



Australia's National  
Science Agency

# Managing our oceans for a prosperous future





# High impact ocean research

We're providing scientific knowledge and tools to support sustainable development of Australia's coastal and marine resources.

As Australia's national science agency, our multi-disciplinary research is informing the development and management of the marine environment to deliver ocean wealth, both in Australia and internationally.

We offer trusted and unbiased advice for ecosystem-based domestic and international fisheries management, offshore developments, marine bioregional planning, and the conservation of Australia's marine biodiversity. Our research also spans plastic pollution and climate adaptation.

## Key capabilities

- Monitoring and mitigation of environmental impacts
- Observation and modelling capabilities of coastal assets
- Conservation of marine biodiversity
- Supporting future blue industries

We're working with government and industry to ensure the efficiency and sustainability of Australia's marine industries, which will enhance economic growth, food security and well-being for all Australians.

**Dr Alistair Hobday**  
Sustainable Marine Futures  
Research Director





# Climate change and adaptation

We are collaborating with industry, policy makers and communities to deliver marine adaptation solutions in response to climate change.

Australia's oceans are rapidly changing as the climate becomes warmer and more variable. Over the coming decades, Australia's marine ecosystems are expected to exhibit some of the largest climate-driven changes in the Southern Hemisphere.

Our research is providing a wide range of adaptation methods that are accessible, fit for purpose and have real-world application.

This includes using computer-based learning to forecast marine heatwaves. Forecasting tools will help ensure ecosystems, marine life and communities can adapt and thrive for generations to come.

Our modelling capabilities also provide insights to help fishers prepare and adapt for future conditions. Such as understanding extreme temperature events and how these could impact the community and ocean resources.

We are applying this knowledge to fisheries, such as the Torres Strait rock lobster fishery, to ensure sustainability, protect livelihoods and avoid negative economic impacts.

**Dr Eva Plagányi**

Domain lead: Climate Impacts and Adaptation





## Domestic fisheries

Our research contributes to the scientific backbone for ensuring Australian fisheries are some of the best managed in the world.

This includes understanding fish biology, distribution, movements and ecosystems, and developing approaches for fisheries assessment and ecosystem-based management.

Our research is applied by management agencies for a wide range of Australian commercial fisheries. Our work spans coastal species such as prawns and lobster, offshore species such as tuna, and deep-water species such as orange roughy, ling and blue grenadier.

We work closely with state and Commonwealth governments as well as with industry to provide robust monitoring and management tools to better understand fish populations and their stock structures.

Our science is used by fisheries managers to help maintain fish stocks at ecologically sustainable levels. It is also used to understand the impacts of fishing on non-target species, and on the marine environment.

**Dr Rich Little**  
Domain lead: Domestic Fisheries





# International fisheries

We are providing new data and scientifically tested management systems for a range of international fisheries agencies.

Our research focuses on priority international fisheries that are managed by Regional Fisheries Management Organisations (RFMO). These include the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) and the world's two largest tuna fisheries, Western Central Pacific Fisheries Commission and the Indian Ocean Tuna Commission.

We've developed genetic tools to transform the monitoring and management of fisheries. This includes Close-Kin Mark Recapture and gene tagging.

The CCSBT use these tools to monitor tuna abundance and set the global total allowable catch using a scientifically tested management procedure. Southern bluefin tuna was overfished, declining to very low population levels. Our research underpins the rebuilding strategy that has led to improved stock levels.

We're also working in collaboration with international partners in the Indian and Pacific Oceans to 'map' the structure and connectivity of tropical tuna, and population biology to improve estimates of productivity. This feeds into the scientific and management processes to improve the sustainability of these globally significant resources.

**Dr Campbell Davies**  
Domain lead: International Fisheries





# Integrated Ocean Stewardship

Our internationally recognized integrated ocean stewardship research includes development of frameworks, methods and modelling tools to advance the sustainable growth of the Blue Economy and to promote climate resilience in an increasingly crowded ocean.

Worldwide, the ocean economy is experiencing rapid growth, and there is a growing demand and competition among sectors for space and access among existing and new uses of Australia's, and our neighbours coastal and ocean areas.

We seek long-term partnerships with Aboriginal and Torres Strait Islander Peoples (First Peoples), industry, research partners, regulators and other community members in the widest sense (local, regional, state, national and global) which together deliver prosperity, equity and environmental sustainability into the future.

Our research supports national and international efforts through the identification of objectives, and the assessment of cumulative impacts, thresholds, and tipping points for marine systems. Using integrated system-level modelling approaches we seek overcome sector-based management boundaries that hinder sustainable marine management.

**Dr Beth Fulton**

Domain lead: Integrated Ocean Stewardship





# Marine pollution

Our research is helping to understand the magnitude of the plastic pollution problem, including its distribution both on land and sea and its impact on the economy.

Along with carrying out litter surveys around the country to underpin a long-term monitoring program to measure change, we are using artificial intelligence to track and identify litter in our waterways. This is being applied both in Australia and globally.

We are also using automated sensor networks and camera technology to monitor river rubbish traps to avoid waste ending up in our oceans.

Our research can evaluate policy effectiveness and change through on-ground activities at local, state and national scales, and build circular economy opportunities.

This information is helping industry, policy-makers and the public generate effective interventions to stem the tide of plastic pollution and help solve Australia's waste crisis.

**Dr Britta Denise Hardesty**  
Domain lead: Marine Pollution





# Biodiversity and conservation

We are supporting the conservation and sustainable management of marine resources and ecosystems.

Understanding the patterns and drivers of marine biodiversity is critical to sustain use of ocean resources and assist with conservation. Our work spans from the shore to the deep sea, including coastal, shelf and offshore environments.

We are working to understand how pressures from climate change and industries impact marine biodiversity. This enables us to estimate cumulative impacts and look for mitigation solutions.

We are engaging with government, NGOs, communities and research partners to enhance biodiversity assessment and manage marine ecosystem health.

Our scientific knowledge and tools apply to monitoring, spatial management and strategic evaluation.

## **Dr Toby Patterson**

Domain lead: Biodiversity and Conservation







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through innovative science and technology.

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