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Coral proxy data records historical climate variability in the Maldives, Indian Ocean

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We present the first historical climate proxy record from the Maldives archipelago (Indian Ocean), obtained from massive *Porites* colonies cored at Rashdoo Atoll (4˚17'N, 73˚00'E). Scleractinian corals are important archives of historical climate data at low latitudes, especially when instrumental records are not available. *Porites* is particularly well suited for high-resolution studies due to average growth rates of 10 to 15mm/a. Annual skeletal banding consists of dense summer layers and less dense winter layers. For this study, coral cores were collected from four living massive shallow water *Porites lutea* colonies from the lagoon and fore reef of Rashdoo atoll. Lengths of the cores are around 1.2 m and cover the entire 20^{th} century, given known growth-rates. Our study focuses on the variability of the proxies δ^{18}O, Sr/Ca and δ^{13}C. Investigations are currently under way. While δ^{13}C can yield information about food supply, photosynthetic activity and anthropogenic CO_2 emission in time, δ^{18}O in coral skeletons is mainly a function of SST and the isotopic composition of the ambient seawater, respectively. Combined with the salinity-independent Sr/Ca ratio it is possible to use the temporal δ^{18}O variability to reconstruct salinity variations (i.e., evaporation, precipitation). Previous historical coral proxy studies in the Indian Ocean have revealed strong non-stationary teleconnections with the Pacific realm via monsoon system and ENSO $(1. - 3.)$. As shown for the Chagos Achipelago (5˚20'S, 71˚55'E), coral time series provide a good tool to track the temporal variability of the Inter tropical convergence zone (ITCZ), due to the fact that rainfall is strongly depleted in δ^{18}O. In the

late 1970s, oxygen isotopes of this time series show a shift from interdecadal (Monsoon variability) to interannual variability (coupled to ENSO variability) in the Indian Ocean, suggesting a major change in the monsoon-ENSO coupling, maybe caused by increasing SST. Therefore, our proxy-data at the location of Rashdoo Atoll, slightly north of the equator, will help to better understand climate development in the NW Indian Ocean, with its influence on monsoon and ENSO variation. δ^{13}C might exhibit information about cloudiness, and therefore help monitoring the location of the ITCZ. Another aspect of our study is to get more information about occurrence and strength of bleaching events, which were caused by high temperatures in the past. A better understanding of the dynamic of the Indian Ocean climate system is of great socio-economic value, because deviation from the normal Monsoon climate variation may cause flooding, draughts and therefore economic crises.

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