

RV Investigator Voyage Scientific Highlights

Voyage #:	IN2019_V05		
Voyage title:	Integrated Marine Observing System: monitoring of East Australian Current property transports at 27° S		
Mobilisation:	Brisbane Thursday 05 – Sunday 08 September, 2019		
Depart:	Brisbane 1000 Monday 09 September, 2019		
Return:	Brisbane 1400 Sunday 29 September, 2019		
Demobilisation:	Brisbane Monday 30 September, 2019		
Voyage Manager:	L. Gaskell		
Chief Scientist:	B.Sloyan		
Affiliation:	CSIRO		
Principal Investigators:	Prof Iain Suthers		
Project name:	Dynamics of larval fish diversity for ocean observing off North Stradbroke Island		
Affiliation:	UNSW		

Scientific Highlights

The Chief Scientist



Dr. Bernadette Sloyan is a Chief Research Scientist with CSIRO's Oceans and Atmosphere. She is a national and international leader in documenting and understanding the role of ocean circulation in the global climate system. Her work has elucidated the importance of ocean key processes for climate; mixing and air-sea interactions, in the Southern, Pacific and Indian Oceans; the role of the ocean in moderating the rate and nature of climate change and variability. She is leading CSIRO's ocean observation efforts in major national and international programs. Her membership of numerous national panels and chair of the Ocean Observations Panel for Climate (OOPC) is recognition of her national and international leadership in ocean climate research.

Title

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

Purpose

This voyage will recover and re-deploy 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 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, bongo nets, SADCP, to characterise the shelf waters off the Stradbroke NRS, and to sample dynamic, ephemeral frontal eddies flowing down from Fraser Island and shelf – boundary exchanges which are fundamental to coastal ecology.

The EAC array data is essential to use of the IMOS-Coffs moorings and the High Frequency radar to observe and model cross-shelf flows in upwelling and frontal eddy formation. Both these processes have a fundamental impact on ocean dynamics, ocean colour (i.e. phytoplankton) and therefore far-reaching effects on annual fisheries productivity and coastal shark interactions along the northern and central NSW coasts.

Contribution to the nation

The East Australian Current (EAC) is the complex and energetic western boundary current of the South Pacific Ocean, 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 and depth 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 commenced a systematic multi-disciplinary study linking physics and planktonic diversity, especially the larval fish and jellyfish community, in relation to the long-term coastal mooring off North Solitary Island.
4. We have found that the East Australian Current is a highly energetic current with rapid transition in strength and position of the southward current core.
5. We have provided teaching and training for 5 (4+1) postdoctoral, 2 doctoral, 1 masters, and 3 undergraduate students from two Australian universities.