

Analysis of Water Quality Trends in Coastal and Inland Waters Adjacent to Urban Areas

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Anthropogenic activities from highly urbanized areas have been known to negatively impact the state and water quality of coastal and inland waters, which cascades to the decline in ecosystem services. Hence, management of these water bodies through a comprehensive spatiotemporal monitoring approach is essential. In this study, the trend of water quality of Manila Bay and Laguna de Bay, both situated near Metro Manila, the capital of Philippines, during the dry season was probed and analyzed. This was carried out via atmospheric correction and water quality modeling of high resolution optical images. Comparison of ground and satellite-derived parameters showed good correspondence, implying the reliability of satellite-derived water quality parameters for spatiotemporal monitoring. Trend analysis of turbidity, a measure of water clarity, showed a significant decline during the two (2) years of pandemic-induced community quarantine. This trend may be associated with the reduction of water pollutants emanating from commercial and industrial activities during this period. Moreover, the improvement in water quality, particularly in Manila Bay, may be a direct effect of the ongoing rehabilitation of its coastal areas. Future works recommend the estimation of other parameters such as total nitrogen, total phosphorus, and dissolved oxygen from satellite measurements for a more comprehensive water quality assessment.

Keywords: water quality, Manila Bay, Laguna de Bay, optical images