

NATIONAL FACILIT

Voyage Plan ss2013_v05











ss2013_v05

Title

Sustained Monitoring of the East Australian Current: Mass, Heat and Freshwater Transports.

Itinerary

Mobilise Brisbane Sunday 18 August, 2013. Depart Brisbane 1000hrs, Monday 19 August, 2013. Arrive Brisbane 1400hrs, Monday 2 September, 2013. Demobilise Hobart Tuesday 10 September, 2013.

Principal Investigator(s)

Title and name.	Mr. Ken Ridgway
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Title and name.	Dr. Bernadette Sloyan
Affiliation.	CSIRO Marine and Atmospheric Research
Contact details.	Bernadette.sloyan@csiro.au

Scientific Objectives

The East Australian Current (EAC) is a complex and highly energetic western boundary system in the south-western Pacific off eastern Australia. It provides both the western boundary of the South Pacific gyre and the linking element between the Pacific and Indian Ocean gyres. This voyage will retrieve an array of full-depth current meter and property (CTD) moorings from the continental slope to the abyssal waters off Brisbane (26°S). At this location the EAC, north of the high eddy variability, the approaching its maximum strength and its flow is relatively uniform and coherent. The aim of this observing system is to capture the mean and time-varying flow of the EAC.

This a component of IMOS, and will provide an intensive reference set of measurements of the EAC flow over sustained period for monitoring EAC transport, improved understanding of relationship of EAC and the South Pacific gyre and impact of the coastal marine ecosystem, and validation and interpretation of the current system in numerous climate and ocean models. The mooring array is located on the existing long-term XBT transects, satellite altimetry and glider tracks. The EAC deep mooring array has been complemented by a Queensland- IMOS operated inshore mooring array on the continental shelf region.

Voyage Objectives

Voyage Plan



RV Southern Surveyor

The main aim of the voyage will be to retrieve an array of (5) full-depth current meter/CTD moorings extending from the continental slope to the abyssal waters off Brisbane. The following specific objectives will be performed:

List of tasks

- 1. Complete ADCP section from inshore to offshore
- Complete CTDs (plus LADCP) along section steaming back from offshore to inshore mooring
- 3. Complete CTD/rosette/LADCP station at each mooring location.
- 4. Retrieve each of the moorings at deployed locations.
- 5. Complete a final ADCP section along the mooring line

All elements of the mooring deployments are required and hence have equal priority. The final ADCP section would have a lower ranking.





Voyage Track



Mooring Positions are

mooring	EAC 1	EAC 2	EAC 3	EAC 4	EAC 5
longitude	153.9690	153.9921	154.2904	154.6471	155.2993
latitude	-27.3082	-27.3064	-27.2518	-27.2086	-27.1020
Depth (m)	1570	1970	4247	4767	4780

Voyage Plan

RV Southern Surveyor



Time Estimates

1. Steaming estimates

Transit legs calculated with ship speed of 10 knots

Location	Latitude	Longitude	Distance	Distance	Total	Steaming	Total Time
	*	2	(km)	(nm)	Distance	Time	
Brisbane			·	·			
Start section	-27.34	153.56	25	15	15	8	8
End section	-27.1	155.8	223	121	136	12	20
CTD1	-27.1	155.8	0	0	136	0	20
CTD2	-27.1	155.3	49	27	162	3	23
CTD3	-27.15	154.95	35	19	181	2	25
CTD4	-27.21	154.65	30	16	197	1	26
CTD5	-27.23	154.45	20	11	208	1	27
CTD6	-27.26	154.29	16	9	217	1	28
CTD7	-27.28	154.15	14	8	224	1	29
CTD8	-27.3	154.03	12	7	231	.5	30
CTD9	-27.31	153.98	5	3	234	.5	30
CTD10	-27.32	153.87	11	6	240	.5	30
CTD11	-27.33	153.78	9	5	244	1	31
CTD12	-27.34	153.56	22	12	256	1	32
EAC1	-27.31	153.97	42	22	279	2	34
EAC2	-27.31	153.99	5	3	281	.5	34
EAC3	-27.25	154.29	26	14	295	2	36
EAC4	-27.21	154.65	36	19	315	2	38
EAC5	-27.10	155.3	65	35	350	4	42
End section	-27.1	155.8	49	27	377	2	44
Start section	-27.34	153.56	223	120	497	12	56
End section	-27.1	155.8	223	120	618	12	68
Start section	-27.34	153.56	223	120	734	12	80
Brisbane						8	88

* Latitude and longitude are in decimal degrees

2. Work time estimates

From Brisbane we will proceed to the inshore start of the section. An ADCP survey will be performed out to the end of the section at EAC5 and beyond. A further CTD survey (with the LADCP) will be completed back into the inshore start of the section. The moorings will then be retrieved working from EAC1 offshore to EAC5. Before retrieval a further CTD will be completed at each mooring. Finally a further 1-2 ADCP runs will be completed along the mooring line.

Complete full CTD survey along section 12 CTDs 40 hours





Retrieve EAC1	12 hours
CTD cast to 1650-m	3 hours
Retrieve EAC2	12 hours
CTD cast to 2300-m	3 hours
Retrieve EAC3	12 hours
CTD cast to 4400-m	3-4 hours
Retrieve EAC4	12 hours
CTD cast to 4800-m	3-4 hours
Retrieve EAC5	12 hours
CTD cast to 4700-m	3-4 hours
Total Work time	114 hours
Transit time	88 hours
Total	206 hours

Southern Surveyor Equipment

- 1. Standard CTD profiles are required with 24 bottle rosettes. We require hydrochemistry support staff to measure oxygen, salinity, NO₃+NO₂, SiO₂ and PO₄.
- 2. Echosounder and recorder
- 3. Wide swath bathymetry
- 4. LADCP attached to CTD
- 5. trawl deck winches and other on ship equipment for mooring operations
 - Net drum winch preferably empty
 - Gilson winch
 - Mooring winch
 - A-Frame, 2 lift points
- 6. XBTs for sound velocity calibration

User Equipment

Container for glass floats – 8000-kg Mooring cable and spools Mooring instruments Other mooring equipment Total weight of 40000-kg See attached sheet for complete details and proposed loading plan

Special Requests

Coordinate the CTD casts with ship operations, to avoid releasing grey water or other wastes during cast.

Personnel List





Ken Ridgway	CMAR	Chief Scientist
Bernadette Sloyan	CMAR	Co-investigator
Phil Adams	CMAR	Moorings
Dan McLaughlan	CMAR	Moorings
Jamie Derrick	CMAR	Moorings
Rebecca Cowley	CMAR	Moorings
Pamela Brodie	CMAR	MNF Voyage Manager
Peter Dunn	CMAR	MNF Electronics Support
Hugh Barker	CMAR	MNF Computing Support
Sue Reynolds	CMAR	MNF Hydrochemistry Support
TBC	CMAR	MNF Hydrochemistry Support
Chris Bull	Student/UNSW	Moorings support, CTD
Sjoerd Groeskamp	Student/UTAS	Moorings support, CTD
Andreas Marouchos	CMAR	Moorings engineering

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	ASO2447
Peter Dunn	ASO3164
Hugh Barker	BB05460
Sue Reynolds	BB03210
(TBC)	

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

Ken Ridgway Chief Scientist May 2013