Katsuhisa Kawashima, Ph.D.

Professor

Program: Environmental Science and Technology

Area: Natural Disaster and Environmental Science

Professional Expertise

My main professional expertise is natural hazard science on snow and ice related disasters such as avalanche, slushflow (Photo 1) and the hazards associated with railways in the winter environment. Recently, I started development of the practical and versatile combined snowmelt-percolation models which enable the hourly estimate of outflow from the bottom of snowpack in mountainous regions. For this purpose, our research group has established several automatic weather stations (AWS) in heavy-snow areas of Japan and Chilean Patagonia (Photo 2).

Photo 1 Slush avalanche debris in the Mizunashi River

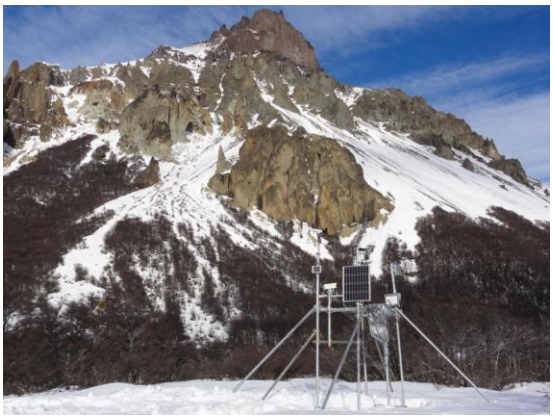

Photo 2　AWS installed in Chilean Patagonia

Research Fields of Interest

1. Snow climatology and snow distribution
2. Snowmelt-percolation processes
3. Metamorphic and transformational processes from snow to firn/ice
4. Trigger and initiation mechanism of slushflow
5. Impact of global warming on cryosphere
6. Mitigation measures against the risk of snow and ice-related disasters
7. Preventive measures against heavy snow for train operation

Education

1998: Ph.D in Science (Glaciology), Graduate School of Science and Technology, Niigata University, Japan

1987: M.S. in Science (Glaciology), Graduate School of Science, Hokkaido University, Japan

1985: B.S. in Science (Geophysics), Faculty of Science, Hokkaido University, Japan

Professional Societies and Activities

1. Member of the International Glaciological Society
2. Vice director of the Hokushinetsu branch of the Japanese Society of Snow and Ice (JSSI)
3. Member of the Japan Society for Natural Disaster Science
4. Executive board member of the Japan Society of Snow Engineering
5. Member of the Japanese Association of Hydrological Sciences

Awards

1. Onuma Award, 1998 (Hokushinetsu branch, JSSI)
2. Hirata Award, 1999 (JSSI)
3. Cold Region Engineering Award, 2001, 2011, 2018
4. JSSI Award for Academic Papers, 2009, 2017

Major Publications

Papers

[1] "A snow-melting system using water sprinkling on the extended section of the Tohoku Shinkansen line and its performance confirmation tests", *Journal of Snow Engineering of Japan*, 27, 204-213, 2011

[2] "Study on quantitative classification of seasonal snow using specific surface area and intrinsic permeability", *Cold Regions Science and Technology*, 59, 163-168, 2009.

[3] "Study of snow climate in the Japanese Alps: Comparison to snow climate in North America", *Cold Regions Science and Technology*, 59, 119-125, 2009.

[4] "Preventive measures against snow for high-speed train operation in Japan", In Merrill K. S., ed. *Cold Regions Engineering: Cold Regions Impacts on Transportation and Infrastructure*, 448-459, 2002.

[5] "Snow avalanche detecting system using a vibration sensor", *Quarterly Report of RTRI*, 42, 63-64, 2001.

[6] "Measurement of snow hardness distribution", *Annals of Glaciology*, 26, 27-30, 1998.

[7] "A portable calorimeter for measuring liquid-water content of wet snow" *Annals of Glaciology*, 26, 103-106, 1998.

[8] "Experimental studies on the transformation from firn to ice in the wet-snow zone of temperate glaciers". *Annals of Glaciology*, 24, 181-185, 1997.

[9] "Formation processes of ice body revealed by the internal structure of perennial snow patches in Japan" *Bulletin of Glacier Research*, 15, 1-10, 1997.

[10] "Remaining snow patterns in mountains, Yukigata, as a scene in spring", In Izumi M., Nakamura T. and Sack, R. L., ed. *Snow Engineering: Recent Advances*, 549-552, 1997.

[11] "A measuring system for snow depth profiles in Maglev guideway using the light cross section method", In Izumi M., Nakamura T. and Sack, R. L., ed. *Snow Engineering: Recent Advances*, 105-108, 1997.

[12] "Regional division of snow-depositional environments and metamorphism of snow cover in plain areas along the Japan Sea coast", *IAHS Publ.* 223, 187-196, 1994.

[13] "Investigations of internal structure and transformational processes from firn to ice in a perennial snow patch", *Annals of Glaciology*, 18, 117-122, 1993.

[14] "Meteorological features in Langtang Valley, Nepal Himalayas, 1985-1986", *Bulletin of Glacier Research*, 5, 35-40, 1987.

[15] "Stream water temperature observations in Langtang Khola, Nepal Himalayas", *Bulletin of Glacier Research*, 5, 25-28, 1987.

[16] "Suspended sediment yield in a glaciated watershed of Langtang Valley, Nepal Himalayas", *Bulletin of Glacier Research*, 5, 19-24, 1987.

[17] "Runoff characteristics in three glacier-covered watersheds of Langtang Valley, Nepal Himalayas", *Bulletin of Glacier Research*, 5, 11-18, 1987.

Book Chapters

[1] Kawashima, K. 2009, "Lessons and challenges obtained from the Mid-Niigata Prefecture Earthquake", *Preparation to seismic hazards*, Niigata Nippo Jigyousha, pp.58-63.

[2] Kawashima, K. and Izumi, K. 2006, "A heavy snowfall attacks stricken areas", *The Mid-Niigata Prefecture Earthquake*, Niigata Nippo Jigyousha, pp.131-159.

[3] Yamada, T. and Kawashima, K. 2005, "Snow cover in mountainous region", *Encyclopedia of snow and ice*, Asakura Syoten, pp.122-129.

[4] Kawashima, K. 2004, "Winter Weather in Snowy region of Japan", *Handbook of snow removal and preventive measures against snow*, Japan Construction Mechanization Association, pp.32-39.

[4] Kawashima, K. 2002, *Encyclopedia of Disaster Prevention Science*, Chikuji Syokan.