

THE CRISUL NEGRU QUALITY FEATURES FROM THE CRISURI HYDROGRAPHIC

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Abstract

In this work we have followed to characterize the quality of the water for Crisul Negru from the Crisuri hydrographic basin, afferent to Bihor country.

The physical and chemical quality of the Crisul Negru water has been analyzed on groups of indicators. These groups are: the oxygen regime: (CBO_5 , CBO_{10} , $CCO-Cr$, dissolved oxygen etc.), nutrients (nitrites, nitrogen, total nitrogen, ammonia nitrogen, phosphates, etc.), salinity (fix residue, chlorides, sulfates, bicarbonate, sodium, potassium, calcium, magnesium, etc.), natural origin specific toxic polluting agents (arsenic, cadmium, cobalt, chromium, copper, iron, manganese, nickel, zinc, etc.) and other relevant chemical indicators (phenols, detergents, etc). The determination of the quality categories has been done on the basis of the norms in force (Water Law No. 107/1996, STAS 4706/88 and the MMGA Order No.161/2006).

There are five quality estates: first class (very good estate), second class (good estate), third class (moderate estate), fourth class (weak estate) and fifth class (bad estate). It has been noticed that during the year 2011 the estate of the Crisul Negru water quality has integrated greatly in the first class.

Key words: oxygen regime, salinity, toxic polluting agents, nutrients

INTRODUCTION

The Crişului Negru spring is situated on the north slope of the Cucurbăta Peak, at the altitude of 1460 m. In the mountain area Crişul Negru has got big slopes this is why its course is powerful, typical for the mountain area.

The waters of the river calm in the hollow. The distance that this river Crisul Negru crosses in the Crisuri hydrographic basin from its spring until Zerind (border) is of 164 km.

MATERIAL AND METHOD

The chemical and physical analysis of the Crisul Negru's water has been done on the basis of the data obtained from Rivers' Water Basin Administration's Office Oradea.

During 2011 the following have been determined: the oxygen regime, nutrients, salinity, natural polluting agents as well as other relevant chemical indicators.

RESULTS AND DISSCUSIONS

The repartition of the surveillance sections in quality classes according to the indicator groups are presented in the following:

Table 1

The length of the section characterized in relation with the features registered for the oxygen regime group for the year 2011

Month	Section	Length (km)					Total
		Class I	Class II	Class III	Class IV	Class V	
January	spring – Zerind fr.	164	-	-	-	-	164
February	spring – Zerind fr.	164	-	-	-	-	164
March	spring – Zerind fr.	164	-	-	-	-	164
April	spring – Zerind fr.	164	-	-	-	-	164
May	spring – Zerind fr.	106	58	-	-	-	164
June	spring – Zerind fr.	86	78	-	-	-	164
July	spring – Zerind fr.	-	164	-	-	-	164
August	spring – Zerind fr.	66	98	-	-	-	164
September	spring – Zerind fr.	164	-	-	-	-	164
October	spring – Zerind fr.	164	-	-	-	-	164
November	spring – Zerind fr.	164	-	-	-	-	164
December	spring – Zerind fr.	164	-	-	-	-	164

Source: data processed after the Rivers' Water Basin Administration

In January, February, March and April the water quality of Crisul Negru on its whole length of 164 km belongs to the class I (table1).

In May and in June the water quality belongs both the class I and to class II of quality. Thus, in May, on a length of 106 km it belongs to class I and on a length of 58 km it belongs to class II of quality.

In June 86 km belong to class I of quality and 78 km belong to class II of quality. The quality of the water in July belongs to class II on a length of 164 km, in August a length of 66 km belongs to class I and 98 km belong to class II.

In September, October, November and December the quality of the water for the oxygen indicator belongs to class I for all those 164 km.

The quality of the Crisul Negru water from the nutrients indicator, in January, February, March and April belongs to class I on its 164 km from its spring to the border in Zerind (table 2).

In May 89 km of the analyzed water belongs to class I, 42 km belong to class II and the rest of 33 km belong to class III.

In June the quality of the water belongs to the first two classes, with 86 km in class I and 78 km in class II. For July, August, September, October, November and December the quality of the water from the nutrients point of view belongs only to class I.

Table 2

The length of the section characterized in relation with the features registered for the nutrients group for the year 2011

Month	Section	Length (km)					Total
		Class I	Class II	Class III	Class IV	Class V	
January	spring – Zerind fr.	164	-	-	-	-	164
February	spring – Zerind fr.	164	-	-	-	-	164
March	spring – Zerind fr.	164	-	-	-	-	164
April	spring – Zerind fr.	164	-	-	-	-	164
May	spring – Zerind fr.	89	42	33	-	-	164
June	spring – Zerind fr.	86	78	-	-	-	164
July	spring – Zerind fr.	164	-	-	-	-	164
August	spring – Zerind fr.	164	-	-	-	-	164
September	spring – Zerind fr.	164	-	-	-	-	164
October	spring – Zerind fr.	164	-	-	-	-	164
November	spring – Zerind fr.	164	-	-	-	-	164
December	spring – Zerind fr.	164	-	-	-	-	164

Source: data processed after the Rivers' Water Basin Administration, Oradea

The quality of the Crisul Negru water from the salinity indicator belongs, on its whole length of 164 km, from its spring until the border of Zerind to class I, all along the year 2011 (table 3).

Table 3

The length of the section characterized in relation with the features registered at the salinity group for the year 2011

Month	Section	Length (km)					Total
		Class I	Class II	Class III	Class IV	Class V	
January	spring – Zerind fr.	164	-	-	-	-	164
February	spring – Zerind fr.	164	-	-	-	-	164
March	spring – Zerind fr.	164	-	-	-	-	164
April	spring – Zerind fr.	164	-	-	-	-	164
May	spring – Zerind fr.	164	-	-	-	-	164
June	spring – Zerind fr.	164	-	-	-	-	164
July	spring – Zerind fr.	164	-	-	-	-	164
August	spring – Zerind fr.	164	-	-	-	-	164
September	spring – Zerind fr.	164	-	-	-	-	164
October	spring – Zerind fr.	164	-	-	-	-	164
November	spring – Zerind fr.	164	-	-	-	-	164
December	spring – Zerind fr.	164	-	-	-	-	164

Source: data processed after the Rivers' Water Basin Administration, Oradea

Table 4

The length of the section characterized in relation with the features registered at the specific toxic polluting agents for the year 2011

Month	Section	Length (km)					Total
		Class I	Class II	Class III	Class IV	Class V	
January	spring – Zerind fr.	-	164	-	-	-	164
February	spring – Zerind fr.	164	-	-	-	-	164
March	spring – Zerind fr.	164	-	-	-	-	164
April	spring – Zerind fr.	164	-	-	-	-	164
May	spring – Zerind fr.	148	16	-	-	-	164
June	spring – Zerind fr.	164	-	-	-	-	164
July	spring – Zerind fr.	164	-	-	-	-	164
August	spring – Zerind fr.	146	18	-	-	-	164
September	spring – Zerind fr.	164	-	-	-	-	164
October	spring – Zerind fr.	164	-	-	-	-	164
November	spring – Zerind fr.	151	13	-	-	-	164
December	spring – Zerind fr.	-	164	-	-	-	164

Source: data processed after the Rivers' Water Basin Administration, Oradea

Along the length of the studied section the quality of the Crisul Negru water from what the specific toxic polluting agents are concerned, in January and in December they belong to class II of quality.

For February, March and April the quality of the water belongs to class I from its spring to the border of Zerind.

In May, on a distance of 148 km it belongs to class I and on a distance of 16 km it belongs to class II.

The quality of the water in June, July, September and October belongs to class I of quality on a length of 164 km and in August, on a length of 146 km, it belongs to class I while the rest of 18 km belong to class II (table 4). In November 151 km belong to class I and 13 km belong to class II.

For the year 2011 the quality of the analyzed water after the group of other relevant chemical indicators belongs to class II on the whole length of 164 km section (table 5).

Table 5

Length of the section characterized in relation with the features registered at the group other relevant chemical indicators for the year 2011

Month	Section	Length (km)					Total
		Class I	Class II	Class III	Class IV	Class V	
January	spring – Zerind fr.	-	164	-	-	-	164
February	spring – Zerind fr.	-	164	-	-	-	164
March	spring – Zerind fr.	-	164	-	-	-	164
April	spring – Zerind fr.	-	164	-	-	-	164
May	spring – Zerind fr.	-	164	-	-	-	164
June	spring – Zerind fr.	-	164	-	-	-	164
July	spring – Zerind fr.	-	164	-	-	-	164
August	spring – Zerind fr.	-	164	-	-	-	164
September	spring – Zerind fr.	-	164	-	-	-	164
October	spring – Zerind fr.	-	164	-	-	-	164
November	spring – Zerind fr.	-	164	-	-	-	164
December	spring – Zerind fr.	-	164	-	-	-	164

Source: data processed after the Rivers' Water Basin Administration, Oradea

CONCLUSIONS

The quality estate of the Crisul Negru water for the year 2011, after the indicator groups taken into study is as follows:

1. After the oxygen regime the waters of the Crisul Negru river belong to class I of quality in proportion of 70% and over 20% belong to class II of quality.

2. According to the nutrients the quality of the Crisul Negru water belongs to class I in proportion of 92%, 6% belong to class II of quality and 2% belong to class III of quality.

3. After the salinity regime the quality of the Crisul Negru water belongs to class I in proportion of 100%.

4. In what the group of specific toxic polluting agents is concerned the quality of the Crisul Negru water belongs 81% to class I of quality and 19% belongs to class II of quality.

5. After the group "other relevant chemical indicators" the quality of the Crisul Negru water belongs 100% to class II of quality.

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