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Sustainability Seminar Series

Sustainability Seminar Series, 2018

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Jan 25th, 4:00 PM - 5:00 PM

## 10,000 Years of Ice Sheet Change in Baffin Bay

Nicolas Young  
*Lamont-Doherty Earth Observatory*

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The MSU Sustainability Seminar Series Presents:  
**10,000 years of ice sheet change in Baffin Bay**

WHEN: January 25 (Thursday), 4:00 pm  
WHERE: CELS 120 lecture hall

**Dr. Nicolas Young**  
**Lamont-Doherty Earth Observatory**



Dr. Young is a glacial geologist, paleoclimatologist and geochemist who is primarily interested in understanding how ice sheets and glaciers have changed through time and what are the driving mechanisms behind these changes. Using a blend of careful field observations and geochemical approaches, Dr. Young reconstructs the past behavior of ice sheets and glaciers and, in turn, uses these reconstructions to inform predictions of future change. Dr. Young received a B.A. in Geology from The College of Wooster (Ohio) and a M.S. and Ph.D. in Geology from the University at Buffalo. Dr. Young is the recipient of the 2015 regional Blavatnik Award in Physical Sciences and Engineering and is currently an Assistant Research Professor at the Lamont-Doherty Earth Observatory of Columbia University.

The Greenland Ice Sheet (GrIS) is the largest ice mass in the Northern Hemisphere with a sea-level equivalent of 7.3 m and is expected to be a key contributor to 21<sup>st</sup> century (and beyond) sea-level rise. Estimates of GrIS-induced sea-level rise are dependent upon numerical ice-sheet models, but these models require some degree of “spin-up” or tuning to test model validity before forward modeling can commence. Within this framework, well-constrained geological records of GrIS change provide important spatial and temporal benchmarks for which to test numerical ice-sheet models. Of particular interest is reconstructing and modeling the behavior of the GrIS through the Holocene because this time period includes 1) abrupt cooling events occurring on human-relevant timescales, and 2) the most recent interval of regional warmer-than-present temperatures. Thus, accurate geological and model-based reconstructions of southwestern GrIS behavior during the Holocene have clear relevance for predicting future GrIS change in response to potential freshwater induced regional cooling, and for assessing the GrIS’s contribution to eustatic sea-level rise in an overall warming world. Here, I use several approaches to precisely reconstruct the behavior of the southwestern GrIS through the Holocene – emphasizing the response of the GrIS to early Holocene abrupt cooling, and the minimum extent of the GrIS during the Holocene thermal maximum. In addition, I will draw on emerging datasets from across Baffin Bay that constrain the behavior of the Laurentide Ice Sheet through the Holocene. Combined, records from Greenland and eastern Canada suggests that ice sheets are capable of dramatic responses to extremely short-lived climate perturbations.