

ASSESSMENT ON THE EFFECTS OF URBANIZATION TO LAND SURFACE TEMPERATURE USING REMOTE SENSING AND GIS-BASED TECHNIQUES IN BUTUAN CITY

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Since the earlier times, many studies have recognized increased heat in urban areas, as one of the results of human medication to the natural landscape. One of the significant environmental consequences of urbanization is reduction in vegetation cover and formation of urban heat island effect. This research utilized Landsat data from to study the spatiotemporal pattern of Normalized Difference Built-up Index (NDBI), Normalized Difference Vegetation Index (NDVI) and Land Surface Temperature (LST) in Butuan City, which is one of the highly urbanized cities in the Philippines. LST has been calculated from thermal data of Landsat 7 ETM+ and Landsat 8 OLI/TIRS using emissivity derived from NDVI images. The pattern of LST indicates that urban/built-up area has increased over the decades and a half and has higher temperature than the surrounding vegetated areas. LST statistics show that there has been a rise of 3.5 degrees in the minimum and 4.9 degrees in the maximum temperature in the 15 years. Urbanization leads to increase in the built-up areas which in turn get heated up as compared to the surrounding areas leading to urban heat island effect. In addition, correlation has been attempted between NDBI to LST and NDVI to LST. The results show an obvious positive correlation between NDBI and LST while NDVI has a negative correlation to LST.

Keywords: Normalized Difference Built-up Index, Normalized Difference Vegetation Index, Land Surface Temperature