

Weekly report 2

Expedition NW Alaska 2025 (Perma-X Ground)

22 - 29 July 2025



Dear colleagues, family, and friends,

With the second week here on the Baldwin Peninsula ending, our expedition here is coming to an end, and we would like to share the highlights of the final week with you.

This week started with our sixth team member arriving in Kotzebue: Amy Breen. Amy is a vegetation ecologist from the University of Alaska Fairbanks with whom we have been collaborating with for several years.



Amy worked with Sasha to identify and map the vegetation composition at our main sites. This task included reviewing plant species lists for established plots, and collecting and pressing plants that require later verification of their identification in the herbarium. She also initiated ground work to create a remote sensing vegetation map for the Schaeffer DLB. She spent two days learning the primary vegetation types in the DLB and collecting georeferenced photographs for each vegetation type to use for training data and validation. This product, together with data on changes in vegetation succession and of greenhouse gas fluxes acquired during 2023 and 2024, will help to understand spatial differences and upscale fluxes.

Besides vegetation survey and sampling for the herbarium, Sasha also continued measuring ground temperature profiles and water temperatures using a temperature lance designed by AWI at the Schaeffer site. She repeated thaw depth surveys for most sites with vegetation descriptions from 2024, including different vegetation types and microtopography. Data from these studies will be used to validate the geomorphological map and the distribution of Yedoma deposits on the Baldwin

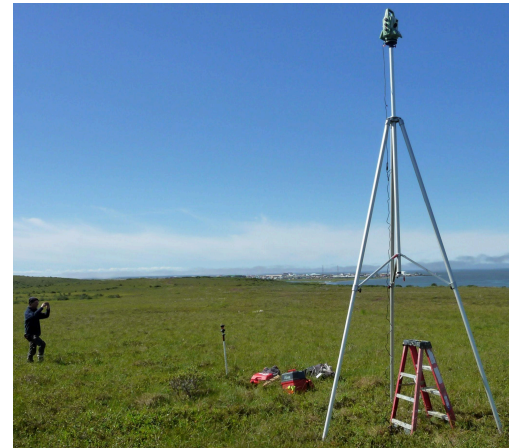
Peninsula. Sasha identified and GPS-located spruce trees and recorded their height and girth to validate the identification of pioneer spruce trees on high-resolution remote sensing data, tracking the northward movement of the treeline on the Baldwin Peninsula. Spruce needles were also collected for DNA analysis.

On Thursday, we had a visitor fly in from Anchorage: Lars Flora, from the Alaska Native Tribal Health Consortium (ANTHC). Lars is the program administrator of the Local Environmental Observer (LEO) Network, a network facilitating reporting of unusual animal, environmental, and weather events by local observers and topical experts. When Schaeffer Lake drained in June 2022, the event was reported to the LEO network by the Tessier family owning the land, and since then updates and comments have been posted frequently. Lars joined our expedition team at the site for two days and was very interested to learn about our work there. In turn, we learned a lot from him about the environment in Alaska and how its ongoing changes are perceived by Alaskans.



On an undisturbed upland adjacent to the Schaeffer DLB, Frank set up a measuring network for laser scanning with the MultiStation. Guido helped set up fixed points for georeference while Anne carefully drove her ATV

with a trailer and sled on tundra trails to transport the heavy construction tripod required for the survey. The team, with our visitor Lars, assisted with the set up and moving of the laser scanning station across the tundra on the first day of measurement. On the following two days, Frank worked together with Sebastian, who made everything run smoothly, to ultimately survey nine different scanning locations. The high-resolution and precise elevation data will potentially allow for better interpretation and calibration of remote sensing-based measurements of permafrost thaw-induced land subsidence. This also includes an informed picture of the seasonal thaw depth, the thickness of which Sasha and Frank measured at around 200 locations within the area of interest on the fourth and final day to complete the survey.



Guido and Sebastian took permafrost samples of ice and sediments, focusing on the lowest, i.e. oldest exposed formations. These were the massive ice deposits at Cape Blossom and the lowest exposed horizons on the beach at the Schaeffer site. A total of 10 luminescence samples and corresponding sediment profiles were obtained. Luminescence dating will provide information about the sedimentation history of the region under changing glacial, marine, and terrestrial conditions.

Guido and Anne spent two more days at the thermo-erosional gully site to re-survey the second transect and measure active layer and permafrost temperatures. They were also really lucky to catch a time window with clear sky in between clouds and fog that was just enough for a repeated drone survey.



At all sites Anne sampled various kinds of surface waters (ponds, lakes, streams, and marine waters) and spent late hours filtering and preparing the samples for analyses in the hydrogeochemistry lab at AWI Potsdam. From these, together with water sampling results of previous years, we hope to gain a better understanding of how erosion and permafrost thaw changes the hydrochemical characteristics of the water bodies and the transport of dissolved organic carbon and solutes across different landscape compartments and into the coastal waters.

We are very happy with all the work that we accomplished and are convinced that this was only possible through the great support of Susan (Schaeffer) and Tim Tessier (landowners of the drained lake basin site), Joe Groves (our local logistics provider and host), and Ed Iten (our highly experienced boat captain). It seems they also had fun spending time with us, because they invited us for dinner at their homes and we enjoyed pleasant evenings together sharing stories about our lives in these so different parts of the world. We also again wish to thank the Kikiktagruk Inupiat Corporation (KIC) for allowing us to work on their lands.



Guido left Kotzebue on 27 July to join the Perma-X Air campaign out of Inuvik in Northwest Canada, and the rest of us flew to Anchorage on 29 July, where we were met by Stefan Kruse and his team who had just finished their joint AWI-UAF Forest Change Alaska Expedition.

Happy greetings from all of us: Amy, Anne, Guido, Sasha, Sebastian, Frank (with Joe and Ed in the middle), and Woody the labrador dog.

