Boron isotope-based pCO_2 record for the Eastern Equatorial Pacific over the last 5 My

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Preliminary results of pH, pCO_2 and deep water [CO_3^{2-}] for the early Pliocene to Holocene based on boron isotope ($\delta^{11}B$) and B/Ca measurements of foraminifera of the Eastern Equatorial Pacific is presented. These records aim to explain the long-term cooling that characterises the last five million years of earth climate. This cooling is thought to be primarily driven by a drop in atmospheric pCO2, the key greenhouse forcing of climate. Possible reasons for this decrease in atmospheric pCO_2 includes changes in air-sea exchange of CO_2 caused by increased stratification of surface waters and / or increase in deep ocean carbon storage. While nutrient consumption in low-latitude environments and the associated carbon export to the deep sequesters CO_2 in the ocean interior, the upwelling of these deep waters to the surface at high latitudes, equator, and along the eastern boundaries releases the CO_2 back to the atmosphere. Quantification of the temporal variation in surface water pCO_2 levels in different regions of the ocean, and the identification of sources and sinks of CO_2 to and from atmosphere are essential to elucidate the role of the ocean in driving and/or amplifying variations in the atmospheric pCO_2 and subsequent climate change.

We have developed records of boron isotopes, B/Ca and Mg/Ca ratios for multiple species of foraminifera (*Globigeneroides sacculifer, Globigeneroides ruber, Neogloboquadrina dutertrei, Cibicidoides wullestorfi*). We reconstruct changes in carbonate system parameters at different depths in the water column in the Eastern Equatorial Pacific at Ocean Drilling Program Site 847 (0°N, 95°W, 3373 m water depth). These data are used to examine if there is evidence for changes in deep ocean carbon storage and CO_2 outgassing during the early Pliocene warm period and during Pliocene intensification of Northern Hemisphere glaciation.