Section B

201/B

Monitoring the spatial expansion of urban heat islands in Kandy city using Landsat TM and ETM+ data

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Formation of Urban Heat Islands (UHI) is considered as one of the significant environmental consequences of urbanization. Satellite images in the thermal infrared can be used for assessing the urban thermal environment as well as for defining heat islands in urban areas. Kandy city with a large population and urban size located in the central province, Sri Lanka was selected in this study to monitor urban heat islands and its spatial expansion. Landsat TM and ETM+ images were used to analyze spatial and temporal distributions of heat islands over the Kandy city in 1992, 2000 and 2002. Thermal bands of 1992 TM image and 2000 and 2002 ETM+ images were utilized to derive brightness temperatures in order to get land surface temperatures after correcting for surface emissivity. Areas with higher temperature were extracted and identified as heat islands. There were clearly visible changes in the spatial distribution of heat islands over ten years with a movement of heat island areas from southern boundary of the city towards northern boundary. Expansion of heat island areas in the centre of the city was observed as gradually with time. From 1992 to 2000 heat island areas expanded by 18% and from 2000 to 2002 by 10% of the total land area showing an alarming rate of expansion in the future. By 2002 30% of Kandy city area was identified as heat islands. The direction of expansion of heat islands is highly correlated with the direction of expansion of built-up area as presented in the land use maps and images of city during the period of study

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