# HOLOCENE ACTIVITY OF PETERMANN GLACIER: A MARINE SEDIMENT CORE PERSPECTIVE FROM PETERMANN FJORD, NORTHWEST GREENLAND

[1]Reilly, B, [1]Stoner, J, [1]Mix, A, [2]Jakobsson, M, [3]Jennings, A, [1]Walczak, M, [4]Dyke, L, [1]Albert, S, and the OD1507 Shipboard Scientific Party

[1]College of Earth, Ocean and Atmospheric Sciences, Oregon State University
[2]Department of Geological Sciences, Stockholm University
[3]INSTAAR, University of Colorado—Boulder
[4]Glaciology and Climate Department, Geological Survey of Denmark and Greenland - GEUS

An international and interdisciplinary expedition to Nares Strait and Petermann Fjord, Northwest Greenland, onboard the Swedish Icebreaker Oden July-September 2015 (OD1507) sought to understand the Holocene history of the Petermann glacial system among other research objectives. Petermann Glacier, which terminates as a floating ice-shelf in Petermann Fjord, is thought to be especially sensitive to ice-ocean interactions. While limited historical observations dating back to 1876 suggest the Petermann Ice Shelf typically extends about 70-90 km from the grounding-line, large calving events in 2010 and 2012 reduced the ice-shelf extent to about 45 km from the grounding-line. Materials and data collected during OD1507 for cosmogenic exposure dating, relative sea level investigation, and sea floor mapping will be used along with marine sediment cores to put these recent changes in perspective and assess the Holocene activity of the Petermann glacial system and its sensitivity to oceanic forcing.

Here we present the initial lithologic characterization and stratigraphic correlation of marine sediment cores collected from Petermann Fjord using a suite of non-destructive measurements (gamma-ray attenuation, magnetic susceptibility, CT scans, and XRF scans). These cores capture a range of glacio-marine depositional environments and includes cores recovered from beneath the present ice shelf (15-25 km from the grounding-line), beneath the pre-2010 historical ice shelf (45-60 km from the grounding-line), and proximal to the edge of the pre-2010 historical ice shelf (65-80 km from the grounding-line). Changes in magnetic mineral concentration, sediment geochemistry, ice rafted debris concentration, and sedimentary facies correlate across cores taken from bathymetric highs (930-1050 m), indicating that we recovered a coherent record of changes in the Petermann glacial system. Future geochronological work, including radiocarbon dating and paleomagnetic correlations to nearby varve-dated lake records, will allow us to assess the timing and rates of these changes.