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Correlation between hypocenter depth, antecedent precipitation and earthquake-induced landslide spatial distribution

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Since Keefer published the paper on earthquake magnitude and affected area, maximum epicentral/fault distance of induced landslide distribution in 1984, showing the envelope of plots, a lot of studies on this topic have been conducted. It has been generally supposed that landslides have been triggered by shallow quakes and more landslides are likely to occur with heavy rainfalls immediately before the quake. In order to confirm this, we have collected 22 case records of earthquake-induced landslide distribution in Japan and examined the effect of hypocenter depth and antecedent precipitation. Earthquake magnitude by JMA (Japan Meteorological Agency) of the cases are from 4.5 to 9.0. Analysis on hycpocenter depth showed the deeper quake cause wider distribution. Antecedent precipitation was evaluated using the Soil Water Index (SWI), which was developed by JMA for issuing landslide alert. We could not find meaningful correlation between SWI and the earthquake-induced landslide distribution. Additionally, we found that smaller minimum size of collected landslides results in wider distribution especially between 1,000 to 100,000 m2.