

OCGC SEMINAR

Ground ice conditions in the McMurdo Dry Valleys of Antarctica, one of the coldest and driest places on Earth

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Thursday, January 31st, 2019, 11:30 AM

University of Ottawa

Advanced Research Complex

Room 233

Jeudi le 31 janvier 2019, 11h30

Université d'Ottawa

Advanced Research Complex

Pièce 233

Abstract:

Antarctica is a place known for its ice sheets and sea ice. However, subsurface ice, the most important and dynamic components of permafrost, has remained largely unexplored. Here, I will present findings of our recent work on the distribution, origin and habitability of ground ice in University Valley, McMurdo Dry Valleys of Antarctica, which now serve for the IceBreaker proposal for Mars mission. In University Valley, ground ice is ubiquitous in the upper 2 m of mineral soils, however ground ice conditions are not homogeneous: 1) ground ice content is variable within polygons and along the valley floor; 2) ground ice has varied origins: vapor-diffusion and deposition, freezing of liquid water and burial of glacier ice; 3) although microbial biomass was found in the permafrost, microbial activity was undetectable. Overall, the presentation will inform on factors that affect ground ice conditions in extremely cold and hyper-arid regions where liquid water is rare, which severely limits microbial activity and survival.

Dr. Denis Lacelle: *Dr. Denis Lacelle is an associate professor in the Department of Geography at the University of Ottawa. He completed a B.A. in Geography (2000) and a M.Sc. at the Department of Geography (2002) at uOttawa followed by his doctoral degree in the department of Earth Sciences. Subsequently, he was an NSERC Visiting Fellow at the Canadian Space Agency (2007-2010). Lacelle's research interests include periglacial geomorphology, low temperature isotope geochemistry and Quaternary sciences. He has 18 years field experience in Arctic and Antarctica and he is leading transdisciplinary national and international research teams that study permafrost processes, ground ice formations, surface and subsurface hydrology in cryospheric environments. In 2013, Lacelle received the University of Ottawa Young Researcher of the Year in Science and Technology and in 2015 he received the Ontario Young Researcher Award.*



Photo of University Valley, McMurdo Dry Valleys of Antarctica

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