

MARINE
NATIONAL FACILITY

2009 RV Southern Surveyor program

voyageplan
ss2009_t02

Quantifying tuna prey resources off eastern Australia in relation to the regional oceanography

Itinerary

Mobilise Noumea 0900 hrs, Tuesday 28 July, 2009

Depart Noumea 1600 hrs, Tuesday 28 July, 2009

Arrive Hobart 0700 h, Friday 7 August and demobilise

Principal Investigators

Dr Rudy Kloster

CSIRO Marine and Atmospheric Research

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Scientific Objectives

Developing models of the sustainability of large fish predators such as tunas requires understanding of ocean productivity, particularly secondary production which includes their food resource. Recent investigations show significant variations in this part of the food web, which can lead to inaccuracies in models aimed at predicting the sustainability of fish predators, potentially more so in future years with increased ocean warming due to climate change.

On the transit we plan a study using net collections, acoustics and biochemical analyses on a transect through the main region of the Eastern Tuna and Billfish fishery to quantify and identify the food web components leading to tuna-like species. These data will be compared and evaluated with respect to previous estimates obtained in 2004 on a voyage by *Southern Surveyor* (SS0904) on the tuna fishing grounds (Young et al., 2009). Sampling in the southern part of the transect will also provide a valuable comparison to ongoing cross-Tasman Sea transects that have been run by CSIRO for the past five years (Kloser et al., 2009).

1. At basin scales, develop the acoustic, optical and net capture methods to determine the distribution, abundance and biodiversity of mid-trophic functional groups.
2. Testing biochemical and genetic techniques, particularly stable isotope analysis to distinguish heterogeneity in the biological communities identified at basin scale.
3. Collection of calibrated underway acoustics at 12, 38 and 120 kHz.
4. In the spirit of the transit voyages PhD students will be on board to gain experience and using the material in their PhD or post doc projects.

References:

Kloser, R.J., Ryan, T., Young, J., and Lewis, M.E. (2009) Acoustic observations of micronekton fish on the scale of an ocean basin: potential and challenges. *ICES J. Mar. Sci.* 66

Young, J. W., Lansdell, M., Hobday, A., Dambacher, J., Cooper, S., Kloser, R. J., Griffiths, S., Nichols, P. and Revill, A. (2009) Determining ecosystem effects of longline fishing in the Eastern Tuna and Billfish Fishery. FRDC Final Report 2004/063. 335 pp

Voyage Objectives

The main voyage objective is to complete a series of midwater trawls matched by acoustic observations along the transit from Noumea to Hobart. We also aim to collect samples of midwater micronekton for biochemical analyses to interpret potential differences in species composition and biomass. Underway we will collect and record nutrients to relate to satellite imagery of the region taken during the voyage. Finally, we aim to provide a preliminary map of the bathymetry of the Taupo Seamount and Tasmanian southern coast 150 to 1500 m using the vessel's swath map capability. We will treat as a priority the involvement of the participating students in all the work carried out during the voyage.

Voyage track

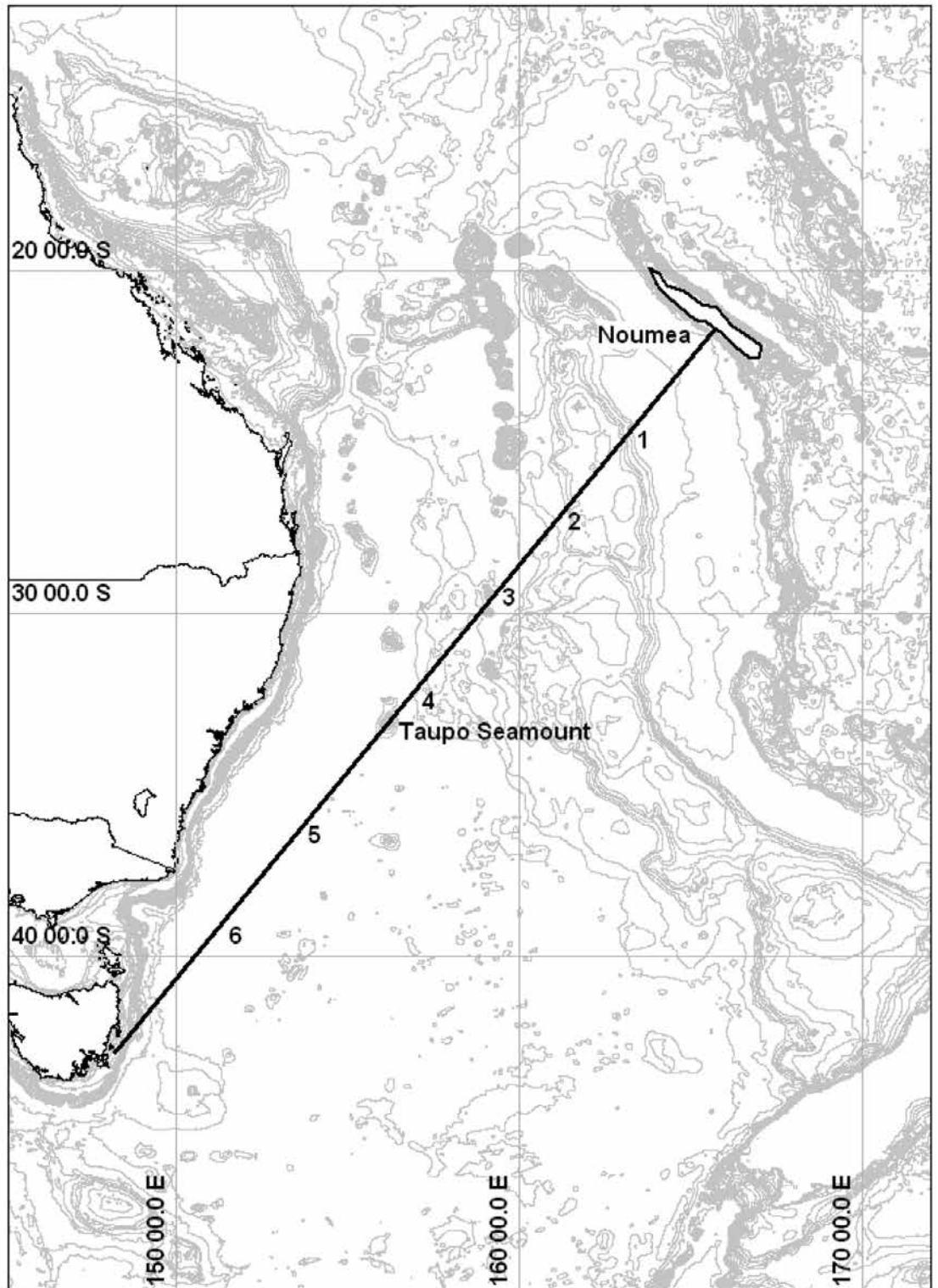


Figure 1: Cruise track SS02/2009 showing approximate positions of net sampling. The first station will be outside the New Caledonia EEZ. Time will also be made available for swath mapping of the Taupo Seamount.

Time Estimates

We will depart Noumea at 1600 h on Tuesday 28 July. We will steam along a SSE transect directly toward Hobart. On this transect we will deploy a midwater net at daily intervals to examine latitudinal variation in the composition, biomass and acoustic strength of midwater fauna known as micronekton.

We will steam for approximately 24 hours to the first trawl position (Station 1, Fig. 1) where we will deploy the Isaacs Kid Midwater Trawl (IKMT) net to a nominal depth of 600 m during the day. This will be followed by a night trawl with the IKMT at approximately the same position. This first station will take approximately 6 hours. We will then steam directly along the transect to the next station which will be at 1800 h the following day which will consist of a midwater trawl to a nominal depth of 600 m. Along the transit, trawls will be completed each night at 1800 h to a nominal depth of 600 m. Underway nutrients will be collected continuously along the transit. Depending on oceanographic conditions and time available, the depth and position of the trawl may be varied. The latest oceanographic model and synthesis data will be used to assist in planning the positioning of net trawls in known water masses (Figure 2). Depending on the depth of the deep scattering layer as determined by the vessels acoustics net catches will be targeted to 800 to 1000 m as appropriate. It is expected that the deepening of the deep scattering layer south of 32o will require sampling to 800 to 1000 m (Station 6). Time permitting a further day night sampling station will be completed at ~41 degrees South (Station 4, Fig. 1) before heading into Hobart.

Piggy-back Projects

1. On route we will carry out preliminary swath mapping of the Taupo Seamount, which is located at ~33 degrees South.
2. A single CTD cast is requested during the voyage to obtain seawater for the CMAR calibration laboratory. At a distance of at least 500km from the nearest large landmass and in a water depth greater than 1000m, deploy the vessel's CTD (fitted with at least 15 x 10 litre Niskin bottles) to a depth of approximately 100m and fire all bottles. Once recovered, the water will be decanted by the MNF Electronics technician into containers supplied by the CMAR calibration facility.
3. Collection of EM300 multi-beam data for the National seabed mapping program.

***Southern Surveyor* Equipment**

EM300

CTD

User Equipment

Isaacs Kid midwater trawl

Personnel List

Participant	Tentative Cabin	Affiliation	Position
Jock Young	Chief Scientist	CMAR	Chief Scientist
Mark Lewis		CMAR	Net specialist
Adrian Flynn		U Queensland	PhD Student
Ron Plaschke		MNF/CMAR	Voyage Manager
Stephen Thomas		MNF/CMAR	Electronics support
Lindsay Pender		MNF/CMAR	Computing support
David Terhell		MNF/CMAR	Hydrochem support
Anoosh Sarraf		MNF/CMAR	Computing support
Bernadette Heaney		CMAR/MNF	MNF Swath Support
Sarah Payne		UTAS	Student
Sophie Edgar		UTAS	Student
Tim Alexander		UTAS	Student

As per AMSA requirements for additional berths on *Southern Surveyor*, the following personnel are designated as System Support Technicians and are required to carry their original AMSA medical and AMSA Certificate of Safety Training on the voyage:

Name	AMSA Certificate of Safety Training No.
Ron Plaschke	AS02925
Steve Thomas	AS02584
Lindsay Pender	AS02763
Dave Terhell	AS02843
Bernadette Heaney	AS02397
Anoosh Sarraf	

This voyage plan is in accordance with the directions of the Marine National Facility Steering Committee for the Research Vessel *Southern Surveyor*.

Jock Young
Chief Scientist

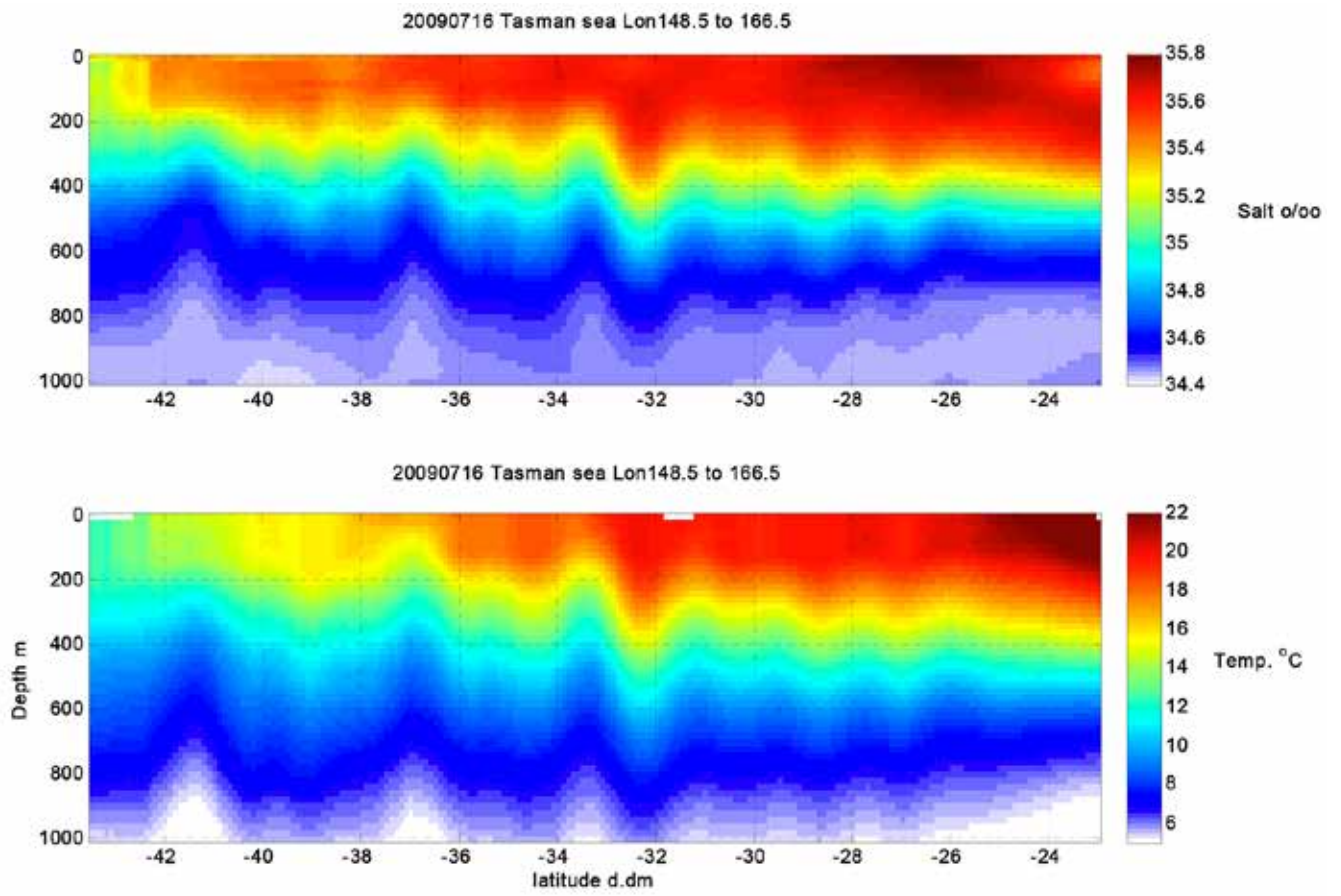


Figure 2