STUDY ON CROSS-SHORE MORPHOLOGY CHANGES ALONG KUALA TERENGGANU COASTAL BY USING NUMERICAL SIMULATION

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STUDY ON CROSS-SHORE MORPHOLOGY CHANGES ALONG KUALA TERENGGANU COASTAL BY USING NUMERICAL SIMULATION

By

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A thesis submitted in partial fulfillment of
the requirement for the award of the degree of
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DEPARTMENT OF MARITIME TECHNOLOGY
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UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled: **Study on Cross-Shore Morphology Changes Along Kuala Terengganu Coastal by Using Numerical Simulation** by **Zukirani Binti Ashari**, Matric No. **UK 17804** have been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfillment towards obtaining the **Bachelor Degree of Applied Science (Maritime Technology)**, Faculty of Maritime Studies and Marine Science, Unitversiti Malaysia Terengganu.

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DECLARATION

I hereby declare that this thesis entitled "*Study on Cross-Shore Morphology Changes along Kuala Terengganu Coastal by Using Numerical Simulation*" is the result of my own research except as cited in the references.

Signature : .....

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KAJIAN PERUBAHAN MORFORLOGI MERENTAS PANTAI KUALA TERENGGANU MENGGUNAKAN SIMULASI BERANGKA

ABSTRAK

Zon pesisiran pantai memainkan peranan penting kepada penduduk dunia dan aktiviti industri. Kedua-dua factor semulajadi dan manusia telah menyebabkan hakisan dan pemendapan. Pantai Kuala Terengganu adalah kawasan yang penting bagi aktiviti pelancongan, perikanan dan aktiviti industri. Walau bagaimanapun, sejak tahun 1980-an kawasan ini telah terjejas oleh hakisan dan pemendapan. Dalam kajian ini, model LITPACK berangka telah digunakan untuk memodelkan perubahan profil rentas pantai di sepanjang kawasan kajian Teluk Ketapang sehingga pantai Seberang Takir kira-kira 5 kilometer. LITPACK adalah sebahagian daripada generasi perisian DHI berdasarkan konsep MIKE Zero. Ia adalah satu pakej perisian untuk simulasi pengangkutan endapan bukan-padu di dalam gelombang dan arus, pesisir hanyut, perubahan pantai dan pembentukan profil di sepanjang pantai yang hampir sekata. Dalam kajian ini, LITPROF modul digunakan untuk menggambarkan perubahan profil merentas pantai berdasarkan siri masa peristiwa gelombang. Modul ini telah digunakan dalam meramalkan hakisan pantai dengan menggunakan ketinggian ombak dan paras air yang berbeza. Model ini berdasarkan andaian bahawa kecerunan sepanjang pantai dalam keadaan hidrodinamik dan sedimen boleh diabaikan dan bahawa kontur kedalaman adalah selari dengan pesisir pantai. Oleh itu, morfologi pantai hanya diterangkan oleh profil rentas pantai. Paras air, data gelombang dan ciri-ciri endapan telah diambil daripada Tentera Laut Diraja Malaysia dan kajian terdahulu. Data ini adalah input untuk simulasi perubahan profil rentas pantai. Pada akhir tesis, modul LITPOF telah berjaya digunakan untuk mengkaji perubahan morfologi rentas pantai sepanjang pantai Kuala Terengganu. Ketinggian ombak dan paras air yang semakin meningkat telah memberi kesan yang berbeza sama ada hakisan atau pertambahan. Hakisan adalah lebih tinggi bagi factor paras air yang berbeza berbanding dengan factor ketinggian ombak yang berbeza. Ini amat berguna untuk membuat keputusan dalam pengurusan zon pantai.

STUDY ON CROSS-SHORE MORPHOLOGY CHANGES ALONG KUALA TERENGGANU COASTAL BY USING NUMERICAL SIMULATION

ABSTRACT

Coastal zone plays as majority crucial roles to the world's population and industrial activity. Both natural and human factor caused erosion and sedimentation. Kuala Terengganu coast presents an important area for tourism, fishing and industrial activities. However, since 1980s this area was affected by erosion and sedimentation. In this study, numerical LITPACK model was applied to model the cross-shore profile changes along the study area of Teluk Ketapang beach to Seberang Takir for about 5 kilometers. LITPACK is part of the generation of DHI software based on the MIKE Zero concept. It is a software package for simulating non-cohesive sediment transport in waves and currents, littoral drift, coastline evolution and profile development along quasi-uniform beaches. In this study, LITPROF module was used to describe cross-shore profile changes based on time series of wave event. This module was used in predicted the coastal erosion using different wave height and water level. The model is based on the assumption that long shore gradients in hydrodynamic and sediment conditions are negligible and that the depth contours are parallel to the coastline. Thus the coastal morphology is solely described by the cross-shore profile. Water level, wave data and sediment characteristics was taken from Royal Malaysian Navy and previous researcher respectively. These data was the inputs for simulating the cross-shore profile changes. At the end of the thesis, LITPOF module was successfully been used to study the cross-shore morphology changes along Kuala Terengganu coastal. The increasing of wave height and water level had given different impact whether erosion or accretion. Erosion higher for increased in water level factor compared to the increasing of wave height factor. This is useful to make a decision in coastal zone management.