

## Direct observation of permafrost on Mt. Fuji

IKEDA, Atsushi<sup>1\*</sup>, IWAHANA, Go<sup>2</sup>, SUEYOSHI, Tetsuo<sup>3</sup>, FUKUI, Kotaro<sup>4</sup>, SAITO, Kazuyuki<sup>3</sup>, Koichiro HARADA<sup>5</sup>, SAWADA, Yuki<sup>6</sup>

<sup>1</sup>Life and Environmental Sci., Univ. Tsukuba, <sup>2</sup>Univ. Alaska-Fairbanks, <sup>3</sup>JAMSTEC, <sup>4</sup>Tateyama Caldera Sabo Museum, <sup>5</sup>Miyagi Univ., <sup>6</sup>Fukuyama City Univ.

This research is a part of our interdisciplinary research project to understand permafrost on Mt. Fuji (3776 m asl.), to monitor its change and to evaluate the impact from changes of climate and volcanic activity on surrounding environments. In the summer of 2008, two boreholes about 3 m deep were dug on the summit area, and ground temperatures and meteorological parameters, such as air temperature and precipitation, were started to monitor automatically. One borehole (K site) is located on a small ridge in the flat area between the summit crater and outer ridge, where snow is mostly blown off by strong wind in winter. The other borehole (T site) is located at a bottom of small depression, where snow is preferentially accumulated.

Contrary to the assumption of the previous studies, permafrost absence was confirmed in both boreholes. Although frost penetration in winter reached deeper than 3 m at K site, rapid increase in ground temperature followed heavy rainfall events until early October. The highly permeable debris allows heat advection by infiltrating rain-water, which prevents the ground from being frozen throughout a year. The mean annual ground temperatures of T site were higher than those of K site, because snow cover in winter prevented the ground from cooling.

Then, we planned to dig a deeper borehole for permafrost monitoring at a most windy and less water-permeable site, and succeeded to make a 9.7 m deep borehole on the ridge near the Hakusan peak in late August 2010. Fifteen temperature sensors were installed in the borehole and recording of the data was started. Unfortunately, the data logger for the borehole was damaged by the lightning in November 1, 2010, and replaced with new logger in early July 2011. The maximum thaw depth was about 2 m in 2011, and the temperature at the depth of 9.7 m was about -3 deg C through the summer. Thus, it is almost certain that the permafrost is present at the site. We hope that the temperature data throughout a winter will be successfully obtained during the next visit in May 2012.

Keywords: permafrost, Mt. Fuji, ground temperature, climate warming