



National Facility Research Vessel

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Voyage Plans and Summaries

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Franklin Voyage Plan FR10/00

Title

Continental Shelf Processes between Shark Bay and North West Cape.

Itinerary

Depart Fremantle 1000 hrs, Tuesday 7 November 2000

Arrive Fremantle 1000 hrs, Monday 20 November 2000

Principal Investigator

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Scientific Objectives

To use RV *Franklin* together with satellite data and other instrumentation to investigate:

(a) the summer circulation patterns and biological productivity along the continental shelf between Shark Bay and North-West Cape;

(b) interaction between the northward coastal current and the southward Leeuwin Current at the coastal promontory at Point Cloates;

(c) processes controlling the exchange of water between Shark Bay and the continental shelf including the fate of high salinity outflow from Shark Bay.

Cruise Objectives

After departing Fremantle, *Franklin* will conduct 10 standard lines along the continental shelf (Figure 1). For each transect, 10-15 CTD stations will be occupied depending on the shelf width. The transects will extend from the coast (20 m isobath) to the 1000m contour. In addition to the standard CTD and fluorescence, nutrient data will also be collected. Primary productivity measurements will be undertaken using ^{14}C methods. Measurement of currents (from the shipborne ADCP) and water properties (temperature, salinity, fluorescence) will enable the mapping of the structure of the continental current systems and the Leeuwin Current.

Process studies (using ADCP measurements and high resolution CTD stations) will be undertaken at three sites: (a) off Point Cloates to examine the eddy structure; (b) at Geographe Channel to examine the Shark Bay outflow; and, (c) at Naturaliste Channel to examine the frontal feature.

Cruise Track

The cruise will depart Fremantle, undertake a cross-shore ADCP transect offshore Hillarys and then will deploy a current meter mooring to the north of Rottnest Island for George Cresswell (CSIRO Marine Research). After the mooring has been deployed, we will sail north to Shark Bay. The first cross-shelf transect, Transect G will be completed and then will sail north to North West Cape. Here, Transects A to D will be completed. Based on the data collected from transects C and D and satellite imagery, we have allowed for 24 hours to undertake stations and ADCP transects at high resolution to capture the eddy structure at Point Cloates. Then we will complete transects E, F and sail into Shark Bay through Geographe Channel and complete transect SB (within Shark Bay). Then we will complete transect H. Depending on time availability, we will then perform some higher resolution stations to identify the Shark Bay outflow on the continental shelf. Then we will complete transects I and J and return to Fremantle. Prior to docking we will undertake a single ADCP transect along Hillarys boat harbour. The cruise track is given on Figure 1.

Time Estimates

Fremantle to ADCP station, 3 hrs @ 11 knots
ADCP mooring, 4 hours
ADCP station to start of transect G, 33 hrs @ 11 knots
transect G, 8 hrs @ 11 knots + 10 hours on station
transect G to start of transect A, 22 hrs @ 11 knots
transect A, 3 hrs @ 11 knots + 7 hours on station
transect A to start of transect B, 4 hrs @ 11 knots
transect B, 3 hrs @ 11 knots + 7 hours on station
transect B to start of transect C, 4 hrs @ 11 knots

transect C, 3 hrs @ 11 knots + 7 hours on station
transect C to start of transect D, 4 hrs @ 11 knots
transect D, 5 hrs @ 11 knots + 10 hours on station
Intensive studies off Point Cloats, 24 hours
transect D to start of transect E, 4.5 hrs @ 11 knots
transect E, 5 hrs @ 11 knots + 10 hours on station
transect E to start of transect F, 5 hrs @ 11 knots
transect F, 8 hrs @ 11 knots + 10 hours on station
transect SB, 4 hrs @ 11 knots + 3 hours on station
Intensive studies in Naturaliste Channel, 12 hours
transect H, 9 hrs @ 11 knots + 10 hours on station
transect H to start of transect I, 9 hrs @ 11 knots
transect I, 8 hrs @ 11 knots + 10 hours on station
transect I to start of transect J, 10 hrs @ 11 knots
transect J to Fremantle, 24 hrs @ 11 knots

Transit time: , 182 hours

On station: , 94 hours

Process studies: , 36 hours

TOTAL, 312 hours, = 13 days

Franklin Equipment

- GPS, DGPS (where possible), sounder, meteorological sensors
- Thermosalinograph with underway fluorometer
- ADCP (150kHz), XBT
- CTD with oxygen, fluorescence (high priority), light sensor (secondary priority) and transmissometer (low priority) and altimeter
- Rosette: 24 x 5L or 10L Niskins (with spares)
- CTD sample analysis for salinity, oxygen, nitrate, silicate and phosphate.
- Milli-Q water supply
- Colour printer, laser printer, unix computers
- Scintillation counter
- Biological container for ¹⁴C work
- Running seawater on the back deck (deck hoses fine).

User Equipment

- Incubation racks
- Current meter mooring for George Cresswell.

Personnel List

Charitha Pattiaratchi, CWR/UWA, Chief Scientist, Physical Oceanography
Anya Waite, CWR/UWA, Phytoplankton, nutrients
Mun Woo, CWR/UWA, Physical Oceanography
Betsy Nahas, CWR/UWA, Physical Oceanography
Christine Hanson, CWR/UWA, Phytoplankton, nutrients
Will Schroeder, University of Alabama, Physical Oceanography
George Cresswell, CMR, Physical Oceanography (provisional)
Tony Koslow, CMR, Zooplankton
Lindsay Pender , CMR, Cruise Manager, Computing
Phil Adams, CMR, Electronics
Neale Johnston, CMR, Hydrochemistry
Gary Critchley, CMR, Hydrochemistry

This cruise plan is in accordance with the directions of the National Facility Steering Committee for the Research Vessel Franklin.

C Pattiaratchi
Chief Scientist

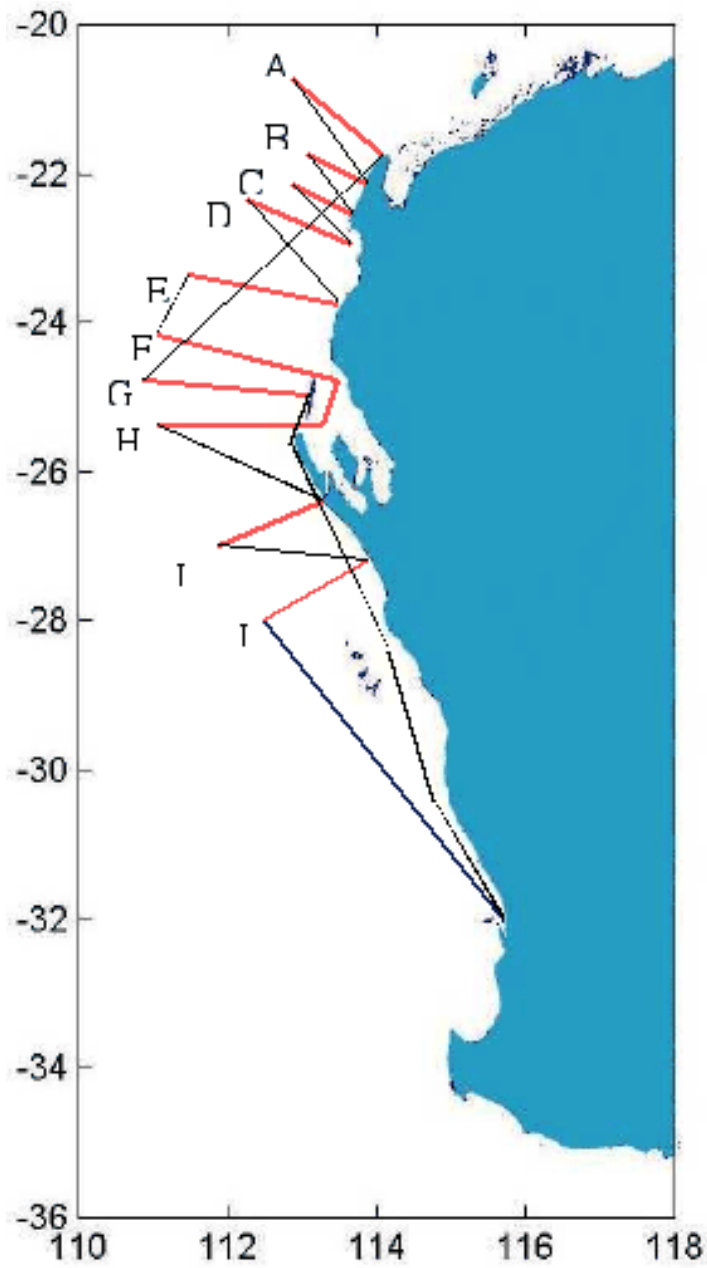


Figure 1. Cruise Track FR10/2000

Updated: 31/01/03



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