

Analysis of the thermal bioclimatic conditions of a Southern Hungarian city and its surrounding

Ágnes Gulyás*, Andreas Matzarakis**, János Unger*

* University of Szeged, Department of Climatology and Landscape Ecology, Hungary

** Meteorological Institute, Albert-Ludwigs University of Freiburg, Germany

Abstract

A Southern Hungarian city (Szeged) was chosen to examine the bioclimatic situation of the urban and the surrounding rural area. One hour averages of the Physiologically Equivalent Temperature (PET) index was calculated, which shows higher occurrence of the strong and extreme heat stress values in the rural areas compared to the urban ones. This phenomenon is due to the strong direct radiation which is disturbed in the city by trees and buildings. Examination of the PET averages through the whole examined time period however, shows 14% higher values in the urban areas. This effect is more pronounced in summer, when daytime with extreme heat stress is followed by night with 7-8°C higher PET values in the city. These nights with higher PET values disturb the regeneration of the human body before the repeated extreme heat stress occurs again during daytime. This makes the summer heat wave period more demanding for humans in the city compared to the rural areas.