

Last glacial to deglacial biotic changes on the Great Barrier Reef from offshore boreholes

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IODP Expedition 325 drilled 34 boreholes into submerged reef structures along the shelf edge of the Great Barrier Reef (GBR). The boreholes were drilled between 42 and 167 mbsl at 17 sites along four transects at three geographic locations (Hydrographers Passage, Noggin Pass, and Ribbon Reef). The last glacial to deglacial reef sequence (~8 ka to ~27 ka) varies in thickness from ~5.5 m to ~34 m and consists primarily of corallgal boundstone with various proportions of microbialite. We use a detailed chronostratigraphic scheme based on numerous C14 and U-Th ages to discuss the evolution of the corallgal communities since the last glaciation. Exp. 325 cores show that different phases of sea level change promoted different shallow reef-building coral species at the study sites. The onset of the deglacial (16-19 ka) is characterized by a peak abundance of *Seriatopora* and *Tubipora* whereas the following rapid sea level rise (<16 ka) is marked by the dominance of massive *Isopora* and *Acropora* with medium- to robust-size branches. The shift in composition of coral communities around 16 ka coincides with the flooding of a pre-LGM MIS2 reef terrace, an event which had a major influence on reef growth and reef composition. We discuss the impact of this event on corallgal communities in the GBR and its significance for Quaternary reef evolution in general.

キーワード: IODP Expedition 325, Great Barrier Reef, Corallgal assemblages, Sea level changes, Glacial, Deglacial
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