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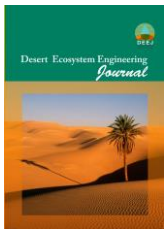

Comparing different land use change detection techniques at Dehloran desert area of Ilam province

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Abstract

Timely and accurate change detection of earth surface features is extremely important for understanding relationships and interaction between human and natural phenomena in order to promote better decision making. Remote sensing data are primary sources extensively used for change detection in recent decades. In this study, images of Landsat (TM) 1985 and Landsat (ETM+) 2007 were analyzed using six change detection techniques in ۵۵۹۸۶ hectares in the region of Dehloran, Ilam province. Considered techniques of change detection were included: image differencing, principal components analysis differencing, NDVI differencing, canonical components analysis differencing, tasscap differencing and post-classification comparison. To determine threshold level, the statistical method has been applied which was achieved from thresholds changing. In this study, threshold level was set at ±1 standard deviation from the mean. After determining optimal threshold, areas having decreasing change, increasing change and no change was determined. Based on ground data and field visit and Google Earth, accuracy assessment of change detection techniques was carried out using overall accuracy and Kappa coefficient. According to the results, infrared differencing with overall accuracy of 90.49 and Kappa coefficient of 91% showed the highest accuracy among applied change detection techniques and on the contrary, CCA2 differencing with overall accuracy 25.48 and Kappa coefficient of ۳۸% had lowest accuracy in land use/land cover change in study area.

Keywords: image differencing, PCA differencing, NDVI differencing, CCA differencing, Tasscap differencing, post-classification comparison.

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