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Faculty of Earth Sciences

ANTHROPOGENIC ASPECTS OF LANDSCAPE TRANSFORMATIONS

2

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INTRODUCTION

This volume presents the collection of papers prepared to the following geographical Polish-Hungarian Symposium „Anthropogenic aspects of landscape transformations” which took place in Faculty of Earth Sciences of University of Silesia in Sosnowiec (13–15 May 2002). It was a result of agreement of co-operation between University of Silesia in Katowice and University of Debrecen.

The papers prepared concern all signs of human impact which are observed in eastern part of Hungary as well as in Silesian Upland in Southern Poland.

Editors

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CHANGES IN RIVER RUNOFF UNDER THE INFLUENCE OF HUMAN IMPACT – SELECTED EXAMPLES FROM KATOWICE PROVINCE

Introduction

Katowice Province (Silesian Voivodeship) – administrative unit created as a result of the new administrative division of Poland takes up the area of 12 300 km² (3,9% of the area of Poland) and is inhabited by nearly 4,9 million people (12,6% of the total number of Poland's inhabitants). Population density is 397 persons/km² and is 3,2 times higher than Poland's average. Katowice Province is the most densely populated region in Poland and it also has the highest urbanization rate in Poland – 79,6%. The industrial character of this region is emphasised by high number of employment in industry and building – 805 800 people, which constitutes 46,8% of the total number of employed.

As far as landscape is concerned we deal with very varied units: from mountain areas and foothills in the south to limestone uplands in the north-eastern part. In the centre of the province there are heavily urbanized and industrialized areas.

As far as hydrography is concerned in the area of the province there is first order watershed, separating river basins of the Vistula and Odra (Oder) rivers.

This paper is the effect of analysis of a large quantity of hydrometeorological data, which was prepared for the requirements of Mapa Hydrograficzna Polski (Hydrographic Map of Poland) scale 1:50 000 (sheets from the area of the middle part of Katowice Province – Absalon, Jankowski, Leśniok, 2001a-g). This was the reason of restricted access to essential long-term hydrological characteristics (encompassing many years) – without the possibility of access to more detailed data (because of considerable cost of getting the basic and processed measurement information from the Institute of Meteorology and Water Management).

For this reason our findings concern only the following hydrological parameters: variability of characteristic runoff in a year, the amount of specific runoff and relation between runoff index and precipitation.

This paper does not aspire to being a monograph and it only indicates that certain negative changes are present in river runoff regime in the area of Katowice Province.

Ten catchments have been chosen for the research (both from the Vistula and Odra river basins) of different size and degree of anthropogenic transformation of water relations. In the case of two rivers: Brynica and Klodnica, 2 and 3 gauge-stations were chosen respectively, closing individual parts of their basins. Basic information about the chosen catchments was presented in table 1, and their location was presented in fig. 1.

Table 1. Basic information about the researched catchments

No	River gauge-station (period)	Catchment area A [km ²]	Average annual discharge from the period in m ³ × s ⁻¹	Catchment characteristics	Comments
1.	Korzenica Miedzyrzecze (1967-2000)	72,5	0,62	quasi-natural (sylvan and agricultural)	
2.	Pogoria Dabrowa Gornicza (1961-1999)	37,3	1,21	anthropogenic (industrial)	water reservoirs in the catchment above the gauge-station
3.	Brynica Brynica (1961-1999)	98,2	0,52	quasi-natural (sylvan and agricultural)	
4.	Brynica Szabelnia (1961-1999)	482,7	5,70	varied (upper part of the catchment - quasi-natural, lower part - anthropogenic)	
5.	Ruda Ruda Kozielska (1961-1999)	381,9	3,25	varied (upper part of the catchment - anthropogenic, lower part - quasi-natural)	large water reservoir above the gauge-station
6.	Nacyna Rybnik (1979-1999)	63,6	0,83	anthropogenic (industry, urbanization)	
7.	Klodnica Klodnica (1961-1996)	72,9	0,90	anthropogenic (industry, urbanization)	
8.	Klodnica Gliwice (1961-1999)	444,0	6,41	varied	
9.	Klodnica Lenartowice (1961-1999)	1054,6	7,03	varied	large water reservoirs above the gauge-station
10.	Bytomka Gliwice (1961-1999)	136,5	2,61	anthropogenic (industry, urbanization)	

