

DRAFT VOYAGE PLAN
RV SOUTHERN SURVEYOR

SSTransit 02/2008

Itinerary

Depart Suva 1500 hrs, Sunday 08th June, 2008
Arrive Cairns 1300 hrs, Wednesday 18th June, 2008

Chief Scientist

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Principal Investigator – backarc survey

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Scientific Objectives

As part of a national seabed mapping initiative map the upper-slope and mid-slope seabed focusing on the 200 m to 1500 m depth range and regions important for regional marine planning, biodiversity and conservation assessments and fisheries habitat mapping (Kloser et al. 2007).

Objectives for the transit voyages:

1. Using transit time, map key areas as identified in gap analysis.
2. Develop methods of improving data quality and calibrating the EM300 backscatter data.
3. Develop and test new rapid methods of “ground truthing” acoustic backscatter maps with optical and physical sampling.

4. Process bathymetry and backscatter data and create maps suitable for ecological interpretation.
5. Collect underway watercolumn acoustic data to characterise ocean basin mid-trophic distribution and abundance.

The objectives to be accomplished on this transit are to investigate three areas of Australian territory (Coral Sea Island Territory, Townsville shelf break and Cairns shelf break). Distinctive features such as canyons that incise the continental slope will be a priority. Where possible (particularly in the Coral Sea Island Territory) the swath sampling will maximise investigative transects to highlight the dominant geomorphic and substrate features.

On route to Australian territory we will map a section of the “backarc” North Fiji Basin where three Basin ridges meet that will consolidate and contribute to a previous voyage (Arculus pers. com. 2008). (See Appendix 1.)

The swath mapping will be carried out predominately along the 400m contour. The periodic deployment of XBTs and the CTD will provide calibration data for the EM300 swath mapper. The concurrent collecting of EK500 acoustic data that will assist in producing longer term metrics for the classification of oceanic water-column structure.

Swath Survey

On route to Cairns from Suva, map the upper slope targeting gaps based on existing EM300 multibeam data. At selected locations obtain temperature profiles to provide calibration inputs to the multi-beam echo sounder for sound speed and absorption measurements and quantify measurement uncertainty when compared to climatic hind cast and forecast sound velocity and absorption profiles. The most recent sea surface temperature and height anomaly map of the region will be used to target water masses for sampling as well as indications from the multi beam across track bathymetric profile.

The estimated swath distance from Suva to Cairns following the voyage track shown in Figure 1 is 2068 n.miles.

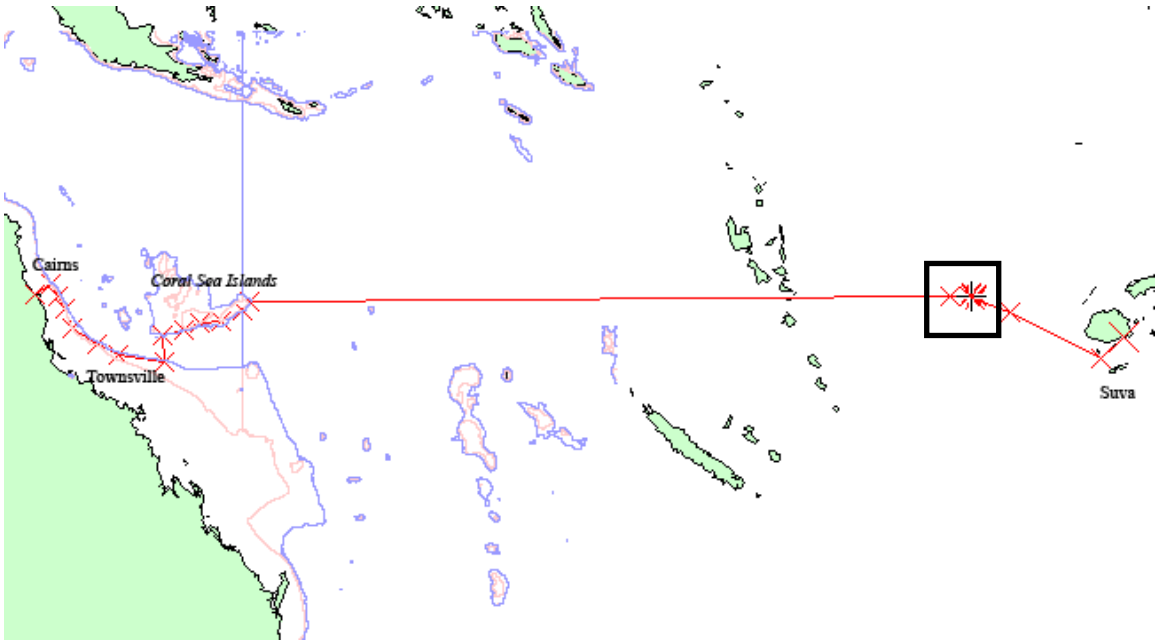


Figure 1 Voyage track from Suva, Fiji to Cairns, Australia with North Fiji Basin swath site marked with a box.

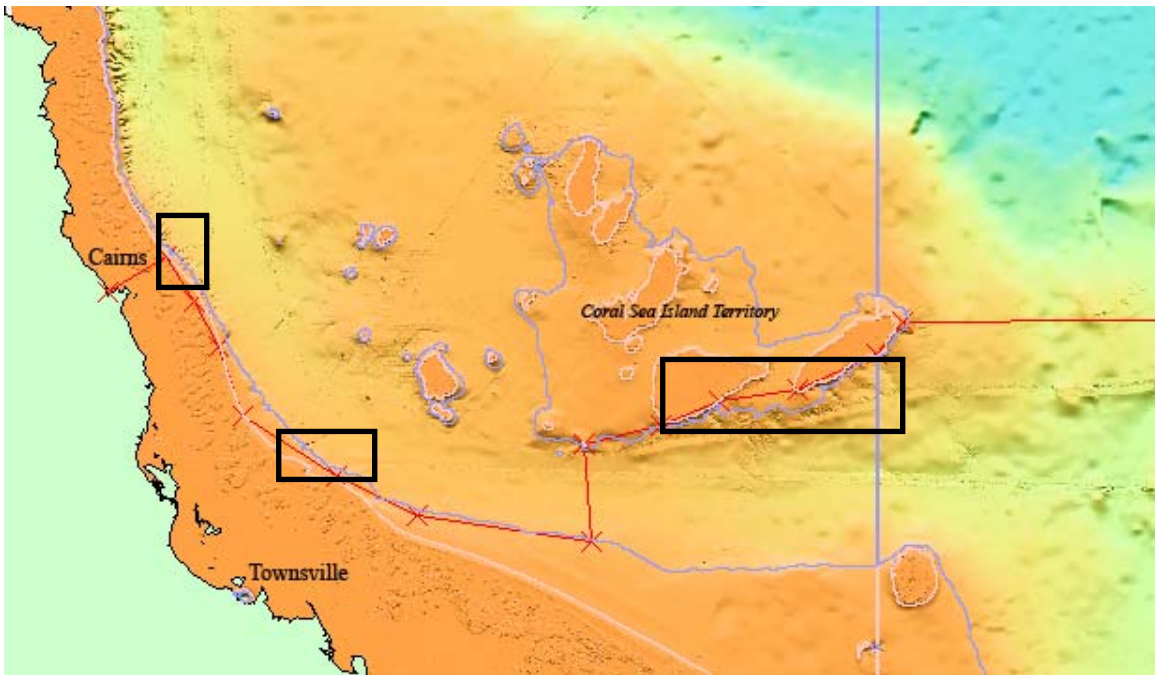


Figure 2 Survey area with proposed track in Australian territory with boxes highlighting areas for more intensive mapping.

Time Estimates

Swath mapping and EK500 data collection;

Suva to Coral Sea Island Territory
North Fiji Basin 40 n.miles + 30 n.miles
CSIT to Aus Con. slope (opp. Townsville)
Townsville to Cairns (along 400 metre isobath)

1574 n.miles at 10 knots = 6.5 days,
80 n.miles at 10 knots = 0.4 days
206 n.miles at 10 knots = 0.85 days,
300.79 n.miles at 10 k = 1.25 days.

Extended mapping in boxes marked

240 n.miles @10 knots = 1.0 days

Total time required = 10 days

Specific Southern Surveyor Equipment

XBT's 20 off.

Personnel List

Participant	Affiliation	Role
Rick Smith	CMAR/ MNF	Chief Scientist
Gordon Keith	CMAR	Swath specialist
Drew Mills	CMAR/ MNF	Electronics support /Voyage Manager
Hiski Kippo	CMAR/ MNF	Computing support

Rick Smith

Chief Scientist

Appendix 1. Coordinates for Richard Arculus's backarc survey.

On the way, the ship will cross the North Fiji Basin which is, on the basis of "length of spreading ridge per square km of new crust" the most active backarc basin on Earth. And to add spice to this, there is a "triple junction" where three of the Basin's ridges meet close to the direct line between Suva and Cairns.

The centre of the triple junction: 16 degrees 56 minutes S, 174 degrees 7 minutes E.

Plan is to swath through two waypoints and then swath 3 lines over the Triple Junction, of 10 nautical miles each, separated by 3.5 NM. (water depths are ~ 2000 to 2250 meters).

The order would be A to B then 1 to 2 to 3 to 4 to 5 to 6, then to D then "home".

A 18 degrees 45 minutes S, 177 degrees 45 minutes E

B 17 degrees 25 minutes S, 175 degrees 0 minutes E

1. 17 degrees 3.0 minutes S, 173 degrees 58.5 minutes E

2. 16 degrees 58.5 minutes S, 173 degrees 48.5 minutes E

3. 16 degrees 55.5 minutes S, 173 degrees 50.5 minutes E

4. 16 degrees 59.5 minutes S, 174 degrees 0.5 minutes E

5. 16 degrees 56.0 minutes S, 174 degrees 1.5 minutes E

6. 16 degrees 52.0 minutes S, 173 degrees 51.5 minutes E

D 16 degrees 38 minutes S, 173 degrees 13 minutes E