[JJ] Evening Poster | H (Human Geosciences) | H-DS Disaster geosciences

[H-DS11]Geohazards in humid, tectonically active countries and their precursors

convener:Masahiro Chigira(Disaster Prevention Research Institute, Kyoto University), Satoru Kojima(Department of Civil Engineering, Gifu University), Hiroshi YAGI(山形大学地域教育文化学部, 共同), Taro Uchida(National Institute for Land and Infrastructure Management)

Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

This session covers mass movements of landslide, slope failure, debris flow, and gravitational slope deformation in tectonically active, humid countries, and aims to discuss on their mechanisms, characteristics of occurrence sites, the significance in geological time scale, and the methodology to mitigate their affects by researchers with various related research fields.

[HDS11-P01]Simplified risk assessment method for snowmelt-induced landslides

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In regions with heavy snowfall, snowmelt-induced landslides occur frequently and become local issues. For a risk assessment of snowmelt landslides, fluctuations in meltwater and/or rain that discharges from the bottom of snowpack (MR) during the snowy season is equally important as a factor as rainfall during non-snowy seasons. However, this must be estimated using other meteorological factors because MR is not commonly observed by public meteorological stations such as AMeDAS by JMA. In this study, we suggest a viscous compression model as a new method to estimate daily MR. This method was originally designed to estimate the depth of new snowfall from two factors (precipitation and snow depth) based on viscous compression theory. For validation, we applied the viscous compression model to the following two landslide cases to estimate the time-series MR during the snow season. One case is the Kokugawa landslide, which occurred on March 7, 2012 at the end of a heavy snowfall season, and the other is the Oguriyama landslide, which occurred on February 7, 2007 during a season with less snowfall. Here, daily precipitation and snow depth at each landslide site were calculated based on the surrounding three AMeDAS data. In addition, we calculated a time-series of the water level in the third tank (SWI-S3) of Soil Water Index (SWI) using MR as the landslide risk index. SWI-S3 for the Kokugawa landslide showed the following variations: SWI-S3 remained at a low level in January, increased in February and peaked in mid- to late March. The Kokugawa landslide occurred in the period of increasing risk (March–April). In contrast, SWI-S3 in the Oguriyama landslide remained at a higher level from early January because of the continuous generation of MR. These results explained the reason the Oguriyama landslide occurred at an earlier point in the lower-snowfall season. Taking into consideration the validations mentioned above, the viscous compression model is promising as an appropriate method to estimate snowmelt-induced landslide risk.