Extreme several day precipitation totals at the Hurbanovo observatory (Slovakia) during the 20th century

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A b s t r a c t : The Hurbanovo Meteorological Observatory is the only one in the Slovak Republic that has continuous series of observations since 1871, the unique climatic data series not only in Slovakia but also in Central Europe. It is located in the Danubian lowland in the southwestern part of Slovakia, 115 m a.s.l. In a broader sense, this observatory is representative for the climatic conditions of the whole region of the Carpathian (Pannonian) hollow, which contains the lowlands of Central Europe. This study is devoted to the analysis of the possible changes in the time series of extreme precipitation totals in connection with global warming. The analysis of the long-term precipitation series and trends in the series of extreme precipitation events at Hurbanovo is important, since the region belongs to the most developed agricultural areas in Central Europe which exhibits a rather high density of rural population and has considerable ground water resources. Expected climate change can cause serious negative impacts in the lowlands due to the expected increase in the number and volume of heavy precipitation events. The extreme precipitation totals for various durations (from 1- to 5-days) for the 1901-2000 period have been analysed (in seasonal and annual periods). It was attempted to identify significant trends in the time series for such extreme precipitation totals. The correlations of extreme one to five day precipitation totals with seasonal (annual) precipitation totals have been elaborated. Finally Depth-Duration-Frequency curves have been derived. Some precipitation climatic characteristics for pentad totals in the 1871-2000 period are included. The results will be used as an input to the construction of baseline scenarios for analysis of climate change impact in Slovakia in the 21st century.

Key words: intense precipitation totals, high daily precipitation totals, high several day precipitation totals, statistical analysis, return periods, climate change

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