

EGU21-15836

<https://doi.org/10.5194/egusphere-egu21-15836>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Tsunami Hazard of the Caspian Sea

Alisa Medvedeva¹ and Igor Medvedev^{1,2}

¹Shirshov Institute of Oceanology, Tsunami Laboratory, Moscow, Russian Federation (alisa.bannikova@gmail.com)

²Institute of Applied Geophysics, Moscow, Russian Federation

A regional model of tsunami seismic sources in the zone of the Main Caucasian thrust has been developed. The parameters of probable models of seismic sources and their uncertainties were estimated based on the available data on historical earthquakes and active faults of the region. The scenario modeling technique was used for the tsunami zoning of the Caspian Sea coast. The time period covered by the model catalog of earthquakes used to calculate the generation and propagation of tsunamis is about 20 000 years, which is longer than the recurrence periods of the strongest possible earthquakes. The recurrence graphs of the calculated maximum tsunami heights for the entire sea coast were plotted. On their basis, the maximum heights of tsunami waves on the coast were calculated with recurrence periods of 250, 500, 1000 and 5000 years and the corresponding survey maps of the tsunami zoning of the Caspian Sea were created. The algorithm for calculating the tsunami run-up on the coast is improved, taking into account the residual (postseismic) displacements of the bottom and land relief. Estimates of tsunami hazard for the coast near the city of Kaspisk were carried out: within the framework of the deterministic approach, the maximum wave heights and run-up distance were calculated. It is shown that the deterministic approach slightly overestimates the maximum heights of tsunami waves with certain return periods. It is shown that changes in the mean sea level can affect the features of the propagation of tsunami waves in the Caspian Sea. Thus, at an average sea level of -25-26 m, the Kara-Bogaz-Gol Bay is linked with the entire sea through a narrow strait. It leads to the propagation of tsunami waves into the water area of the bay and a decrease in wave height on the eastern coast of the sea. When the mean sea level decreases below -27 m, the positive depths in the strait disappear and water exchange through the strait stops, and the wave height in this part of the sea increases.