Voyages SS06-2008

Morphology and Chronostratigraphy of Fossil Reefs around Lord Howe Island

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Contribution to Australia's national benefit

Coral reefs are sensitive indicators of climate, while fossil reefs preserve a record of past climate conditions that enable the reconstruction of their response to past climate change.

The Lord Howe Island reefs are especially sensitive, located at the latitudinal limit to reef formation. The fossil reefs that were studied as part of this research voyage will provide insights into the palaeoclimatology of this part of the Tasman Sea.

During this voyage researchers from the University of Wollongong and the Marine Biodiversity Research Hub at Geoscience Australia collaborated to map the shallow shelf and fossil reefs in the marine park around Lord Howe Island. This work contributes to a major marine biodiversity mapping project with the objective of understanding the ecosystems that occur on seamounts around southern Australia.

The voyage research included detailed benthic surveys of a little known part of the Lord Howe Marine Park. Mapping of the seabed will provide a firm foundation for management of shallow marine ecosystems, and the palaeoenvironmental reconstructions support better understanding of reef response to climate change.

As a part of this voyage, samples were collected that will provide invaluable data on the history of reef development and the environmental conditions under which former reefs flourished.

As a result of this voyage:

1. We have a better understanding of the former extent of reefs at this sensitive southern latitudinal limit to reef growth, the nature of sediment production on the shelf and the associated benthic ecology.

2. We have found that the former reefs around Lord Howe Island were much more extensive than those that exist there today. Reefs are sensitive to global climate change, especially periods of warming, and these former reefs may provide an analogy for how reefs will respond to future climate change.

3. We have mapped the morphology of the shelf surrounding Lord Howe Island with a high degree of resolution, and the digital relief model of shallow marine environments will provide a valuable guide for more detailed assessment of benthic communities.

4. We have commenced a program of determining sediment production and reef growth history at this key latitudinal site that can provide a foundation for the better management of the marine park.

Addressing National Research Priorities:

An Environmentally Sustainable Australia

Goal 7 Responding to climate change and variability

Itinerary

Departed Sydney 1000 hrs
Wednesday 16 April 2008

Arrived Noumea 0800 hrs
Tuesday 29 April 2008

> Voyage track SS06-2008