An update on the Australian National Coastal Ocean Modelling System (ANCOMS)

Emlyn Jones (CSIRO) on behalf of the ANCOMS FOO/NMSP-R4 working group

2025 Forum for Operational Oceanography 19-20 Nov. 2025

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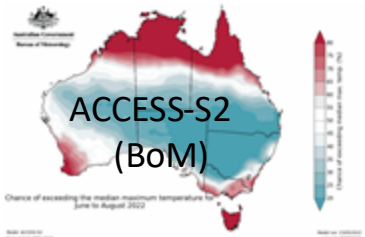
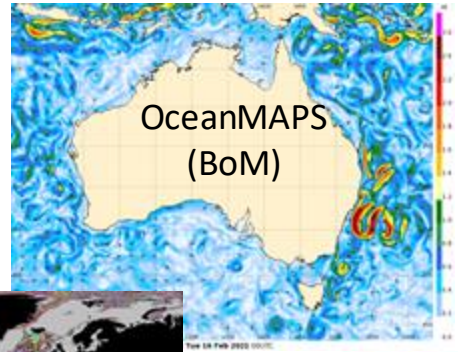
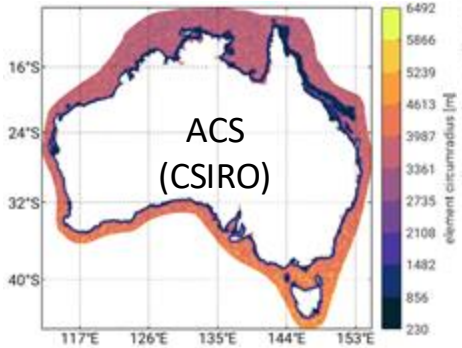
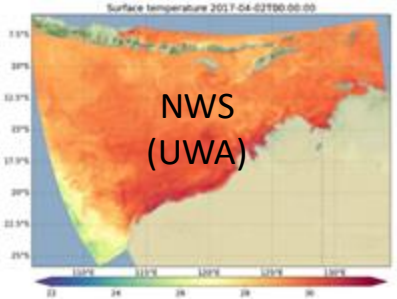
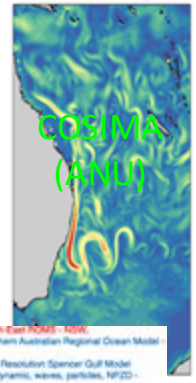
Background: Existing Domains/Systems … that we are aware of from FOO/ACOMO 2022 and since

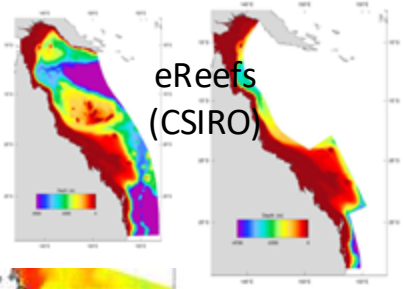


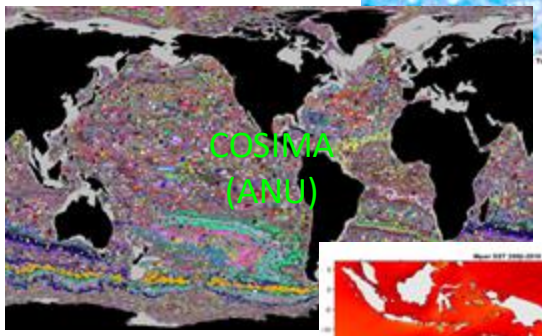


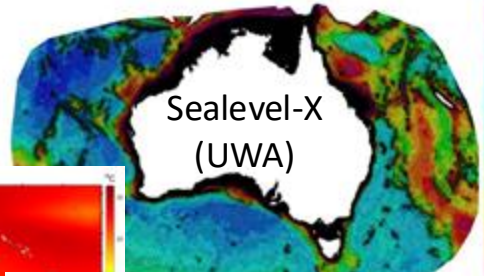


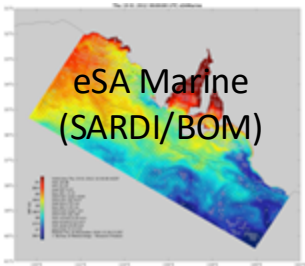


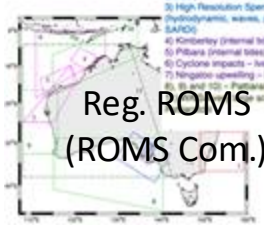


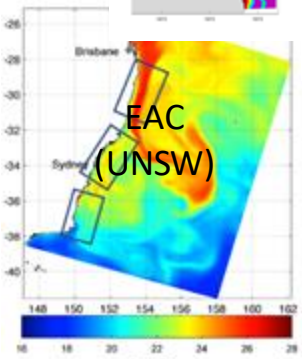


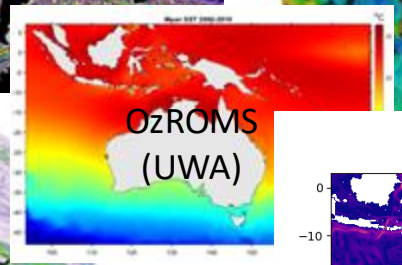


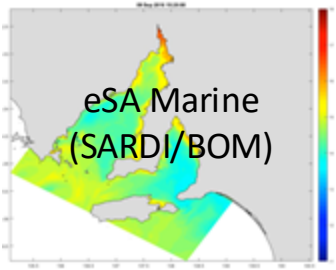


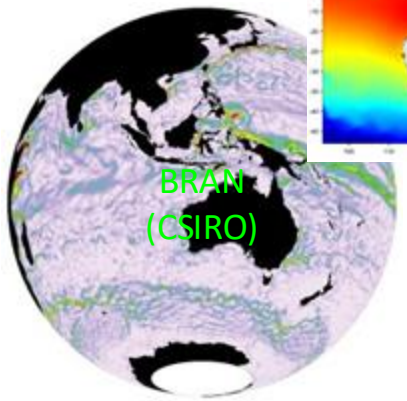


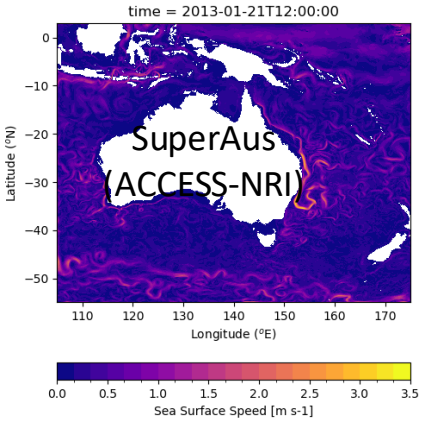


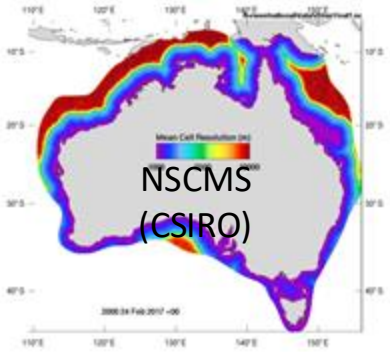


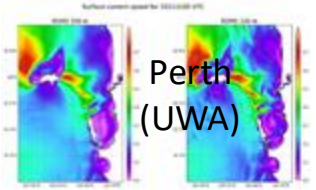


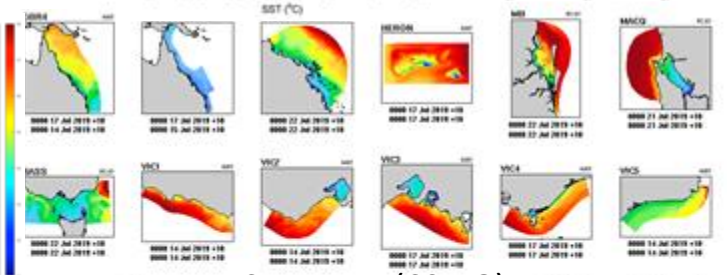


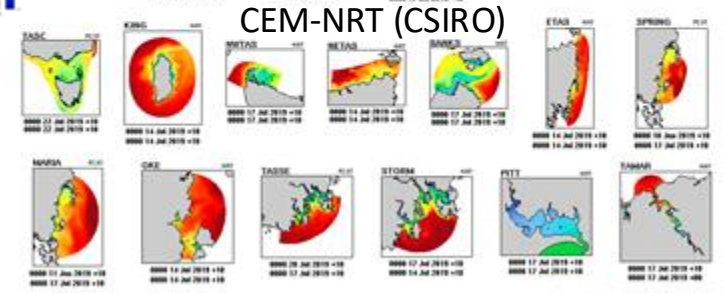






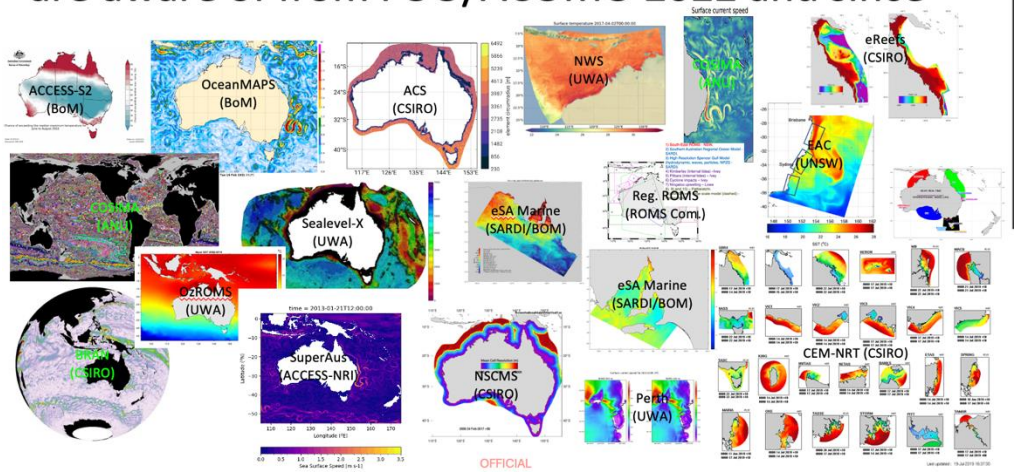




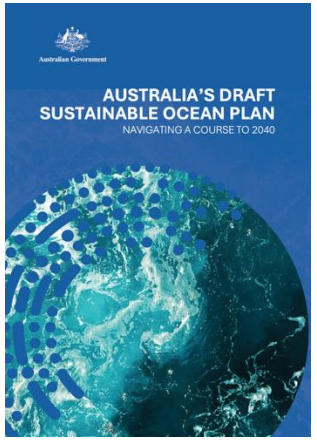


The growing list of initiatives relevant to the coastal modelling community

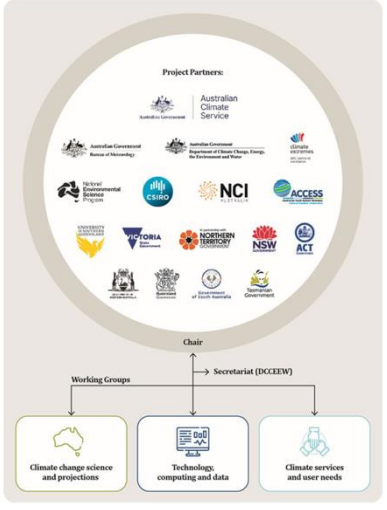
Background: Existing Domains/Systems … that we are aware of from FOO/ACOMO 2022 and since



What new models are we missing?



Climate Projections Roadmap for Australia



ACCESS
National Research Infrastructure

GlobalCoast

CoastPredict's Framework for Implementation

See the map of the GlobalCoast Network below

Our Future Oceans

A proposed ARC Centre of Excellence

CoastRI

Research Infrastructure Connecting Land and Sea

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

Australian National University

UNSW SYDNEY

The University of Queensland
AUSTRALIA

The University of Western Australia

UNIVERSITY of TASMANIA

Australian National Coastal Ocean Modelling System (ANCOMS)

GOAL:

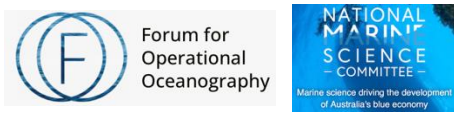
Develop an integrated national coastal ocean modelling system to provide the information necessary to support our coastal endeavors that builds upon and adds value to existing Australian modelling and observational initiatives.

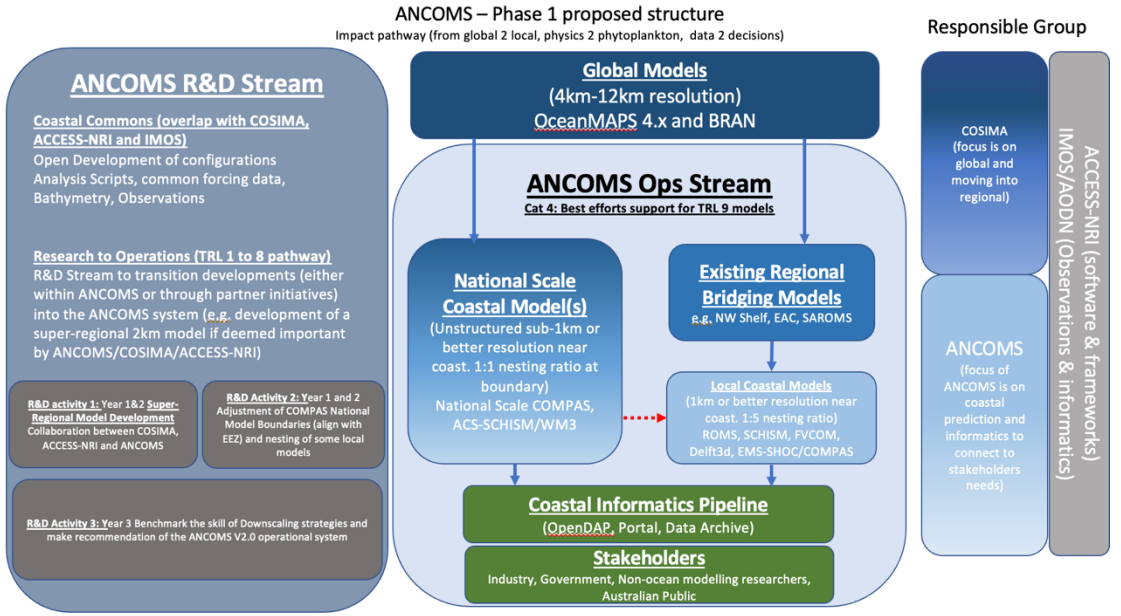
OBJECTIVES:

- enhance **predictive capability for coastal zones in the Australian mainland and Tasmanian EEZ (e.g. nominally within 200nm of the coast)**. Australian Offshore territories, and Antarctica are currently out of scope for this proposal.
- provide **fit for purpose information** in the coastal zone using models that capture relevant process from physics to bio-geochemistry (and ideally through to fisheries/ecosystem and socio-economic models) that **span a range of time horizons**: Past, Present, Forecasts and Scenarios (inc climate futures).
- **incorporate an informatics** pipeline so model output and downstream products are discoverable.
- improve the efficiency of model deployment and development via a **shared development environment**.
- **integrate** coastal observations to improve model configurations and predictions of the coastal ocean.
- encourage **transparent and consistent assessments of model skill** with assessments of uncertainty (where possible) provided to end-users.

The success of this vision depends upon cross-institutional, multi-disciplinary collaboration that leverages the strengths of both national scale and regional/local expertise.

- The implementation plan delivered to NMSC outlines a path to realise the vision.
- ANCOMS as a whole is not yet funded. However, if we look across the projects that ANCOMS participants are involved with,components are attracting investment.
- Some seed/initial funding has been provided through ACCESS-NRI (Coast-RI) and existing projects leveraged to establish the Coastal Commons and commence some R&D tasks.
- Activity in the operational stream is mostly aligned with existing projects, with ANCOMS providing some coordination





Industry/Government Stakeholders

Research Users

Informatics Pipeline

Ongoing Operations (TRL 9)

Operational Stream
Cat. 4 (Researcherational)

ACCESS-NRI/CoastRI/OFO COE (proposed) & others

Coastal Commons (TRL 1-8)

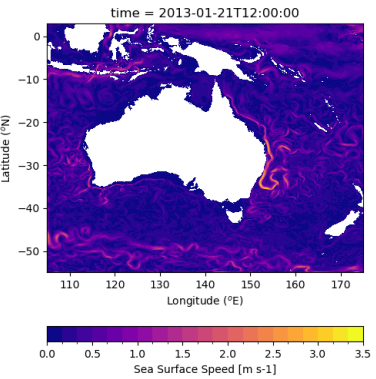
Development

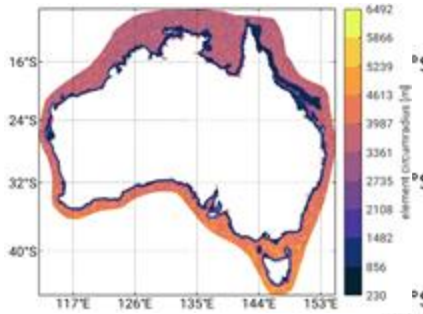
Assessment

Refinement

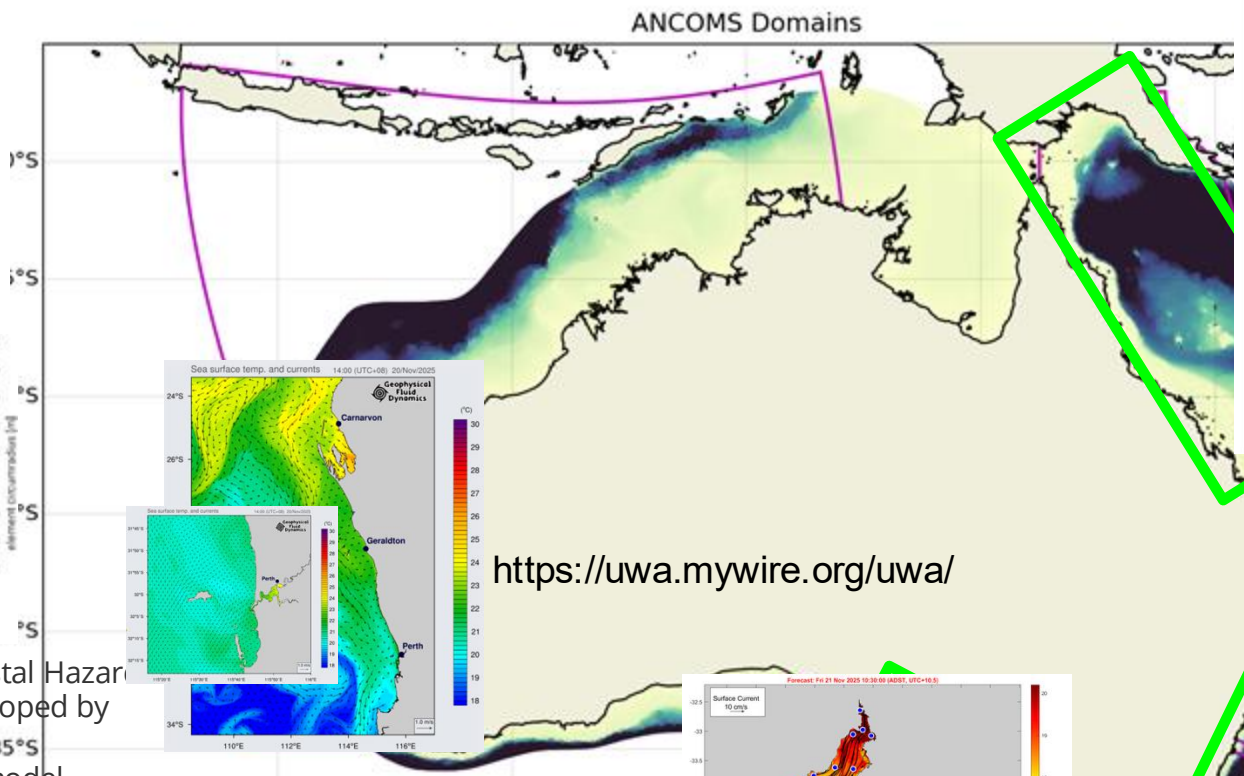
Forcing Data
Bathymetry
Obs
Analysis Scripts

National/Regional models with discoverable and accessible configs/outputs/products … as of this morning

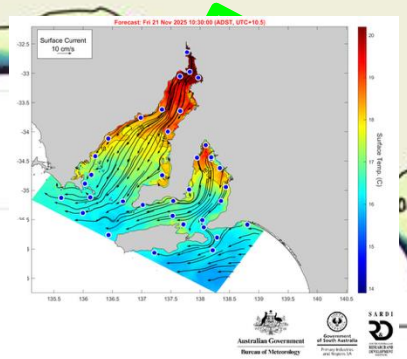




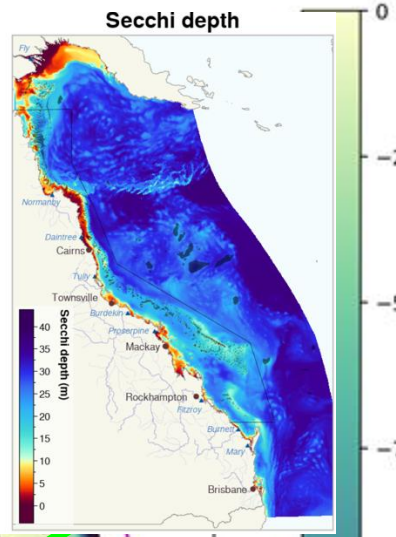
CCHaPS, the Coupled Coastal Hazard Prediction System, is developed by CSIRO via ACS and is a 2D hydrodynamic and wave model.
https://data.csiro.au/collection/csiro:65669



https://uwa.mywire.org/uwa/



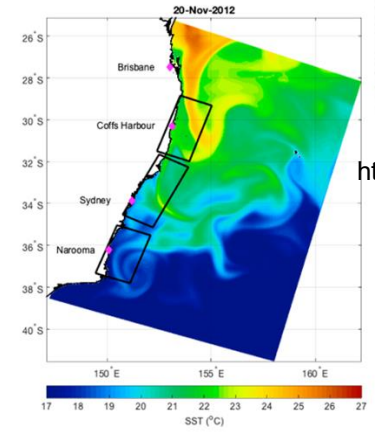
https://pir.sa.gov.au/sardi/aquatic_sciences/mar_ecosystems/esa_marine/two_gulfs_model/sea_surface_temperatures_and_currents



https://thredds.nci.org.au/thredds/catalog/fx3/gbr4_v2/catalog.html

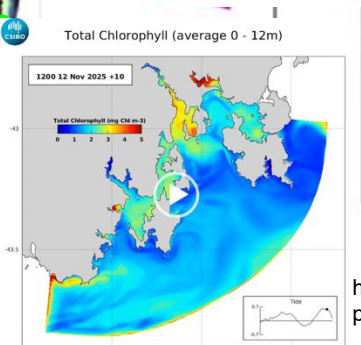
https://ereefs.aims.gov.au/gbr4/bgc/baseline/secchi_kd-490_epipar-sg/

https://www.ereefs.org.au/outputs/



https://zenodo.org/records/14063981

Coastal and Continental Ocean Model of Australia (CoCOMA) has been developed by CSIRO and is a 3D national scale coastal model, extending from the coast to beyond the continental shelf.
https://cem.csiro.au/thredds/catalog/compas/national/2K/catalog.html



https://research.csiro.au/cem/projects/current-projects/storm-bay/

Summary and next steps

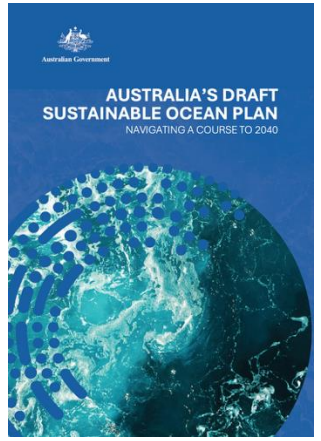
CoastRI

Research Infrastructure Connecting Land and Sea

- The ANCOMS working group was established in early 2023 in response to the panel discussion at FOO 2022 and the need to address NMSP R4.
- Our aim is to be as inclusive as possible, while remaining small enough to make progress. There is good representation from PFRA's and the Uni sector. No representation from commercial sector (we recognize this as a weak point).
- The ANCOMS Implementation plan considers: **COORDINATION & INTEGRATION – there are many initiatives underway in Australia, but few span the full breadth of PFRA's and academic institutions.**
    - Phased Approach to realise the system outlined in the vison document.
    - Combination of national scale and regional/local scale model components.
    - Path to impact via research outputs and operational delivery.
- Challenges:
    - The group is lacking representation from the private/commercial sector – is there interest to join? Do the open development principals align with commercial interests?
    - There is freely available ocean data available via the EU Copernicus system (it may not be fit for purpose, but its free!). Realising the ANCOMS vison is going to cost money!
- Opportunities
    - No regrets efforts to improve efficiency within the R&D component (e.g. coastal commons etc)
    - Alignment with the (Draft) Sustainable Ocean Plan
    - Collaboration with the National Partnership for Climate Projections (NPCP)
    - Alignment with UN DO opportunities.
    - **Unify the landing point to discover the diversity of models available.**

NCRIS National Research Infrastructure for Australia
An Australian Government Initiative

ACCESS National Research Infrastructure



GOOS CoastPredict with The Global Ocean Observing System

GlobalCoast by CoastPredict

Submit a Pilot Site Deadline: 6 March 2026

2021 2030 United Nations Decade of Ocean Science for Sustainable Development