Oral session

Development of an underwater video system for the observation of coastal benthic vegetations

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Benthic vegetation has important roles in coastal ecosystems. Vegetation analysis and biomass estimation are urgently required for proper utilization and conservation of coastal area and also for sustainable fisheries. Not only in Japan but also in Southeast Asian countries, vast coastal areas remain to be explored where threatened by coastal development. Therefore low cost and feasible methods to elucidate coastal benthic vegetation should be developed. Although remote sensing methods such as aerial photography and satellite imaging give us efficient ways for vegetation mapping on wide area, these methods are still expensive and limited in the spatial and temporal coverage with high resolution satellites like Ikonos or Quickbird. Seagrasses occur on shallow and flat sandy bottom suitable for these methods, ground truthings are still required. For macroalgae, predominant on rocky littoral and sub-littoral zones, direct visual observation by divers has been used. The accuracy of species identification is expected to be high, but the time consuming procedures result in limited coverage of area.

To overcome these limitations we have developed a monitoring system for benthic vegetation in conjunction with underwater video, GPS and depth sounder. Although limited resolution of the image might affect the accuracy of species identification, the synchronized recordings of video image and three-dimensional positioning of vegetation enabled quick monitoring to cover certain spread of area. It was possible to deploy the system in different ways, from traditional quadrat placement on transect line, to serial towing, so that the diversity of species and bottom environments could be adequately observed. Bathymetry and monitoring of bottom substrate and invertebrates were also enabled with the system.

The two applications of this system in Japan and SE Asia will be introduced. In Japan we conducted boat-based observation for steep rocky littoral to sublittoral zones where canopy forming large brown alagae such as *Sargassum* and *Laminaria* were abundant in spring and early summer. Another example is an observation in tropical intertidal flat where seagrasses such as *Thalassia* and *Enhalus* are dominant.