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From Understanding the Sources of Pollution to Control the Quality of Coastal Sediment from Non-Point Pollution Sources

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The end-point treatment of point pollution sources is the best way to improve the quality of water and prevent coastal pollution, all over the world. Nevertheless, non-point pollution sources that influence the quality of surface water are serious concerns. Terrestrial pollution was deposited and accumulated over the estuary and coastal areas by adhering to the suspended particles in the rivers. Therefore, the pollution status and its history can be understood by analyzing and monitoring the sediments in the estuary as well as in the lagoon area. Sediments not only act as the carrier of pollution, but also as a potential secondary source of pollution in aquatic systems [1,2].

High concentrations of PAHs in sediments are usually high in highly industrialized and urbanized locations [3,4]. Moreover, highly anthropogenic activities are generally recognized to be the most important source of PAHs release into the environment [5]. At coastal areas, anthropogenic polycyclic aromatic hydrocarbons are introduced via urban runoff [6], industrial processes, vehicle exhausts, and spillage of fossil fuels [7]. Meanwhile, heavy metals discharged into a river system by natural or anthropogenic sources during their transport are distributed between the aqueous phase and bed sediments. Therefore, sediments are regarded as the ultimate sinks for heavy metal cations [8]. Heavy metal residing in contaminated habitats may accumulate in microorganisms, aquatic flora and fauna, which in turn may enter the human food chain and result in health problems [9,10].

Multivariate approaches have been used successfully to support the interpretation of complex field measurements, and to extract meaningful information from such databases [11,12]. Canonical Discriminate Analysis (CDA) determines how a set of quantitative variables may differentiate among many known classes. Finally, which group the unclassified values (samples in the lagoon) are classified into can be predicted correctly by using CDFs [13,14]. The approach also allows for relationships among the groups to be graphically represented by plotting the canonical scores of sample observations and have been used popularly to find sources of pollution.

Effective pollution control and water-resource management, especially in lagoons, depend upon identifying the main sources of pollution. The results might yield useful information concerning estuary recovery and water resources management and might be applicable to other basins with similar characteristics that are experiencing similar coastal environmental issues.

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