

## THE NOWADAYS STATE OF THE SEA OF AZOV RUSSIAN COAST

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### Abstract

When elaborating and implementing coast protection measures it is necessary to take into consideration the existence of lithodynamical systems including sources of nourishment, transit and accumulation of sediments. The Sea of Azov coast protection systems, which take into account geological, hydro-lithological and economical peculiarities of the coast, well combine the efficiency of coastal protection with the possibility to use the shore for recreation and economic purposes.

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The Sea of Azov coast has a large economic potential. Today a rate of its opening up is considerably increased. Old industrial and transport objects on a shore are reconstructed and new ones are built. Stability of inter-political situation, comfort climatic conditions, richness of the area with natural, cultural and historical places, ease to access the area and development of the transport net make the Kuban-Near-Azov region a very attractive for a recreation field of economy. Complex study of modern coastal processes affords to single out three main types of coasts: abrasion (abrasion-landsliding), accumulative and stable ones. A length of eroding coasts within this section is 240 km, that of accumulative one – 230 km. A length of relatively stable coast is about 120 km. Spits Chushka, Achuevskaya, Yasenskaya, Kamyshchevskaya, Dolgaya may be considered as accumulative forms, which are fed due to bottom sediments from bars of Khanka Lake, Beisugsky and Akhtanizovsky firths are widely spread. Today a part of accumulative coast undergoes erosion. Especially intensive is erosion of Dolgaya spit. In 2008 in some places a rate of the eastern coast retreat was 4-6 m. Abrasion coast can be observed near Primorsko-Akhtarsk and Yeisk towns, near Cape Kameny, to the north of Glafirovskaya spit and in other places. A rate of retreat of the coast cliffs is 1.8-2 m per year, and in some places it is 5-7 m/yr. Every year tens of hectares of lands are lost, during the last 100 years a belt of land, 500-600 m wide, was cut by sea [1]. Such a high rate of abrasion may be explained both by the influence of natural (geological structure of coasts, rising of the water level by the effect of wind) and anthropogenic factors. Erosion of coasts composed of loess loams practically does not give a material for a beach formation. During the period of water level rising under wind storm waves influence directly upon coast cliff coast retreat can reach several tens of centimeters during one storm. Stable coasts where abrasion and accumulative processes are not well defined today are observed in firths and between mouths of the rivers Protoka and Kuban. It should be noted that a term "Stable" can be used only in a sense of relatively weak influence of waves directly upon the shore. At the same time a coastline retreats in many places, especially between rivers the Kuban and the Protoka and this can be explained by a relative rise of a sea level and by the other processes. A human activity in the Sea of Azov basin has resulted in a great transformation of its ecosystem and this has affected on the structure of alongshore sedimentary flows. River solid run-off, abrasion products and products of biogenic origin are the main sources of material supply into the coastal zone. Construction of water storage basins results in the decrease of solid run-off in several times as compared with natural regime [2]. Decrease of natural reproduction of mollusks and uncontrolled shell withdrawals are important reasons of erosion of unique shell spits [3]. Retreat of a coastline results in destruction of arable lands and industrial objects situated on shore. To prevent this, local coast protection complexes are created within inhabited localities, as a rule. A total length of protected sections of the Sea of Azov coast within the Krasnodar region is about 30 km. When the whole length of the coast is 572 km. Coast protection has realized with the help of bank retaining walls, baffle plates, artificial beaches, rip-rap berms, fills of figure blocks, groins, breakwaters and other erections. Today a majority of existing constructions are insufficiently effective ones; many of them are damaged or destroyed. A large mobility of sediments, landsliding and sagging, oscillations of sea level under effect of wind create additional troubles for coast protection [4]. Walls of different design were built in Morozovsky and Tamarinsky settlements, on the southern coast of Yeisky firth, in Dolzanskaya Stanitsa. Some of them need a reconstruction, the other is damaged, and neighbor coast sections undergo intensive erosion. The state of the coast protected by rip-raps or artificial beaches is considerably better one. Man-made beaches are a part of the coast protection complex in Primorsko-Akhtarsk town near lighthouse, in Alexandrovka settlement. They are 10-20 m wide and they protect coast from erosion well enough. Building of complex coast protection constructions including artificial beaches in combination with different kinds

of sediment holding erections can be recommended for protection of the southeastern coast of the Sea of Azov. It's better to make berms, groins and heels in riprap variation. Such constructions keep sediments better owing to a high roughness of side planes and cavities; they better scatter wave energy and do not break a compositional integrity of a natural landscape. Correctly designed anthropogenic elements increase diversity of landscape and promote its attractiveness. Since a near shore zone is a shallow one, the use of interrupted breakwaters which suppress wave energy behind the breakwater can give good results. And then a wave shadow is created between the shore and an erection, accumulation of sediments occurs. Building of wave suppressing erections of large stones or figure blocks is possible outside the recreation zones.

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