

Evaluating effects of earthquake induced landslides on forest carbon stocks: Cases study in 2018 Hokkaido Eastern Iburi Earthquake

IORI YASOKAWA, TAKASHI GOMI AND YOHEI ARATA
Graduate School of Agriculture, Tokyo University of Agriculture and Technology
Presenting Author: yasokawa80j@gmail.com

We evaluated the effects of earthquake induced landslides by 2018 Eastern Iburi Earthquake (Mw 6.6) on carbon stocks within a forest watershed. The study site was conducted in the Pankezawa River basin (357 ha) within Habiu River system located northwest 11 km from epicenter. Climate in this area is cold and temperate with 1028mm of mean annual precipitation and 7°C of mean temperature. Altitude of the watershed ranging from 60 and 320 m with mean 28 hillslope gradient. Dominant overstory vegetation was natural broadleaf forests consisting mainly of *Quercus crispula* and birch and larch plantations with Sasa bamboo as understory vegetation. The soil with 2 to 3 m in depth consists of the sequences of volcanic ash deposits (tephra) originated from Mt. Tarumae at 1739 A.D., 1,667 A.D., 2.5 ka, and about 8.7-9.2 ka. A total of 428 landslides with 20.6% landslide area ratio was identified. Sliding surface of landslide ranged from 0.8 and 2.7 m in depth. Carbon stocks were calculated from tree surveys, forest floor vegetation cutting, dead tree surveys, litter samples, and soil samples (up to 3 m depth) from field investigation and GIS analysis. Andosol between tephra layers had greater amount of organic carbon with 0.026 and 0.071 t-C/m³ (mean: 0.042 t-C/m³) comparing to tephra layers (mean: 0.016 t-C/m³). The landslide area ratio at broadleaf forests > 81 years old and larch forests (31.5%, 24.0%) was higher than that in mean values (20.6%). Estimated carbon stocks affected by landslide were 4.1×10⁴t-C which became 21.7% of total carbon stocks. Our detail estimations suggested that the ratio of carbon stocks affected by landslides tended to be higher compared to the landslide area ratio, because the carbon stock and susceptibility of landslides by earthquake differed among forest stand conditions.

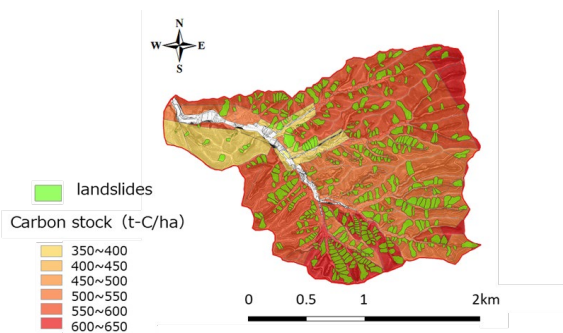


Fig. 1 Landslides and carbon stocks in the study site