

## Reef environmental changes under anthropogenic influences: sediment cores beneath the reclaimed areas of Naha City

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Coral reef ecosystems are now being threatened by global environmental changes and human impacts. However, it is still argued that when and how increasing human populations historically affect coral reef ecosystems. This is because limited studies have been conducted on long-term environmental and ecological changes in coral reefs. In this study, we examined the geochemistry and micropaleontology of sediment cores drilled from the reclaimed areas of Naha City (Okinawa Prefecture, Japan), where pristine coral reefs had been reclaimed. 10-m deep cores with a recovery of >90% were obtained from six sites in coastal reclaimed areas of Naha City. In order to determine the timing and impacts of anthropogenic influences (e.g., terrigenous inputs and human activity), major elements ratio (e.g., SiO<sub>2</sub>/CaO) was measured by EDX (XRF), and mineral compositions (quartz/carbonates) were determined by XRD. To reveal long-term reef environmental changes, grain-size compositions, and the taxonomic composition and abundance of foraminiferal assemblages were analyzed. Results showed that Holocene sediments with several meters in thickness cover the Pleistocene limestone (the Ryukyu Group), and are overlain by landfill sediments and soils. The Holocene cores consist mainly of bioclastic carbonate sand and mud with *in situ* corals and coral gravels, and increasingly contain terrigenous siliciclasts in the upper part of cores. Radiocarbon ages of fossil *in situ* corals and molluscs indicate that coral reefs developed at least 7-6 ka in offshore areas, and at ca. 5-4 ka in inshore areas, and that some cores may record historical changes in terrigenous sediment inputs into coral reef environments, starting from periods of Gusuku and Ryukyu Kingdom.