

FRANKLIN

National Facility
Oceanographic Research Vessel

RESEARCH PLAN

FR 7/96

Sail	Fremantle	1000	Wednesday 14 August 1996
Arrive	Fremantle	1000	Wednesday 11 September 1996

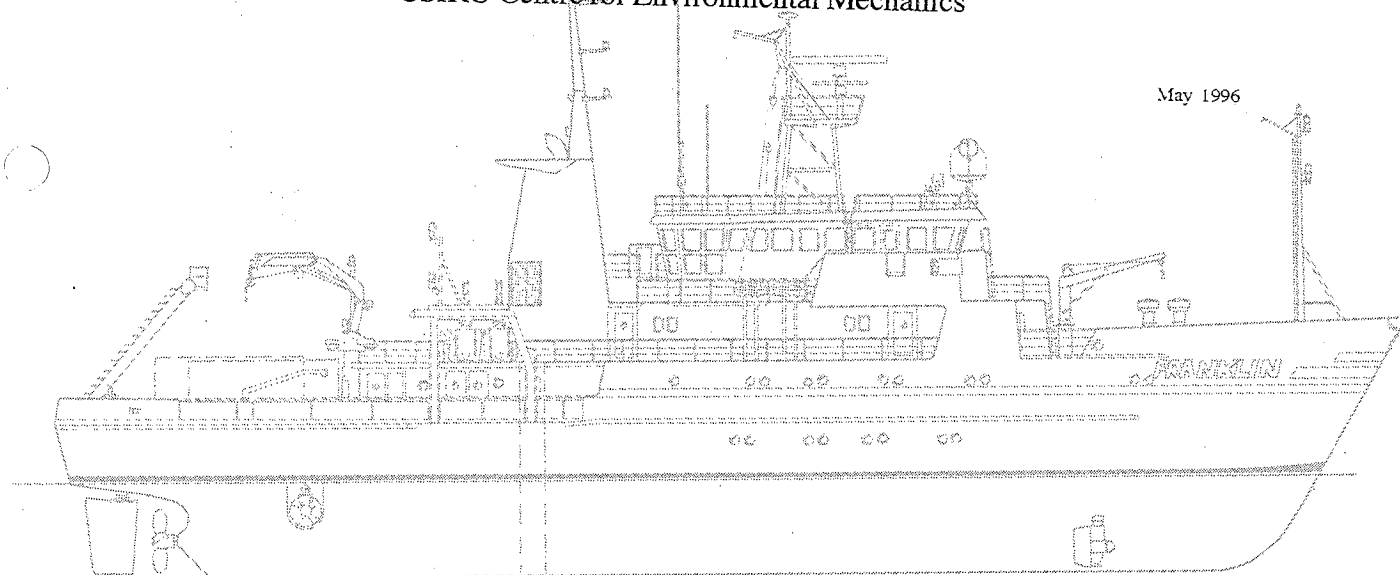
FRESHWATER AND HEAT BUDGETS IN THE TROPICAL INDIAN OCEAN

Principal Investigators

Dr. J.S. Godfrey
CSIRO Division of Oceanography

Professor M. Tomczak
Flinders Institute of Atmospheric and Marine Sciences

Dr. E. F. Bradley
CSIRO Centre for Environmental Mechanics



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RESEARCH PLAN

RV FRANKLIN CRUISE Fr 7/96

Freshwater and Heat Budgets in the Tropical Indian Ocean

Sail : Fremantle 1000 Wednesday August 14 1996
Arrive: Fremantle 1000 Wednesday September 11, 1996

Principal Investigators and Institutions

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Aims of the cruise:

The main objectives of this cruise are to undertake a budget closure somewhat similar to that undertaken during TOGA-COARE, but designed primarily to measure the spatially inhomogeneous freshwater input, rather than the much more regular heat budget (although the latter will be obtained as a matter of course). For this purpose, FIAMs scientists have prepared a video camera to place on top of the ship's 3-cm radar. This will provide rainfall estimates over the area seen by the radar, which we will check against estimates obtained from raingauges on the ship and the buoy. We plan to supplement our earlier COARE-style calculation of the heat and freshwater budgets at the buoy with estimates of the change of freshwater (and heat) content along parcels of water, that are intercepted twice by the ship's track.

The buoy deployment site is at (2°S, 94°E). This places it in the centre of a band of heavy rainfall usually found at this time, according to rainfall atlases..

Scientific program:

As in COARE, we will deploy a drifting buoy, and run a regular pattern around the buoy, with legs past the buoy every four hours. Rainfall will be monitored by two raingauges of different type on the buoy, with three more on the ship, and the video of reflectivity from the 3-cm radar. Data will be gathered at least once during the drift; weather permitting, this will be done by launching the ship's boat.

Heat fluxes will be estimated by bulk formulae, using the 15-minute mean data from the foremast. The foremast platform has been extensively calibrated for this purpose using the COARE results. The boom will be deployed, with the net radiometer mounted on it.

The "Silverfish" will be deployed at the bow. It can now operate routinely at 8 knots, so we will be able to check the shallow-water performance of the SeaSoar against simultaneous "Silverfish" profiles. Near-surface SST will be measured with the "SeaSnake", towed clear of the ship's bow-wave from the side-boom on the foredeck.

It is hoped that the COARE-style heat and freshwater budgets will be completed during the cruise. The change of freshwater (and heat) content along parcels of water that are intercepted twice by the ship's track will be undertaken after the cruise.

Fluxes will be measured both on the way up, and on the way back. Other routine underway measurements will also be maintained throughout the cruise. The detailed personnel arrangements for this are presently being worked out.

Cruise track:

The largescale track is shown on Figure 1.

Passage to buoy deployment site: Fremantle (32°S, 115.5°E) to (2°S, 94°E) = 2182 nm @ 12 kts = 7 days 14 hrs.

Return voyage to Christmas Island: (2°S, 94°E) to (10.5°S, 105.5°E) = 854 nm @ 10.5 kts = 3 days 9 hours.

Refuelling stop, Christmas Island: 1 day.

Passage, Christmas Island-Fremantle: (10.5°S, 105.5°E) to (32°S, 115.5°E) = 406 nm @ 10 kts = 5 days 21 hours.

Total travelling time: 17 days 20 hours.

Experiment time: 10 days 4 hours.

ORV Equipment required

All standard equipment, including SEASOAR and winch.
Standard meteorological instruments, including Eppley pyranometer and pyrgeometer, with their Datataker.
R.M. Young rain gauge.
Thermosalinograph;
ADCP
CTD with 12 bottle rosette.
Foredeck side boom

Equipment to be provided by users

Meteorological boom, with associated sensors and loggers
Optical rain gauge
Drifting buoy, with meteorological sensors, SeaCat and 2 current meters
Current meter reader.
Image recorder for 3 cm radar
"Silverfish"
"SeaSnake"

Personnel:

E.F. Bradley	CSIRO CEM	(Cruise Leader)
J.S. Godfrey	CSIRO Oc.	(Cruise Manager)
M. Tomczak	FIAMS	
E. Schulz	CSIRO Oc	
I. Lebedev	FIAMS	
L. Pender	CSIRO ORV	
I. Helmond	CSIRO ORV	
E. Madsen	CSIRO ORV	

V. Latham

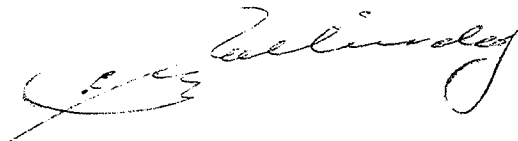
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We may be joined by a birdwatcher, on the whole cruise or from Christmas Island onwards.

This cruise plan is in accordance with the directions of the National Facility Steering committee for the oceanographic research vessel *Franklin*.

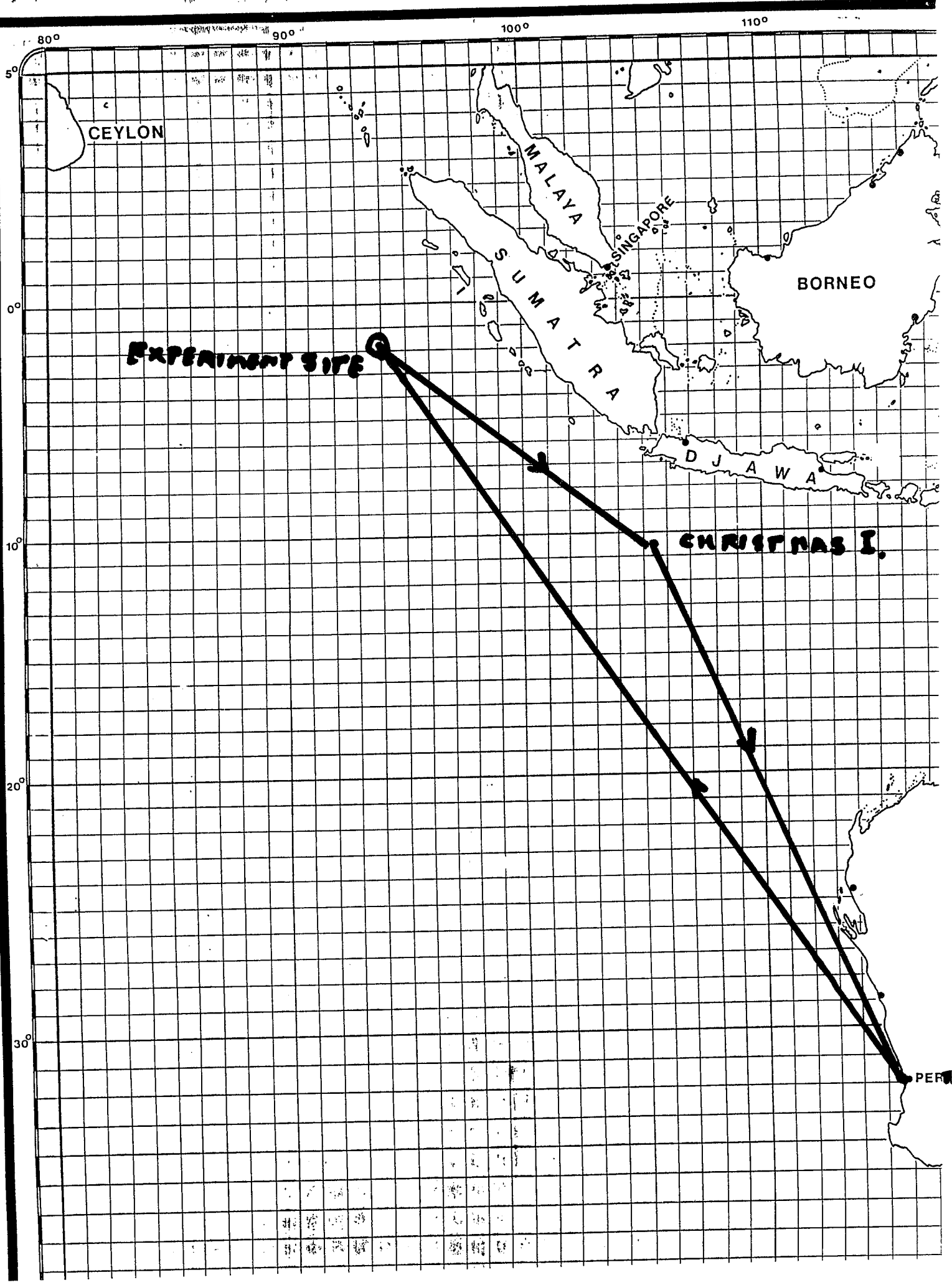


C. B. Fandry
CSIRO Division of Oceanography



G Paltridge
National Facility Steering Committee

May 1996



CEYLON

MALAYA

SINGAPORE

BORNEO

SUMATRA

DJAWA

EXPERIMENT SITE

CHRISTMAS I.

PER