



## Voyage Summary

**SHIP****Name:** SOUTHERN SURVEYOR**Call Sign:** VLHJ**Type of ship:** DEEP-SEA RESEARCH VESSEL**VOYAGE NO.**

SST02/2009

**VOYAGE NAME** Quantifying tuna prey resources off eastern Australia in relation to the regional oceanography**VOYAGE PERIOD**start 30/07/2009 to 07/08/2009 end  
(set sail) day/ month/ year day/ month/ year (return to port)**PORT OF DEPARTURE** Noumea, New Caledonia**PORT OF RETURN** Hobart, Australia**RESPONSIBLE LABORATORY****Name** CMAR**Address** PO Box 1538 Hobart 7001**Country** australia**CHIEF SCIENTIST(S)** Jock Young (CMAR)**OBJECTIVES AND BRIEF NARRATIVE OF VOYAGE**

## Scientific Objectives

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. 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.

**Voyage Objectives**

1. complete a series of midwater trawls matched by acoustic and hydrographic observations along the transit from Noumea to Hobart
2. augment existing bathymetry along the eastern seaboard using the swath mapper
3. develop seagoing and sampling skills of participating students

## **Results**

### **Voyage Narrative**

We departed Noumea on 30 July at 0830 h for Hobart after a lengthy delay caused by a port strike. We were scheduled to leave on the 28<sup>th</sup> July. Our aim was to complete a series of trawls on the transit south. Because of the delay in leaving, planned replicate tows were replaced by single tows every 24 hours. We followed this pattern sampling at ~ 200 nmile intervals on nightfall. We completed three trawls in tropical waters which at that time extended to 30 S (Figure 1). Before each trawl we completed a CTD and after each trawl an XBT was fired. At the first coldwater station the entire net system including MIDOC was lost. A full report on the loss has been prepared by the voyage manager. With no spare net on board we were restricted from then on to swath mapping on route to Hobart. The 2000 m was mapped from the north eastern tip of Tasmania to a position just south of Storm Bay. The four students helped prepare a report on the net sampling and hydrography completed on the voyage. This is attached as Appendix 2.

### **Summary**

Four sets of midwater tows were collected along the transect with accompanying acoustics and hydrography. The loss of the net stopped sampling in colder Tasman Sea waters. The second objective, to provide increased swath mapper coverage, was successful. In particular, swaths were completed around the Taupo Seamount and along the Tasmanian continental slope. The four students were involved in all aspects of the sampling. They were enthusiastic and attentive to the tasks they were set and were good company on board.

## **PROJECT (IF APPLICABLE)**

### **Project name**

### **Coordinating body**

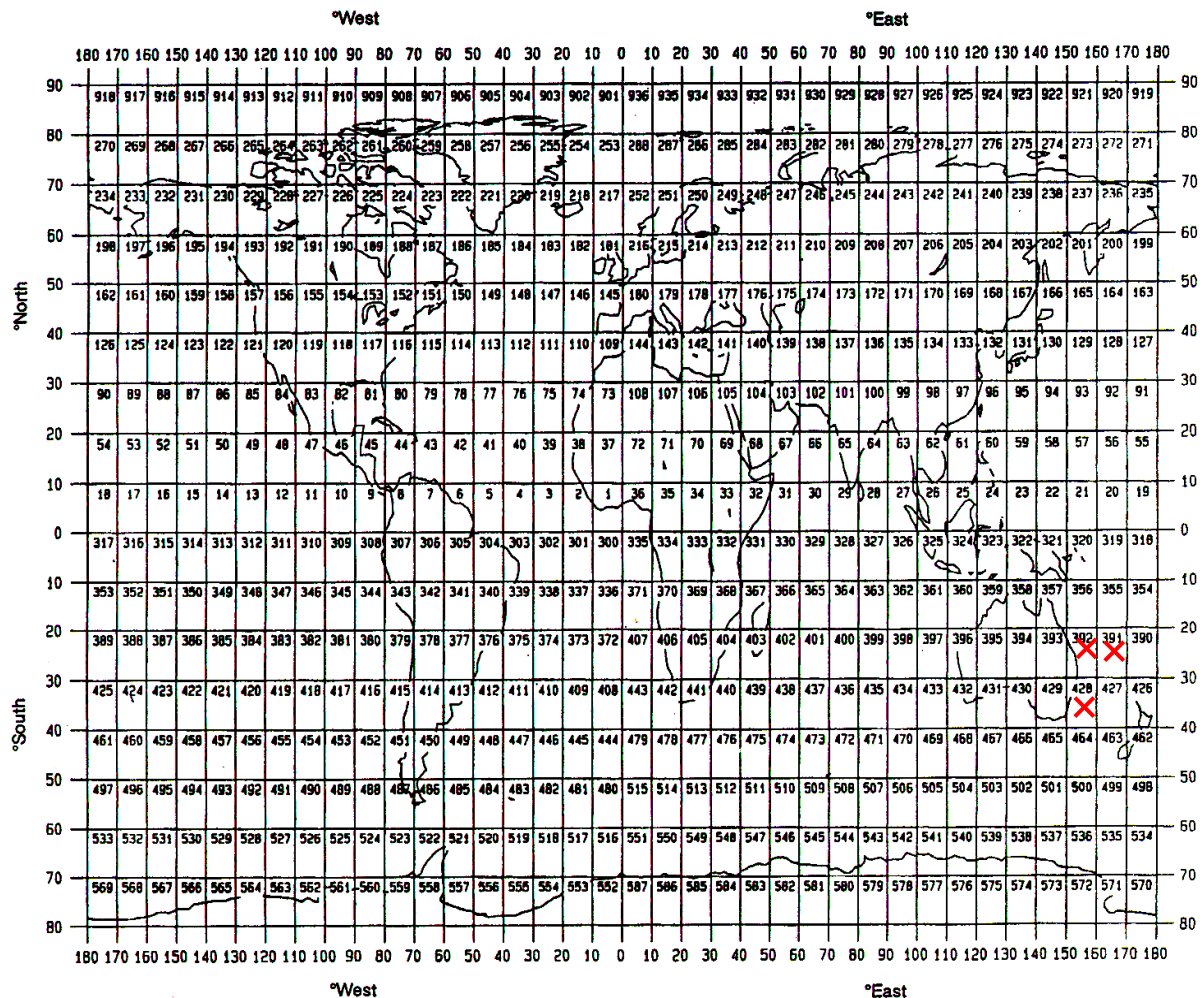
## **PRINCIPAL INVESTIGATORS**

- A.** Dr Jock Young CMAR GPO Box 1538 Hobart, 7001, Tasmania
- B.** Mr Rudy Kloser CMAR GPO Box 1538 Hobart, 7001, Tasmania

# MARSDEN SQUARES

× × × ×

## GEOGRAPHIC COVERAGE - INSERT 'X' IN EACH SQUARE IN WHICH DATA WERE COLLECTED



## MOORINGS, BOTTOM MOUNTED GEAR AND DRIFTING SYSTEMS

This section should be used for reporting moorings, bottom mounted gear and drifting systems (both surface and deep) deployed and/or recovered during the voyage. Separate entries should be made for each location (only deployment positions need be given for drifting systems). This section may also be used to report data collected at fixed locations which are returned to routinely in order to construct 'long time series'.

[illegible]

## SUMMARY OF MEASUREMENTS AND SAMPLES TAKEN

Except for the data already described above under 'Mooring, Bottom Mounted Gear and Drifting Systems', this section should include a summary of all data collected on the voyage, whether they be measurements (e.g. temperature, salinity values) or samples (e.g. cores, net hauls).

Separate entries should be made for each distinct and coherent set of measurements or samples. Different modes of data collection (e.g. vertical profiles as opposed to underway measurements) should be clearly distinguished, as should measurements/sampling techniques that imply distinctly different accuracy's or spatial/temporal resolutions. Thus, for example, separate entries would be created for i) XBT drops, ii) water bottle stations, iii) CTD casts, iv) towed CTD, v) towed undulating CTD profiler, vi) surface water intake measurements, etc.

Each data set entry should start on a new line – it's description may extend over several lines if necessary.

NO, UNITS :for each data set, enter the estimated amount of data collected expressed in terms of the number of 'stations'; miles' of track; 'days' of recording; 'cores' taken; net 'hauls'; balloon 'ascents'; or whatever unit is most appropriate to the data. The amount should be entered under 'NO' and the counting unit should be identified in plain text under 'UNITS'.

[illegible]

## CURATION REPORT

[illegible]



|   |                                     |
|---|-------------------------------------|
| <b>TRACK CHART</b>  | <input checked="" type="checkbox"/> |
| <b>GENERAL OCEAN AREA(S)</b> Coral and Tasman Seas  |                                     |
| <b>SPECIFIC AREAS</b> The voyage transited from Noumea, New Caledonia to Hobart, Tasmania |                                     |

## PERSONNEL LIST

### *Scientific Participants*

| Name              | Affiliation       | Role                 |
|-------------------|-------------------|----------------------|
| Jock Young        | CSIRO MAR         | Chief Scientist      |
| Ron Plaschke      | CSIRO MNF         | Voyage manager       |
| David Terhell     | CSIRO MNF         | Hydrochemist         |
| Lindsay Pender    | CSIRO MNF         | Computing            |
| Anoosh Saraaf     | CSIRO MNF         | Computing            |
| Stephen Thomas    | CSIRO MNF         | Electronics          |
| Bernadette Heaney | CSIRO MNF         | Swath mapping expert |
| Mark Lewis        | CSIRO MAR         | Net Technician       |
| Adrian Flynn      | University of QLD | PhD student          |
| Sarah Payne       | UTAS              | University student   |
| Sophie Edgar      | UTAS              | University student   |
| Timothy Alexander | UTAS              | PhD student          |
|                   |                   |                      |

## **Marine Crew**

| <b>Name</b>     | <b>Role</b>   |
|-----------------|---------------|
| Marcus De Fina  | Master        |
| John Barr       | C/O           |
| Rob Ferries     | 2/O           |
| John Howard     | Bosun         |
| Roger Thomas    | C/E           |
| Mike Sinclair   | 1/E           |
| Craig Hogarth   | 2/E           |
| Grant Webberley | Seaman        |
| Dan Nicholson   | Seaman        |
| Matt Barrett    | Seaman        |
| Jonathon Lumb   | Seaman        |
| James McGarvey  | Chief Steward |
| David Nichols   | Chief Cook    |
| Rebecca Lee     | Second cook   |

## **ACKNOWLEDGEMENTS**

**We would like to thank the skipper and crew of the Southern Surveyor for their support during the voyage**

Jock Young

**Chief Scientist**

## **FIGURES**

## **APPENDICES**

***Appendix 1 - Science Report***

***Appendix 2 – Student report on the voyage***

# Appendix 1 - Science Report

Voyage SST02/2009

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

***Dr Jock Young*** (Chief Scientist)

Note: Rudy Kloser was instrumental in planning this voyage but was not on board

## ***Itinerary***

Departed Noumea, Departure Time (08:00)

30/7/2009

Arrived Hobart, Arrival Time (06:00)

7/8/20-09

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

As a result of this voyage:

1. We have a better understanding of winter acoustic backscatter of the Tasman and Coral Seas. This backscatter gives an indication of the concentration and biomass of the prey of tunas and billfish which form the basis of an important commonwealth fishery. The acoustic signal of these animals was recorded to a depth of 1000 m along the transect.
2. We found acoustic backscatter in the Coral Sea similar to the relatively more productive waters of the Tasman Sea
3. On route to Hobart we mapped the bathymetry of the Taupo Seamount and the continent slope off eastern Tasmania using the on-board swath mapper.

## CSR/ROSCOP PARAMETER CODES

|     | <b>METEOROLOGY</b>                |
|-----|-----------------------------------|
| M01 | Upper air observations            |
| M02 | Incident radiation                |
| M05 | Occasional standard measurements  |
| M06 | Routine standard measurements     |
| M71 | Atmospheric chemistry             |
| M90 | Other meteorological measurements |

|     | <b>PHYSICAL OCEANOGRAPHY</b>                             |
|-----|--|
| H71 | Surface measurements underway (T,S)                      |
| H13 | Bathythermograph   |
| H09 | Water bottle stations                                    |
| H10 | CTD stations   |
| H11 | Subsurface measurements underway (T,S)                   |
| H72 | Thermistor chain   |
| H16 | Transparency (eg transmissometer)                        |
| H17 | Optics (eg underwater light levels)                      |
| H73 | Geochemical tracers (eg freons)                          |
| D01 | Current meters   |
| D71 | Current profiler (eg ADCP)                               |
| D03 | Currents measured from ship drift                        |
| D04 | GEK  |
| D05 | Surface drifters/drifting buoys                          |
| D06 | Neutrally buoyant floats                                 |
| D09 | Sea level (incl. Bottom pressure & inverted echosounder) |
| D72 | Instrumented wave measurements                           |
| D90 | Other physical oceanographic measurements                |

|     | <b>CHEMICAL OCEANOGRAPHY</b>              |
|-----|---|
| H21 | Oxygen                                    |
| H74 | Carbon dioxide                            |
| H33 | Other dissolved gases                     |
| H22 | Phosphate                                 |
| H23 | Total - P                                 |
| H24 | Nitrate                                   |
| H25 | Nitrite                                   |
| H75 | Total - N                                 |
| H76 | Ammonia                                   |
| H26 | Silicate                                  |
| H27 | Alkalinity                                |
| H28 | PH  |
| H30 | Trace elements                            |
| H31 | Radioactivity                             |
| H32 | Isotopes                                  |
| H90 | Other chemical oceanographic measurements |

|     | <b>MARINE CONTAMINANTS/POLLUTION</b> |
|-----|--------------------------------------|
| P01 | Suspended matter                     |
| P02 | Trace metals                         |
| P03 | Petroleum residues                   |
| P04 | Chlorinated hydrocarbons             |
| P05 | Other dissolved substances           |
| P12 | Bottom deposits                      |
| P13 | Contaminants in organisms            |
| P90 | Other contaminant measurements       |

|     | <b>MARINE BIOLOGY/FISHERIES</b>                       |
|-----|---|
| B01 | Primary productivity                                  |
| B02 | Phytoplankton pigments (eg chlorophyll, fluorescence) |
| B71 | Particulate organic matter (inc POC, PON)             |
| B06 | Dissolved organic matter (inc DOC)                    |
| B72 | Biochemical measurements (eg lipids, amino acids)     |
| B73 | Sediment traps  |
| B08 | Phytoplankton   |
| B09 | Zooplankton   |
| B03 | Seston  |
| B10 | Neuston   |
| B11 | Nekton  |
| B13 | Eggs & larvae   |
| B07 | Pelagic bacteria/micro-organisms                      |
| B16 | Benthic bacteria/micro-organisms                      |
| B17 | Phytobenthos  |
| B18 | Zoobenthos  |
| B25 | Birds   |
| B26 | Mammals & reptiles                                    |
| B14 | Pelagic fish  |
| B19 | Demersal fish   |
| B20 | Molluscs  |
| B21 | Crustaceans   |
| B28 | Acoustic reflection on marine organisms               |
| B37 | Taggings  |
| B64 | Gear research   |
| B65 | Exploratory fishing                                   |
| B90 | Other biological/fisheries measurements               |

|     | <b>MARINE GEOLOGY/GEOPHYSICS</b>          |
|-----|---|
| G01 | Dredge                                    |
| G02 | Grab                                      |
| G03 | Core - rock                               |
| G04 | Core - soft bottom                        |
| G08 | Bottom photography                        |
| G71 | In-situ seafloor measurement/sampling     |
| G72 | Geophysical measurements made at depth    |
| G73 | Single-beam echosounding                  |
| G74 | Multi-beam echosounding                   |
| G24 | Long/short range side scan sonar          |
| G75 | Single channel seismic reflection         |
| G76 | Multichannel seismic reflection           |
| G26 | Seismic refraction                        |
| G27 | Gravity measurements                      |
| G28 | Magnetic measurements                     |
| G90 | Other geological/geophysical measurements |