

# R.V. FRANKLIN

## NATIONAL FACILITY OCEANOGRAPHIC RESEARCH VESSEL

### RESEARCH SUMMARY

#### CRUISE FR 12/89

Sailed Launceston 1500 hrs 3 November 1989

Arrived Hobart 1400 hrs 10 November 1989

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#### Study of Southern Rock Lobster Ecology

Dr Bruce Phillips

CSIRO Division of Fisheries

--oOo--

#### Infrared Radiation Upwelling

Dr Ian Barton

CSIRO Division of Atmospheric Research

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#### Ship's Head By GPS

Mr Bob Edwards

CSIRO Division of Oceanography

Wan Fu

University of NSW

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18 December 1989

For further information contact

ORV Operations Manager

c/- CSIRO Division of Oceanography

GPO Box 1538, Hobart, Tas. 7001

Telephone (002) 20 6222

Telex AA 57182



R.V. FRANKLIN IS OWNED AND OPERATED BY CSIRO

# RV FRANKLIN

## RESEARCH SUMMARY

CRUISE FR 12/89

### Itinerary

Sailed Launceston 1500 hrs 3 November 1989  
Arrived Hobart 1400 hrs 10 November 1989

### Program

1. To study the ecology of the late stage phyllosoma larvae and puerulus stage of the Southern Rock lobster, *Jasus novaehollandiae*.
2. To investigate the nature of the infrared radiation upwelling from the ocean surface.
3. To investigate ships heading derived from GPS navigation data.

### Principal Investigators

Dr B.F. Phillips  
CSIRO Division of Fisheries  
PO Box 20  
North Beach, Western Australia 6020  
Telephone: (09) 246 8222

Dr I.J. Barton  
Dr B.P. Cechet  
CSIRO Division of Atmospheric Research  
Station Street  
Aspendale, Victoria 3195  
Telephone: (03) 586 7666

Mr R.J. Edwards  
ORV Operations Group  
CSIRO Division of Oceanography  
GPO Box 1538  
Hobart, Tasmania 5001  
Telephone: (002) 206 222

### Cruise Narrative

After departing Launceston at 1500 on Friday 3 November the ship steamed to near Bicheno, off eastern Tasmania. F.B. Griffiths was deputising as Chief Scientist.

On Saturday 4 November a day time trial deployment of the EZ net showed that the use of 10 nets was impractical and it was decided to reduce the number of nets to 6.

A second trial deployment, on the night of 4 November, was aborted when the wire jumped out of the block and went down beside the wheels support and rested on the axel. A new block had to be used and wire cut from cable. The complete night's sampling was lost.

In the afternoon of Sunday 5 November, B.F. Phillips, the Chief Scientist, was picked up from near Triabunna and transferred to "Franklin" by the ship's rescue boat.

On the night of Sunday 5 November the EZ net was, on the first occasion, launched with 6 nets but this was then reduced to 5 nets and this was kept standard throughout the rest of the cruise.

From Sunday 5 November to Wednesday 9 November sampling was conducted either along  $41^{\circ}50'S$  or  $148^{\circ}E$ . During the day of 10 November the ship steamed south to a position off Maria Island and then at night sampled offshore along  $42^{\circ}59'S$ .

## Results

Measurement of the infrared radiation upwelling from the sea surface (Dr I.J. Barton and Dr B.P. Cechet)

Two dual channel infrared radiometers were mounted above the bridge to view the sea surface outside the ship's wake. Each radiometer sampled at wavelengths of 11 and 12 microns - similar to the bands on the operational meteorological satellites that routinely supply measurements of sea surface temperature.

The two radiometers were operated continuously during the cruise in several different modes. Normally both were operated at 11 microns but on occasion one or both were switched to the 12 micron channel to detect any fine difference in the structure of the oceanic skin layer. Also, for short periods, one radiometer was pointed to the sky at the same viewing angle as that used to view the sea surface. This was done in clear, fully overcast and partly cloudy conditions in order to estimate the reflected sky contribution to the upwelling radiation. The radiometer data will be compared to measurements of SST using data from the thermosalinograph, CTD and bucket measurements.

On-board processing showed that the radiometers were giving sensible data but the fine detail required for complete analysis will only be possible with careful post-cruise analysis of the data.

The ecology of the phyllosoma larvae and puerulus stage of the Southern Rock Lobster, *Jasus novaehollandiae* (Dr B.F. Phillips, F.B. Griffiths and D. Edwards).

A total of 23 successful launchings of the EZ net resulted in the collection of 115, 10 min samples at depths between 10 and 400 m.

The sub-surface samples were complemented by a total of 129 surface hauls at the same, and additional stations, to the subsurface stations.

Only 2 phyllosoma larvae were observed during on board handling of the samples, but other larvae are probably hidden in the samples, as in many cases considerable material was collected.

A total of 37 CTD stations were made either at the beginning or end of each sampling series.

### GPS Navigation Data

The two antennae were installed prior to the cruise. Due to lack of suitable length antenna cables, the foremast receiver was operated on the deck near to the acid storage jars, while the funnel receiver was operated in the base of the funnel. Two 12 DC power supplies were provided to operate the receivers. Good data was collected on all possible GPS times.

### EZ Net Testing

The EZ net system was successfully tested on FR12/89.

In all, 23 successful launchings were made and 115 sub-surface samples collected at selected depths between 10 and 400 m. We now have a modern, multiple, opening and closing plankton sampler, with real time read out, thereby permitting selection of sampling depths. This is no small achievement and it has taken 5 years to complete!

Principal credit for the successful development of the sampler must go to Dave Edwards, and also to Brian Griffiths. They make a good team. Dave Edwards' electronic talents are the basis for the software which he has developed to drive the net system. This is now the key to the operation of the net system, while Brian Griffiths' practical advice and enthusiasm overcome all other difficulties (except the weather). Our excellent technical staff did a great job with launching and recovery of the system and we all learnt a lot about the sampler and its operation.

Some further improvements to the system including linking of the ship positioning information and data storage from the sampler, provision of better light level sensing including time elapsed since net opening, and individual recording on net bar release, will further enhance the sampling reliability.

It became obvious during the cruise that experienced staff are needed to operate the EZ net sampler during deck handling operations. We were fortunate in having two highly trained senior technical officers who could oversee deck operations. However, they need to be supported by a team of no less than 3 people. This imposes an important requirement on future cruises to see that such people are available. Hence it may not be possible to undertake a wide range of research objectives during EZ net operations, unless the staff for those other programs could support the deck operations with the EZ net system.

It is essential that the winch operator is provided with an accurate wire out measuring device. This will permit the operator to know at all times the depth that the EZ net sampler is below the surface.

#### Personnel

##### CSIRO Division of Fisheries

B. Phillips - Chief Scientist  
D. Wright  
S. Braine  
S. Kelly

##### CSIRO Division of Atmospheric Research

I. Barton  
R. Cechet

##### Tasmanian Department of Sea Fisheries

R. Kennedy

##### University of New South Wales (Surveying)

Wan Fu

##### CSIRO-ORV

F.B. Griffiths  
D. Edwards - Cruise Manager,  
K. Suber  
B. Barker