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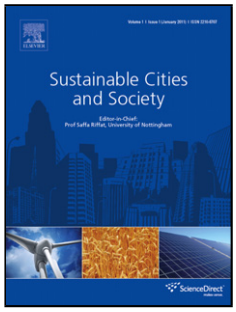

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Decadal assessment of urban sprawl and its effects on local temperature using Landsat data in Cantho city, Vietnam

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Highlights

- Study explored effects of urbanization on temperature in Cantho city, Vietnam.
- The city had been drastically urbanized during 1996 to 2016.
- Rapid urbanization yielded influence of landscape configuration on the temperature.
- Average temperature of urban areas had significantly increased during 1996–2016.

ABSTRACT

Urbanization has increasingly become a prevailing issue confronting scientists worldwide due to its effects on temperature and environment. This study explored effects of decadal urbanization on local temperature from Landsat data in Cantho city, Vietnam from 1996 to 2016. The mapping results of built-up areas achieved from the random forests (RFs) indicated the overall accuracies and Kappa coefficients higher than 89.5% and 0.79. Cantho city had been drastically expanded with the built-up areas increasing from 1,274.0 ha in 1996 to 2,932.7 ha in 2006, and 3,428.8 ha in 2016, respectively. The urbanization by transforming opened lands to artificial surfaces had led to effects on the city temperature. The results of temperature retrieved from Landsat data revealed the temperature obtained for 1996 in range of 25.7–37.1°C, while the values for 2006 and 2016 falling between 26.3–37.3°C and 24.1–40.2°C, respectively. The average temperature of urban areas had increased 0.8°C from 31.7 °C in 1996 to 32.5 °C in 2016. Considering 32 °C as an uncomfortably hot threshold that may affect the human health and environment, only 637.7 ha was observed for 1996, while those for 2006 and 2016 increased to 1,131.9 ha and 2,155.4 ha, respectively.