

Landslides caused by the 2018 Hokkaido Eastern Iburi Earthquake

*Shin-ichiro Hayashi¹, Nobutomo Osanai¹, Takashi Yamada¹, Shin'ya Katsura¹, Takahisa Furuichi¹, Seiji Yanai², Yasuhiro Murakami³, Tomoyoshi Miyazaki⁴, Yuichiro Tanioka¹, Shigetaka Takiguchi⁵, Mayumi Miyazaki⁶

1. Hokkaido University, 2. Ishikawa Prefectural University, 3. Civil Engineering Research Institute for Cold Region, PWRI, 4. Shin Engineering Consultant, Co., Ltd., 5. Ministry of Land, Infrastructure, Transport and Tourism, 6. Pasco Corporation

The 2018 Hokkaido Eastern Iburi Earthquake struck the eastern Iburi region (epicenter: 42.691°N, 142.007°E, depth: 37.0km) of Hokkaido, Japan, at 3:07.59 JST, September 6, 2018 (18:07.59, September 5, 2018 UTC). Many shallow landslides and several large-scale deep-seated landslides, generating a landslide dam in the Hidaka-horonai River, were triggered by this magnitude 6.6 M_w (6.7 M_j) earthquake. The sedimentary rock in the affected area was covered by thick pyroclastic fall deposits derived from the Tarumae Volcano etc.. Landslides were densely distributed over hilly regions (elevation: 200–400 m) within an area of approximately 400 km² in Atsuma, causing 36 deaths, Abira and Mukawa, and representing the largest total area of earthquake-related landslides in Japan since the Meiji Era (1868–1912). The shallow landslides were characterized as follows: 1) pyroclastic fall deposits on sedimentary rock (basement complex) were moved by the strong seismic shock, 2) slip surface types included weathered tephra, weathered bedrock, and buried humus layers, 3) many occurred at relatively gentle slopes (< 30°), 4) shallow landslides moving along valley type topography tended to travel longer than those moving along planar slope topography, and 5) concentrated shallow landslides occurred in tributary catchments of the Atsuma and Abira Rivers. Large-scale deep-seated landslides were characterized as follows: 1) rare occurrence and 2) slip surface within sedimentary rock.

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