

Ningaloo

Ningaloo research

A program of intense, coordinated and collaborative research has produced an unprecedented wealth of knowledge about the iconic Ningaloo coastal region.

The scale of the findings demonstrates the benefits of coordinated research to achieve results beyond the capacity of individual research organisations. The crucial challenge now is to ensure that the products of the research can be maintained and used by planning and management agencies, industries and other stakeholders to assist in making wise decisions about and for the region.

The research will also contribute to improved understanding and management not only of Ningaloo, but of other coral reef systems in Australia and globally.

The research is a collaboration between the Western Australian Marine Science Institution (WAMSI), CSIRO's Wealth from Oceans Flagship, universities (Murdoch, Curtin, UWA, Edith Cowan, ANU and UQ), the Sustainable Tourism Cooperative Research Centre, the WA Departments of Environment & Conservation and Fisheries, and the Australian Institute of Marine Science (AIMS), working with local communities and enterprises.

Regional challenges

The Ningaloo Reef is Australia's largest fringing coral reef, extending across 300 kilometres of coastline between Exmouth and Carnarvon. This spectacular area is a global biodiversity hotspot, a premier tourist destination, home to the three communities of Carnarvon, Exmouth and Coral Bay, and a key service point for oil and gas development and exploration. Conservation and management of the reef given these multiple uses depends on quality science and integrated decision making.

The Ningaloo Marine Park was established in 1987 and is one of the world's most pristine marine protected areas. The marine park was extended in 2004 to cover the entire reef which provides the habitat for more than 500 fish, 250 coral and 600 mollusc species, as well as whale sharks, humpback whales, dolphins, manta rays, turtles and dugong.

The use and future management of the Ningaloo region raise continuing challenges because of the involvement of multiple tiers of government, industry, a passionate local and visitor community and potentially worldwide attention with its recent nomination for World Heritage Listing. Decisions about its management must be based on strong science with practical application to balance the social, economic and environmental interests in the area.



Campsite at Red Bluff, the southernmost boundary of Ningaloo Marine Park, Quobba Station, Western Australia
(Department of Environment and Conservation WA)

Research snapshot

- collaboration of CSIRO's Ningaloo Collaboration Cluster; the Western Australian Marine Science Institution (WAMSI), the Australian Institute of Marine Science (AIMS) and universities
- 2006 to 2011
- Ningaloo physical, biological and social systems
- multi-disciplinary
- Commonwealth and Western Australian Government investment in Ningaloo research has transformed the science foundations for managing human activities in and around the Ningaloo Marine Park and provided a model for research in other Australian marine ecosystems



Student volunteer conducting an underwater visual census of fish in the Ningaloo Marine Park (CSIRO)



Modelling workshop 2009 Exmouth (CSIRO)

Strategic success

Conducting the research as a strategic collaboration enabled the involvement of a diverse range of marine, social and economic researchers who worked to better understand both the natural and human systems of the Ningaloo region. The outcomes produced by these researchers have increased knowledge about Ningaloo and its biodiversity tenfold.

This information can be used to assess and modify current management strategies, where appropriate, to ensure the sustainability of valued marine resources and human communities far into the future.

The research partners have also focused on knowledge transfer; and are working to ensure that the research does not lie dormant once the researchers leave the region. To achieve this, the team is working to present the research findings in ways that are understood, useful and meaningful to both scientists and non-scientists.

Science impacts

The research has:

- produced computer models that act like “flight simulators” and will assist planners and managers to play out different scenarios and management options which evaluate the potential impacts on the economy, the community, tourism and natural resources; and assist to resolve trade-offs between development and conservation
- identified detailed patterns of activities of people along the coast and how those relate to access roads and other infrastructure
- produced highly accurate and detailed maps of the physical and biological components of the reef, lagoon and terrestrial systems
- studied the impacts of tourism on the park to predict the potential effects of different development plans on environmental, economic and social outcomes
- worked with a wide range of stakeholders to identify what information and key communication processes are required for integrated coastal management to be improved and maintained for the long term

- provided baseline information about abundance, diversity and distribution for different marine species that inhabit the marine park
- developed a better understanding of the influence of physical and biological processes on the distribution of different marine species
- explored cost effective methods for monitoring the park’s marine biodiversity and reef health along with the natural and human pressures they face.

Outcomes

- major leap in the quantity and quality of scientific information
- models for ecology, economy and tourism
- comprehensive collation of results from multiple research projects
- “flight simulators” for planners and managers

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