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My Semester in Svalbard

I graduated from Memorial University (MUN) in 2015 with a degree in Civil Engineering. During my final semester, I completed courses in ice mechanics and offshore engineering, which developed my interest in ice and engineering in harsh, cold environments. Upon graduation, I was able to return to MUN to complete a Master's program with a focus on the abrasion of marine concrete structures in pack ice conditions.

During one of my graduate courses taught by Dr. Rocky Taylor, we were given the opportunity to attend lectures from guest Dr. Aleksey Marchenko, visiting from the University Centre in Svalbard (UNIS). It was during these lectures, and then again at the Arctic Technology Conference in October 2016, that I learned about UNIS and the opportunities to study there.

I was nearing the end of my Master's program when the chance came to take a course at UNIS and I couldn't think of a better way to finish off my program. With the support provided by the SITRA project through UNIS and MUN, my Master's degree reached an exciting conclusion with a 2-month stay on Svalbard taking the course AT-332, Physical Environmental Loads on Arctic Coastal and Offshore Structures with Dr. Marchenko.

The entire experience was unique, educational, and beneficial to my ongoing research and work at home. My class consisted of students from Norway, Denmark, Italy, and other SITRA supported students from Russia, Ukraine, and Kazakhstan. The course consisted of class lectures on a variety of topics including hydrodynamics and wave loads, sediment transport, ice mechanics and loading, and iceberg management. We were able to complete supplementary lab works and field works which provided hands on experience to what we were learning in class.

In the spare time from the course, I took in as many hikes, views, and adventures as possible. This included a sea kayaking trip, hiking all around the greater Longyearbyen area, boat trips to the Russian mining towns Barentsburg and Pyramiden, and a visit to the Svalbard Global Seed Vault. Once the weather turned colder I was able to experience the nearby ice caves, try out kayak polo, and catch a glimpse of the Northern Lights.

Students of AT-332 and guest lecturer Jean Rabault on a hike overlooking Adventfjorden in Longyearbyen

On our first outdoor field work we boarded a local boat and deployed equipment into Adventfjorden to measure and analyze sediment transport in the area. In the UNIS cold labs, we completed wave tank drift experiments with guest lecturer, Jean Rabault (University of Oslo, UiO).

Keeping warm in the UNIS provided suits during our first fieldwork

Later in the course, we performed lab tests to analyze ice properties and mechanics; this included compression, tension, indentation, relaxation, and flexural tests. This approach allowed the class to observe ice performance, as it related to the theory we learned in lectures.

SITRA professors A. Sakharov and P. Chistyakov (Lomonosov Moscow State University) help set up the ice disk flexural strength tests

As temperatures dropped, we completed a day of field work on a nearby freshwater lake. We performed multiple in-situ fixed end beam and cantilever beam tests. Personally, this was my favourite part of the course. It was such a valuable experience to see these tests first-hand, having only being able to read about them prior.

Cantilever beam test setup during AT-332 fieldwork

From the completed lab and field work, the class assembled full reports which presented the collected data and the analyzed results.

My semester in Svalbard was an opportunity that I do not take for granted. I am extremely appreciative of the SITRA project, UNIS and MUN, who provide the chance for students like myself to obtain first-hand experience of the Arctic environment and all it has to offer.

Hiking along Longyearbreen