

Remote Sensing Of The Urban Heat Island Effect On Regional Precipitation Patterns: A 20-Year Time Series In Eswatini

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The use of remote sensing has seen great application in various environmental aspects. The environmental degradation evident with urbanization is one aspect well studied using remote sensing data coupled with other ancillary variables. Satellite data like Landsat 5 and 8 has been proposed to study the development of urban heat islands over areas of high urbanization to note the effects these changes have brought. Urban heat islands are known to cause elevated surface temperatures and come with land use land cover changes. A broad range of indexes like the normalized difference vegetation index, normalized difference built up index, population growth rate and energy consumption can be used as supporting data in outlying the changes that go hand in hand with urbanization. Landsat 5 was proposed to study time periods before 2013 before Landsat 8 came into operation. And through the use of these 2 satellite systems, the research aims to do a 32 year analysis of how these urban heat islands have evolved over the years in our chosen study area. Such changes have been linked to impacts on the regional weather patterns and have been noted to impact on precipitation rates and relative humidity in the and around the urban areas as opposed to the rural and less built up areas. This phenomena can be attributed to the urban heat island effect. Other factors that affect this can be the impervious surface areas which serve to increase the total heat absorption during days time and thus increasing the heating up of surfaces in the urban areas. With such techniques as remote sensing, this effect can be properly studied with very high spatial coverage of mega cities of even globally.

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