

## Seagrass bed indicator in sediment off coral reef beach in the Eastern Kume Island.

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There are biological and geomorphological zones called seagrass bed off the coast of the coral reef. Seagrass bed is the name of shallow sea areas overgrown with seagrass, it is located in coral reefs and just offshore from beach, and provides the fishery that provided marine products and various ecosystem services which is the habitat of dugongs and sea turtles as known as an endangered species (Unsworth et al., 2019). Seagrass bed plays various roles in the coral reef and is attending to ecological study. However, the timing of landform developing of seagrass bed is still incompletely understood. Previous geomorphological research of coral reefs has focused on understanding development process of reef crest.

The coral reef landform of Kume Island, which is our research area, started forming about 8,300 years ago, and the reef crest reached the sea-level about 5,700 years ago. Then, after reaching the sea-level of the reef crest, the lagoon separated from the open sea is filled with unconsolidated sediment (Takahashi et al., 1988, Kan et al., 1991). However, the coastal area composed unconsolidated sediments represented by seagrass beds is still incompletely understood.

In this study, sediment cores obtained from seagrass beds in Eastern Kume Island were used as samples. And field surveys and some experiments were carried out (e.g. Radiocarbon dating using coral pebbles and foraminifera included in sediments, biocrust analysis, grain size analysis, foraminifera community analysis and mineral analysis using X-ray diffractometer). Field surveys in the seagrass bed in eastern Kume Island carried out and found large benthic foraminifera (*Calcarina calcarinoides*) that predominately lives on modern seagrass leaves.

As a result of foraminifera community analysis contained in sediments using this foraminiferal fossil as an indicator of seagrass bed developed, results indicating that seagrass bed was developed after 3900 cal yr BP (water depth less than 3 m below mean sea-level). Furthermore, grain size analysis of sandy sediments indicated that sorting of particle size was better in layers indicating seagrass bed developed than before seagrass bed developed. This results indicate the ability of the seagrass bed to fix sediment. Therefore, the seagrass bed growth upward with fixing sediment on its sediment by seagrass formed a community.

Keywords: Coral reef, seagrass bed, Foraminifera, Radio carbon dating, Holocene