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Tsunami generated by the 2010 Chilean Earthquake

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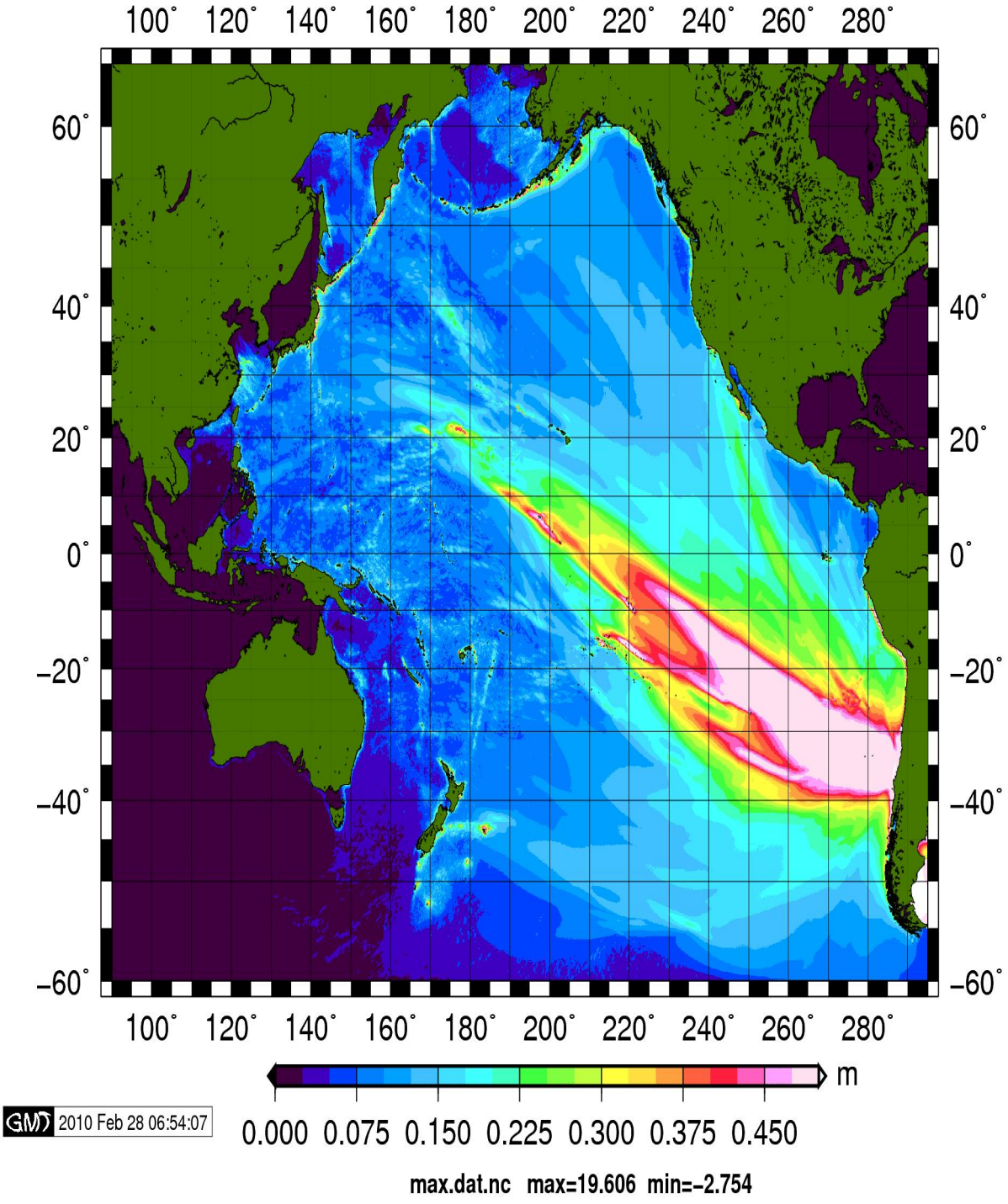

A Magnitude 8.8 earthquake (moment magnitude calculated by the Japan Meteorological Agency (JMA)) occurred in the central coast of Chili at 15:34JST on February 27, 2010. This earthquake generated a tsunami, and it traveled across the Pacific Ocean and even in Japan tsunamis were observed at many tide stations on the Pacific coast.

The JMA issued tsunami warnings (major tsunami) to the Pacific coast of Tohoku region, and tsunami warnings (tsunami) and tsunami advisories to the wide areas of the Pacific coast from Hokkaido to Okinawa at 9:33JST on February 28.

The first observation of tsunami waves in the mainland of Japan was at Hanasaki (Nemuro City) in Hokkaido Prefecture. After this, tsunamis were observed at many tidal stations in Japan. And at many stations first waves were followed by larger recurring waves. The typical observations of the maximum tsunami heights are as follows; Hanasaki (Nemuro City, Hokkaido Pref.) 1.0m (18:23JST), Kuji-ko (Iwate Pref.) 1.2m (17:01JST), Sendai-ko (Miyagi Pref.) 1.1m (20:52JST), Suzaki (Kochi Pref.) 1.2m (19:42JST), and Shibushi (Kagoshima Pref.) 1.1m (19:56JST).

The long-continued tsunamis gradually diminished and the tsunami warnings (major tsunami) were changed to the tsunami warnings (tsunami) at 19:01JST. Eventually, all of tsunami warnings were cancelled at 3:06JST on 1 March, and all of the tsunami advisories were cancelled at 10:15 JST on 1 March.

Site survey for the inundated areas in Iwate and Miyagi Prefectures were conducted by the JMA's Mobile Observation Team (JMA-MOT). The team found the trail of tsunami inundation that showed tsunami reached at a height of 1.9m in Iwate Prefecture's Rikuzen-takata City.

In drawing up and issuing tsunami warnings/advisories, the JMA not only utilized the operational quantitative tsunami database for distant tsunamis, but conducted numerical simulation of tsunami propagation. Moment magnitude 8.8 by the United States Geological Survey (USGS) was applied to the simulation, and the calculated results well coincided with observations at DART buoys and tidal data of Hawaii. Accordingly, the JMA drew-up tsunami warnings for the Japanese coast based on the synthesis of the M8.8 simulation results and the outputs of operational quantitative tsunami database with M8.8. The results showed that Tohoku region's tsunami would be more than 3m, and then tsunami warnings (major tsunami) were issued for the region. As a result, the maximum tsunami height was less than 2m including the values obtained from site survey.

Fig. Tsunami height distribution calculated by the JMA's tsunami simulation with M8.8

Keywords: Tsunami warning, The 2010 Chilean Earthquake, Quantitative tsunami database, Numerical simulation of tsunami propagation