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Statistical analysis of floods in Bohemia (Czech Republic) since 1825

P. Yiou (1), M. Nogaj (1), P. Naveau (1), P. Ribereau (1), R. Brázdil (2), V. Kakos (2)

(1) Laboratoire des Sciences du Climat et de l'Environnement (LSCE/IPSL), CE Saclay l'Orme des Merisiers, 91191 Gif-sur-Yvette France, (2) Department of Geography, Masaryk University, Kotlarska 2, 61137 Brno, Czech Republic

In this study, we focus on two main rivers of Bohemia (Czech Republic), the Vltava and the Elbe rivers. Their flows are determined for the Elbe at Decin (discharges), Litomerice (water stages) and for the Vltava in Prague (discharges). Extreme characteristics of the flows have an important socio-economic impacts, and the prediction of their occurrence is hence crucial. We separated the two types of floods according to meteorological causes: (i) the winter type floods are caused by snow melt, ice damming, usually also with rain, and (ii) the summer type floods are caused by continuous heavy rains. We analyzed the amplitude and frequency of floods from those three locations using a Peak Over Threshold (POT) methodology, in a non-stationary context. This allowed us to determine the trends of the extreme floods during the 20th century, and their dependence to atmospheric circulation indices and greenhouse gas content. We conclude with predictions of return levels of floods for the two rivers.