



Voyage SS09-2006

A comparison of nutrient supply processes and biological productivity in upwelling and frontal regions of the Lord Howe Ridge.

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The Lord Howe Rise, Middleton Reef and Taupo Seamount are volcanic islands and seamounts. As a consequence, the flanks of the island shelves and seamounts are extremely steep, approaching 45° in some places.

The impact of the East Australia Current (EAC) extension on the region is thus interesting from both a physical and biological perspective.

At the time of our voyage the area was highly complex, with patches of EAC and temperate waters intermixed, and in continuous motion relative to each other. Thus there was no well-defined Tasman Front crossing to the Lord Howe area, as we originally envisaged.

Currents were however strong enough to generate significant vertical and horizontal flow disturbances over the Taupo Seamount, the Lord Howe and Ball's Pyramid area and Middleton Reef.

At the end of the voyage, observations were also made near the centre of a cold-core eddy located just off the NSW central coast.

In general, Tasman Sea waters are nutrient poor in the surface layers. Our observations show clearly that flow perturbation, by currents flowing over or around islands and seamounts and in cold-core eddies, do create significant nutrient uplift, creating localised areas of biological productivity.

1. We have observed physical processes of flow perturbation around island wakes and seamounts, and in the centre of a cold-core eddy.
2. We have found that such flow perturbations induce nutrient supply from the deeper ocean into the surface layers where photosynthesis and plankton productivity take place.
3. We have commenced a program of physical and biological modelling wherein we plan to simulate the physical processes using a regional ocean model, and the biological processes using a nutrient-plankton model.

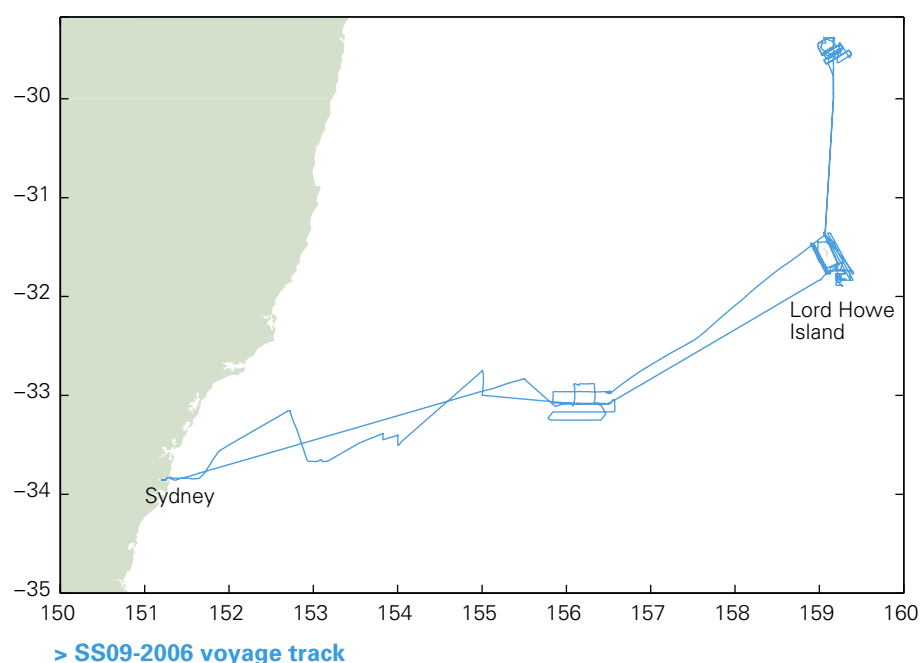
understanding of the oceanography and productivity of the Tasman Sea at the present time, but it is also important in understanding possible climate change impacts. The project is relevant to National Research Priority 1 "An Environmentally Sustainable Australia", through Goals 5 and 7.

Itinerary

Departed Sydney 11:00hrs
Wednesday 27 September 2006

Arrived Sydney 08:00hrs
Wednesday 11 October 2006

This research improved our



As a result of this voyage: