

Is water depth a major factor in the heavy metal concentrations of the sediment cores collected from the northern part of the Straits of Malacca?

Abstract

In this paper, heavy metal concentrations in the sediment cores (0 to 42cm) collected from two sampling sites located at the northern part of the Straits of Malacca were determined. The sampling sites were chosen from water depths of 83 m and 50 m in order to see the differences of heavy metal concentrations that could be due to the water depths rather than anthropogenic inputs since the Straits of Malacca is a busy shipping lane in this region. Four metals namely Ni, Cu, Cd and Pb were analyzed by using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) while another three metals namely As, Cr and Zn were analyzed by using Instrumental Neutron Activation Analysis (INAA). It was found that, generally, higher concentrations of Cd, Cu, Ni, Pb and Zn are found in the deeper sediment cores (83m) when compared to shallower sediment cores (50m). This could be due to higher rate of sedimentation in the deeper sediment cores. Although present findings support our hypothesis that sediment cores collected from a greater water depth had higher metal concentrations, more evidence is still required to confirm our claim. In general, As, Cd, Cu, Pb and Zn have low potential to cause adverse effects on biota except for Cr and Ni that a biological effect could affect some benthic species occasionally, as compared to the Interim Sediment Quality Values. These relatively low metal levels indicated that the northern sediment cores are not heavily contaminated by heavy metals.

Keyword: Heavy metals; Sediment cores; Straits of Malacca.