

## Poster #1-9

### Characterization of Permafrost Landscapes Using an Unmanned Aerial System: LiDAR Mapping the NGEE Teller Site

Christian Andresen<sup>1\*</sup>, Adam Collins<sup>1</sup>, Erika Swanson<sup>1</sup>, Lauren Charsley-Groffman<sup>1</sup>, and Emily Schultz-Fellenz<sup>1</sup>, and Cathy Wilson<sup>1</sup>

<sup>1</sup>Los Alamos National Laboratory, Los Alamos, NM

Contact: [candresen@lanl.gov](mailto:candresen@lanl.gov)

BER Program: TES

Project: NGEE Arctic

Project Website: <https://ngee-arctic.ornl.gov/>

We surveyed the NGEE Arctic Teller research site (~3km<sup>2</sup>) in August 2017 with an Unmanned Aerial System (UAS). A state-of-the-art Light detection and Ranging (LiDAR) scanner onboard the UAS acquired centimeter-resolution topography data in the form of a point-cloud. In addition to LiDAR, the UAS was equipped with a digital camera that collected high-resolution aerial imagery at 24 Megapixels. Preliminary Lidar and Photogrammetry datasets and associated derived products are presented here. The LiDAR point cloud datasets have a density of 740 points/m<sup>2</sup> and a DEM resolution of 2cm. The LiDAR point-cloud of Teller site will serve as a keystone dataset to better understand the association and co-dependence between topography and multiple environmental processes related to hydrology, geochemistry, geomorphology as well as the relationship between ecosystem structure and function.