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Danger of tsunami in Kerch strait

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The paper considers potential strong tsunamigenic earthquakes, the sources of which are localized in the Black Sea basin at the entrance to the Kerch Strait and at the outlet from the strait into the water of the Azov Sea. Seismic source of an elliptical shape for the earthquake with magnitude M = 7 were considered. Within the framework of nonlinear shallow water equations, two possible tsunami propagation scenarios are simulated under given source localizations. Wave characteristics were obtained both during the movement of a tsunami wave from the Black Sea through the Kerch Strait to the Azov Sea. A symmetrical problem is also considered when moving tsunami from the Sea of Azov through the Kerch Strait to the Black Sea. Estimations of wave characteristics in the area of the bridge across the Kerch Strait under construction were carried out in detail. From the calculation it was found that with potential strong earthquakes with magnitude M = 7 in the Black Sea, the height of tsunami waves in the Kerch Strait in the area of the bridge under construction can reach 1.5-2 m. The speed of the water flow in the vicinity of the western bridge supports circumscribing the cape Ak -Burun, can reach 30 km / h. In the eastern part of the bridge, the Tuzla spit serves as a natural dam, extinguishing the destructive energy of the tsunami. After 1 hour and 45 minutes after the tsunami is generated, a crest of a wave up to a meter high approaches the middle of the bridge, while the left side of the wave front attacks the western part of the bridge that surrounds the Ak-Burun cape. Further propagation of the wave occurs with lower heights. When the problem is posed again, when the potential source of the tsunami is located in the Azov Sea, the wave heights in the Kerch Strait are much less, up to half a meter. Unlike the case of the location of the source of the earthquake in the Black Sea, a wave of elevation attacks the bridge across the entire width of the bridge from the Tuzla spit in the east to the cape Ak-Burun in the west. It should be noted that the wave height for this scenario is significantly less than in the first case, however, the entire bridge design is immediately attacked. Based on the results of calculations, one-dimensional histograms of the maximum wave heights along the western and eastern sections of the coast of the Kerch Strait are constructed in the region of the western and eastern pillars of the bridge. Estimates of the frequency range of the region where the main energy is concentrated in the passage of the area of these pillars are performed. The results obtained are in good agreement with both the few observational data and those of other authors.

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