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Crustal seismicity of the Black Sea areal

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The main target of the study is to decipher the seismicity of the Black Sea areal from the tsunami-genetic potential. From the seismotectonical point of view the earthquakes which are responsible for tsunami are those associated with thrust faults (subduction zones), normal and inverse faults and less strike slip faults (only if the oblique-slip and deep slip components are predominant), with magnitude higher than 6.5 (even the USGS cited tsunami at 5.1 magnitude) and depth, a shallow one, less than 20 km depth.
In order to delimit the seismic sources from Black Sea and to discrimate among them the tsunamigenic ones, the following elements have been taken into account:
- depth of the earthquakes foci, that allow separation of two major categories: deeper than 40 km depth and crustal, normal, (less than 40 km deep);
- development of the earthquakes epicenters in the orogen zone or in zones with active tectonics (fault systems);
- establishment of the areas of active faults along which the earthquakes epicenters are aligned;
- the absence of a recent or actual tectonic activity; the epicenters recorded in these tectonically stable zones are considered as the result of a diffuse, accidental seismicity.
The studies on active tectonics have clearly shown the position of the seismic sources (connected to well define active fault) which do not interfere and do not result in alternatives of other seismotectonic model constructions.
According to the distribution map of earthquakes and as well as to the map of the areas with active tectonics, ten seismic sources were established: Central Dobrogea(S1), Shabla(S2), Istanbul(S3), North Anatolian Fault(S4), Georgia(S5), Novorossjsk(S6), Crimea(S7), West Black Sea Fault(S8) and Mid Black Sea Ridge(S9).
The maximum possible magnitude of each seismic source was obtained through three aproaches: (i) using seismotectonics and geological database (the length of the faults, possible apparition on surface, geomorphology, etc), concerning international practice and IAEA recommendation, (ii) applying the observed maximum magnitude or intensity and (iii) using statistical distributions (Cornell and extreme values Gumbel I) to model the seismogenic process for all the earthquake sources from the Black Sea region. The advantage of the statistical method is the possibility to compute all the quantities used in probabilistic hazard assessment, including recurrence times for different magnitudes.
Another important issue is to evaluate the seismic hazard for the Black Sea using a probabilistic approach. The major contribution to the total sesimic hazard in the western part of the Black Sea is given by the Shabla crustal source that has a maximum epicentral intensity equal with VIII $\frac{1}{2}$.