DETERMINATION OF TIDAL INFLUENCES TOWARDS STRATIFICATION OF KERTEH RIVER ESTUARY

NORA DIANA BINTI HALIM

FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

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DETERMINATION OF TIDAL INFLUENCES TOWARDS STRATIFICATION OF KERTEH RIVER ESTUARY

By

Nora Diana Binti Halim

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
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DEPARTMENT OF MARINE SCIENCE
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UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION
FINAL YEAR RESEARCH PROJECT

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

Determination of Tidal Influences towards Stratification of Kerteh River Estuary by **Nora Diana Binti Halim**, Matric No. **UK16617** has 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, University Malaysia Terengganu.

Verified by:

.....

Principal Supervisor

Name: Dr. Mohd Fadzil Mohd Akhir

Official stamp:

DR. MOHD FADZIL MOHD AKHIR
Lecturer
Department of Marine Science
Faculty of Maritime Studies and Marine Science
Universiti Malaysia Terengganu (UMT)
21030 Kuala Terengganu.

Date: 25/4/11

.....

Head Department of Marine Science

Name: Dr. Razak bin Zakariya

Official stamp:

DR. RAZAK ZAKARIYA
Ketua Jabatan Sains Marin
Fakulti Pengajian Maritim dan Sains Marin
Universiti Malaysia Terengganu
(UMT)

Date: 29/4/11

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Abbreviations

Abbreviation	
s	second
hhmm	in hour and minute
m	metre
m/s	metre per second
m^3	cubic metre
km	kilometre
kg	kilogram
ppt	parts per thousand
%	percent
°	degree
°C	degree celcius
±	plus minus
a.m.	time measurement: morning
p.m.	time measurement: afternoon until night
DO	dissolved oxygen
DO%	percentage of dissolved oxygen
GPS	global positioning system
T/S	temperature salinity

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ABSTRACT

This study was conducted at Kerteh River, Kerteh, Terengganu. The objectives of this study are to study the tidal influences on the estuary hydrodynamics and to study the tidal influences towards salinity changes at Kerteh River Estuary. The study was conducted in two months which were April and October 2010. Physical parameter in-situ data was taken by using Multiprobe Sensor Hydrolab Datasonde and Multiprobe Sensor Hydrolab Quanta. To get a record of 24 hour data, Multiprobe Sensor Hydrolab Datasonde was deployed at Station 9. The Physical parameter data recorded were the temperature and salinity. Meanwhile, Multiprobe Sensor Hydrolab Quanta was used to record manually the temperature and salinity of Kerteh River. By using this equipment, the data were collected during high tide and low tide session based on the tides table. The data were taken at nine stations. The data were analysed by using the MATLAB software version 2008. The results of this study showed that tides gave high influences towards the salinity patterns of Kerteh River estuary for both months. For the first sampling (April), there was insufficient movement of river runoff towards the sea which caused the saltwater to move faster into the estuary and produced a wedged column of water at the bottom of the river. Meanwhile, for the second sampling (October), the saltwater intrusion into the estuary was prevented by the sufficient movement of river runoff causing the freshwater and saltwater to mixed partially and formed a vertical mixing. As a result, for the high tide session in first sampling, the Kerteh River estuary can be classified as a salt-wedge estuary meanwhile, for the low tide session in first sampling and both high and low tide sessions in second sampling, the estuary can be classified as a partially-mixed estuary.

ABSTRAK

Kajian ini telah dijalankan di Sungai Kerteh, Kerteh, Terengganu. Objektif kajian ini adalah untuk mengkaji pengaruh pasang surut terhadap hidrodinamik muara dan unutk mengkaji pengaruh pasang surut terhadap perubahan saliniti muara Sungai Kerteh. Kajian ini telah dijalankan dalam masa dua bulan iaitu April dan Oktober 2010. Data in-situ parameter fizikal telah diambil dengan menggunakan Multiprobe Sensor Hydrolab Datasonde dan Multiprobe Sensor Hydrolab Quanta. Untuk mendapatkan rekod bacaan data selama 24 jam, Multiprobe Sensor Hydrolab Datasonde 4a diatur kedudukannya di Stesen 9. Data fizikal parameter yang direkodkan adalah suhu dan saliniti. Multiprobe Sensor Hydrolab Quanta pula digunakan untuk merekod suhu dan saliniti Sungai Kerteh dengan cara manual. Dengan menggunakan alat ini, data diambil semasa sesi air pasang dan air surut berdasarkan jadual pasang surut. Data telah diambil di sembilan stesen. Data-data itu dianalisa dengan menggunakan perisian MATLAB versi 2008. Hasil daripada kajian ini menunjukkan bahawa pasang surut air memberikan pengaruh yang besar terhadap corak saliniti muara Sungai Kerteh bagi kedua-dua bulan. Bagi penyampelan yang pertama (April), didapati pergerakan aliran sungai kearah laut tidak cukup laju sehingga menyebabkan pergerakan air laut ke dalam sungai lebih cepat dan menghasilkan pengumpulan air yang bersaliniti tinggi di dasar sungai. Sementara itu, bagi penyampelan yang kedua (Oktober), aliran masuk air laut ke dalam muara telah dihalang oleh aliran air tawar yang laju sehingga menyebabkan kedua-dua air itu bercampur secara sederhana dan mewujudkan percampuran secara menegak. Hasilnya, bagi penyampelan yang pertama, semasa sesi air pasang, muara Sungai

Kerteh boleh diklasifikasikan sebagai muara saliniti penuh dan untuk sesi air surut dan kedua-dua sesi air pasang dan surut semasa penyampelan yang kedua, muara itu boleh diklasifikasikan sebagai muara separa campur.