

Abstract

This paper deals with the analysis of long-term temperature changes in Europe in the period 1957-2002 with an emphasis on the evaluation of the differences in values of temperature trends among selected data sources. One of the objectives of this paper is to analyze the spatial distribution of warming in Europe in individual seasons and to attempt to discuss the causes of different warming rates in different areas. Another aim of this thesis is to show, describe and justify differences in temperature trends between three different data sources: the ECA&D station database, the E-OBS interpolation network data set and the ERA-40 reanalysis. Despite the slight differences in the minimum and maximum temperature trends, the long-term mean surface air temperature change is mainly described. In the first part of the thesis we summarize the scientific literature dealing not only with warming in Europe but also the suitability of individual types of data sources for estimating the temperature trends. Most scientific articles at European level describe a long-term temperature change based on only one data source and do not analyze differences in temperature trends between databases. This diploma thesis should bring new or more detailed knowledge of these differences together with their justification. For analysis, I used data from 92 ECA&D climate stations, 325 grid points of E-OBS and 323 grid points of ERA-40 reanalysis. I used the linear regression method to calculate the temperature trends at individual stations and each grid point. The results are presented in the form of maps in which the temperature trends are represented by cartogram (E-OBS), isolines (ERA-40) and dot method (ECA&D). A mapping of statistical significance of these trends is also included in the maps. Maps are then supplemented with graphs of mean year average temperature deviations that serve to reveal the causes of differences between trends estimated from data from individual data sources.

Keywords: temperature, long-term changes, climate change, climate database, reanalysis