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Natural Disasters
Tsunami Warning System

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A B S T R A C T

Earthquakes occur along tectonic plate boundaries. In the past 500 years three million people have died in major earthquakes. The rapid growth in population and industrial and harbor facilities increase the earthquake and tsunami hazards. Tsunamis triggered by undersea earthquakes or volcanic eruptions have killed some 52 thousand people around the Pacific basin in the past 100 years. Systems that warn populations of an approaching tsunami must work quickly since most deaths caused by the tsunami waves occur in the first 20 minutes and less than 100 kilometers from the source. Late tsunamis occured in Nicaragua, Indonesia and Japan in 1992 and 1993, with hundred of victims, has shown that actual tsunami warning systems are not sufficient to save human lives within the near-field.

In 1966, IOC established the International Coordination Group for the Tsunami Warning System in the Pacific, which identified the U.S. Seismic Sea Wave Warning System, in operation since 1948 at the Seismological Observatory near Honolulu, as the Pacific Tsunami Warning Center (PTWC). The operational objective of PTWC is to detect and locate major earthquakes in the Pacific region, to determine whether they have generated tsunamis, and to provide timely and effective tsunami information and warning to the population of the Pacific to minimize the hazards of tsunamis, especially to human life and welfare.

No such a warning system exists for major earthquake occurrence yet. Researcher are looking for proper signs of the when and where of them. Monitoring by instruments is performed all over the world looking for better forecasting.

There are several ways of reducing risk from tsunami hazards. One is assessing vulnerability, which can be attained through two methods evaluation of historical impact from tsunamis and numerical simulation. Tsunami risk is essentially a function of land uses interacting with tsunami characteristics. There are two approaches to tsunami risk reduction: construction of barriers and risk management policies.

The development of regional and national tsunami warning centers using new operational concepts will reduce the time needed to evaluate the tsunami hazard, make decisions, and disseminate the warnings.

Most of the mentioned risk reduction measures are expensive and take a lot of time to implement. Developing countries, most of which are located at the rim of the Pacific basin, have a better chance to reduce earthquake and tsunami hazard through a comprehensive education program on both natural hazards.