



Research projects:

Management strategy evaluation (CSIRO)

- Developing a modelling framework relating selected ecological and socio-economic processes to test and improve management effectiveness

Geomorphology (Curtin)

- Describing the underlying structure of the park: sediments, bathymetry, morphology and growth history of the reef

Groundwater (Curtin)

- Describing links between the groundwater system and the marine park, and the oceanic processes and potential implications for climate change and human use

Oceanographic processes (UWA)

- Describing and modelling water flow through the marine park
- Linking water movement to oceanic processes and relating them to connectivity in the marine park and other systems
- Improving our understanding of oceanographic processes

North West Marine Research Inventory (CSIRO)

- Creating an on-line searchable meta data database of marine research in the north west bioregion (Kalbarri to the Northern Territory)

Researchers have:

- identified high biodiversity, such as large sponge gardens;
- gathered information to create benthic habitat maps of the marine park's deep water areas which will determine whether sanctuary zones currently cover appropriate key habitats;
- documented and recorded the habitats and movement of several target fish and shark species;
- provided improved bathymetry, or ocean floor mapping, for the marine park;
- improved our understanding of the marine park's geomorphology, reef evolution and sedimentology;
- improved our understanding of water circulation over and around the reef; and
- improved our understanding of the drivers behind Ningaloo Reef's productivity.

This research program will provide a thorough and integrated understanding of the marine park, its resources and current pressures. This information will be used in decision-making processes that will improve the park's long term management. For example, research results will be used to:

- assess the effectiveness of sanctuary zones; and
- determine whether sanctuary zones are in the right place and are of an appropriate size to conserve and protect marine biodiversity and processes; and
- test potential management scenarios.

The Western Australian Marine Science Institution (WAMSI) is a consortium of 15 State and Commonwealth government, academic and private partners undertaking multi-disciplinary marine research. It is Australia's first collaborative research facility dedicated to understanding the marine environment and resources, and to contributing to policy and management decisions on the future use of oceans.

WA State Government provided a \$21 million five-year investment with a \$60 million co-investment by member partners. WAMSI's strategic projects address climate change, its likely impacts, how marine and coastal ecosystems function and how science can be used to understand the impacts of human activity in the marine environment.

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Images courtesy of the Department of Environment and Conservation Western Australia.



managing and conserving the marine state



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Ningaloo Marine Park is one of the most beautiful natural resources in Australia.

Stretching 300 kilometres along the Western Australian coast, the park is an area where tropical and temperate waters mix to create a unique display of marine life. It is home to at least 250 coral, 500 fish and 600 mollusc species.

State Government allocated \$5 million through the Western Australian Marine Science Institution (WAMSI) to carry out research to improve our understanding and management of the park.

This research program is part of a larger program that extends beyond WAMSI and its partners to include a CSIRO Wealth From Oceans Flagship program, the Ningaloo Collaboration Cluster, as well as additional external research

That initial investment by State Government, through WAMSI, has escalated to a four-year \$60 million research program that includes a vast range of research projects being carried out by more than 100 scientists..

WAMSI research is being led by the Department of Environment and Conservation and includes projects by the Australian Institute of Marine Science (AIMS), CSIRO, Curtin University and the University of Western Australia, with the Western Australian Museum, Edith Cowan University and the Department of Fisheries Western Australia also participating as partners.

This collaborative research effort will positively shape the way our marine environment is managed by underpinning decisions about marine protected areas, developments and resource use. Cooperation between scientists and integration of research findings will result in a holistic view that is not possible through a single agency or project.

Because of Ningaloo Marine Park's natural beauty, the research will improve the science information and tools needed for management and decisions about developments and resources.

The research will have a flow-on effect for other marine parks and will ensure that marine ecological and socio-economic values are sustained in marine parks around WA.

*better science
better decisions*

Research projects

Deep water biodiversity and assessing protocols (AIMS)

- Assessing and cataloguing deep water communities and their habitats
- Assessing the status of target, subtidal invertebrate species
- Identifying protocols to monitor reef health over time

Migratory patterns of whale sharks that use Ningaloo Marine Park (AIMS)

- Describing whale shark movement patterns, both within and outside the marine park
- Assessing the diversity, abundance and distribution of sharks and rays
- Developing habitat maps for shark and ray distribution
- Tracking individual movement patterns

Assessing biodiversity and the impact of human use on the ecosystem (CSIRO)

- Determining whether established sanctuary zones are effective in protecting exploited fish and invertebrates
- Identifying fish communities at both a broad and fine scale
- Examining trophic cascade effects of recreational fishing on communities and ecosystems
- Assessing intertidal invertebrate communities
- Using an acoustics array to track fish movement patterns at both a fine and broad scale