

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

©2011. Japan Geoscience Union. All Rights Reserved.



HTT033-02

Room:202

Time:May 25 08:45-09:00

Factors affecting the formation of U-shaped valley form inferred from morphometric analysis using DEMs

Kosuke Naruse^{1*}, Takashi Oguchi²

¹Grad. Sch. Frontier Sci., Univ. Tokyo, ²CSIS, Univ. Tokyo

Glaciers filled some mountain valleys in the Quaternary period. Such glaciers left U-shaped valleys, whose form may vary according to environmental factors. We investigated how U-shaped valley form is related to environmental factors, the equilibrium line, and erosion rates. For six valleys in the United States and Switzerland, we made the longitudinal profiles and cross sections using DEMs. Then the elevation of past glacial surfaces was estimated from the cross sections and plotted along the longitudinal profile. The results indicate two to four periods of glacial advances in all valleys. For the valleys longer than 10,000 m such as Lauterbrunnen, the newest glacier deeply eroded the valley bottom.

We also conducted more detailed analysis of cross sections including the measurements of slope and curvature, and estimated erosion rates and equilibrium lines. This study will reveal the detailed topographic characteristics of typical U-shaped valleys and they will be used to estimate the past glacial distribution in other less typical U-shaped valleys.

Keywords: U-shaped valley, DEM, GIS