

ANALYSIS OF HYDROLOGICAL DROUGHT OF THE BIEBRZA RIVER TO THE BURZYN GAUGE IN MULTIYEAR 1951-2002

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This paper presents analysis of hydrological droughts in the Biebrza River down to the Burzyn gauge in multiyear 1951-2002. The catchment area is situated in the north-eastern part of Poland. An important role in this region is played by numerous wetland areas, which are protected by the Biebrza National Park. A stretch of 156 km of the Biebrza River is included in the National Park. The Biebrza Wetlands conditions depend on levels ground and surface water and thus, a hydrological drought is a danger to wetlands. The water shortage causes transformation and decline wetland areas. Hydrological drought is a period of low and very low flows in rivers. The examined catchment area is part of the Podlaska Lowland where droughts occurred most often in the country.

This paper is a presentation of hydrological droughts in 1951-2002 period. The daily discharge hydrographs and annual sums of precipitations are basis of analysis. In author opinion, low discharge is then, when sequence of daily discharges with value lower then threshold discharges of low flow (Q_0) lasts at least 10 days. Truncation level value of drought was applied as statistical value $Q_{90\%}$ determined from flow duration curve with the upper discharges. The droughts are characterized for 4 parameters: deficit volume of drought, time duration of drought, average discharges of drought and minimal discharges of drought. Estimation of the severity of hydrological droughts in catchment area consists of the following characteristic: av. number of droughts in year, mean duration of drought, av. deficit of drought [th. m³]. In 1951-2002 multiyear 35 droughts was observed. The biggest deficit volume of drought approx. 41074 th. m³ was in 1969 year and it lasted for 130 days. The longer duration of drought 155 days was in 1953 year. Results of 52 years studies prove that 60 % all droughts stay over month. The long droughts were noted in the periods: 1951-55, 1963-64, 1968-71, 1982-83, 1992, 1994, 2000, 2002. Most of droughts appear in summer half-year. Since 1973 to 2002 year no observed any drought in winter half-year.

Negative consequence of the droughts are fires of peatlands in the Biebrza National Park. The biggest fires took place in 1992 years when 2.5 th. ha peatlands was burnt and in 2002 when 3.6 th. ha lowmoors was destroyed mainly in Central Biebrza basin.

The analysis of the Burzyn gauge does not indicate any significant changes of the river low flow during the last 52 years.