Natural Environment Monitoring
2017, *No 19(1)*, 61-68

DROUGHTS IN THE BYSTRZANKA CHANNEL IN THE LONG-TERM 1991–2015

Witold Bochenek

Key words: drought, cut-off level, drought duration, drought streamflow deficit, the Bystrzanka catchment

Summary

Droughts, resulting from the deficit of rainfall, cause a serious threat to the proper functioning of geoecosystems, resulting from the lack of water available for plants, natural habitats and agroecosystems. The purpose of the conducted research was to determine the duration, number, distribution of the droughts in the hydrological years and during the hydrological year and the amount of water deficit caused by the occurrence of low flows in the Bystrzanka channel during the 25 years (1991–2015). Threshold values of droughts were determined on the basis of 70th (total drought) and 95th (profound drought) of the percentile from the discharge duration curve together with the higher ones. The constant (for a whole year) level of the cut-off and the variable (for months) level of cut-off in the daily average flow rate chart were calculated. The average duration of a total drought in the year was 124 days (constant cut-off level) and 111 days (variable cut-off level). The duration of low flow during the year showed an upward trend. On the basis of a permanent values of a cut-off level for the total and profound droughts, were distinguished 94 events of droughts, including during 44 events a discharge fell below the upper limit of the profound droughts. In the summer half-year, the mean duration of droughts was nearly two times longer than in the winter half-year, when a constant cut-off level was applied. When using a variable cut-off level, the average duration of droughts was similar. Analyzing the occurrence of droughts during the year, it was found that this phenomenon occurs most often in the first and second decades of September and its absence was found in the third decade of March. For individual years covered by the study, the deficit of outflow during droughts was calculated, which was on average 16.6 mm year-1 (constant cut-off level) and 12.1 mm year-1 (variable cut-off level).