

Urbanization and its impacts to land surface temperature on small medium size city for year 1991, 2011 and 2018: case study Kota Kinabalu

ABSTRACT

Transformation of land cover vegetation toward urban areas causes the temperature at urban higher to compare to suburban and rural areas, namely urban heat island (UHI) effect. The UHI has a negative impact, such a stroke heat, air pollution, green gasses emission, and electric consumption. UHI studies at a tropical country still limited due to the containment of cloud cover. Besides that, studies only focus on big cities which have residents above than 2 million. The outcome this studied important to enhance our knowledge of urban heat effect at small-medium cities and guidelines to policymaker and urban planner to discover there has effectively taken to decrease the effect of urban heat at the hot spot area. The main goal of this research about to discovered influence of urban growth and selected urban index, namely the Normalized Difference Built Index (NDBI) to LST. NDBI is an index which denotes intensity of urban built up. In the first step, we generate the LST and NDBI from Landsat 8 OLI at year 2018 and Landsat 5 TM for the year 2011 and 1991. Second, we applied the unsupervised classification of Landsat 8 OLI and Landsat 5 TM to generate the land cover maps for the years 1991, 2011, and 2018. Third of our method to examine the relationship between Land surface temperature (LST) and NDBI. The higher value NDBI is a hot spot, and the low value is a cold spot. In the last step, we applied for Change Detection analysis using GIS to examine the land cover change between 1991 and 2018. Our results show the higher the value of NDBI and LST at the centre of the city and the lowest value at vegetation land cover. The transformation of land cover vegetation to urban increase at countryside area and out-of-town and significantly increase of distribution of UHI. On another hand, the shows positive relationships between LST and NDBI. The output of the study provides a guideline for policymakers and town designers to develop to toward city zero carbon, sustainable and health.