

Web Based Online Tsunami warning for Thailand Andaman Coastline

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Objective

To develop tsunami warning system for Thailand Andaman coastline by using web based technique. Results of tsunami wave height and arrival time from 420 tsunami numerical simulation of hypothetical earthquakes and GRNN model are expressed online. This technique is very useful for warning several tsunami risked communities.

Methodology

The present study has 2 parts. The first part we assume 420 hypothetical earthquakes as shown in Fig.1 according to the past earthquake and tsunami records from USGS, then numerical computation was performed in both liner and nonlinear schemes. The Finite Different Method (FDM) on a Leap-Frog Scheme was used to simplify the equations. The fault parameters of the earthquake were found by regression equation of Donald and Kevin (1994). The simulation was done at the initial stage by using the Fault Model of Mansinha and Smiley. Computational was separated into 2 regions of different grid sizes as shown in Fig.2.

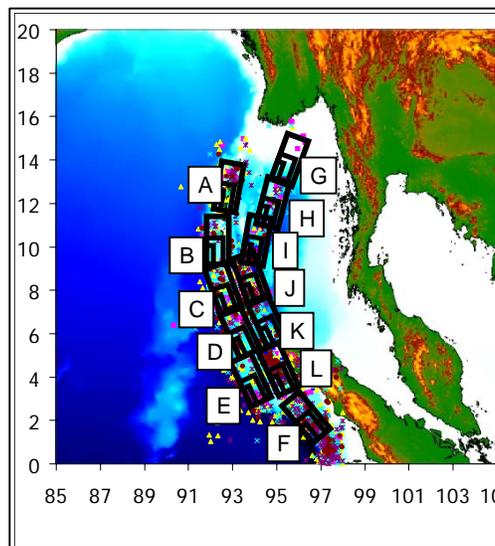


Figure 1. Assumed the earthquake location

Figure 2 shows a computing domain covering the Andaman Coastline. The total region is covered by a 1.85 km. base grid with dynamic linking in the box area. According to this method, larger grids in the deep sea are overlapped and dynamically linked with grids having 1/4 of its width in the shallower region (linking of 1.85km to 462.5 m). During the computation, water level and discharge are exchanged with each other satisfying a dynamic equilibrium along the boundary of these two regions. This process is repeated until required grid resolution is obtained. The numerical simulation results in terms of tsunami height and arrive time at 58 selected communities along Thailand Andaman coastline are given in Fig. 3.

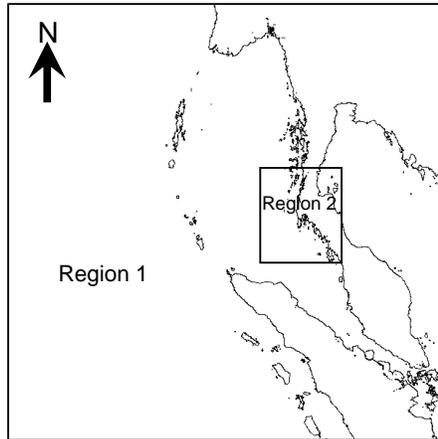


Figure 2. Computing Domain.



Figure 3. Location 58 selected communities

The second part is to use the GRNN for developing the tsunami database. This was done by training the results obtained from the first part and testing with new earthquake cases.

Results

The web-based tsunami warning is show in Fig. 4. Outputs are tsunami height and arrival time at 58 selected risk communities.

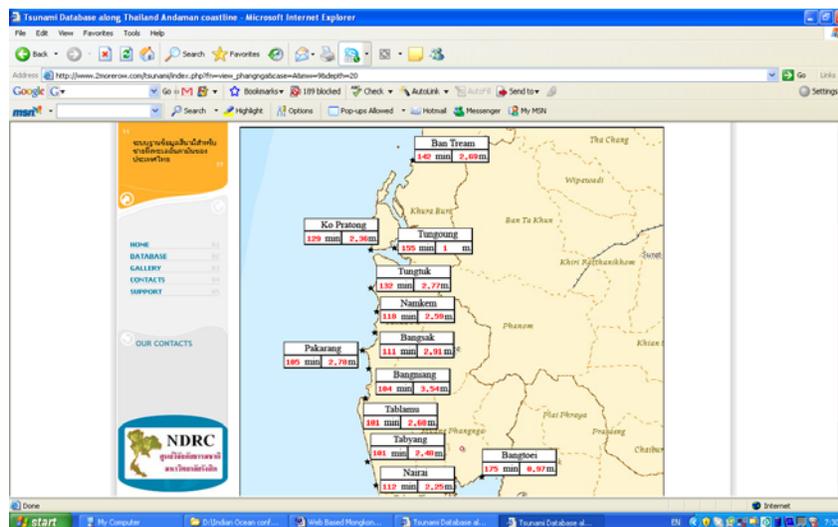


Fig. 4. Output of web-based

Conclusion

Tsunami warning database was developed to use online by web-based technique. People in several risked communities can know the situation immediately after the occurrence of earthquake. They can plan for evacuation to safe places before the tsunami attack.

Reference

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