

THE SEDIMENT LOAD SIMULATION OF KERTEH RIVER
CATCHMENT AREA, TERENGGANU USING ARC VIEW SOIL
AND WATER ASSESSMENT TOOL (AVSWAT)

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2010

2010

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TOOL (AVSWAT)**

By

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**Research Report submitted in partial fulfillment of
The requirement for the degree of
Bachelor of Science (Marine Science)**

**Department of Marine Science
Faculty of Maritime Studies and Marine Science
UNIVERSITI MALAYSIA TERENGGANU
2010**

This project report should be cited as:

Taufiq, A.B. 2010. The sediment load simulation of Kerteh river catchment area, Terengganu using ArcView Soil and Water Assessment Tool (AVSWAT). Undergraduate thesis, Bachelor of Science in Marine Science, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu, Terengganu. 5 lp.

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DECLARATION AND VERIFICATION REPORT
RESEARCH PROJECT I AND II

It is hereby declared and verified that this research report entitled:

The Sediment Load Simulation of Kerteh River Catchment Area, Terengganu Using ArcView Soil and Water Assessment Tool (AVSWAT) by Muhammad Taufiq B. Abu Bakar, Matric No. UK16180 have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the **Degree of (Science) Marine Science**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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ACKNOWLEDGEMENTS

First and foremost I would like to express my gratitude to my project supervisors, Dr. Razak Zakariya for his constructive advices, guidance, opinion and his valuables suggestions greatly improved the preparation of this thesis.

I also would like to extend my deepest appreciations to his Master student, Miss Norleen Jibril, lab officers and lab assistants for their helps and assistance during the process of sampling and analyzing data. Besides that, I want to say thank you to my partner in this study, Muhammad Fakhrurazi, and Azyan who had help us gathering some of the weather data for this study.

Thanks also to the Malaysian Remote Sensing Agency, the Malaysian Meteorological Department, and the Drainage and Irrigation Department for all their help in supplying all the valuable data and information needed in this research study. Also thanks to all my housemates, course mates and others for all the support and help their given to me.

Last but not list, my thanks to mum who has provided good and some education to me. Also thanks to dad because some of his useful opinion on this hydrological study helps me to understand this project more better. Allah Almighty and thanks Him for His love and faithfulness throughout my life. Thank you.

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ABSTRACT

River flows contain an amount of energy. If the energy is strong enough, stress will occur at the bed of stream and suspend all the deposited sediment. The sediment will remain suspended in the water until the current velocity is slower enough for it to settle down again. The movement of suspended sediment from one place to another place can be applied to measure the sediment load. The traditional method on observing and measuring the amount of sediment discharged by a river sometimes takes a long period of time. But the measurement is very costly besides the limitation of financial and time. To overcome this problem, many simulation models on hydrological processes have been created. In this study, the ArcView Soil and Water Assessment Tool was used to create a simulation model of Kerteh river catchment area which is located at the eastern coast of West Malaysia. In this simulation, 10 years weather data including precipitation, solar radiation, temperature, wind speed and humidity is used as input database. The period of simulations is five years starting from 2005 until the end of 2009. Then the result was compared with the suspended sediment concentration (SSC) that analyzed from two stations in the study site. This model has strong correlation with suspended sediment concentration that measured in the field where the value of r for Sub-basin 19 and 27 are 0.91 and 0.93 respectively. So the result proves that AVSWAT was success in simulating sediment load in the Kerteh basin.

SIMULASI PENGANGKUTAN SEDIMEN BAGI KAWASAN TADAHAN SUNGAI KERTEH MENGGUNAKAN KAEDAH PENILAIAN TANAH DAN AIR ARCVIEW (AVSWAT)

ABSTRAK

Aliran sungai mengandungi sejumlah tenaga. Jika kekuatan tenaga itu mencukupi, tekanan akan berlaku di dasar sungai dan semua sedimen yang termendak akan terapung. Sedimen tersebut akan kekal timbul di dalam air sehinggalah halaju arus cukup perlahan untuk ia mendak semula. Sedimen terampai yang bergerak dari satu tempat ke tempat yang lain boleh diaplikasikan untuk mengukur pengangkutan sedimen. Kaedah tradisional dalam memrhati dan mengukur jumlah sedimen yang diangkut keluar oleh sesuatu sungai kadang-kadang memakan tempoh waktu yang lama. Tetapi kaedah pengukuran itu memakan kos yang sangat tinggi selain kekangan dari segi kos dan masa. Bagi mengatasi masalah ini, banyak model simulasi yang berkaitan dengan proses hidrologi telah dicipta. Dalam kajian ini, kaedah ArcView Soil and Water Assessment digunakan untuk membuat satu model simulasi tadahan Kerteh yang terletak di pantai timur Semenanjung Malaysia. Dalam simulasi ini, 10 tahun data cuaca termasuk hujan, radiasi solar, suhu, halaju angin dan kelembapan digunakan sebagai pangkalan data. Tempoh simulasi adalah 5 tahun bermula dari tahun 2005 sehingga akhir 2009. Hasilnya kemudian dibandingkan dengan kepekatan sedimen terapung (SSC) dari dua stesen tadahan. Model ini mempunyai hubung-kait yang kuat dengan kepekatan sedimen terampai yang diukur di lapangan dengan nilai r untuk sub tadahan 19 dan 27 masing-masing adalah 0.91 dan 0.93. Jadi, hasil itu mumbuktikan yang AVSWAT berjaya dalam mensimulasikan pengangkutan sedimen di kawasan tadahan Kerteh.