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Tsunamis hazard assessment and monitoring for the Back Sea area

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NIEP has improved lately its researches regarding tsunamis in the Black Sea. As part of the routine earthquake and tsunami monitoring activity, the first tsunami early-warning system in the Black Sea has been implemented in 2013 and is active during these last years.
In order to monitor the seismic activity of the Black Sea, NIEP is using a total number of 114 real time stations and 2 seismic arrays, 18 of the stations being located in Dobrogea area, area situated in the vicinity of the Romanian Black Sea shore line. Moreover, there is a data exchange with the Black Sea surrounding countries involving the acquisition of real-time data for 17 stations from Bulgaria, Turkey, Georgia and Ukraine. This improves the capability of the Romanian Seismic Network to monitor and more accurately locate the earthquakes occurred in the Black Sea area. For tsunamis monitoring and warning, a number of 6 sea level monitoring stations, 1 infrasound barometer, 3 offshore marine buoys and 7 GPS/GNSS stations are installed in different locations along and near the Romanian shore line.
In the framework of ASTARTE project, few objectives regarding the seismic hazard and tsunami waves height assessment for the Black Sea were accomplished. The seismic hazard estimation was based on statistical studies of the seismic sources and their characteristics, compiled using different seismic catalogues. Two probabilistic methods were used for the evaluation of the seismic hazard, the Cornell method, based on the Gutenberg Richter distribution parameters, and Gumbel method, based on extremes statistic. The results show maximum values of possible magnitudes and their recurrence periods, for each seismic source.
Using the Tsunami Analysis Tool (TAT) software, a set of tsunami modelling scenarios have been generated for Shabla area, the seismic source that could mostly affect the Romanian shore. These simulations are structured in a database, in order to set maximum possible tsunami waves that could be generated and to establish minimum magnitude values that could trigger tsunamis in this area. Some particularities of Shabla source are: past observed magnitudes > 7 and a recurrence period of 175 years.
Some other important objectives of NIEP are to continue the monitoring of the seismic activity of the Black Sea, to improve the data base of the tsunami simulations for this area, near real time fault plane solution estimations used for the warning system, and to add new seismic, GPS/GNSS and sea level monitoring equipment to the existing network.

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