Integrated Ocean Drilling Program

Australia has joined the Integrated Ocean Drilling Program (www.iodp.org), which is the world's largest multinational geoscience program and includes almost all OECD countries. IODP carries out deep scientific coring around the world's oceans, and provides 'ground truthing' of global geoscientific theories that are often based largely on remote sensing techniques.

New technologies and concepts in geoscience are continuously being developed through IODP. IODP is a long-term program and membership will have important scientific outcomes for us. Australia was a highly successful member of IODP's precursor, the Ocean Drilling Program (ODP). The Research School of Earth Sciences hosts the Australian IODP Office (www.iodp.org.au) along with other National Facilities - AuScope and ANSIR.

Submarine plateaus off northeast Australia

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Mellish Rise and adjacent deep-water plateaus of northeast Australia: new evidence for continental basement from Cenozoic micropalaeontology and sedimentary geology. *In*: Blevin, J.E., Bradshaw, B.E. and Uruski, C. (Eds), *Eastern Australasian Basins Symposium III*, Petroleum Exploration Society of Australia, Special Publication, 317-323.

Widespread rifting and seafloor spreading replaced the compressional regime off eastern Australia from around 120Ma, in the Early Cretaceous. The magnetic anomalies in the newly formed oceanic crust indicate that spreading commenced in the south and migrated progressively northwards carving off large ribbon-like microcontinents. Gaina et al (1998) postulated from geophysical data that the Mellish Rise and other seafloor highs off northeast Australia might be microcontinental fragments but no geological evidence was available.

Two scientific cruises using R.V. *Southern Surveyor* (GA270 and GA274) obtained core and dredge samples, and seismic and bathymetric data, from the Kenn Plateau and Mellish Rise, and the Louisiade Plateau. A diverse suite of sedimentary rocks includes shallow and deep-water carbonates, siliciclastics, volcanogenic facies, deep-water siliceous lithologies, and some seawater precipitates. The carbonates have provided age dates from foraminiferal and calcareous nannofossil assemblages, which range in age from Paleocene to present day, and prevailing climate and palaeo-water have also been determined.

Some carbonates and siliciclastics contain quartz and mica grains and metamorphic lithic fragments indicating a continental provenance. Dredge sites located along the recently acquired seismic profiles indicate that the continental-derived lithologies correspond to isostatically buoyant basement blocks that have a uniform chaotic seismic reflection. The elevation of the basement blocks relative to oceanic crust in the intervening deep basins, coupled with the petrological properties of the grains and lithics, suggest that continental basement underlies the seafloor highs. The best evidence comes from a Late Eocene sandy glauconitic calcarenite on the southern Mellish Rise, which incorporates angular quartz grains. The age implies that deposition occurred subsequent to drifting and hence reflects a local source rather than contamination by terrestrial material from the continental shelf.

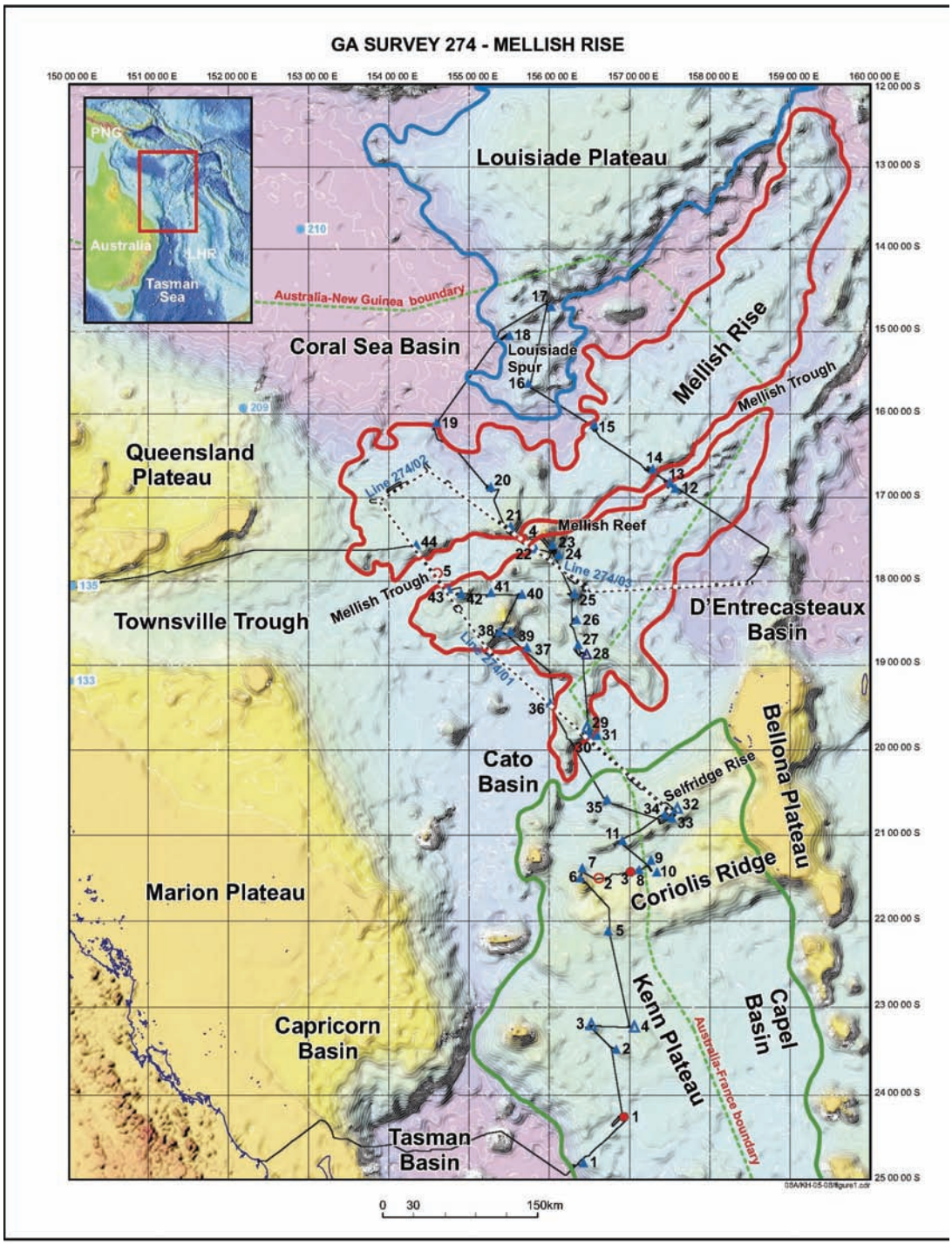

Figure 1. *Bathymetric map of offshore northeast Australia showing the Kenn Plateau, Mellish Rise (north and south segments), and Louisiade Plateau with the ship's tracks, dredge and gravity core sites from GA274 cruise. Legend: dredge sites (blue triangles), gravity core sites (red circles), ship's track (solid black line), seismic lines (dashed black line), and ocean drilling sites (numbered blue circles).*