

TIDAL CONTROL ON THE NUTRIENT VARIABILITY IN SUNDARBAN MANGROVE ECOSYSTEM

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Abstract

The present investigation deals with diurnal studies in order to understand the impact of cyclic tidal resurgence, if any, as well as to delineate the factors controlling the water quality in Sundarban Mangroves Ecosystem, India. Water samples were collected on an hourly basis from locations representing the land use pattern and subsequently analyzed for nutrients. Studies reveal that the water samples were slightly alkaline in nature irrespective of the locations, with a high electrical conductivity and the total dissolved solids load. Sodium was the most dominant cation accounting for 71-80% of the cationic load whereas chloride was found to be the dominant anion in the samples. During the ebb flow, a significant increase in dissolved-silica and nitrate concentrations was observed at intertidal and the sub-tidal stations, suggesting the dominance of riverine input. Conversely, during the high tide, river nutrient concentrations were lowered by the mixing of fresh water with sea water pertaining to the fact that salinity has a major control over nutrient variability and distribution. Nitrate and phosphate showed distinct diurnal variability at sites having an anthropogenic influence. Net variability in nutrient concentration in the mangrove water was complex, since biological regeneration nutrients were coupled with simultaneous biological removal (e.g. ammonium, nitrates and phosphate). Diurnal variability in the hydro-geochemical characteristics of the Sundarban mangrove could thus be suggested to be the dependent characteristic of the sampling location such as fresh water sources, tidal flushing, the inherent reducing environment and anthropogenic discharge.

Keywords: Tidal variability, Nutrients, Mangroves, Salinity, Sundarban