Geophysical Research Abstracts
Vol. 14, EGU2012-11937, 2012
EGU General Assembly 2012

Intensity and delimitation of the night Urban Surface Heat Island over the Paris metropolitan area

M. Madelin, G. Beltrando, and A. Sakhy
University Paris Diderot - UMR PRODIG, UMR PRODIG CNRS, Geography, France (malika.madelin@univ-paris-diderot.fr)

The Urban Heat Island is one of the main factors of the urban climate. Known for a long time, it corresponds to a temperature differential between urban and rural areas surrounding and was defined firstly from the temperatures measured in the conventional network weather stations or by mobile measurements. In the present study, we used the daily night MODIS Land Surface Temperature (LST) product at 1 km resolution and during the years 2002-2011 in order to investigate the Urban Surface Heat Island (USHI) over the Paris metropolitan area (around 14 millions inhabitants, about 150 km from east to west and a little less from north to south). We calculated and used LST anomalies for the selected nights (clear sky) to overcome the seasonal and daily variations. The objective of this study is to propose a delimitation of USHI and study the relationship between the observed data points in the 9 weather stations of Météo France network and the surface temperatures of the satellite MODIS pixels. The different synthetic images, obtained from the mean, median of all the dates selected and a principal component analysis (PCA), show clearly high surface temperatures over dense urban areas and a strong decrease (around 9°C) from the center of Paris to about 30 km. Beyond the assessment of its intensity, the night USHI is defined by the Pettitt test performed on transects in all directions and shows logically the influence of topography and land use (dense urban areas vs. forest or agricultural areas).