



eResearch Collaboration across the Pacific: Marine Systems and Australian Marine Science Data

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Outline

Australian Ocean Data Network

- Introduce the Australian Ocean Data Network
- Possibilities for trans-Pacific collaboration

The AODN Vision

Australian Ocean Data Network

A single distributed, federated network for Australian marine science data and information.

Motivation:

- Promote the discovery, transfer and implementation of knowledge about marine environments by facilitating the management, exchange of, and ready access to, marine data and information.
- Provide enabling technology for e-research.

The AODN

Australian Ocean Data Network

- AODCJF as 'core component'
- BlueNet project
- eMII project of IMOS



Australian Ocean Data Centre Joint Facility

Australian Ocean Data Network

A partnership among Commonwealth Agencies:

- Australian Antarctic Division (AAD)
- Australian Institute of Marine Science (AIMS)
- Bureau of Meteorology
- CSIRO Marine and Atmospheric Research
- Geoscience Australia
- Royal Australian Navy

- with support from the National Oceans Office

To manage ocean data to meet national and international obligations

A DEST-funded project with three main roles:

1. Join universities to the AODN
 - data facilitators
 - BlueNet Champions
2. Help C'wealth agencies prepare to host 'external' data
 - building the virtual repository
3. Develop technologies for the AODN
 - Metadata Entry and Search Tool (MEST)

BlueNet - partners

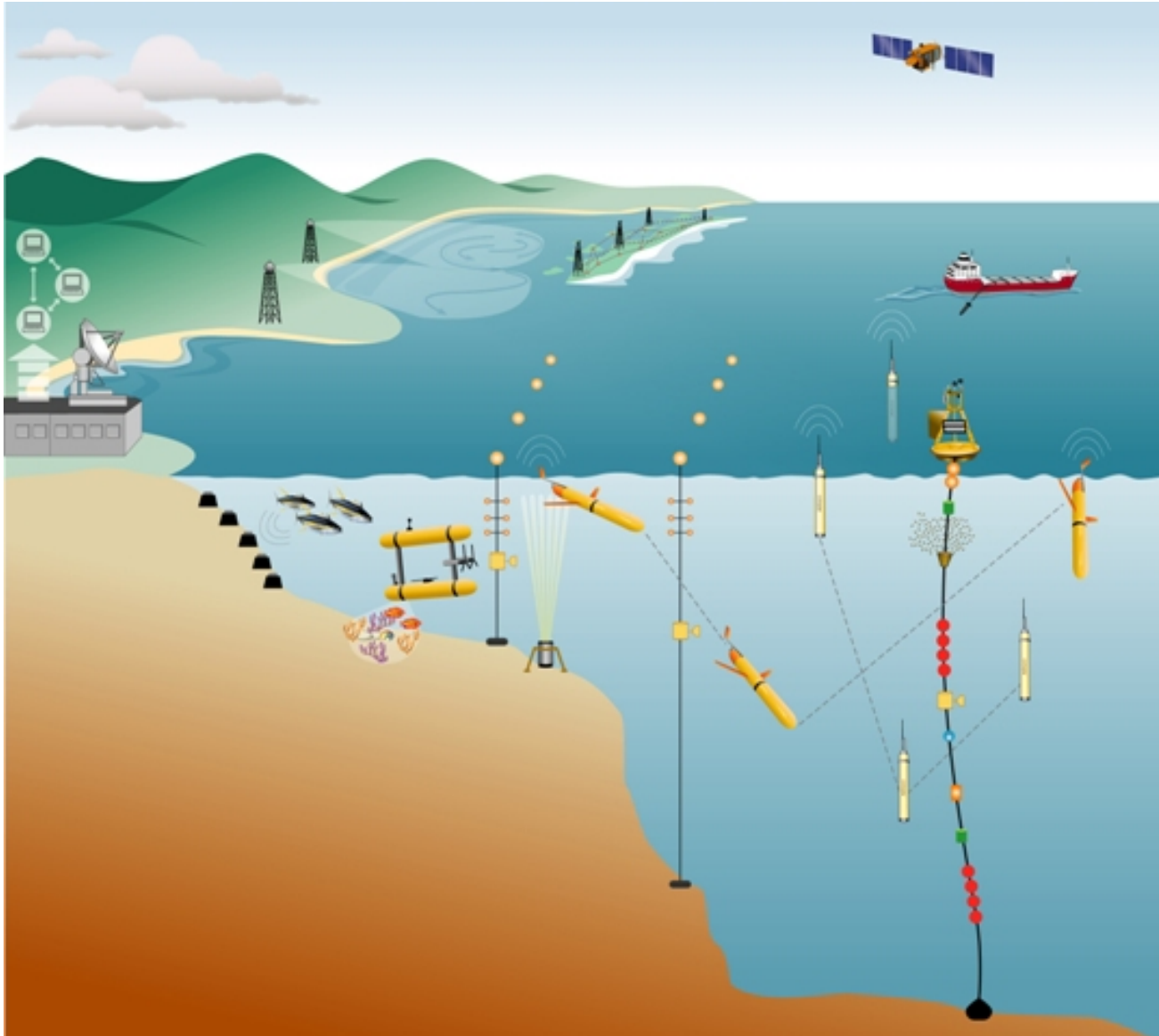
Australian Ocean Data Network

- *AODCJF Agencies, TPAC*
- James Cook University
- University of Sydney
- Australian National University
- University of Melbourne
- University of Tasmania
- University of Western Australia
- Flinders University

- (University of Queensland)
- (University of New South Wales)
- (Deakin University)

eMII

the data management component of IMOS



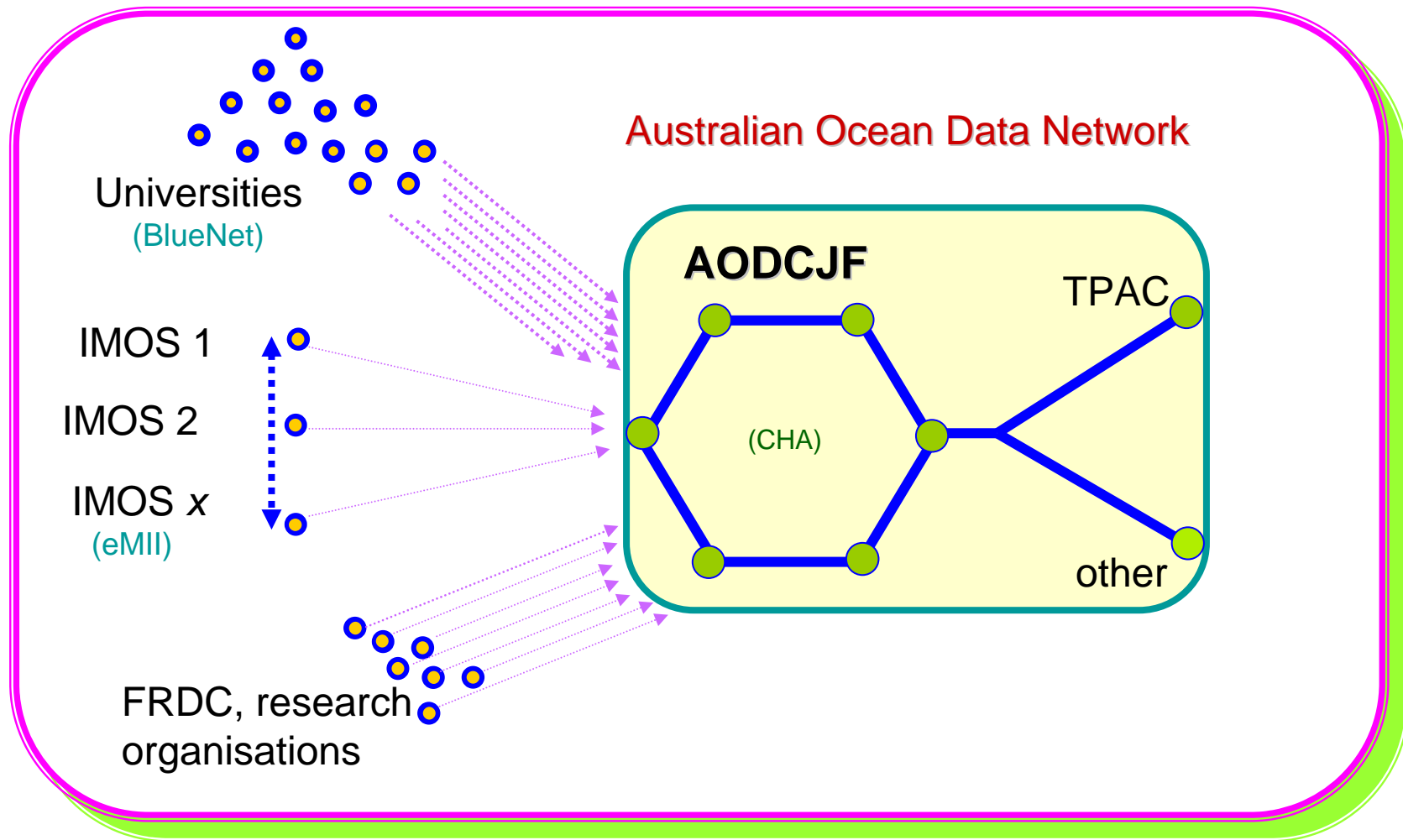
eMII

the data management component of IMOS



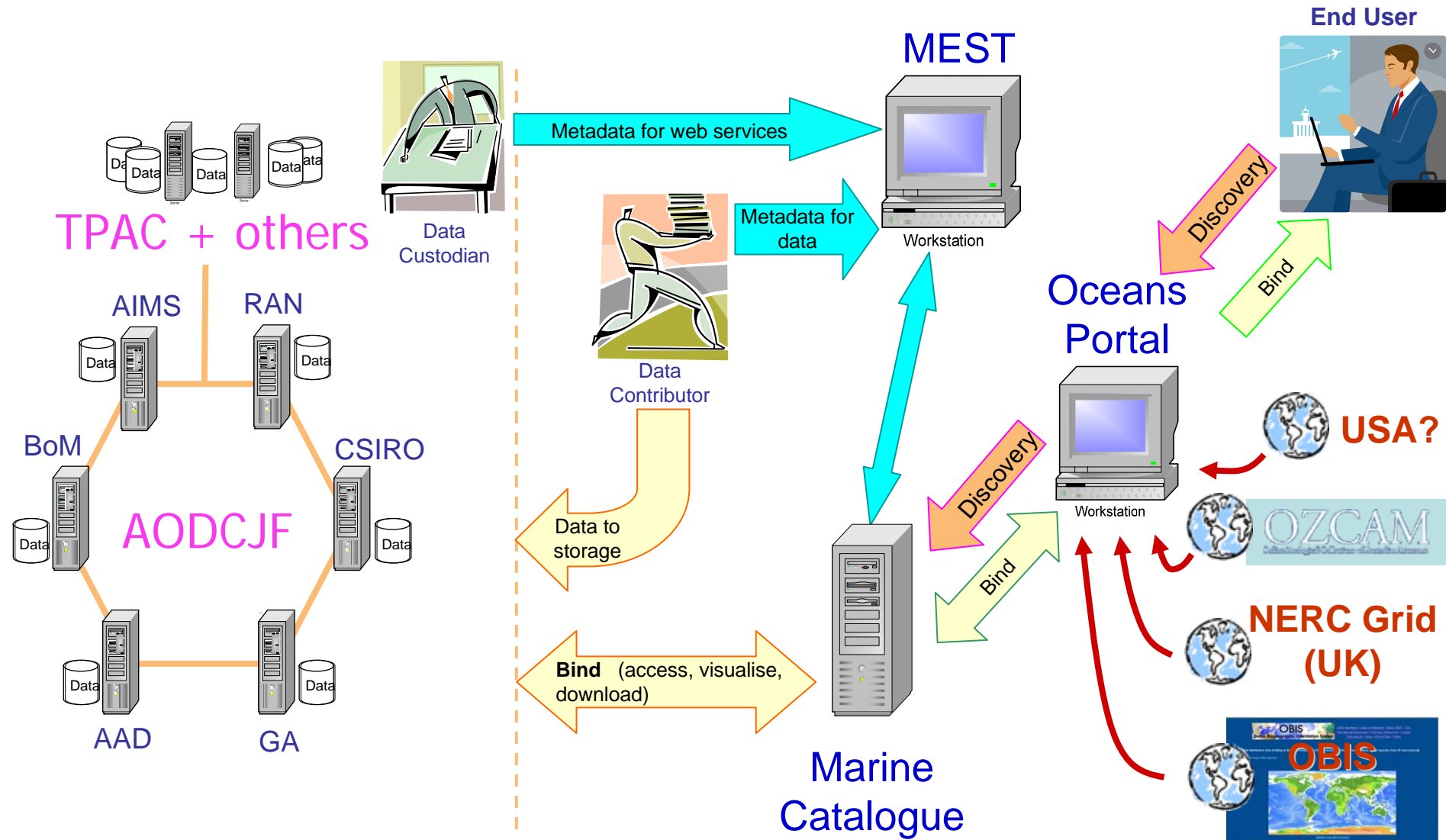
The AODN Network

Australian Ocean Data Network



The AODN Network

Australian Ocean Data Network



AODN Technologies: MEST

Australian Ocean Data Network

Metadata Entry & Search Tool (GeoNetwork based)

- Simultaneous searching across multiple catalogues / repositories
- Manages permissions and access
- Explicit content-specific display of “Copyright and Use-limitations”
- Gathers statistics about data-downloads; data owners advised of users
- ISO19115 compliant (the international geospatial metadata standard) PLUS other metadata standards, e.g. for sensors, observation and measurement
- Several ‘controlled’ vocabularies relevant to marine science ‘sub-disciplines’
- Customisable metadata-entry templates for varying data types
- Data upload and download
- Web map services - allowing visualisation of multiple datasets

AODN Technologies: MEST

Australian Ocean Data Network

Metadata Entry & Search Tool (MEST)

- Intended to be flexible
- Will evolve with needs of community
- Adopted by Office of Spatial Data Management (OSDM)



AODN Technologies Portal & Catalogue

Australian Ocean Data Network

Portal

- Visualises / integrates disparate datasets
- GIS-like functionality (map layering, legend, zoom, etc)
- GUI to search for and call services listed in Catalogue
- Several different types of searches
- Allows user to build complex searches

Catalogue

- Harvested metadata records are imported into the Catalogue
- No GUI; handles calls from remote clients (e.g. Oceans Portal) for searching
- Is a registry for:
 - metadata
 - data
 - for web services (provides links to services that facilitate data access, data manipulation, visualisation and download)

Trans-Pacific Collaboration

Australian Ocean Data Network

- Data discovery and access
- Server-side computing
- Sensor nets

Data discovery & access

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Connection to US-based data – an interoperable data system

- discovery / access through AODN portal
- challenges:
 - authentication and access
 - speed of access to data
 - bandwidth
 - more mirroring?
 - access to real time data (buyer beware)
 - interoperability
 - standards
 - common vocabularies, symbologies
- access to historical data: legacy data / systems

Server-side computing

Australian Ocean Data Network

Establishment of and access to 'remote' modelling

- portal technology
 - to handle authorisation / authentication?
 - access to model(s)
 - information about models
 - structure, assumptions etc.
 - parameters, run times etc.
 - model initialisation and run / output control
 - link to input data
 - visualisation of and access to model output data
 - registries / catalogues of models
 - discoverability of models
 - details of models – params, run times, etc

Server-side computing

Australian Ocean Data Network

Types of models and related tools

- ecosystem models
- particle / larval tracking, connectivity (e.g. Blue Link)
- geospatial reference – a ‘marine Google Maps / Earth’ including terrestrial margins:
 - point and click
 - high resolution GIS-type functionality
 - bathymetry





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19°14'38.32" S 146°49'14.15" E elev 0 ft

Streaming 100%

Eye alt 11962 ft



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or 19°19'09.88" S 148°03'55.93" E elev 6 ft

Streaming ||||| 100%

Eye alt 30087 ft

Server-side computing

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Better integration of real-time data into models

- Challenges:
 - standards
 - bandwidth / capacity to transfer data
 - signal quality detection and reporting

Sensor nets

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- Real time processing of sensor net data (e.g. maps)
- Remote control of sensor direction / position
- Google Maps / Earth type capability for spatial reference
 - identify sensors / data streams in chosen area
 - select which ones to look at
 - obtain information about instruments, calibrations, data streams, QA processes, images, permissions etc.