

Earthquake Early Warning of JMA - The 2011 off the Pacific coast of Tohoku Earthquake and its aftershocks -

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Japan Meteorological Agency (JMA) started to provide EEW to a limited number of users from August 2006 and to the public through TV and radio in October 2007. The Meteorological Service Act amended in December 2007 defined legally JMA EEW as "forecast" and "warning" of strong ground motions caused by an earthquake. "Warning" is issued when Seismic intensity of 5 or larger (on JMA scale) is expected.

The 2011 off the Pacific coast of Tohoku earthquake (Mw9.0) occurred of March 11, 2011, caused strong ground motion around northeastern Japan. Before the strong ground motion hit cities, JMA issued EEW announcements to the general public of the Tohoku district. After the mainshock, JMA issued 96 warnings and 3751 forecasts from the mainshock to December 2011 (10 months) for its quite active aftershocks and induced earthquakes. (Note that, from October, 2007 to March, 2011 (41 months), JMA issued 17 warnings and 1928 forecasts).

On the other hand, some inaccurate "warnings" were issued after the mainshock. From March to December 2011, JMA issued 27 "false-alarms", caused by the active seismicity, in which seismic intensity did not exceed 3 everywhere in observation even when seismic intensity 5 lower (or larger) was expected.

The reason of the false-alarms is that multiple earthquakes sometimes occurred simultaneously over the wide source region during the period, the system became confused, and did not always determine the location and magnitude correctly,

In this presentation, we will present evaluation of the performance of EEW issuance, lessons learned from the earthquakes and various efforts and direction to improve EEW of JMA.

Keywords: Earthquake Early Warning, Warning event, The 2011 off the Pacific coast of Tohoku Earthquake