MNF Voyage Highlights

VOYAGE #:	IN2022_V06		
Voyage title:	Integrated Marine Observing System: monitoring of East Australian Current property transports at 27° S		
Mobilisation:	Wagners Wharf, Pinkenba (Brisbane) Friday, 8 July 2022		
Quarantine and Pre-medical clearance period:	Brisbane, Monday, 4 to Monday, 11 July 2022 (inclusive)		
Continuation of mobilisation and pre-departure medical clearance period:	Tuesday, 12 to Wednesday, 13 July 2022 (inclusive)		
Depart:	Wagners Wharf, Pinkenba (Brisbane) Thursday, 14 July 2022		
Return:	Wagners Wharf, Pinkenba (Brisbane) 08:00 Saturday, 30 July 2022		
Demobilisation:	Wagners Wharf, Pinkenba (Brisbane) Saturday, 30 July 2022		
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Principal Investigators:	Amandine Schaeffer (UNSW)		
Project name:	Integrated Marine Observing System: monitoring of East Australian Current property transports at 27° S		
Affiliation:	UNSW	**Contact details:**	a.schaeffer@unsw.edu.au

Voyage Highlights

The Chief Scientist

Dr Chris Chapman is a research scientist with the CSIRO's Oceans and Atmosphere business unit. He studies the role of the ocean in the climate systems and marine ecosystems. IN2022_V06 was his 2nd voyage as chief scientist.

Title

Integrated Marine Observing System: Monitoring of East Australian Current property transports at 27°S

Purpose

This voyage will recover an array of six full-depth current meter and property (temperature, salinity and pressure) moorings from the continental slope to the abyssal waters off Brisbane (27°S). The observing system is designed to capture the mean and time-varying flow of the East Australian Current (EAC). In order to resolve interannual and decadal signals we need to maintain multi-year deployments of the array.

We will discover the spatial and temporal variability of shelf water and plankton around the Stradbroke Island National Reference Station (NRS) mooring. We will undertake biological and oceanographic sampling, using CTDs, Triaxus tows, SADCP, rapid-cast CTDs to characterise the interaction between shelf water and the EAC along the east coast of the Australian continent. These boundary exchanges are fundamental to coastal ecology.

The EAC array data is essential for understanding the long term variability of the EAC and to monitor its response to a changing climate. The EAC and its interaction with shelf waters and influence on small-scale eddies are of fundamental importance to the oceanography of the region, with flow-on effects to ocean dynamics, primary productivity (i.e. phytoplankton) and therefore far-reaching impacts on annual fisheries productivity along the northern and central NSW coasts and in southern Queensland.

Contribution to the nation

The East Australian Current (EAC) is the complex and energetic boundary current of the east coast of Australia, influencing the lives and economies of people on the eastern seaboard. It is the dominant mechanism for the redistribution of heat between the ocean and atmosphere and has a strong influence on the weather and seasonal climate, coastal ocean circulation and marine ecosystem affecting nearly half the Australian population. This project will improve our understanding of the EAC influences on climate, leading to more reliable forecasts for eastern Australia and coastal communities, and improved management of east coast fisheries.

As a result of this voyage

1. We have extended the time-series of direct observations of the seasonality variability of the East Australian Current;
2. These observations will be used by the national and international community to improve our understanding of complexity and variability of the heat and salt transport from the tropics to the Tasman Sea, over a range of temporal and spatial scales;
3. We have extensively sampled the interaction between a large scale meso-scale eddy , small scale frontal eddy, and the EAC;
4. We have undertaken preliminary investigation of a potentially super-productive submarine canyon;
5. We have provided teaching and training for 2doctoral students, and 4 undergraduate students, including 2 ITSS scholars from 4 Australian universities.

Next steps

Quality control and calibration of all recovered mooring instruments will begin within weeks of our return from sea. The effort to compile, QC, correct, calibrate and infill missing data is a substantial undertaking that will take several months. Once these data are curated, they will be submitted to the Australian Ocean Data Network (AODN) portal, where they will be freely and publically available for download. All computer code used to produce these datasets will also be made publicly available through the Github remote repository. We anticipate that this process will be complete by March 2023.

A number of scientific publications and curated datasets will arise from the work undertaken during this voyage. These will include papers describing the dynamics of the EAC transport variability and its interaction with mesoscale eddies in the region. We have laid the foundations for a voyage to the Richmond Canyon scheduled for 2024 and for potential coring of the South-east Queensland “Bulge”.