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PRESPA LAKE WATER QUALITY AND PROTECTION

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Abstract

The purpose of this paper is to display the Prespa Lake accuracy quality as well as measures for lake protection. To perform a risk assessment of surface waters pollution before a season in 2011 it is made a monitoring on a beach and lake water quality by the Center for Public Health and Bitola. It is also observed the health - environmental risk from sewage works wastewater from catering-tourist facilities and sewage works in Ezerani. Due to the great importance of the Prespa Lake as a natural lake, a control is periodically performed on its surface water from January to October. Also regular reviews are made on the coast, in and out of season to be able to perform proper assessment of existing risks on its contamination. Parameters disturbance of the oxygen regime is due to the large increase in the level of the lake which appeared large underwater movements and almost daily rainfall, which contributed to disturbance water quality. Coliform bacteria identification in surface indicates *E. Coli* presence, which is an indicator of fresh faecal contamination. There are direct contaminants, rivers that pass through villages and collect sewages from rural population. Also, sanitary protection zones are not respected, there is not a local sewerage in all villages around the lake and the existing sewage-works are not maintained and do not treat sewages to needed quality. According to the physical-chemical parameters, the research results display that water purity ranges from class I to III and according to bacteriological parameters from class I to II.

Keywords: Prespa lake, protection, quality, water.

Introduction

Due to the great concentration of population by the lake, water quality in natural sources is gradually worsening. Lakes located near large agglomerations are exposed to high pollution rate - 1.5. Natural and artificial lakes have a great economic importance of humans, as tourism and transportation purposes, for fishing, supplying of urban centers with drinking and industrial water, electricity and etc. Because of their huge importance the man should pay attention to protection of these waters if he wants to continue to use their benefits. Quality preserving and environment protection and improvement and human health protection includes regular monitoring and classification of water quality for bathing, then its management and giving an information to the public about it 2.6. According to requirements of adopted directives, the water quality of Prespa Lake is regularly controled. After 25 years, the level of the lake is 1.5 meters in height, during 2011, which means that from previous year is 3.5 meters in height. By water coming the Prespa Lake quality is improved 3.4.

Aim

The purpose of this paper is to display the Prespa lake accuracy quality as well as measures for lake protection.

Material and method

To perform a risk assessment of pollution of surface waters before a season in 2011 it is made a monitoring on a beach and lake water quality by the Center for Public Health - Bitola. It is also observed the health - environmental risk from sewage-works wastewater from catering-tourist facilities and sewage-works in Ezerani. The Prespa Lake water quality is followed on 5 measuring points as follows: Dolno Dupeni, Otesevo, Pretor, Slivnica and Stenje. The following parameters were controlled:

- Evaluation of the hygienic-epidemiological status of the site;
- Laboratory parameters of the oxygen regime (dissolved oxygen, saturation and BPK5);
- Physico-chemical parameters characteristic for lake water natural composition;
- Water sanitary-microbiological examination.

Results

Directive 2000/60 EC has been taken on 15 February 2006 to preserve the quality, protection and improvement of the environment as well as human health protection. It consists the regulations for regular monitoring and classification of water quality for bathing, then running with water quality for bathing and informing the public with waters. All requirements from Directive 2000/60 are regularly controlled by water from Prespa lake. To perform a risk assessment of surface waters pollution before a season in 2012 it is made a monitoring on a beach and lake water quality, then it is observed the health-environmental risk from sewage works wastewater from catering-tourist facilities and sewage works in Ezerani.

Tested parameters	I class	II class	III class
O2 saturation	93.3%		6.7%
BPK 5		47%	53%
HPK		100%	
Suspended substances		100%	
Dry residue from filtered water	100%		
Ph	100%		
Turbidity	46.8%	46.6%	6.6%
Total nitrogen	100%		
Nitrates, nitrites, ammonia, chloride	100%		

Table 1. Physico-chemical parameters figure

Microbiological indicators	I class	II class	III class
Aerobic mesophilic bacteria/1000 m	40%	60%	
Total coliform bacteria/1000 ml	60%	40%	
Coliform bacteria from faecal origin/1000 ml	93.4%	6.6%	
Streptococci from faecal origin/1000 ml	100%		

Table 2. Figure on samples microbiological tests

Due to the great importance of the Prespa Lake as a natural lake, a control is periodically performed on its surface water from January to October. Also regular reviews are made on the coast, in and out of season to be able to perform proper assessment of existing risks on its contamination.

Discussion

Disturbance of the parameters of the oxygen regime is due to the large increase in the level of the lake which appeared large underwater movements and almost daily rainfall, which contributed to water quality impairment. Identifying coliform bacteria in surface water can be explained as follows: the presence of *E. coli* is an indicator of fresh faecal pollution noticeable in measuring points: Otesevo, Pretor, Slivnica and Stenje. It is a result of large waves and movement of lake water because in that period no tourist facility works. Besides the analysis of physico-chemical and microbiological parameters, this year starts the examination of pesticides presence and their residues. Since last year's tests residues of pesticides are not detected in lake water.

Conforming to all insights, there are direct contaminants, the rivers, that pass through villages and collect sewages from rural population, also zones of sanitary protection are not respected (v. Stenje), there is not a local sanitation in all villages around the lake, the sewage-works are not maintained and do not treat sewages to desired quality. In addition, there are indirect polluters as industrial buildings from city that its sewages directly flows into Golema Reka which its riverbed was modified and now directly flows into the lake.

Conclusion

According to the Decree on categorization of watercourses and lakes in Macedonia and the Regulation for waters classification, Prespa Lake waters should belong to I class,

but tests results show that under the physical-chemical parameters, the purity of the water ranges from I to III class and according to bacteriological I to II class.

Proposed measures:

- Immediately construction of sewage-works on already built sewerage in those villages where is possible;
- Immediately construction on local sewerage with sewage-works in villages around the lake, for lake prevention from direct pollution;
- Immediately reconstruction or replacement of existing, with new sewage-works on tourist sites for improving the operation of these facilities;
- Permanent control of natural rivers and lake pollutants by the inspector for the environment and taking actions for warning the pollutants of wildlife in the river how they pollute the environment;
- Regular monitoring for funds proper using on fruit trees protection and making conditions for healthy environment preserving;
- Regular monitoring for Prespa Lake surface waters quality;
- Respecting the first zone of sanitary protection;
- Workplaces which directly flows sewages in Big River to set up mini- sewage-works.

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