OCGC SEMINAR

Greenland Ice Sheet Surface Elevation: satellites, planes, and snowmobiles

Dr. Robert Hawley

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Earth Sciences

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University of Ottawa
Advanced Research Complex
Room 233

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Pièce 233

Abstract: Surface elevation on a large ice sheet changes due to multiple physical processes, some of which imply mass change of the ice sheet, and some not. Accumulation of new snow, in absence of other processes, will increase surface elevation as new mass is added to the ice sheet. The density of this new snow affects the amount of mass added. Compaction of snow and firn, both new and old, decreases surface elevation with no corresponding change in mass. As ice flows out to the sides on an ice sheet, conservation of mass dictates that the surface elevation will decrease, corresponding to mass loss. In response to long-term changes in mass, the continental crust on which the ice rests seeks isostatic balance, resulting (since the last glacial maximum) in an increase in elevation, with no associated mass change. The summation of these processes results in net elevation change.

This presentation will range from the importance of Greenland Ice Sheet mass balance in an accelerating climate system, to methods for measuring ice sheet elevation from space, to direct attribution of elevation changes to physical process using a 10+ year time series of in-situ measurements at Summit, Greenland.

Dr. Robert **Hawley** *started working as a glaciologist in 1995, as an undergraduate at the University of Washington, through the National Science Foundation 'Research Experience for Undergraduates' (REU) Program. Following the completion of his BS degree he continued in glaciological research by participating in the inaugural winter-over at Summit camp, Greenland, during the 1997-1998 boreal winter. He earned a PhD. in geophysics from the University of Washington in 2005. Following his PhD, he spent 3 years in Cambridge, England, as a post-doc at the Scott Polar Research Institute, studying radar altimetry. Since 2008 he has taught, mentored, and researched at Dartmouth College, as an Assistant and now Associate Professor. His research interests include: the physics of firn densification, mass balance of large ice sheets, interpretation of ice core records, and remote sensing. He has worked primarily in East and West Antarctica and Greenland.*

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