

Landslide occurrences and recurrence intervals of heavy rainfalls in Japan

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Rainfall-induced landslides frequently occur in the Japanese archipelago. Radar-Raingauge Analyzed Precipitation has been operated by Japan Meteorological Agency since 1988. These rainfall data is useful for understanding the relation between landslide occurrences and the rainfall conditions. This study developed the probable rainfall database across Japan and analyzed the potential correlation between the landslide magnitude-frequency and the recurrence interval of the heavy rainfall. We analyzed 4,744 rainfall-induced landslides (Saito et al., 2014, *Geology*), and the rainfall intensity (mm/h), cumulative rainfall (mm), and soil water index (SWI). We then estimated recurrence intervals for these parameters using a Gumbel distribution with jackknife fitting. Results show that the recurrence intervals of SWI which caused landslides ($<10^3 \text{ m}^3$) are less than 10 yr across Japan. The recurrence intervals increased with increases in landslide volumes. With regard to the landslides larger than 10^6 m^3 , recurrence intervals of the rainfall events are more than 100 yr. These results suggest that recurrence intervals of heavy rainfalls are important for assessing regional landslide hazard in Japan.

Saito, H., Korup, O., Uchida, T., Hayashi, S., and Oguchi, T., 2014. Rainfall conditions, typhoon frequency, and contemporary landslide erosion in Japan. *Geology* 42, 999-1002.

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