WIND-INDUCED RESUSPENSION OF TOTAL SUSPENDED MATTER IN LAGUNA LAKE

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ABSTRACT.

Laguna Lake is the largest lake in the Philippines and serves as a freshwater resource used by surrounding regions including the National Capital Region which has the largest population density in the country. The lake's water quality has been deteriorating over the years despite its significance to society. One of the parameters used to measure water quality is total suspended matter (TSM). Suspended matter is known to increase nutrient cycling, and turbidity among other effects. However, few studies have been done on the dynamics of suspended matter in Laguna Lake. The lake's shallow depth allow wind-induced wave action to cause resuspension of matter settled on the lake bed. Due to the varying wind speeds experienced by Laguna Lake throughout the year, it is expected that different parts of the lake experience this phenomenon in varying magnitudes. This spatiotemporal variability may, in turn, affect the productivity in different parts of the lake throughout the year. This study aims to study the spatiotemporal variability of wind-induced TSM resuspension in Laguna Lake. Empirical and analytical techniques will be implemented to determine the spatiotemporal variability of the phenomenon. A model will be used to predict TSM concentrations and will be validated using satellite-derived TSM measurements. The model will use wind speed, fetch, and bathymetry as input. Landsat imagery will be used to derive TSM concentrations for the entire lake. The satellite-derived TSM concentrations will be calibrated through actual field measurements and will be correlated to wind speed simulations and to the model's output.