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BOOK OF ABSTRACTS

Urban Heat Island and Outdoor Thermal Comfort Indices Research in Kazakhstan

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Abstract

Current research presents investigation of UHI phenomenon and outdoor thermal comfort indices, calculated with Rayman model (Matzarakis et al., 2010) in the steppe zone on the example of Kazakhstan big cities. Current investigation covers the ten-year period from 2003 to 2012. This period is representative for the study because during this short time the city area and its population rapidly increased (from 250 000 to 835 000 within the city).

Research area is quite interesting domain because Kazakhstan's capital city, Astana is the second coldest capital city in the world after Ulaanbaatar, Mongolia. So, the main purpose of the research is to study the UHI phenomenon in Astana and the surrounding steppe areas. The average annual value of the UHI intensity (approximately 1, 26◦C) is the indicator of high-intensity urban heat island for the steppe zone, and detected the positive trend of UHI intensity. The population growth of the Astana (mainly due to labor migration) raises the question of the expansion of the area of the city and the construction of new buildings.

Also analysis of several biometeorological indices, particularly PET (physiological equivalent temperature) and WBGT during summer heat waves showed significant differences between urban and rural outdoor thermal comfort conditions.

Key words:

Urban heat island, steppe zone, Kazakhstan