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COMPARISON OF VEGETATION INDICES (INTRINSIC BASED VEGETATION INDEX) FOR MANGROVE VEGETATION MAPPING AT KELANTAN DELTA

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2007

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COMPARISON OF VEGETATION INDICES (INTRINSIC BASED VEGETATION INDEX) FOR MANGROVE VEGETATION MAPPING AT KELANTAN DELTA

By

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Research Report submitted in partial fulfillment of
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LIST OF ABBREVIATIONS

ARVI	-	Atmospheric Resistant Vegetation Index
AVHRR	-	Advanced Very High Resolution Radiometer
DN	-	Digital Number
DVI	-	Different Vegetation Index
ERDAS	-	Earth Resources Data Analysis System
GEMI	-	Global Environment Vegetation Index
GIS	-	Geographic Information System
GPS	-	Global Positioning System
HRV	-	High Resolution Visible
IPVI	-	Infrared Percentage Vegetation Index
LAI	-	Leaf Area Index
m	-	meter
MACRES	-	Malaysia Centre for Remote Sensing
MIR	-	Middle Infrared
MSAVI	-	Modified Soil-Adjusted Vegetation Index
NDVI	-	Normalized Difference Vegetation Index
NIR	-	Near-Infrared
nm	-	nano meter
NOAA	-	National Oceanic and Atmospheric Administrative
OSAVI	-	Optimized Soil-Adjusted Vegetation Index
R	-	red
RVI	-	Ratio Vegetation Index
SPOT	-	System Pour I'Observation de le Terre
spp.	-	species
SR	-	Simple Ratio
TIR	-	Thermal Infrared
TM	-	Thematic Mapper
TSAVI	-	Transformed Soil-Adjusted Vegetation Index
VI	-	Vegetation Index
VIs	-	Vegetation Indices
VIS	-	Visible
2-D	-	2-Dimensi

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ABSTRACT

The vegetation index (VI) had been used for monitoring and mapping the mangrove vegetation by estimate their parameter. The study was conducted by using the Landsat image Thematic Mapper (TM) 2000 at Kelantan Delta. Intrinsic indices such as Normalized Difference Vegetation Index (NDVI), Infrared Percentage Vegetation Index (IPVI), Different Vegetation Index (DVI) and Ratio Vegetation Index (RVI) are a simplest and the most widely used index in remote sensing of vegetation and have been applied in this study. Five of mangrove classes have been classified by conventional unsupervised classification with accuracy 72.67%. There are *Avicennia*, *Avicennia-Sonneratia*, *Acanthus-Sonneratia*, Mixed *Sonneratia* and Mixed *Acrostichum*. From the unsupervised classification by vegetation indices (VIs) the highest accuracy was obtained by NDVI which 74.44% followed by IPVI (72.22%), DVI and RVI both were 69.17%. Each VIs can differentiate the mangrove classes based on their reflectance characteristic. RVI had been determined four mangrove classes if compare to NDVI, DVI and IPVI which only can discriminate only three classes. All indices found performed higher in accuracy percentage, but worst to discriminate mangrove classes because of some factors such as saturated problem to identify mangrove classes, sensitivity of soil background reflectance, affected by additive atmospheric (path radiance) and high moisture content.

PERBANDINGAN INDEK-INDEK TUMBUHAN (INDEK ASAS TUMBUHAN) TERHADAP PEMETAAN PAYA BAKAU DI DELTA KELANTAN.

ABSTRAK

Indek tumbuhan telah digunakan untuk mengawasi dan pemetaan kawasan paya bakau dengan penyukatan parameter pokok tersebut. Kajian ini telah dijalankan dengan menggunakan imej Landsat TM 2000 di Delta Kelantan. Indek asas tumbuhan seperti NDVI, IPVI, DVI dan RVI ialah indek mudah dan digunakan meluas dalam penderiaan jarak jauh bagi tumbuhan dan digunakan untuk kawasan kajian ini. Lima kelas paya bakau telah bejaya dikelaskan bagi pengkelasan tanpa berpenyelia dengan ketepatan 72.67%. Ia termasuklah *Avicennia*, *Avicennia-Sonneratia*, *Acanthus-Sonneratia*, 'Mixed' *Sonneratia* dan 'Mixed' *Acrostichum*. Daripada pengkelasan tanpa berpenyelia untuk indek-indek tumbuhan, ketepatan kelas paling tinggi dirumuskan oleh NDVI dengan 74.44%, di ikuti oleh IPVI (72.22%) dan DVI serta RVI masing-masing mencatatkan 69.17%. Setiap indek dapat membezakan kelas paya bakau berdasarkan ciri-ciri pantulannya. RVI telah dapat dipisahkan dengan empat kelas paya bakau jika dibandingkan dengan NDVI, DVI dan IPVI yang hanya dapat memisahkan tiga kelas. Semua indeks menunjukkan penilaian ketepatan kelas adalah tinggi, walaubagaimanapun, indek-indek ini lemah untuk membezakan kelas paya bakau disebabkan oleh faktor seperti masalah kepadatan untuk identifikasi kelas tumbuhan, sensitif terhadap pantulan tanah, kesan penambahan awan (sinaran pendek) dan pengaruh kandungan kelembapannya.