

# **GEOECOLOGICAL CHARACTERISTIC OF THE CHEBOKSARY RESERVOIR COAST**

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**Construction of Cheboksary hydroelectric power station with a reservoir was begun in 1968 and was stopped in 1981. The hydrostation was put into operation when filling a reservoir to a mark of 63,0 m with incomplete construction of protective actions. As a result of rise in level of the Cheboksary reservoir to 68,0 m territories of the Nizhny Novgorod Region, the Republics of Mari El and the Chuvash will be flooded.**

**Operation of the Cheboksary reservoir within 33 years on a temporary mark of the retaining level of 63,0 m promotes further development of possible negative impacts and deterioration of life of the population in points of accommodation getting to a zone of influence of a reservoir.**

**In work problems of influence of the Cheboksary reservoir on the nature of adjacent territories are considered. The analysis of influence of natural and technogenic factors on the Cheboksary reservoir is submitted. Comparative research of the territory of a right bank and left bank on studying of hydrological and hydrogeological processes and processing of coast in a zone of influence of a reservoir on key points is conducted. The state is considered recreational development of the territory. Features of a current state of technical objects of the Cheboksary reservoir are defined, the geoeological situation on coast of a reservoir on the studied key sites is revealed. Recommendations about decrease in negative impact of recreational use of coastal zones of a reservoir are developed.**

*Key words: engineering protection of the territory, hydrogeological processes, geoeological situation, recreational conditions of the territory.*

## **I. INTRODUCTION**

Construction of Cheboksary hydroelectric power station with a reservoir has been begun in 1968. As a result of rise in level of the Cheboksary reservoir to NPU of 68,0 m the part of squares at territories of the Nizhny Novgorod Region, the Republic of Mari El and the Chuvash Republic will be flooded.

Operation of the Cheboksary reservoir within 33 years on a temporary mark of the retaining level of 63,0 m promotes further development of possible negative impacts and deterioration of life of the population in points of accommodation getting to a zone of influence of a reservoir. Safety of Cheboksary hydroelectric power station is actual not only in the conditions of a reservoir level raising, but also at the existing reservoir mark.

Purpose: Studying of influence of the Cheboksary reservoir on the nature of adjacent territories.

Tasks: 1. The analysis of influence of natural and technogenic factors on the territory of the Cheboksary reservoir.

2. Comparative research of the territory of a right bank and left bank:  
studying of hydrological and hydrogeological processes and processing of coast in a zone of influence of a reservoir.

3. To consider recreational development of the territory.

4. Forecast of a state of environment.

Object of research: coast of the Cheboksary reservoir.

Object of research: geocological condition of a reservoir.

Research methods: field, cartographical, system analysis.

Cheboksary hydroelectric power station - the fifth (and the last on construction time) a step of the Volga Kama cascade.

The Perm, Jurassic, neogenic and quarternary deposits take part in a geological structure of the territory of the Cheboksary reservoir. The bed of reservoir, is generally put by deposits of a complex of quarternary sandy-argillaceous deposits of the valley of the Volga River and its inflows. Sandy-argillaceous deposits have the greatest distribution on a left bank of Volga. The valley of the Volga River has an asymmetric profile: high and steep right-bank slope (a.o. 85-190 m), flat left coast (a.o. 65-80) m.

In the course of carrying out research carrying out 2 routes lasting 1-2 days on on a right bank and a left bank of Volga was planned. Routes are carried out in August, September, 2015.

The problem of the first route was to give the general visual representation of a geological and geomorphological structure of a right bank, of a condition of objects of engineering protection of the territory of Cheboksary.

## II. MATERIALS AND METHODS OF RESEARCH

On key site №1 hydrogeological conditions of the territory spring were studied. The spring is located on a slope of the Novoillarionovsky ravine. The absolute mark of a site of an exit of a spring makes 120 m. The source is located on a forest slope. In upper courses of a slope of a ravine accumulation of firm household garbage are observed. Approaches to a spring are well equipped and improved. The spring output at the time of research, made 0,02 l/sec. Water transparent, a smell is absent, without taste. Water from a spring is used for drinking water supply by inhabitants of city streets. Ecological condition of the territory is satisfactory.

On key site №1; 2; 3 the complex of radical Perm breeds of the Tatar tier is presented. We have studied a geological exposure. It consists of clays with pro-layers mergely and alevrit. On the studied key points throughout all route landslides of various types are presented: slidings, currents, block.

We have studied a landslide which is in 100 m from the Person and River organization. Length of a landslide makes 50 m, in a profile - concave. There are fresh deformations; they are connected with remoistening of soil.

Key site No. 2 Supervision over the flooding phenomena

Bogging has local nature of development and is observed on small sites. The main reason them - unloading of underground waters and concentration in decreases.

## III. RESULTS OF THE RESEARCH

Supervision of over coastal processes. Processing of the coast continues to develop actively. It promotes abrasion accumulation to processes of coast [7]. Processes by us were observed both on a right bank and on a left bank of Volga.

Engineering protection of the city of Cheboksary includes the following objects:

On the Western slope - it is the pressure head pipeline, a dam of river. Residents of Cheboksary, pump station of the stormwater drainage system, pressure head pipeline. On East slope – the HBK pump station, storm sewerages, etc.

During studying on key sites I have shown inspection of a condition of engineering constructions that the part of viewing wells is filled up with dirt and garbage, hatches on wells are absent, the water waste ditch grows with a moss and silt, water waste collectors are hammered, concrete plates grow with vegetation.

Cheboksary is on the right, sublime coast of Volga, and engineering protection is presented first of all by bank protections with a total length more than 10 km, and the drainages protecting them.

The route No. 2 passed on a left bank of Volga. I began in the territory of engineering constructions near Sosnovka and I came to the end in a zone of sanitary protection of sanatorium "Chuvashia".

Problem of a route: to study constructions of engineering protection, to consider natural recreational conditions of the territory of a left bank.

In the late seventies have begun design and construction of constructions of engineering protection of genitive Sosnovka for protection of the territory against flooding and flooding at NPU of 68,0 m. The project has provided protective dikes and a soil drainage network. Now part of a construction not builds.

On a left bank eolian processes are brightly presented. They are especially brightly presented on a key point No. 5 around sanatorium of "Chuvashia" where we observed both lamination of sand, and wind ripples ashore, and dunes - eolian accumulative educations. On a key site No. 5 morphometrical measurements of the growing ravine which began to become more active in 2015 Due to the processing of the sandy coast of a reservoir around sanatorium "Chuvashia" are taken the coast will approach the I zone of a high security of sanitary protection of mineral sources that can have an adverse effect on quality of medicinal waters.

Here we observed water blossoming.

For recreational studying of the territory environment components were estimated: air, water and soil and vegetable cover [4].

The received integrated quantitative assessment has allowed to allocate within a coastal zone of a reservoir on usefulness degree for development of a recreation and tourism three categories of sites: 1) favorable, 2) rather favorable and 3) adverse.

1-optimum it is the territory of Zavolzhye [8].

Here the coast throughout is put by the accumulative educations presented by two high water terraces covered with the pine woods. Along a level of water the beach zone is allocated.

2 Sites of the territory of the second category settle down along the right coast of a reservoir.

3. Sites of the third category settle down as along the left low coast experiencing intensive bogging and on the right coast along abrasion coastal ledges.

During a route also negative actions of recreant have been noted. It and campfires, trampling of vegetation, firm garbage especially it was shown on the right coast.

#### IV. CONCLUSION

Studying of a coastal zone of a reservoir has revealed the following geoenvironmental problems complicating his economic use:

1 bank protections have been constructed in Soviet period and updating of a number of sites, collectors needs.

2-there is an intensive processing of coast. Washout of coast exerts negative impact on recreational development of the coast and an ecological condition of a reservoir.

3. For improvement of a recreation to increase a share road path networks by a left bank near Sosnovka, informative and educational (ecological) tracks; to equip places of short-term rest with campfires, arbors, benches dustbins,

4. Messages monitoring activity.

5. To lead ecological discussions with pupils of schools Cheboksary.

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