Mapping of submerged aquatic vegetation in the lake using the multispectral satellite remote sensing approach

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Submerged Aquatic Vegetation (SAV) plays a central role in stabilizing the freshwater ecosystem and can also potentially affect the water quality of inland or coastal water bodies. Recently, the massive overgrowth of invasive SAV species associated primarily with the anthropogenic nutrient enrichment negatively affecting the water quality, biodiversity and recreational activities of many freshwater ecosystems in the world. However, the temporal and spatial monitoring of SAV and other optically active components such as chlorophyll is commonly hindered by the limited accessibility and the cost involved in the site-specific observations for many large lakes. In this study, we present a satellite remote sensing based approach for the monitoring of SAV for the Lake Biwa (2014-2016). A spectral decomposition algorithm was used to estimate the concentration of optically active substances and water clarity, using the Landsat-8 satellite images. The image was used to classify and map the SAV coverage area using the spectral mixture analysis. The SAV biomass estimation model was used to determine biomass of the SAV classified pixels in the lake. The satellite-derived water quality and SAV result were validated using the in-situ measurements of the lakes.

Keywords: Submerged Aquatic Vegetation, Water Quality, Remote Sensing

