SEDIMENT AND SELECTED SEDIMENT OXIDES DISTRIBUTION IN THE NEARSHORE AND BEACH AREAS OF PAHANG-JOHOR DURING PRE- AND POST-NORTHEAST MONSOON

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In this study, sediment distribution (mean size, sorting and skewness) and sediment oxides (SiO_2, Al_2O_3, Fe_2O_3, TiO_2, MgO, K_2O, Na_2O, CaO, and MnO) were examined before Northeast Monsoon and after Northeast Monsoon, in Pahang-Johor nearshore and beach areas.

Before the Northeast Monsoon, nearshore sediments were ranged from 0.26 ø (coarse sand) to 6.64 ø (very fine silt) in the nearshore area and became finer after Northeast Monsoon (ranged from 0.53 to 6.45 ø). Both monsoon sediments were poorly sorted and very positively skewed in this study. While, both monsoon sediments of beach area were categorized as fine sand, which consist of 2.15 ± 0.72 ø and 2.36 ± 1.43 ø in pre- and post-Northeast Monsoon seasons, respectively. The beach sediment was moderately well sorted (0.64 ± 0.25 ø) before Northeast

Monsoon and tended to moderately sorted (0.80 ± 0.42 ø) after Northeast Monsoon. Both monsoon sediments were negatively skewed in this study.

Mean size, sorting and sediment oxides on the nearshore and beach areas were not significantly different in their distribution during pre- and post-Northeast Monsoon seasons. However, a few of the sediment oxides were significantly different in their contents, such as aO, MgO and K_2O at nearshore area, and MgO and Al_2O_3 at beach area.

In this study, SiO_2 at nearshore area were mostly derived from the coastal zone that originates from granite. Al_2O_3 content was well-correlated with CaO. This maybe related to CaO as it is being mostly associated with aluminosilicate. In the nearshore area, the CaO and MgO contents were significantly higher; however K_2O content was significantly lower in post-Northeast Monsoon sediments.

In the beach area, the abundance of SiO_2 content was correlated with low CaO and MgO contents. The abundance of SiO_2 may be due to the contribution of the granite and consequently lack of CaO and MgO in this area. The condition appeared opposite to the location which was supplied with input from limestone. The MgO and Na_2O contents were significantly higher, and Al_2O_3 and MnO contents were significantly lower in post-Northeast Monsoon sediments.

Generally, types of sediment located at the nearby riverbank, the great rainfall during Northeast Monsoon and the constant of littoral drift must take in account in

reconstructing the sediment distribution to this study area. The content of oxides in the sediments was influenced by the presence of granite, limestone and volcanic rocks on the mainland. Besides, the Northeast Monsoon found affected the input of MgO and hence significantly changing the MgO content in the nearshore environment.

Abstrak tesis yang dikemukakan kepada Senat of Universiti Malaysia Terengganu sebagai memenuhi keperluan untuk ijazah Master Sains.

TABURAN SEDIMEN DAN OXIDA SEDIMEN TERPILIH DI KAWASAN PERAIRAN DAN PANTAI DI PAHANG-JOHOR SEBELUM DAN SELEPAS MONSUN TIMUR LAUT

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Dalam kajian ini, taburan sedimen (saiz, sisihan dan kepencongan) dan oxida sedimen (SiO_2, Al_2O_3, Fe_2O_3, TiO_2, MgO, K_2O, Na_2O, CaO, and MnO) sebelum dan selepas Monsun Timur Laut telah dikaji di kawasan perairan dan pantai Pahang-Johor.

Sebelum Monsun Timur Laut, sedimen kawasan perairan bertaburan dari 0.26 ø (pasir kasar) ke 6.64 ø (tanah liat) dan menjadi lebih halus selepas Monsun Timur Laut (dalam lingkungan 0.53 hingga 6.45 ø). Sedimen dalam kedua-dua monsun berada dalam sisihan tidak sempurna dan berpencongan positif dalam kajian ini. Manakala, saiz butiran di kawasan pantai dikategori sebagai pasir halus dengan 2.15 ± 0.72 ø dan 2.36 ± 1.43 ø, sebelum dan selepas Monsun Timur Laut masing-masing. Sedimen di kawasan pantai bersisihan sederhana sempurna (0.64 ± 0.25 ø) sebelum Monsun Timur Laut dan beranjak ke sisihan sederhana (0.80 ± 0.42 ø)

selepas Monsun Timur Laut. Sedimen dalam kedua-dua monsun berpencongan negatif dalam kajian ini.

Min saiz, sisihan piawai dan oksida sedimen di kawasan perairan dan pantai tidak menunjukkan perubahan ketara sebelum dan selepas Monsun Timut Laut. Walaubagaimanapun, beberapa oxida sedimen mempunyai perubahan yang ketara dalam komposisinya seperti CaO, MgO dan K_2O di kawasan perairan, dan MgO dan Al_2O_3 di kawasan pantai.

Dalam kajian ini, kandungan SiO_2 di kawasan perairan kebanyakan datang dari kawasan pantai yang bertaburan granit. Kandungan Al_2O_3 mempunyai korelasi yang baik dengan CaO dan ini kemungkinan CaO berkaitrapat dengan aluminosilika. Di kawasan perairan, kandungan CaO dan MgO dalam sedimen bertambahan; manakala kandungan K_2O berkurangan selepas Monsun Timur Laut.

Di kawasan pantai, kandungan SiO_2 yang tinggi berkorelasi songsang dengan kandungan CaO dan MgO yang rendah. Kandungan SiO_2 yang tinggi berkemungkinan disebabkan oleh granit dan sebaliknya kandungan CaO dan MgO disebabkan oleh batu kapur. Di kawasan pantai, kandungan MgO dan Na_2O bertambahan dan kandungan Al_2O_3 dan MnO berkurangan selepas Monsun Timur Laut.

Secara keseluruhan, jenis sedimen yang berada di kawasan berdekatan dengan sungai, taburan hujan yang tinggi sewaktu Monsun Timur Laut dan arus litoral yang

konstan perlu diberi perhatian dalam membentuk semula taburan sedimen di kawasan kajian ini. Kandungan oxida sedimen pula dipengaruhi oleh granit, batuan kapur dan batuan volkanik dari kawasan daratan. Monsun Timur Laut didapati mempengaruhi kemasukkan kandungan MgO dan seterusnya mengubah kandungan MgO secara ketara di kawasan kajian ini.