SEDIMENTARY STRUCTURES AND CHEMICAL ELEMENTS DISTRIBUTION OF THE SUBMARINE LANDSLIDE IN THE NORTHERN CONTINENTAL SLOPE,SOUTH CHINA SEA

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We take DLW3101 core obtained at the top of the canyon (no landslide area) and DLW3102 core obtained at the bottom of the canyon(landslide area) on the northern continental slope of the South China Sea as research objects. The chronostratigraphic framework of DLW3101 core and elemental strata of DLW3101core and DLW3102 core since MIS5 are established by analyzing oxygen isotope, calcium carbonate content and XRF scanning elements. Based on the information obtained by analyzing the sedimentary structure and chemical elements in the landslide deposition. The main conclusion were drawn as follow:

(1) Through the analysis of sedimentary structures, there are four symbolic landslide layers in DLW3102 core since MIS5. The landslide layers identified by the sedimentary structure reflect an anomalous enrichment in Si, K, Ti and Fe which indicating terrigenous debris sources, confirming that the four strata are landslide sediments. Among which, L1 occurred in MIS1; L2, L3 and L4 occurred in MIS5.

(2) L1 (2.15-2.44m) is a slump layer with small sliding distance and scale. L2 (15.48-16.00m) is a debris flow layer with scale and sliding distance greater than L1. The upper part (19.00-20.00m) of L3 is a debris flow layer, the lower part (20.00-20.90m) is a slide layer, and the landslide scale is large. The upper part (22.93-23.50m) of L4 is a turbidity layer, the lower part (23.50-24.27m) is a slump layer, its thickness is thinner than L3, but its sliding distance is longer than L3, L4 is also a large landslide.

The “Source-to-Sink” processes of sediment and paleo-environment change in the western Sunda Shelf since the Holocene

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To understand the role of grain size to rare earth elements (REE) in tropical mountainous river sediments and establish suitable provenance proxies, river sediments from Peninsular Malaysia were determined for REE composition in seven size fractions, we found that 4-8 μm fraction is sensitive to REE variation. Furthermore, the relationship between upper continental crust-normalized δEu and (Gd/Yb) could be used as an effective indicator for identifying river-sourced sediments around the southern SCS. Sedimentary, mineralogical and geochemical analysis of the sediments from the western Sunda shelf revealed that sediments types are mainly sandy silt and silty sand. Based on REE compositions and parameters, the western Sunda Shelf can be divided into three geochemical provinces, the western Sunda Shelf can be divided into three geochemical provinces, and provenances among them are Kelantan River and Mekong River, Pahang River, and coastal erosion, respectively. The erosion, transport, and deposition of sediments in the western Sunda Shlef are mainly controlled by the northeast monsoon current, coastal current, and wave energy. High-resolution sedimentary records of Core K17 from the western Sunda Shelf were investigated to evaluate the response of weathering and terrigenous input to climatic changes and human activities over the past 7400 years. From 7400 to 1600 cal yr BP, weathering and erosion are primarily controlled by climate change, while since 1600 cal yr BP, human activities have gradually overwhelmed natural climatic controls on weathering and erosion processes.

Sedimentology of the modern seasonal lower Ganges River with low inter-annual peak discharge variance, Bangladesh

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The Ganges River, one of the largest rivers on Earth, is a typical monsoonal and flood-controlled system but has low inter-annual peak discharge variability. The seasonal discharge can reach 70000 m^3 sec^{-1} during the wet season but maintains a low base flow of 500–3000 m^3 sec^{-1} during the dry season. However, the constancy in peak discharge every year categorizes the lower Ganges River as a river with low inter-annual peak discharge variability.
This paper examines the modern lower Ganges River by conducting a detailed process-oriented investigation of the main channel, channel margin and overbank deposits, supplemented by satellite image observation and comparison with other modern fluvial systems. The channel and braid bar deposits show a dominance of small-scale to medium-scale cross-sets, with a variety of accretion processes constructing braid bars. The braid bar and channel deposits are typical of facies models of rivers with low inter-annual peak discharge variance. In contrast, the channel flank deposits are dominated by planar lamination, massive sand and mud couplets, and some ripple cross-lamination, with very little cross-bedding. Characteristic channel margin deposits represent sediments that accumulated by high-speed flows, multiple-surge and rapidly depositing flows, rapid or regular waning flows and hyperconcentrated flows. The overbank deposits predominantly comprise current ripples with long thin bedforms and soft sediment deformation structures, which record flow transformation on the muddy flat topography and the processes of an unstable river bank.
Our study shows that the channel margin and floodplain deposits are entirely different from those of the braid bar and channel. The bedform distribution of the fluvial deposits here (main channel, channel margin and overbank) may be an important tool in the identification of the similar seasonal rivers with low inter-annual peak discharge variance and in the interpretation of the fluvial processes.

Geochemical comparison between Cenozoic basalts from southern Vietnam and eastern Cambodia: implication for deep dynamics from the South China Sea region since Miocene

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Continental intraplate basalts from the South China Sea region show OIB-type geochemical signatures, which are characterized by binary mixing between Depleted MORB Mantle (DMM) and EM2 enriched mantle component in terms of Sr-Nd-Pb isotopes. Origin of the enriched component is debating including sub-continental lithospheric mantle, recycled oceanic crust, and Hainan plume. Here we present major and trace elemental compositions and Sr-Nd-Hf isotopes for basalts from southern Vietnam and eastern Cambodia to uncover the origins of their mantle source. We find that basalts with low-SiO_2 have negative Ti and Hf anomalies and superchondritic Ca/Al ratios, indicating a carbonated component in the mantle source. By comparison, the basalts with high-SiO_2 have positive Ti and Nb anomalies, indicating that rutile-bearing eclogite should also play an important role in formation of these basalts, in addition to mantle peridotite. The covariant relationship between Nd and Hf isotopes points out that basalt mantle source contains recycled oceanic crusts with different ages. We proposed that the geochemical signal of enriched component is derived from the inconsistent melting of carbonated mantle and recycled oceanic crusts. Additionally, besides of the enriched component, all samples share a low Ce/Pb end-member with moderate $^{87}Sr/^{86}Sr$ (~0.7040) and ε_{Nd} (~+5), confirming its affinity as a FOZO mantle source instead of the depleted asthenosphere (DMM). Combined with geophysical observations, we suggest that a ridge-suction induced upper mantle convection model is most likely to explain the regular distribution of intraplate volcanisms in time, space, and geochemistry in the South China Sea region since Miocene.

Erosion and accretion of salt marsh in extremely shallow waters stages

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The hydrodynamic forces in extremely shallow water stage have an important impact on the geomorphic evolution of tidal flats, which is usually characterized by high velocity and high suspended sediment concentration. In our study, the duration of the extremely shallow water stage in the salt marsh only accounts for about 14-15% of the entire tidal cycle, but its deposition is very intense, the average bed level change rate is 7-8 times compared with the deep water period. The rate of bed level change during strong winds is more obvious, under the rough weather, the rate of bed level change at unvegetated station reaches + 0.15 mm / min, much higher than that in calm weather (+ 0.01 mm / min). Correspondingly, the bed change rate of vegetated area in rough weather is + 0.12 mm / min, which is 2.4 times higher than that in calm weather. The extremely shallow water stages have a great impact on the change of salt marsh evolution, affected by the high flow resistance efficiency of the salt marsh vegetation, the cumulative erosion and deposition in very shallow water stage of the entire tidal cycle with vegetated area is +33.8 mm, which is higher than the +20.8 mm of the unvegetated area. It plays a very important role in supplying the sediment in saltmarsh.

Effects of engineering construction on sediment of Mangrove Wetland—— A case study of Langen Mangrove in Beihai, China

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As an important ecological barrier in the coastal zone, mangrove sedimentary environment and ecosystem are affected by the dual effects of land and ocean. It is one of the most frequent areas of material and energy exchange between land and ocean. However, since June 2017, the Langen mangrove in Beihai has been damaged in a large area and causing a serious ecological damage. Therefore, we take the sediments of Langen mangrove wetland as the research object to analyze the damage causes. Through XRD analysis of sediment material composition, it is found that the content of kaolinite in the surface layer (0-15 cm) of the damaged repair area increases sharply, it is almost above 42%. The adhesivity, volume expansion and other properties of kaolinite reduce the porosity, water permeability and air permeability of sediments, and even part of kaolinite are attached to the leaves, roots and air roots of mangroves, which lead to the normal growth of mangroves and then death.

Influences of tropical monsoon climatology on the delivery and dispersal of organic carbon over the Upper Gulf of Thailand

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Organic carbon cycling in SE Asia is data-sparse and poorly studied, although high sediment yield and organic carbon intensity occur in the tropical region. In this study, we evaluated the role of tropical monsoon pertaining to fluvial discharge, sediment load, coastal current and water stratification on seasonal OC dynamics during four sampling campaigns in the Upper Gulf of Thailand (UGoT). This study demonstrates that particulate organic carbon (POC) is closely correlated with the river suspended sediment, which is generally regulated by the local rainfall. Higher POC is found near the large estuarine section during SWM and the small estuarine section during November 2013 when tropical cyclones impacted. POC in the estuarine sections is more significantly influenced by the seasonal shift compared with the coastal sections. Anthropogenic inputs and dam regulation also influence the river export of OM during high precipitation periods. Total organic carbon (TOC) however displays less seasonal monsoon variations than POC. TOC in the CHAO and MK sections however displays more seasonal variations with prevailing river input evidenced by coarser sediment and higher C/N ratios. Moreover, the almost year round water stratification acts as the barrier in retaining OC in the estuaries and their vicinities from dispersal into the lower GoT. High sedimentation rate further facilitates the OC burial in the study area. The delivery, dispersal and burial of OC are closely associated with the climate-controlled precipitation, and thus the tropical monsoon climatology under the global warming in particular is an important factor influencing OC in the UGoT.

Impact of Source Variability and Hydrodynamic Forces on the Distribution, Transport, and Burial of Sedimentary Organic Matter in a Tropical Coastal Margin: The Gulf of Thailand

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Carbon cycling in the tropical margin is more extensive compared with other regions of the world. The goal of this study was to better understand the origins, transport, and burial of sedimentary organic matter (SOM) in the Gulf of Thailand (GOT) from the coastal margin of Southeast (SE) Asia, which serve as a major depository of fine-grained sediments and the associated organic carbon (OC). The results revealed a variety of organic matter (OM) inputs and the selective transport of fine sediment, resulting in preferential dispersal of terrigenous SOM in the GOT. Bulk OC indices with low carbon/nitrogen ratios and enriched stable carbon isotope ratios (−24.2‰ to −20.4‰, and mean −21.4 ± 0.56‰) are likely related to the presence of marine-derived OM and anthropogenic interference. A binary mixing model further clarified the significant contributions of terrestrial derived-OM within the upper and central GOT. The n-alkane compositions and principal component analysis indicated that a majority of the terrigenous SOM settles within the estuary in the upper GOT, while a selective dispersal of land-based SOM through long-distance transport toward the modern depocenter in the lower GOT. The characteristics of lower molecular weight n-alkanes also suggest anthropogenic OM input from petroleum-related contributions. Altogether, the depositional patterns and spatial heterogeneity of the SOM indicated by both the bulk and molecular signatures reveal the important roles of source variability and the selective dispersal of land-based OM on the supply and accumulation of OC in the tropical coastal margin.

Monitoring and Research on dynamic geomorphic process of Dongsha beach in Zhujiajian Island, Zhejiang Province,China

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Due to the global climate change with sea level rise and more frequent and severe storms, serious beach erosion is observed all over the world. Beach nourishment is a proved effective protection approach which has been widely used in recent years. Based on the continuous images between June 2016 and July 2017 taken by the Argus video monitoring system, the response of Dongsha beach to storms in the aspects of beach geomorphology, profile, beach shoreline, and beach width were analyzed quantitatively. The results show that shorelines retreated during autumn and winter when storms were intensive, while advanced in spring and summer, with a lot of bulges occurred after nourishment projects. Abrupt variations in the beach orientation were always followed by gradual recoveries to the average beach orientation, while continuous counter-clockwise rotation occurred after March 2017 when storm events were sparse. Comparing the different beach responses to individual storm events, we found that small-scale and short-interval sand nourishment implemented timely after storms can compensate for sediment loss more effectively on this beach.
This study can provide a reference for local beach management.

Historical changes and sedimentary evolution of abandoned Yellow River delta（Sheyang River Mouth）in Jiangsu Province: Historical maps, core ages and seismic profiles

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The abandoned Yellow River delta in Jiangsu province is a major sediment supplier to the South Yellow Sea and East China Sea. It formed between 1128 and 1855. In 1855, the Yellow River shifted into the Bohai Sea, the delta suffered erosion and adjustment. However, as main part of the delta, the coast near Sheyang River mouth remained not erosion. In this study, ages of two cores, seismic profiles, and comparison of historical maps were used to examine its deltafront clinoform (nearshore clinoform). The original historical maps and nautical charts since 1750s were collected and compared after calibration, showing the accretion of the shoreline before 1855, when the Yellow River shifted to the Bohai Sea. Near Sheyang River mouth, two 20m-long cores onshore (1 m above present sea level) and offshore (6 m bellow present sea level) were on a line normal to the shoreline. Samples of both cores were dated using AMS ^{14}C and OSL technologies. Ages in bottoms of the cores are 43000 to 44000 cal yr BP. At approximate 17.5m below present sea level in both cores, yellow and younger (younger than 5000 yr BP) silt sediment occurs. Several young ages in upper part of two cores were obtained, and these show a clear clinoform pattern. Furthermore, seismic profiles across the offshore core show the deltafront clinoform. The upper part weak reflector or transparent part in seismic profiles become thinner seaward and the lower part is strong reflectors. Sea bottom nearshore shows a convex shape.