



Sediment dynamics of the Mzymta river estuary

Marina Krylenko (1) and Maria Isupova (2)

(1) The Southern Branch of the P.P. Shirshov Institute of Oceanology, Gelendjik, Russia, krylenko@mail.ru, (2) Water Problems Institute RAS, Moscow, Russia, misupova@yandex.ru

The Mzymta River dates on the southern slope of the Caucasus Mountains at height 2980 m above sea level. It runs into Black Sea (at Adler, Russia) as uniform channel with width about 170 m, forming a shallow and vast alluvial cone. Length of the Mzymta River is 89 km, the basin area is 885 km². River alimentation is mixed; water regime is characterized by presence of a spring-and-summer high water and rain high waters.

The river sediment runoff is closely connected with features of a water regime of the Mzymta River. The maximum sediment discharge is observed in May and July and occurs due to the high water flow during the flood and high turbidity of waters in this period. The average annual discharge of sediments increases downstream from 4,8 to 11 kg/s. In some years the sediment runoff in a river mouth can reach $730 \cdot 10^3$ t/year (average turbidity to 420 g/m³) or, on the contrary, decrease to $38 \cdot 10^3$ t/year (38 g/m³). The greatest value of water turbidity in the Mzymta River was observed in August, 1977 and amount to 11000 g/m³.

Average- and small-sand, and clay particles prevail in granulometric composition of the suspended sediments. The river bed is composed by larger material: sand, gravel, pebble and boulder. The river mouth forms a broad alluvial cone blocked by sand alongshore barrier beach.

The coast of Black Sea around estuary of the Mzymta River is the accumulative coast generated on steep slope. Beach deposits can leave on the depth excluding return receipt. Several active submarine canyons are situated near Mzymta estuary. Long evolution of these forms carries pulsation character and position of canyons essentially does not vary. According to the aerial mappings for various years, the sizes of pulsations reach 100–120 m.

Beach between the Mzymta and Psou rivers are form by Mzymta solid runoff. It confirmed by petrographic structure of the beach deposits. Progressive reduction of the average size of beach deposits and increase of sand part are observed because of reduction of sediment transport and change of its structure.

Regulated of the Mzymta River flow has led to reduction of a drain of deposits of the river. Now the drain of deposits of the river makes about 70 % from the natural. At reduction of sediment transport of the river Mzymta and deficiency beach deposits the excess line of underwater slope on depth is forward to approach on coast. The canyon “Novy” especially quickly runs into a land. So in its limits 10-metre isobatic curve has promoted towards coast to 90 m during last 100years and 5-metre isobatic curve – to 120 m. At list 2 million 3 of sediments has been withdrawn from around the Mzymta mouth beach during last 10 years.

As a result of fulfilled research a detailed characteristic of modern sediment dynamics and determining factors was done. Climatic variations and man impact are basic factors that determine a formation of Mzymta seaside and proceeding of dynamical processes at present.