

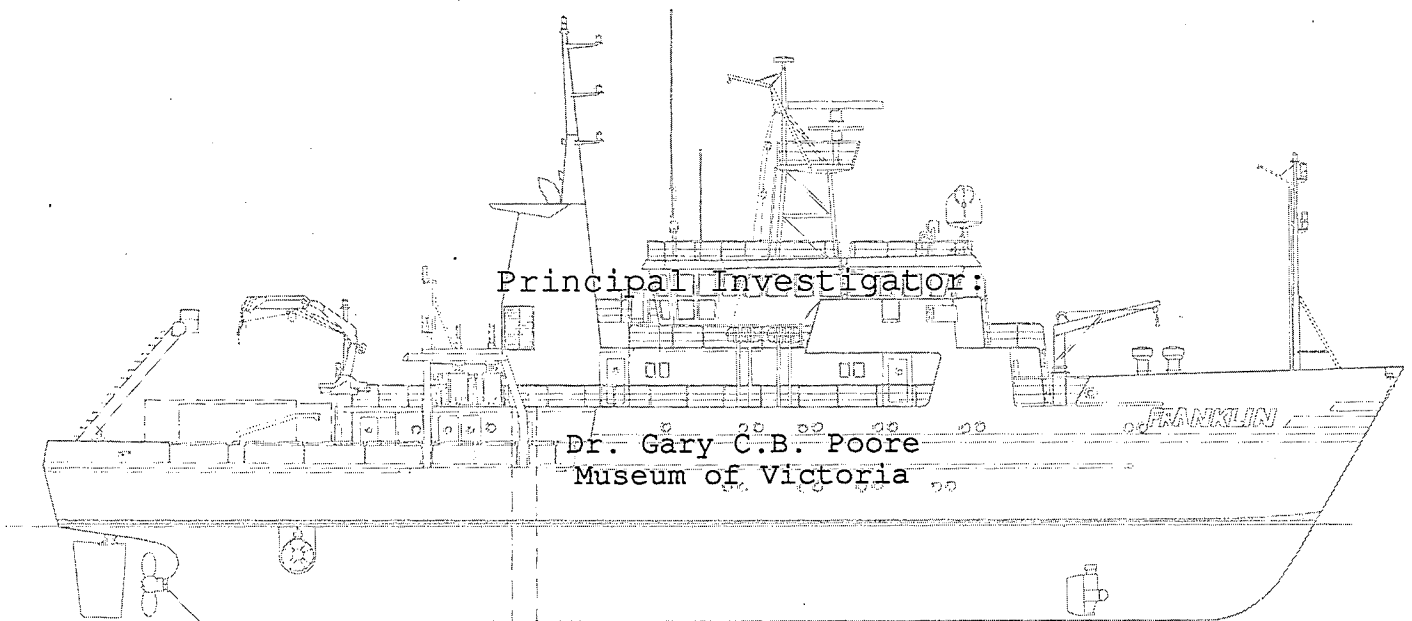
R.V. FRANKLIN

NATIONAL FACILITY
OCEANOGRAPHIC RESEARCH VESSEL

RESEARCH SUMMARY

R.V. 'FRANKLIN'

FR09/88



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R.V. FRANKLIN IS OWNED AND OPERATED BY CSIRO

Cruise Summary
R.V. Franklin
FR09/88

Itinerary

Departed Sydney	1530 hr	Thursday 20 October 1988
Arrived Hobart	0830 hr	Monday 31 October 1988

Scientific Program

To sample benthic, demersal and mesopelagic fauna from the continental slope of south-eastern Australia from a depth range of 400 to 3000 metres; specifically

- * to sample benthic invertebrates on three transects using a WHOI epibenthic sled and box corer
- * to sample epibenthic and demersal invertebrates and fishes using a 3.5 metre beam trawl
- * to sample mesopelagic fishes, squid and other invertebrates using an Isaacs-Kidd Midwater Trawl (IKMT)
- * to sieve, sort and study material from all the samples and to preserve them for further taxonomic study
- * to compile film of the cruise activities and scientific findings for a documentary on the natural history of the slope.

Principal Investigator

Dr Gary C. B. Poore,
Museum of Victoria
71 Victoria Crescent,
ABBOTSFELD, Vic 3067

Results

Samples were taken from all three transects: TRANSECT 1 off Nowra, TRANSECT 2 in Bass Strait and TRANSECT 3 off Freycinet Peninsula.

TRANSECT 1: 4 IKMT samples from cable depths of between 450 and 4000 m; 4 sled samples from between 430 and 3000 m; 4 beam trawl samples from between 345 and 2800 m; and 3 box core samples from between 1000 and 3150 m.

TRANSECT 2: 1 IKMT sample from cable depth of 1350 m; 3 sled samples from between 1277 and 2900 m; 2 beam trawl samples from between 1100 and 1300 m; and 2 box corer sample from between 1770 and 2113 m.

TRANSECT 3: 5 IKMT samples from cable depth of 450 and 4300m; 4 sled samples from between 1100 and 2600 m; 2 beam trawl samples from between 650 and 1300 m; and 2 box corer sample from between 2025 and 2500m.

Fewer samples were taken than anticipated because of some initial problems with gear and because of delays due to bad weather.

The weak link used first-off with the sled broke on the first two occasions and the sled was recovered reversed. In all later samples a stronger rope link was used as had been done on previous cruises and successful samples were obtained. Samples from the greatest depths were not as productive as might have been expected but the sled definitely reached bottom.

The box corer failed to fire on the first two times. A modification to the firing mechanism ensured success on all later occasions except once when the corer may have tipped over.

Flooding of the 2500dB Submersible Data Logger (SDL) on the IKMT on the first lowering meant that no reliable data on towing depths were obtained. On two subsequent attempts at shallow depths a second 300dB SDL. Some data on the relationship between towing depth, cable length and speed were obtained but these were contradictory. The difficulties of not knowing at what depth gear is working from a practical point of view were illustrated on the last tow when the IKMT hit bottom and was damaged. The failure of this equipment was for us a serious problem for two reasons. First we do not know a what depths the gear fished, and second, safety considerations prevented us sampling at all near the bottom.

Data on sampling depth in real time would be ideal for both midwater and benthic gear. Although we rarely recovered benthic sampling gear which had not reached the bottom we were never sure how long it had been there. The quantity of sample obtained was therefore unpredictable. We would urge CSIRO to develop or purchase a device which can relay depth or distance from the bottom in real time for the use of all programs using midwater or benthic sampling equipment.

Narrative

RV Franklin departed Sydney at 1530 hr on 20 October 1988, 6.5 hours after the scheduled time due to a seamen's stop-work meeting. The scheduled 0800 sailing had been re-scheduled to 0900 due to the late arrival of one of the scientific party.

The first station off Nowra was reached at 2236 hr and the first IKMT sample was taken. Over the next 3 days all gear was used successfully after a bit of trial and error for some. During this period only about 4 hours was lost due to rough seas. It was pleasing to see the new IKMT work well at all depths and return good catches.

At 1918 hr, 23 October, the ship left for Bass Strait zone and was delayed on its voyage south due to especially rough SW seas. At times speed was reduced to less than 4 knots and it was not possible to commence sampling again on station until 0615 hr, 25 October. Almost a day's sampling was lost.

Sampling in deep water in eastern Bass Strait was successful but was cut short because of impending bad weather. We left at 1300 hr on 26 October and reached TRANSECT 3 at 1330 the next day.

One day out of the next four (night of 28th and most of 29th) was lost due to bad weather, wind over 30 knots for most of the period preventing any sampling. A compromise sampling scheme involving all types of gear was achieved. The last day was somewhat spoiled when the last beam trawl came up with a broken beam but other wise intact, and the IKMT hit bottom and filled with shell rubble. Luckily only the paravane was damaged. We departed the area at

1700 hr on 30 October for a rough trip back to Hobart.

Equipment

1. 50 metres of towing warp was cut off and the wire re-terminated following an unexplained tangle which resulted in a tight knot.
2. The GO tension meter performed well with the analog chart output.
3. The 2500dB Submersible Data Logger failed to trigger on its first deployment. It was set to start sampling at a Conductivity of 10mmho/cm. Following resetting the SDL was redeployed but the unit did not communicate on recovery. Upon examination 100ml of water was found inside the pressure case. Subsequent examination found that the water was entering via the temperature sensor. The likley cause was found to be uneven machining marks in the seat of the "O-ring" seal on the temperature sensor.
4. On the last IKMT for the cruise the 300dB SDL was deployed for a second time, to get an estimate the sampling depth. From an previous test the ratio of wire out to sampling depth had been found to be 2.4. Following an unexpected shoaling and signs of bottom contact on the tension meter the deployment was aborted. Subsequent examination of the data showed that the wire out to sampling depth ratio, may, under some circumstances, be much less than 2.0. (Of the order of 1.5 was indicated.) The SDL appeared to sustain only superficial damage.
5. On-Board Logging equipment worked faultlessly.
6. The INMARSAT antenna azimuth drive motor was unserviceable making communications very unreliable. Unless the antenna was manually aimed at the satellite, and then only in smooth seas and whilst on a steady course, communications where not possible.
7. The Chief Engineer and the **Franklin's** engineering staff repaired and rebuilt two damaged sleds and the paravane of the IKMT which were damaged during sampling operations.

Summary

The cruise was overall a success, 38 sampling stations having been made to compliment the work done in 1986. In all 10 IKMT trawls, 8 beam trawls, 11 sled samples and 9 box cores were taken, about 60% of those planned. This was achieved in spite of 2¹/₂ days of rough weather, about one quarter of the total cruise.

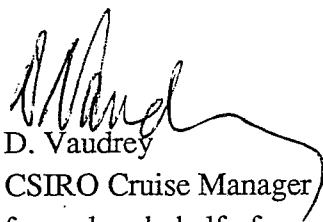
In all aspects the ship served its purpose well. The level of cooperation of the officers, crew and CSIRO ORV Staff, excellent. Our only disappointment was the inability to Obtain information of the fishing depth of the midwater trawl, elaborated above.

Personnel

Gary Poore	Museum of Victoria (Chief Scientist)
Martin Gormon	Museum of Victoria
Robin Wilson	Museum of Victoria
Tim Stranks	Museum of Victoria
Laurie Hammond	Museum of Victoria

Jean Just
Dave Smith
Ivan Johnston
Peter Shaughnessy
Dave Vaudrey
Erik Madsen

Museum of Victoria
ImageAction Films
ImageAction Films
ORV Steering Committee
CSIRO - ORV (Cruise Manager)
CSIRO - ORV



D. Vaudrey

CSIRO Cruise Manager

for and on behalf of

Gary C.B. Poore

Chief Scientist.

Fr09/88

Attachments

1. Filming report.
2. Electronics report.

Attachment 1: Filming

David Smith and Ivan Johnston undertook the task of documenting the cruise on film. The end result of this effort will be an hour long television documentary, called "Edge of Abyss" which has been pre-purchased by the Australian Television Network. (Channel 7) for national broadcast in the second half of 1989.

The film details the various sampling methods used, and includes rare footage of deep-sea creatures filmed within hours of being brought to the surface. This was achieved using a seawater aquarium in which a variety of organisms were photographed using both cine and still photography. A major problem was that vibration, especially when **Franklin** was holding station during Box Coring, however we believe we will have a reasonable cover of many species, some of which may never have been filmed alive. At slow trawling speeds (2-3 knots) the **Franklin** was stable enough to allow successful photography, but we will not know for sure until the film has been processed.

Overall, we found the **Franklin** an ideal vessel for filming and we appreciated the comfortable cabins and abundant supply of food. Our film will explore the nature of marine biologists and so we were fortunate in having to weather several periods of high winds and rough seas. Under such conditions the resilience of both crew and scientists was tested and we noted a very business like attitude to what was really very unpleasant weather. The unstinting co-operation of all concerned was greatly appreciated.

It is hoped that, by setting out in some detail the nature of this kind of marine research, our film will promote an increased understanding of and sympathy for both the marine environment and those who study it.

David Smith
ImageAction Films.

Attachment 2: Electronics Report.

S/Steel SDL Ser No. 010

Prior to the first IKMT (#50) the newly refurbished SDL was set to trigger on 10mmho/cm Conductivity, however on retrieval, communication showed sampling had not been triggered. Tests were made using real time logging and then triggering was reset on temperature as another deployment was waiting. On retrieval after IKMT #51 there was no communication between the SDL and controller, and following dismantling, a small amount of water was found inside the pressure vessel. All electronics were removed and cleaned. See also

Equipment above.

Plastic SDL Plant no. MH1205

The scientific part requested the use of the PVC SDL in a shallow IKMT cast to obtain some idea of how deep the net was trawling with a known amount of wire deployed. The PVC SDL was deployed on the IKMT with 450m wire out, the resultant data showed a flightpath of 185-190m at 1.8 knots.

A second cast trawl was done in 500m depth using 600m of wire and planned velocity of 2 knots for 15 minutes followed by 15 minutes at 3 knots, however the bottom came up very fast to 180m and the IKMT was retrieved after only 5 minutes at 600m wire out to reveal the cod end of the net full of shells and other bottom material.

The SDL appeared to have only superficial damage, the data was retrieved and showed that the pressure had exceeded full scale, but without pressure calibration onboard it was impossible to say whether this was the case or not. Real time logging onboard confirmed all sensors to be OK.

EK400 Sounder.

A interesting intermittent problem developed with the EK400, the symptoms are that the AR805 trace gradually gets weaker and then disappears completely. At first this could be remedied by exercising the Transducer Select relay, but later it seemed to be more sensitive to exercising the attenuation level, as if a glitch might occasionally find its way into the attenuation control register.

INMARSAT Receiver

The antenna disc AZ motor is now completely u/s, the antenna has to be turned by hand at all times. With a multitude of course changes during dredging and trawling it is virtually impossible to maintain sufficient receiver signal level for communication.

Intech Navigation

Although this has worked reasonably well lately, a small problem arose where a manually set drift of 8 knots could not be removed without a hardware reset.

Closed Circuit Television

The Master has requested that the CCTV camera, mounted on the starboard side of the funnel, be serviced during the next port period, in particular, attention should be given to the iris adjust and wiper control as they are not operational at all.

Erik Madsen

31-Oct-88