



## Homogenized, gridded observations for better climate change services - summary of the CARPATCLIM project

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The CARPATCLIM project is a good example of creation a long term, high quality, homogenized and harmonized gridded observational dataset. It overcame the national borders and different data policies in the Carpathian Region by applying mathematically well-established automatic homogenization and interpolation methods.

No doubt that the availability and quality of the data are key questions in the climate change services. The gridded dataset which was created in CARPATCLIM project is a high quality, homogenized and harmonized gridded observational dataset. The project resulted in daily gridded dataset in  $0.1^\circ$  ( $\sim 10 \times 10$  km) spatial resolution which consist of 13 basic variables (daily mean, minimum and maximum temperature, precipitation, wind direction, wind speed, sunshine duration, cloud cover, global radiation, relative humidity, surface vapour pressure, surface air pressure) and 37 derived climate indicators (amongst several drought indices) in the period of 1961 to 2010 for the Carpathian region (cca. 500 000 km<sup>2</sup>). The same methods were executed by each country in the project: the MASH (Multiple Analysis of Series for Homogenization; Szentimrey) for homogenization, quality control and data completion; and the MISH (Meteorological interpolation based on surface homogenized data basis, Szentimrey, Bihari) for gridding. Both tools are automatic and were developed at the Hungarian Meteorological Service (OMSZ) specifically for meteorological data. The freely available gridded dataset with the description of metadata, the data rescue activity and the methodology can be found here: <http://www.carpatclim-eu.org/pages/home/>. The project was led by OMSZ and supported by the JRC. The target area is partly includes the territory of Czech Republic, Slovakia, Poland, Ukraine, Romania, Serbia, Croatia, Austria and Hungary. Uniform process of data homogenization was crucial due to the fact that significant differences might be occurred between the measurements and data handling of participant countries during the examined fifty-year-long period. The inhomogeneities were eliminated by commonly used method for data homogenization and quality control MASH procedure.

Interpolation of the homogenized time series was carried out by applying the MISH. The MISH method is developed for interpolation of meteorological data, and an adequate mathematical background was also developed for the purpose of efficient use of all the valuable meteorological and auxiliary model information.

The tender service was accomplished in three modules. Module 1 focused on improving the availability and accessibility of homogeneous and spatially representative time series of climate data for the Carpathian Region through data rescue, quality control, and data homogenization. The activities in Module 2 ensured data harmonization with special emphasis on cross-border harmonization and production of gridded values for each country. A digital Climate Atlas as a basis for climate assessment and further applied climatological studies was developed in Module 3.

The gridded data resulted in CARPATCLIM project improves the digital data basis at national meteorological services in the Carpathian region, and facilitates access to derived gridded climatological datasets by the wider scientific community and for better services as well.