Long-term dynamics of a high-latitude coral community at Sodwana Bay, South Africa

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Dynamics in percentage cover, mortality and recruitment success of a high-latitude coral assemblage in South Africa were studied over 20 years with the rationale of detecting the effects of climate change. Coral communities at this locality are the southernmost on the African continent, non-accretive, attain high biodiversity and are dominated by soft corals. Long-term monitoring within fixed transects on representative reef was initiated in 1993, and has entailed annual photo-quadrat surveys and hourly temperature logging. Although sea temperatures rose by 0.15 °C p.a. at the site up to 2000, they have subsequently been decreasing, and the overall trend based on monthly means since monitoring commenced has been a significant decrease of 0.03 °C p.a. Minor bleaching was encountered during the 1998 El Niño Southern Oscillation event. A significant decreasing trend in soft coral cover has been evident throughout the monitoring period, attributable to decreases in Sinularia and Lobophytum spp. cover. Contrastingly, hard coral cover gradually and significantly increased up to 2005, this being largely attributable to increases in cover by Acropora spp. Recruitment success and mortality for both soft and hard corals has displayed high inter-annual variability with increasing but non-significant trends in the last five years. The reduction in soft coral cover has been more consistent and greater than that of hard corals but it is difficult at this stage to attribute this to changes in acidification-linked accretion or temperature. These factors as well as other possible causes for the decline will be discussed.