



## National Facility Research Vessel

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### Voyage Plans and Summaries

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#### Franklin Voyage Plan No. FR08/00

##### Title

The Continent-Ocean Transition of the Crust and Mantle across the North West Shelf (Leg 2)

##### Itinerary

Depart Dampier 1000 hrs, Friday 22 September 2000  
Arrive Dampier 1000 hrs, Monday 25 September 2000

##### Principal Investigator(s)

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##### Scientific Objectives

The north west margin of Australia includes the Pilbara Archaean shield, the Phanerozoic Canning and Canarvon sedimentary basins and the Exmouth Plateau. Geophysical measurements of magnetic and electric fields onshore

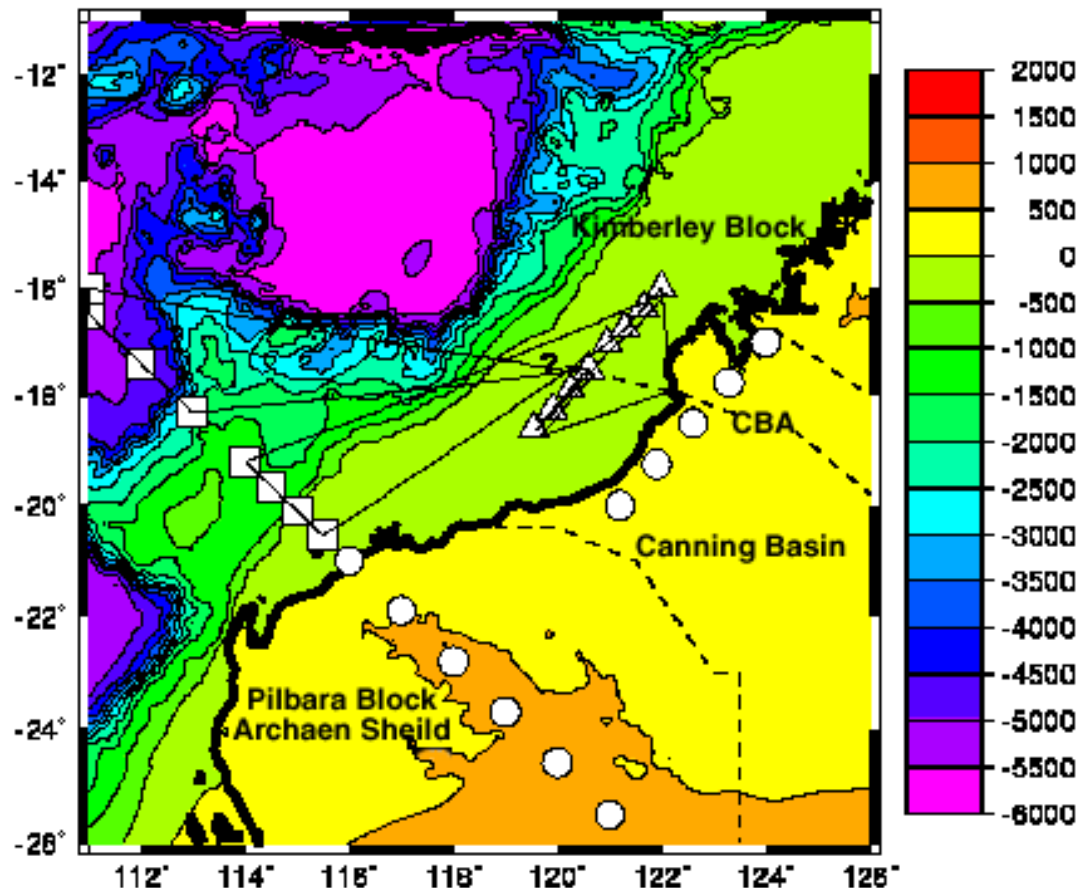
and offshore provide a means of imaging the crust and mantle structure in terms of electrical conductivity. The principal aims of the project are:

(a) to determine crust-mantle structure and anisotropy across the continental margin, from Archaean shield to ocean abyssal plain;

(b) to investigate the Canning Basin conductivity anomaly across the margin and its relationship to extensional faults imaged from deep-seismic profiles of the Fitzroy Trough.

### Cruise Objectives

Up to twelve seafloor MT instrument (squares in Figure 1) will be recovered from the seafloor deployments sites established from the first leg of the cruise in August. The same instrumentation was recently recovered off the coast of Eyre Peninsula (1998) and Gulf of Carpentaria (1999) in a similar configuration, so we foresee no logistical difficulties.



**Figure 1** : Geology, instrument locations and ship tracks for the first cruise. The main geological units are the Archaean Shields of the Pilbara and Kimberley Blocks, between which lies the Canning Basin. The Canning Basin electrical conductivity anomaly is shown by the dashed line marked CBA. Circles show approximately the proposed instrument locations on land. At sea, squares show location of the long-period instruments that will be deployed for

a few weeks, while triangles show the sites of short-period instruments that are deployed for two-days at a time.

### **Cruise Track and Time Estimates**

The cruise will simply leave Dampier and steam along the line of instruments (squares in Figure 1), starting from the deepest site and ending up at the coast. Up to twelve instruments will be recovered during the cruise.

Day 1. Leave Dampier, steam to outer site in 5000 m of water. Estimated distance 400 nm @ 10 knots = 40 hours.

Recover twelve instruments (approximately 40 hours and 12 instruments @ 1.5 hours each = 58 hours)

Day 4. Return to Dampier. Total time required = 98 hours = 4 days

### **Piggy-back Project**

Two berths on this cruise will be made available to researchers from the Cetacean Ecosystem Program at Deakin University, who will participate as cetacean observers.

### **Franklin Equipment**

*Franklin's* bottom mounted 12 kHz transducer as on previous cruises.

### **User Equipment**

Eight seafloor magnetotelluric instruments, four seafloor magnetometer instruments, acoustic deck unit.

### **Personnel List**

Dr G. Heinson, Adelaide University, Chief Scientist, Recover OBEMs  
A/Prof A. White, Flinders University, Project Leader, Recover OBEMs  
Dr F.E.M. Lilley, ANU, Magnetomer Recovery  
Prof. K. Bahr, Goettingen University, Marine Geophysics  
Dr F. Simpson, Goettingen University, Marine Geophysics  
\*TBA, Deakin University, Cetacean Observer  
\*TBA, Deakin University, Cetacean Observer  
Ron Plaschke, CMR, Cruise Manager  
Lindsay Pender, CMR, Computing  
Erik Madsen, CMR, Electronics

\* The cetacean observers will also participate on the transit leg from Darwin leaving on Sunday, 17 Sep 2000 and sailing to Dampier arriving Thursday, 21

September 2000.

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

John Wallace  
Ships Manager

Updated: 31/01/03

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