GEOURBAN INFLUENCES ANALYSIS ON IPORÁ - GOIÁS URBAN CLIMATE

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Lugar de defensa: São Carlos, São Paulo, Brasil
Fecha: 10/06/2016
Calificación: Doctorado

Disponible: Aún no está disponible

The changes imposed by man unbalance the complex natural system, changing the climate elements and features at local scale. The city is the most significant example of these transformations and the urban thermal field is the element of the city-atmosphere most affected by the use and land cover change system. In Brazil, it has been observed that the vast majority of urban climate research is focused on big cities, so that little is known on urban climate characteristics for the Midwest, especially in small towns. Thus, the objective of this research was to analyze the influence of Geourban characteristics in the climate setting of the city of Iporá and to identify the temporal and spatial variability of urban heat islands. Therefore, eight Thermo-Hygrometer devices for collecting air temperature and humidity data and two complete weather stations were settled, one in the urban area and the other in the rural area; Landsat 5 and 8 multi-spectral images of were also used. In data analysis simple and multiple linear regressions, modeling and simulations were used and an index (InGe) was proposed to quantify the man influence on the city climate. The results showed that: 1 - in some areas of Iporá city significant trends of increasing intensity of thermal anomalies were observed; 2 - the most influential variables in the multiple regression of surface temperature (TS) were explained by NDVI (35 % of the variability) and population density (25 %); 3 - the final equation, proposed as a maximum intensity predictive model of the urban surface heat island for the West Region of Goiás, we obtained an R² 0.6; 4 - the greater the distance from the green area, the higher surface temperature; moreover, in the spring, or close to it, the intensity of the green area effect on TS was by far superior to the effect at other periods; 5 - the patterns of the absolute humidity deviations allow us to affirm that the central area, urbanized, had the highest negative variances, while the areas with higher NDVI values and nearby watercourses showed the highest positive deviations moisture; 6 - urban heat islands on Iporá were more frequent at the intensity of 0.5°C to 1°C, while the maximum intensity was observed at 3.5°C; 7 - the areas located in the valley bottoms had the lowest thermal values, suggesting a cold air drainage. However, it was found that the city of Iporá, despite being a small town, modifies its atmospheric parameters.

Keywords: Urban climate, Urban heat island, Remote sensing, Multiple linear regression