

## Late Pleistocene to Early Holocene large landslides in Takamaga-hara, Mount Suisho of Hida Mountains

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We describe the geologic and geomorphic features of large landslides (rock avalanches) in the uppermost Kurobe River in the northern Japanese Alps. The source area of these landslides was a steep amphitheater on the west face of Mount Suisho (2978 m a.s.l). The landslide deposits fill the valley of the Iwagoke-kodani River, which is a subsidiary stream of the Kurobe River, and cover an area of approximately 1.53 km<sup>2</sup>. Moreover, hummocks and depressions have developed on the top surface of the landslide deposits. The landslide deposits consist of a thick (>70 m) gravel layer with brecciated rock clasts; the gravel layer has an estimated volume of 4.6 x 10<sup>7</sup> m<sup>3</sup>. The lithology of the clasts in the gravel layer is the same as that observed on the rock slopes around the amphitheater at Mount Suisho. <sup>14</sup>C dating of seven wood fragments collected from the gravel layer provides age estimates of 10.187-9.631 cal ka. Meanwhile, sandstone fragments sampled from the amphitheater exhibit ages of 4.2-3.2 <sup>10</sup>Be ka, and a granodiorite specimen collected from a hummock surface produces ages of 68-40 <sup>10</sup>Be ka and 21-12 <sup>10</sup>Be ka. These ages, combined with the geographic separation of the sampling sites, suggest that multiple landslides occurred during the Last Glacial and the Late Glacial periods, as well as during the early Holocene epoch.