

Remote Sensing Data Reveals Eco-Environmental Changes in Urban Areas of Klang Valley, Malaysia: Contribution from Object Based Analysis.

ABSTRACT

Understanding the growth and changes in urban environments are the most dynamic system on the earth's surface is critical for urban planning and sustainable management. This study attempts to present a space-borne satellite-based approach to demonstrate the urban change and its relation with land surface temperature (LST) variation in urban areas of Klang valley, Malaysia. For this purpose an object-based nearest neighbour classifier (S-NN) approach was first applied on SPOT 5 data acquired on 2003 and 2010 and subsequently five land cover categories were extracted. The overall accuracies of the classified maps of 2003 and 2010 were 90.5 % and 91 % respectively. The classified maps were then used as inputs to perform the post classification change detection. The results revealed that the post-classification object-based change detection analysis performed reasonably well with an overall accuracy of 87.5 %, with Kappa statistic of 0.81 %. The changes represented that the urban expanded by 10 % over the period, whereas the urban expansion had caused reduction in soil (1.4 %) and vegetation (11.4 %), and growth in oil palm (2 %), and water (0.7 %). Additionally decision tree method was used to derive the surface heat fluxes from thermal infrared Landsat TM and ETM+bands. Subsequently, a comparison was made with classified result from SPOT 5 images. Results showed high correlation between urban growth and LST.

Keyword: Eco-environmental change, Remote sensing, GIS, Klang Valley, Malaysia