

Accumulation Rates and Chronologies from Depth Profiles of ^{210}Pb in Sediments of Northern Beibu Gulf, South China Sea

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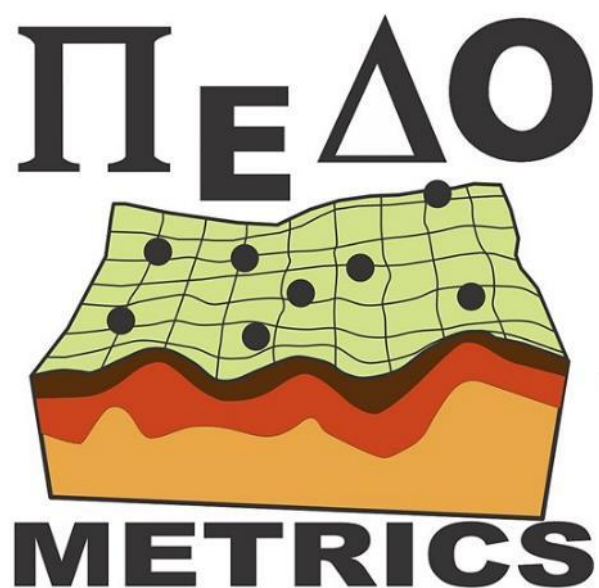
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Abstract

Being a complex environment subject to coastal and marine processes, little is understood concerning the evolution of northern Beibu Gulf and the human impacts on its ecosystem. Since various environmental information can be stored in the deposited sediments, it is considered to be useful tracers for natural and anthropogenic processes. The aim of this study is to determine a detailed reconstruction of the sedimentation rates in the past decades by applying the ^{210}Pb dating method. To achieve this, 3 sediment cores located in different regions along the coast of northern Beibu Gulf were collected. ^{226}Ra and ^{210}Pb were measured using gamma spectrometry and age determination was analyzed by the CRS model. Physical parameters (water content, grain size and bulk density) and TOC were determined for each core. The results showed that the average sediment mass accumulation rates (dry mass) calculated from ^{210}Pb profiles was 0.043-0.008 g cm⁻² yr⁻¹ in core of Sanniang Bay and 0.028?0.003 g cm⁻² yr⁻¹ in core of Lianzhou Bay. Sediment mass accumulation rates decreased with increasing water depth. The sedimentation rate was 0.54 cm/y in Sanniang Bay and 0.38 cm/y in Lianzhou Bay. Water content and grain size did not change much with age variation, while TOC showed a general decline during past decades, probably due to the terrigenous input. This study provides a chronological framework for comparing the depositional histories and inventories of various pollutants that have been measured in the same sediment cores. This information will be useful for resolving scientific environmental quality and coastal management in northern Beibu Gulf.



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Accumulation Rates and Chronologies from Depth Profiles of ^{210}Pb in Sediments of Northern Beibu Gulf, South China Sea

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