

RV *Investigator* Scientific Highlight

Voyage #:	IN2015_v02
Voyage title:	Sustained monitoring of the East Australian Current: Mass, heat and freshwater transports
Mobilisation:	0800, Hobart, Wednesday, 6 May 2015
Depart:	2000, Sydney, Friday, 15 May 2015
Return:	1300, Brisbane, Tuesday, 26 May 2015
Demobilisation:	Hobart, Friday, 26 June 2015



Introduction

The East Australian Current (EAC) is the complex and highly energetic western boundary current of the South Pacific Ocean. This voyage will retrieve and redeploy an array of full-depth current meter and property (temperature, salinity and pressure) moorings from the continental slope to the abyssal ocean off Brisbane (27°S). The mooring array was initially deployed in April 2012. At this location the EAC, north of the high eddy variability, is 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. The mooring array is located near the existing long-term XBT transects, satellite altimetry and glider tracks. The array is a component of IMOS, and will provide an intensive reference data set to: monitor EAC mass, heat and salt transport; improve understanding of relationship of EAC and the South Pacific gyre and; determine the impact of the EAC variability on the coastal marine ecosystem. The observations will also be used to assess the EAC simulation in numerous climate and ocean models. The EAC deep mooring array is complemented by a Queensland- IMOS operated inshore mooring array on the continental shelf region.

Contribution to the nation

This project is aligned with the IMOS strategic priority, 'To provide a national backbone for observing boundary currents'. This aims to develop a coherent national strategy for monitoring the major ocean currents on Australian coastal boundaries with a particular focus on the EAC and Leeuwin Current. To this end the project commences the roll-out of observing infrastructure platforms to monitor the major Australian boundary currents. Within the IMOS framework the proposed EAC array will be maintained in this location as a long-term observing system.

As a result of this voyage

1. The project will provide a better understanding of the variability of the EAC at decadal and longer term time scales.
2. We have found that the EAC is highly variable and required long-term constant monitoring.
3. We have mapped the variability of EAC ocean properties and current strength.
4. We have commenced a program of monitoring of the EAC that is a driver of climate variability over Australia and the larger region.

CSR/ROSCOP Parameter Codes

	METEOROLOGY
M01	Upper air observations
M02	Incident radiation
M05	Occasional standard measurements
M06	Routine standard measurements
M71	Atmospheric chemistry
M90	Other meteorological measurements

	PHYSICAL OCEANOGRAPHY
H71	Surface measurements underway (T,S)
H13	Bathythermograph
H09	Water bottle stations
H10	CTD stations
H11	Subsurface measurements underway (T,S)
H72	Thermistor chain
H16	Transparency (eg transmissometer)
H17	Optics (eg underwater light levels)
H73	Geochemical tracers (eg freons)
D01	Current meters
D71	Current profiler (eg ADCP)
D03	Currents measured from ship drift
D04	GEK
D05	Surface drifters/drifting buoys
D06	Neutrally buoyant floats

	MARINE BIOLOGY/FISHERIES
B01	Primary productivity
B02	Phytoplankton pigments (eg chlorophyll, fluorescence)
B71	Particulate organic matter (inc POC, PON)
B06	Dissolved organic matter (inc DOC)
B72	Biochemical measurements (eg lipids, amino acids)
B73	Sediment traps
B08	Phytoplankton
B09	Zooplankton
B03	Seston
B10	Neuston
B11	Nekton
B13	Eggs & larvae
B07	Pelagic bacteria/micro-organisms
B16	Benthic bacteria/micro-organisms
B17	Phytobenthos
B18	Zoobenthos
B25	Birds
B26	Mammals & reptiles
B14	Pelagic fish
B19	Demersal fish
B20	Molluscs
B21	Crustaceans
B28	Acoustic reflection on marine organisms

D09	Sea level (incl. Bottom pressure & inverted echosounder)
D72	Instrumented wave measurements
D90	Other physical oceanographic measurements

B37	Taggings
B64	Gear research
B65	Exploratory fishing
B90	Other biological/fisheries measurements

	CHEMICAL OCEANOGRAPHY
H21	Oxygen
H74	Carbon dioxide
H33	Other dissolved gases
H22	Phosphate
H23	Total - P
H24	Nitrate
H25	Nitrite
H75	Total - N
H76	Ammonia
H26	Silicate
H27	Alkalinity
H28	PH
H30	Trace elements
H31	Radioactivity
H32	Isotopes
H90	Other chemical oceanographic measurements

	MARINE GEOLOGY/GEOPHYSICS
G01	Dredge
G02	Grab
G03	Core - rock
G04	Core - soft bottom
G08	Bottom photography
G71	In-situ seafloor measurement/sampling
G72	Geophysical measurements made at depth
G73	Single-beam echosounding
G74	Multi-beam echosounding
G24	Long/short range side scan sonar
G75	Single channel seismic reflection
G76	Multichannel seismic reflection
G26	Seismic refraction
G27	Gravity measurements
G28	Magnetic measurements
G90	Other geological/geophysical measurements

	MARINE CONTAMINANTS/POLLUTION
P01	Suspended matter
P02	Trace metals
P03	Petroleum residues
P04	Chlorinated hydrocarbons
P05	Other dissolved substances
P12	Bottom deposits
P13	Contaminants in organisms
P90	Other contaminant measurements