R.V. FRANKLIN

NATIONAL FACILITY
OCEANOGRAPHIC RESEARCH VESSEL

RESEARCH PLAN

CRUISE FR2/91

Sails Adelaide 0700 — Tuesday 15 January 1991
Calls Portland— Monday 28 January 1991
Arrives Hobart 1200 — Wednesday 30 January 1991

Principal Investigators

Professor Chris von der Borch School of Earth Sciences
Flinders University of South Australia
Bedford Park, SA 5042

Drs Yvonne Bone and Vic Gostin Dept of Geology + Geophysics
Adelaide University
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Dr Noel James Department of Geological Sciences
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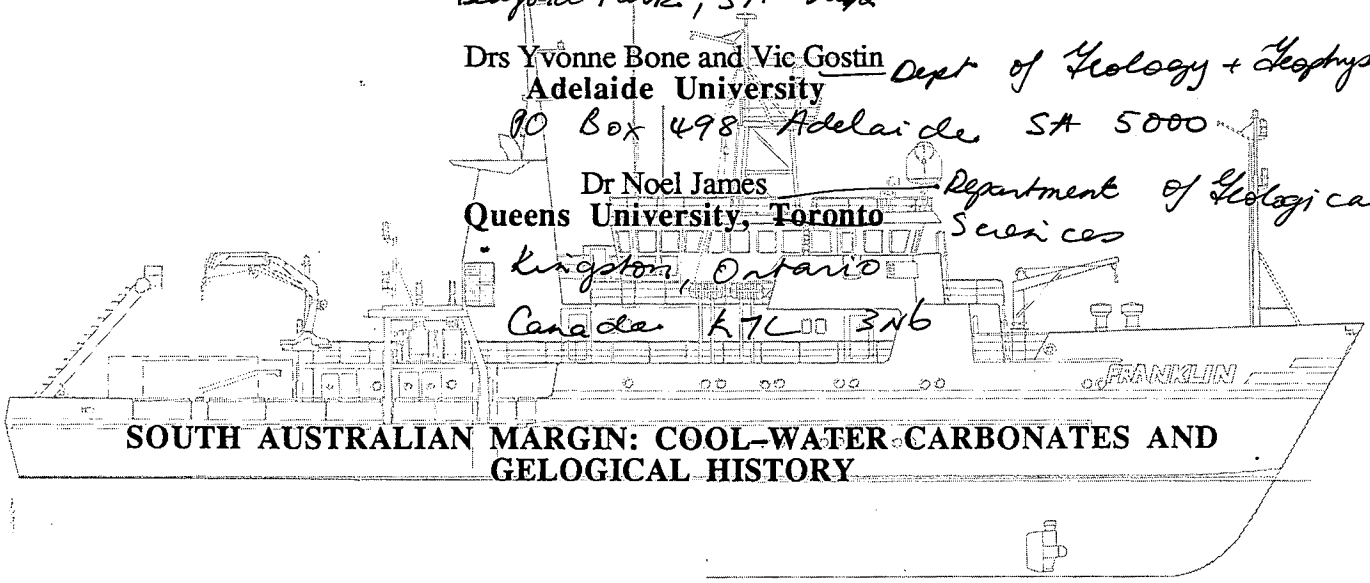
Kingston, Ontario
Canada K7L 3N6



SOUTH AUSTRALIAN MARGIN: COOL-WATER CARBONATES AND GELOGICAL HISTORY

15 October 1990

Bernadette Baker

CSIRO Division of Oceanography

HOBART

For further information contact

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:D AND OPERATED BY CSIRO

R.V. FRANKLIN
NATIONAL FACILITY OCEANOGRAPHIC RESEARCH VESSEL

RESEARCH PLAN CRUISE FR 02/91

Itinerary

Depart Adelaide: 0700 hours Tuesday, 15th January, 1991 (Day 1)
Arrive Portland: 1200 hours Monday, 28th January, 1991 (Day 14)

Personnel

C.C. (Chris) von der Borch – Chief Scientist, Flinders University
V.A. (Vic) Gostin – Adelaide University
N.P. (Noel) James – Queens University, Ontario
Y. (Yvonne) Bone – Adelaide University
G. (Graham) Evans – Electronics – Flinders University
R. (Bobbie) Rice* – Adelaide University
A. (Tony) Belperio – S.A. Dept. Mines & Energy
V. (Viki) Drapala* – Australian National University
T. (Tom) Burreen – Queens University, Ontario
S. (Shane) Andrews* – Flinders University or
C. (Colin) Gatehouse* – S.A. Dept. Mines & Energy
D. (Dave) Vaudrey – Cruise Manager – CSIRO
E. (Erik) Masden – CSIRO

(* to be confirmed)

Background to scientific programme

A GLORIA and SEABEAM survey (HMAS Cook), collected detailed swathe imagery and bathymetric information on the outer continental shelf and continental slope south of Kangaroo Island, South Australia (Fig. 1). This has provided an invaluable database upon which to base a subsequent cruise. The subsequent cruise (FR 02/91) will focus on selected areas of the GLORIA image and SEABEAM bathymetry as well as on nearby areas studied previously during FR 03/89. This will provide ground–truth sampling of the GLORIA image (sediment dredging, seafloor photography and piston coring). It will also test shelf–edge and upper slope depositional processes in a region of coolwater carbonate production Finally, high–resolution seismic profiling will be utilized to collect sub–bottom information along the outer shelf region adjacent to the GLORIA survey area, where previous studies (FR 03/89) have demonstrated the existence of notable slope progradation.

Specific cruise aims

Four sampling and profiling techniques will be utilized: (1) piston coring (700 kg); (2) sediment dredging; (3) seafloor photography; (4) high–resolution seismic profiling. Techniques 1 and 4 require calm conditions, technique 3 requires calm to moderate seas, while technique 2 can be successfully carried out in moderately rough seas. Thus the cruise plan is left somewhat flexible so that particular sampling techniques can be matched to varying weather conditions. Basically, however, all sampling and profiling will be carried out in close relation to the GLORIA survey area shown in Fig. 1., outlined by latitudes 37°00 to 37°40', and longitudes 137°40' to 139°00'. Sample tracks and localities are shown on Figs. 1 and 2. Because it is our experience that weather conditions off southern

Australia are likely to be quite variable, no details of an actual schedule are provided.

ORV equipment required

Standard navigation and depth systems will be required, but no call will be made on specialized physical oceanographic facilities apart from a few XBT casts. Use will be made of IBM compatible computers for data logging and report writing. The cruise party will provide piston corers and accessories, dredges, bottom camera and seismic profiler, together with all sample handling and collection tools and containers.

There will be a requirement for rigging the 700 kg piston corer for deployment through the main (stern) A–frame. Maximum clear space will be require on the aft deck to facilitate loading and unloading of the corer. The cruise party will provide a steel cradle to store the corer in a horizontal position. The stern rope capstan winch will be required for attaching the corer trigger weight.. The corer will be identical to that deployed recently on cruise FR 05/90.

Detailed cruise plan

As stated above, no specific days are earmarked for the various techniques. However the following plan will be more than sufficient to fill the allotted time.

Between 100–300 nm of seismic profiling will be attempted, running at 4 knots (dashed zig zag track, Fig. 1). The actual amount will depend upon sea state and the functioning of the equipment in water depths beyond 150m.

Based on the results of the seismic profiling, a sediment dredging programme will be designed, to sample key regions of outcropping strata, in water depths between 150 and 500m. Bottom photography will also be carried out on targets selected from the seismic lines.

A piston coring, dredging and deepsea photography programme will focus on targets selected on the basis of the existing detailed SEABEAM bathymetry (Figs. 1 and 2). The aims will be (1) to provide a sediment core transect across the upper continental slope to water depths of about 1000m (Stations 1–5, Fig. 2). Coring also will be attempted along the axes and levee banks of two of the main upper slope gullies (stations 6–17, Fig. 2). The aim of these samples will be to test whether or not sediments are being transported down slope during the present sealevel highstand.

Summary of time estimates for cruise

Steaming time: 520 nm. @ 12 knots	43 h
Seismic survey: 320 nm. @ 4 knots	80 h
Piston coring (26 stations):	80 h
Dredging (60 stations):	60 h
Bottom photography (40 stations):	40 h
Contingency time(weather; minor variations to station loaclities based upon equipment performance)	14 h
Total operations time	317 h
Time available:	317 h

This cruise plan is in accordance with the directions of the National Facility Steering Committee for the oceanographic research vessel R.V. Franklin.

A.D. McEwan
CSIRO Division of Oceanography

D.H. Green
National Facility
Steering Committee

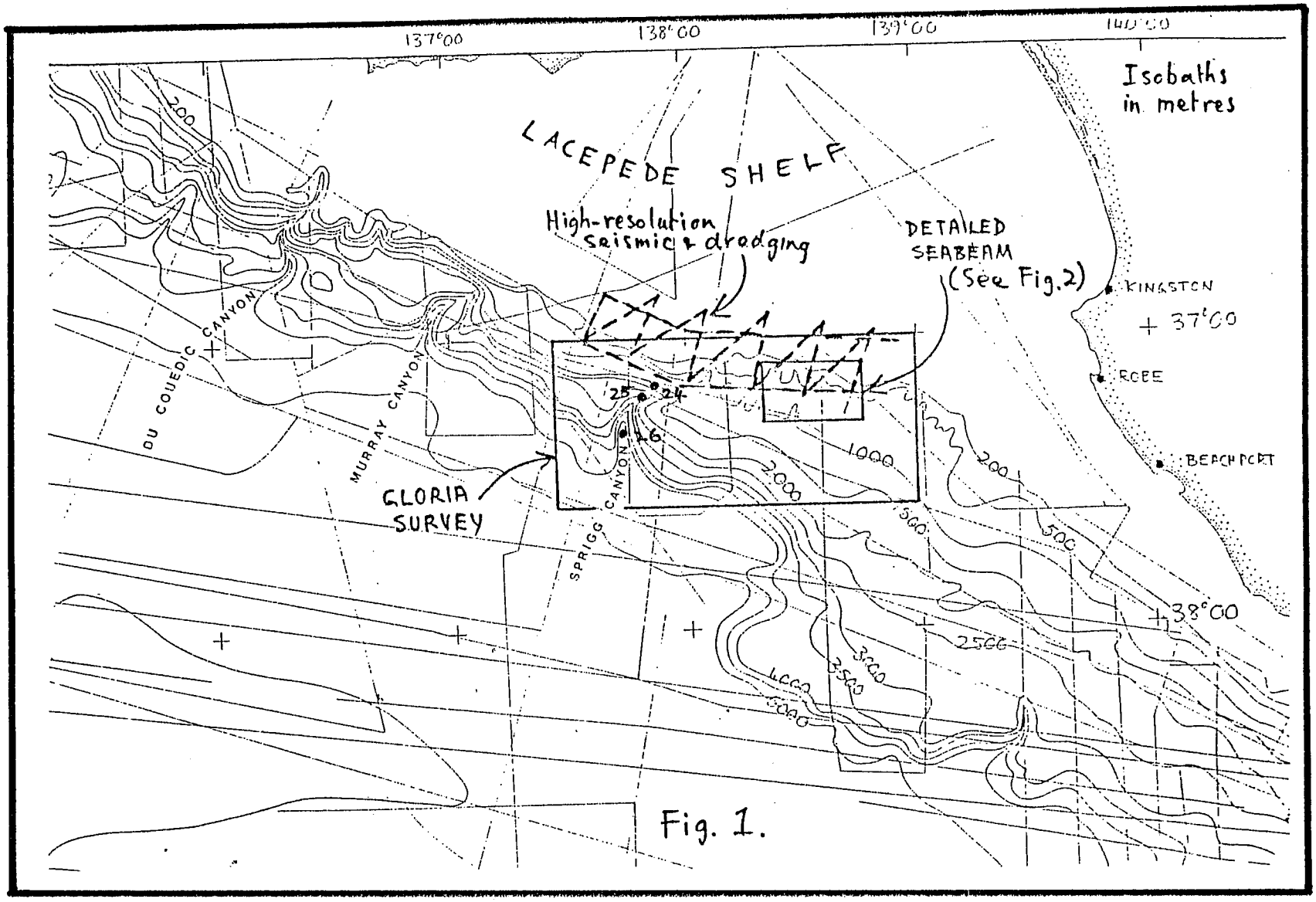
137°00
138°00
139°00
140°00
Isobaths in metres
LACEPEDE SHELF
High-resolution seismic & dredging
DETAILED SEABEAM (See Fig.2)
KINGSTON
37°00
ROBE
BEACHPORT
38°00
DU COUEDIC CANYON
MURRAY CANYON
SPRIGG CANYON
GLORIA SURVEY
25
24
26
200
1000
2000
500
2500
3000
3500
4000
5000

Fig. 1.

SEABEAM BATHYMETRY (metres)

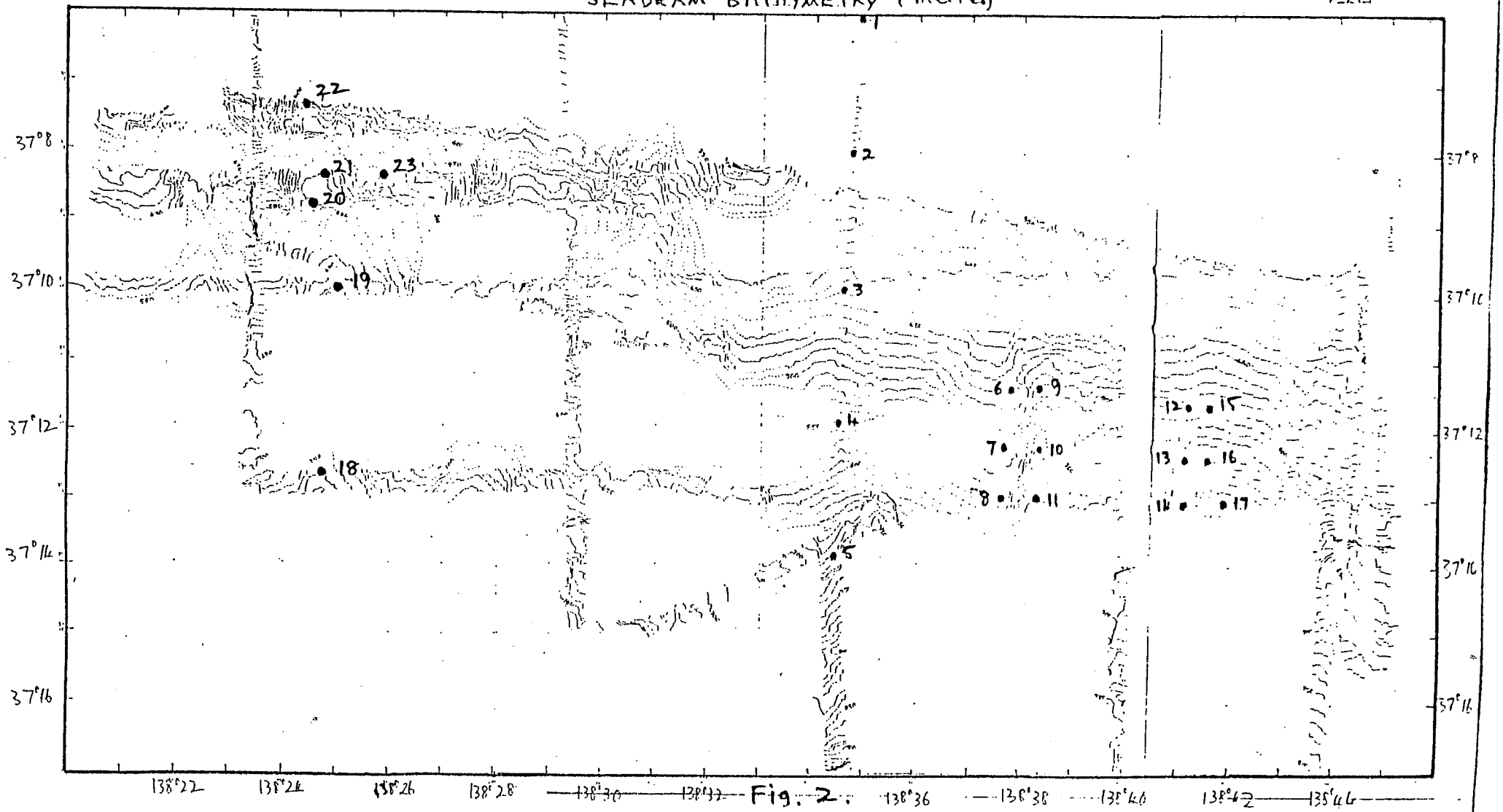

Fig. 2.

FRANKLIN CRUISE FR 02/91

Piston core stations

Station No.	Lat.	Long.	Depth (m)
1	37° 06.0	138° 34.9	150
2	37° 08.0	138° 34.7	200
3	37° 10.0	138° 34.5	440
4	37° 12.0	138° 34.4	550
5	37° 14.0	138° 34.3	690
6	37° 11.4	138° 37.8	470
7	37° 12.3	138° 37.7	510
8	37° 13.1	138° 37.7	545
9	37° 11.4	138° 38.4	500
10	37° 12.3	138° 38.4	565
11	37° 13.0	138° 38.4	600
12	37° 11.4	138° 41.3	490
13	37° 12.6	138° 41.2	525
14	37° 13.2	138° 41.2	540
15	37° 11.7	138° 41.7	500
16	37° 12.4	138° 41.6	545
17	37° 17.0	138° 41.9	600
18	37° 12.7	138° 24.7	760
19	37° 10.0	138° 25.0	610
20	37° 8.8	138° 24.5	550
21	37° 8.4	138° 24.8	540
22	37° 7.4	138° 24.4	450
23	37° 8.4	138° 25.9	480
24	37° 8.0	137° 51.5	1500
25	37° 10.5	137° 48.3	2800
26	37° 20.0	137° 45.8	4600