

A fossil reef from the last interglacial, Western Australia

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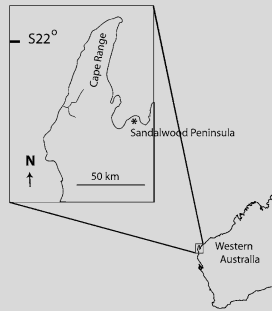


Fig. 1 Location of the Sandalwood Peninsula



Fig. 2 Fossil coral reef assemblage. **a** Coral colonies including *Goniastrea*, *Hydnophora*, *Favia*, *Favites*, *Lobophyllia* and *Platygyra* preserved in growth position on erosion surface. **b** Detail of erosion surface with *Goniastrea australiensis* preserved in situ. **c** View of erosion surface with extensive borings preserved

We report an initial investigation of a Devils Point Event (DPE) style surface exposed approximately 1.5 m above present sea level in a spectacularly preserved reef sequence in southern Exmouth Gulf, Western Australia. The fossil coral reef is exposed at Point Maxwell on the Sandalwood Peninsula (Fig. 1). Two reef-building sequences, separated by a distinctive erosion surface are present. The erosion surface truncates a lower coral-bearing unit and has been colonized by numerous coral colonies preserved in growth position (Fig. 2a, b). The surface is riddled with many different borings (Fig. 2c). Although initial dating of corals using alpha spectrometry suggests a Late Pleistocene age, the geochronology of the sequence has not been established. We interpret it as Last Interglacial (MIS 5e) based on its position relative to present sea level, its mode of preservation, and a tentative correlation with fossil reefs exposed on the west side of Cape Range (for which radiometric ages have been published). The distinctive sedimentologic and paleontologic signatures of the erosion surface suggest a regressive-transgressive event similar to the DPE described from Great Inagua and San Salvador Islands, Bahamas by Wilson et al. (1998) and White et al. (1998). U-series dates obtained from reef corals preserved in the Pleistocene Tantabiddi Limestone exposed on the western margin of Cape Range (approximately 75 km west of southern Exmouth Gulf) were published by Stirling et al. (1998) and evaluated in the context of the DPE by White et al. (2001). Reliable dates for that region range from 115 to 129 ka, and are divided equally between pre- and post-DPE ages. However, the stratigraphic relationship between the assemblages from which the corals were obtained is unknown. Moreover, the significance of Late Cenozoic tectonism versus glacio-eustatic change in exposing the marine sequences in the region remains unclear (Kendrick et al. 1991). Further examination of the fossil reef described here should provide additional evidence to assess the climatic instability that has been reported for the Last Interglacial.

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References

- Kendrick GW, Wyrwoll K-H, Szabo BJ (1991) Pliocene-Pleistocene coastal events and history along the western margin of Australia. *Quaternary Sci Rev* 10:419–439
- Stirling CH, Esat TM, Lambeck K, McCulloch MT (1998) Timing and duration of the Last Interglacial: evidence for a restricted interval of widespread coral reef growth. *Earth Planet Sc Lett* 160:745–762
- White B, Curran HA, Wilson MA (1998) Bahamian coral reefs yield evidence of a brief global sea-level lowstand during the Last Interglacial. *Carbonates and Evaporites* 13:10–22
- White B, Curran HA, Wilson MA (2001) A sea-level lowstand (Devil's Point Event) recorded in Bahamian reefs: comparison with other Last Interglacial climate proxies. In: Greenstein BJ, Carney CK (eds) *Proceedings of the 10th symposium on the geology of the Bahamas and other carbonate regions*. Gerace Research Center, San Salvador, Bahamas, pp 109–128
- Wilson MA, Curran HA, White B (1998) Paleontological evidence of a brief global sea-level event during the last interglacial. *Lethaia* 31:241–250

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Reef sites

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