



## Voyage ss2010\_v08

### Krill in 3D – Vertical Stratification and Spatial Distribution of Krill Communities in the East Australian Current.

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#### Contribution to Australia's national benefit:

Physical forcing and upwelling events affect biodiversity, species distribution and the outcomes of competitive interactions in pelagic zooplankton (e.g. between krill and salps). The nature of these interactions is important in determining the fate of carbon in analogous temperate systems in the northern hemisphere and Antarctic, but these dynamics are unknown in the unique Eastern Australian Current (EAC) community. Demonstrated changes to physical forcing and nutrient input to coastal waters resulting from climate change and variability will have substantial effects on the abundance, distribution and interactions of these species. Climate impacts at the bottom of the food chain cascade to the higher trophic levels that offer ecosystem services of social, cultural and economic significance. These findings will be integrated with predicted physical derived from established ocean models, to provide estimates of changes in zooplankton community structure and productivity at the key Intergovernmental Panel on Climate Change (IPCC) breakpoints. These predictions will be relevant to the region of our east coast that provides much of the primary and secondary productivity to support juvenile fish which eventually progress to the important South-east Trawl fishery.

#### As a result of this voyage:

1. We have a better understanding of the way in which different layers of the ocean interact with each other, and how the movement of animals such as krill can shunt energy between food webs in a nutrient limited environment such as the EAC.
2. We have found that krill and salps appear to have a negative interaction off eastern Australia. Krill are far more abundant this year than on previous voyages (2008 and 2009), when salps dominated the plankton assemblage.
3. We have mapped the diversity of krill and copepods in relation to hydrography, across areas of differing primary productivity and different circulation patterns. A diverse krill assemblage forms an important part of the zooplankton off NSW, providing food for fish, seabirds and whales.

We have commenced a program investigating the movement of organisms between the ocean depths of the most rapidly changing water mass in the world. We will study the nature and variability of organism movement across latitudes and depths over coming years and develop models that simulate changes in energy flow in response to climate variation.

#### Itinerary

Departed Sydney  
16:30, Wednesday 22 September 2010  
Arrived Sydney  
11:30, Tuesday 5 October 2010

#### > Voyage track ss2010\_v08

