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To the restoration of the washed-out sea coast of the city Poti

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Large-scale geomorphological changes in the coast area of the Poti city (the main port city on the Georgian Black Sea coast) started to occur after 1939 when the course of the Rioni river (with a maximum discharge up to 4000 m3 /s) was completely diverted northwards from the city. Though this diversion protected the city from frequent floods, it at the same time created an irreversible deficit of beach-forming alluvia and, as a result, the sea coast of Poti was irreparably washed out by sea waves and its area diminished by hundreds of meters.
To restore the washed-out sea coast of Poti, in 1959, the dam with a regulator (sluice) was built across the Rioni river, at the 7th kilometer to the north-east of Poti. Its purpose was to divide the river flow so that a part (400 m3/s) of the river discharge would flow back to the former river bed (the so-called city channel) in order to compensate for a sediment deficit (600 m3 per year). However, for a variety of reasons, this measure did not lead to the desired result and the coast continued to be washed out.
As shown by our theoretical studies based on the asymptotic solution of the problem of long wave invasion in river estuaries, one of the principal reasons for persistent washouts of the coast of Poti is the absence of the operation modes of spillway gates of the city channel: they should not be opened during sea storms, that is higher than 3(H), since in that case the alluvia transported by the city channel are completely lost in the deep sea canyon located far from the coast and do not serve for the coast restoration. Therefore, in stormy weather it is necessary to close the spillway gates of the city channel. Besides, it is necessary to clean the channel bed in order to increase its transportation capacity.