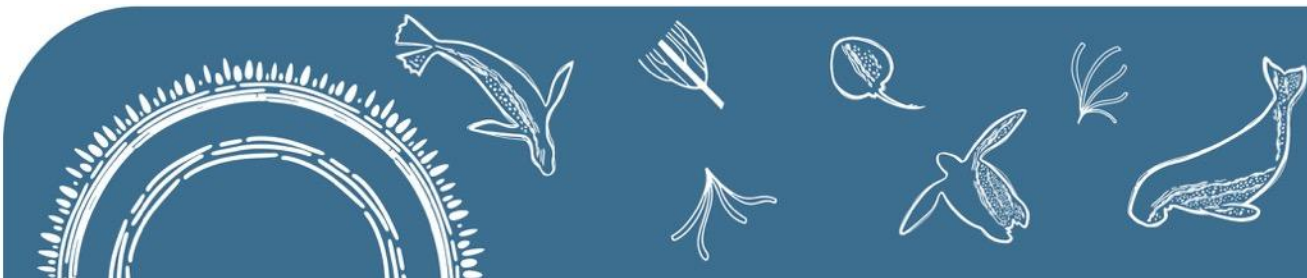




AODN Data Products

Data products and facilitating data use



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.

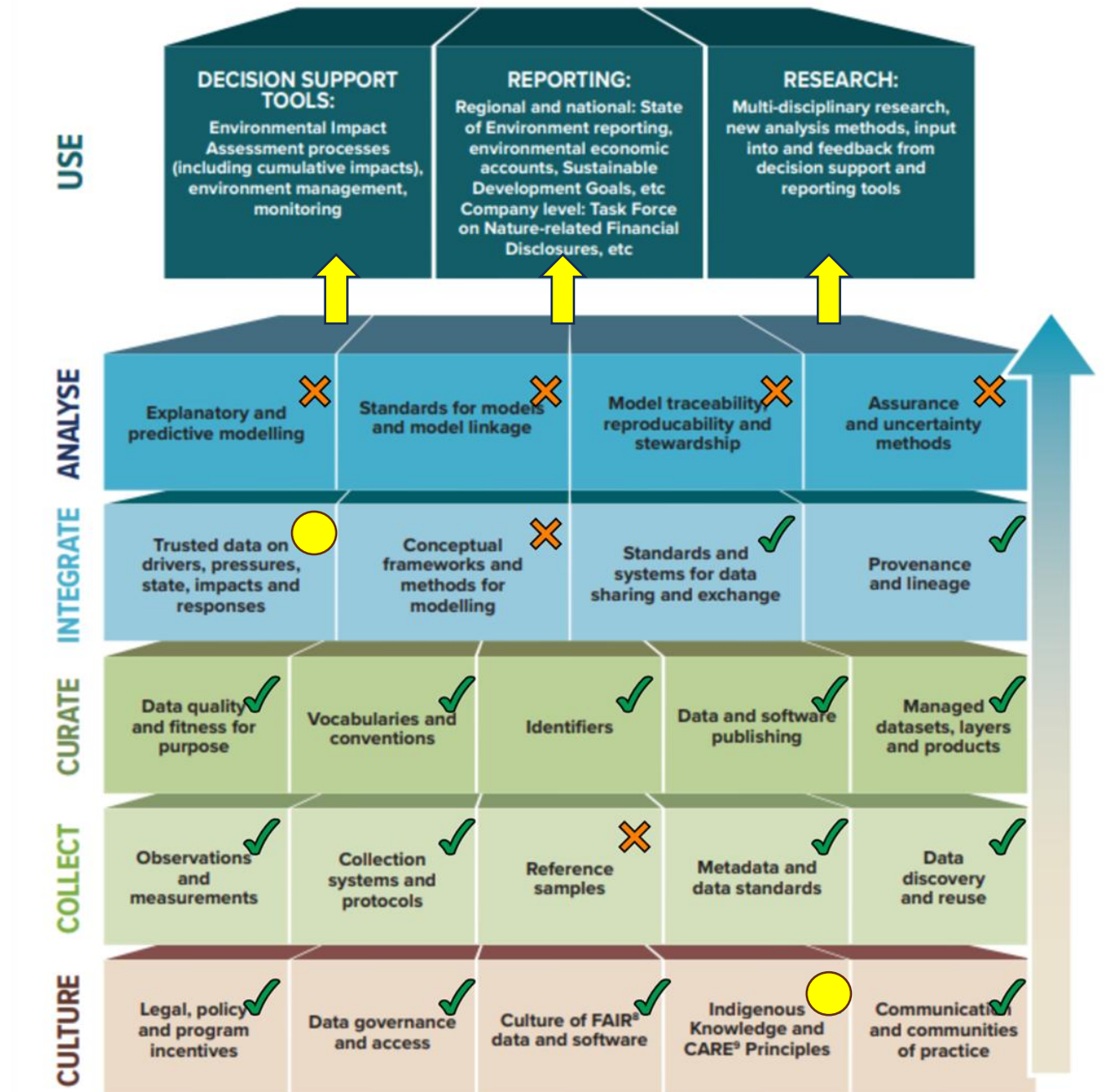
Strong data management foundations

Positions us well to focus on:

1. Bridging the gap between data and use
 - Data/information accessibility & usability
2. Priority 3rd party data
 - Inaccessible, hard to find, not easy to use
3. Indigenous Knowledge and CARE principles

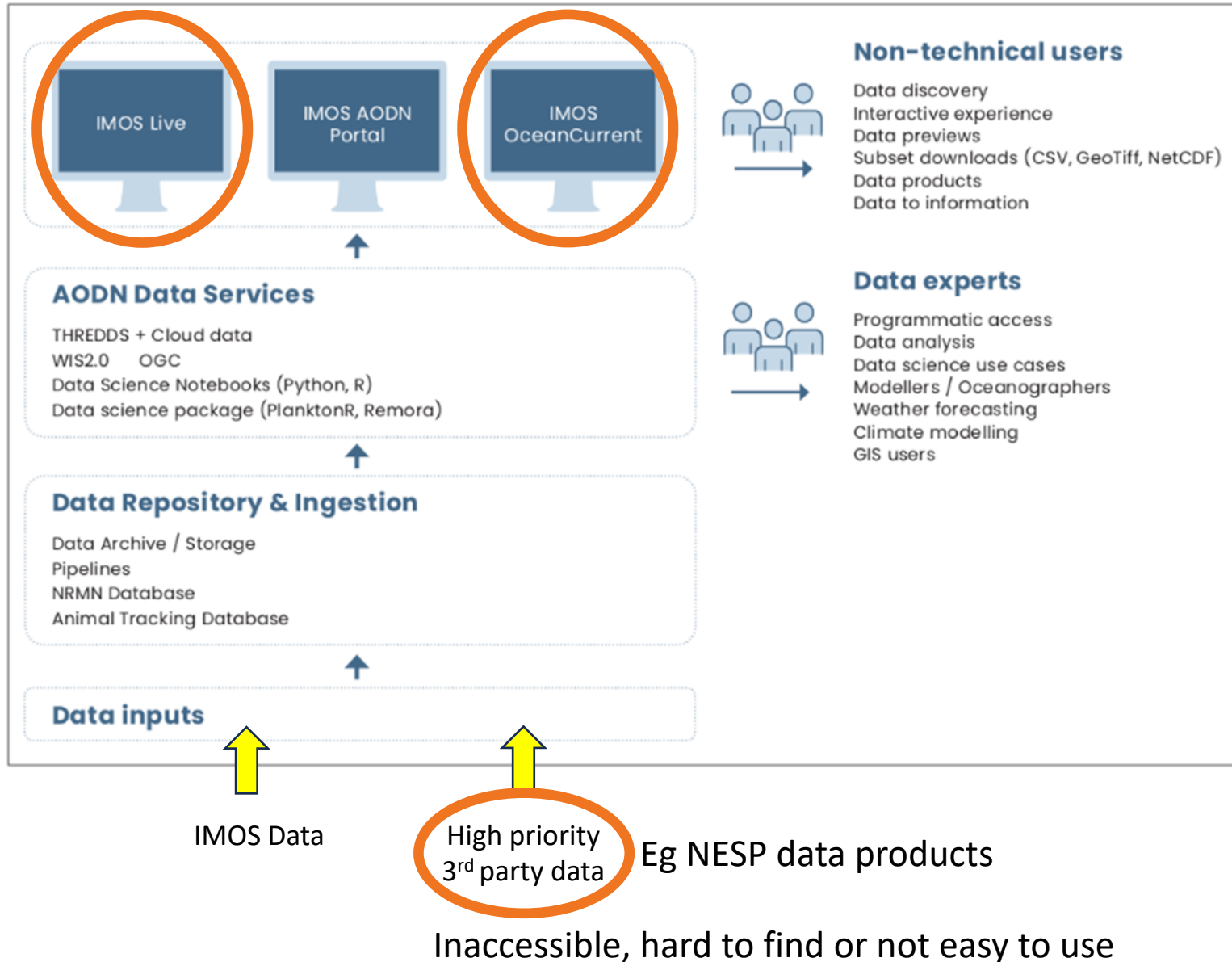


Image source: GIDA



SAFE: https://wamsi.org.au/research_themes/safe-shared-analytic-framework-for-the-environment/

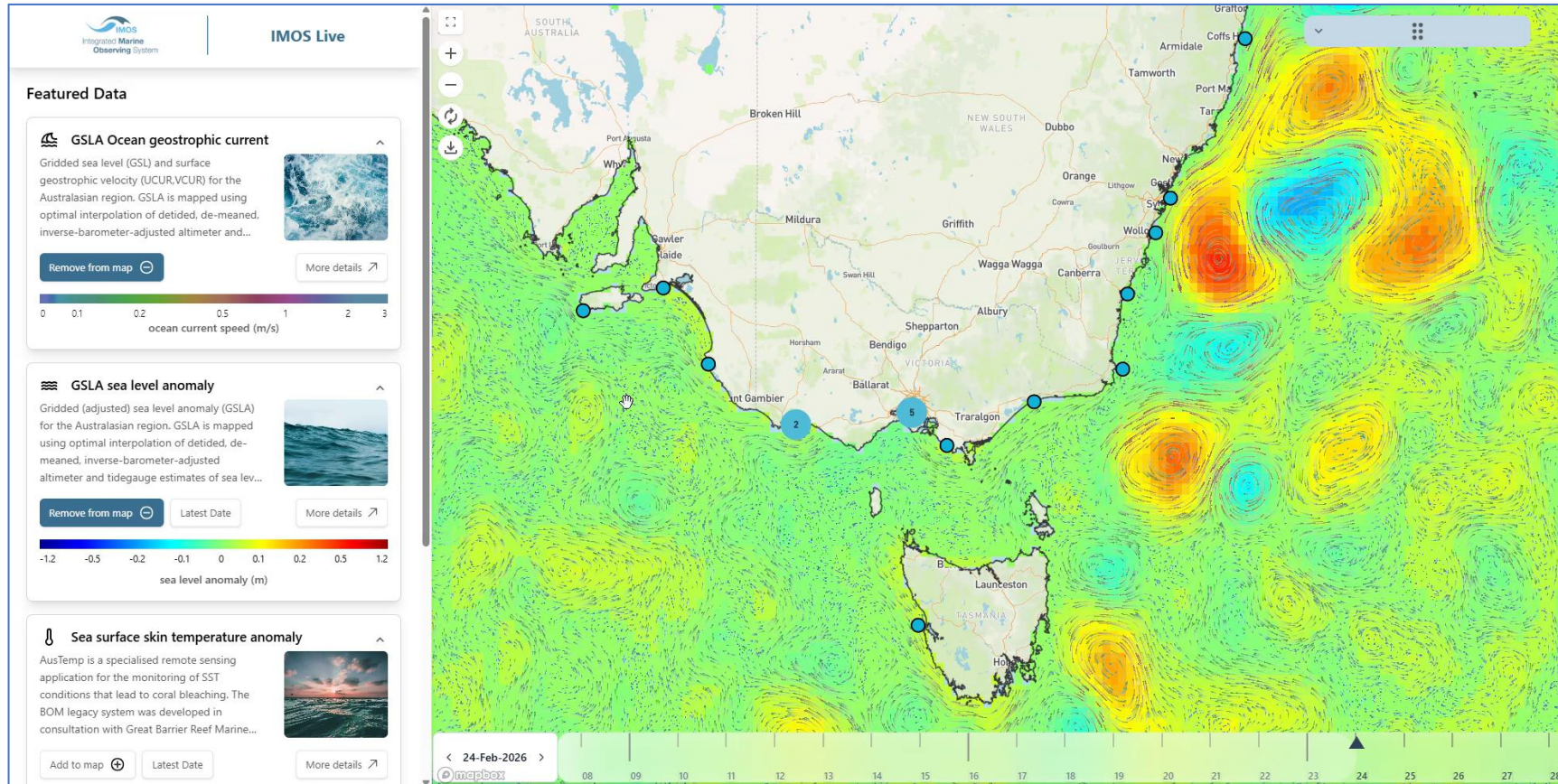
IMOS AODN Data Accessibility



Data accessibility & usability

- Multiple access methods
 - General users
 - Interactive/visual
 - Expert usage
 - Enable data analysis
- Cloud optimised data
 - Aggregated harmonised
 - 'ready to use' data
 - We do all the wrangling 'once', so you don't have to

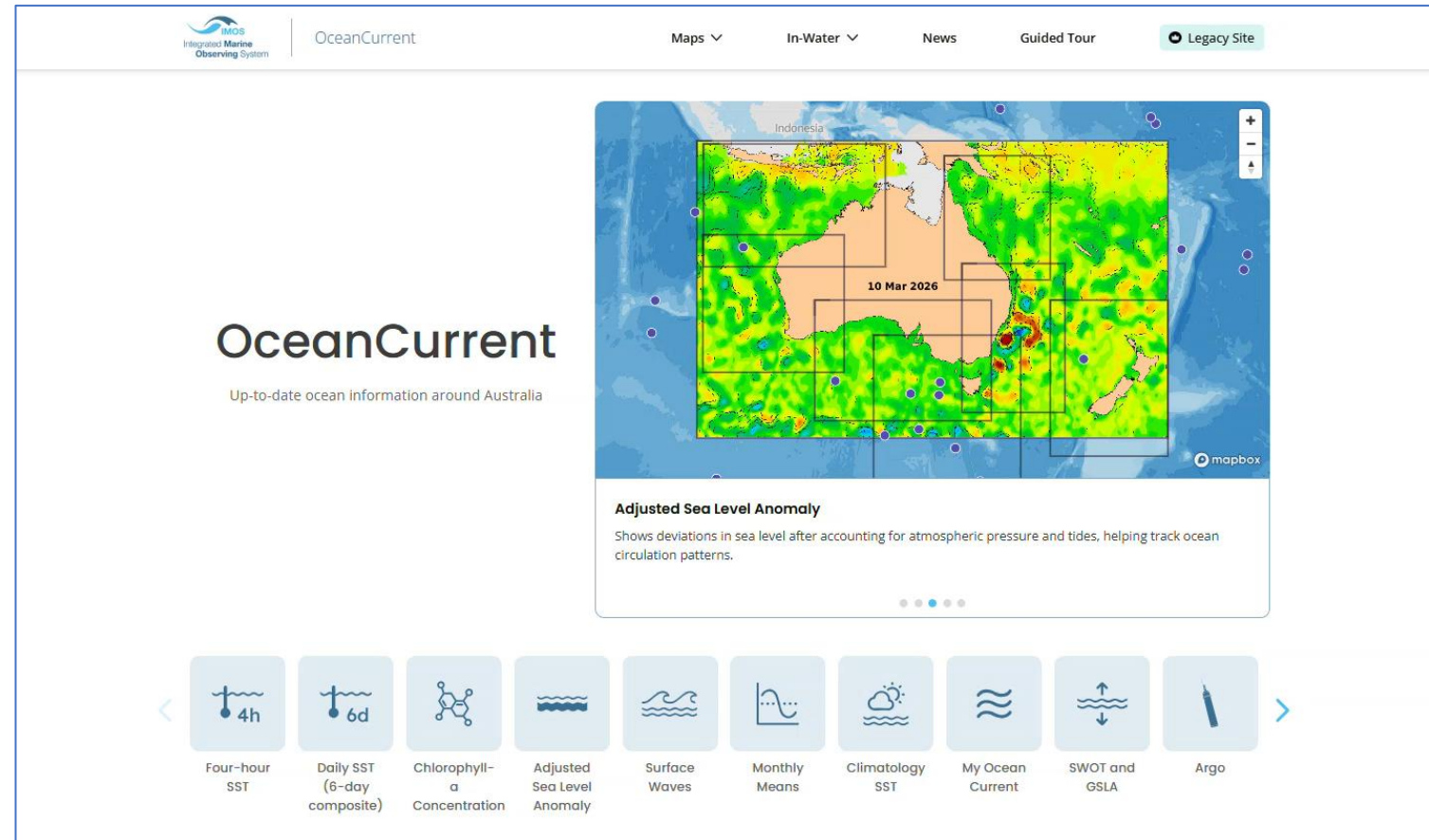
IMOS Live



- Interactive near real-time data
- Beta version available for 'preview' and feedback
- Mobile and desktop browser friendly
- Zoom and pan interactive map
- Step through previous 30 days
- Dynamic chart for timeseries data

- Ocean currents, wave buoys time series, heat stress indicators
- More data streams to be added in future: marine heatwaves, chlorophyll, moorings...

IMOS OceanCurrent



- Implemented using modern technologies
- Consistent with IMOS design
- Uses existing GIF Figures, but easier to navigate
- Mobile friendly

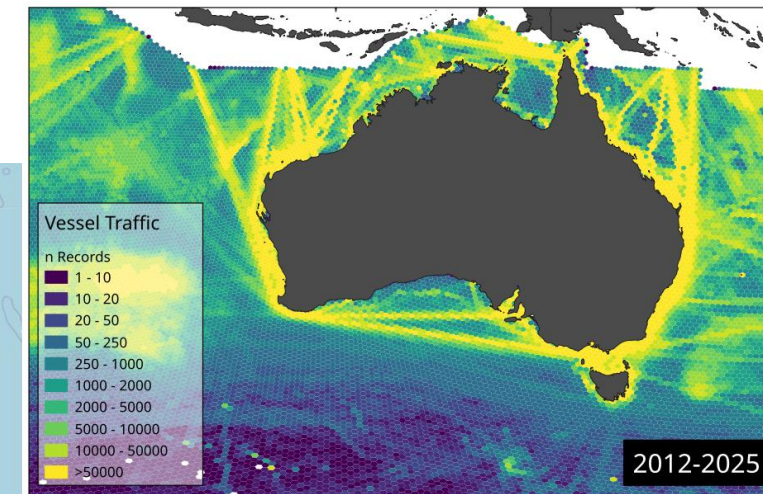
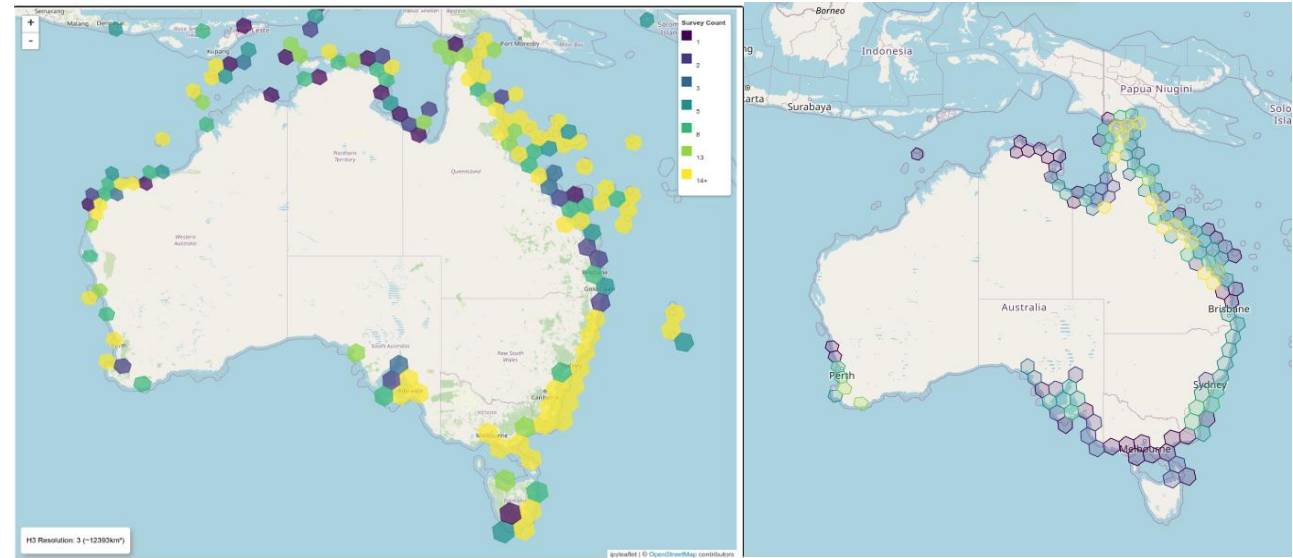
- Initial feedback received and being addressed
- Beta version to be released, few features from the legacy site not yet implemented due complexities
- Working with Gabbi, David & Dirk (CSIRO)



NESP funded data products

Making marine data more 'assessment-ready'

- NESP Marine and Coastal Hub funded project
- Target: State of the Environment reports, Environmental Economic Accounts and environmental approvals
- Aggregated products from heterogeneous research datasets into cloud-optimised, ready to use, delivered through IMOS AODN infrastructure
- Six stakeholders-prioritised datasets:
 - Habitats: Seagrass, Corals, Kelp
 - Species: Seabirds, Dugongs
 - Pressures: Vessel traffic

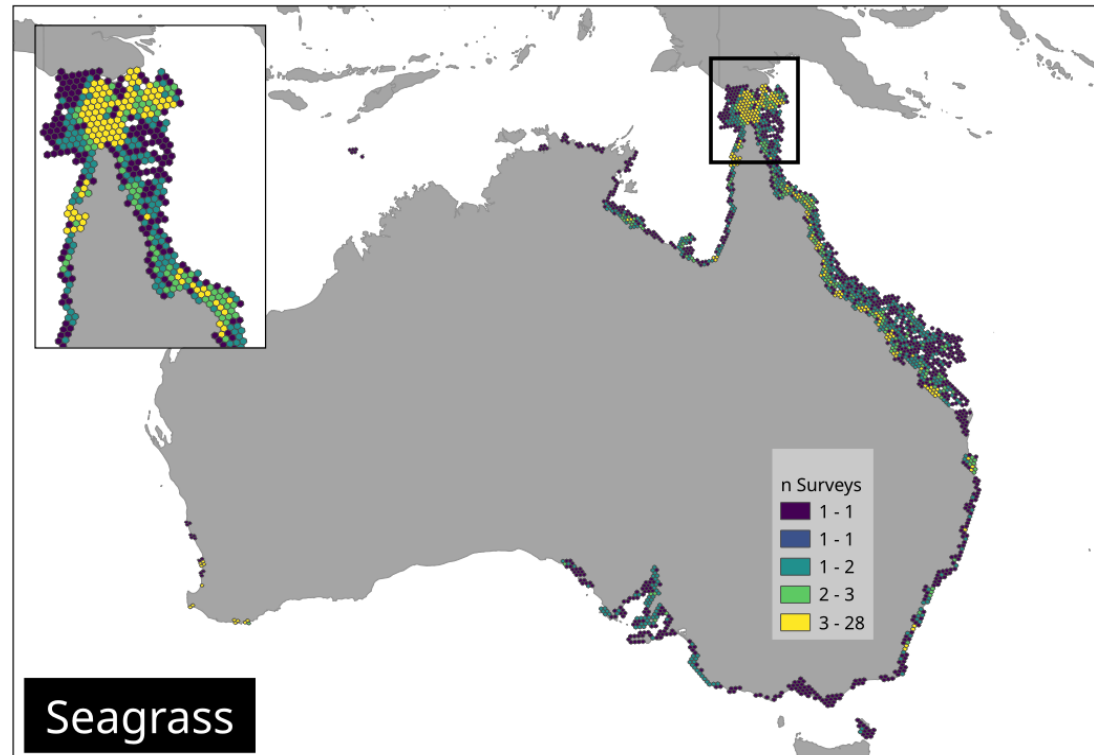


NESP Data product

Habitats: Seagrass

- 83 disparate datasets from IMAS Seamap Australia, AIMS eAtlas, WAMSI, UQ, SA EPA
- 3.2 million observations
- Harmonisation extremely challenging
- Close collaboration with SeaMap Australia IMAS/UTAS

Title	National Seagrass Data Aggregation
Temporal coverage	1967 – 2024
Geographic coverage	Australian coastal waters (national)
Contributing datasets	83 source datasets
Output format	Parquet (long format)
Licence	CC-BY 4.0 (some contributing datasets carry NC or SA conditions)
Update frequency	As needed
Status	Complete

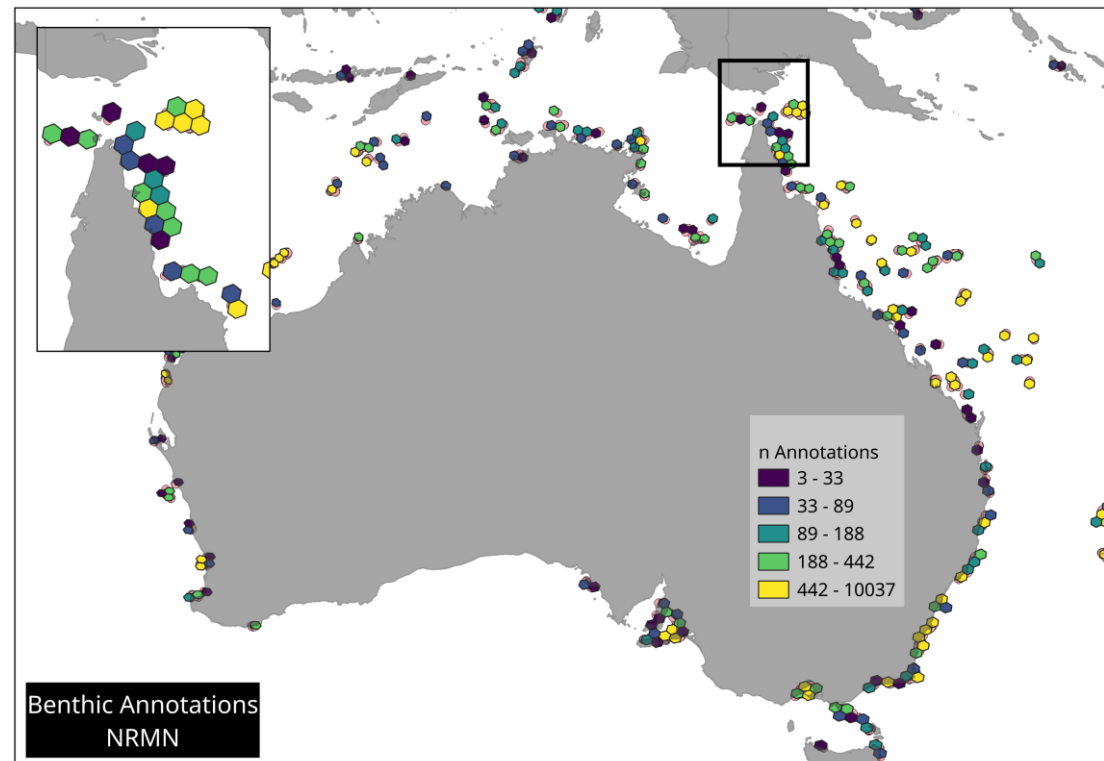


NESP Data product

Habitats: Benthic annotations

- Aggregation of NRMN and SQUILE+ annotations
- +95,000 annotations
- Harmonisation of different labelling schemas
- Close collaboration with NRMN facility and SQUIDDLE+

Title	NRMN Photo Quadrat Aggregated Data Product
Temporal coverage	Aligned with IMOS NRMN monitoring programme
Geographic coverage	Australian temperate and tropical reef sites
Sources	IMOS National Reef Monitoring Network legacy database; Squidle+ private NRMN annotations
Output format	Parquet (~1 MB, public and private variants)
Licence	Public component: open access; Private component: restricted
Update frequency	Ongoing (scheduled refresh)
Status	Complete

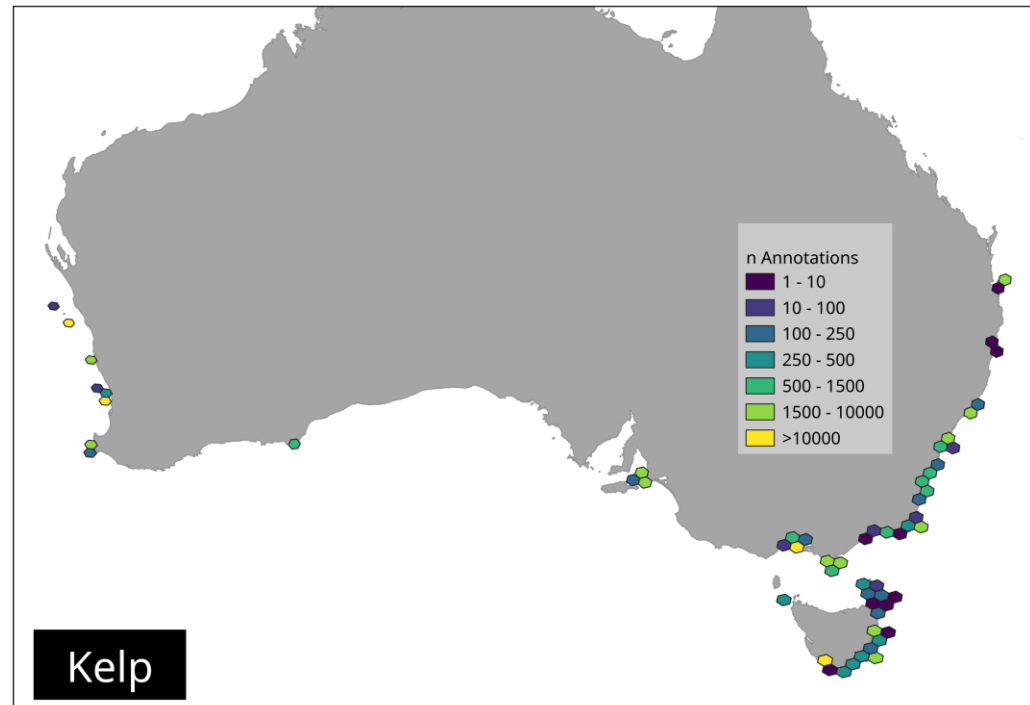


NESP Data product

Habitats: Kelp

- 90,000+ Annotations from SQUIDLE+
- Darwin Core / WoRMS taxonomy harmonised
- Challenge: Complex SQUIDLE+ API and labelling schemas

Title	National Kelp Dataset
Temporal coverage	2008 – 2025
Geographic coverage	Southern and eastern Australian coastal waters (113.4°E–153.5°E, 43.7°S–27.1°S)
Source platform	Squidle+ public annotation sets
Output format	Parquet (~2 MB)
Licence	CC-BY 4.0
Update frequency	Ongoing (scheduled refresh)
Status	Complete

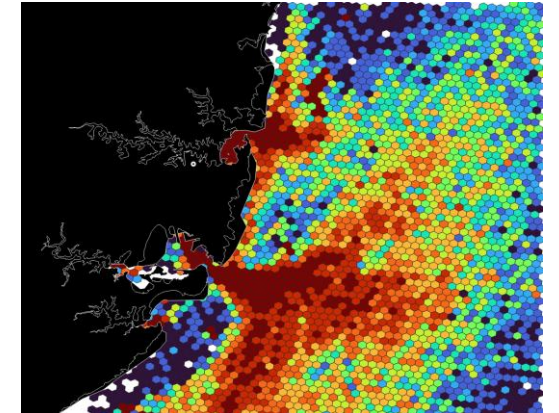
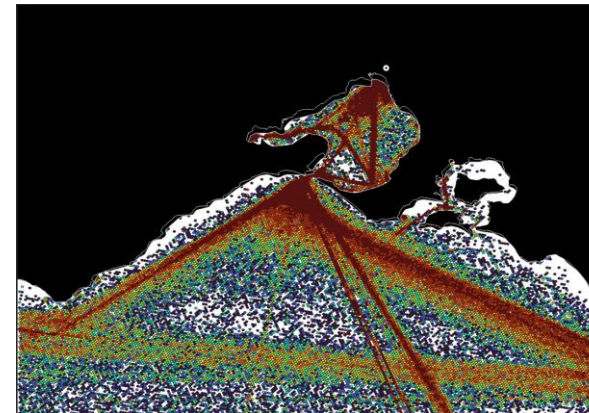
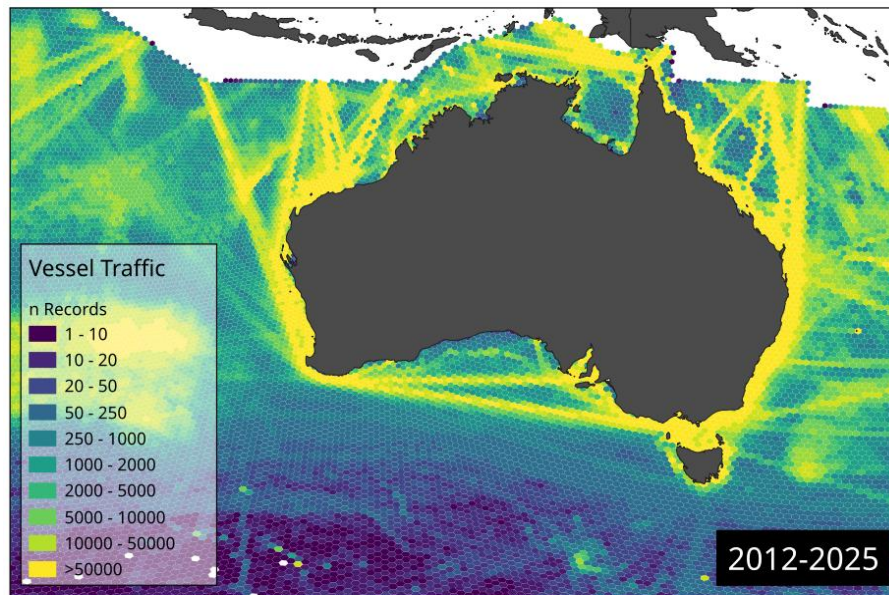


NESP Data product

Pressures: Vessel traffic

- 200+ million records from 2012 onwards
- H3 spatial indexing (used in all the datasets)
- Challenges:
 - Data cleaning
 - No data service for automatic downloads

Title	Aggregated AMSA Vessel Tracking Data 2012–2025
Temporal coverage	September 2012 – 2025
Geographic coverage	Australian Search and Rescue Region (75°E–163°E, 86.6°S–2°S)
Source authority	Australian Maritime Safety Authority (AMSA)
Output format	Parquet (yearly master files)
Licence	CC-BY-NC 4.0
Update frequency	Ongoing (monthly ingestion)
Status	Complete

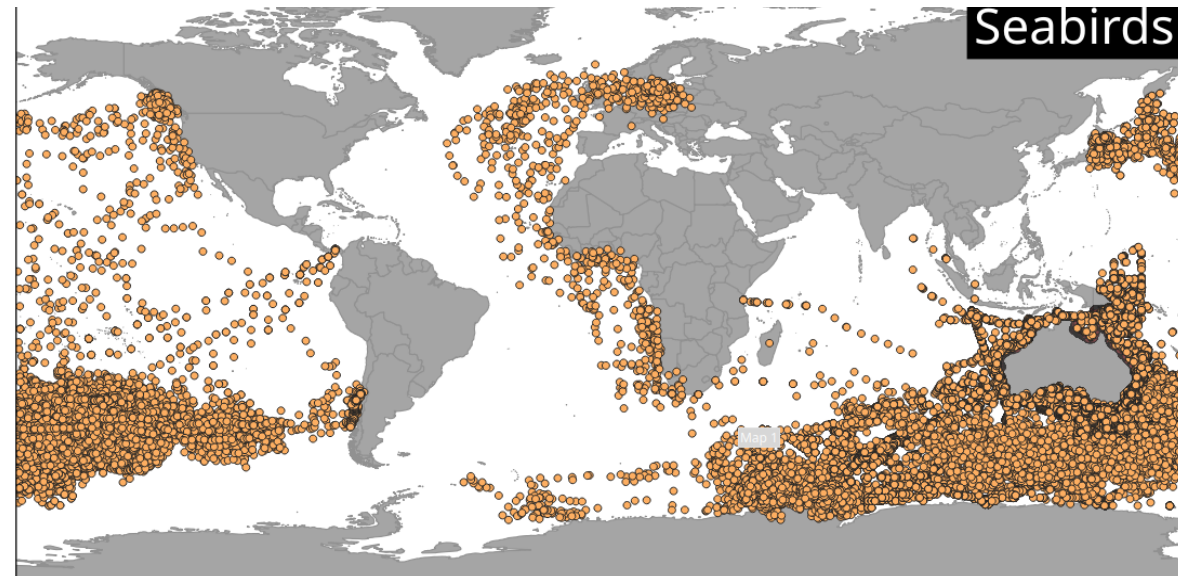


NESP Data product

Species: Seabirds

- Aggregation from OBIS-AU
- Future: Aggregate from OBIS Int sources:
 - 2.5 million Records
 - >140 sources
- Even if all DS are in DwC, harmonising values within columns was a challenge
- Collaboration with CSIRO

Title	Seabird Aggregated Data Product
Temporal coverage	1939 – 2025
Geographic coverage	Global (bounding box: 180°W–80°E, 71°S–63°N); primarily Australian and Southern Ocean waters
Contributing datasets	41 Darwin Core archives from OBIS Australia Node
Output format	Parquet (~5 MB)
Licence	CC-BY 4.0 (some contributing datasets carry NC conditions)
Update frequency	Daily (automated refresh)
Status	Complete

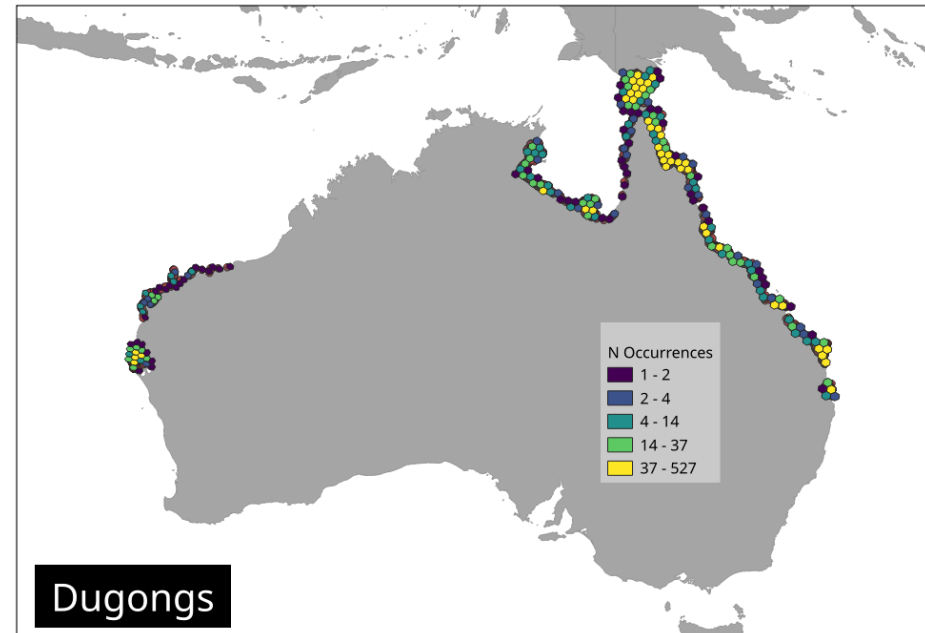


NESP Data product

Species: Dugongs

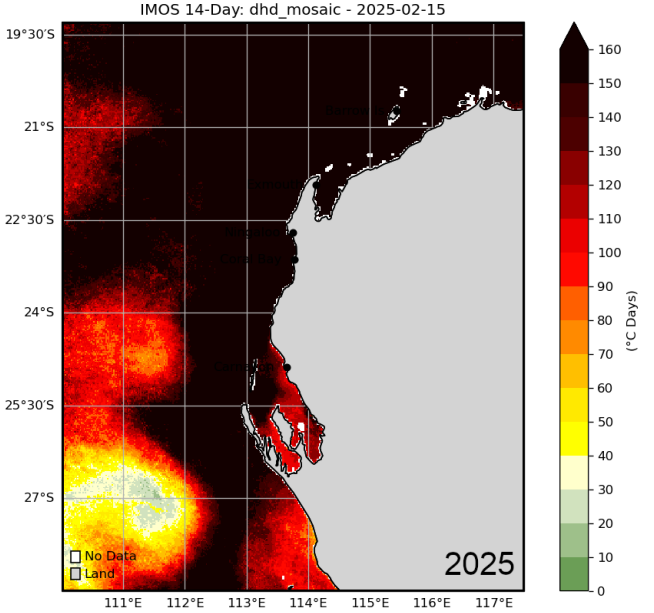
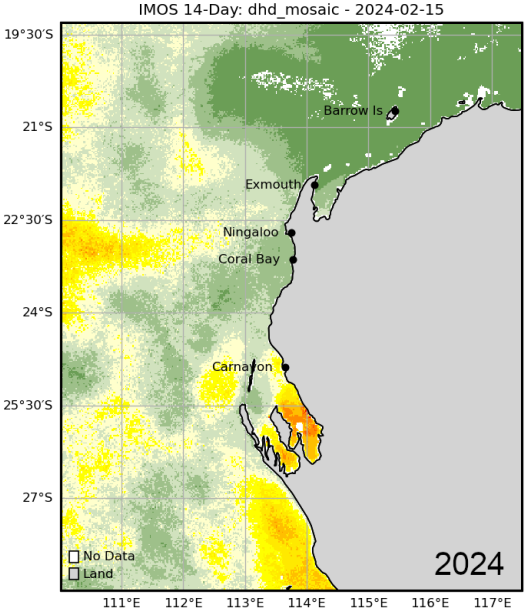
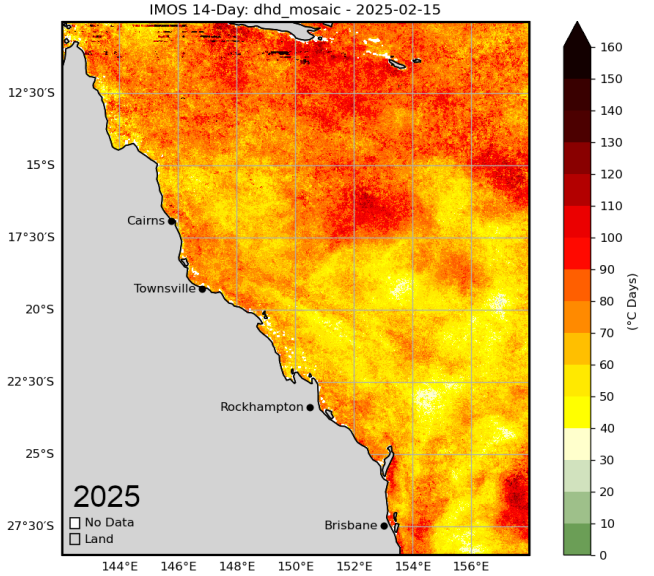
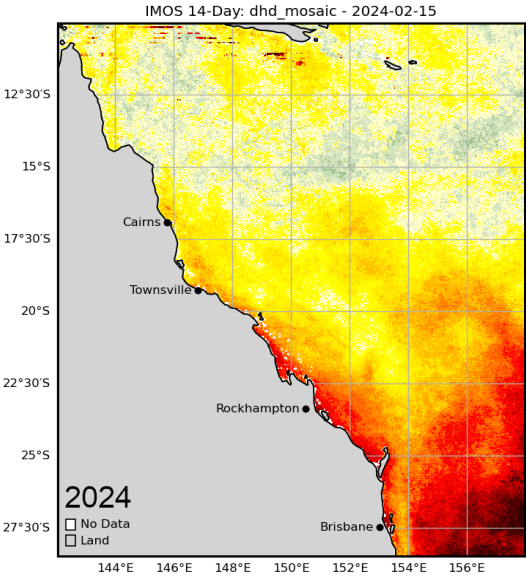
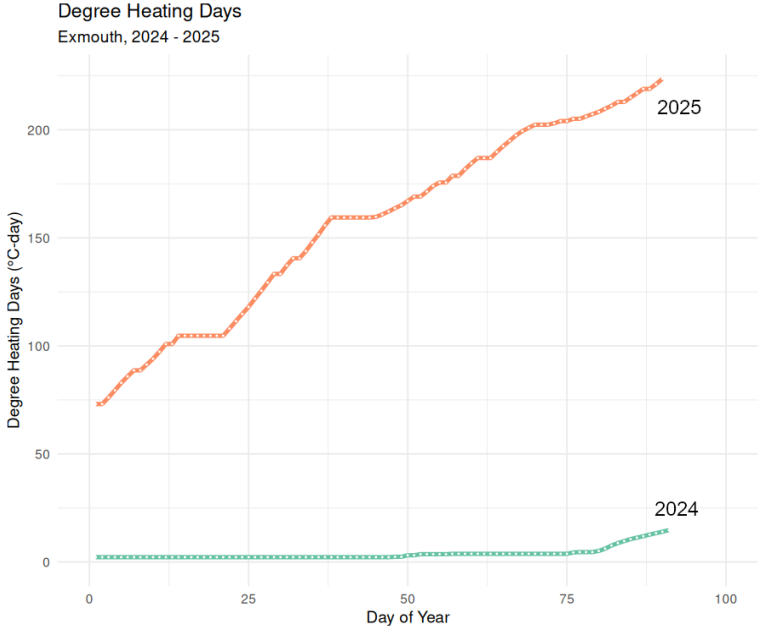
- Aggregation from 30y JCU surveys
- Harmonising table schemas challenging (even from the same provider)
- Collaboration with JCU

Title	Dugong Aerial Survey Database
Temporal coverage	1984 – 2023
Geographic coverage	Northern Australian coastal waters (nine broad survey regions)
Source institution	James Cook University (JCU)
Output format	Parquet
Licence	CC-BY 4.0
Update frequency	As surveys are conducted
Status	In development



Heat stress products

- Degree Heating-Day, SST anomaly, heatwave indicators
 - Successful implementation of the BOM legacy product
 - New heatwave product based on SSTAARS climatology
 - Daily Update frequency, all year, all Australia region
 - Accessible in Portal, IMOS Live, cloud optimised, NetCDF





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



SIMS is a partnership involving four universities

ASSOCIATE PARTICIPANTS



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.

