Geophysical Research Abstracts
Vol. 16, EGU2014-5304, 2014
EGU General Assembly 2014

Headwaters Retention Potential Assessment with Respect to Hydrological Extremes

Jan Kocum, Bohumir Jansky, and Lukas Vlcek
Charles University in Prague, Czech Republic (vlcek@natur.cuni.cz)

Urgent need of solving of issues dealing with protection against hydrological extremes calls also for detailed clarification of runoff generation mechanisms. The topicality of this subject is associated with recent climate change and the intensification of hydrometeorological extremes, taking place in Central Europe as well. Suitable conditions for the research realization at present is related to the highly peaty Otava River headwaters, sw. Czechia. To understand and clarify the runoff generation process and the effect of various physical-geographic factors on its dynamics, the analyses of runoff regime in chosen experimental catchments were done. In order to evaluate the study area retention potential peat bogs hydrological function assessment had to be carried out. Attention was also focused on findings of a runoff dynamics dependence on the ground water table in the peatland. Hydrochemical and geochemical approaches including isotope hydrology principles were used to explain the mechanisms of streamflow generation processes in the highly peaty catchments.
On the base of acquired results and time series statistical analyses it could be stated that more distinct runoff variability is typical for streams draining catchments with the significant proportion of peatland. The fact that the existence of bogs has the negative effect on the runoff process, especially during extreme hydrological situations, was confirmed by hydropedological, hydrochemical and geochemical approaches. Implementation of unforceable measures, such as the use of potential accumulation and retention spaces in the catchment area, could contribute significantly to reduction of peak flows and to increase of water resources during eventual extreme droughts in future.

Key words: hydrological extremes, runoff formation, retention potential, Otava River, automatic stations, experimental catchment, peat bogs hydrological function, oxygen isotopes, snow cover, retention and accumulation spaces, climate change