



Diurnal and seasonal variability of surface urban heat island phenomena in Warsaw (Poland)

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The phenomenon of urbanization is an important environmental and social issue that modern society has to face. According to current estimates half of world's population lives in urban areas. It is expected that urban population will grow in the future. Urbanization and subsequent release of anthropogenic heat pollution lead to formation of an urban heat island (UHI). Development of UHI is a highly non-linear process (Kato et al., 2007) that depends on a number of factors such as magnitude of the anthropogenic heat flux, the texture of the city, local geophysical conditions and mesoscale meteorology (Sailor and Lu, 2004 after Narumi et al., 2003).

We will present analyses of the magnitude and spatial extend of Surface Urban Heat Island (SUHI) in the capital of Poland, Warsaw. SUHI characteristics will be identified based on the Land Surface Temperature (LST) product derived for MODIS observations, which will be collected for time-series for April 2009 (34 acquisitions) and November 2011 (33 acquisitions). We will present maps of SUHI for morning, evening and night hours, for April and November separately.

Several locations representing different types of land cover will be selected in order to analyze the temporal variability and amplitude of surface temperature in various parts of the city. In addition, air temperature from six automatic stations, maintained by Voivodeship Inspectorate of Environmental Protection, for periods coincident with satellite observations will be collected. Air and land temperature comparisons will be performed in order to investigate correspondence between surface UHI and air UHI. Impact of the synoptic conditions will be also discussed, with a particular caution for those terms when effect of UHI will be the strongest.