionality on searching dataset collections through its existing metadata catalogue, visualising data on a map using Web Map Service (WMS) and providing access to data through multiple download services in a single user interface. At the launch of the revamped AODN Portal, almost all dataset collections available to users were collected by the IMOS program.

Soon after, IMAS (Institute for Marine and Antarctic Studies) and NIWA (National Institute of Water and Atmospheric Research) became the two major external contributors of dataset collections to the AODN Portal.  This early success was explained by their choices of infrastructure. They implemented a complete copy of the AODN software stack making the integration much simpler.

More recently, the Marine Research Data Cloud project, funded by the Australian Research Data Commons (ARDC), enabled the AODN team to establish infrastructure connections and data integration with the following major oceanographic data providers in Australia:

- The Australian Insitute of Marine Science (AIMS)
- Geoscience Australia (GA)
- The Australian Antarctic Data Centre (AADC)
- The Atlas of Living Australia (ALA)
- The CSIRO Oceans and Atmosphere Data centre

The new dataset collections made available on the AODN Portal are key datasets with existing public access and interest.
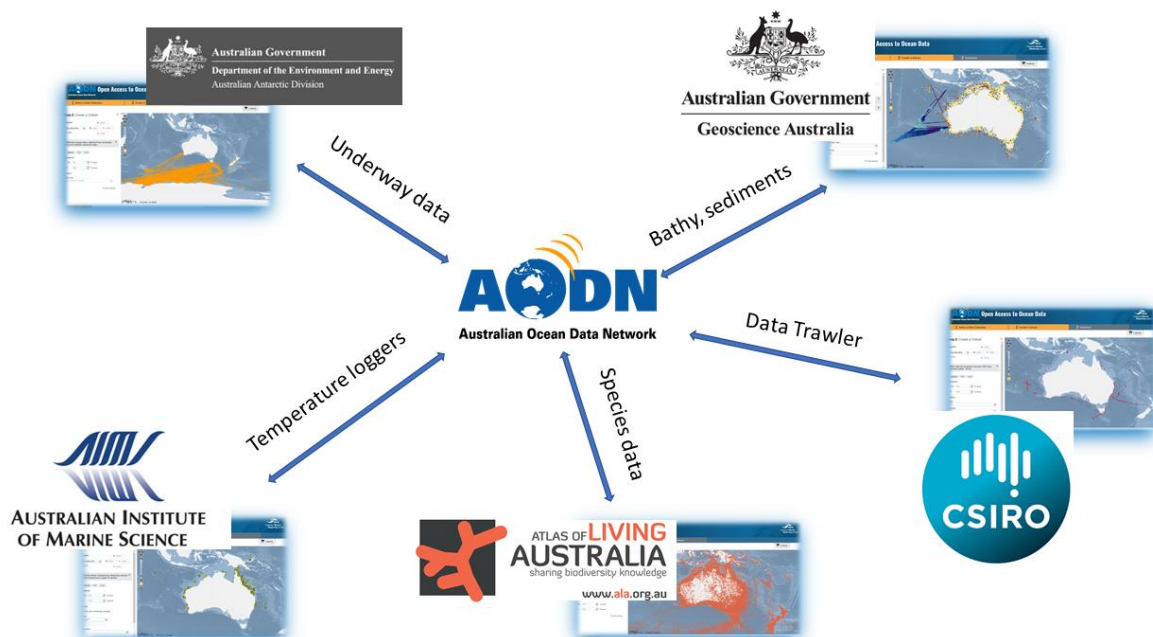
Figure 1: an overview of the new dataset collections published on the AODN Portal

These five organisations have been targeted to demonstrate that the integration of data provided through multiple types of infrastructure is possible. Each organisation currently uses different tools to publish metadata records, Web Map Services and download services (e.g. Web Feature Service or Web Processing Service). Upgrades to the existing infrastructure of each organisation and new developments to the AODN Portal were required to allow the AODN Portal to connect to existing web services and integrate new dataset collections.

**The AODN Portal now provides more than 250 dataset collections to end users**. Half of these dataset collections represents data collected by IMOS while the other half is made available by the different partners of the network.

Wider adoption of published controlled vocabularies, harmonisation of data services provided by partners, improved workflows to configure and test new dataset collections pre-publication and securing on-going funding to expand on these initiatives are some of the key challenges that need to be overcome in order to expand the marine data resources made available on the Australian Ocean Data Network (AODN).

The demonstrated data integration and improved connectivity with its distributed partner dataset collections provides a proof of concept of the truly distributed data network the AODN has aspired to for so long.