

ODP Proposal Log Sheet

Interior

☐

Environment

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519-Full2

Proposal received: March 15, 1999

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New proposal

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Revised proposal

☐

Addendum

☐

Other

The Last Deglacial Sea-Level Rise in the South Pacific: Offshore Drilling in Tahiti (French Polynesia) and on the Australian Great Barrier Reef

G.F. Camoin, E. Bard, B. Hamelin, P. Pezard, P.J. Davies, W.C. Dullo

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Brief description:

The history of sea-level and sea surface temperature variation associated with the last deglaciation is of prime interest to understand the dynamics of large ice sheets and their effects on Earth's isostasy. So far, the only sea-level record that encompasses the whole deglaciation is based on offshore drilling of Barbados coral reefs which overlie an active subduction zone, implying that the apparent sea-level record may be biased by tectonic movements. This proposal seeks to establish the course and effects of the last deglaciation in two reef settings developed in tectonically inactive areas at sites located far away from glaciated regions, in Tahiti (French Polynesia) and on the Australian Great Barrier Reef. At each site, it is proposed to realize a transect of several offshore drill holes using a Portable Remotely Operated Drill ('PROD') in combination with submersible ('JAGO') observation and mapping, downhole measurements and high-resolution seismic-reflection profiles. The study will have three major objectives. The first objective will be to reconstruct the deglaciation curve for the period 20,000 to 10,000 yrs BP in order to establish the minimum sea-level during the Last Glacial Maximum (LGM), and to assess the validity, the timing and amplitude of meltwater pulses (so-called MWP-1A and MWP-1B events; c. 13,800 and 11,300 cal. yr BP) which are thought to have disturbed the general thermohaline oceanic circulation and, hence, global climate. Secondly, we will establish the SST variation accompanying the transgression at each transect. These data will allow us to examine the impact of sea-level changes on reef growth, geometry and biological makeup, especially during reef drowning events, and will help improving the modeling of reef development. The third major objective will be to identify and to establish patterns of short-term paleoclimatic changes that are thought to have punctuated the transitional period between present-day climatic conditions following the LGM. It is proposed to quantify the variations of sea surface temperatures based on high-resolution isotopic and trace element analyses on massive coral colonies. When possible, we will try to identify specific climatic phenomena such as El Nino-Southern Oscillation (ENSO) in the time frame prior to 10,000 yrs BP.

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Proposal reviewed:

☐ *New proposal*☒ **Revised proposal**☐ *Addendum to proposal*☐ *Other***The Last Deglacial Sea-Level Rise in the South Pacific: Offshore Drilling in Tahiti (French Polynesia) and on the Australian Great Barrier Reef**

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Abbrev. Title: Sea-Level Rise South Pacific Reefs

Key: Great Barrier Reefs

Area: SW Pacifi

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Objectives:

1. To reconstruct the deglaciation curve for the period 20,000-10,000 years BP in order to establish the minimum sealevel during the Last Glacial Maximum (LGM), and to assess the validity, timing and amplitude of meltwater pulses.
2. To establish the SST variations accompanying the transgression at each transect.
3. To identify and establish patterns of short-term paleoclimatic changes that are thought to have punctuated the transitional period between present-day climatic conditions following the LGM.

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