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Inorganic nutrient removal efficiency of a constructed wetland before discharging into an urban eutrophic estuary

Lemley, D; Lekane, CP; Taljaard, Susan and Adams, JB

Abstract
This study investigated the nutrient removal efficiency of a constructed wetland (CW) piloted to treat urban runoff before entering an estuary. Physico-chemical, dissolved inorganic nutrient (DIN and DIP), and stormwater inflow volume data were measured. The CW removal efficiency of DIN was negligible (5% uptake), while it acted as a consistent source of DIP (68% efflux) to the receiving estuarine waters. There was low water residency within the small CW (0.8 ha) that has been compounded by a 10-fold increase in flow volume since 2016. The surface area of the CW would need to be increased to 46 ha to cope with current daily inputs (ca. 6300 m3 d-1). The lack of maintenance (e.g., macrophyte harvesting, sediment desludging) has reduced nutrient uptake and increased autochthonous inputs. The conversion of an abandoned saltpan into an extension of the CW has been considered to manage the high flow volume and remove nutrients.