

# Depositional environmental changes recorded in the Paleogene calcium carbonates in the mid-latitude South Pacific Ocean—Preliminary report of bulk chemical and Nd-Sr isotope ratios at IODP Site U1553

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During the Paleogene, Earth experienced a significant transition from hot to cold climate, or from the “Hothouse” to the “Coolhouse” [1]. Specifically, during the long warm period of the early Paleogene, the oceanic environment was different from the present day because there was no large polar ice sheet and a reduced equator-polar sea surface temperature gradient [2]. Moreover, the Paleogene was also marked by large-scale tectonic events in the high-latitude South Pacific, such as the spreading of the Tasman Sea [3], and the opening of the Tasman Gateway as the Australian continent broke away from the Antarctic continent allowing the formation of the Antarctic Circumpolar Current [4]. However, it is not fully understood how the global climate change or tectonic movements during the Paleogene affected the depositional environment in the high-latitude South Pacific. In early 2020, International Ocean Discovery Program (IODP) Expedition 378 drilled Site U1553 (1221 meters below seafloor) at the Campbell Plateau located south of New Zealand, which recovered continuous deep-sea sediments from the early Paleocene to the early Oligocene [5].

Here, we report new results of the bulk chemical compositions and Nd-Sr isotopic ratios of Site U1553 bulk sediments. Combining our results with the shipboard analyses of carbonate contents performed on the same samples, we will present a preliminary discussion of the recorded depositional environments at Site U1553.

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