



Flood producing mechanism identification in Otava river

T. Vlasák

Czech Hydrometeorological Institute, Hydrological forecasting office, Czech Republic (tomas.vlasak@chmi.cz)

Variability of flood causes is strongly determined by geographic environment of catchment area. Identification of unique flood characteristics such as seasonality, precipitation pattern, or typical interference of flood peaks at river confluences could be very useful for flood forecasting and control. Analysis of historical flood causes is proved method to get this knowledge.

Paper describes compilation and analysis of Flood Archive (database of flood events), which was developed for application in the scope of flood protection of Otava river basin (2780 km²). Otava river basin is situated in south-west part of the Czech Republic and includes north-western part of Šumava mountain (Böhmer Wald). Archive consists of detail description of 72 flood events (including meteorological causes and hydrological response) that occurred between 1890 and 2006 with peak flow in closing profile at Písek exceeding threshold given as 10-year return period for 1890-1961 and 1-year return period for 1961-2006). Flood formation mechanism in Otava river basin was described using this Archive.

The most important features of flood formation mechanism in Otava river basin were described and explained in relation to geographical environment. Predominance of summer floods was found in Otava river basin, and its increase with increasing return period was observed. On the other hand there were only 4 out of 72 flood events with dominant snowmelt contribution to the runoff.

Expected difference was found between weather causes of winter and summer floods. Winter floods are generally the consequence of strong western circulation with crossing frontal systems bringing rain precipitation on snow. While summer floods are caused mostly by cyclonic precipitation of stable low pressure formation in Central European area. Different air circulation type results in different wind ward effect of precipitation and consequently different runoff response. Analysis results were used to create complex categorization of floods. It recognizes 9 categories of floods with typical characteristics of air circulation, precipitation pattern as well as runoff response in the Otava river basin.