

In light of the May Federal budgets announcement of additional funding to expand *Investigator's operations* by 120 days per year, the 2018-2019 and 2019-20 schedules have been reviewed to incorporate expanded and additional voyages, resulting in opportunities for supplementary research (**NOTE** – the voyage schedules available on the [MNF Website](#) will be amended to reflect the new opportunities below once the supplementary round is complete).

A description of the voyage opportunities is provided below:

2018-19 Supplementary Voyage Opportunities

IN2018_V07 – Prof Tom Trull – (Depart Hobart 6 Aug – Return Hobart 11 Aug)

Supplementary Berths available – 15

Station time available to supplementary projects – None

An additional voyage of 5 days has been granted to re-deploy a deep water mooring following failure to redeploy during IN2018-V02.

Please contact the MNF Science Operations Manager Mr Matt Kimber on 03 6232 5186 to discuss if your proposal is suitable for this opportunity.

IN2018_V08 (Depart Hobart 27 Dec – Return Hobart 10 Jan)

Supplementary Berths available – 28

Station time available to supplementary projects – 16 days

An opportunistic voyage can be delivered in this period as a result of the recent funding announcement to increase operational days for *Investigator*.

Applicants wishing to apply for this opportunity are requested to contact the MNF Science Operations Manager Mr Matt Kimber on 03 6232 5186 to discuss the particular constraints that will apply to any proposals approved.

2019-20 Supplementary Voyage Opportunities

IN2019_V05 – Dr Bernadette Sloyan (Depart Brisbane 8 Sept – Return Brisbane 1 Oct 2019)

Supplementary Berths available – 17

Station time available to supplementary projects – None

This voyage is being re-advertised as supplementary berths are still available

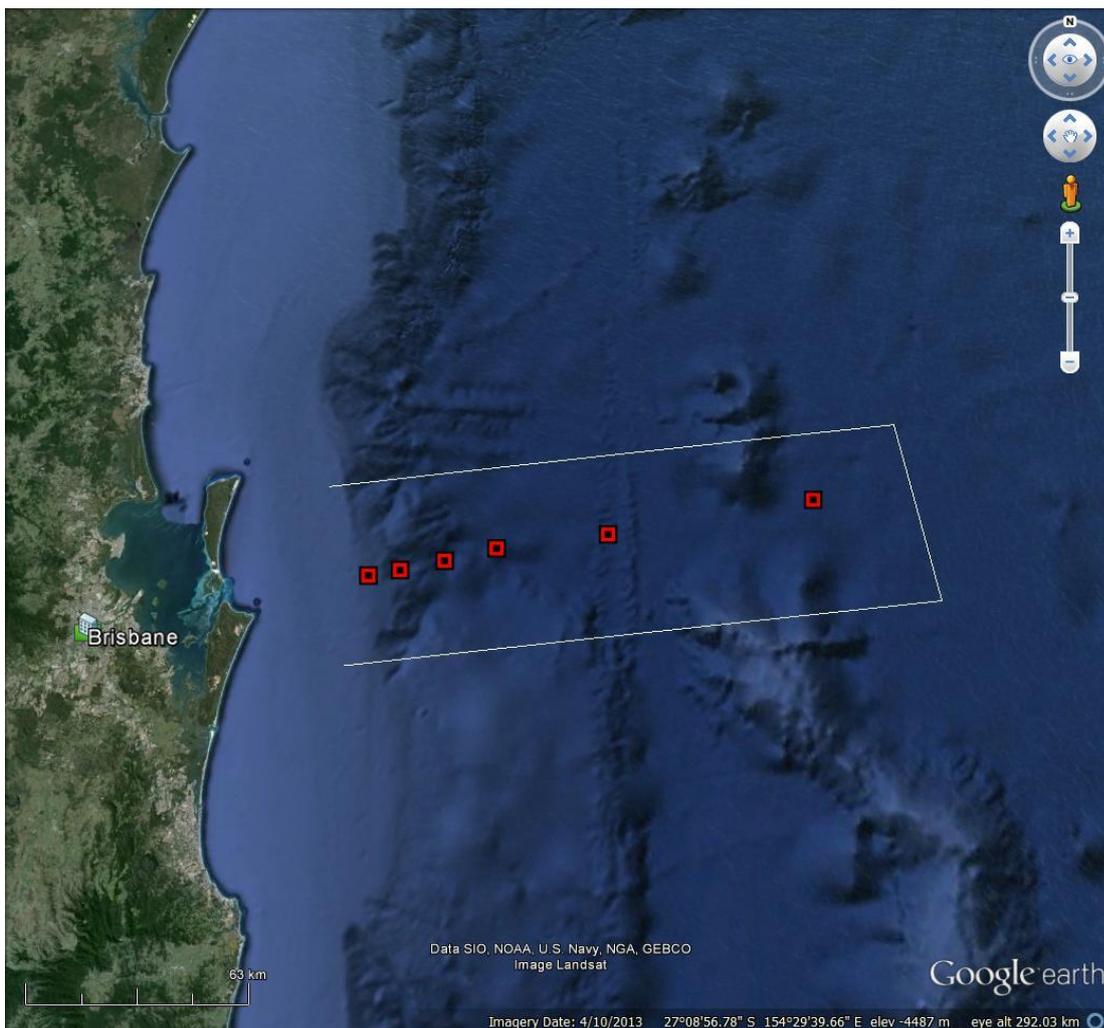
The East Australian Current (EAC) is the complex and highly energetic western boundary current of the South Pacific Ocean. This voyage will retrieve and redeploy an array of full-depth current meter and property (temperature, salinity and pressure) moorings from the continental slope to the abyssal ocean off Brisbane (27°S). 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.

Mass, heat and salt transports within boundary currents are of leading importance in basin-scale ocean budgets, yet direct observations of these transports have not been sustained to the extent required to fully complement observations within the ocean interior. In large part, this is due to the particular challenges of maintaining observing networks within energetic regimes, and capturing the significantly shorter time and space scales of variability there.

The long-term monitoring of boundary currents, at key locations, will provide a comprehensive reference data set that will: measure mass, heat and salt transport; improve our understanding of the relationship of boundary currents and the basin-scale gyre forcing and; determine the impact of the boundary current variability on the coastal circulation and marine ecosystem. The observations will also be used to assess the simulation of boundary currents in various climate and ocean models. The continued monitoring of boundary currents is central to our understanding of how climate signals are communicated through the ocean.

Map of proposed voyage track



Mooring positions (red squares) and proposed ship track for ship ADCP sections north and south of the mooring array. We will also occupy a CTD section and ship ADCP sections across the mooring array from the deep abyssal plain to the continental shelf.

IN2019_T03 – Dr Alain Protat (Depart Darwin 24 Dec 2019 – Return Fremantle 2 Jan 2020)

Supplementary Berths available – 21

Station time available to supplementary projects – up to 18 hours

This voyage is being re-advertised as supplementary berths are still available.

IN2020_V02 – Prof Mike Coffin (Depart Hobart 24 Mar 2020 – Return Hobart 18 Apr 2020)

Supplementary Berths available – 5

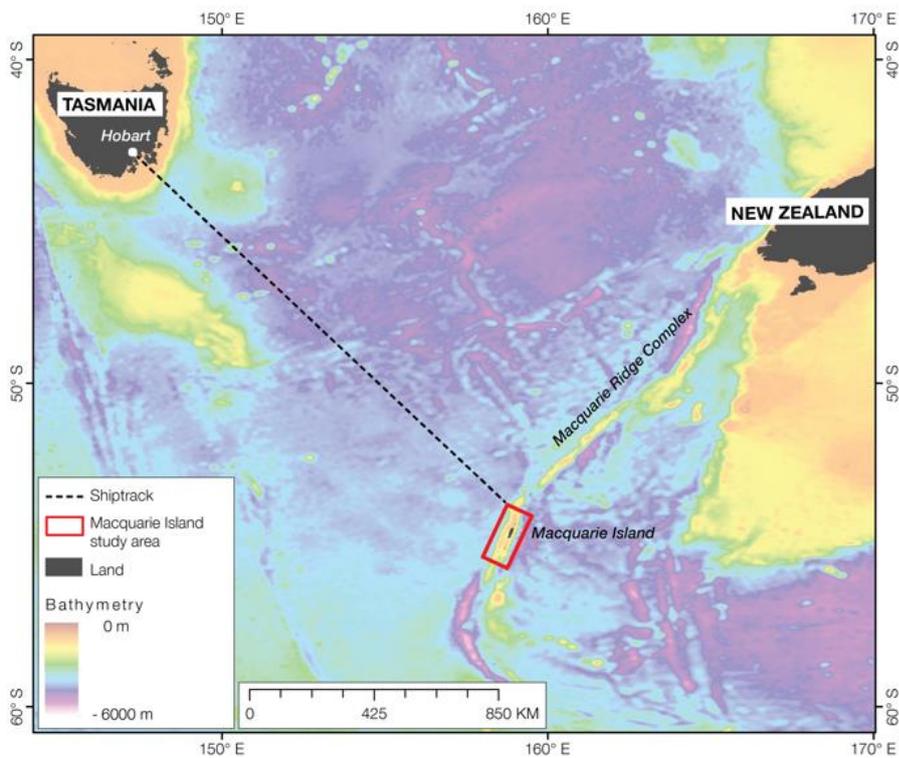
Station time available to supplementary projects - None

The Macquarie archipelago surmounts the Macquarie Ridge Complex (MRC), the boundary between Indo–Australian and Pacific plates in the southwest Pacific Ocean. Understanding how plate boundaries evolve remains a major, outstanding issue in Earth science, and the MRC is arguably the most dynamically changing plate boundary on the planet. Beneath the MRC lies a ‘factory’ for the world’s most powerful earthquakes not associated with ongoing subduction. *Why do they occur along this plate boundary, and what were the physical conditions facilitating the largest 20th century strike-slip earthquake (May 23, 1989, Mw=8.2) to strike in this seemingly unlikely setting? Could future events cause destructive tsunamis that threaten the populations and economies of circum-Pacific countries, including Australia and New Zealand? What is the significance of proximal intraplate earthquakes and is subduction initiating in this region?*

To answer these outstanding questions, we will map the active plate boundary using RV *Investigator*’s acoustic systems and deploy 30 seismic recorders for 12 months. An array of 20 three-component ocean bottom seismometers, a recent ~\$2M investment of AuScope, will be utilised. A team of 20 scientists, students, and support staff, will conduct the acoustic mapping and install 10 portable land seismometers on Macquarie Island and 20 ocean bottom seismometers to depths of ≤6000 m near Macquarie Island.

The project will impact two areas: 1) hazard assessment, and 2) evolution of tectonic plate boundaries and deep Earth imaging. In the former, most research focuses on earthquake and tsunami hazard assessment at convergent margins, yet magnitude 8+ earthquakes occur elsewhere in the oceans. In the latter, a major focus of Earth science research is how subduction initiates and its relation to deep Earth processes. In both cases, this study will be the first to comprehensively examine these phenomena via acoustic and novel seismic imaging methods.

Map of proposed Voyage Track



IN2020_T02 – (Depart Hobart 13 May 2020 – Return Sydney 17 May 2020)

Supplementary Berths available – 20

Station time available to supplementary projects – Up to 12 hours

Proposals for supplementary opportunities for this transit voyage are invited from all applicants.
