



## **Evaluation of satellite-based estimation of water quality parameters in Reservoir Valle de Bravo in Mexico**

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Lakes and reservoirs usually provide essential water resources, including drinking water for most cases, for nearby basins and local communities. Maintaining high water quality standards of lakes and reservoirs is an important aspect of water management. To this end, timely and accurate monitoring of water quality parameters is essential for detecting sudden harmful changes and taking measures to maintain adequate standards of water quality. The conventional method for monitoring water quality is from in-situ point-based sampling and analysis. It requires time and financial resources, and most important, the number of sampling is often temporally and spatially limited leading to insufficient characterization of water quality in large lakes and reservoirs. Satellite remote sensing has been demonstrated to be a powerful tool for monitoring water quality of water bodies timely and at a larger scale. In this study, we will evaluate the performance of satellite-based estimation of water quality parameters in Reservoir Valle de Bravo that is a multipurpose waterbody providing drinking water to the metropolitan area of Mexico City. After reviewing various satellite data, we decide to use satellite imagery from MERIS (Medium Resolution Imaging Spectrometer) together with part of limited in-situ measurements to develop satellite-based methods for estimating water quality parameters. The three considered water quality parameters include Secchi Disk Depth (SDD), Turbidity and Total Dissolved Solids (TDS). Various combinations of MERIS bands and band ratios are considered and evaluated for developing the optimal and specific algorithms for estimating each of the three water quality parameters. Independent in-situ measurements are used to validate the satellite-based estimates of water quality parameters. The validated algorithms are further applied to long time-series MERIS imagery data to analyze the temporal and spatial patterns of water quality in Reservoir Valle de Bravo.