

Analysis of the Effectiveness of Public Warning Service in Taiwan

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Effectively and accurately informing the public about natural threats in real-time is an important task of disaster reduction and prevention. During the Great East Japan Earthquake, Japan's Earthquake Early Warnings enabled the public to receive alerts just as an earthquake starts, providing valuable seconds for people to protect themselves before strong shakes arrive. In Taiwan, the "Public Warning System (PWS)" allows disaster management authorities to use telecommunications operators' mobile broadband networks to send warning messages to people's mobile phones in emergency situations, ensuring that the public receives immediate disaster-related alerts.

In order to evaluate the effectiveness of Public Warning Service in Taiwan, the transmission time only calculated from the message sending to the telecommunications operator's core network. In the current cell broadcast message delivery process, it is not possible to record the actual reception data on mobile phones. Therefore, this study deployed 100 devices across 60 sites, with 10 sites having the capability to receive signals from five telecom operators. These devices contain mobile communication chips to simulate mobile phone reception, analyzing the delivery effectiveness of Public Warning Service in Taiwan.

This study uses data from the P-Alert Strong Motion Network (Wu et al., 2013), which has over 760 stations in Taiwan till 2024. By combining earthquake information and waveform data provided by the P-Alert Strong Motion Network, we perform time-sequence analysis of earthquake early warnings. Analysis of data from the April 3rd Hualien earthquake shows that the Public Warning Service in Taiwan can achieve an early warning effect before strong motion arrives at locations 30 kilometers away from the epicenter.

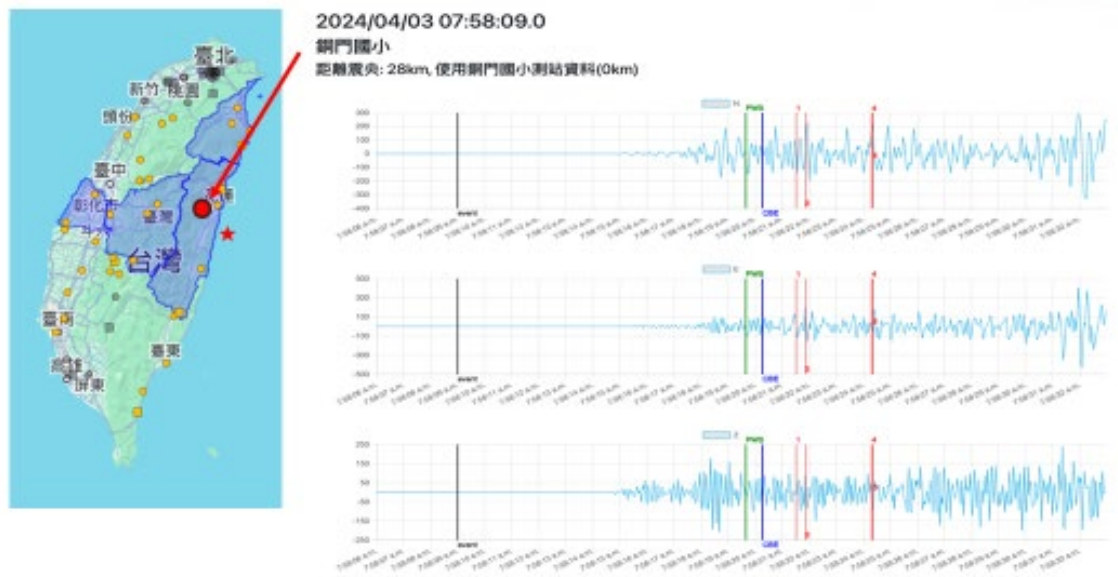


Figure 1. An effectiveness case of PWS during the April 3rd Hualien earthquake.

REFERENCES

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