

**MARINE
NATIONAL FACILITY**

voyageplan
ss2010_t03

2010 *RV Southern Surveyor* program

Next Wave
tomorrow's marine scientists

Transit voyage Hobart to Sydney

Supported by CSIRO-MAR, MNF, and SIMS

Itinerary

Mobilise Hobart 1000 h, Thursday 16 September 2010

Depart Hobart 1600 h, Thursday 16 September 2010

Arrive Sydney (local time) 1500 h, Tuesday 21 Sept. 2010 (124 or 108 hours in total)

Demobilise 1500-1700

Principal Investigators

Dr Jock Young (Chief Scientist-on-board) – CMAR

Email: Jock.young@csiro.au **Phone:** 0429 568 152 or (03) 6232 5360

Professor Iain Suthers (Chief Scientist-on-land) – Sydney Institute of Marine Science and UNSW

Mr Benjamin Harris (Alternate Watch Leader) – Sydney Institute of Marine Science and UNSW

Email: I.Suthers@unsw.edu.au **Phone:** 0414 385 351

Dr Kerrie Swadling – TAFI and U. Tasmania

Email: Kerrie Swadling K.Swadling@utas.edu.au

Dr Sebastian Holmes – U. Sydney

Email: sebastian.holmes@sydney.edu.au



Scientific Objectives

“Next Wave” is a new programme of the National Facility Research Vessel Southern Surveyor to encourage young scientists to try research at sea, inspired by the success of the 2006 voyage led by Dr Moninya Roughan and supported by ARCNESS. Next Wave provides the additional crew as well as a full scientific staff (electronics, hydro, computing etc) on their transit voyages between ports. SIMS has hosted two recent transit voyages Transit SS03-2008 (Aug08, Gladstone to Sydney) and Transit SS01-2009 (Jan09, Sydney to Wellington), with students from all over Australia. The students and leaders work 12 h shifts between 07:00-23:00 to operate the CTD rosette and N70, XBT casts, as well as underway TSG, fluorometer etc, bird/whale counts, etc.

This transit provides experience and supports the research of:

- 1) two PhD students examining the community composition of euphausiids and salps (Ben Harris 2010-12; Natasha Henschke 2010-12);
- 2) an honours (Samantha Castle, U.Tas) and PhD student (Ben Roennfeldt, Deakin U) studying plankton;
- 3) an MSc.Phil. student starting a project on salp fecundity (Lauren Ooi, 2010-2011 who needs this voyage for live rearing;
- 4) Provides background for a new PhD student (Josh Humphries) using Slocum glider deployments and how this relates to oceanography in the temperate waters of the NSW coast, as well as looking at salp ecology along the EAC;
- 5) 5 keen undergraduates selected from the UNSW third year Ocean Biology & Fisheries class.

Our scientific objectives are to provide at-sea experience of working on a moving platform and working as a team. Specifically, students will examine with CTD, N70 net, acoustics and EZ net, at two locations: approximately off Eden (~19th for 10 h) and off Jervis Bay (~20th for 10 h), to arrive off Sydney Heads on morning of 21st. These two main sampling sites will be preceded by tool boxes and trial deployments of the gear in the morning (~18th for 4 h) off NE Tasmania.

The scientific objectives at each site are:

- 1) the change in abundance of krill and salps between on-shelf (~150 m isobath) and off-shelf (~1500 m isobath), and in relation to CTD casts, ADCP, MODIS SST and ocean colour images;
- 2) Determine spatial (negative) correlation between salps and crustacean zooplankton (copepods and krill);
- 3) to determine the composition and dynamics of the ascending, deep scattering layer (DSL) around sunset (approx 17:30 in late September) at a site off the shelf;
- 4) Where possible to opportunistically investigate oceanographic features of the East Australian Current such as fronts and eddies off the NSW coast identified from MODIS images and BlueLink;

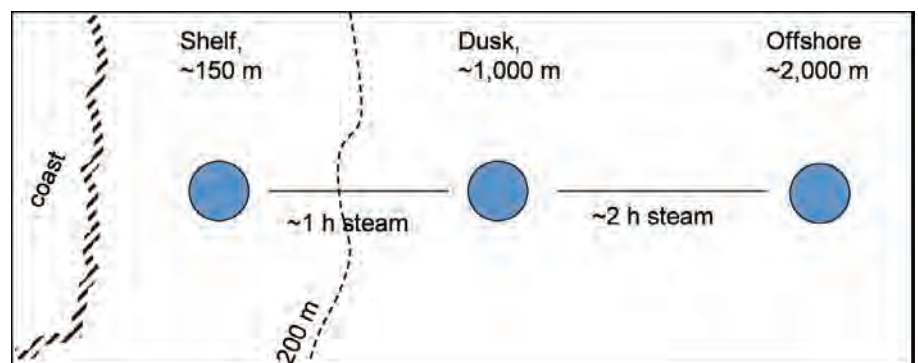
Voyage Objectives

Our voyage objectives are :

- i) To expose students to the challenges of research voyages, by using the basic equipment of the vessel and occasional lectures or tutorials by the scientific crew and the officers; to appreciate the importance of communication, mutual respect, lines of authority and safety “toolboxes” for each operation;
- ii) Complete toolboxes on Fri morning
- iii) Complete St Helens site on Friday afternoon 13:00-23:00
- iv) Complete Flinders Is site on Sat 18 September 13:00-24:00
- v) Complete Eden site on Sun 19 September 13:00-24:00
- vi) Complete Jervis Bay site on Mon. 20 September 13:00-24:00
- vii) To determine the cross-shelf gradient in nutrients, phytoplankton and zooplankton (particularly salps and krill) - as well as counting seabirds and whales. At each site, CTD casts and plankton tows will occur during the afternoon and evening, and will be aligned with any oceanographic features;
- viii) To monitor the ADCP and underway data (T, S and fluorescence at 4 m intake) as the vessel crosses eddies and other oceanographic features;

The sites of Flinders, Eden and Jervis Bay do not have to be precisely determined, so long as we start around 1300 and finish before midnight, and the Dusk station starts around 1700-18:30 to capture dusk in around 1000 m, to capture the sequences of vertical migration. To capture the event with the EZ net, you could do the EZ net tow before the CTD station if necessary.

We should reserve the last 10-12 h to steam towards Sydney Harbour entrance by around 1300 Tuesday, dock by 1500.

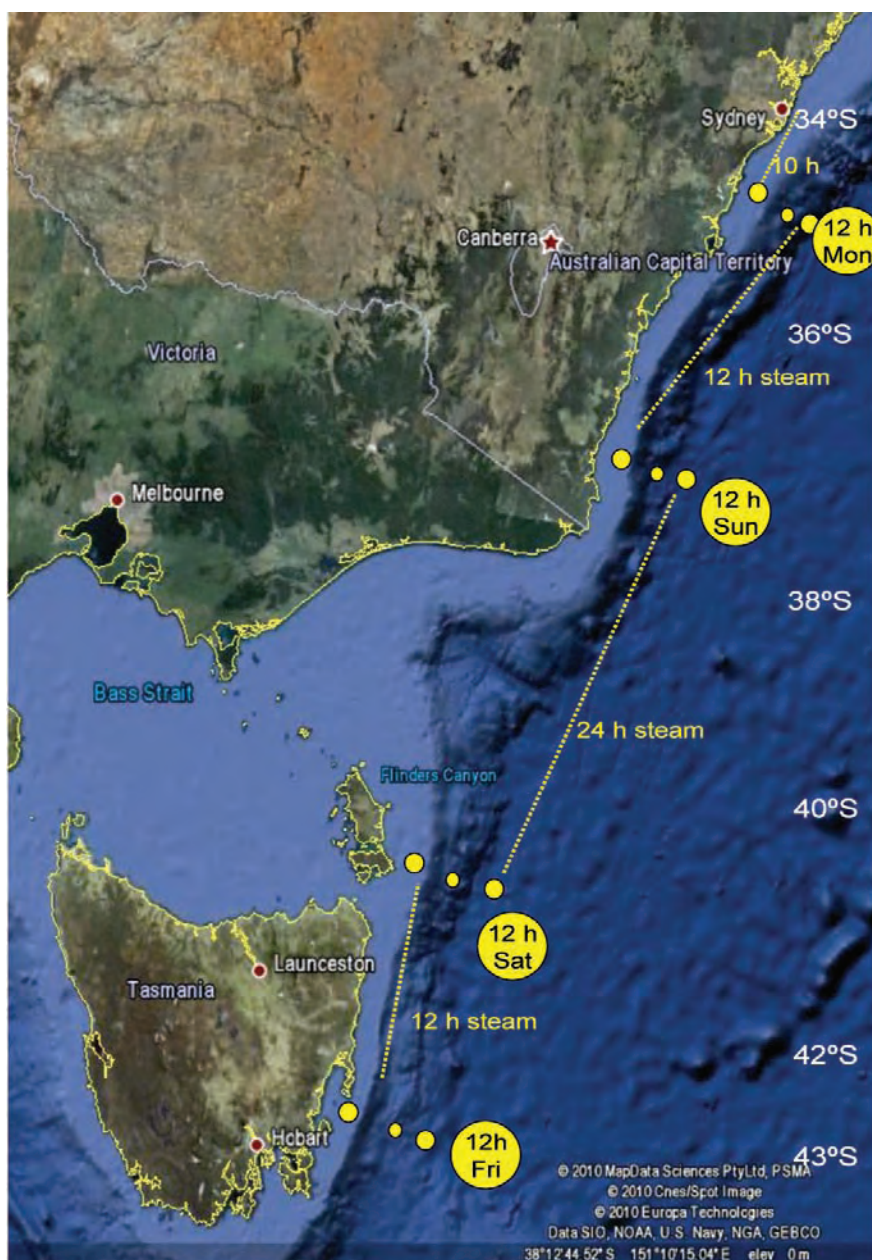


Sketch of general sampling strategy off the 3 locations, with one CTD+N70 vertical haul, and one EZ net tow per station (approx. 3 h per station). St Helens site is a lower priority compared to the Eden and Jervis sites. Off Eden start at 1300 from the coast end; off Jervis start at 1300 off the offshore end (or vice versa; they are assumed to be replicates).

NB: the EZ net is absolutely essential for the next voyage. If any doubt exists (weather, gear etc) it should be stowed and the surface neuston and bongo nets used instead.

Voyage Track

Clearly show the area of operation and the intended voyage track. The figure should feature a map showing the entire voyage track, and relevant coastline showing major towns or cities so that readers can see at a glance where Southern Surveyor will be relative to well known features. Fine details of the voyage track in the area of operation need not be shown. The figure can be shown here (if small) or as an A4 size attachment.



Approximate voyage track and times from Hobart to Sydney, with smapling duration circled in yellow. The outside Hobart is for tool boxes etc

Time Estimates

16:00 Thursday 16 September 2010 to

15:00 Tuesday 21 September = 124 hours total voyage*

10:00 Friday 17 September 2010 to

10:00 Tuesday 21 September = 108 hours total voyage.

Steaming (including underway, ADCP and swath mapping) from Hobart to Sydney (583 nmiles @ 10 knots = 58 hours, plus 4 hours in port traffic and muster drills etc.), leaving approximately* 62 hours for science and diversions:

Date	Activity	Duration [cumulative]
Thurs 16 Sept	Steam out, CTD + N70 tool box (1000 m pressure test?) Weather and stomachs permitting	
Fri 17 Sept.	Or CTD + N70 tool box (1000 m pressure test?)	3 h [3]
~St Helens Fri 17 Sept. 1300-2400	Possible morning lecture * 1pm St Helens offshore CTD, EZ net tow Steam west 10 nm towards 1000 m isobath Dinner * CTD + EZ at mid location in 1000 m at dusk Steam west 10 nm towards 150 m isobath * CTD, EZ net tow on shelf Complete by 24:00	[15]
~Flinders Sat. 18 Sept. 1300-2400	Possible morning lecture * 1pm Flinders Is offshore CTD, EZ net tow Steam west 10 nm towards 1000 m isobath Dinner * CTD + EZ at mid location in 1000 m at dusk Steam west 10 nm towards 150 m isobath * CTD, EZ net tow on shelf Complete by 24:00	[27]
~Eden Sun 19 Sept. 1300-2400	Possible morning lecture * 1pm Eden offshore CTD, EZ net tow Steam west 10 nm towards 1000 m isobath Dinner * CTD + EZ at mid location in 1000 m at dusk Steam west 10 nm towards 150 m isobath * CTD, EZ net tow on shelf Complete by 24:00	2+3 h 1 h 2+3 h 1 h 2+3 h [39]
~Jervis Bay: Mon 20 Sept. 1300-2400	Possible morning lecture * 1pm JB shelf CTD, EZ net tow Steam west 10 nm towards 1000 m isobath Dinner * CTD + EZ at mid location in 1000 m at dusk Steam east 10 nm towards 2000 m isobath * CTD, EZ net tow offshore Complete by 24:00 and completion of science activities	2+3 h 1 h 2+3 h 1 h 2+3 h [51]
Tues 21 Sept	Steam towards Sydney (approx 12 h away) No sampling is to be conducted on Tuesday Clean up EZ net etc.	

CTD set-up:

16 bottles

PAR and the wet labs fluorometer, plus a possible, stand alone (self logging)
Eco-puck triplet sensor (identical to that deployed on the IMOS gliders);

Most casts to 150 m or to 500 m (bathymetry permitting), with a pair
of bottles popped at 500, 250, 150, 100, 75, 50, 25, 0 (the second
bottle at ea depth maybe filtered onto a sieve for tiny salps).

Piggy-back Projects

Deploy Argo Floats as requested by Bob Weldon, CMAR.

Southern Surveyor Equipment

ADCP,

Underway sensors;

CTD and rosette, with 16 bottles, fluorometer, PAR sensor;

EZ net with 300 um mesh nets. (not 500 mentioned in proposal)

User Equipment

- Back up nets:
Bongo net frame
- 75 cm² Neuston net from forward boom; own block and tackle from hydro frame;
- Nally bins, and black drums with O-rings for sample storage.
Vacuum pump, filters for chlorophyll, isotopes
Stereo microscope
- Formalin, alcohol, jars, consumables

Personnel List

Scientist	Name	Tentative cabin	Organisation	Position
1	Pamela Brodie	Crew/Sci 3	CMAR	MNF Computing, voyage manager
2	Karl Forcey	Crew/Sci 2	CMAR	MNF Electronics
3	Alicia Navidad	Crew/Sci 4	CMAR	MNF Hydrochemistry
4	Jock Young	CS	CMAR	Chief Scientist
5	Ben Harris	1	UNSW	Alternate watch leader
6	Sam Castle	2/3	U.Tas	Student
7	Lauren Ooi	2/3	UNSW	Student
8	Ben Roennfeldt	4/5	Deakin U	Student
9	Paloma Matis	4/5	Sydney U	Student
10	Natasha Henschke		6/7	UNSW Student
11	Emma Hall	6/7	UNSW	Student
12	Louisa Attard	8/9	UNSW	Student
13	Natalie Rivero	8/9	UNSW	Student
14	Luke McPhan	10/11	UNSW	Student
15	Matt Ward	10/11	UNSW	Student

There will be at least two MNF support staff included in this list. Refer the Application Form and liaise with the Operations Manager as required. Any additional scientific berths over 12 up to the maximum of 15 must be occupied by System Support Technicians (SST's) as per AMSA requirements. You must identify these SST's on the personnel list as well as quoting their AMSA Certificate of Safety Training number. The Operations Manager can assist as most MNF support staff have the required qualifications.

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.
Pamela Brodie	AS02447
Karl Forcey	BB02062
Alicia Navidad	AS04836

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

Jock Young (and Iain Suthers)
Chief Scientist (co-investigator)