

## VOYAGE PLAN SS06/2003

### Title

INSTANT: International Nusantara Stratification And Transport program

### Itinerary

Depart Darwin 1000 hrs, Tuesday, 5 August, 2003  
Arrive Dampier 1000hrs, Saturday, 16 August, 2003.

### Principal Investigator(s)

Susan Wijffels (Chief Scientist)  
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### Scientific Objectives

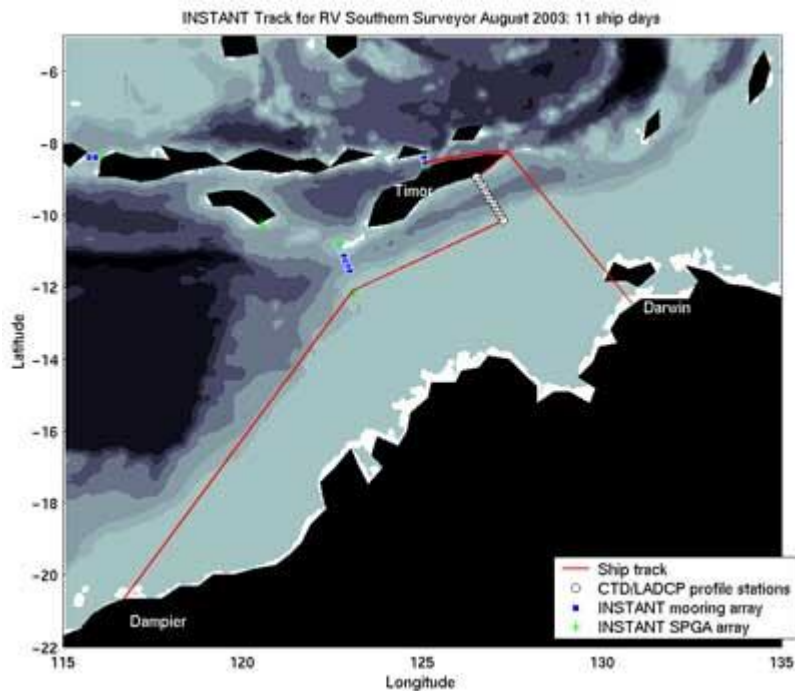
The aim of INSTANT is to directly measure the leakage of Pacific thermocline and intermediate waters from the western equatorial Pacific into the South Indian Ocean. The Indonesian Passages represent an important 'choke point' of the global ocean overturning circulation and the climate system. The size and depth distribution of the flow through this choke point remains a troublesome unknown, with currently available observations giving ranges from 0-20Sv, thus giving little guide to model results and introducing large uncertainties into ocean-based heat, freshwater, nutrient and carbon budgets of the South Pacific and Indian Oceans. The deep portion of the flow, in particular, is poorly known and can only be measured by long term in situ instruments. INSTANT will deliver 3 years of in situ velocity, temperature and salinity data from the sea-floor to the surface in the major inflow and outflow straits that make up the Indonesian choke point. The array is designed to measure the mass, heat and freshwater transports that flow into and out of the Indonesian Seas. Five nations will participate in INSTANT: Indonesia, France, the Netherlands, the USA and Australia. By far the major share of INSTANT will be carried out by the USA and Australia, with the bulk of the work subcontracted to CSIRO Marine and Atmospheric Research by Lamont Doherty Earth Observatory, Palisades, NY. The Indonesian Ministry of Marine and Fisheries is sponsoring the Indonesian involvement.

### Cruise Objectives

- To deploy one of the moorings comprising the INSTANT array in the waters of East Timor in Ombai Strait
- To deploy two of the INSTANT shallow pressure gauges (SPGA): one on the north coast of East Timor and one off Ashmore Reef in Australian waters.
- To collect highly-spatially resolved property and velocity sections across Timor Strait

## Cruise Track

**Figure 1:** Cruise track for INSTANT cruise on RV Southern Surveyor marked in red. White points mark the sites of CTD/LADCP stations to be carried out on the cruise. Blue points the sites of the INSTANT moorings and green asterisks, the sites of the INSTANT SPGAs. Bathymetry shading changes every 100m to 500m, then 1000m beyond.



## Time Estimates

We have budgeted for 3 days of mooring work in Ombai, 1 day of mooring work at Ashmore Reef. The CTD/LADCP section across Timor Strait will take about 1 day (11 stations). Total steaming distance is 1654.4229 nm, which at 11 knots is 6.3 days. Thus the total cruise time is 11 days. See Table 1 for details.

## Piggy-back Projects (if any)

None.

## Southern Surveyor Equipment

- Ramp cover down and use of net winch for mooring deployment
- 24 position rosette w/ 2.5L Niskin bottles — analysis of salts, oxygen and major nutrients
- CTD/02
- LADCP fitted to CTD frame
- Underway ADCP, TSG, meteorological measurements
- Winches for mooring deployments.
- Small boat and diving compressor.
- XBT launcher for tests and profiles during mooring work.

## User Equipment

Mooring equipment as per attached mooring design. Shallow pressure gauges and dive equipment as per attached dive plan.

## Personnel List

Susan Wijffels CMR Chief Scientist  
Lindsay Pender CMR Mooring engineer  
Kevin Miller CMR Mooring engineer

Peter Mantel CMR CTD watch-stander  
 Helen Phillips CMR CTD watch-stander  
 Ann Thresher CMR CTD watch-stander  
 Janet Sprintall Scripps Institution of Oceanography, INSTANT Co-investigator  
 Paul Harvey Scripps Institution of Oceanography, Mooring engineer  
 Bernie Heaney CMR Computing  
 Jeff Cordell CMR Electronics  
 Mark Rayner CMR Hydrochemistry  
 Kate Berry CMR Hydrochemistry  
 Celestino da Cunha Barreto East Timorese Ministry of Agriculture, Forestry and Fisheries Observer  
 This voyage plan is in accordance with the directions of the National Facility Steering Committee for the Research Vessel Southern Surveyor.

**Susan Wijffels**  
**Chief Scientist**

**Table 1:** Cruise timetable estimates

**Station No, Position °E °N, Depth(m), Arrival Time, Distance from last (Nm)**

Darwin, 130.833 -12.450, 0.0, 2003/ 8/ 5 10: 0: 0, 0.0  
 way, 127.380 -8.240, 0.0, 2003/ 8/ 6 15:30:27, 324.6  
 way, 126.420 -8.300, 0.0, 2003/ 8/ 6 20:41:59, 57.1  
 Ombai, 125.089 -8.539, --, 2003/ 8/ 7 4: 0: 2, 80.3  
 72 hours mooring and SPGA installation.  
 way, 126.420 -8.300, 0.0, 2003/ 8/10 11:18: 6, 80.3  
 way, 127.380 -8.240, 0.0, 2003/ 8/10 16:29:38, 57.1  
 1, 126.510 -8.960, 104.0, 2003/ 8/10 22:36:45, 67.3  
 2, 126.585 -9.078, 868.0, 2003/ 8/10 23:53: 9, 8.4  
 3, 126.660 -9.196, 1497.8, 2003/ 8/11 1:58:27, 8.4  
 4, 126.735 -9.314, 1979.6, 2003/ 8/11 4:26:27, 8.4  
 5, 126.810 -9.432, 2467.2, 2003/ 8/11 7:11:19, 8.4  
 6, 126.885 -9.550, 2530.5, 2003/ 8/11 10:13:15, 8.4  
 7, 126.960 -9.668, 1837.0, 2003/ 8/11 13:17:23, 8.4  
 8, 127.035 -9.786, 1426.8, 2003/ 8/11 15:57:15, 8.4  
 9, 127.110 -9.904, 454.2, 2003/ 8/11 18:22:45, 8.4  
 10, 127.185 -10.022, 282.1, 2003/ 8/11 20:11: 0, 8.4  
 11, 127.260 -10.140, 193.0, 2003/ 8/11 21:50:39, 8.4  
 Ashmore, 123.067 -12.092, --, 2003/ 8/12 23:29:40, 273.2  
 24 hours for SPGA installation  
 Dampier, 116.700 -20.650, 0.0, 2003/ 8/16 8:50:51, 630.9  
 Number of stations is 11  
 Total CTD/mooring station time is 4.6852 days  
 Total distance is 1654.4229 nm  
 Time at 11 knots is 6.2668 days  
 Total cruise time is 10.952 days

**Attachment 1:**

Schematic of the South Ombai mooring to be deployed by RV Southern Surveyor.

INSTANT Mooring - Ombal 2 02-Jun-2003

depth	component	S/N	length	rope
87 m	Float 44"			
			2 m	chain 13mm
100 m	ACM			
			1 m	8mm wire ic
100 m	Barber Proc		22 m	8mm wire ic
120 m	Microcal T,C			
			16 m	8mm wire ic
140 m	15627 Thec		30 m	8mm wire ic
170 m	15627 Thec		30 m	8mm wire ic
200 m	ADCP-FMG			
			46 m	2mm wire ic
248 m	Beacon			
260 m	YUCU			
			94 m	2mm wire ic
347 m	ADCP Float 40"			
			2 m	chain 13mm
350 m	YUCU			
			47 m	2mm wire ic
400 m	15627 Thec		48 m	2mm wire ic
448 m	Benthos			
450 m	RCM-8			
			98 m	2mm wire ic
550 m	Microcal T,C			
			147 m	2mm wire ic
598 m	Benthos			
700 m	RCM-8			
			224 m	2mm wire ic
998 m	Benthos			
1000 m	RCM-8			
			482 m	8mm ICV
1498 m	Benthos			
1500 m	RCM-8			
			1023 m	8mm ICV
			5 m	2mm wire ic
	12' Drouge			
			15 m	8mm strap
3174 m	Benthos			
3176 m	2242 release(2)			
			15 m	8mm strap
			5 m	chain 13mm
8200 m	anchor 880 kg			