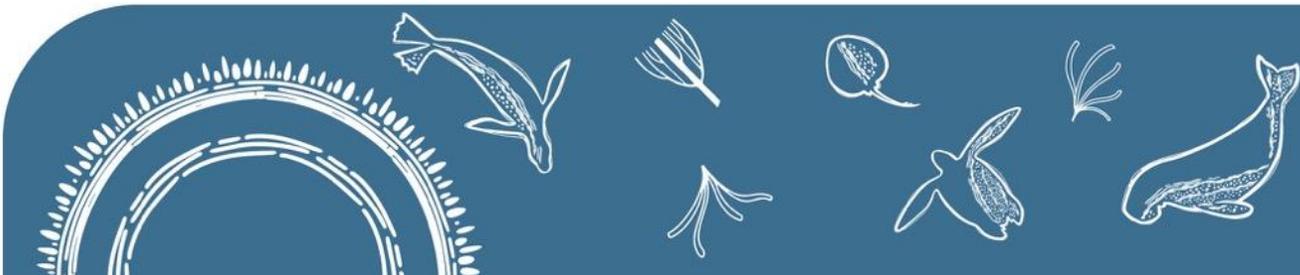




# AODN Data Products

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.

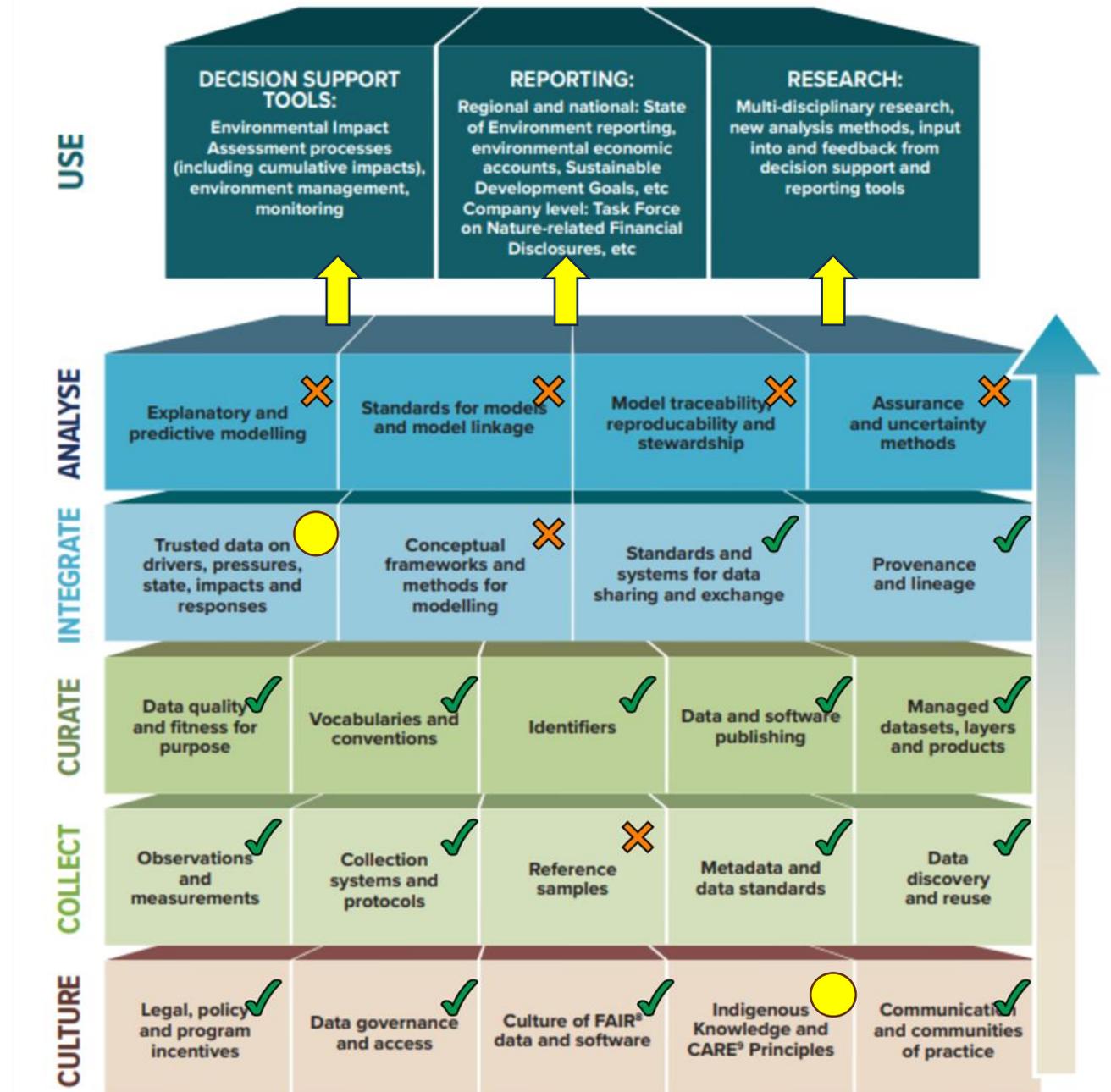
# Strong data management foundations

Positions us well to focus on:

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

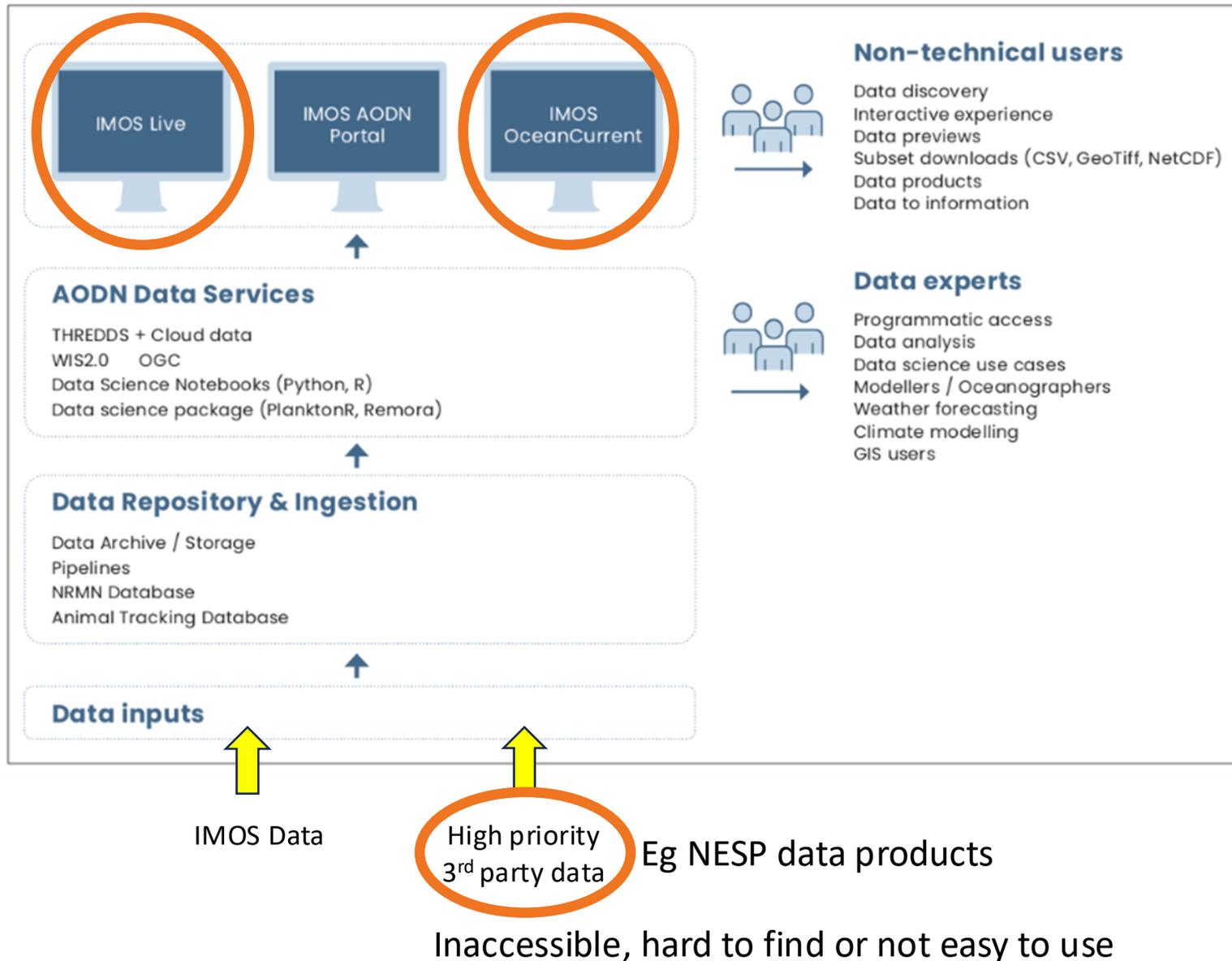


Image source: GIDA



SAFE: [https://wamsi.org.au/research\\_themes/safe-shared-analytic-framework-for-the-environment/](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

VIDEO NOT AVAILABLE

- 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

VIDEO NOT AVAILABLE

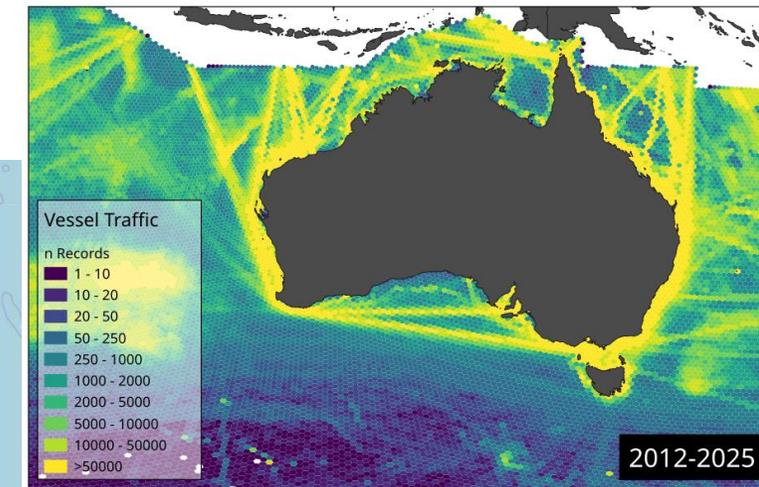
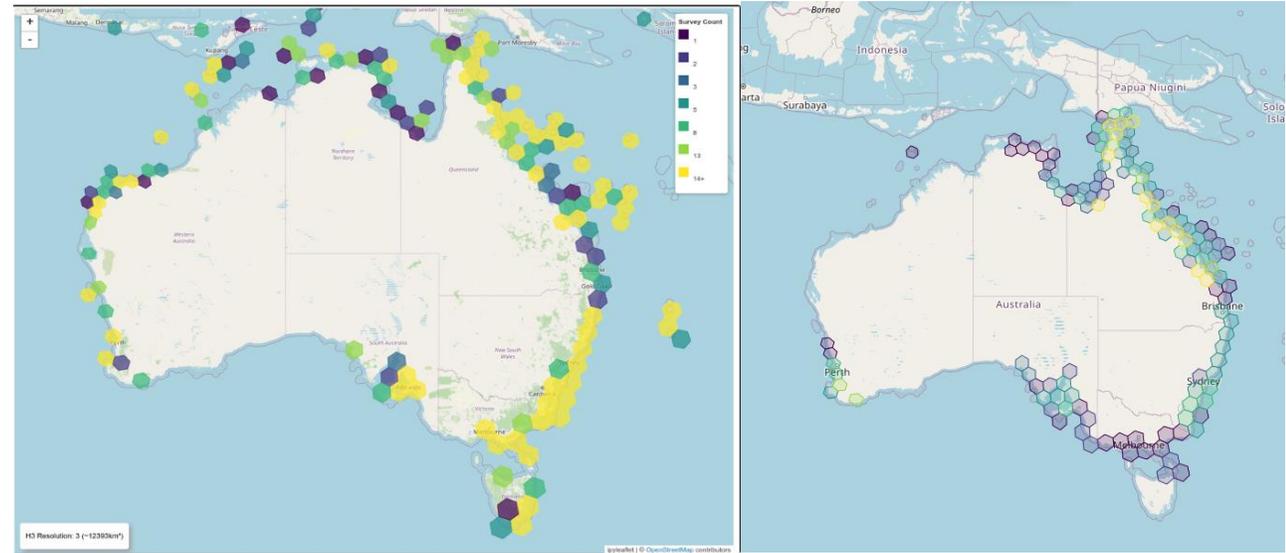
- Implemented using modern technologies
- Consistent with IMOS design
- Uses existing GIF Figures, but easier to navigate
- Mobile friendly
- Initial feedback received and being addressed
- Beta version to be released, few features from the legacy site not yet implemented due complexities
- Working with 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

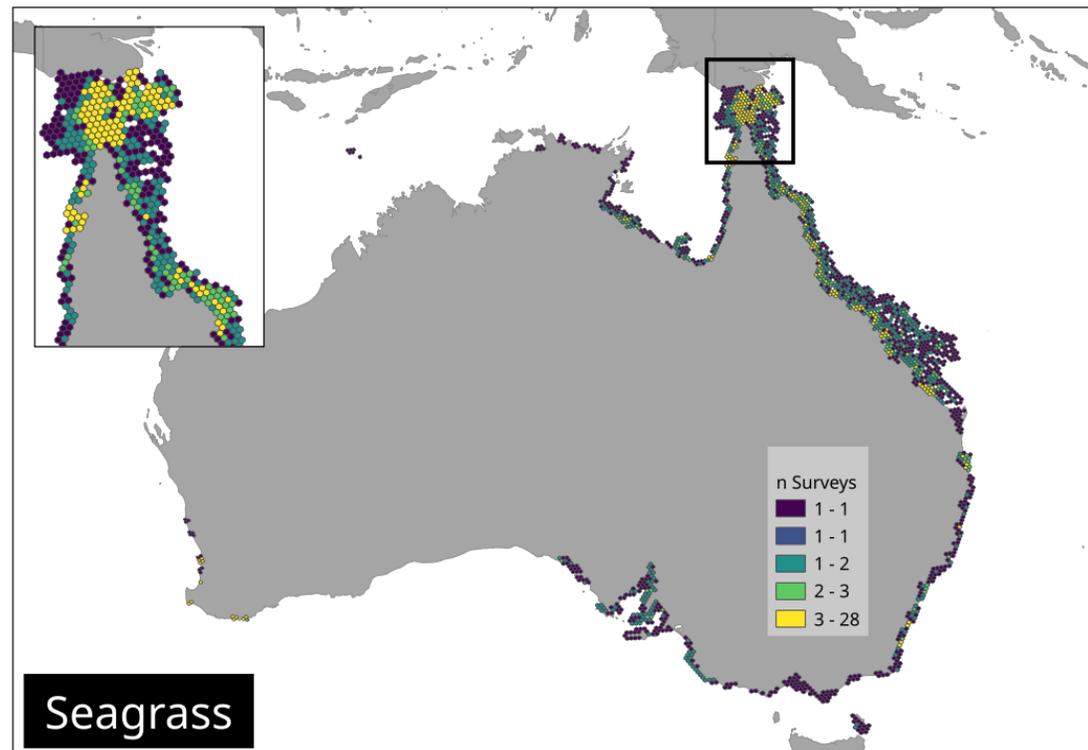


# NESP Data product

## 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

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

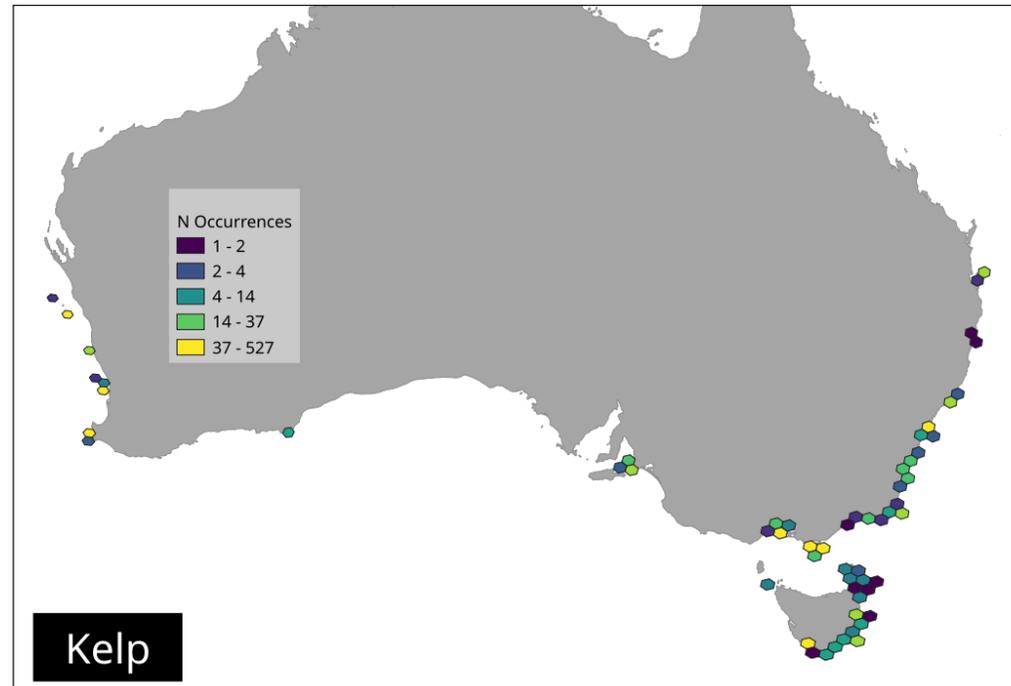


# NESP Data product

## Habitats: Kelp

- 8,000+ Annotations from SQUIDLE+
- Darwin Core / WoRMS taxonomy harmonised
- Challenge: Complex SQUIDLE+ API and labelling schemas

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

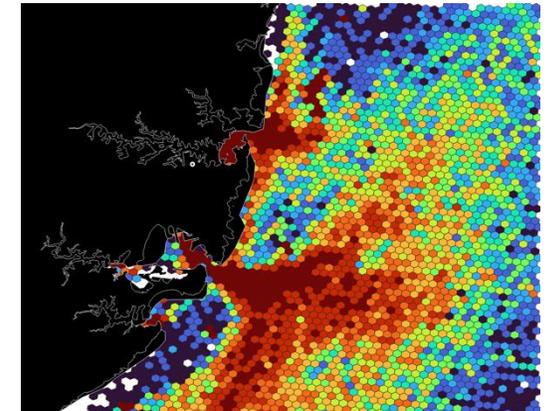
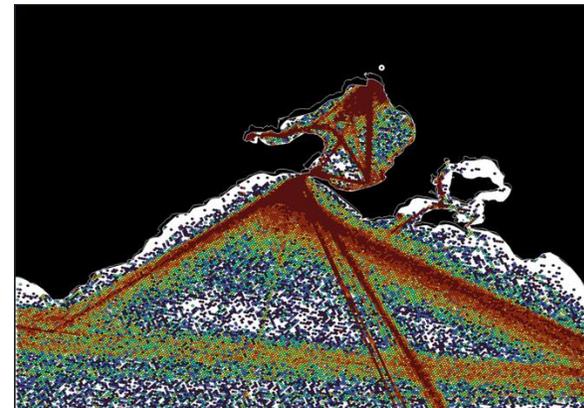
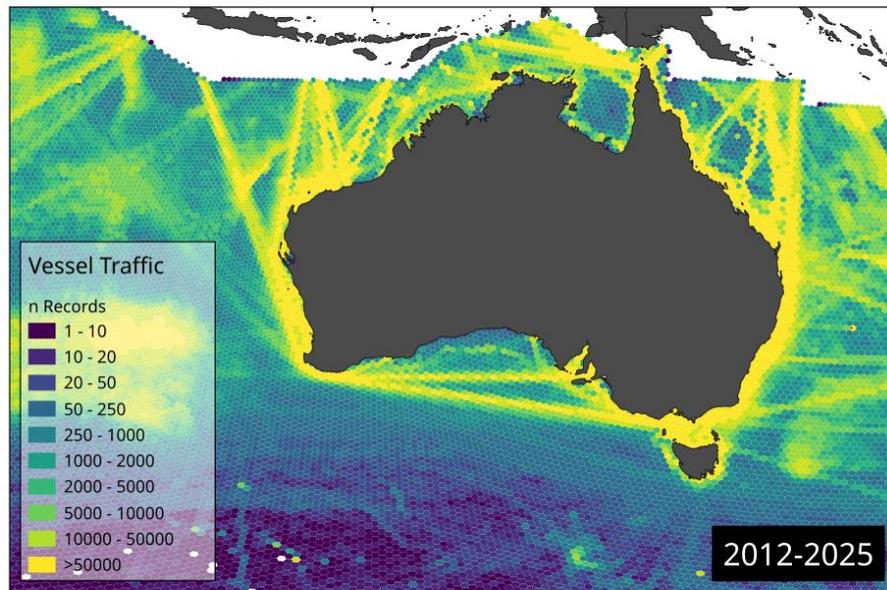


# NESP Data product

## 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

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

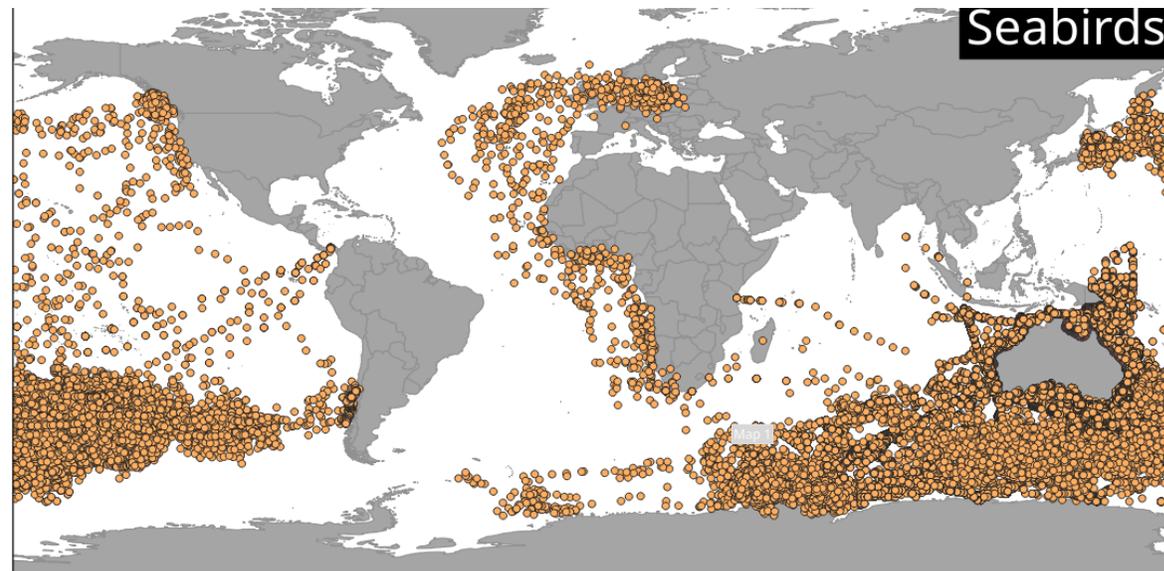


# NESP Data product

## 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

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

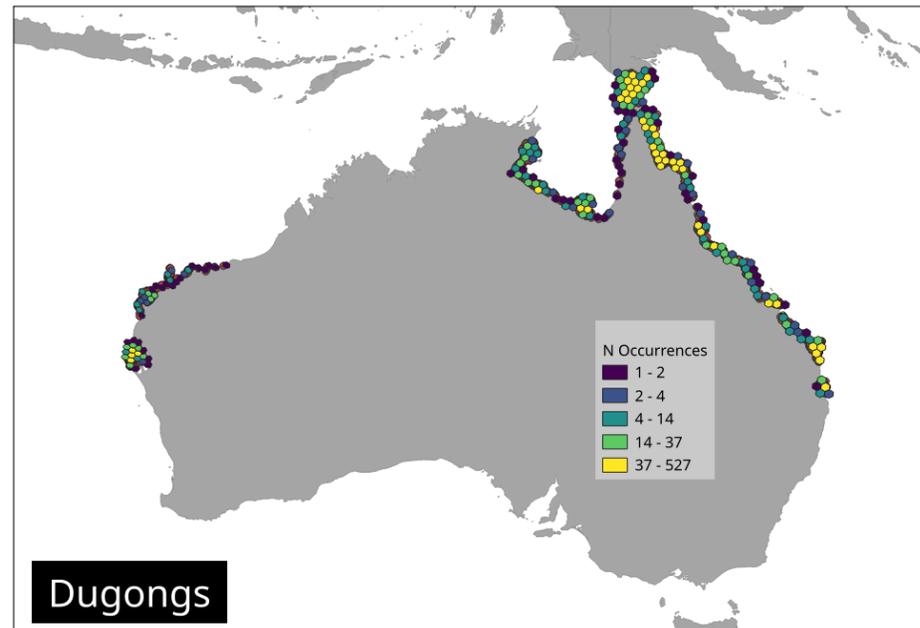


# NESP Data product

## Species: Dugongs

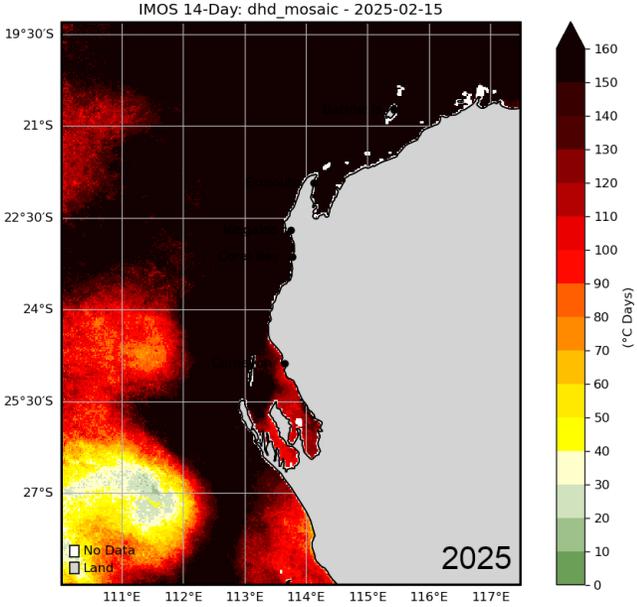
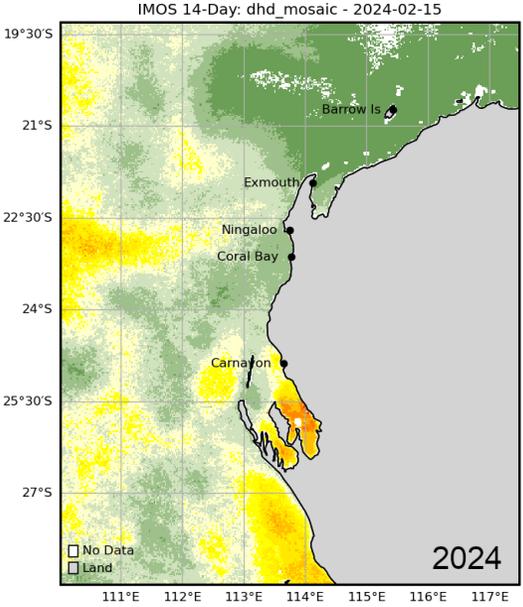
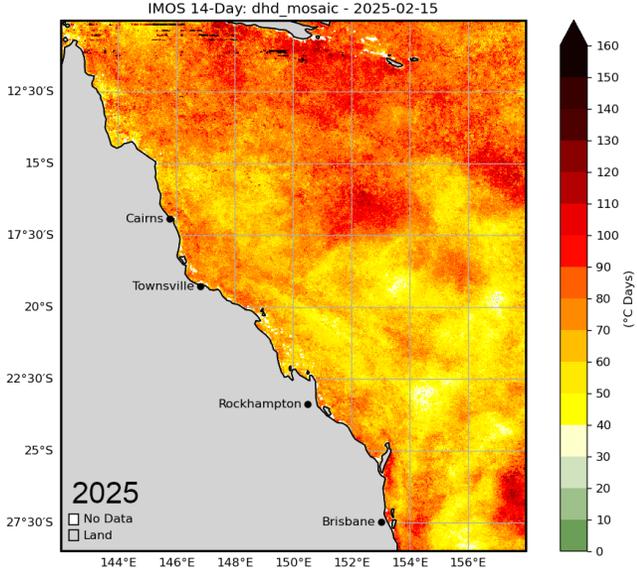
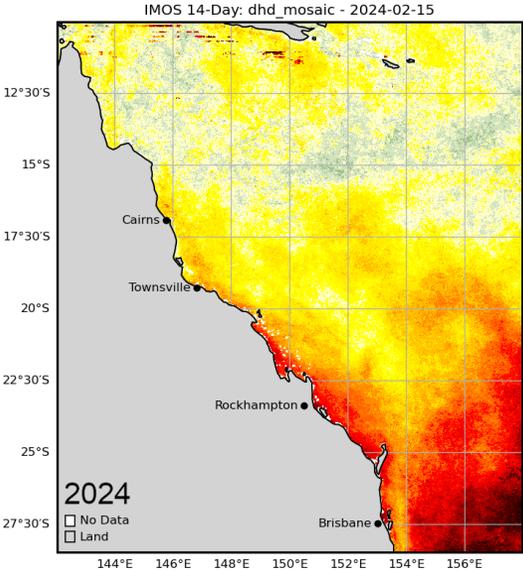
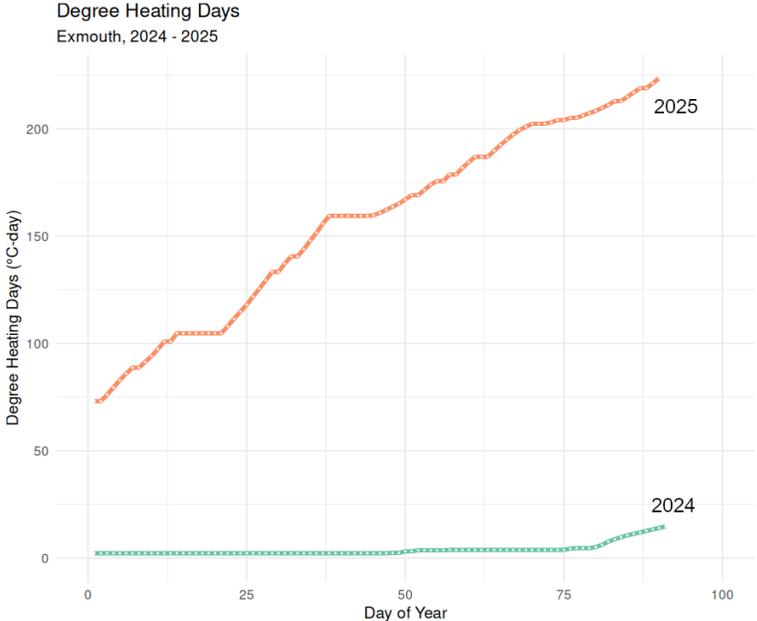
- Aggregation from 30y JCU surveys
- Harmonising table schemas challenging (even from the same provider)
- Collaboration with JCU

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

