Risk Assessment for the Azov Sea Coast due to Sea-Level Rise

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Abstract

Coasts of the Sea of Azov are among the most economically developed in Russia and Ukraine. Therefore, they will be extremely vulnerable under the anticipated global changes including sea-level rise. On the basis of our integrated methodology of risk, or vulnerability, assessment for sea coasts we estimated the possible vulnerability of the Russian coasts of the Sea of Azov for the scenario of 1-meter global mean sea-level rise until 2100.

The methodology is based upon the concept of various types of resources (natural, economic, cultural) and probabilistic prediction of shoreline retreat values for different morphological types of sea coasts. Assessment of anticipated losses of natural resources includes estimation of natural vulnerability to sea-level rise and value of resources on a per unit area basis. Economic losses are presented as a sum of losses of national wealth, national income, and compensation costs. In the small-scale surveys, a per unit area population number and value of economic production may be used as integrated indices of economic resources. Graded scale is constructed to evaluate each type of resources and natural vulnerability in the comparable manner. The results allowed us to quantitatively estimate possible losses under sea-level rise and to present recommendations for choose between retreat, accommodation and protection response strategies.