

A STUDY OF LAND COVER CHANGES IN KERTEH  
CATCHMENT AREA USING SATELLITE IMAGERY

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**A STUDY OF LAND COVER CHANGES IN KERTEH CATCHMENT AREA USING  
SATELLITE IMAGERY**

**By  
Tan Beng Lee**

**Research Report submitted in partial fulfillment of  
the requirement for the degree of  
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DEPARTMENT OF MARINE SCIENCE  
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**DECLARATION AND VERIFICATION REPORT**  
**FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled: A Study Of Land Cover Changes In Kerteh Catchment Area Using Satellite Imagery by Tan Beng Lee, Matric No. UK16458 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 Bachelore of Science in Marine Science, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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## LIST OF ABBREVIATIONS

PCA	- Principal Component Analysis
ANN	- Artificial Neural Networks
GIS	- Geographical Information System
ERTS	- Earth Resources Technology Satellite
NASA	- National Aeronautics and Space Administration
U.S.	- United States
m	- Meter
TM	- Thematic Mapper
SPOT	- Satellite Pour l'Observation de la Terre
HRG	- High Resolution Geometrical
HRVIR	- High-resolution Visible and Infrared
HRS	- High Resolution Stereoscopic
DORIS	- Doppler Orbitography and Radio-positioning Integrated by Satellite
ha	- Hectare
%	- Percentage
GPS	- Global Positioning System
MACRES	- Malaysian Centre for Remote Sensing
GCP	- Ground Control Points



RMS Error	- Root Mean Square Error
RSO	- Rectified Skew Orthomorphic
°	- Degree
NE	- Northeast
SE	- Southeast
SW	- Southwest
NW	- Northwest

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## ABSTRACT

The Kerteh catchment area located at the South of Kuala Terengganu with total area approximately 27,500 hectares. A period of ten years has caused big differences in the land cover composition due the data of land cover plays a pivotal role in environmental change, e.g. river flow and sediment load around the area. This study is to create land cover map of year 2000 and year 2010 by using remotely sensing data and to detect the qualitative and quantitative changes rate of land cover in this ten year interval. The ground truth data were collected for run the classification process of Landsat 7 satellite imagery year 2000 and SPOT 5 satellite imagery year 2010 to get the land cover map of year 2000 and year 2010. The classification maps were then overlay by using union method and follow by analysis result by using query to get qualitative and quantitative result. The land cover changes have been successfully detected. Grassland has a lowest loss of land cover, which was only 15.113 hectare with 100% change rate. Rural area has a highest loss of land cover, which was 6049.707 hectare with 91.95% change rate. Mangrove has a lowest add of land cover, which was only 0.62hectare with 0.08% change rate. Oil palm has a highest adds of land cover, which is 8736.245 hectare with 201.78% changes rate. Grassland was fully changed to other type of land cover, which is from grassland change to forest and oil palm in year 2010. Forest has scored the highest no change of land cover, which was there still have 7110.004hectare with 82.53% no change rate.

## **SATU KAJIAN TENTANG PERUBAHAN LITUPAN TANAH DI KAWASAN TADAHAN KERTEH DENGAN MENGGUNAKAN SATELIT IMEJ**

### **ABSTRAK**

Kawasan tadahan Sungai Kerteh terletak di Selatan Kuala Terengganu dengan jumlah keluasan lebih kurang 27,500 hektar. Masa sepanjang sepuluh tahun telah menyebabkan perubahan yang besar kepada komposisi tanah litupan kerana tanah litupan memainkan peranan yang penting dalam perubahan alam sekitar, misalnya aliran sungai dan muatan mendapan di sekitar kawasan itu. Penyelidikan ini adalah untuk memeta peta tanah litupan pada tahun 2000 dan tahun 2010 dengan menggunakan data penderiaan jauh dan untuk mengesan kadar perubahan dari segi kualitatif and kuantitatif tanah litupan dalam jarak sebanyak sepuluh tahun. Data dasar kebenaran dikumpulkan untuk menjalankan proses pengkelasan pada satelit imej Landsat 7 tahun 2000 dan SPOT 5 tahun 2010 untuk mendapatkan peta tanah litupan tahun 2000 dan tahun 2010. Peta klasifikasi kemudian lapis dengan menggunakan kaedah kesatuan diikuti menganalisis dengan menggunakan query untuk mendapatkan keputusan kualitatif dan kuantitatif. Perubahan tanah litupan telah berjaya dikesan. Tanah litupan yang hilang dengan paling sikit adalah padang rumput, iaitu hanya 15,113 ha dengan kadar perubahan 100%. Kawasan luar bandar hilang paling banyak, iaitu sebanyak 6049.707 ha dengan kadar perubahan 91.95%. Tanah litupan bakau tambah paling rendah, iaitu hanya 0.62 ha dengan kadar perubahan 0.08%. Tanah litupan kelapa sawit menambah dengan banyak sekali, iaitu 8736.245 ha

dengan kadar perubahan 201.78%. Tanah litupan padang rumput berubah sepenuhnya menjadi hutan dan kelapa sawit pada tahun 2010. Hutan memperoleh tiada perubahan yang tertinggi, iaitu masih memiliki 7110.004 ha dengan kadar 82.53%.