

# Anomalously negative $\delta^{13}\text{C}$ across the water column of the tropical oceans during the penultimate warm period

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We present new results of a paleoclimate study from the Indian Ocean (Bay of Bengal). The record reveals an anomalously low carbon isotope ratio across the water column during the Eemian warm period, demonstrating the recent discovery of a negative carbon isotope anomaly in the Equatorial Atlantic Ocean and Indian Ocean (Weldeab et al., 2022, Clemens et al., 2023) presents not an isolated but wide-a spread event that impacted the carbon isotope of the entire water. The shallow subsurface sediments of the Gulf of Guinea and Bay of Bengal contain abundant methane hydrate deposits. In the Gulf of Guinea record, the timing of the carbon isotope anomaly coincides with an intermediate water warming that exceeds the stability field of methane hydrates. We hypothesize that the carbon isotope anomaly is a manifestation of methane hydrate destabilization. Our study documents climatic events and climatic feedback processes associated with and triggered by the penultimate peak climate warming.

Reference:

**Weldeab S.** et al. (2022): Evidence for massive methane hydrate destabilization during the penultimate interglacial warming. *The Proceedings of the National Academy of Sciences*. <https://doi.org/10.1073/pnas.2201871119>.

Clemens et al. (2023): Indian margin methane hydrate dissociation recorded in the carbon isotopes of benthic (Miliolida) foraminifera. *Earth and Planetary Science Letters*. <https://doi.org/10.1016/j.epsl.2023.118101>