

Study influence of land cover change in wetland and vegetation on land surface temperature

ABSTRACT

Wetlands are a vital component of land cover in reducing impacts caused by urban heat effects and climate change. Remote sensing technology provides historical data that can study the impact of development on the environment and local climate. The studies of wetland in reducing Land Surface Temperature (LST) in a tropical climate are still lacking. The objective of the study is to examine the influence of land cover change wetland and vegetation on land surface temperature between the years 1988 and 2019. First of all, step, pre-processing, namely geometric correction, atmosphere correction, and radiometric correction, were performed before retrieval of the LST dataset from thermal band Landsat 5 and 8. Then, Iso Cluster, unsupervised was chosen to produce the land cover map for 1988 and 2019. Geographical Information System (GIS) technology was utilized to determine changes to land cover and LST change between the years 1988 and 2019. With GIS technology, a study of the impact of wetland deforestation on local temperatures at a local scale was carried out. Next to that, correlations between LST and the wetland were analyzed. The results indicated the different land cover between the years 1988 and 2019. The areas of land cover for wetland and vegetation decrease and while area of urban increased. The land cover changed the influences of LST significantly in the study area. The LST increased with the decreasing in areas wetland areas for every 5-kilometer square (km^2) wetland lost an increase in 1-degree Celsius of LS was estimated. The size of wetland influence on LST was significant. Wetland and vegetation function in reducing the urban heat island effect was vital in providing a comfortable environment to the Kuching population and indirectly reduce the demand for power energy.