



National Facility Research Vessel

RV FRANKLIN

VOYAGE DOCUMENTS

RV SOUTHERN SURVEYOR

CSIRO AUSTRALIA

CSIRO MARINE AND
ATMOSPHERIC RESEARCH

Voyage Plans and Summaries

[\[back to voyage document index\]](#)

Franklin Voyage Plan No. FR07/00

Title

Tidal mixing and the seasonal cycle of the Leeuwin Current II (mooring recovery).

Itinerary

Depart Broome 1000 hrs, Friday 11 August 2000
Arrive Darwin 1100 hrs, Friday 18 August 2000

Principal Investigators

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* denotes a Principal Investigator who will not be present on the cruise.

Scientific Objectives

The objectives of the study will be:

1) To estimate temperatures and currents (both directly and via geostrophy) over a year, within a closed region from Darwin to the southern North West Shelf, with a view to

(a) testing the closure of mass and heat budgets;

(b) documenting the "Rochford Current", observed in 1962 by Mr. David Rochford as a tongue of high-nutrient water intruding from the Arafura Sea towards the Gulf of Carpentaria, in winter.

2) To examine the probable role of tidal mixing in forming the 50-100m deep internal mixed layers observed in XBT traces near the continental shelf edge, off Darwin; in converting cool inflow to warmer outflow; in removing SST minima contrasts during the summer upwelling regime; and in surveying the predicted regions of intense internal tides.

3) To measure ocean skin temperature, for validating the new Terra satellite.

The scientific background is described in more detail in Godfrey and Mansbridge (JGR, in press).

Cruise Objectives

To recover nine moorings deployed in July 1999. These should have data on currents and temperatures, from which we should be able to analyse the amount of heat exported out of the region by tidal mixing over a year; indications of the relative roles of tidal mixing and wind-driven upwelling; and relate longshore currents in this region to the better-known Leeuwin Current system, further southwest. In addition we will undertake CTD stations opposite each mooring, mostly to calibrate the temperature and salinity recorders on the moorings. As time permits, we will undertake further CTDs to explore flow and hydrographic features in the Arafura Sea.

Cruise Track

See Figure 1.

Time Estimates

Travel: 1125 miles @11 kts = 4 days 7 hrs.

Time for CTD stations at moorings and mooring recovery: 2 days 18 hrs

(N.B.: Since moorings must be recovered in daytime, we have allowed for up to 8 hours at some moorings, see schedule below). Numbers (1) to (9) refer to numbered mooring locations on the cruise track, in order of encounter from Broome. Depths beside the numbers are the depths of water at each mooring.

1000 Fri 11/7/200: Depart Broome. 21.3 hrs steaming.

0720 Sat 12/7: Arrive (1) (178m). Recover, deploy AIMS mooring, CTD = 5 hrs.

1220 Sat 12/7: Depart (1). 4.4 hrs steaming.

1650 Sat 12/7: Arrive (2) (450m). Recover +CTD= 2.3 hrs.

1920 Sat 12/7: Depart (2). 10.3 hrs steaming, plus one hr CTD to 1000m.

0650 Sun 13/7: Arrive (3). (402m). Recover +CTD = 2.3 hrs.

0920 Sun 13/7: Depart (3). 6.1 hrs steaming + 3 CTDs = 7.6 hrs.

1700 Sun 13/7: Arrive (4) (250m). Recover +CTD= 2.3 hrs.

1820 Sun 13/7: Leave (4). 4.9 hrs steaming + 3 CTDs = 6 hrs.

0020 Mon 14/7: Arrive (5).(128m) Wait 6 hrs till dawn, then CTD and recover.

0800 Mon 14/7: Leave (5). 16 hrs steaming + 6 CTDs = 18 hrs.

0200 Tue 15/7: Arrive (6). (73m). Wait 4 hrs till dawn, CTD and recover.

0700 Tue 15/7: Leave (6). 21.6 hrs steaming + 6 CTDs = 23.6 hrs.

0600 Wed 16/7: Arrive (7) (300m). CTD and recover.

0820 Wed 16/7: Leave (7). 1.7 hrs steaming.

1000 Wed 16/7: Arrive (8). (180m). CTD and recover.

1230 Wed 16/7: Leave (8). 3.5 hrs steaming.

1600 Wed 16/7: Arrive (9) (61m). CTD and recover.

1830 Wed. 16/7: Leave (9).

The time between 1830 16/7 (or completion of mooring recovery, whichever comes last) and 2230 17/7 will be spent in CTD surveys along the line from (7) to (9).

2230 Thur 17/7: Leave (9).

1100 Fri 18/7: Arrive Darwin.

Piggy-back Projects

Deploy mooring for Dr. Craig Steinberg, AIMS, at 14°37.58'S, 121° 21.45'E. This continues a four year time series that Dr. Steinberg has maintained, providing the longest such time series anywhere on the NW Shelf. The mooring will be recovered by AIMS.

Franklin Equipment

CTD with 12-bottle rosette; thermosalinograph; ADCP; standard reagents for nutrient chemistry; transmissometer; fluorometer (for qualitative use). Standard meteorological gear, including mainmast pyranometer and pyrgeometer.

User Equipment

One mooring for Dr. Steinberg (see above). Radiosonde equipment and Barton radiometer for Dr. Barton.

Personnel List

Stuart Godfrey, Chief Scientist , CSIRO Marine Research
Andreas Walsch, Hamburg
Gavin Wark, WNI
Kevin Miller, Ocean Engineering, CSIRO Marine Research
Dan McLaughlan, Ocean Engineering, CSIRO Marine Research
Phil Adams, Electronics, CSIRO Marine Research
Dave Terhell, Hydrochemistry, CSIRO Marine Research
Helen Beggs, Computing, CSIRO Marine Research?
Ken Suber, CSIRO Marine Research

This cruise plan is in accordance with the directions of the National Facility

Steering Committee for the Research Vessel Franklin.

Stuart Godfrey
Chief Scientist

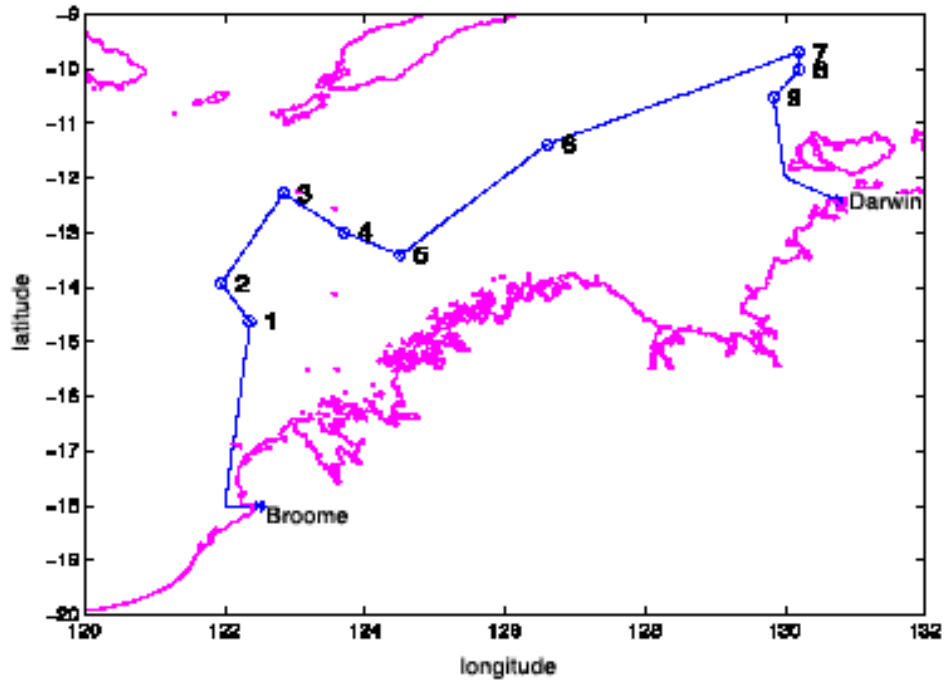


Figure 1. Cruise track FR07/00. Numbers indicate mooring locations.

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