

Prediction of sand mass and organic matter distribution via in situ measured wet sediment bulk density profile

ABSTRACT

The objective of the study is to develop a spatial prediction model of sand mass and organic matter distribution in an urban stormwater holding pond using in situ measured wet sediment bulk density profile data to spatially distinguish the most likely contaminated sediment deposit areas. The wet bulk density profiles of deposited sediment at 25 locations in the Berembang (Malaysia) stormwater holding pond were measured using a single-probe nuclear density gauge. The sand and organic matter compositions of the surface sediment sample, 5 cm thickness from the bed surface, were determined. Discriminant analysis (DA) was conducted to generate two Fisher's linear discriminant functions for the prediction of sand mass and organic matter composition areas, respectively. The linear discriminant functions generated better area classifications of surface organic matter composition compared to the sand mass distribution using wet sediment bulk density data measured at more than 15 cm depth levels.

Keyword: Wet sediment bulk density; Holding pond; Nuclear density gauge; Discriminant analysis; Sand mass distribution; Organic matter distribution