



Influence of the Pearl River on the spatial variations of heavy metals and organic carbon in the northern South China Sea continental shelf and slope sediments

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Pearl River is one of major rivers in Mainland China, also a major terrigenous material source exported to the continental shelf and slope region of the South China Sea. However, fate of these terrigenous material transport into the SCS are not well studied. The objectives of this study are to characterize and to understand fate of river sediments from Pearl River on the northern South China Sea by analyzing shelf and slope surface sediments Al, Fe, Mn, Cu, Zn, Pb, Cd, grain sizes, organic carbon, carbonate contents and sedimentation rate. The results demonstrated that terrigenous sediments from the Pearl River are a major source of sediments to the northern South China Sea. Pearl River delta sediments are characterized by fine-grained sediment with high concentrations of metals and organic carbon. These fine-grained sediments were carried and gradually deposited on the river delta and extended seaward to the slope region. Away from the delta (west-east direction), most heavy metal and organic carbon concentrations decreased rapidly. Coarse-grained relict sediment and biogenic carbonate are two primary diluting agents for the fine-grained aluminosilicate sediments from the Pearl River. Good linear relationships between metals and mud content showed a grain size effect on sediments metal concentration. However, diagenetic remobilization also play a role on some metal distribution. Higher Mn concentrations were found in slope surface sediments. Unusual high concentrations of Fe, Pb were found in sediment near the Pratas (DongSha) Islands. Sedimentation rate decreased away from the Pearl River Delta. Sediment buried in the region is only a small fraction of the annual river discharge. The result suggests that a great proportion of the river particles may export to the deeper South China Sea.