Climate of the Carpathian Region
Digital climate atlas of the Region- Summary of the CARPATCLIM project
L. Makatos, Z. Bihari, T. Szentimrey, S. Szalai and “CARPATCLIM participants”
lakatos.m@met.hu, Hungarian Meteorological Service


1. Background and objectives: The main aim of CARPATCLIM is to improve the climate data source and data access in the Carpathian Region for applied regional climatological studies such as a Climate Atlas and/or drought monitoring, to investigate the fine temporal and spatial structure of the climate in the Carpathian Mountains and the Carpathian basin with unified methods. The JRC (European Commission Joint Research Centre) launched a tender call in 2010 for supplying the data demand of its Desert Action activity (JRC, 2010). The consortium led by the Hungarian Meteorological Service (OMSZ) together with 10 partner organizations from 9 countries in the region was supported by the JRC to create a daily homogenized gridded dataset during the period between 1961 and 2010.

3. The final outcome of the CARPATCLIM is a ~10 x 10 km resolution homogenized and gridded dataset on daily scale for basic meteorological variables and several climate indicators, 37 in total, on different time scales from 1961 to 2010.

4. Methodology: For ensuring the usage of the largest possible dataset, the processes were implemented by the countries themselves using the same methods and software. The commonly used methods were the MASH (Multiple Analysis for Series Homogenization; Szentimrey, 2011) procedure for homogenization, quality control, and completion of the observed daily series and the MASH (Meteorological Interpolation based on Surface Homogenized Data Basis; Szentimrey and Bíhari, 2007) for gridding of homogenized daily data series. The harmonization of the datasets was carried out by the exchange of the near border station data of the neighbouring countries before and after homogenization. The snow depth was estimated by ZAMG snow model (O.2.8).

5. Why MASH for homogenization? The high quality of times series got through the MASH procedure are guaranteed by the excellent monthly benchmark results from the COST HOME Action (Venema et al., 2012) and the promising outcomes of the daily tests. Moreover, MASH is an automatically working software. Application of manual homogenization methods would be exceptionally labour intensive due to handling data series. In addition, the test results of the homogenization and quality control (e.g., detected errors, degree of inhomogeneity of the series system, number of break points, estimated corrections, and certain verification results) are documented in automatically generated tables during the homogenization process.

6. Why MISH for gridding? The MISH method is developed for interpolation of meteorological data, and an adequate mathematical background was developed for the purpose of efficient use of all the valuable meteorological and auxiliary model information. Main advantages of MISH are that the modeling part and the gridding could be run by countries in the project. The gridded daily time series were generated automatically in one step for the 50 years long period.