



Voyage ss2011_v06

The Perth Abyssal Plain: Understanding Eastern Gondwana Break-up.

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Contribution to Australia's national benefit

The Perth Abyssal Plain is one of the more poorly understood ocean basins surrounding Australia. The aim of cruise ss2011_v06 was to collect magnetic, bathymetric and dredge data to address knowledge gaps regarding the:

1. Crustal nature of prominent features in the basin.
2. Tectonic mechanism/s responsible for forming the basin and its prominent structures.
3. Timing of the formation of the basin and prominent structures.

Survey ss2011_v06 achieved its scientific aims including the collection of six magnetic anomaly profiles across the Perth Abyssal Plain, and the collection of swath and dredge data from seven sites on the Batavia Knoll, Gulden Draak Ridge, and Dirck Hartog Ridge. Continental rocks were recovered from the Batavia Knoll and Gulden Draak Ridge demonstrating that these features are micro-continents rifted from India during breakup between Australia and India.

This project contributes to Australia's national benefit under National Research Priority Goal 1.6, developing deep earth resources, by mapping areas of unexplored seafloor offshore the Western Australian coast.

As a result of this voyage:

1. We have found that the Batavia Knoll and the Gulden Draak Ridge are likely continental in nature, while the Dirck Hartog Ridge is likely a purely oceanic feature.
2. We have a better understanding of the seafloor spreading processes that formed the Perth Abyssal Plain and led to the formation of the Batavia and Gulden Draak micro-continents, as well as the Dirck Hartog Ridge, and the distinctive trough north of the Batavia Knoll.
3. We have mapped both bathymetry and magnetic anomaly data across the previously under-surveyed Perth Abyssal Plain, and collected rock samples from 7 locations to understand the crustal nature of the seafloor.

4. We have commenced programs of:

- i. magnetic anomaly processing and interpretation; and
- ii. analyses of the rock samples obtained to understand the timing and mechanism of their formation. Together these data will enable us to refine tectonic reconstructions of India-Australia separation, which formed the Perth Abyssal Plain.

Itinerary

Departed Fremantle,
16:00, Thursday, 20 October 2011

Arrived Fremantle,
08:00, Wednesday, 9 November 2011

> Voyage track ss2011_v06

