

Technology Development to Mitigate Damage by Sediment Disasters Accompanying Large-Scale Earthquakes

Sabo Department

In the Kumamoto Earthquakes of 2016, massive damage occurred as a result of a large number of slope failures over a wide area, and landslide-prone conditions continued after the initial disaster, hindering the reconstruction of the region. NILIM is developing a technology which enables quick estimation of the occurrence of sediment disasters accompanying large-scale earthquakes and a technique for setting the standard rainfall for forecasting sediment disasters after earthquakes.

Social background and issues

- In order to contribute to a fast, efficient emergency response to sediment disasters caused by earthquakes, a technique that enables estimation of the occurrence or non-occurrence of sediment disasters immediately after earthquakes is considered necessary.
- Because smaller-than-usual rainfall sometimes triggers sediment disasters for some time after a large-scale earthquake occurs, a risk assessment technology for sediment disasters that appropriately considers the effect of earthquakes is also considered necessary.

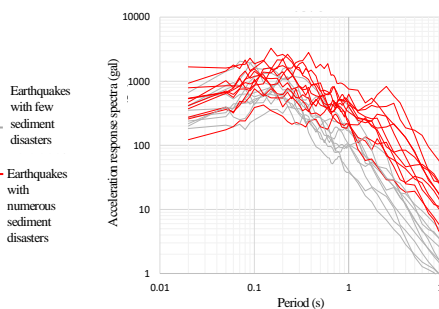
Study contents

Quick estimation of occurrence of sediment disasters accompanying large-scale earthquakes

The Sabo Department will propose guidelines for estimating the occurrence or non-occurrence of sediment disasters based on a comparison and analysis of the acceleration response spectra of earthquakes with numerous sediment disasters or with few sediment disasters in recent years.



Slope failures caused by 2016 Kumamoto Earthquakes



Comparison of acceleration response spectra of earthquakes according to sediment disasters occurrence

Preparing for heightened likelihood of sediment disasters caused by rainfall after earthquakes

Considering slope destabilization by earthquake ground motion, the threshold for issuing Sediment Disaster Alert was provisionally reduced by 20-30% in areas with JMA seismic intensities of >5+. The warning system was operated with rainfall less than pre-designated, based on this threshold.

Decisions to make the provisional threshold to the normal threshold are made based on the actual data on rainfall and sediment movements, and confirmed and recommended by NILIM.

During 2019, technical recommendations were made for Niigata Prefecture (Yamagata Offshore Earthquake) and Hokkaido (Hokkaido Eastern Iburi Earthquake).

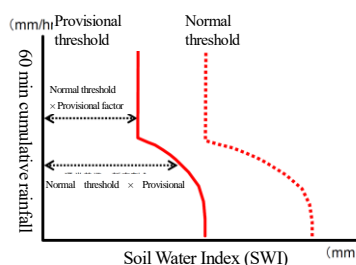
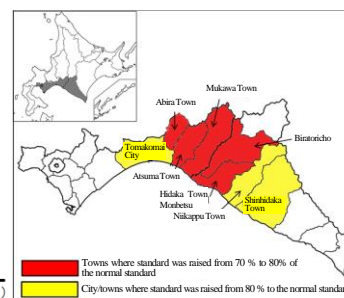


Image of provisional threshold



Target municipalities of provisional threshold (Iburi / Hidaka areas of Hokkaido)

Damage mitigation and rapid reconstruction, made possible by On-time, streamlined response to rain-induced sediment disasters after large-scale earthquakes.

☞ Related article is here (Introduction of related article by division in charge)

- Analysis of Factors in Occurrence or Non-Occurrence of Sediment Disasters by Spectrum Analysis of Observed Seismic Waves (p. 58)