



New evidence for the existence of the MWP-1A from a “far-field” site - Preliminary results from the Tahiti IODP Expedition 310

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Tahiti is a volcanic island characterized by slow and regular subsidence rates and located at a considerable distance from the major former ice sheets and corresponds, therefore, to an ideal setting to reconstruct the deglacial sea-level rise and to constrain short-term events that are thought to have punctuated the period between the Last Glacial Maximum and the present days. So far, the only coral record that encompasses the entire deglaciation is based on cores drilled offshore Barbados [1, 2]. This record suggests a non-monotonous sea-level rise punctuated by two dramatic accelerations. These so-called MWP1-A (Melt Water Pulse) and MWP1-B events, centered at $\sim 14,000$ and $\sim 11,300$ cal. yr BP respectively, are thought to correspond to massive inputs of continental ice.

Nevertheless, the exact relationship between those events and the global climatic evolution remains enigmatic and controversial. The available deglacial curves obtained from continuous cores drilled in reefs off Huon Peninsula [3] and Tahiti [4], did not confirm the magnitude and timing of the MWP-1B. Barbados is relatively close to the former North-American ice sheet and the island itself belongs to an accretionary prism overlying an active subduction zone. The possibility remains that the apparent

sea-level record may not be free of tectonic or isostatic complications. Concerning the MWP-1A, several paleoclimatic records are consistent with its occurrence, but the ice source responsible for such a step in sea-level rise has not yet been identified. Consequently, it is a key issue to fully confirm the existence and amplitude of the MWP-1A by a precise coral reef record in a far-field site located in a oceanic basin distant from Barbados. Such a record would also allow geophysical models to reconstruct the temporal and spatial patterns of MWPs and thereby help to identify the sources of the ice (e.g. [5]).

The recent IODP Expedition #310 “Tahiti Sea Level” [6] offers the unique opportunity to extend the existing Tahiti sea-level curve [4] and to provide a continuous coral reef record for the Pacific Ocean that encompasses the MWP-1A key period (~14,500 – ~13,700 cal. yr BP). The offshore coring operations carried out during that expedition recovered more than 400 m of post-glacial reef material, ranging from 122 to 40 m below modern sea level (see Camoin et al. in session CL36 for an overview of the objectives and first results of the expedition). Preliminary U-series dating results of selected corals considered as reliable indicators of past sea-level positions imply the occurrence of an accelerated rise in sea level during the MWP-1A time window. Its amplitude is apparently similar to that of the MWP-1A recorded in Barbados. Additional data will be necessary to constrain it accurately. The implication of this result in terms of the potential sources of the ice that generated the MWP-1A will be discussed.

[1] Fairbanks 1989, *Nature* **342**, 637.

[2] Bard et al. 1990, *Nature* **346**, 456.

[3] Edwards et al. 1993, *Science* **260**, 962.

[4] Bard et al. 1996, *Nature* **382**, 241.

[5] Clark et al. 2002, *Science* **295**, 2438.

[6] Camoin, G.F., Iryu, Y., McInroy, D., and the Expedition 310 scientists, in press. Proc. IODP, 310 : College Station TX (Integrated Ocean Drilling Program Management International, Inc.).