Title:
Links between atmospheric circulation and surface air temperature distributions in climate models

Abstract:
This thesis comprises a collection of five papers dealing with validation of regional climate model (RCM) simulations over Central Europe. The first paper illustrates and discusses problems with observed data that are used for model validation and how the choice of reference dataset affects the outcomes in validating the RCMs' performances. The second paper evaluates daily temperatures, and it indicates that some temperature biases may be related to deficiencies in the simulations of large-scale atmospheric circulation. RCMs' ability to simulate atmospheric circulation and the observed links between circulation and surface air temperatures are examined in detail in the third paper. This article also compares performances of individual RCMs with respect to the driving data by analysing the results for the driving data themselves. The fourth paper focuses on biases in the diurnal temperature range within RCMs and their possible causes by examining links of the errors to the atmospheric circulation and cloud amount. The last paper investigates the observed relationships between atmospheric circulation and daily precipitation amounts over three regions in the Czech Republic, as well as how these links are reproduced by the RCMs.