Logan Club Presentation Series

Permafrost after equilibrium

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Geological Survey of Canada
601 Booth Street
Room 177

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Commission géologique du Canada
601 Booth Street
Chambre 177

Permafrost regions have encountered greater climate change than other parts of our world, and there are many reasons to believe this will continue to be the case. Both principal climatic indices - temperature and precipitation - are being adjusted. In the 1970s, when permafrost science matured in Canada, we considered landscapes to be in equilibrium with climate, partly because the impetus for the research then was engineering. Permafrost is a climatic phenomenon, no doubt, but it changes over longer time scales than the atmosphere and is no longer in equilibrium with it. We might expect three primary consequences: first, events that we have not encountered before, such as the 87 landslides on the Caribou Hills north of Inuvik in September 2017. Second, acceleration of processes we have recognized for some time, such as near-surface ground subsidence. Third, gradual adjustments that ultimately will affect the integrity of permafrost, either through its bearing capacity or its ability to act as an impermeable medium. The latter is significant for the integrity of waste sumps throughout northern Canada. Contrary to our former predictions, the effects of climate change on permafrost are locally controlled by the configuration of the environment and have become first apparent where the ground is relatively cold.

Biography

Chris Burn is Chancellor's Professor of Geography at Carleton University. He has been studying permafrost in Yukon and the western Arctic since 1982, especially considering the role of changes in surface conditions, including climate, on ground temperatures. He is currently a Visiting Scientist in the Northern Canada Division. Chris is Senior Vice-President of the International Permafrost Association and in June this year will succeed to the Presidency.

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