Application of Bio-Optical Model and Satellite Image in Identification and Mapping of Submerged Macrophytes in South-Basin of Lake Biwa, Japan

*Shweta Yadav[1], Yosuke Yamashiki[1], Minoru Yoneda[1], Tamura Masayuki[1], Suzaki Junichi[1], Kanako Ishikawa[2]

1.Kyoto University, 2.Lake Biwa Environmental Research Institute (LBERI)

Abstract
Aquatic macrophytes are important for primary production and environmental protection of marine and fresh water ecosystems. However excessive growth of macrophytes may cause an adverse shift in shallow lakes from clear-water plant-dominated states to turbid algae-dominated state. In order to effectively manage the inland waters and their ecosystem, it is crucial to monitor the community structure and distribution of aquatic macrophytes.
Present study focus on identifying and mapping the submerged macrophyte species dominated in eutrophic south basin of Lake Biwa, using satellite image (Landsat) and bio-optical model. Spectral signature of various submerged macrophytes were generated. Laboratory experiments were conducted to identify the reflectance spectra of the macrophytes at different wavelength, using FieldSpec Spectroradiometer. Result indicates that visible (450-670 nm) and near-infrared (850-880 nm) bands are the significant for spectral discrimination of submerged macrophytes. Image processing software Erdas-Imagine-2013 was used to map the macrophytes species.

Keywords: Remote Sensing, Bio-Optical Model, Submerged Macrophytes, Mapping