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Topographic surveying to estimate coastal protection area : Majuro atoll, Marshall Island

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Majuro Atoll in the Marshall Island is one of the atolls in the South Pacific islands. Atoll islands are formed by coral reefs and their elevation are few meters above sea level. Central lagoon is shallow compared to the ocean. Now coastal erosion is a serious problem in the Majuro atoll, and it is said that caused by human land development. The main purpose is to maintain the land for sea level rise. Sato et al (2006) have been conducted annual field survey in Majuro atoll since 2004. They survey along the shore line which SOPAC (Pacific Islands Applied Geoscience Commission) surveyed 1997 and 1998. Kuwahara et al(2007) developed of spatial information in coastal areas. They determined the elevation of coastal areas by visual inspection, three of medium and low and high categories.

In this study, our purpose is to determine priority protection area in Majuro atoll. Now we need detailed topographic information based on the field surveying, GPS camera, and satellite data. So, we conducted detailed topographic survey around SOPAC survey line with using Total Station (Nikon DTM-S405C).

We presenting following two results and prospects for future research.

- 1) At northern part of Laura Island, We confirmed that the sand was moved from the lagoon to the ocean compared to the 2004.
- 2) We define the border of the elevation classification low level and middle level.

It is whether the highest elevation point is 2.0m higher than average sea level Majuro atoll. These results help quantify the elevation of visual classification. In the future, in addition to this result, we are going to observe the changes in vegetation and sand area from past satellite images, and analyze configuration of soil particles collected in the survey point to assessment of priority areas. Ultimately we want to determine the priority areas.

Keywords: coastal erosion, topographic surveying, sea level rise