

Taiwan and Regional Tsunami Early Warning

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Tsunami is a high impact, but a rare natural event. Another large tsunami similar to the 2011 East Japan tsunami and 2004 Indian Ocean tsunami will occur somewhere on the earth sooner or later. Such an event cannot be stopped. However, we can avoid a similar disaster by taking immediate actions towards establishing tsunami early warning systems in different parts of the world.

Recently the USGS issued a report assessing the potential risk as a tsunami source along the entire Pacific subduction zones (A preliminary report USGS1 Tsunami Subduction Source Working Group). It identified the Manila trench as a high risk zone, where the Eurasian plate is actively subducting eastward underneath the Luzon volcanic arc on the Philippine Sea plate. This subduction zones can also rupture and generate large tsunamis in the future that will have significant impacts on the countries in the South China Sea region. However, it is clear that recent attention on tsunami early warning system development has been primarily focused on the Indian Ocean, Pacific Ocean and Caribbean Sea. Potential devastating tsunami disasters in the South China Sea region have been overlooked. This study aims to propose a new scope of constructing a low-cost but high efficient tsunami early warning system. Because the limited area and the complex international situation of SCS, the conventional buoy system is not practical. Instead, we put scientists in the fields of tsunami, seismology, geology, and high performance computing together to develop a low-cost but high efficient tsunami early warning system. The kernel of this system is COMCOT tsunami model. This model has been upgraded to the parallel version recently. With high performance computing, this model is able to finish a complete 2011 East Japan tsunami simulation with 3-layer nested grid in 3 minutes on an 8-core server. This system will also be integrated with the earthquake early warning system to provide the tsunami early warning within totally 10 minutes. A cloud-based platform will finally be constructed to share this system with the countries

around SCS.