Voyage ss2013_c02

Great Australian Bight Science Plan: Benthic, Pelagic and Petroleum Geochemistry Themes

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Contribution to Australia's national benefit:

This was a chartered voyage servicing the needs of three Theme areas (Benthic and Pelagic Ecology and Petroleum Geochemistry) within a research program that aims to characterise key elements of marine ecosystems across the GAB, including in the deep central GAB area where oil and gas exploration is planned in the next few years.

It is expected that uptake of this information will include identifying the needs of monitoring programs for ecosystem effects of oil and gas exploitation if the exploration phase finds commercially viable reserves.

This information will provide national benefit by helping the Australian government, especially the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), understand benthic conservation values attributed to Commonwealth Marine Reserves (CMR) spanning wide depth ranges. These values remain untested on the mid- and lower continental slope – which is particularly relevant in the GAB where oil and gas lease areas extend across the deep reaches of the GAB Marine Park.

As a result of this voyage:

1. We will have a better understanding of deep ocean (200-2000 m depth) benthic habitats and macrofaunal and meiofaunal biodiversity in the previously unsampled central GAB, and be able to characterize and quantify the structure and function of microbial communities (including hydrocarbon degrading microbes).
2. We developed new equipment and implemented a chain-of-custody process for samples and data that represents best practice for future MNF voyages.
3. We used the EK60 single beam, EM300 multibeam sonar and the TOPAS sub-bottom profiler to map all sample sites, plus several prospective seep areas identified by analysis of historical seismic data and by using real-time synthetic aperture radar detection of surface slicks. Hydrocarbon sensing data were taken at all sites (near-seabed), and near-surface by underway sampling.
4. We have commenced a program of deep marine ecosystem characterisation by successfully collecting quantitative samples of benthic infauna and associated environmental covariates.

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