

LAND COVER CHANGES OF KUALA TERENGGANU
DISTRICT USING LANDSAT TM IMAGES

HANNA BINTI SUDIN

FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU
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TM images / Najiha Sudin.

PERPUSTAKAAN
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21030 KUALA TERENGGANU

1100051210

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HAK MILIK
PERPUSTAKAAN UMT

LAND COVER CHANGES OF KUALA TERENGGANU DISTRICT USING
LANDSAT TM IMAGES

By

Najiha binti Sudin

Research report submitted in partial fulfillment of
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Faculty of Science and Technology
UNIVERSITI MALAYSIA TERENGGANU
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JABATAN SAINS BIOLOGI
FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU

**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II
RESEARCH REPORT VERIFICATION**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: LAND COVER CHANGES OF KUALA TERENGGANU DISTRICT USING LANDSAT TM IMAGES oleh NAJIHA BINTI SUDIN, no. matrik: UK 10427 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperoleh ijazah SARJANA MUDA SAINS GUNAAN (PEMULIHARAAN DAN PENGURUSAN BIODIVERSITI), Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

Disahkan oleh: / Verified by:



Penyelia Utama / Main Supervisor
Nama: **KASAWANI IBRAHIM**
Pensyarah
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu.

Tarikh: 13/5/2007



Penyelia Kedua (jika ada) / Co-Supervisor (if applicable)
Nama: **MOHD SUFFIAN IDRIS**
Pensyarah
Institut Oseanografi
Universiti Malaysia Terengganu (UMT)
21030 Kuala Terengganu, Terengganu

Tarikh: 13/5/2007



Ketua Jabatan Sains Biologi / Head, Department of Biological Sciences
Nama:
Cop Rasmi: **DR. AZIZ BIN AHMAD**
Ketua
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Tarikh: 13/5/2007

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LIST OF ABBREVIATIONS

%	-	percent
ASTER	-	Advanced Spaceborne Thermal Emission and Reflection Radiometer
E	-	East
ERTS-1	-	Earth Resource Technology Satellite
ETM+	-	Enhanced Thematic Mapper Plus
GCPs	-	Ground Control Points
GIS	-	Geographic Information System
GPS	-	Global Positioning System
ha	-	hectare
INOS	-	Institute of Oceanography
ISODATA	-	Iterative Self Organizing Data Analysis Technique
km ²	-	kilometer square
m ²	-	meter square
MACRES	-	Malaysian Center for Remote Sensing
MASTER	-	Airborne MODIS/ASTER Simulator
MSS	-	Multispectral
N	-	North
NAVSTAR	-	NAVigation System with Time And Ranging
RMS Error	-	Root Mean Square Error
RSO	-	Rectified Skew Ortomorphic
TM	-	Thematic Mapper
UMT	-	Universiti Malaysia Terengganu
USGS	-	United State Geology Survey

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ABSTRACT

Land cover mapping is very important in identifying the land cover classes of a study area to determine the distribution of each class, in order to conserve and manage the biodiversity that lie beneath them. Therefore, this study aims to map land cover classes in Kuala Terengganu district and further determine the changes rate occurred. The study area covered approximately 4690.656 hectares of Kuala Terengganu. Three Landsat TM images, which dated on 15th October 1998, 14th July 2002 and 15th August 2005, were used in digital image processing by using band combinations of 4, 5, 2. Overall classification accuracy are 74.55 percent for 1998, 82.42 percent (2002) and 90.91 percent (2005). United State Geology Survey (USGS) Classification Scheme has become the framework to determine the eleven classes of land cover, which are Barren Land, Cloud, Cloud Shadow, Forest Land, Oil Palm, Orchard, Paddy, Rubber, Urban or Built-up Land, Water and Wetland. The images were independently classified and total areas of land cover were compared between different dates of imageries. Distinct changes that observed are increment of Rubber class area with 10.30 percent and the declining areas of Urban or Built-up Land class with 12.98 percent. The changes rate that can be observed for Rubber class is 1.47 percent per year and 1.85 percent per year for Urban or Built-up Land class. Integration of remote sensing and Geographical Information System (GIS) in this study has proved its capability in determining the land cover and land cover changes in Kuala Terengganu from 1998 to 2005 in an easier way with less time required when compared to the conventional method.

PETA PERUBAHAN LITUPAN TANAH BAGI DAERAH KUALA TERENGGANU MENGGUNAKAN IMEJ LANDSAT TM

ABSTRAK

Pemetaan litupan tanah sangat penting dalam menentukan pengkelasan litupan tanah yang terdapat di kawasan kajian. Ini dapat menjamin pemuliharaan dan pengurusan biodiversiti di kawasan kajian berdasarkan taburan sesuatu litupan tanah. Oleh itu, kajian ini bertujuan untuk menyediakan peta litupan tanah bagi daerah Kuala Terengganu, dan seterusnya menentukan kadar perubahan litupan tanah yang berlaku. Kawasan kajian meliputi sekurang-kurangnya 4690.656 hektar daripada keseluruhan daerah Kuala Terengganu. Tiga imej Landsat TM bertarikh 15 Oktober 1998, 14 Julai 2002 dan 15 Ogos 2005 telah digunakan dalam pemprosesan imej digital dengan kombinasi jalur 4, 5, 2. Ketepatan pengkelasan keseluruhan adalah 74.55 peratus bagi imej 1998, 82.42 peratus (2002) dan 90.91 peratus (2005). United State Geology Survey (USGS) Classification Scheme merupakan panduan bagi pengkelasan yang telah menentukan sebelas kelas litupan tanah, iaitu Tanah Tandus, Awan, Bayang Awan, Hutan, Kelapa Sawit, Dusun, Padi, Getah, Bandar dan Pembangunan, Air dan Tanah Lembap. Imej dikelaskan secara berasingan dan jumlah kawasan litupan dibandingkan antara tahun berlainan untuk menentukannya. Perubahan ketara dapat dilihat pada peningkatan kawasan Getah iaitu sebanyak 10.30 peratus dan kawasan Bandar dan Pembangunan yang berkurangan sebanyak 12.98 peratus. Kadar perubahan bagi kawasan Getah adalah sebanyak 1.47 peratus setahun, manakala kawasan Bandar dan Pembangunan berubah sebanyak 1.85 peratus setahun. Integrasi antara penderiaan jauh dan Sistem Informasi Geografi (GIS) dalam kajian ini membuktikan kebolehan untuk menentukan litupan tanah dan perubahan litupan tanah di Kuala Terengganu dari tahun 1998 hingga 2005 dengan menggunakan kaedah yang lebih mudah dan cepat berbanding kaedah yang konvensional.