



Voyage SS06-2006

Central North West Shelf Seepage: Identifying potential natural hydrocarbon seeps and petroleum prospectivity, Offshore Canning and Roebuck Basins.

Dr John Kennard, Geoscience Australia (Chief Scientist)

Contribution to Australia's national benefit:

This research was undertaken to improve understanding of the petroleum prospectivity of the Offshore Canning and Roebuck Basins off Broome, WA. This frontier exploration region is located between proven hydrocarbon provinces of the Carnarvon Basin to the southwest, the Browse Basin to the north and includes the pristine coral reefs of the Rowley Shoals.

Sites of hydrocarbon seepage can support highly diverse ecosystems. The interaction of nutrients they deliver with biogeochemical cycles and the resulting impacts on sediment substrates may see them associated with fossil and, or modern reef systems. Natural hydrocarbon seepage can provide direct evidence for an active petroleum system within the subsurface, a key indicator of a region's prospectivity for petroleum exploration.

Areas of potential hydrocarbon seepage were targeted for investigation by combining existing seismic, bathymetry, and satellite based synthetic aperture radar data. The areas of interest were investigated during the voyage by acquiring sediment samples, multi-beam swath bathymetry, echo-sounder, side-scan sonar, sub-bottom profiler and fluorometry data, seafloor video-camera footage and additional, satellite based, synthetic aperture radar images.

Highlights of the voyage included:

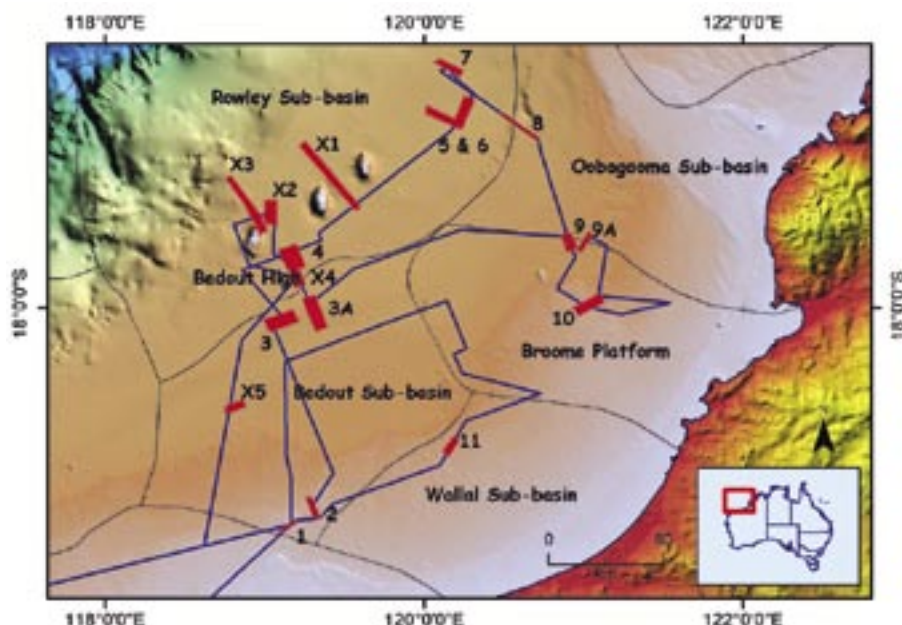
- mapping a transtensional fault zone aligned with and immediately inshore of the Rowley Shoals reefs. The high quality sub-bottom profiles obtained indicated active fault movement within 5-10 m of the seabed in the historically recent past (1000-10,000 years),
- discovery of an extensive 60 m thick pelagic depositional mound,
- investigation of a field of oolitic megadunes pierced by clusters of small, crater-shaped, pockmarks

lined with nodular concretions. Video camera images showed cloudy fluids being actively vented from the pockfield. Follow-up geochemical analyses of the concretions will be undertaken to investigate the origin of the vented fluids (eg. basinal or meteoric groundwaters) and presence of hydrocarbons.

Itinerary

Depart Geraldton 1200 hrs, Monday 29th May 2006.

Arrive Port Headland 1510 hrs, Thursday 22nd June 2006.



> SS06-2006 voyage track:

Surveyed Areas 1-11 and X1-X5.