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Estimating eroded soil and predicting further erosion in Daisetsuzan National Park in Hokkaido, Japan

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This study has three objectives: (1) to estimate changes of the eroded volume of mountain trails from 2014 to 2016 by making DSMs, (2) to understand a relationship between the trail erosion and micro-topography, and (3) to predict the volume of soil that can be eroded in future. Trail erosion has been investigated near Mt. Hokkai-dake in Daisetzuzan National Park, Hokkaido, northern Japan, with a drone (UAV) from 2014 to 2016. Seven segments with the soil erosion from starting sites to ending sites were selected to make DSMs and Orthophotographs by Agisoft, which is one of the Structure from Motion (SfM) software. Then, at fourteen points in each of the seven segments were selected to estimate the volume of soil that can be eroded in the future by PANDA2, a soil compaction penetrometer. The eroded volume in the segment with the largest eroded value attained 274.67 m3 for the two-year period although extremely heavy rain hit this area in the 2016 summer. The result obtained by PANDA2 shows that soil more than 100 cm in depth will be potentially eroded at four points in three years to one hundred years.