

FRANKLIN

National Facility
Oceanographic Research Vessel

RESEARCH PLAN

Cruise FR 1/95

INTERNAL TIDAL EVOLUTION ON THE NORTHWEST SHELF

Itinerary

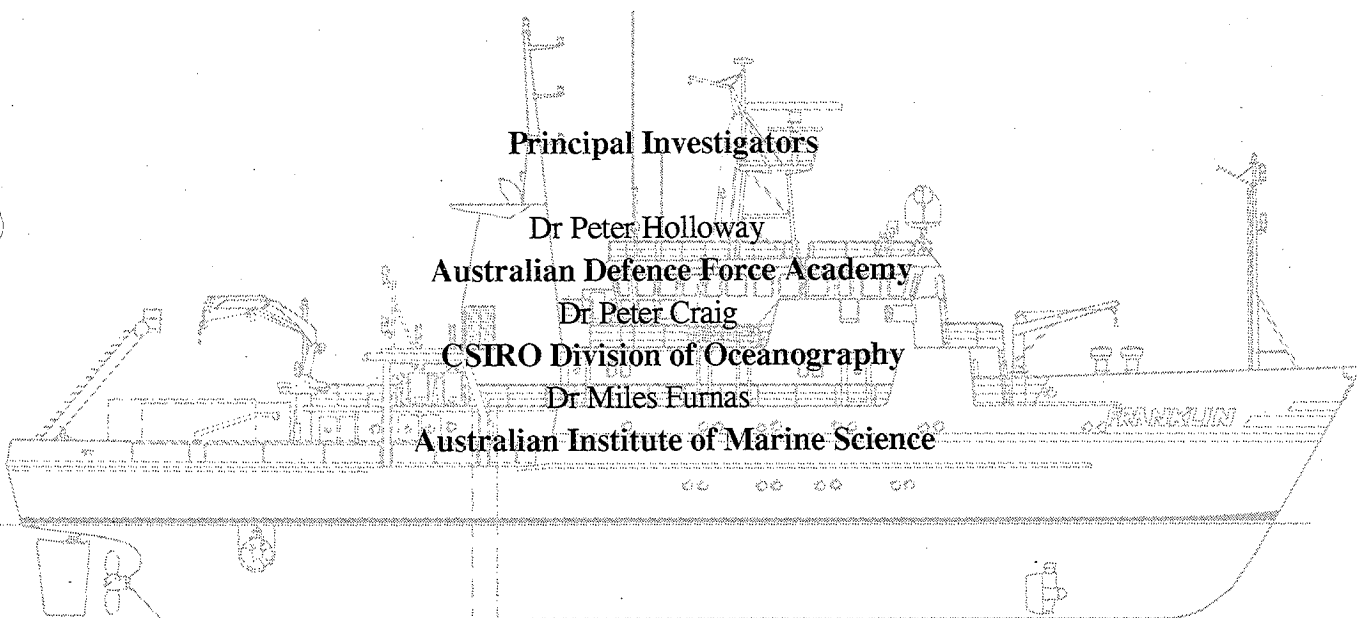
Sail Fremantle 0001 10 Jan 1995
Arrive Dampier 1500 24 Jan 1995

Principal Investigators

Dr Peter Holloway
Australian Defence Force Academy

Dr Peter Craig
CSIRO Division of Oceanography

Dr Miles Furnas
Australian Institute of Marine Science



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Scientific Objectives

- 1 To describe the temporal and spatial evolution of internal tides across the Northwest Shelf and the associated higher frequency internal waves.
- 2 To measure the temporal and spatial variability of primary production on the Northwest Shelf, and relate this to physical dynamics.

Cruise Objectives

- 1 To deploy 3 current meter strings, 3 moored Acoustic Doppler Current Profilers (ADCPs), and 3 thermistor strings across the shelf.
- 2 To occupy 15 CTD and ADCP stations along the current meter line for 13 hours apiece, to resolve the full tidal cycle at each. Then to occupy a further 6 stations, for between 1 and 13 hours each, on a parallel line approximately 11 nm (20 km) to the east.
- 3 At each CTD station, to collect repeated water samples, to be analysed on-board for phytoplankton primary productivity using ^{14}C uptake and size fractionation.

Cruise track

The vessel will depart Fremantle and steam direct to mooring location M1 (see attached figure), approximately 100 n.miles offshore from Dampier. Moorings will then be laid successively to the innermost M6. We will then steam to CTD station C1, and occupy each of the stations successively up to C15, doing repeat casts for 13 hours at each station. We then occupy CTD stations C16 to C21 for between one and thirteen hours each, and finally steam to Dampier.

Time estimate (hours)

Fremantle-Station M1	900 nm at 11 kt	82
Steaming: Stations M1 - M6 - C1 - C19 - Dampier		
	30 nm at 11 kt	30
9 moorings		9
15 CTD stations x 13 hr		195
2 CTD stations x 13 hr plus 4 x 1 hr		28
Total		344 (14.3 days)

ORV equipment

CTD	ADCP
Rosette	Hydrology
Thermosalinograph	Rear-deck winch and capstan
A-frame	

User equipment

All mooring components (ADFA and CSIRO)

On-deck laboratory (AIMS)

Personnel

Peter Holloway	ADFA	Chief Scientist
Peter Craig	CSIRO Oceanography	
Stephen Walker	"	
Fred Boland	"	
Kevin Miller	"	
Danny McLaughlin	"	
Alan Mitchell	AIMS	
David Vaudrey	CSIRO - ORV	Cruise Manager
Erik Madsen	"	
Mark Rayner	"	

Mooring locations

	Latitude (S)	Longitude (E)	Depth (m)	Instruments
M1	19°08'	115°40'	750	6 x Aanderaa current meters 1 x water-level recorder
M2	19°20'	115°54'	300	6x S4 current meters
M3	19°26'	116°01'	170	1xADCP
M3A	"	"	"	1xthermistor string
M4	19°33'	116°09'	125	1xADCP
M4A	"	"	"	1xthermistor string
M5	19°39'	116°16'	80	1xADCP
M5A	"	"	"	1xthermistor string

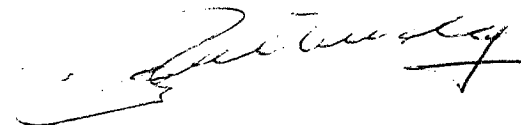
M6 19°45' 116°23' 65 2xVACMs
1 x water-level recorder

CTD stations

	Latitude (S)	Longitude (E)	Comment
C1	19°49'	116°2'7	
C2	19°45'	116°23'	M6
C3	19°43'	116°20'	
C4	19°39'	116°16'	M5/M5A
C5	19°36'	116°12'	
C6	19°33'	116°09'	M4/M4A
C7	19°30'	116°05'	
C8	19°26'	116°01'	M3/M3A
C9	19°23'	115°57'	
C10	19°20'	115°54'	M2
C11	19°14'	115°47'	
C12	19°08'	115°40'	M1
C13	19°02'	115°33'	
C14	18°50'	115°19'	
C15	18°38'	115°06'	
C16	18°58'	115°48'	
C17	19°11'	116°02'	
C18	19°21'	116°13'	
C19	19°28'	116°22'	
C20	19°34'	116°28'	
C21	19°40'	116°35''	

This Research Plan is in accordance with the directions of the National Facility Steering Committee for the oceanographic research vessel *Franklin*.

A D McEwan
CSIRO Division of Oceanography



G W Paltridge
National Facility Steering Committee

November 1994

