

Preliminary measurement of surface erosion and sedimentation in mangrove forests

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Preliminary measurement for detecting sea level rise (SLR) effects on mangrove forests has been done at Iriomote Island, Japan and Ponpei Island, Federal States of Micronesia in 2018. The short term SLR effects were measured by surface erosion and sedimentation. If sedimentation rate on a mangrove forest floor is faster enough to catch up with SLR, the forest will adapt on the change (Fujimoto et.al. 1989).

Nevertheless, if it is slower than SLR, or erosion rate becomes greater than sedimentation rate, the forest will NOT adapt on the change (Furukawa et.al. 2002).

Sedimentation rate has been observed by 7 cm diameter sediment traps set on the forest floor. Organic matters in the trapped sediment has been checked by simplified Ignition Loss test by 400 degC burning. Sedimentation pattern was determined using simple relation i.e. under the well mixed sediment transport condition, sedimentation rate is decayed naturalized logarithmically from sediment supply point (Furukawa et.al 1997). Erosion rate has been calculated by subtraction of sedimentation rate from observed net flux. It was observed by high frequency (1 min.) sampling of water level and suspended sediment concentration at border of the forest and sea.

Various observation sites gave different pattern but same order of sedimentation and erosion could be happen in the forests. For further consideration, following points should be studied i.e. 1) clarification of detail sediment transport mechanism by sheet flow occurring inundation and drained timing, 2) clarification of sediment transport mechanism change due to tidal range, and 3) clarification of sediment transport through secondary creeks.

This research has been done as a part of “Mangrove forests community situation understanding against SLR.”

Keywords: Sea Level Rise, Adaptation of ecosystem, Mangrove forests, Sediment transport