

Monitoring and Simulating Land Use/Cover Changes and its Impact on Land Surface Temperature in Sapporo City, Japan

*RUCI WANG¹, YUJI MURAYAMA¹

1. University of Tsukuba

In recent years, urban heat island phenomenon (UHI) which prevails in many cities worldwide has caused broad public concern. UHI phenomenon impairs healthy urban development and causes excessive energy consumption, climatic and environmental deterioration. Land use/cover changes are one of the most crucial variables influencing on UHI. Therefore, monitoring and simulating land use/cover changes and analyzing its effects on LST are essential for healthy urban development. This study aims to capture the impact of land use/cover on LST and simulate the LST under various land use/cover scenarios in Sapporo city, Japan. At first, we monitored the land use/cover changes from 1985 to 2015 and detect the change of LST concerning land use/cover distribution. Then, we predicted the future conditions of LST based on various land use/cover scenarios. The results show that the LST differs according to land use/cover types, and the proportion of land use/cover types is the most significant factor affecting LST. The findings also indicate that the built-up area and paddy field have the highest average LST, while the green space and water area help cool the city. In the future, the green area such as urban green parks and grassland should be planned in the city to mitigate the UHI phenomenon. It reveals the spatial characterization of LST which provides significant insights for government and city planners.

Keywords: Geographical information science, Urban heat island, Land surface temperature, Land use/cover change, Sapporo city