

# Application of Satellite Remote Sensing to Monitor Eutrophication Status of Inland Lakes

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Eutrophication of inland lakes is becoming a severe environmental issue all over the world. Routine monitoring of eutrophication status of inland lakes is essential for guaranteeing sustainable development of freshwater resources. The coupled spatial and temporal heterogeneity of water bodies often result in inadequate monitoring and characterization of water quality by using conventional sampling methods. On contrast, satellite remote sensing is quite flexible for monitoring the eutrophication status of inland lakes in terms of being able to cover large spatial areas at very frequent intervals. However, remote sensing of inland lakes has been far less successful than that of open oceans, due mainly to the complex interactions among optically active substances in the lake waters, as well as the difficulties in atmospheric correction. In this presentation, we will introduce our state-of-the-art remote sensing algorithms for estimating Chlorophyll-a concentrations (Chl-a) and Secchi disk depth (SDD), which have been widely used to evaluate the eutrophication status of lakes. These algorithms have been extensively validated using extensive in situ collected data sets, yielding satisfactory performances in overcoming the difficulties in remote sensing of turbid inland lakes. Application studies on satellite-based operational monitoring of Chl-a and SDD in several lakes of Japan will also be presented. Assessment results demonstrated that the proposed algorithms have the potential of being applied to operationally monitor water quality of inland lakes.

Keywords: inland lake, satellite remote sensing, water quality