



Parameters of streamflow droughts in agricultural basin in central Poland

A. Bartczak (1), R. Glazik (2), and S. Tyszkowski (1)

(1) Department of Environmental Resources and Geohazards, Institute of Geography and Spatial Organization, Polish Academy of Sciences, Torun, Poland, (2) Department of Hydrology and Water Management, Institute of Geography, Nicolaus Copernicus University, Poland

Extreme hydrological phenomena – especially droughts, are scrutinized by many scientists. These phenomena occur on both regional and local scale and result in severe economical losses. Identification and assessment of the severity of hydrological droughts in areas of highly developed agriculture is significant, as the deficit, especially during the vegetation season, becomes a barrier for an intensive agricultural development.

The main aim of this part of the research was to determine the parameters of streamflow droughts of the ZgŁ owiczka River to WŁ ocŁ awek Ruda gauge, collecting the water from a typical agricultural area. The total basin area amounts to 1.495,6 km². Presently, in terms of land use, the river basin area dominated by farmland, which takes up i.e. 80.1% of the basin area. The farmland structure is dominated by arable land, which takes up 73.1%.

The analysis was carried out on the basis of sets of daily discharges from the period 1951-2010. The methodology used in this paper describes the streamflow droughts, where river discharges are below the selected levels. The value of selected levels is $Q_{70\%}$ and $Q_{90\%}$ determined from the flow duration curve with the upper discharges. Every selected streamflow drought was described with the use of the following parameters: the day of the beginning and the day of the end, duration, deficit volume, the minimal and the medium discharges of the streamflow drought. The period of streamflow drought was then compared with the precipitation deficit which occurred within the same period and the quantity of days without precipitation.

The paper was carried out within the framework of the research project no. N N306 473538 Polish Ministry of Science and Higher Education