

Monitoring Tropical Urban Wetlands through Biotic Indices

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ABSTRACT Integrity of urban wetlands depends on biological aspects, which is dependent on physical and chemical aspects. Biological assessment focuses on biotic components of an ecosystem. Among many known bioindicators, benthic diatoms and macroinvertebrates are commonly used. This study investigates the water quality for 11 urban wetlands in a tropical region (Bangalore, India) using bioindicators. Diatom and macroinvertebrate community structure, diversity and indices were calculated to understand the appropriateness of a particular biotic indicator group for routine and long term monitoring of wetlands. Principal component analysis bi-plot separates most polluted sites influenced by phosphate, electrical conductivity, hardness and chloride in axis 1 from the least polluted sites in axis 3. The species assemblages and distribution pattern also confirm the level of pollutants. A correlation of biological oxygen demand, chemical oxygen demand and electric conductivity with trophic diatom index (TDI) was significant than with biotic index (BI). The TDI indices clustered eutrophic sites in class V, while oligotrophic, clean water sites in class I reflecting the measured water quality. The BI index grouped sampling sites into Class I, II and III, indicating water quality to meso - eutrophic status. The insufficient data of tolerance values for several insects and mollusc species indicate the inability of BI indices for the present eco-regions. The analysis using TDI indices, with BI and FBI indices, highlight the appropriateness of implementing diatom indices for biomonitoring. In this context, developing long term monitoring programme focusing on diatom as bioindicators would help in understanding the drivers of ecosystem changes.