

A STUDY ON THE GEOMORPHOLOGY AND
SEDIMENTOLOGY OF THE SELECTED
COASTAL ZONE AND ESTUARIES OF
TERENGGANU, MALAYSIA

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MASTER OF SCIENCE
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**Thesis Submitted in Fulfillment of the Requirement
for the Degree of Master of Science in the Institute of
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Journal of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfillment of the requirement for the Degree of Master Science

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I dedicated this thesis to my beloved wife and son,

my lovely parent

and also my adorable family members with lot of love

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Institute : Institute of Oceanography and Environmental

A study for geomorphology and sedimentology was conducted using beach profile and bathymetry. The sedimentological characteristics (mean, sorting and skewness) were conducted using dry sieving method and laser diffraction method. The mineral contents of the sediments were determined using scanning electron microscope-energy dispersive x-ray (SEM-EDX) and quantitative mineral examination (QME). A total of 57 stations were identified for sedimentological characteristic and mineral contents, where 11 stations were beach areas and 46 stations were estuarine and coastal water stations. Beach stations were sampled during June, August, and

December 2009, while estuarine and coastal water stations were sampled during July and October 2009. The results showed that the mean sizes of sediments at beach stations were very coarse to medium, very coarse to medium, and very coarse to coarse during June, August, and December 2009 respectively. However, for the collections at estuaries and coastal water stations during July and October, the mean sizes of sediments were very coarse and fine silt. Sediments at beach stations were well sorted to poorly sorted for all periods while sediments at estuaries and coastal water for skewness were strongly fine skewed to strongly coarse skewed for both stations. This study found that ilmenite was dominant at the beach stations, while ilmenite, topaz, and zircon were dominant at the estuaries and coastal water stations. However, the oxides and silicates group of heavy mineral were dominant in the sediments. Based on seasonality changes, the deposition process was observed during June and August 2009 while, erosion was observed in December 2009 was because of Northeast monsoon seasons. The beach slope ranged between 1.83° to 9.36° was significantly correlated to beach slope gradient and the grain-size properties. The domination of steep beach showed coarser grain sediment while, gentler beach showed finer grain size.

Abstrak tesis yang dikemukakan kepada Senat Universiti Malaysia Terengganu
sebagai memenuhi keperluan untuk Ijazah Sarjana Sains

**KAJIAN TERHADAP GEOMORFOLOGI DAN SEDIMENTOLOGI DI
KAWASAN ZON PANTAI DAN MUARA TERPILIH TERENGGANU,
MALAYSIA**

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Satu kajian untuk geomorfologi dan sedimentologi telah dijalankan menggunakan profil pantai dan batimetri. Ciri-ciri sedimentologi (min, sisihan piawai dan kepencongan) telah dijalankan menggunakan kaedah pengayakan kering dan kaedah pembelauan laser. Kandungan mineral pada sedimen telah ditentukan dengan menggunakan imbasan mikroskop elektron-serakan tenaga sinar-x (SEM-EDX) dan pemeriksaan mineral kuantitatif (QME). Sebanyak 57 stesen telah dikenalpasti untuk ciri sedimentologi dan kandungan mineral, di mana 11 stesen di kawasan pantai dan 46 stesen di kawasan muara dan pantai berair. Stesen pantai telah disampel pada Jun,

Ogos dan Disember 2009, manakala stesen muara dan pantai berair telah disampel pada bulan Julai dan Oktober 2009. Hasil kajian menunjukkan bahawa min saiz sedimen di stesen pantai sangat kasar kepada sederhana kasar, sangat kasar kepada sederhana kasar, dan sangat kasar kepada kasar semasa Jun, Ogos dan Disember 2009 masing-masing. Walau bagaimanapun, bagi koleksi di muara dan stesen pantai berair pada bulan Julai dan Oktober, saiz min sedimen adalah sangat kasar dan kelodak halus. Sedimen di stesen pantai baik susunan kepada kurang susunan untuk semua tempoh manakala sedimen di muara dan pantai untuk kepencongan adalah amat halus kecondongan kepada amat kasar kecondongan tertumpu untuk kedua-dua stesen. Kajian ini mendapati bahawa ilmenit adalah dominan di stesen pantai, manakala ilmenit, topaz, dan zirkon yang dominan di stesen muara dan pantai berair. Walau bagaimanapun, kumpulan oksida dan silikat untuk mineral berat adalah dominan dalam sedimen. Berdasarkan perubahan bermusim, proses pemendapan telah diperhatikan semasa bulan Jun dan Ogos 2009 manakala, hakisan diperhatikan pada bulan Disember 2009 kerana musim monsun Timur Laut. Cerun pantai adalah antara 1.83° hingga 9.36° berkorelasi secara signifikan kepada kecerunan cerun pantai dan ciri-ciri saiz butiran. Penguasaan pantai curam menunjukkan kasar bijian sedimen manakala, pantai tidak curam menunjukkan saiz bijian halus.