

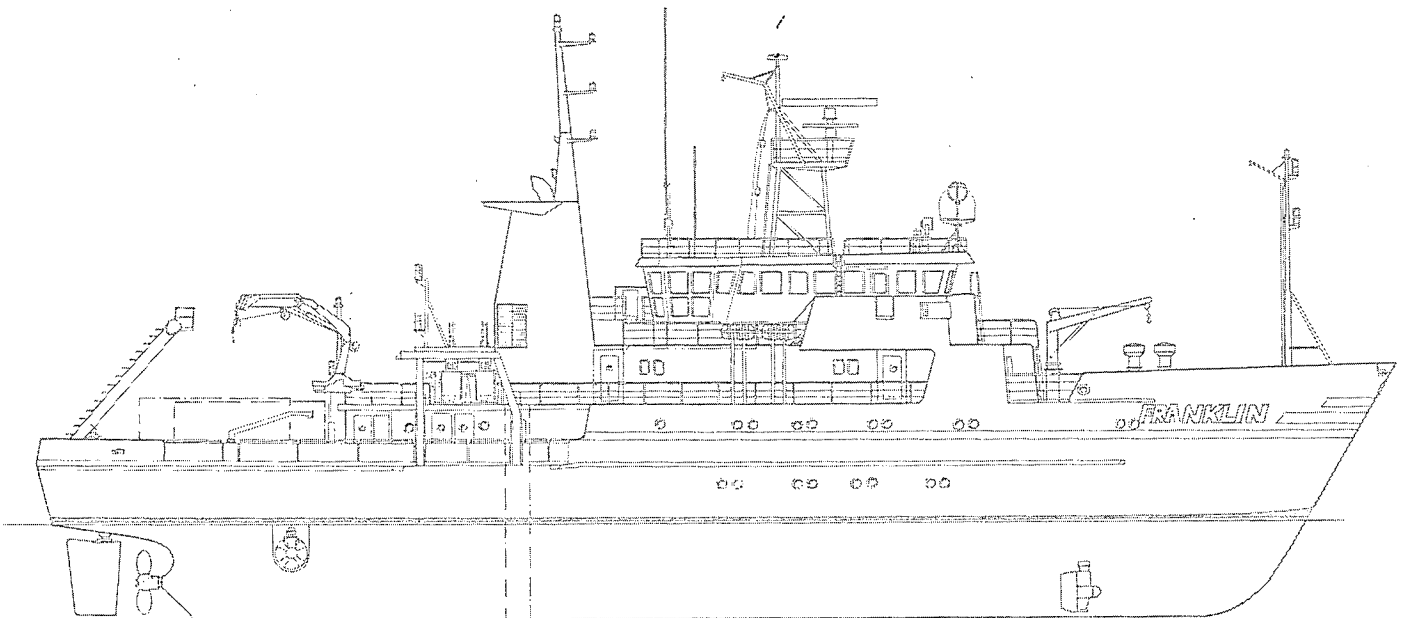
R.V. FRANKLIN

NATIONAL FACILITY OCEANOGRAPHIC RESEARCH VESSEL

RESEARCH CRUISE SUMMARY

R.V. 'FRANKLIN'

FR 8/87



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R.V. FRANKLIN IS OWNED AND OPERATED BY CSIRO

CRUISE SUMMARY
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ITINERARY

Depart Fremantle	1630 hrs	26 August 1987
Arrive Fremantle	1930 hrs	9 September 1987

SCIENTIFIC PROGRAM

1. Ecology of the late stage phyllosoma larvae and puerulus stage of the western rock lobster.
2. Satellite sea surface temperature validation.
3. Collection of larval fish, particularly tuna.
4. Examine the vertical distribution of organic particulates.

PRINCIPAL INVESTIGATORS

1. Dr B. F. Phillips
CSIRO Division of Fisheries Research
2. Dr J.D. Penrose and Dr M.J. Lynch
Centre for Marine Science and Technology
Curtin University

CRUISE TRACK

See Figure 1.

CRUISE NARRATIVE

After departing Fremantle the ship steamed to just south of the Houtman Abrolhos Islands at approximately 29°S and most of the sampling of the plankton and organic particulates was conducted in this area. Hauls were made from west to east through the Leeuwin Current and from south to north inshore of, and within, the Leeuwin Current.

The major problem encountered during the cruise was the failure of the EZ NET system to operate correctly. This is detailed in a separate report but basically there were failures in the electronics system and in the mechanical operation of the nets within the sampler. In all 10 attempts were made to operate the EZ net and it never operated correctly on any occasion.

After several days of unsuccessful sampling in the vicinity of the Houtman Abrolhos Islands it was decided to make the ship available for maximum sea surface temperature validation. The ship then steamed north as far as Point Cloates (22°45'S) before returning again to the Houtman Abrolhos area. During this time, repairs were made to the EZ net and new stainless steel bars were obtained at Geraldton port. The EZ net still failed to operate correctly and the cruise was abandoned. The ship returned to Fremantle taking a zig-zag path to provide further data for sea surface temperature validation.

Sea conditions were relatively calm throughout most of the cruise and had no significant effect on the sampling.

CRUISE ACHIEVEMENTS

Plankton Study

The EZ net failed to operate satisfactorily during the cruise. However, samples were collected on 3 occasions. A sequence of samples was taken using a surface net operated on a boom from the side of the ship.

It was not useful to continue surface sampling in the latter part of the cruise because of the bright moonlight at that time.

Sea Surface Temperature Study

Sea surface was measured during the cruise by seven different instruments or techniques. Three infrared radiometers were mounted above and on the bridge deck and provided radiometric measurements of sea surface temperature, viz.,

1. A Barnes PRT-5 was operated throughout the cruise.
2. The CSIRO dual channel radiometer was operated at satellite overpass times for the first half of the cruise and continually for the latter half.
3. A new dual channel radiometer from the U.K. was operated during satellite overpass times.

The other sea surface temperature measurements were made by a thermistor element (deployed from a boom mounted off the port side and operated when the ship was under way), the thermosalinograph and by bucket measurements. The seventh sea surface temperature measurement was from the NOAA series of operational meteorological satellites. Radiosonde measurements were made at satellite overpass times throughout the cruise. About 30 balloon launches were made from the Vaisala launching system mounted on the foredeck.

A detailed intercomparison of the various sea surface temperature measurements will be made together with a study of the nature of sea surface temperature variations, the accuracy of the satellite product and the cause of any variations in the different measurement techniques.

Measurements of downcoming long-and short-wave radiation were measured using University of Tasmania instruments mounted on the mast head. These measurements are a preliminary to the April cruise next year that is to investigate sea surface energy budgets to the north of Papua New Guinea.

Organic Particulates and Phyllosoma

The major objective for the cruise was achieved, viz. collection of samples to evaluate the vertical distribution of organic particulates (<1mm) in the water column. Samples were collected on GFC filters from the 10L Niskin bottles of each hydrocast along the East-west transect south of the Houtman Abrolhos Islands. Preliminary assessment of biomass indicates this size class of organic particulate (free of zooplankton) is of very low concentration and probably of little direct significance to phyllosoma diet.

Further analysis are being carried out at Marmion labs. Data will be assessed in association with other information from the Houtman Abrolhos Island and Dongara regions, and contribute to a formal manuscript.

The secondary objective of investigating dietary utility of particulates by phyllosoma was suspended due to a paucity of samples (comments on EZ net operation).

EQUIPMENT

1. CTD and ROSETTE

CTD #2 was used for the small number of stations measured. The rosette stuck a few times on ramp position 12. This was cured by washing the unit down with fresh water and spraying the ramp mechanism with CRC 66.

The prototype Titron PH probe was fitted to CTD #1 prior to the commencement of the cruise. Just prior to the completion of the cruise, this CTD was deployed to 3900 meters. The PH probe appeared to function correctly to this depth, although with an offset. The before and after dip calibration checks were as detailed below:

	OUTPUT VOLTAGE (MEASURED BY 1150 DECK UNIT)		
	SEAWATER	4pH BUFFER	7pH BUFFER
PRIOR TO CAST	-1.220	-5.220	-2.272
AFTER CAST	-2.192	-5.183	-2.131

During this cast, the rosette malfunctioned, and did not trigger any bottles. It is suspected that the mechanism has frozen due to lack of use.

2. EK400 SOUNDER

No problems were experienced with the sounder. The power output of the 12kHz slave transmitter appears to be down, but as the unit was performing well, no attempt was made to remedy this.

3. GPS RECEIVER

The additional RS232 serial port was installed.

No problems were experienced in obtaining fixes. It was noticed part-way through the cruise that no GPS data was being logged. This was eventually traced to incorrect wiring of the RS232 plug at the rear of Micro 3. After swapping pins 2 and 3, data logging commenced.

4. THERMOSALINOGRAPH

No problems were experienced with this unit. John Penrose compared the temperature from this unit with the sea-surface temperature obtained from a thermistor and found a difference of about 0.1°C, with the thermosalinograph being higher.

5. EZNET

This is the subject of a separate report.

6. RS232 CONCENTRATOR

This unit had been previously wired to the CTD (priority input), the ADCP (secondary input) and the LA100 printer (output). The new (second) GPS serial port was connected to the spare secondary input. Since no handshaking is provided on the secondary inputs, the baud rate of the CTD line was reduced from 9600 to 1200, allowing both the CTD and the GRP to use the printer without requiring any cable or baudrate changes. It is still necessary to slow the ADCP baud rate from 9600 to 1200 to use the LA100.

7. ADCP

No problems experienced with this unit.

8. GO BLOCK

On a number of occasions this unit malfunctioned, and required the power to be cycled to achieve satisfactory operation. On one occasion it was found that the wire out reading increased slowly when the ship was pitching noticeably.

9. FREEZER ALARM

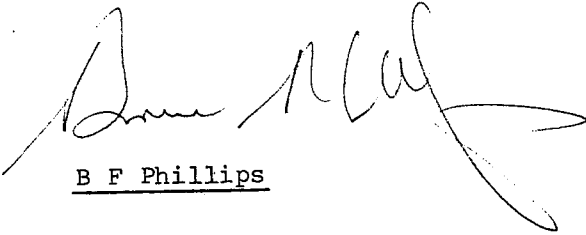
Partway through the cruise the meter ceased to function. The unit is still monitoring the three freezer temperatures. This problem will be overcome when the new unit is installed.

10. INMARSAT

No difficulties were experienced with this unit, except when the funnel obscured the satellite. Instructions on how to operate the unit were upgraded and provided for the master. They can be found in the ELECTRONICSINMARSAT.DOC file on the VAX.

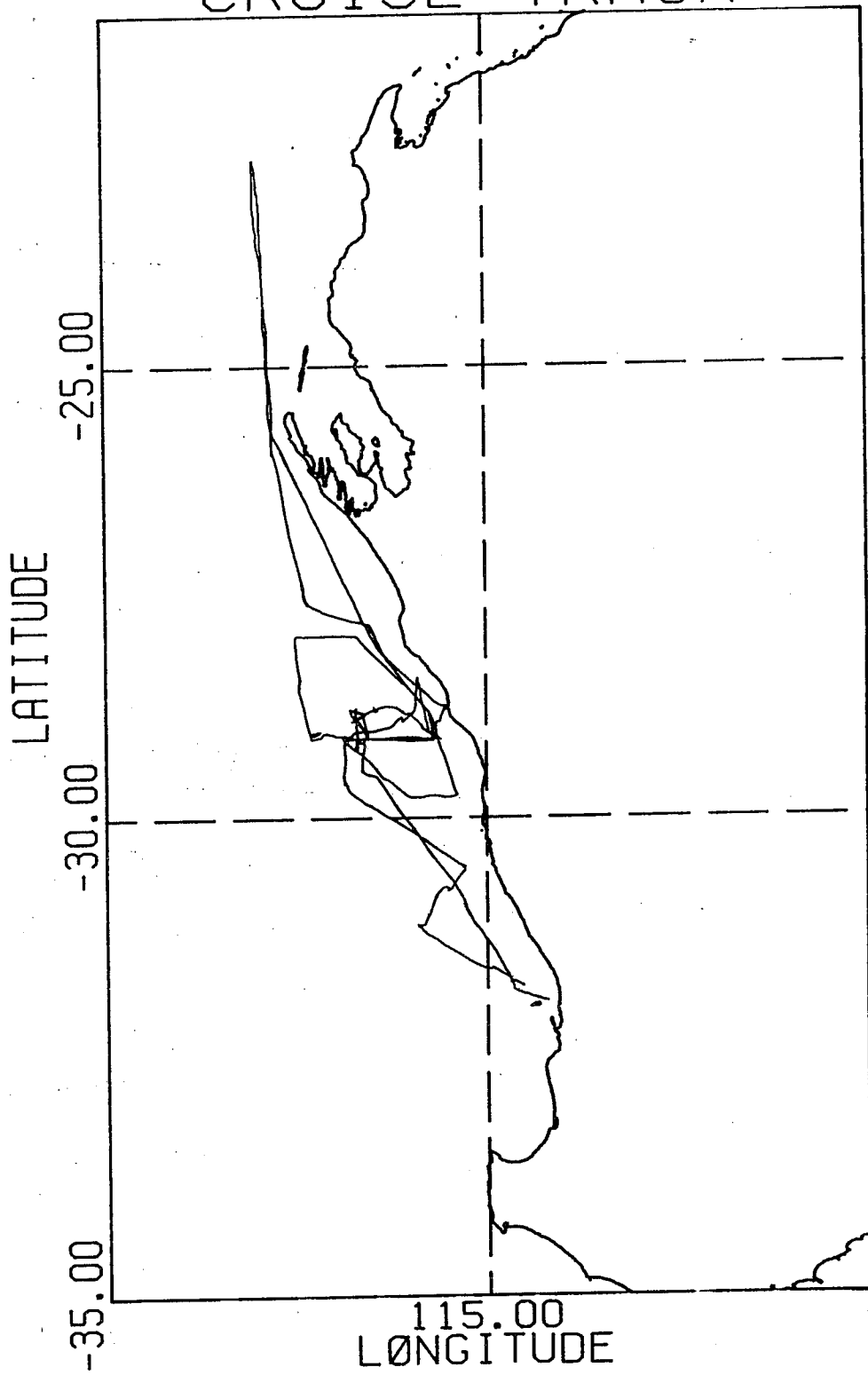
SCIENTIFIC PERSONNEL

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B F Phillips

CRUISE TRACK



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