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Precipitation extremes in the Alpine region as seen from a trans-national multi-decadal gridded rain-gauge dataset

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The utility of currently available gridded climate datasets in Europe is complicated either by the constraint of regional data products to national territories, or by restrictions in the station data available to continental scale data products. These limitations are particularly relevant in the Alpine region, because of the complex and non-congruent geo-political and climatological segmentation.

In this presentation we report on an activity, undertaken in the framework of EU project EURO4M, to develop a gridded trans-Alpine dataset of daily precipitation that extends over the entire Alpine massif and utilizes data from the high-resolution national rain-gauge networks. The station dataset encompasses more than 6000 stations from Austria, Croatia, France, Germany, Italy, Slovenia and Switzerland. In a recent effort the data coverage could be significantly enhanced in regions/periods with previously inferior coverage. It now covers the period 1971-2008.

In this presentation we give an overview of the entire processing chain from data collection and quality control to the procedure of spatial analysis. The latter is accomplished on a 5-km grid with a two-step procedure (climatology and anomalies analyzed individually and with different methods). A second focus of the presentation will be placed on a climatological analysis of precipitation extremes, i.e. the frequency of intense precipitation and long consecutive dry periods. To this end, gridded analyses of common extremes indices will be discussed. This analysis offers interesting insights into regional peculiarities, topographic effects and the annual cycle of the Alpine precipitation climate.

By the time of the conference, a preliminary version of the complete daily grid dataset is expected to be ready. It will allow illustrations of major heavy precipitation events over the past 40 years.