

Remote sensing and GIS based method for mapping changes in green patterns and its impact on urban environment

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Significant shrinking in vegetation coverage and sprawl in urban constructions to meet the needs of rapid population growth in the past decades have altered the regional environment. This paper investigates the role of green patterns on regulating local environment. A Geographical Information System (GIS)-based model is developed with support of Analytic Hierarchy Process (AHP) scheme to assess the eco-environmental vulnerability in relation to changes in natural space with involvement of green patterns and other indicators retrieved from Landsat time series data. The developed method was tested in the Hue City, Vietnam where has been experiencing significant transformation in land use/land cover (LULC) in the past decades. In general, results of analysis of temporal eco-environmental vulnerability maps in years 1979, 1989, 2003, and 2014 corresponding to changes in green patterns in the Hue City indicate that (i) enhancement in *heavy* and *very heavy* eco-environmental vulnerability levels during the timeframes 1979-1989, 1989-2003, and 2003-2014 exposes a good cohesion with increase in building patterns and decrease in green spaces; and (ii) at a local scale, certain extended green patterns may have a significant influence on the environment by cooling urban heat island. However, the green patterns may have a limited effect on the surrounding environment. Thus, concentration of larger greenspace at specific locations may not be a good idea. It is suggested that decision makers should wisely distribute the extended green patterns to maximize their role in regulating regional environment.

Keywords: GIS, Remote Sensing, land use/land change

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