

Spatial variation in phosphorus and nitrogen spiral metrics in a tropical watershed in relation to land uses

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Condition of river systems is largely affected by land stoichiometry and concentrations of nitrogen and phosphorus from nonpoint sources. Studies in marine and terrestrial ecosystems utilizes the Redfield Ratio, N:P in ecological assessment. Spiral metrics are also important in the estimation of the nutrients flow between the benthic and the water column. However, both approaches are applied scarcely in the tropics. This study investigates the N:P ratio and spiral metrics in Marikina Watershed (MW), Philippines. MW (700km²) is a 5th order stream watershed flowing to both freshwater lake (Laguna de Bay, largest lake in the Philippines) and marine ecosystem (Manila Bay). Its upper basin was declared as a government protected area for conservation and flood mitigation while its downstream reaches are highly urbanized area in Metro Manila. A total of 69 monitoring sites were identified for discharge measurement, physical and chemical parameters. Land use pattern showed discrete separation using the inverse distance weighted interpolation (IDW) of the concentrations of total nitrogen (TN) and total phosphorus (TP) showing limitations in N and P in various areas. Analyses of the nutrient uptake using the SPATIally Referenced Regressions On Watershed (SPARROW) method will be included in the presentation. Moreover, this study pioneers the application for a strictly tropical watershed.

Keywords: spiral metrics, SPARROW method, IDW interpolation, tropical watershed

