EARTH OBSERVATION SYMPOSIUM (B1)
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REMOTE SENSING WATER TRANSPARENCY MEASUREMENT FOR TROPHIC STATE MONITORING OF LAKES AND RESERVOIRS

Abstract

Lakes and reservoirs serve as important resources by providing water for a variety of crucial needs, including drinking water, agriculture, recreation, fisheries, wildlife, and many other uses Consequently, there is increasing concern that anthropogenic eutrophication threatens the usability of lakes and reservoirs. However, consistent and reliable monitoring is critical to preserving this valuable resource. Historic methods such as direct, in-situ measurements may not provide the necessary spatial or temporal coverage to maintain comprehensive monitoring. Therefore, water resource managers continue to investigate alternate methods to facilitate the monitoring and protection of these natural resources.

This project uses Landsat and MODIS satellite image data to supplement traditional means of measuring water clarity to determine tropic state. Satellite imagery was collected from November 2002 to September 2004 and compared to existing state-wide water clarity data collected by the Mississippi Department of Environmental Quality (MSDEQ). The in-situ water clarity measurements were determined by measuring Secchi Depth, the depth at which a Secchi Disk is no longer visible within the water column. Satellite-based water clarity measurements were determined from the Landsat and MODIS spectral radiances. This research proposes to compare these two types of water clarity measurement techniques to determine their effectiveness in monitoring trophic state.

The goal of this investigation is to develop a state-wide system to monitor water clarity and trophic state of lakes and reservoirs using satellite imagery. Specifically, this project investigates the viability of using remote sensing data to monitor water transparency and presents a trophic state classification of selected MS lakes and reservoirs using spectral reflectance derived trophic state scale. These methods could improve the areal coverage, reduce the costs and increase the potential frequency of water transparency monitoring. If viable, the proposed methods could complement current water monitoring methods and permit the interpolation of trophic state of lakes and reservoirs.