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RMSe

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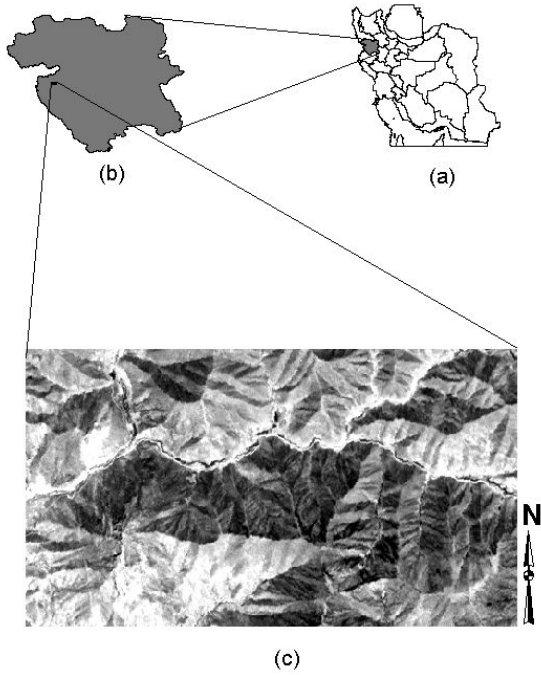
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... **ASTER**

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(Quercus

spp.)



ETM+ TM

2

(b) (a) (c)

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TERRA

VNIR

SWIR

TIR

Visible and Near Infrared
Short Wave Infrared
Thermal Infrared

- Thematic Mapper
- Enhanced Thematic Mapper
- Landsat
- Advanced Spaceborne Thermal Emission and Reflection Radiometer

() %
 () % () % () % () % :
 () %

$$\log \% S_x = 1/782 - 0/76 \log n$$

()
 = % S_x ± 1DN
 = n

Orthorectification

Toutin

$$S_{p_i} = \pm \sqrt{\frac{P_i(1 - P_i)}{N}}$$

() RMSe¹
 = E_i
 = N
 = S_{p_i}

$$S_{p_i} \% = \frac{S_{p_i} \times 100}{P_i}$$

() ()
 = % S_{p_i}

Root Means Squar Error

... **ASTER**

$$E\% = E_i \times 100/P_i$$

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(n > %

) t= /

(E_i)

(E%)

/

() () ()

×

$$E_i = t \times SP_i$$

()

/

×

(

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		(n)	(s)	(S/N) _x
				%
				%
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				% /
		(N)		

... MSAVI1,2 PVI NDVI

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DN

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(1-3)

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SWIR (4-6) SWIR (1-3) VNIR

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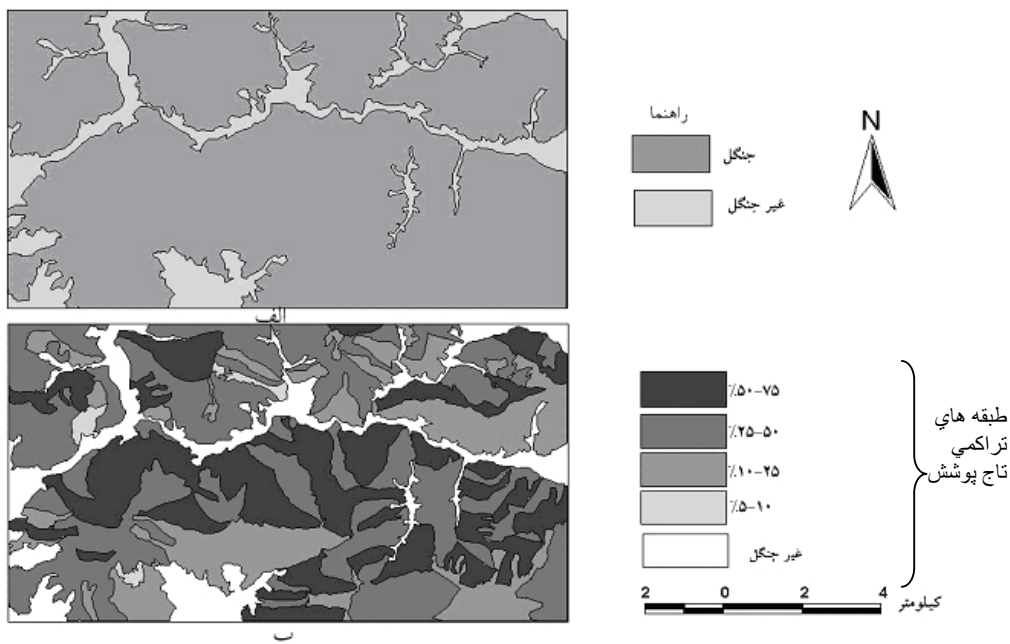
RMSe

Striping

$\pm 1DN$

Bhattacharria Distance

Transformed Divergence



VNIR1,2,3		
VNIR1,2,3 - PC1(SWIR1-6)		
VNIR1,2,3 - PC1(SWIR1-6) - NDVI		
VNIR3 - PC1(VNIR1,2,3) -PC1(SWIR1-3) PC1(SWIR4-6) – PVI2-MSAVI1	*	
-VNIR3 - PC1(VNIR1,2,3) -PC1(SWIR1-3)- (VNIR3/VNIR1+3) PC1(SWIR4-6) – (VNIR3/VNIR1+2) - (VNIR3/VNIR3+2)- VNIR3 – (VNIR3/VNIR2) - MSAVI1		
VNIR1,2,3- (VNIR3/VNIR3+2)		
VNIR3 - PC1(VNIR1,2,3) -PC1(SWIR1-3) PC1(SWIR4-6) – (VNIR3/VNIR2)		
VNIR3 - PC1(VNIR1,2,3) -PC1(SWIR1-3) PC1(SWIR4-6)- (VNIR3/VNIR3+2) - (VNIR3/VNIR1+3)	*	
VNIR3 - PC1(VNIR1,2,3) -PC1(SWIR1-3) PC1(SWIR4-6) - (VNIR3/VNIR2)- NDVI- MSAVI1		

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DGPS

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SPOT 5

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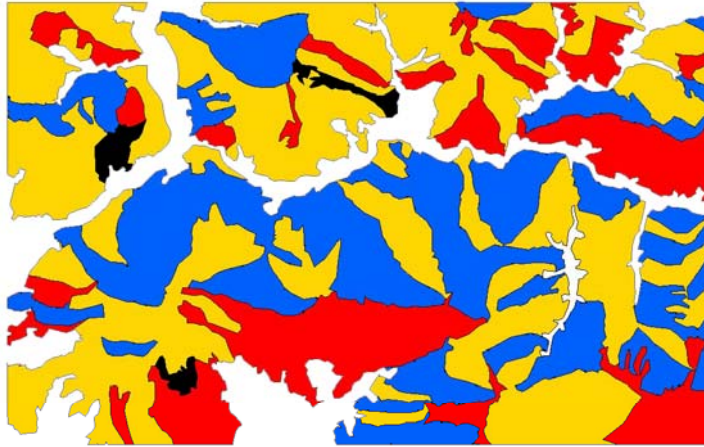
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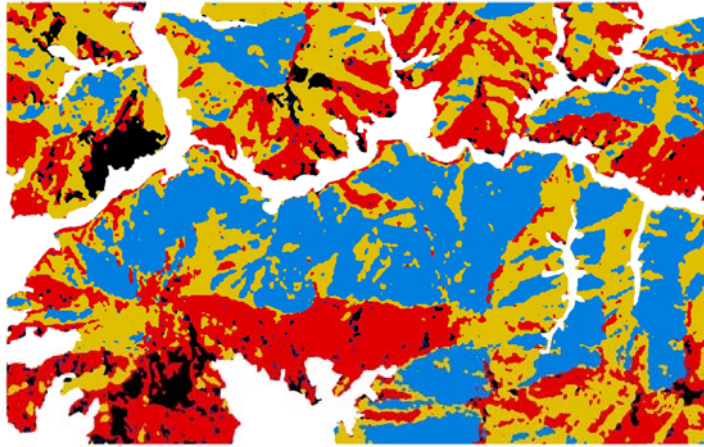
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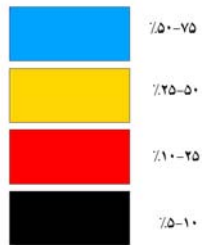


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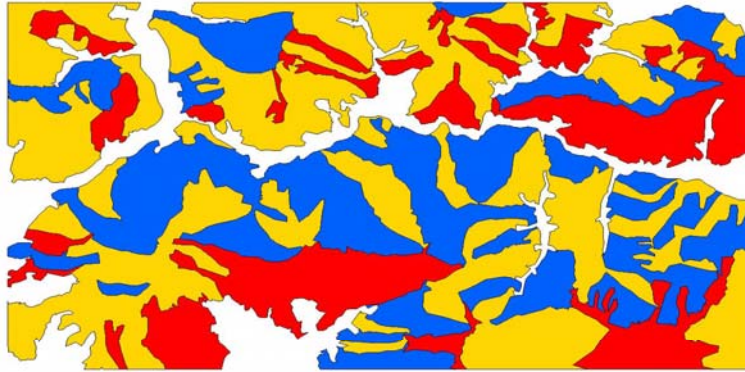
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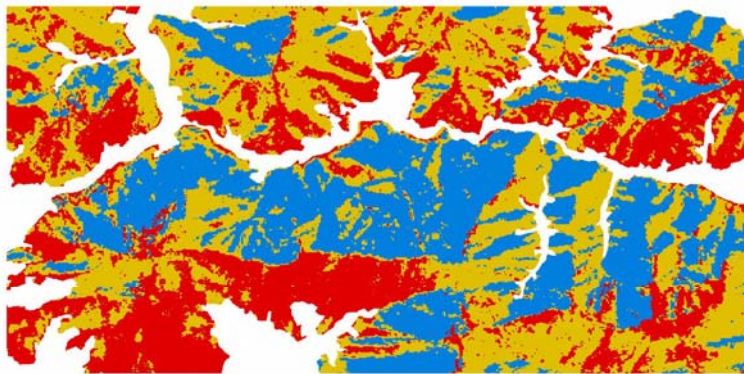


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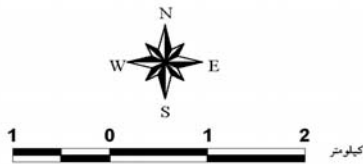
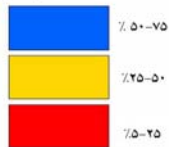


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9 – Anonymous, 2001. ASTER Users Guide, Part1, General, Ver. 3.1, Earth Remote Sensing Data Analysis Center.

10- Estman Ronald, J. 2003. Guide to GIS and Image Processing, Idrisi3.2, Vol. 2, Clark University.

11 - Joffre, R., 1993. Estimation Tree Density in Oak Savana -Like 'Dehesa' of Southern Spain from SPOT Data, Int. J. Remote Sensing, Vol. 14, No. 4, 658-697.

12- Kressler, F.P., Y.S.Kim & K.T. Steinnocher, 2003. Object Oriented Land Cover Classification of Panchromatic KOMPSAT-1 and SPOT-5 Data, IEEE.

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Potentiality of ASTER images for forest density mapping in Zagros (Case study: Marivan forests)

N. Ahmadi Sani¹, A. A. Darvishsefat^{*2}, M. Zobeiri³ and A. Farzaneh⁴

¹ M. Sc., Faculty of Natural Resources, University of Tehran, I.R. Iran

² Associate Prof, Faculty of Natural Resources, University of Tehran, I.R. Iran

³ Professor, Faculty of Natural Resources, University of Tehran, I.R. Iran

⁴ Ph. D., Forest, Range & Watershed Management Organization, I. R. Iran

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Abstract

The potential of ASTER images from the Marivan forests, dating June 2003, for forest density mapping in Zagros was investigated. The aerial photographs (scale of 1:20000) dated September, 2004 were used to generate a ground truth map. Images did not show any radiometric error. Geometric correction of images and photographs was implemented using Orthorectification method with RMSE less than one pixel. Different synthetic bands from rationing, principal component analysis and suitable vegetation indices were created to employ in further digital analysis, together with the original bands. The data were classified based on four classes using supervised method with the maximum likelihood, minimum distance to mean and fuzzy algorithms using synthetic and original bands. The highest overall accuracy and kappa coefficient equal to 65.5% and 48.7% were obtained with maximum likelihood algorithm. According to the primary results, the highest spectral similarity was observed between the 4th and the 5th classes. On the other hand, 5th class had a little extent in the study area. So, the 4th and 5th classes were merged. In three-class classification, the highest overall accuracy and kappa coefficient equal to 68.5% and 51.5% respectively, obtained with maximum likelihood algorithm. Spectral similarity between open density classes, lack of precise topographic maps and also shade effects on interpretation and analysis were the most important problems. Finally, it can be concluded that the resulted accuracy, using the data set, processing and analysis methods considering the restrictions, was relatively desired.

Keywords: ASTER, Zagros forests, Density mapping, Aerial photographs, Ground truth

* Corresponding author: Tel: +98 261 2223044 , Fax: +98 261 2249312 E-mail: adarvish@ut.ac.ir