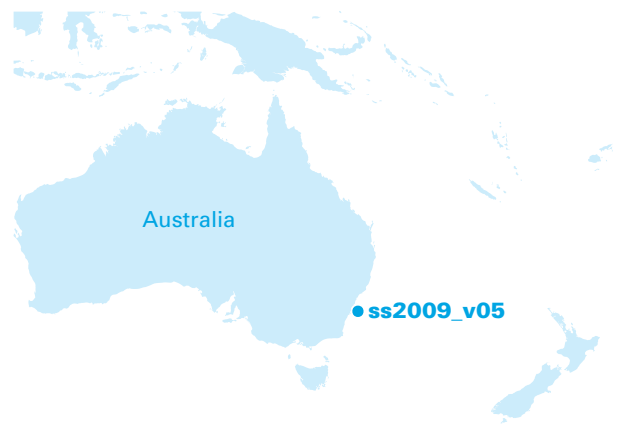




Voyage ss2009_v05

Salps, Eddies and Entrainment in the Stockton Bight

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Contribution to Australia's national benefit:

The separation of the East Australian Current from the coast creates an unappreciated zone of production for South Eastern Australia, which has major implications in anticipating climate change effects. The region is especially productive in the spring, generating vast concentrations of gelatinous zooplankton ("jelly balls" or salps). Surprisingly, these filter feeders may actually be nutritious and could enhance carbon uptake into the coastal ocean. Off Port Stephens, the separation injects new nutrients into the waters of the Continental Shelf, and also forms clockwise and anticlockwise eddies. These specific processes were observed on this voyage, in conjunction with two autonomous ocean gliders, extending our 3D view over four months from birth to death of an eddy. We have begun to analyse the 160 plankton samples, looking for larval sardine growth and production and to estimate the fantastic production rates of these enigmatic salps (described as growing at 10% of their length per hour).

As a result of this voyage:

1. We have observed the formation and the effects of a cold core eddy off the productive Stockton Bight region. The eddy entrained water laden with larval fish and plankton into what we believe to be a nursery or "incubator" – the first test of this novel hypothesis.
2. We have found a concentration of gelatinous salps and larval sardines are in part driven by the cold core eddy which complements the Bakun (1997) paradigm for successful fisheries production: entrainment; enrichment; and retention.
3. The Stockton Bight region is renowned for its biodiversity and production, as well as an aggregation/feeding zone for juvenile white shark. This voyage has provided the benchmark data to establish why the region is so productive and just how important the region is for the NSW coast.

4. We discovered remarkable concentrations of krill in the Tasman Sea, which contribute to the daily 500m vertical migration of the deep scattering layer. We targeted these layers acoustically and with a net. These temperate krill (5 species) are not just the purview of the Southern Ocean and may be an unappreciated cog in the fisheries production of our coastal ocean.

Itinerary

Departed Sydney, 16:00,
Friday 16 October 2009

Arrived Sydney, 10:00,
Tuesday 27 October 2009

> Charter voyage track ss2009_v05

