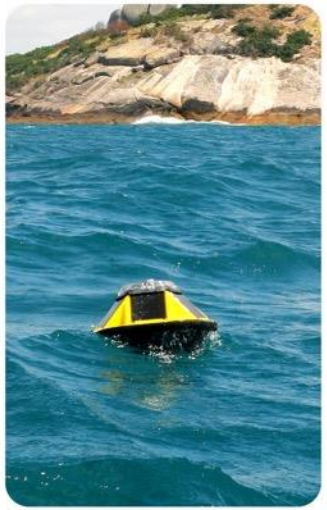
CELEBRATING 20 YEARS
OF SUSTAINED MARINE OBSERVING

IMOS
Integrated Marine Observing System



AODN 20-Year Retrospective

History and evolution of Australia's marine data network

IMOS acknowledges the Traditional Custodians and Elders of the land and sea on which we work and observe, and recognise them as Australia's first marine scientists and carers of sea Country. We pay our respects to Aboriginal and Torres Strait Islander peoples past and present.

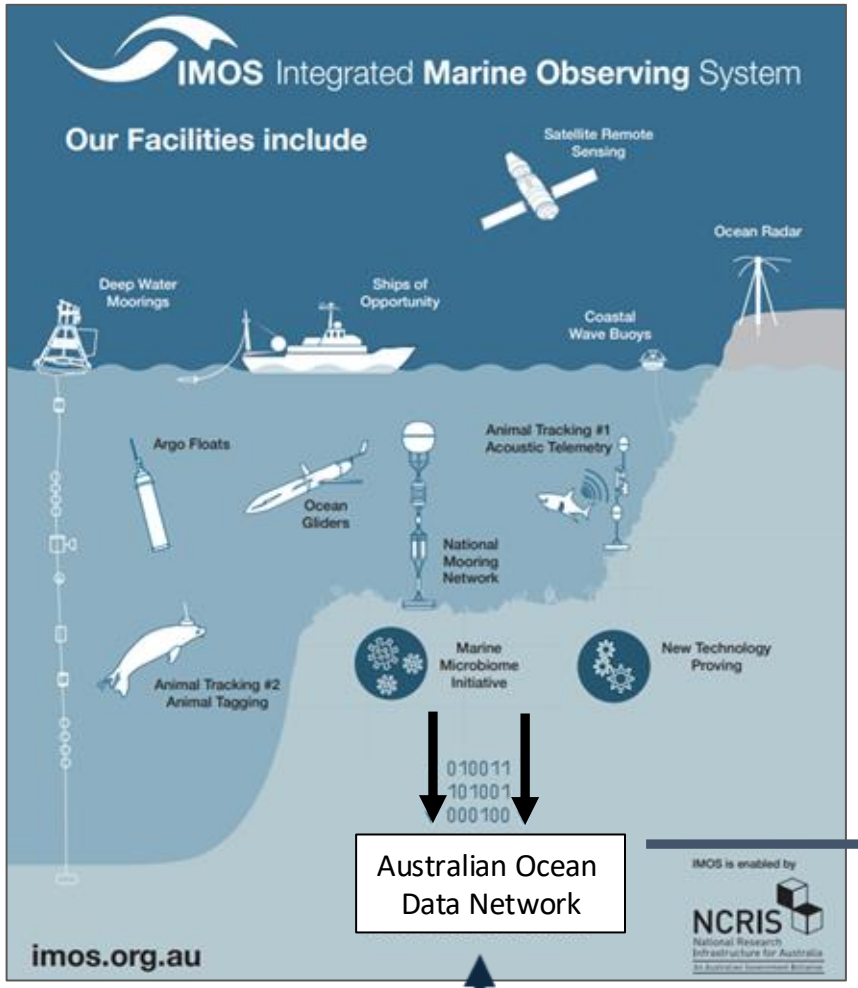
AODN 2-Parts

A certified repository for IMOS data - a national scale marine observing program (55 facilities from 10 Institutions)

- IMOS data are centralised (hosted by AODN)

Also, a federated network of Partners, underpinned by:

- Metadata standards
- Spatial data standards
- Data hosted by the Partner



National & International Connections Eg WMO

AODN Federated Partners

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Origins

Conceived by the Australian Oceanographic Data Centre – Joint Facility (AODC-JF) (AAD, AIMS, BoM, CSIRO Marine, GA, RAN)

Goal:

Make Australia's marine data discoverable, accessible and reusable

At this time, data were typically:

- Fragmented
- Inconsistent metadata and formats
- Limited discoverability and reuse
- Inaccessible, within organisation

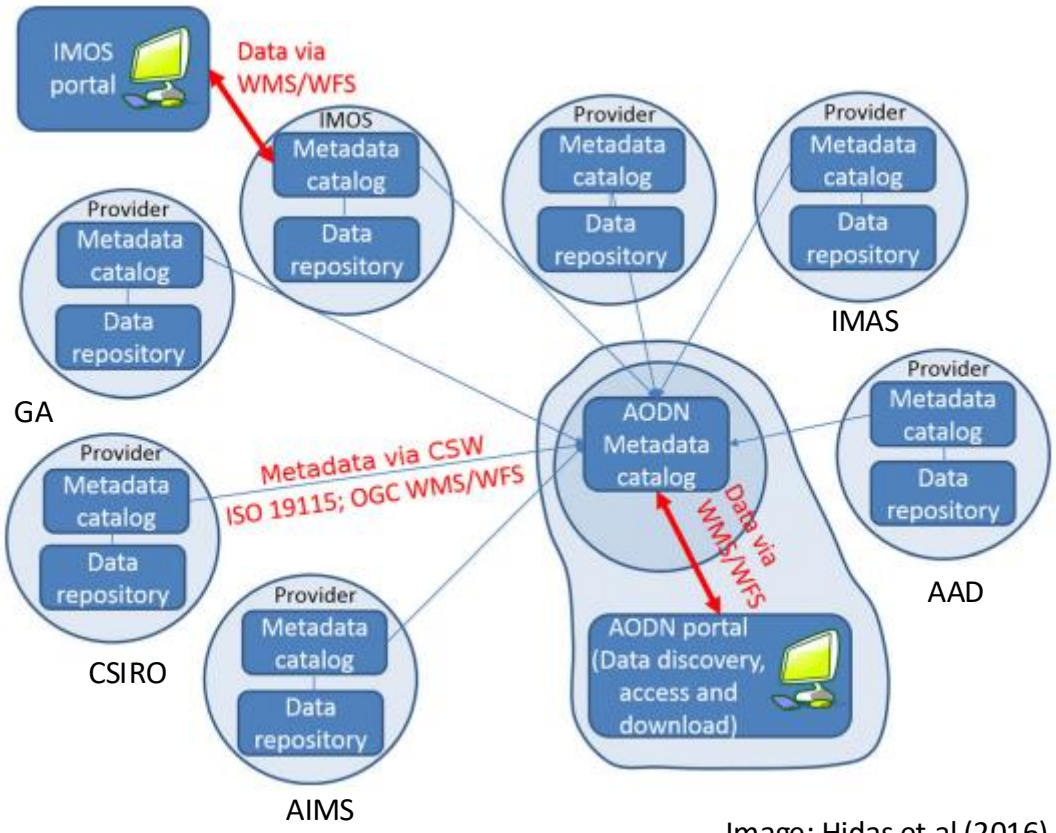

Image: Hidas et al (2016)

Technical vision

A federated data infrastructure consisting of:

- GeoNetwork (metadata)
- GeoServer (spatial data sharing)
- Self-hosted data
- Centralised Portal and Catalogue (discovery)

A significant achievement!

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Early years (2007-2014): Foundations

2007

- Dedicated funding allocation
  - eMarine Information Infrastructure (eMII)
- UTAS server infrastructure
- Manual data ingestion
- THREDDS data service
- Adoption of standards
  - NetCDF, SOP's, metadata, spatial
- Develop culture of open data
- Adopt metadata ISO-19115 MCP
  - Marine Community Profile (MCP)

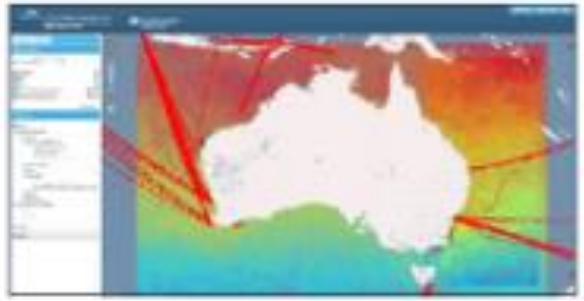
2009

- IMOS Ocean Portal
  - By eMII
- ARCS Data Fabric

2010

- Animal Tracking Database
- AODN Web Portal
  - By AODN-DO until 2011
- Matlab Toolbox
  - Instrument data processing into NetCDF

2014



IMOS Ocean Portal
(2009 – 2014)

AODN Web Portal
(2010 – 2016)

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2014-2016 Period

2014

Migrate to National Server Program (TPAC)

Metadata vocabularies formed

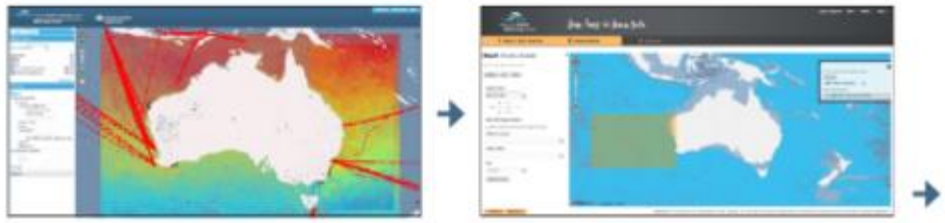
Develop IMOS 123 Portal

Better data downloading (subsetting)

Significant focus on OGC spatial standards

Maintain AODN Web Portal

2016



IMOS Ocean Portal
(2009 – 2014)

IMOS 123 Portal
(2014 – 2016)

AODN Web Portal
(2010 – 2016)

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IMOS Integrated Marine Observing System

Cloud transition and consolidation (2016-2024)

2016

- IMOS eMII rebadged as AODN
- Migrate to AWS Cloud Provider
- Data pipelines using workflow engine
- One Portal: IMOS AODN Portal
  - Merging of AODN and IMOS 123 Portals
  - 150 + 150 dataset collections available
- FAIR data principles
- National Reef Monitoring Network
  - Begin unification of Reef Life Survey & Aus Temperate Reef Collaboration

2019

- Animal Tracking redesign
- Adopt metadata ISO-19115
  - Drop the Marine Community Profile (MCP)
- Better pipelines

2020

- National Reef Monitoring Network

- Core Trust Seal certification
  - Strong data management foundations

2024

IMOS AODN Portal
(2016 – 2026)

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Recent developments (2024-2026)

2024

WDS membership

Consolidate IMOS & AODN catalogues

IODE accreditation

Improve data security

AODN Portal 2026
Preview/subset 150 +150
Discover 15,000 partner datasets

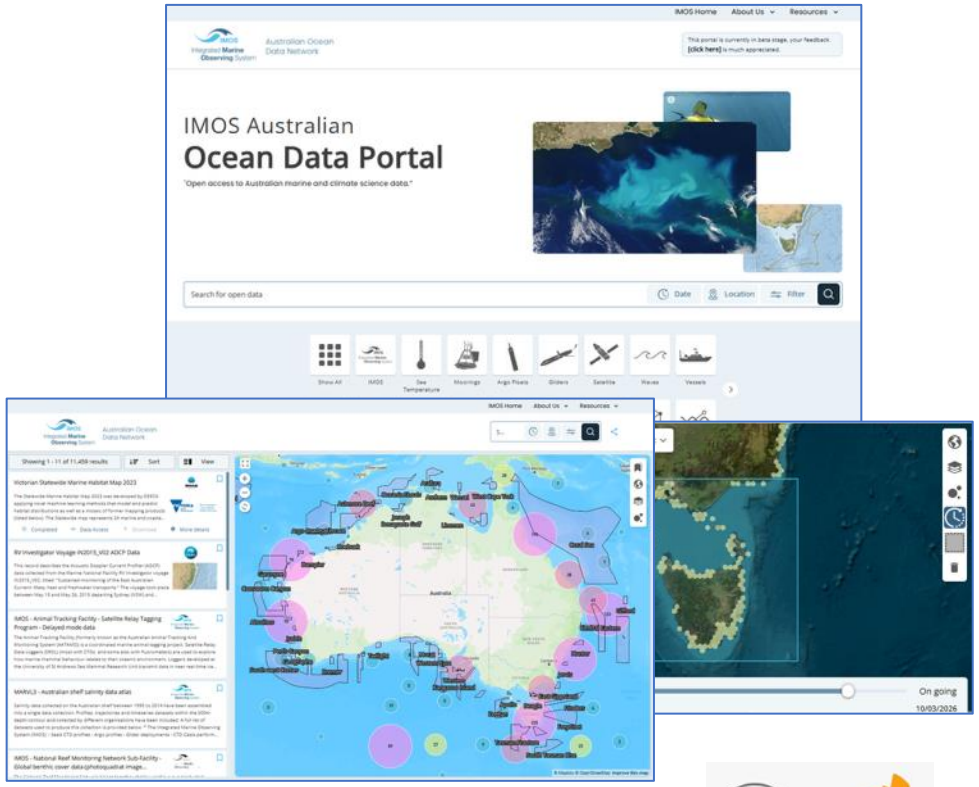
2026

Re-engineer data pipelines
Scalability and manageability

Incorporate cloud optimised capabilities

Renew CTS certification

Official WMO WIS2.0 node



WMO WIS2.0 Nodes

Data management credentials

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AODN Portal 2026

Important features and concepts

- Search suggest
- Spatially aware
- Extended catalogue (15,000)
- Dataset information
- Subset download (150+150)
- Previews of data (150+150)
  - Data density maps
  - Web map service
- User survey
- Citation copy
- THREDDS
- Cloud optimized
- Links to data science notebooks

- Available in ‘beta preview’ for feedback
- Will continue to evolve based on feedback and technology change
- Not all IMOS data are available yet
- Old Portal will continue in parallel

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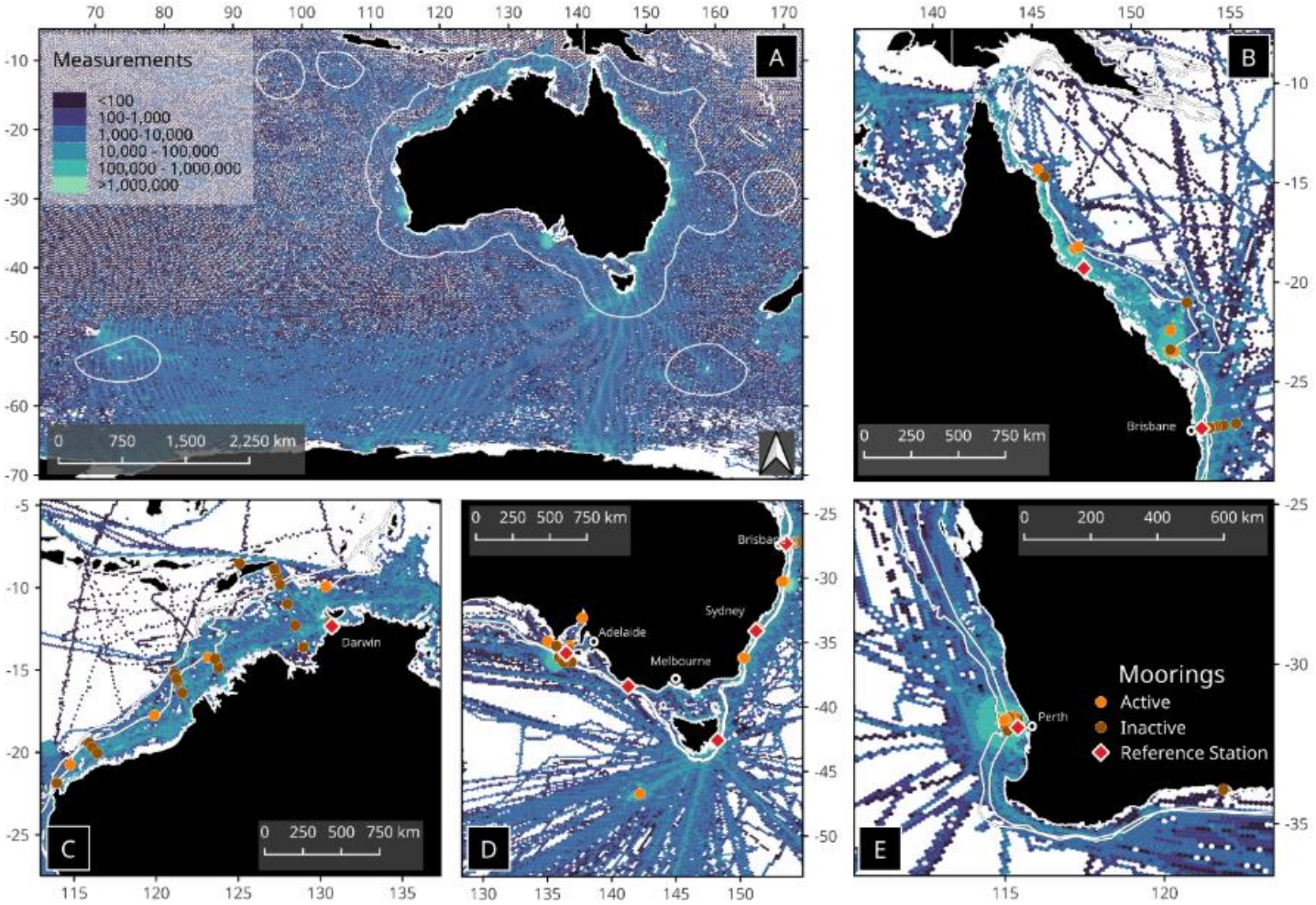
Some fun facts

1.5 Billion
measurements

88 TB
data volume

100 Million
data files

20+ Years
timeseries



15,000
metadata

150 + 150
dataset collections

1,440
voyages

325
industry vessels

840 K
profiles

3,600
mooring deployments

3 Million
satellite images

820
wave buoy deployments

15,000
benthic images
69 AUV campaigns

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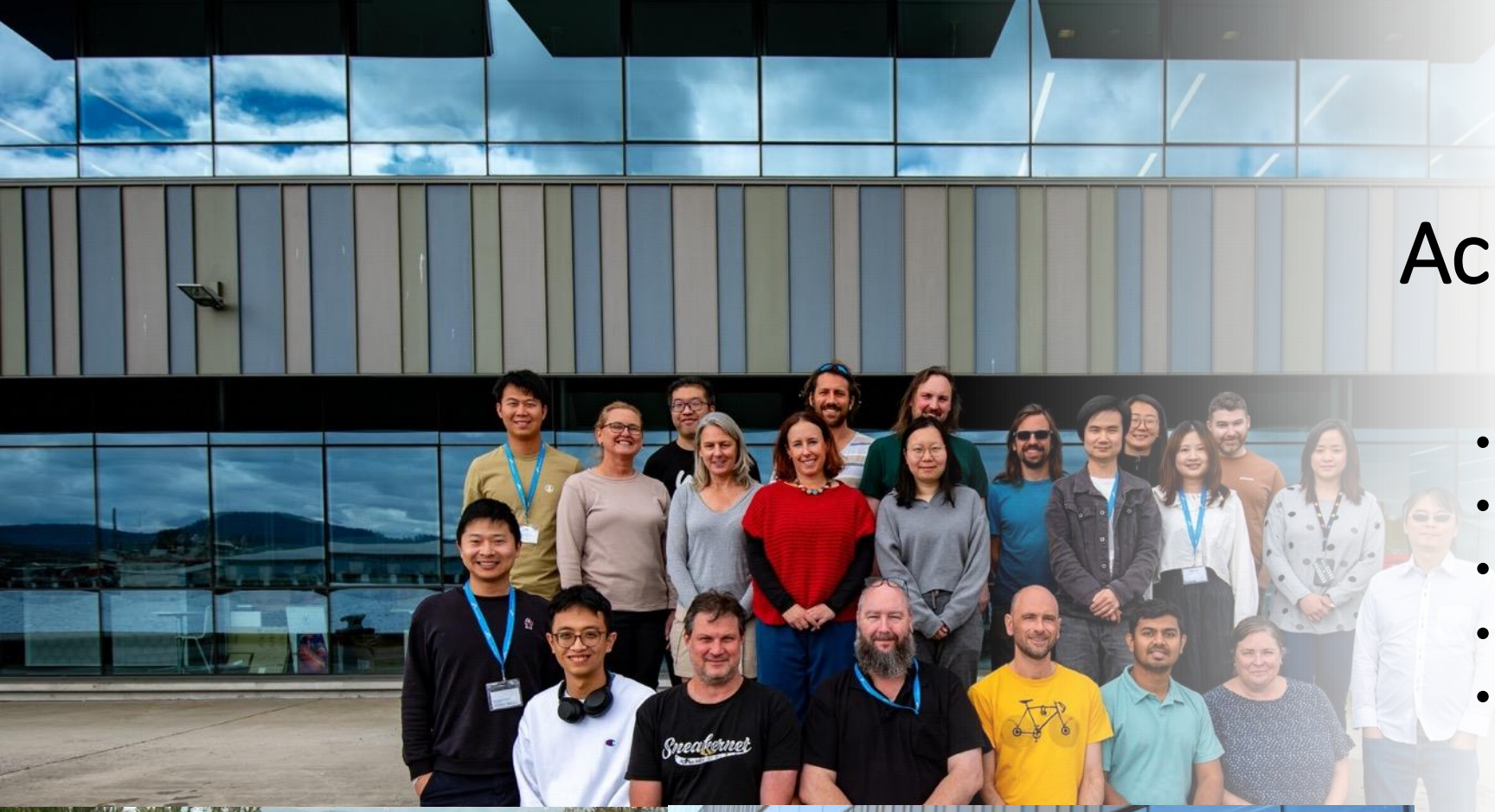
Acknowledgement



- AODN Staff past and present
- IMOS Directors past and present
- IMOS Admin team
- IMOS Facilities
- NCRIS and UTAS

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IMOS Integrated Marine Observing System

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

Australia's Integrated Marine Observing System is enabled by the National Collaborative Research Infrastructure Strategy (NCRIS). It is operated by a consortium of institutions as an unincorporated joint venture, with the University of Tasmania as Lead Agent.

PRINCIPAL PARTICIPANTS

University of Tasmania (Lead Agent)

Australian Government

Australian Institute of Marine Science

Australian Government Bureau of Meteorology

CSIRO

Government of South Australia

SARDI South Australian Research and Development Institute

The University of Western Australia

sims sydney institute of marine science

UTS

The University of Sydney

Macquarie University

UNSW Sydney

SIMS is a partnership involving four universities

ASSOCIATE PARTICIPANTS

Curtin University

Australian Government Department of Climate Change, Energy, the Environment and Water Australian Antarctic Division

Australian Antarctic Program

Deakin University

The University of Melbourne

IMOS thanks the many other organisations who partner with IMOS, providing co-investment, funding and operational support, including investment from the Tasmanian and Western Australian Governments.