

# EVALUATION OF PROCESSES ON THE COAST OF THE WATER RESERVOIR THROUGH SPACE SURVEY (ON THE EXAMPLE OF CHIMKURGAN RESERVOIR)

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### Abstract

This article examines the changes in the shores of the reservoir, the geological conditions and the factors influencing it, based on observational data obtained from the shores of the Chimkurgan Reservoir through space surveys of the reservoirs. Based on the study, the geological condition of the coast was determined. Known areas were selected according to the formation of coastal rocks and changes in them were studied.

**Key words:** Rock, coastal length, profile, geology, water level.

**Introduction.** The purpose of the construction of reservoirs in our country is one of the most important issues in the flow of rivers, the integrated use of available water resources. Therefore, the effective use of existing reservoirs, the gradual supply of water to consumers during the growing season, the establishment of the most optimal operating modes to increase the useful volume lost during operation, the development of improved methods. And most importantly, special attention is paid to high economic efficiency.

Today, the use of modern new information technologies is effective in improving the mode of operation of the reservoir and the timely delivery of the required water supply to the consumer. At the same time, the issues of coastal change over the years and its negative consequences are still relevant today. Based on these factors, the development of an improved mode of operation of reservoirs and the implementation of effective filling and emptying on the basis of this regime, minimizing the loss of useful volume, improving design and calculation methods, constantly monitoring changes in shoreline, changing surface Determining the evaporation that occurs is one of the most pressing issues.

**Research method:** The research was conducted based on the method of comparative analysis. Comparisons of satellite data were made with comparisons with data obtained from natural observations.

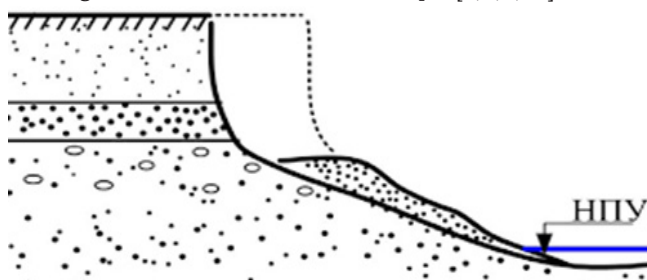
**Materials and Methods.** As a result of our field research, after the construction of a reservoir in the river valley, its various rocky shores are subject to erosion for a certain period of time, a process that begins to cover all zones of the reservoir. Coasts, where air temperature is strongly influenced by natural climatic factors, are the most prone to landslides.

The geological conditions of the area are of great importance in the process of erosion of the reservoir shores. In particular, the study of the shape structure of rocks formed in the region and their impact on water is evaluated as a factor that gives the greatest results.

As a result of geological studies, the specific gravity of rocks, taking into account the gravitational effect of water  $\gamma$  is calculated by the following formula.

$$\gamma = (\gamma_b - 9810) \frac{\gamma_r}{\gamma_v}$$

where  $\gamma_b$  and  $\gamma_v$  are the specific gravity of rock particles and dry rocks are determined by direct measurements or by standard data taking into account the geological and lithological structure of the coastal slope. [2,5,6,10].



**Figure 1. The movement of soils during landslides that occur on the banks of reservoirs**

When the banks of the reservoir were surveyed, it was found that landslides occurred as a result of insufficient adhesion of the soils. For this reason, we can see that there are very large landslides on the banks of the reservoir, and in a short time the shoreline of the reservoir has undergone a great deal of change.

Soil analyzes taken from the reservoir shores show that medium sandy and heavy sandy soils have formed in the area, with a high susceptibility to water erosion.

**Table 1  
Soil composition eroded by water on the banks of the Chimkurgan Reservoir**

Sample location	Soil composition %				Soil type
	> 0.25	0.1-0.05	0.01-0.005	<0.001	
1	1.8	35.9	23.7	2.1	sand
2	1,5	33,1	19,6	1,3	middle sand
3	0,7	15,5	7.6	5.2	heavy sand

As a result of the research, the analysis of space surveys taken during the years when the reservoir shoreline was observed was carried out. As a result of the observations, differences in the selected region were compared.



Figure 2. The process of sampling of soils on the banks of the Chimkurgan Reservoir

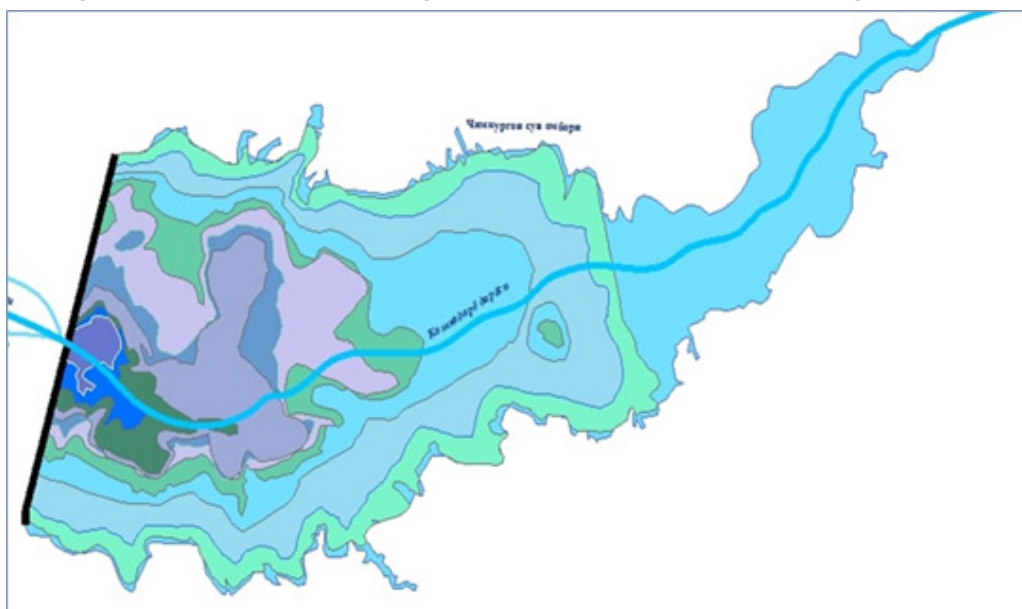


Figure 3. GAT map of the shoreline formation of the Chimkurgan Reservoir.

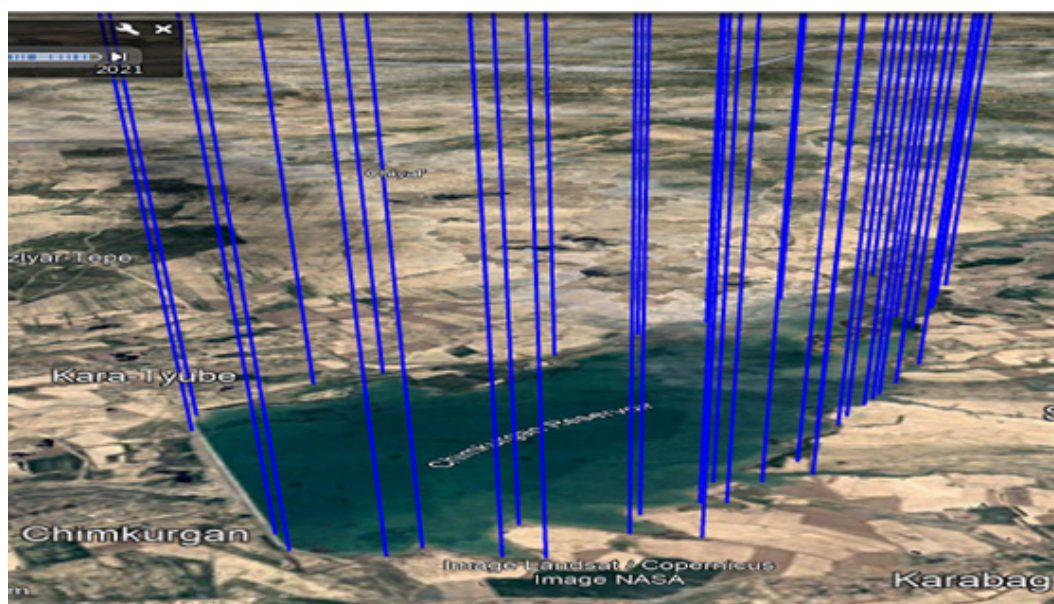


Figure 4. The coastal boundaries of the Chimkurgan Reservoir have been identified



Figure 5. Figure 6 , December 1984. March 2020 coastal shape

**Conclusion.** The survey showed that the space survey of the Chimkurgan Reservoir was 488 meters above sea level in 1984 and decreased to 487 meters by 2022. During the observation period, there was a deepening and lateral erosion on the bank of the reservoir.

Using the Google Eart database to assess the formation of the shoreline of the Chimkurgan Reservoir, the change

profile of the shores at the same altitudes in different years was studied and the difference was determined. According to the study, in order to prevent soil washing processes from the shores and to maintain the volume of the reservoir for some time, it is possible to reduce the problems on the banks of the reservoir by planting trees in coastal areas in cooperation with the Republican Forestry.

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