



Voyage SS08-2005

GA Survey 282: Characterising benthic habitats and sedimentary processes of southwest Australian margin, including developing an understanding of the petroleum potential of the East Mentelle Basin.

Dr Andrew Heap, Geoscience Australia (Chief Scientist)

Contribution to Australia's national benefit:

The main survey objectives were to address existing knowledge gaps regarding deep-water temperate benthic marine habitats on the outer shelf, slope and offshore platform environments on the southwest Australian margin. A further objective of the survey was to assess the petroleum potential of the Mentelle Basin.

This work has obvious benefits in the development of valuable resources in the region.

The major scientific outcomes of the geophysical surveying program were:

- Swath data cover a completely new area of the seabed that revealed the true extents of the blind submarine canyons in SW Australia including two previously unknown canyons.
- The swath data also completed coverage of the Perth Canyon to fill in remaining gaps. The Perth Canyon is now 100% covered by high-resolution swath bathymetry data;
- The most comprehensive shallow seismic dataset ever collected for the SW margin. The data revealed the sediment thickness and sub-surface architecture of the study area.

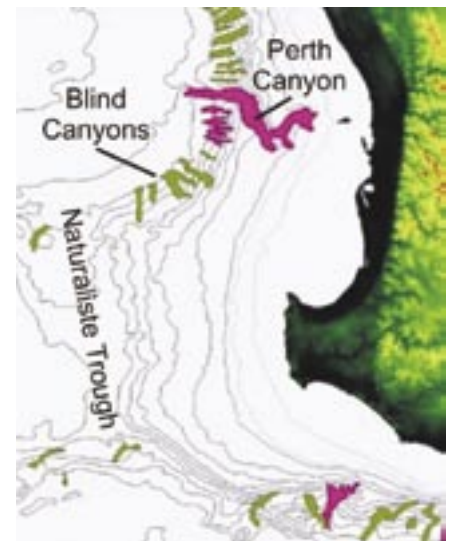
The major scientific outcomes of the physical sampling program were:

- Obtained history of deep-water sediment deposition in the canyons and surrounding margin from the cores.
- Recognised four major water masses throughout the region. These water masses are: 1) well-mixed surface layer (0-100 m), 2) stratified oxygen-rich water (100-600 m), 3) stratified oxygen-poor water (600-1200 m), and 4) stratified cold bottom water (>1200 m);
- Obtained first rocks ever to be collected from the Mentelle Basin (terrigenous mudstones) (Fig. 5);
- Obtained basement rocks (metamorphosed granite) close to the surface indicating the extent of the Mentelle Basin sequence along its northern margin;
- Obtained the first ever images of the seabed below 2,000 m from this margin. The seabed images revealed that the deep sea is mostly covered with spiculitic ooze with sub-cropping rocks restricted to steep flanks and incised canyons. The benthic biota are sparse, but the photographic evidence indicates that there is an abundant and active infauna, with many new species.

Itinerary

Depart Fremantle 1000hrs,
Wednesday 28th September 2005.

Arrive Fremantle 1000hrs,
Thursday 20th October 2005.



> SS08-2005 voyage track:

The location of known submarine canyons on the southwest margin of Australia. Perth Canyon is the largest and most extensive canyon on the southwest margin and cuts the shelf. The other canyons are "blind" canyons and wholly confined to the slope.