

Assessment of Land Surface Temperature Using Satellite Remote Sensing

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Abstract : The unplanned urbanization affects the environment due to pollution, conditions of the atmosphere, decreased vegetation and the pervious and impervious soil surface. Considered to be a cumulative effect of all these impacts is the Urban Heat Island. In this paper, the urban heat island effect is studied for the Chennai city, TamilNadu, South India using satellite remote sensing data. LANDSAT 8 OLI and TIRS DATA acquired on 9th September 2014 were used to Land Surface Temperature (LST) map, vegetation fraction map, Impervious surface fraction, Normalized Difference Water Index (NDWI), Normalized Difference Building Index (NDBI) and Normalized Difference Vegetation Index (NDVI) map. The relationship among LST, Vegetation fraction, NDBI, NDWI, and NDVI was calculated. The Chennai city's Urban Heat Island effect is significant, and the results indicate LST has strong negative correlation with the vegetation present and positive correlation with NDBI. The vegetation is the main factor to control urban heat island effect issues in urban area like Chennai City. This study will help in developing measures to land use planning to reduce the heat effects in urban area based on remote sensing derivatives.

Keywords : land surface temperature, brightness temperature, emissivity, vegetation index

Conference Title : ICRSGDA 2018 : International Conference on Remote Sensing, Geodesy and Data Acquisition Techniques

Conference Location : Mumbai, India

Conference Dates : February 22-23, 2018