Annual maximum discharges with given probability in a small lowland river of central Poland

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The results of estimation of the probable annual flood flows with the use of two various approaches are presented in the paper. 46-year-set of flow data (1963-2008) from a small agricultural river of Zagożdżonka, of catchment area of 82 km2, located in central Poland (ca. 100 km south of Warsaw) has been used for flood frequency analysis. In the first approach, the traditional statistical series is formed from the annual maximum (AM) flows of hydrological years. In the other approach, two separate series of floods are formed; of maximum annual winter season floods and maximum annual summer season floods (WS-M). A computer program, using four types of probability distribution functions (Gamma, log-Normal, Weibull and log-Gamma), and developed by IMGW (Institute of Meteorology and Water Management), has been applied for frequency analysis with the use of AM and WS-M series, respectively.

Results of computations with the use of AM and WS-M data indicate clear differences in probable flood flows with low probability between the two approaches. Flood flow with return period of 100-year estimated with the WS-M data is 23% higher then the other one. The carried out investigation with flow data from the small river has shown that ratio of 100-year flood and 2-year flood was significantly higher then such regional ratio, estimated for larger rivers in this region of Poland.