

IMOS FIVE YEAR PLAN

2026 – 2031



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.

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Introduction

Australia's Integrated Marine Observing System (IMOS) has operated since 2006, enabled by the National Collaborative Research Infrastructure Strategy (NCRIS). IMOS focuses on delivering benefits to Australia by undertaking systematic, sustained and scientifically robust observations of our vast and valuable marine estate. IMOS observations span from the open ocean to the coast, from the tropics to polar regions, and range across physics, biogeochemistry and biology.

Over two decades, IMOS has evolved from a foundational set of observing capabilities into a mature, integrated national capability and a world-leading program trusted by researchers, government, industry and international partners. This evolution has been driven by a clear purpose: to deliver impactful ocean time series and near real-time measurements that support research advances, operational services, environmental management, and national decision-making. As of 2026, IMOS has delivered over 1.5 billion physical, biological, biogeochemical and atmospheric ocean measurements and supported 3,458 peer-reviewed scientific publications, 328 postgraduate research projects, 571 policy documents, and 14,350 users from 2,888 institutions in 105 countries.

The IMOS Strategy 2025–2035 sets a bold direction for the next decade, emphasising:

- Sustained and emerging observations to support Australia's ocean, climate and coastal resilience;
- Empowerment of scientific discovery and innovation;
- Expanded collaboration with First Nations, industry and global partners; and
- World-class, end-to-end data management and delivery.

This Five Year Plan outlines *how* IMOS will deliver the Strategy. It translates strategic objectives into actionable priorities, strengthening our national ocean observing system, lifting our impact, and ensuring that IMOS continues to deliver trusted ocean intelligence for Australia and our region. The Plan is aligned with Australia's National Science and Research Priorities, National Marine Science Strategy 2026–2036 and NCRIS objectives, and draws upon extensive operational experience, comprehensive consultation through IMOS Nodes and Science and Technology Advisory Committee, partner and end-user engagement, and review of national and global policy drivers. It reflects the information needs related to a rapidly changing marine environment and the expanding expectations of end-users.

Why IMOS Matters

Australia's marine estate underpins our economy, environment, communities and climate. As climate-driven shifts accelerate, pressures on our oceans and coasts intensify. Extreme events such as marine heatwaves, harmful algal blooms, storm surges and coastal hazards increasingly affect infrastructure, industries, biodiversity and communities.

At the same time, Australia's ocean economy is growing, maritime domain awareness requirements are expanding, and national and global reporting obligations are increasing. Meeting these demands and supporting integrated management of Australia's vast marine estate requires sustained, reliable, interoperable ocean observations integrated across disciplines, scales and ecosystems.

IMOS occupies a unique and important national role:

- IMOS is Australia's national end-to-end marine observing system, delivering long-term, high-quality multi-disciplinary ocean measurements, and acting as a catalyst for collaboration and data exchange between research organisations, operational services, and government agencies.
- IMOS is the authoritative provider of FAIR (Findable, Accessible, Interoperable, Reusable) marine observations through the Australian Ocean Data Network (AODN), Australia's accredited National Oceanographic Data Centre.
- IMOS data underpins weather and climate forecasting, ocean modelling, operational decision-making, State of the Climate and State of the Environment reporting, national marine and climate policy, as well as the National Marine Science Strategy 2026-2036.
- IMOS contributes directly to Australia's obligations under the:
 - United Nations Framework Convention on Climate Change and Paris Agreement;
 - World Meteorological Organisation Global Greenhouse Gas Watch;
 - Kunming-Montreal Convention on Biological Diversity and Global Biodiversity Framework;
 - United Nations Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction; and
 - United Nations Sustainable Development Goals.
- IMOS is tightly integrated and aligned with the Global Ocean Observing System's Framework for Ocean Observing and actively supports global and Indo-Pacific observing efforts, international standards, knowledge exchange on best practices, and scientific capability.
- IMOS supports national technical expertise and capacity in marine science through workforce development and knowledge exchange, ensuring a skilled and adaptable workforce capable of responding to emerging scientific, industrial and policy challenges.

In this context, IMOS also directly underpins Australia's National Science and Research Priorities and fulfills NCRIS objectives. Specifically, IMOS:

- Catalyses and supports a nationally coordinated network of marine research infrastructure and observing activities;
- Enables high-quality research and innovation across the marine and climate science sectors;
- Provides seamless, open access to national research infrastructure and data to support priority research and decision-making; and
- Supports collaboration between researchers, government and industry, both nationally and internationally.

The value IMOS delivers is significantly greater than the sum of its individual platforms, reflecting two decades of coordinated investment and national collaboration. Sustained ocean observations enable Australia to:

- Detect long-term climate and ecosystem trends and tipping points;

- Improve forecasting models for weather conditions and extreme events;
- Measure the outcomes of environmental interventions;
- Meet national and international reporting requirements; and
- Make evidence-based decisions for marine industries, conservation and communities.

This Plan ensures that IMOS continues to deliver the environmental intelligence required for Australia's resilience, prosperity and climate action.

IMOS Five Year Plan Approach

Grounded in the 2025–2035 Strategy, IMOS will deliver this Plan based on five operating tenets:

1. IMOS' value comes from delivering the full chain of ocean observations, from observing infrastructure through to open and FAIR, trusted, ready-to-use data and information products.

How it drives the Plan: The Plan must prioritise sustained observing platforms, modernised data systems, and improved data-to-information pathways.

2. IMOS is designed to observe Australia's marine estate holistically, from physics to ecosystems, and across diverse regions and habitats.

How it drives the Plan: The Plan must maintain a diverse, nationally distributed suite of capabilities and time series data.

3. IMOS functions through extensive collaboration and shared delivery across partners and sectors.

How it drives the Plan: The Plan embeds partnership-building as a core priority, including co-design with First Nations, collaboration with industry, alignment with government needs, and strengthening scientific community capability.

4. IMOS plays a recognised role in global ocean observing and national strategic science priorities.

How it drives the Plan: The Plan must position IMOS for continued leadership, meeting global standards, supporting international initiatives, and enabling national and international climate and ecosystem assessments.

5. IMOS is sustained not just by platforms but by the expertise and people behind them.

How it drives the Plan: The Plan must advocate for and support, where possible, the continued strength of Australia's marine technical capability. This includes recognising the expertise required to operate observing platforms and data systems, promoting capacity building and knowledge transfer where possible, and reinforcing the importance of stable, nationally coordinated technical capacity to ensure IMOS' ongoing delivery.

Strategic Partnerships

Partnerships remain a defining strength of IMOS, and are central to delivering a nationally integrated observing system. IMOS partnerships and collaborations:

- Increase observing capability to cost-effectively address user needs;
- Facilitate the delivery and accessibility of high value non-IMOS datasets via the AODN;
- Support interoperability across key national and international data repositories; and
- Support capacity building in First Nations communities, neighbouring regions or among observing systems.

IMOS' approach to partnerships is anchored upon the following commitments:

- **Respect, listen and learn:** establish early two-way dialogue, acknowledging the respective skills, expertise and views of all parties and any potential conflicts of interest.
- **Co-design:** work together to identify sites of interest, data needs, equipment deployment and maintenance logistics, co-investment opportunities, and design appropriate data workflows and information products.
- **Co-deliver:** work together to deliver the agreed outcomes, communicating clearly and transparently, and using ongoing feedback loops to maintain relationships and incorporate insights from all partners to optimise outcomes.

Partnerships and collaboration will become increasingly important as observing challenges and data requirements grow more complex. Over the next five years, IMOS will deepen engagement across NCRIS Facilities, Government agencies, Industry, First Nations and jurisdictional, national and international partners.

NCRIS Facilities

IMOS will continue to work collaboratively with other NCRIS Facilities including the Marine National Facility, Bioplatforms Australia, the Australian Community Climate and Earth System Simulator National Research Infrastructure, Australian Research Data Commons, Atlas of Living Australia, and others to support seamless cross-domain observing, data delivery and national coordination. For example, recent collaborative planning across 13 NCRIS Facilities has identified opportunities for a more integrated national approach to coastal observing, data and modelling that connects land, estuaries and the ocean via a proposed Coastal Research Infrastructure (CoastRI). While the scope and timing of such developments are contingent on future investment, IMOS will continue to act as an integrator and enabler within Australia's marine research infrastructure landscape.

Government agencies

IMOS will continue to work with Commonwealth government agencies (e.g. Department of Climate Change, Energy, the Environment and Water; Department of Foreign Affairs and Trade; Department of Defence; Bureau of Meteorology; Commonwealth Scientific and Industrial Research Organisation; Australian Institute of Marine Science; Australian Antarctic Division; Parks Australia; National Environmental Science Program) to ensure IMOS observations support government activities and priorities. Similarly, IMOS will continue to work with state government authorities to ensure that IMOS observations support state and regional management needs. Where appropriate, IMOS will strengthen

these relationships through co-delivery and engagement at strategic, operational and technical levels. This will reduce duplication of effort and ensure that state and regional observing activities are nationally integrated and interoperable.

Application of IMOS data will underpin operational and modelling needs to support the blue economy, as well as science advances, environmental and risk assessments, policy development, and the effective management of Australia's marine estate. Consistency in operational procedures, data standards and best practice data management will underpin confidence in IMOS data and information products, while active engagement will support shared understanding and evidence-based decision-making.

Industry

IMOS will expand partnerships with industry to support cost-effective observing through various means including platforms of opportunity (e.g. commercial vessels, offshore infrastructure). The focus will be on co-delivery and shared observations with industry partners. IMOS will explore potential for integration of high-value industry datasets into the AODN to make them discoverable, interoperable and analysis- and model-ready. This will help support operational needs across the blue economy, as well as scientific advances, policy decisions and the effective management of Australia's marine estate. These activities will require careful navigation of data governance, commercial sensitivity and public good objectives to ensure that IMOS continues to serve a broad and equitable user base.

First Nations

IMOS recognises Aboriginal and Torres Strait Islander peoples as the first marine scientists and custodians of sea Country. Their deep and continuous knowledge of ocean conditions, habitats, species and environmental change offers critical insights about our oceans.

A key focus in the coming years is to build and expand IMOS' approach to observing sea Country, ensuring that First Nations values and priorities are reflected in the data IMOS collects and delivers, to provide a fuller understanding of Australia's marine environment. Growing partnerships with sea ranger groups and organisations through co-design will be essential, focusing on mutually beneficial outcomes and activities that support sustainable management and capacity building for the monitoring of sea Country. Embedding the CARE Principles for Indigenous Data Governance (Collective benefit, Authority to control, Responsibility, Ethics) in AODN will be important to provide appropriate data solutions aligned with Indigenous data sovereignty values and systems. These efforts will require sustained relationships anchored in trust, mutual learning and approaches that respect Indigenous governance, priorities and knowledge systems.

International, national and jurisdictional partners

IMOS will continue its leadership role within the Global Ocean Observing System (GOOS) and collaborations in the Indo-Pacific, the Southern Ocean, and through international observing initiatives and the Ocean Best Practices System, ensuring that Australian observations contribute to and benefit from global efforts. Increased collaboration between AODN and international data centres will streamline data pathways and ensure IMOS data are used widely by international communities.

Additionally, IMOS will continue to engage in and support science initiatives aiming to use IMOS observations to generate knowledge advances and inform the sustainable management of Australia's marine estate, such as the new Centre of Excellence for Our Future Oceans and South Australian Office of Algal Bloom Research.

FIXED PLATFORMS
IN SITU SAMPLING
AUTONOMOUS PLATFORMS
ANIMALS & ECOSYSTEMS
SHIPS OF OPPORTUNITY
SATELLITE REMOTE SENSING

COLLECT
DATA

010011
101001
000100

RECEIVE
DATA

QA ✓
QC ✓

PROCESS
DATA



MAKE DATA
AVAILABLE



SCIENTIFIC
ANALYSIS AND
USE OF DATA



IMPROVED
WEATHER
FORECASTING



IMPROVED NATURAL
DISASTER &
EXTREME WEATHER
PREPAREDNESS



IMPROVED MARITIME
DOMAIN AWARENESS,
SOVEREIGNTY &
SECURITY



IMPROVED
MARINE PARK
MANAGEMENT



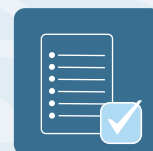
IMPROVED
SEA COUNTRY
MANAGEMENT



IMPROVED
FISHERIES &
AQUACULTURE
MANAGEMENT



IMPROVED
MARITIME
OPERATIONS &
SAFETY



IMPROVED POLICY
RESPONSES

The IMOS Observing Portfolio (2026-2031)

IMOS observations deliver the greatest impact when designed, operated and interpreted as an integrated system. While each observing capability plays a unique and valuable role, it is the integration of observing platforms and data infrastructure that enables IMOS to deliver a world-leading, impactful, national program delivering sustained observations.

Organised into complementary observing clusters based on platform type, the IMOS portfolio provides coordinated data streams to support climate modelling, ecosystem assessments, operational services and national environmental reporting. Over the next five years, IMOS will focus on maintaining long-term time series, improving integration, strengthening operations and reducing fragmentation across platforms and institutions.

Fixed Platforms

Fixed platforms, including moorings, buoys, and land-based stations provide long-term, high-resolution, depth-resolved observations at strategic locations across Australia's marine estate to detect variability and change in oceanographic and ecosystem conditions.

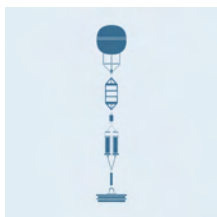
The time series data produced serve as important reference points for research and environmental reporting. Some of these sites produce the longest time series records for Australia's coastal waters and the Southern Ocean, spanning over 75 years of continuous measurements.

Why this cluster is important

IMOS fixed platforms:

- Provide the longest and most consistent marine time series in Australia.
- Supply boundary conditions and validation data for models and forecasts.
- Enable detection of national climate indicators and long-term environmental change.
- Underpin extreme event analysis, and coastal hazard modelling.

Included in this cluster



National Reference Stations

Coastal reference sites providing long-term, multi-parameter time series on physical, biogeochemical and biological properties of shelf waters.



National Mooring Network

Oceanographic moorings delivering continuous, depth-resolved, physical measurements of shelf water masses including boundary currents and key upwelling regions.



Southern Ocean Time Series

Deep-water, autonomous, depth-resolved moorings measuring air-sea fluxes and biogeochemistry in the Southern Ocean.



Acidification Moorings

Bespoke systems monitoring carbon chemistry and acidification trends in key marine regions.



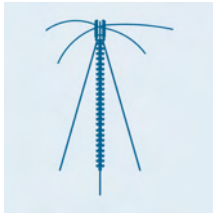
Estuarine and Coastal Moorings

Near real-time water quality stations monitoring conditions in dynamic Australian estuaries and coastal regions.



Wave Buoys

Near real-time platforms providing sea state and wave observations along Australia's coasts.



Ocean Radar

Land-based systems mapping local nearshore surface currents at high spatial and temporal resolution.

Priorities for 2026–2031:

- Maintain long-term time series.
- Increase standardisation, reliability and longevity where possible.
- Enhance biogeochemical capability where feasible and aligned with emerging needs.
- Increase availability and delivery of near-real time data streams where possible.
- Support coastal hazard and coastal modelling inputs through targeted deployments.

In Situ Sampling

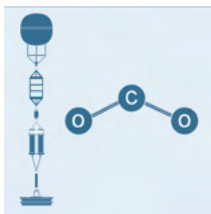
In situ sampling provides direct measurements of biodiversity and biogeochemical properties at key reference sites such as IMOS National Reference Stations and the Southern Ocean Time Series Observatory. These observations support ecosystem health assessment, biodiversity trend detection, and understanding of drivers of change.

Why this cluster is important

IMOS *in situ* sampling:

- Detects early signals of ecosystem pressures and biodiversity change.
- Supports fisheries, extreme event response (e.g. harmful algal blooms, marine heatwaves), marine management, biosecurity and conservation.
- Provides validation for remote sensing and model-derived products.
- Contributes to national and global biodiversity observing initiatives.

Included in this cluster



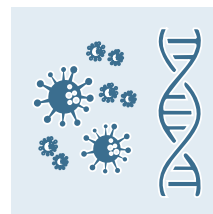
Biogeochemical Sampling

Direct measurement of nutrients, carbon and oxygen chemistry to support understanding of nutrient cycling, primary productivity and greenhouse gas concentrations at national reference sites.



Plankton Community Sampling

Biological sampling that tracks plankton species composition and abundance.



Biomolecular Approaches (eDNA, microbiome)

Genomic analysis of water samples tracking biodiversity and microbial community composition.



Marine Microplastics Sampling

Monitoring of micro-debris (including microplastics) composition and abundance to assess pollution pressures and coastal impacts.

Priorities for 2026–2031:

- Maintain long-term time series and continue to improve data quality, consistency and usability.
- Expand coastal sampling where aligned with CoastRI and sea Country priorities, and offshore sampling where possible to advance modelling capability and understanding of regional processes.
- Support integration between biological, biogeochemical and physical observations.

Autonomous Platforms

Autonomous platforms, including profiling floats and ocean gliders, provide broad-scale, depth-resolved observations across diverse and remote marine environments, extending IMOS' capability to observe subsurface and dynamic processes including in adverse conditions or in response to extreme events.

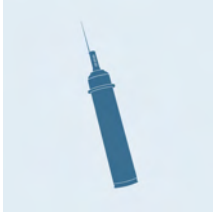
Why this cluster is important

IMOS autonomous platforms:

- Deliver dynamic, spatially extensive coverage that fixed platforms alone cannot achieve.
- Provide essential data for understanding ocean circulation, heat content, carbon uptake, and climate-driven anomalies.

- Support weather, climate, and ocean forecasting models.
- Enable rapid deployment during marine heatwaves, harmful algal blooms, or other extreme event conditions.
- Strengthen IMOS' contributions to global observing efforts.

Included in this cluster



Argo Floats (Core, BGC, Deep)

Autonomous profiling floats collecting high-resolution, near real-time temperature, salinity and biogeochemistry measurements for the upper and deep ocean.



Ocean Gliders

Remotely operated vehicles collecting high-resolution, multi-parameter, subsurface measurements in near real-time for Australia's coastal and shelf regions.



Event-Based Sampling

Rapid deployments of ocean gliders targeting marine heatwaves, harmful algal blooms, severe storms and tropical cyclones, cold spells and upwellings and coastal run-off plumes to inform event response and management decisions.

Priorities for 2026–2031:

- Support global efforts and regional capacity, especially in the Pacific where observations are critical to the detection and understanding of El-Niño Southern Oscillation (ENSO) cycles.
- Foster collaborative approaches to event-based sampling and the integration of IMOS data streams to better detect, monitor, understand and predict extreme events.
- Increase blue water to coastal connectivity through coordinated measurements.

Animals and Ecosystems

Through a combination of traditional ecological monitoring surveys, imagery annotation technology, and animal telemetry, this cluster delivers ecological and biodiversity observations including benthic habitat condition, species distribution and connectivity, and ecosystem responses to environmental change.

Why this cluster is important

As a cluster, Animals and Ecosystems:

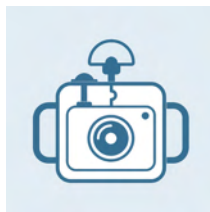
- Links physical and biogeochemical change to ecological outcomes.
- Enables biodiversity trend detection and environmental health assessments.
- Supports conservation planning, fisheries management, and habitat protection.
- Contributes to global biodiversity observing efforts.
- Strengthens integration of ecosystem observations within the broader observing system.

Included in this cluster



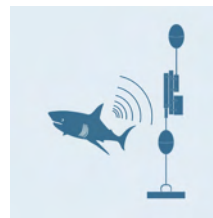
National Reef Monitoring Network

Long-term, systematic, reef monitoring program delivering diver-collected observations of biodiversity and habitat condition.



Understanding Marine Imagery

A national data infrastructure offering standardised acquisition, annotation and long-term storage of benthic imagery for ecological analysis.



Acoustic Telemetry

A national, collaborative, data repository and infrastructure network tracking broad-scale movements of aquatic species tagged by Australian researchers.



Animal Tagging

Satellite-linked oceanographic sensors mounted on marine animals, generating high-resolution, near-real time, vertical profiles of ocean properties (as well as insights into critical habitats) in remote regions of northern Australia and the Southern Ocean.

Priorities for 2026–2031:

- Enhance national-scale ecological observing through animal telemetry and benthic imagery.
- Strengthen linkages to biodiversity indicators, reef health reporting and assessments.
- Promote integration with IMOS physical and biogeochemical ocean variables to support understanding of ecological processes and ecosystem modelling approaches.
- Contribute data to global biodiversity programs and databases.
- Support machine-learning approaches to data standardisation, processing, and imagery annotation.

Ships of Opportunity

IMOS Ships of Opportunity leverage research and commercial vessels to collect physical, biogeochemical and biological observations across Australia's vast marine estate, providing important datasets for satellite validation and climate and fisheries research.

Why this cluster is important

IMOS Ships of Opportunity:

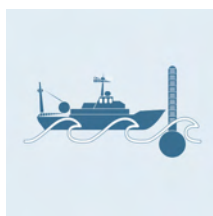
- Provides basin-scale observations supporting climate and ocean processes, as well as ecological and biogeochemical research.
- Supplies calibration and validation data for satellite products.
- Enables high-value biogeochemical and physical sampling across remote regions.
- Supports marine transport, fisheries, and operational decision-making.
- Maximises value through partnerships with industry and government fleets.
- Expands IMOS' national footprint cost-effectively and strengthens connections to operational sectors.

Included in this cluster



Real-Time Air-Sea Flux Systems

Autonomous sensors on research vessels measuring important meteorological and ocean surface observations in near-real time.



Sea Surface Temperature Sensors

Near real-time Sea Surface Temperature sensors installed on industry vessels, supporting calibration of global remotely sensed imagery and operational models.



Biogeochemical Sensors

Underway carbon chemistry monitoring systems installed onboard research vessels, providing high-resolution measurements of ocean carbon dioxide concentrations at scale.



Expendable Bathythermographs

Repeat upper-ocean temperature profiles collected along vessel tracks.



Bioacoustics

Using echosounder data from industry vessels to characterise the broad-scale patterns in biomass of forage species supporting marine food webs.



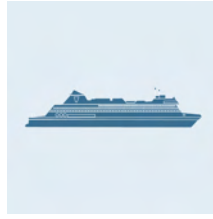
Continuous Plankton Recorder Surveys (AusCPR, SO-CPR)

Continuous plankton recorders towed by industry vessels, sampling surface plankton communities around Australia and in the Southern Ocean.



Temperature Sensors on Fishing Vessels (FishSOOP)

Near real-time subsurface sea temperature measurements at scale enabled through installing equipment on fishing gear deployed by a network of commercial vessels.



Sensors on Temperate Merchant Vessels

Autonomous water monitoring equipment installed on industry vessels operating in the Bass Strait, measuring a range of surface variables in near-real time across repeat voyages.

Priorities for 2026–2031:

- Continue to advocate for the adoption of IMOS data collection procedures on vessels to cost-effectively fill data gaps.
- Expand spatial and temporal footprint of coverage, including in coastal areas where industry partners operate consistently.
- Maximise basin-scale observations via sustained partnerships.
- Further support calibration/validation for satellite sensors and models where required.

Satellite Remote Sensing

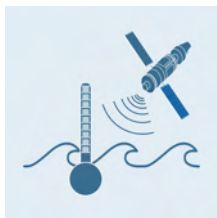
Satellite remote sensing provides broad-scale, high-frequency observations of ocean conditions across Australia’s marine estate. IMOS complements the delivery of bespoke satellite ocean data products with *in situ* calibration and validation infrastructure, ensuring accuracy and relevance for national and international applications.

Why this cluster is important

IMOS Satellite Remote Sensing:

- Delivers national-scale, high temporal resolution, spatially gridded environmental information.
- Supports detection and monitoring of extreme events including marine heatwaves, harmful algal blooms, coastal run-off or tropical storms, as well as hazard monitoring, and operational forecasting.
- Provides boundary conditions and assimilation inputs for ocean and climate models.
- Supports global observing and data quality-control efforts through contributions to international satellite missions and standards.

Included in this cluster



Sea Surface Temperature Products

High-resolution satellite-derived SST data products compliant with the Group for High Resolution SST (GHRSSST) Data Specification version 2.0 (GDS2) guidelines to help a wide spectrum of operational and research applications.



Surface Waves

Remotely sensed wind and wave field measurements providing important broad-scale data for marine industries, extreme weather event monitoring, and forecasting.



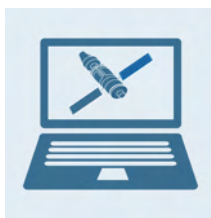
Ocean Colour

Calibrated and validated chlorophyll-*a* concentration data products from a range of satellite platforms (MODIS, VIIRS, Sentinel-3), to estimate ocean productivity and monitor extreme events such as harmful algal blooms and coastal run-off.



Altimetry Calibration and Validation

In situ systems used to verify satellite sea level and wave height products, important for Southern Hemisphere accuracy and quality control.



Remote Sensing Collections

Curated long-term collections of IMOS satellite observations supporting trend and climate analysis and other IMOS data products.

Priorities for 2026–2031:

- Maintain calibration/validation infrastructure.
- Support Australian contributions to major and new satellite missions, and capacity building for Australia.
- Increase integration between satellite and *in situ* data for event detection, monitoring and forecasting.

IMOS data streams contribute to 43 internationally-recognised Essential Ocean, Climate and Biodiversity Variables



Data and Information Delivery

Over the next five years, IMOS will continue to provide sustained, high-quality observations, expand access to high-value non-IMOS and aggregated national datasets and explore ecological indicators designed for rapid uptake by decision-makers. This effort will enhance translation of marine observations into environmental, climate, social, and economic outcomes.

As Australia's national marine data infrastructure, the AODN underpins IMOS' ability to generate public value from ocean observing. By 2031, the AODN will operate as a trusted national hub for curated, high-quality, analysis-ready and AI-ready marine and coastal datasets, evolving towards a national marine data commons that supports open, coordinated access to Australia's marine information assets wherever possible. Through a set of strategic activities, the AODN will continue to strengthen its role as a critical national data repository across NCRIS and the science and policy landscape. Its modern discovery portal, interoperable services, intuitive applications and exemplar implementation of best practice data management will be essential to serve trusted data to end-users ranging from technical specialists to operational agencies, industry, community stakeholders and Traditional Owners. In doing so, the AODN will provide national leadership in marine data stewardship, setting standards for data integration, accessibility and reuse across the broader marine science and industry community.

Accessibility and Interoperability

As the volume, diversity, and complexity of ocean data continue to grow, ensuring discoverability and vertical accessibility – from highly skilled data professionals to foundational users who need information in directly discoverable and usable forms – is essential. AODN's objective is to make IMOS data not only open, but also meaningful, intuitive, and integrated across technical skill levels.

For general users (including policymakers, managers, educators, community groups, and operational sectors): IMOS will increasingly provide straightforward, product-focused access pathways as well as tools and resources to facilitate use. These will allow users to quickly locate and apply trusted marine information without requiring specialist expertise, which will support evidence-based decision-making and broaden public value.

For advanced users (i.e. data scientists, model developers, and domain specialists): IMOS will integrate seamlessly with high performance computing environments at the National Computational Infrastructure (NCI), improve access mechanisms from analysis environments (e.g. Python, R), and deliver analysis-, model- and AI-ready datasets curated, prepared and packaged for easier and more efficient use. This will enable large-scale modelling, innovation and science advances using Australia's rich ocean data holdings.

IMOS will play a more active role in delivering near-real time data streams to the global user community as Australia's first World Meteorological Organisation Information System (WIS 2.0) node, enabling operational uses both domestically and internationally.

Enhanced interoperability across NCRIS Facilities will enable improved cross-domain data usage, particularly in the coastal zone where marine, terrestrial, and atmospheric systems intersect. This will support emerging applications such as digital twins, climate risk assessments, and multi-sector planning.

Inclusive partnerships and fit-for-purpose delivery

IMOS will work with its stakeholder and expert communities to develop and deliver products and services tailored for policymakers, industry, educators and Indigenous communities.

Developing suitable data exchange systems that support controlled data access for Indigenous and industry data will remain a priority. Aligned with both FAIR and CARE principles, IMOS will uphold open science while respecting Indigenous data sovereignty and supporting two-way knowledge sharing with Traditional Owners and sea Country managers. This commitment ensures that IMOS data systems remain inclusive, trusted, and culturally respectful.

AODN will expand its federated data network, welcoming new data partners and incorporating high-value non-IMOS datasets that address national gaps, including state government holdings, indicators, and model outputs.

Through collaboration with regional and global observing systems, IMOS will align standards, share data openly, and contribute to international capacity building.

Emerging Priorities

Guiding approach to identifying and progressing emerging priorities

IMOS operates in a highly dynamic scientific, environmental and policy landscape. While sustained, long-term observations remain central to IMOS' value, the observing system must remain adaptive and able to evolve in response to emerging risks, national priorities, stakeholder needs, and scientific and technological advances. This includes prioritising improvements in operational efficiency and cost-effectiveness, while selectively adopting emerging approaches where they demonstrably improve capability or value.

Emerging priorities identified in the Plan represent areas that IMOS should actively monitor and prepare for, rather than pre-committed new programs. They provide strategic direction so that IMOS can respond in an orderly, evidence-based manner should opportunities arise through policy alignment, partnerships or future investment.

Emerging priorities are identified through:

- Alignment with national strategies and policies, including the IMOS Strategy 2025–2035, Australia's National Science and Research Priorities 2024 and the National Marine Science Strategy 2026–2036;
- Engagement with end-users across government, industry, research and First Nations communities;
- Consultation with IMOS Node Leaders and the IMOS Science and Technology Advisory Committee; and
- Awareness of international observing developments and opportunities.

Assessing readiness and feasibility

Not all emerging priorities are ready for immediate implementation. IMOS therefore applies a structured, transparent assessment approach that considers:

- **Alignment with national strategies and priorities**, ensuring consistency with the IMOS Strategy 2025–2035, Australia’s National Science and Research Priorities, the National Marine Science Strategy 2026–2036 and NCRIS objectives;
- **End-user needs**, ensuring that IMOS delivers impactful data streams that generate benefits for multiple stakeholders and help address national priorities;
- **Science readiness**, including the maturity of observing methods and the ability of the research community to use the data effectively;
- **Feasibility**, including partnerships, costs, co-investment opportunities, servicing requirements, data management, and sustainment; and
- **Impacts on the existing observing system**, including avoiding duplication of effort and risks to critical long-term time series and to IMOS’ reputation.

This assessment is continuous and iterative. It allows IMOS to:

- Take a standardised approach to assessing and comparing potential priorities;
- Make informed decisions about when and how to scale new capabilities;
- Incorporate stakeholder input where feasible to increase relevance, ownership and impact; and
- Identify opportunities for system modernisation, efficiency and value-adding without compromising long-term data continuity.

Initial emerging priorities

These emerging priorities do not replace IMOS’ core commitment to existing, sustained observing activities. Instead, they guide strategic preparation, ensuring IMOS is well placed to respond when science maturity, partnerships and resources align, to continue to maintain relevance and impact.

The following emerging priorities represent themes that IMOS could consider over the coming five years.

Transforming coastal ecosystem observations for improved management

Rationale and drivers:

Australia’s coasts support most of its population, critical infrastructure, and culturally and economically significant ecosystems. Climate change, urbanisation and changing land-sea fluxes are increasing pressure on coastal environments and communities. The NCRIS CoastRI initiative is designed to deliver enhanced observations at the land-sea interface to inform risk management strategies for coastal infrastructure and communities. Building on the objectives of CoastRI, there is a growing demand for coherent, sustained observations to inform ecosystem health and management, including the potential impacts of emerging interventions (e.g. climate adaptation measures and carbon management approaches).

Benefits for marine science:

- Model-ready, integrated coastal datasets capturing chronic and acute change.
- Expanded time series of biological and biogeochemical variables in nearshore waters.

Societal benefits:

- Improved coastal ecosystem management and national and state environmental reporting.
- Stronger food security through resilient fisheries and aquaculture.
- Enhanced stewardship of sea Country and culturally significant species.
- Increased climate resilience for coastal communities.

Integrated extreme event monitoring to bolster forecasting and decision-making

Rationale and drivers:

Extreme events, including marine heatwaves, tropical storms, floods, harmful algal blooms and biosecurity incursions, are increasing in frequency and intensity. Effective response requires timely, trusted information, yet monitoring systems are often fragmented and retrospective.

IMOS has established capability for event-based sampling through the Ocean Gliders Facility, delivering timely and dynamic subsurface observations of extreme events to inform response, prioritised according to consultation with key stakeholders. There is a growing need for co-designed observing, information delivery, and integration for event-based monitoring across IMOS capabilities beyond gliders, enabling stakeholders to detect, assess and respond to events more rapidly and comprehensively.

Benefits for marine science:

- Integrated, event-responsive observations to validate models and forecasts.
- Predictive risk models informed by near real-time data.
- Improved understanding of drivers and impacts of marine extremes.
- Improved availability of timely observations for rapid assessment and development of bespoke indicators.

Societal benefits:

- Reduced economic risk and improved industry resilience.
- Better protection of public health and food security.
- Strengthened climate adaptation and natural disaster response.
- Improved outcomes for vulnerable and remote communities.

Ocean basin-scale process controls on Australia's seas and climate

Rationale and drivers:

Australia's climate and marine environment are strongly influenced by basin-scale processes such as ENSO, the Indian Ocean Dipole and Southern Annular Mode. While these drivers are well understood, their translation into ocean, coastal and local-scale impacts remains insufficiently resolved.

Improved observing of open ocean conditions and processes, and stronger integration with coastal modelling systems, will enhance forecasting, early detection of change, and climate resilience from ocean basin to coastal scales.

Benefits for marine science:

- Expanded open ocean observations and baseline datasets.
- Increased linkages between offshore and nearshore observing and modelling efforts.
- Improved understanding of nearshore to open ocean process controls.

Societal benefits:

- Improved forecasting of ocean conditions and processes affecting Australia and the Indo-Pacific.
- Enhanced food security through better prediction of ecosystem variability and associated risks.
- Support for safe and efficient maritime operations through improved environmental intelligence.

Ocean soundscape monitoring to inform policy and ecosystem management

Rationale and drivers:

Underwater noise is increasingly recognised as a form of marine pollution, with known impacts on marine mammals, fish and ecosystem functioning. International and national regulators are beginning to require evidence to inform management of underwater noise from shipping and other activities.

Advances in passive acoustic monitoring and data analytics (e.g. machine learning) create new opportunities to observe ecosystem processes, biodiversity and anthropogenic pressures at scale.

Benefits for marine science:

- Improved insights into vessel activity, species occurrence and ecosystem condition through soundscape analysis.
- Improved understanding of species distribution, behaviour and long-term ecosystem change.
- Systematic, long-term, nationwide records of anthropogenic pressure to assess future change against established baselines.

Societal benefits:

- Evidence to support regulatory frameworks for underwater noise.
- Improved protection of threatened and migratory species.

- Enhanced management of coastal waterways and ecosystems.

Expanding sea Country observing through First Nations partnerships

Rationale and drivers:

IMOS recognises the importance of First Nations knowledge systems and the enduring connection of Indigenous Australians to sea Country. Nationally, there is a growing understanding of the value of elevating Indigenous leadership in environmental monitoring and management, alongside increasing demand for culturally appropriate, place-based information to support sea Country stewardship. Building on existing partnerships and pilot activities, there is an opportunity to expand co-designed observing and information delivery that reflects First Nations priorities, knowledge systems and data governance expectations.

Benefits for First Nations communities and knowledge systems:

- Co-designed observing programs that reflect community priorities and knowledge systems.
- Improved access to fit-for-purpose, culturally appropriate information products to support decision-making and sea Country management.
- Elevated First Nations leadership and participation in the design, delivery and governance of sea Country observing activities.
- Enhanced integration of Indigenous knowledge with environmental data through “two-eyed seeing” approaches.

Societal benefits:

- Improved environmental stewardship and outcomes for culturally and ecologically significant areas.
- Stronger national understanding of coastal and marine change through inclusion of Indigenous knowledge and places.
- More inclusive and equitable approaches to marine science and decision-making.
- Enhanced alignment with national commitments to Indigenous partnerships, data governance and shared decision-making.

Strengthening industry partnerships through co-delivery and data integration

Rationale and drivers:

Australia’s offshore industries collect significant volumes of environmental data across multiple sectors including shipping, energy, communications, fisheries and emerging blue economy activities. Much of this data remains under-utilised outside its original purpose, representing a substantial opportunity to expand national observing capability and create societal value. There is increasing interest across industry and government in improving collaboration, reducing duplication, and unlocking shared value through open or appropriately governed data frameworks. IMOS is well positioned to facilitate co-delivery and integration of high-value industry datasets where alignment exists.

Benefits for marine science:

- Established national framework and infrastructure for industry data ingestion and delivery.
- Expanded spatial and temporal coverage through integration of industry-collected observations.
- Improved baseline datasets to support climate, ecosystem and operational research.
- Enhanced calibration and validation opportunities for models and remote sensing products.
- Increased efficiency through reduced duplication of data collection effort.

Societal benefits:

- Increased return on existing investments in environmental data collection.
- Improved environmental assessments, risk management and regulatory decision-making.
- Stronger evidence base to support sustainable development across the blue economy.
- More timely and integrated environmental information to support national marine management.

Measuring Success

Success over the next five years will be measured through a balanced suite of indicators aligned with the objectives of the IMOS Strategy 2025–2035, reflecting IMOS’ role as a national, end-to-end ocean observing system. These measures focus on the continuity, quality and relevance of observations; the accessibility, interoperability and uptake of IMOS data and information products; and the strength of partnerships that enable national and international impact. Together, they capture how IMOS delivers sustained societal benefit by supporting scientific advances, informing policy and management, and enabling operational decision-making. They also reflect IMOS’ contribution to Australia’s leadership in ocean observing and the long-term resilience of the observing system, ensuring it remains trusted and fit-for-purpose.

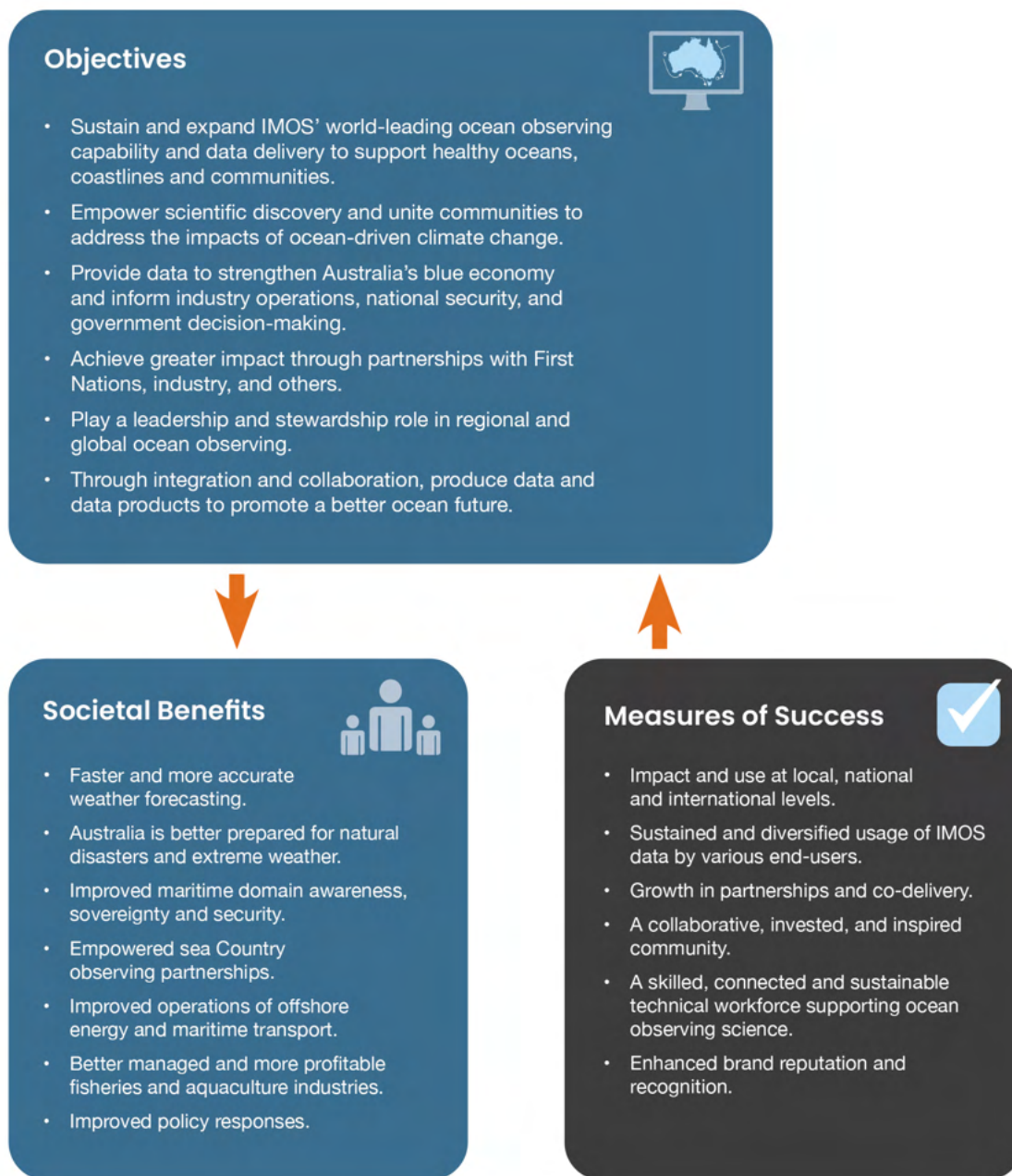
Performance against these measures will be supported by a defined suite of indicators and underlying datasets embedded within IMOS’ monitoring and reporting processes, enabling transparent and consistent tracking of progress over time.

The IMOS Impact Database will continue to support quantitative assessment of key IMOS impact pathways and collaborative outcomes across science, policy and education, spanning local, national and international scales. Data usage metrics will be monitored across IMOS products and AODN web services to improve understanding of user communities, data uptake and evolving needs.

IMOS will actively engage with and survey its user and stakeholder communities to inform priorities, strengthen alignment with emerging needs, and track indicators such as user satisfaction, reputation and broader awareness. These will be complemented by monitoring of website usage, data product access and participation in IMOS-led events and engagement activities.

Growth in partnerships and collaborations will be assessed through measures such as co-investment, operational co-delivery, documented scientific collaborations and expanded participation across sectors, alongside emerging approaches to quantifying the value of co-invested datasets and the composition of IMOS partnerships across sectors.

Observing system performance will be monitored through indicators of platform availability, data delivery and quality of service, including alignment with FAIR and CARE data principles, data inflow status, and progress against operational milestones supporting end-to-end program delivery.



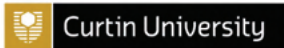
Australia's Integrated Marine Observing System (IMOS) is enabled by the National Collaborative Research Infrastructure Strategy (NCRIS). It is operated by a consortium of institutions as an unincorporated joint venture, with the University of Tasmania as Lead Agent.

PRINCIPAL PARTICIPANTS



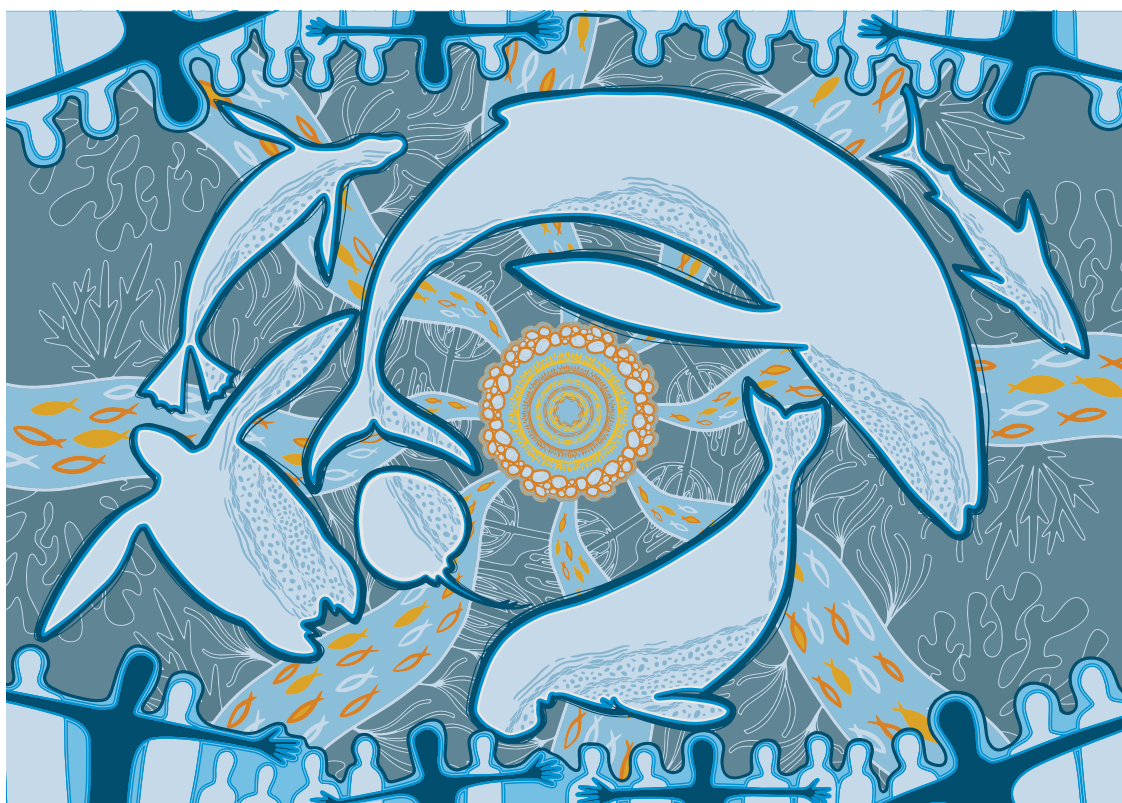
SIMS is a partnership involving four universities

ASSOCIATE PARTICIPANTS



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

imos.org.au



'Around the Campfire'

The design underscores the importance of preserving traditional knowledge, understanding marine ecosystems, and fostering collaboration between indigenous wisdom and modern science (data).

The campfire acts as a classroom and lessons can be taught by talking, singing, artwork and dancing. Some of the stories talk about the marine animals depicted in the artwork and tell the environmental importance as well as the cultural significance, this is what creates a connection with people and nature.

It's a powerful reminder of the interconnectedness of all life and the importance of protecting our natural environments for future generations.

Artwork by Tarquin Singleton, Yirrganydji

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