

Urbanization and its impact on local environment: An assessment based on historical baselines of land use/ land cover and future scenarios

*Nguyen Kim Anh¹, Yuei-An Liou¹, Ming-Hsu Li¹

1. National Central University

Land use or land cover modification is a primary contributing factor of changing local environment and land surface temperature. The evolving process of urbanization is a dominant demographic trend and significant component of land conversion, resulting in changes in urban climate and urban ecology. One of the most challenges for the decision makers is to find a suitable solution to keep a balance between urbanization level and urban climate and eco-environmental systems. Natural surface in the Hue City, Vietnam has been greatly replaced by engineering constructions to meet the requirement of rapid population growth in the past decades. This study focuses to generate maps of spatiotemporal eco-environmental vulnerability for different land use or land cover change scenarios based on historical baselines of land cover retrieved from Landsat satellite data in the years 1975, 1989, 2003, and 2014. The series maps of eco-environmental vulnerability with differential future scenarios of land use or land cover changes are then simulated to provide references for planners. Results demonstrate that urbanization magnitude has a significant effect on the local environmental and urban climatic conditions.

Keywords: Urbanization, Eco-environment, Landsat data, Land use or Land cover

Urbanization and its impact on local environment: An assessment based on historical baselines of land use/ land cover and future scenarios

Anh Kim Nguyen^{1,2,3}, Yuei-An Liou^{3,4*}, and Ming-Hsu Li¹

¹The Graduate Institute of Hydrological and Oceanic Sciences, National Central University

²Institute of Geography, Vietnam Academy of Science and Technology

³Taiwan Group on Earth Observations

⁴Center for Space and Remote Sensing Research, National Central University

Land use or land cover modification is a primary contributing factor of changing local environment and land surface temperature. The evolving process of urbanization is a dominant demographic trend and significant component of land conversion, resulting in changes in urban climate and urban ecology. One of the most challenges for the decision makers is to find a suitable solution to keep a balance between urbanization level and urban climate and eco-environmental systems. Natural surface in the Hue City, Vietnam has been greatly replaced by engineering constructions to meet the requirement of rapid population growth in the past decades. This study focuses to generate maps of spatiotemporal eco-environmental vulnerability for different land use or land cover change scenarios based on historical baselines of land cover retrieved from Landsat satellite data in the years 1975, 1989, 2003, and 2014. The series maps of eco-environmental vulnerability with differential future scenarios of land use or land cover changes are then simulated to provide references for planners. Results demonstrate that urbanization magnitude has a significant effect on the local environmental and urban climatic conditions.