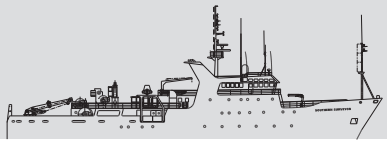

MARINE
NATIONAL FACILITY

2012 program

RV Southern Surveyor

voyageplan
ss2012_t06

Marine debris distribution in the Eastern Indian Ocean and Timor Sea.

Itinerary

Depart Fremantle 0800hrs
Friday 7 September, 2012

Arrive Darwin, 0800hrs,
Sunday 16 September, 2012

Principal Investigators

Dr Chris Wilcox *(Chief Scientist)*
CSIRO Marine and Atmospheric Research
Phone: 03 6232 5446 **Email:** chris.wilcox@csiro.au

CSIRO

Scientific Objectives

Marine Debris Surveys (Chris Wilcox,CMAR)

We plan to address the following questions:

1. What is the density of marine debris in the oceanic regions around Australia?

2. What is the composition of marine debris in the regions sampled?

3. What fraction is anthropogenic in origin?

We also hope to evaluate the use of an aerostat as a tool for collecting low level aerial images from behind the vessel. However this is conditional on further development of the appropriate camera with our technological collaborator.

Plankton Surveys (Dave McLeod, CMAR)

To collect plankton using a CPR along a transect between Broome and Darwin to improve our understanding of plankton abundance and distribution in the north west area of Australia.

Measurements of Nitrogen Fixation (Eric Raes, UWA)

Collect physical and biological data using the ship's conductivity – temperature – depth profiler from the surface and the oxygen minimum feature in the photic zone at stations between Broome and Darwin, particularly targeting eddies where possible.

Voyage Objectives

Voyage objectives will include surface sampling using a manta trawl net, visual sampling from observation points on either side of the bridge, and trial of an aerostat for collecting low level aerial images from behind the vessel. We are currently investigating the utility of data collection from the aerostat and will be able to advise on its suitability within the next two weeks.

While the ship is on the manta trawl stations, the CTD will be deploy to collect samples at the surface and at the oxygen minimum feature in the photic zone. The water budget for each depth is 30 litres. For manta trawl stations where the CTD is not deployed due to time constraints or other issues, surface samples will be taken from either the surface flow through in the wet lab or using a surface bucket.

The CPR will be deployed continuously between Fremantle and Darwin and will not interfere with the planned neuston net or aerostat tows. The CPR can be deployed at cruising speed whenever suitable for the crew after departure and can be towed continuously for up to 500 nautical miles.

Table 1 Summary of the planned activities.

Date	Time	Activity	Time Required	Speed Required
07/09/2012	08:00	Depart Fremantle, including pilotage	30 minutes	NA
07/09/2012	08:30	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
07/09/2012	09:15	Deploy CPR	5 minutes	NA
07/09/2012	14:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
07/09/2012	22:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
Commencing 08/09/2012 Ending 11/09/2012	06:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
As above	11:00	Recover and redeploy CPR	30 minutes	NA
As above	14:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
As Above	22:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
Commencing 12/09/2012 Ending 15/09/2012	06:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
As above	06:45	CTD cast, surface and ~150 m	30 minutes	0 kts
As above	11:00	Recover and redeploy CPR	30 minutes	NA
As above	14:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
As above	14:45	CTD cast, surface and ~150 m	30 minutes	0 kts
As above	22:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
As above	22:45	CTD cast, surface and ~150 m	30 minutes	0 kts
16/09/12	06:00	Manta net trawls 3 @ 15min @ 3kt	45 minutes	3 kts
As above	06:45	Recover CPR	30 minutes	NA
As above	07:30	Start pilotage and Arrive Darwin	30 minutes	NA

Voyage Track

No voyage track has been included as the sampling can be done along the most efficient vessel route from Fremantle to Darwin. The presumed distance is 1840 nautical miles. The exact route, and thus locations of the sampling stations, will be determined in consultation with the ship's Master and Voyage Manager.

Time Estimates

Table 1 gives the times and speeds required for the various activities. Locations are not specified in the table, as the exact locations are not essential. The primary goal is to distribute sampling stations evenly along the vessel route. Trawl samples can be taken at 3 kts, with the net deployed and retrieved while underway. CTD casts need to be done with the vessel stationary. CTD casts are planned at the end of the trawl samples to minimize the time lost to slowing down to a stop to launch the CTD and subsequently regaining steaming speed. It is assumed that the sampling and subsequent acceleration will require 30 minutes. Vessel speed is assumed to be 10 kts otherwise.

Southern Surveyor Equipment

Marine Debris study:
Winches for deployment of neuston net
Winch for deployment of aerostat

Plankton Survey:
Coring or towed body winch

Nitrogen Study:
CTD and winch for deployment

User Equipment

Marine Debris study (Chris Wilcox, CMAR):
2 nylon neuston nets, 0.333mm mesh size
aerostat, approximately 1 cu meter when inflated.

Plankton Survey (Dave McLeod, CMAR):
Continuous Plankton Recorder (including 1 x towed body and 3 x internal cassettes)

Nitrogen study (Eric Raes, UWA):
5 nally bins for on deck incubations

Special Requests

Marine Debris study:

Processing of materials will require access to a wet laboratory, a dissecting scope, and facilities for handling small amounts of liquids necessary for cleaning nets and preserving samples. This project also requires access to vantage points for starboard and port observations, with one person at each observation station.

Nitrogen study:

Sample processing will require use of the general purpose lab, one bench in the fish lab for filtration, along with usage of the fire hose for a continuous water flow. The project will also require storage space on deck for 5 plastic bins, approximately 20 litres volume each, for incubation of samples

Personnel List

Participant	Affiliation	Position
Chris Wilcox	CMAR	Chief Scientist
Ray Cilia	Earthwatch	Marine debris team member
Peter Hoskin	Earthwatch	Marine debris team member
TBA	Earthwatch	Marine debris team member
TBA	Earthwatch	Marine debris team member
David McLeod	CMAR	Plankton Study Technician
Eric Raes	UWA	Nitrogen study team leader
Allison McInnes	UWA	Nitrogen study team member
Hannipoula Olsen	UWA/Texas Uni	Nitrogen study team member
Sascha Frydman	CMAR	MNF Voyage Manager
Karl Forcey	CMAR	MNF Electronics Support
Anoosh Sarraf	CMAR	MNF Computing Support

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.
Sascha Frydman	BB07960
Karl Forcey	BB02062
Anoosh Sarraf	BB02298

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

Chris Wilcox
Chief Scientist