WATERSHED TOPOGRAPHY AS A PREDICTOR OF STREAM CHEMISTRY ACROSS NON-GLACIAL SYSTEMS IN GREENLAND

Megan Black[1], *Jonathan B. Martin*[1], *Ellen E. Martin*[1], *Andrea J. Pain*[1,2], *Madison K. Flint*[1]

[1]Department of Geological Sciences, University of Florida, Gainesville, FL, USA

[2]Horn Point Laboratory, University of Maryland Center for Environmental Science, Cambridge, MD, USA

The retreat of continental ice sheets since the Last Glacial Maximum has exposed underlying landscapes to increased biological activity and chemical weathering reactions. The transformation of these landscapes from glacial to non-glacial systems changes stream water chemical composition as weathering reactions alter minerals in the freshly comminuted glacial sediment. In addition, organic carbon and nutrient stream water concentrations change due to shifts in vegetation coverage with ecosystem succession following exposure. Rates of chemical weathering reactions may be affected by factors such as topographic relief, including slope and slope orientations relative to north because of their control on snow accumulation, timing of melting, and water retention in the landscape. This project aims to evaluate whether key landscape topographical variations can be used as predictors of stream chemistry across non-glacial terrains in Greenland using remotely sensed and stream chemistry data. More specifically, relationships between slope and slope orientation versus solute and nutrient concentrations will be explored across nine non-glacial watersheds in southwestern and southern Greenland. These watersheds were previously covered by the Greenland Ice Sheet but were exposed between ~12 and 7 thousand years ago as the ice sheet retreated. Analyses will explore relationships between watershed slope and aspect with concentrations of PO4, NO3, NH4, Si, SO4, Na, Ca, Mg, Sr, and DOC using legacy stream data chemistry collected during three summer field seasons in 2017 and 2018. Determining the role of topography in altering stream chemistry may allow similar analyses across broad region with remote and difficult access, thereby improving evaluations of solute and nutrient delivery to Arctic coastal water.

PRESENTER BIO: Megan Black is a PhD candidate in the Department of Geological Sciences and a WIGF fellow at the University of Florida. Her research focuses on using remote sensing techniques and field data to identify relationships between landscapes and stream chemistry in Greenland.