Preliminary exploration of the southern Great Barrier Reef Ice Age submerged palaeoshorelines and drowned coral reefs

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Figure 1. The Schmidt Ocean Institute research vessel Falkor *mapping and exploring the upper continental slope at the outer edge of the Great Barrier Reef, Queensland, Australia (image credit Dean Miller/Schmidt Ocean Institute).*

The southern extent of the modern Great Barrier Reef (GBR) marks the transition from tropical to subtropical ocean conditions. The shelf edge and upper slope in this vast area of the southern GBR were poorly mapped when compared to the north. Very little systematic multibeam seafloor mapping had been done in the southern GBR with most datasets collected opportunistically while in transit.

Here, we present preliminary results from a 30-day expedition on the Schmidt Ocean Institute research vessel *Falkor* (Fig. 1) that targeted the shallow upper continental slope and shelf-edge of the southern GBR between depths of 50 – 150 m below present sea level. During the Last Glacial Maximum (LGM) sea level was ~120 m lower than today and the continental shelf was exposed, with parts of the GBR connected to the mainland.

The results of high-resolution multibeam sonar mapping has revealed a diverse suite of submerged geomorphic features that are consistent with past sea level modal depths (Brooke et. al., 2017). The 50 – 60 m and 90 – 120 m contours revealed a series of laterally extensive drowned coral reef terraces along the entire Capricon-Bunker shelf edge (Fig. 2), consistent with features investigated further north (Webster et al., 2018). A series of 15 m high linear beach ridge storm deposits were mapped in 90 m water depth and are analagous to similar beach ridge deposits

found on the present-day coastline 130 km to the west (Brooke et. al., 2008). Mapping also revealed the geomorphic characteristics of the palaeo-Fitzroy River channel and delta, previously obscured in airborne lidar bathymetry data (Ryan et. al., 2007).

These new bathymetry and backscatter data extend our understanding of eastern Australia's palaeoshorelines and provide a basis for further investigating the southern GBR in relation to coastal geomorphology, sea level dynamics, reef growth and demise, sediment transport, benthic habitats and potential sites of human occupation during periods of lower sea level.

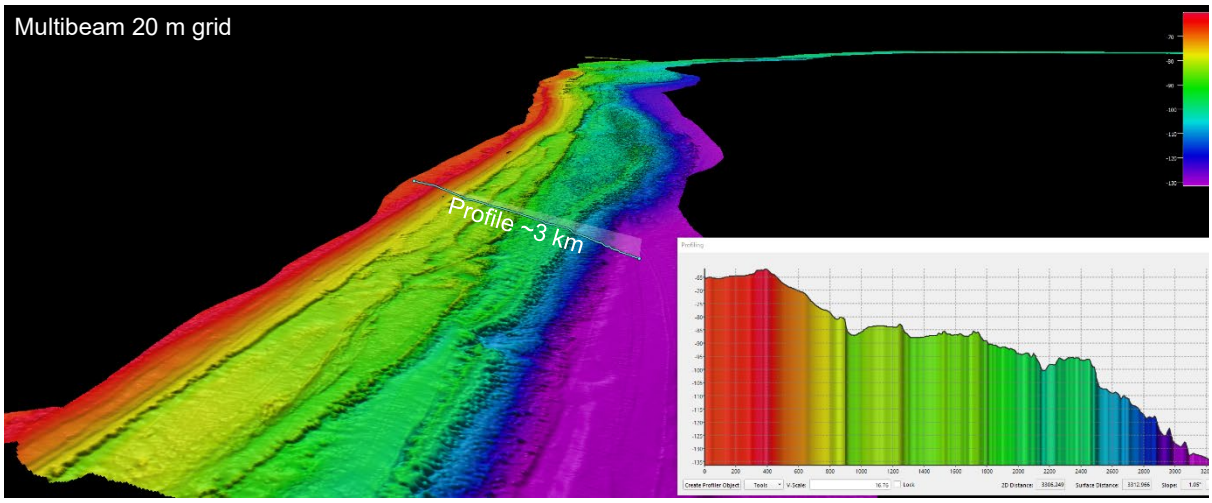

Figure 2. New high resolution multibeam bathymetry mapping revealed a diverse suite of submerged palaeoshoreline features including laterally extensive coral reef terraces that grew and 'drowned' in response to glacial and post-glacial sea level change (multibeam data from Schmidt Ocean Institute).

References

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