



Earthquake early warning for Israel: Recommended implementation strategy

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The Government of Israel has resolved on June 7, 2012 to build a nationwide Earthquake Early Warning System (EEWS). Towards this goal, the Israeli Earth and Marine Research Administration (EMRA) assembled an advisory committee, composed of international EEW experts and Israeli scientists. The proposed system is planned to provide earthquake warning to schools around the nation within 2 years of project commencement, and nationwide warning beyond a period of 3 years. The Israeli EEWS will be constructed as a seismic fence along the major fault systems, and will be integrated into the regional Israeli Seismic Network (ISN). The seismic equipment at the entire integrated network will be of similar standards.

The recommended alarm approach for Israel will be hybrid: an S-wave based threshold alert will be merged with a P-wave based algorithm. The S-wave based threshold algorithm will alert when two or more seismic stations observe ground shaking above a pre-defined strong shaking level. The P-wave based algorithm uses waves which travel about twice as fast as S-waves to detect earthquakes, characterize the source magnitude and location, and then issue an alert based on predicted shaking. This approach allows for location specific alerts and regular testing through detection of smaller earthquakes, and will be useful for events occurring far from the known major faults. The proposed new seismic network to be installed is as follows: A total number of about 50 accelerometer-only sites will be deployed close to the Dead Sea and Carmel Faults in a single line of stations every ~ 10 km, south of the Dead Sea, and in a staggered geometry from the Dead Sea northward. Five additional sites with co-located seismometers and accelerometers should be deployed at large spacing along the Dead Sea Fault. The feasibility of the system is confirmed by travel-time calculations. The new seismic network will provide a significant amount of geophysical data that should be effectively mined to improve understanding of seismic hazard and seismotectonics. In order to support the successful operation and development of the early warning system, mechanisms to encourage, promote and support exchange of scientists from and to Israel for earthquake research is necessary.