



Long-term droughts changes in a small Carpathian stream channel (Poland)

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Droughts, resulting from the deficit of rainfall, causes a serious threat to the proper functioning of geoeosystems, resulting from the lack of water available for plants, natural habitats and agroecosystems. The purpose of the research was to determine the duration, number, distribution of the droughts in the years and the water deficit caused by the occurrence of low flows in the Bystrzanka channel during the long period 1991-2015. Based on the 70th and 95th percentile of the discharge duration curve together with the higher discharges, total and severe droughts thresholds were estimated. 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. Based on the constant values of a cut-off level for the total and severe droughts, 94 droughts events were distinguished. Discharge bellow the upper limit of the severe droughts fall during 44 events. During the summer season, the mean duration of droughts was nearly two times longer than in the winter season, when a constant cut-off level was applied. The average duration of droughts was similar in variable cut-off level. It was found that droughts occurs most often in the first and second decades of September and its absence was found in the third decade of March. The deficit of outflow during droughts for each years was average 16.6 mm year⁻¹ (constant cut-off level) and 12.1 mm year⁻¹ (variable cut-off level).