

インターバルカメラと多種センサーによるデータロギングを併用した山岳斜面変動の観測

Combining time-lapse photography and multisensor data logging to monitor alpine slope dynamics

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Interval cameras visually monitored soil movements and rockfalls in a periglacial zone of the southern Japanese Alps (Mt. Ainodake). The time-series images greatly improve understanding of slope processes in remote, seasonally inaccessible areas. They detect the timing of slope movements at a high temporal resolution. They visualize both slow progressive movements (frost creep) and rapid temporary movements (rill erosion and rockfalls). Stereographic view of successive images displays 3D slope movements that indicate the location and magnitude of displacement. When combined with sensor-based data logging, visual monitoring allows more reliable evaluation of thresholds (environmental controls) for slope movements.

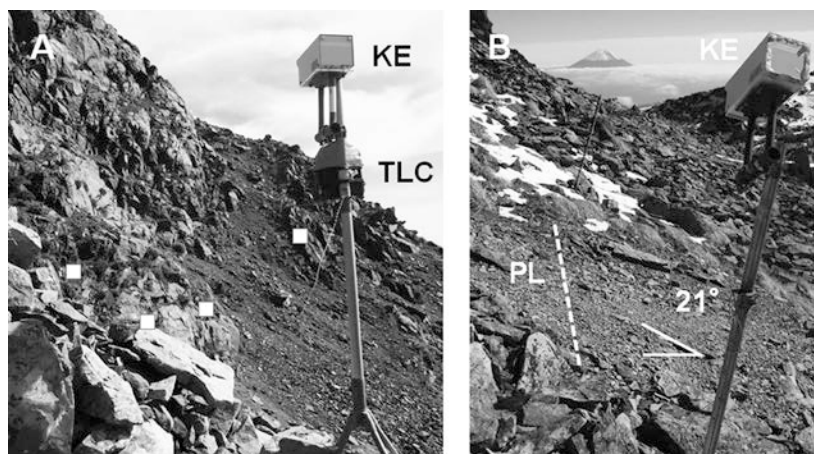


Fig. 1. Visual monitoring of slope processes with interval cameras. A. Monitoring Rockfall. B. Monitoring soil movements. KE=KADEC-EYE II, TLC=TimeLapseCam, PL=painted line, White box=painted squares.

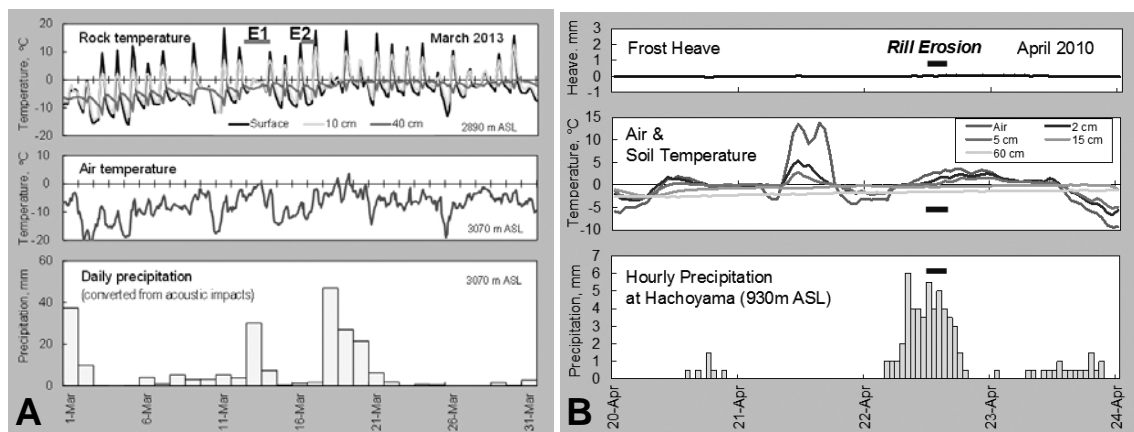


Fig. 2. Timing and triggers of movements, indicated by multisensor data logging.

A. Major rockfall events (E1, E2) occurred with superficial thawing in March 2013.

B. Rapid soil erosion (rill erosion) occurred when superficial thawing was followed by intensive rainfall.