

CRUISE PLAN

RV FRANKLIN

FR 06/99

Title

Joint Air-Sea Monsoon Investigation in the Bay of Bengal (JASMINE II).

Itinerary

Depart Darwin 0830hrs Thursday 2 September, 1999.

Arrive Singapore 1000hrs Tuesday 28 September, 1999.

Principal Investigators

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Scientific Objectives

This cruise follows a longer one in the same region, conducted in May 1999, using the US vessel R/V Ron Brown. The overall aim of the two cruises is to provide information of relevance to a number of questions regarding air-sea interaction in the eastern Indian Ocean, such as:

1. Is air-sea interaction an essential part of the "Intraseasonal Oscillation" events which control the net strength of the monsoon in a given year?
2. Large currents occur in this region: does this imply that advection is a major part of the heat and freshwater balance?
3. Can we close heat and freshwater budgets on the timescale of days, over a region a few kilometres wide?
4. Given TRMM satellite rain estimates, can we close the freshwater budget between the 2 cruises on Bay of Bengal scale?

In addition, we will perform a "thin" measurement of Indonesian Throughflow magnitude.

Cruise Objectives

Before leaving Darwin we will deploy the boom and mount the meteorological instruments, set up the radar recorder, and set up the radiosonde launcher.

1. After leaving Darwin, we will undertake a long transect of accurate fluxes, by bulk measurement of all 4 components of the surface heat flux, plus precipitation. Rain will also be recorded on a radar recorder. This flux timeseries will be continued throughout the cruise. We will also start a "thin" measurement of the Indonesian Throughflow, with 3 CTDs near (12S, 123E); (10S, 106E); (7.5S, 100E); plus XBTs every degree longitude from 122E to (5S, 94E). Radiosondes will be released at 1100 local every third day during this phase of the cruise, to coincide with ATSR overpasses. Hydrology personnel will be on Transit Duty for 3 days, between (12S, 123E) and (10S, 106E).
 2. Repeat the survey undertaken by *R/V Ron Brown* in April, 1999, which consists of a section of 35 CTD casts from (5S, 94E) to (0, 8830'E), thence along 8830'E between 0S and 12N. Along this line, conduct CTD casts every 0.5 degrees latitude; to 1000db at even degrees, to 500db at half-degrees, with salinity, oxygen, standard nutrients. Radiosondes to be launched at 0000Z, 0600Z, 1200Z, 1800Z.
- Undertake a heat and freshwater budget closure and mixed-layer experiment, over an 8-day period near (12N, 8830'E). Exact location for this work will be chosen to minimise surface current strength. During this period, we will proceed around a triangle of sides 11nm, with CTDs at corners to 400db and CTDs to 200db at the centre of each side. These will not have any chemistry or nutrients, except for one on the completion of each circuit - about every 5 hours. Radiosondes to be released 6 times/day, at 0000Z, 0400Z, 0800Z, 1200Z, 1600Z, 2400Z. Thus over 7 days, we will complete about 200 shallow CTDs, 33 of them with chemistry. Details of this procedure may alter, depending on results from JASMINE I.
 - Sail for Singapore, dropping XBT's every 1 longitude to (7N, 98E). Drop XCTD at latter location, to complete thin Indonesian Throughflow measurement.

Cruise Track

See Figure 1.

Time Estimates

Travel Darwin - (5S, 94E): 2208 miles @ 11 kts = 8 days 9 hrs

3 * 1000db CTD stations: 3 hrs.

Basic survey line, (5S, 94E) - (0, 8830'E) - (12N, 8830'E):

1236 miles @ 11 knots, + 35 stations @ 1hr: 4 days 16 hrs + 35* 1hr = 6 days 3 hrs.

Budget survey near (12N, 8830'E): 7 days 5 hrs.

Travel, (12N, 8830'E) to Singapore: 1098 miles @ 11 kts = 4 days 4 hrs.

Total = 26 days.

Franklin Equipment

CTD with 12-bottle rosette; ADCP; thermosalinograph; standard ship's mainmast meteorological package - including Eppley pyranometer and pyrogeometer; R.M. Young raingauge; Vaisala balloon launcher.

User Equipment

Boom (eg. as used on FR07/96). It will be placed aboard before FR05/99.

Meteorological gear for foremast (to be brought by Dr. Bradley)

Meteorological balloons and sondes

Recorder for ship's radar (from Flinders University).

XCTD software; two probes.

Personnel List

Stuart Godfrey Chief Scientist CMR

Frank Bradley Co-investigator CSIRO Land and Water

Mathew Wells Student Uni of Melbourne

Tara Ansell Student ANU

Dan McLaughlan Foreboom CMR

Val Latham Hydrochemistry CMR

Gary Critchley Hydrochemistry CMR

Mark Rayner Hydrochemistry CMR

Neal Johnson Hydrochemistry trainee CMR

Bob Beattie Computing CMR

Erik Madsen Electronics CMR

Cetacean Observer Cetacean Ecosystem Program Deakin University

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

Signed

Ships Manager

CSIRO Marine Research