



Reef response to sea-level and environmental changes during the last deglaciation. IODP Expedition 310 “Tahiti Sea Level”

Gilbert Camoin and the IODP Expedition 310 Tahiti Team

CEREGE, UMR 6635, CNRS-Collège de France-IRD, B.P. 80, F-13545 Aix-en-Provence cedex 4 France. Email :
gcamoin@cerege.fr

The last deglaciation has been characterized by a rapid sea-level rise and coeval abrupt environmental changes. The Barbados coral reef record suggested that this period has been punctuated by two brief intervals of accelerated melting (Melt Water Pulses), occurring at 14,000 and 11,300 cal. yr. BP, superimposed on a smooth and continuous rise of sea level. Although their timing, their magnitude, or even their existence have been actively debated, those catastrophic sea-level rises are thought to have induced distinct reef drowning events.

The reef response to sea-level and environmental changes during the last deglacial sea-level rise at Tahiti is reconstructed based on a chronological, sedimentological and paleobiological study of cores drilled through the relict reef features occurring on the modern fore-reef slopes during the IODP Expedition 310.

Changes in the composition of coralgall assemblages coincide with abrupt variations in reef growth rates and characterize the response of the upward-growing reef pile to a non-monotonous sea-level rise and coeval environmental changes.

No major break in reef development occurred between 16,000 and 10,000 cal. yr. BP. Reefs accreted mostly through aggradational processes at growth rates averaging 10 mm yr⁻¹, thus precluding any catastrophic impact on reef development such as the temporary cessation of reef growth as it was reported in the Barbados record. An incipient drowning and a general backstepping of the reef complex have been evidenced during the 14,600-13,900 cal. yr. BP time window implying that reef growth gradually lagged behind sea-level rise.