

Title: Urban heat island intensity in a changing climate

Author: Tatsiana Bardachova

Department: Department of Atmospheric Physics

Supervisor: Mgr. Peter Huszár, Ph.D., Department of Atmospheric Physics

Abstract: This bachelor thesis analyzes air temperature, specific humidity, height of boundary level, sensitive heat, speed and direction of wind in central Europe for the time periods from the year 2001 to 2010, 2041 to 2050 and 2090 to 2099. The sources of data are the regional climate model RegCM version 4.4 and the model of the land surface CLM version 5.5 extended with the urban model CLMU. The goal of the analysis is to determine the influence of the urban ecosystems on the meteorological conditions and to describe its development over time. The analysis is performed based on comparison of the diurnal cycles and examination of differences in values of a selection of meteorological parameters within and outside the city borders. In addition, this thesis provides an analysis of temperature distribution histograms and compares the model output with the empirical data obtained from measurements performed in Prague during the years 2005 to 2010. The results reveal the existence of correlations between values of certain meteorological parameters in urban and rural areas.

Keywords: climate, urban heat island, regional climate models, urbanization