THE MULTIANNUAL DISCHARGE FLUCTUATION OF TOPA RIVER AT THE HIDIŞEL HYDROLOGICAL STATION

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Abstract

This paper presents the multiannual discharge fluctuation of Topa river at the Hidişel hydrological station in the 2006-2010 period.

The multiannual average discharge is $1.65 \text{ m}^3/s$. The highest average discharge was recorded in 2006, $2.67 \text{ m}^3/s$, while in 2008 the lowest value was recorded, $0.811 \text{ m}^3/s$.

The highest discharge value in the period included in the study was 56.4 m^3/s and it was recorded on 01.06.2006. The same discharge was recorded on 31.12.2009.

The lowest discharge of the period was $0.006 \text{ m}^3/\text{s}$, recorded on 24.08.2009.

Key words: highest discharge, hydrological station, lowest discharge, river.

INTRODUCTION

The hydrological parameter most often used to express the flow of river systems is water discharge. Water discharge is the amount of water that flows through the active cross-sectional area of a river per unit time. It is expressed in m^3/s of l/s (Pişota I., Zaharia Liliana, 2003).

Climatic factors influence river discharge. Among them, precipitation has a high influence, as it increases water levels.

Discharge is also influenced by air temperature – higher temperatures mean higher evaporation, which results in decrease of water discharge.

MATERIAL AND METHOD

In the study on the discharge of Topa river at the Hidişel hydrological station data provided by the "Romanian Water" National Administration, Crişuri Water Branch, were used. The period covered by the study was 2006-2010.

The water discharge data were processed using statistical and mathematical methods. The results were graphed so that the fluctuation in time could be better followed.

RESULTS AND DISCUSSIONS

The multiannual average discharge of Topa river at the Hidişel hydrological station is 1.65 m^3 /s. The highest annual average discharge in

the period included in the study is 2.67 m³/s, recorded in 2006. An average discharge close to this one was recorded in 2010, that is, 2.63 m³/s.

The lowest annual average discharge was recorded in 2008, 0.811 m^3/s . A value close to that one was recorded in 2007, 0.917 m^3/s . In 2009, the annual average discharge was 1.24 m^3/s (see Figure 1).

The above data show that water discharge at the Hidişel hydrological station has significant fluctuations, high discharges were recorded in 2006 and 2010, 2.67 m³/s and 2.63 m³/s respectively. In 2007, 2008 and 2009 the discharges had lower values.



Figure 1. Evolution of annual average discharges at the Hidişel hydrological station (2006-2010)

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Fluctuation of the highest annual discharges at Hidişei in 2000-2010 period					
Highest discharge	56.4	33.5	26.2	56.4	50.9
m ³ /s					
Date	01.06.2006	12.02.2007	09.03.2008	31.12.2009	29.07.2010

Elustration of the highest annual discharges at Hidigal in 2006 2010 period

Source of data: Crişuri Water Branch

The above data on the fluctuation of highest annual discharges show that the highest discharges, 56.4 m³/s, were recorded on 01.06.2006 and on 31.12.2009. A value close to this one was recorded on 29.07.2010 as well, $50.9 \text{ m}^3/\text{s}$ (Table 1).



Figure 2. Evolution of highest annual discharges at the Hidişel hydrological station (2006-2010)

In 2007 and 2008 the highest discharges drop to 33.5 m³/s and 26.2 m³/s, values recorded on 12.02.2007 and 09.03.2008 respectively (see Figure 2).

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i idetdation of the lowest annual disenarges at findişer in the 2000 – 2010 period					
Lowest discharge	0.040	0.026	0.018	0.006	0.248
m ³ /s					
Date	29.07.2006	24.07.2007	22.08.2008	24.08.2009	06/07/10
Source of date: Crigari Water Drough					

	Fluctuation of the lowest annual	l discharges a	ıt Hidişel in th	ie 2006 – 2010	period
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Source of data: Crişuri Water Branch

The lowest annual discharge in the period of the study was $0.006 \text{ m}^3/\text{s}$, recorded on 24.08.2009. The highest value of lowest annual discharge was recorded in 2010, the value of 0.248 m³/s, on July 6th. Intermediate values were recorded on 22.08.2008, 0.018 m³/s, followed by the one recorded on 24.07.2007, 0.026 m³/s, and then up to 0.040 m³/s recorded on 29.07.2006 (see Figure 3, Table 2).



Figure 3. Evolution of lowest annual discharges at the Hidişel hydrological station (2006-2010)

CONCLUSIONS

The multiannual average discharge is $1.65 \text{ m}^3/\text{s}$. The highest value was 2.67 m³/s, recorded in 2006, while the lowest one was 0.811 m³/s, recorded in 2008.

The highest water discharge was recorded on 01.06.2006 and 31.12. 2009, the value of 56.4 m^3/s .

The lowest water discharge was recorded on 24.08.2009, the value of $0.006 \text{ m}^3/\text{s}.$

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