North West Shelf

Joint Environmental Management Study

The North West Shelf - *An Environmental Study*

Introduction

Western Australia's North West Shelf is a $6 billion contributor to the national economy and the most economically significant land or sea region in Australia. It produces the majority of Australia's domestic and exported oil and gas, and hosts commercial fisheries, aquaculture, salt production and tourism, and shipping associated with the transport of oil, gas, salt and iron ore.

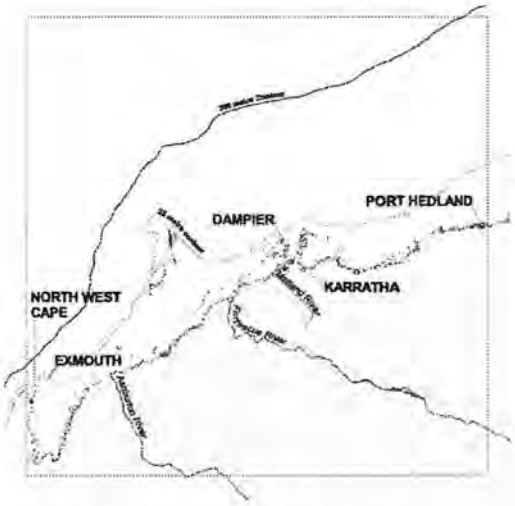
These industries operate in a 110,000-square-kilometre region of tremendous natural wealth and biodiversity covering some 1500 km of coastline, from North West Cape in the south to Port Hedland in the north. An integrated, ecologically based management framework is vital to protecting the integrity and productive capacity of this marine ecosystem for all interest groups.

In June 2000, the Federal Minister for Science, Industry and Resources, Senator Nick Minchin, and the Western Australian Minister for the Environment, Cheryl Edwardes, agreed to fund a $6 million collaborative study to provide a scientific basis for integrated planning and management of the North West Shelf environment and resources.

The principal objective of the North West Shelf Joint Environmental Management Study is to develop and demonstrate practical and science-based methods that support integrated regional planning and management of marine ecosystems to achieve ecologically sustainable development.

The study will provide an understanding of the marine environment, and the tools to aid and streamline management decision-making. This will help Governments avoid the mistakes made with our land resources, which are now costing industry and government billions of dollars to rectify.

In 1998, the Western Australian government allocated $2.7m to the Study. This provided the impetus for additional support and involvement of the key stakeholders from the research, industry and government agencies operating on the North West Shelf.



Within the total North West Shelf study area, of around 110,000 square kilometres a highly complex level of biodiversity is found. The seabed habitats in this region support the greatest marine biodiversity in the world.

In February 1999, CSIRO announced that it would allocate new resources in the order of $3.4m to North West Shelf research. A major factor leading to this decision was an initiative, providing the opportunity for Western Australia and CSIRO to establish a joint collaborative study.

Considerable environmental research has already been completed on the North West Shelf by industry, Western Australian and Federal Government authorities, and research organisations such as CSIRO, the Australian Institute of Marine Science and the Australian Geological Survey Organisation. The study will combine this research to address the significant gaps in knowledge to improve environmental decision making, planning and management.

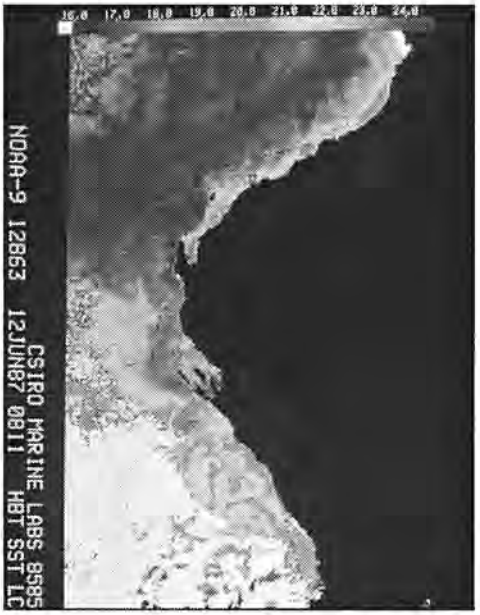
Study Outcomes

Outcomes of the four-year Study will support initiatives by the Government of Western Australia to manage human uses of the region using an integrated, ecosystem and science-based approach.

They will include:

- A model of the North West Shelf to predict the cumulative impacts of multiple use.
- Methods of testing proposed management options and scenarios, in a risk context, for regional multiple management.
- An understanding of how the physical and chemical environment and the biological environment are linked, with a focus on major primary producers, rare and endangered species, and commercial and recreational species.
- The ability to predict the effects of selected human uses on conservation and other values of the North West Shelf ecosystem.
- Predictions for use in risk assessment and risk management strategies, including strategies based on adaptive management in response to the results of monitoring programs.
- Comprehensive knowledge of the region's natural wealth and variability in the short- and long-term to enable greater flexibility in managing new threats and activities.

Oil and Gas production from the North West Shelf is expanding, confirming the regions position among the most economically significant land or sea regions in Australia.



Remote sensing by earth observation satellites helps to characterise seasonal changes in ocean conditions.

Biological wealth

Australia's North West Shelf is ecologically diverse and complex. Its seabed habitats support the greatest recorded marine biodiversity in the world; including a remarkable array of marine fauna including tropical fish, turtles, hard and soft corals, sponges, and crustaceans.

It has diverse and productive inshore reefs and some of the world's finest examples of tropical arid-zone mangroves. Marine ecosystems that meet arid landscapes – such as the North West's Pilbara region – have distinctive characteristics and sensitivities. But unlike their tropical counterparts, they have received little study.

Ningaloo Marine Park, at the southern end of the Shelf, is home to endangered dugongs, migratory whales and giant whale sharks. Ningaloo attracts many thousands of tourists each year and new tourism facilities are being developed to meet increasing demand. Marine parks are also being proposed for the Dampier Archipelago and the Monte Bello Islands.

Strong links exist within and between the region's shallow-water tropical marine systems. Coral larvae can be transported by ocean currents to help maintain 'downstream' coral reefs. Mangrove-lined shores prevent coastal erosion and consequent silting of adjacent reefs. These mangroves provide nurseries for some juveniles of marine species that live around reefs as adults. Coral reefs in turn protect shores from violent wave action. Because of these links, any local damage caused to one part of an ecosystem can have flow-on effects elsewhere.

Shelf Natural Features

The North West Shelf experiences an average of three to four cyclones a year, the highest incidence of tropical cyclones along Australia's coast. These can cause massive destruction to coastal areas and seabed habitats, and contribute significantly to the region's natural inter-annual variability.

The effect of these and other natural phenomena on the natural variability of the North West Shelf's marine ecosystem, however, is not well understood due to the absence of long term monitoring programs. This means scientists and managers cannot properly assess the potential impact of proposed industrial developments and other human activities.

The North West Shelf is also affected by large-scale variations in ocean temperatures and salinity. These are influenced by the Indonesian throughflow (fluctuating flows in the Indonesian Archipelago between the Pacific and Indian ocean), and by other regional currents.

A large percentage of the Shelf's offshore surface waters are low in phytoplankton. This unusual phenomenon is attributed to a deep overlying layer of low-nutrient waters, perhaps linked to the Indonesian throughflow. In contrast, sub-surface productivity is high, and contributes to the region's rich diversity of sponges and epifauna.

The North West Shelf study region experiences large tides (up to 3m at its northern end) and large internal or sub-surface waves. These waves suspend and move sediments at the seabed, exposing features such as oil pipelines.

Multiple-Use Management

Under the United Nations Convention on the Law of the Sea, Australia is obliged to manage its 11-million sq. km Exclusive Economic Zone to conserve living and non-living resources in a sustainable manner. Achieving these goals on the North West Shelf is complicated by the rapid growth of marine industries, and complex management and regulatory structures.

One of the first industries to develop on the Shelf was South Seas Pearling, which sparked the first wave of immigrants to Australia's north-west coast in the 1880s. They built the foundation for pearling, Australia's richest aquaculture enterprise. Opportunities for new regional wealth emerged in the early 1960s, when the first commercial oils flowed from wells sunk on Barrow Island. Expanding oil and gas production has been accompanied by shipping and coastal development, commercial and recreational fishing and tourism.

Each of these industries has its own management authority, and these operate under more than 200 separate federal, state and local government legislative requirements. They govern ports, maritime safety and pollution, quarantine and immigration, environmental protection and conservation, waste management, harvesting and licensing, recreational and indigenous fishing, vessel registration, tourism and fisheries management.

A collaborative approach to integrated management that identifies the resources, habitat types and conservation values of ecosystems, and involves stakeholders in decision-making, is essential to balancing these uses, and avoiding conflict.

The North West Shelf Study further extends research on the integrated management of Australia's regional marine ecosystems. It complements major projects under way on the Great Barrier Reef, and in Australia's South-east, as a part of Australia's Oceans Policy.

North West Shelf Joint Environmental Management

Ecosystem-based marine management can ensure that the integrity of marine ecosystems is maintained. This will assist to maintain sustainable development and will benefit future generations of Australians.

Summary

In outlining the Australian Government's innovative National Oceans Policy in 1998, Federal Environment Minister Senator Robert Hill acknowledged Australia had well-established regimes for managing specific ocean sectors such as shipping, fisheries, oil and gas, and marine protected areas.

What was lacking, he said, was a synchronised and comprehensive planning and management regime, which can resolve conflicts and competing interests, and identify gaps in knowledge. Senator Hill said this approach would ensure that the national return on marine resources is maximised, without compromising the sustainability of important environment values and marine biodiversity.

"We do want to see greater emphasis given to ecosystem-based management of our oceans to ensure that the integrity of ecosystems are maintained and that artificial jurisdictional boundaries do not hinder effective governance of our seas", Senator Hill said.

The North West Shelf Study is a significant step towards achieving that capability.

Study Collaborators

WA Department of Environmental Protection, and CSIRO Marine Research

Project Support

West Australian Government
Minerals and Energy, Fisheries, Conservation and Land Management

Science
Australian Institute of Marine Science, Australian Geological Survey Organisation

Industry
Australian Petroleum Production Exploration Association, Woodside Energy, Apache Energy

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