



Comparison of heavy precipitation events in two mid-elevation mountain systems in Central Europe: the Vosges Mountains (France) and the Ore Mountains (Czech Republic-Germany border)

Jana Minářová (1,2), Miloslav Müller (2,3), and Alain Clappier (1)

(1) Laboratoire Image, Ville, Environnement, University of Strasbourg, Strasbourg, France

(jana.minarova@live-cnrs.unistra.fr), (2) Department of Physical Geography and Geoecology, Faculty of Science, Charles University in Prague, Prague, Czech Republic (minarovj@natur.cuni.cz), (3) Institute of Atmospheric Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic (muller@ufa.cas.cz)

The goal of this study is to compare the heavy precipitation events in the area of the Vosges Mountains (north-eastern France; VG) and of the Ore Mountains (Germany–Czech Republic border; OM), two examples of mid-elevation mountain systems in Central Europe. The most natural hazards (e.g., flooding) in such areas are in most cases related to heavy rainfall.

Based on daily precipitation totals from 335 gauge stations over the study areas within the period 1960–2013, the 1–10day precipitation events not interrupted by a day without precipitation are considered. The selection of heavy precipitation events proceeds from the Weather Extremity Index (WEI), which is calculated from return period values that are computed from the 3-parametric Generalized Extreme Value distribution. The 54 most extreme events per study area, i.e. 54 highest WEI values, are further analysed and compared.

The analysis has shown that the extreme events (except one episode) from one studied site do not overlap with the events from the second site. In the VG, they occur both in summer and winter half-year and are of rather shorter duration (1-2day), whereas in the OM they occur mostly in summer half-year and are either shorter (1-2day) either longer (8-10day). The different duration of events may be related to a different genesis of precipitation, i.e. of the convective and stratiform precipitation. The summer events affect generally a lesser area than winter events, which is especially true in the case of the OM (except few outliers). Furthermore, shorter events tend to affect smaller area than longer events in the VG, whereas in the OM it is less evident. Moreover, the tendency curves evince in both regions a slight increasing although insignificant trend in the occurrence frequency of heavy rainfall events.