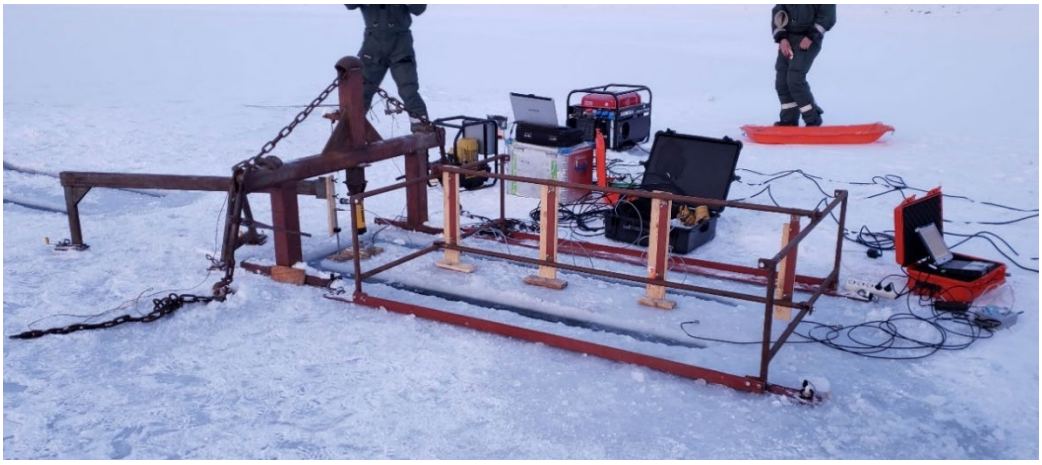
I am setting up an ice saw, which we used to finish cutting through the ice after the first layer is removed using a chainsaw, when setting up for ice strength field experiments.
This photo was taken by visiting ice researcher Kari Kolari

Amy Price

I am in my 2nd year of my Master of Engineering studying ocean and naval architectural engineering at Memorial University of Newfoundland (MUN) in St. John's, Newfoundland and Labrador, Canada. After I finished my undergraduate degree in mechanical engineering at the University of New Brunswick (in Fredericton, New Brunswick, Canada), I decided to go to Newfoundland and study naval architecture, which then led me to this amazing opportunity. I was thrilled when given a chance to visit UNIS and take part in some fieldwork in the area of ice mechanics. With my thesis research around the topic of ship structures in ice with more focus towards the structure component, I thought this would be an exciting opportunity to learn more about the ice mechanics side of my research topic and take part in some field and lab experiments in a new and exciting place.

The Sunday I arrive for my visit as a guest master's student was also the last day that the sun rose above the mountains, as my visit went on the sunlight disappeared much quicker than I was expecting. Therefore, with the impending darkness and the lake ice now thick enough, field experiments were set for the week I arrived. The first day out on the lake, which was not too far from town and up around a mountain, two different cantilever beam tests were set up to study that season's lake ice strength. The first day in the field, the students from the environmental load course joined us. The students and I, along with another visiting MUN student, helped prepare the cantilever beams, while the experienced ice researchers, operated the chainsaws and set up the equipment. The first field day, we were lucky with beautiful clear weather, and it was not too windy or cold. The next day out in the field was a little colder, but still had clear skies and a reasonable amount of sunlight.



First field day on the lake, one of the cantilever beam experimental setups

Before I got there, I had this idea that it was going to be so much colder there since we were in the Arctic Circle, but the weather there, at least at the end of October up to midway through November, reminds me of winters back home on the East Coast of Canada. On the 3rd and last field day that I joined, we were not as lucky with the weather, it was very windy, along with blowing snow. That day we were conducting another cantilever beam experiment, along with an experimental set up to study the vibrations experienced by a fixed beam from adjacent loads. That was also my longest day out in the field, but I surprised myself; as long as I kept busy and helping out, I was not too cold and enjoyed the experience. The field suits and gear that UNIS lent us helped too.

The final field day, finishing work in the dark (around 3 pm) with the help of a floodlight and headlamps

The following weeks focused on lab work and creating ice samples. Igor, the other visiting MUN student, and I were tasked with creating ice samples that contained small pebbles at various angles to see how it affected the compressive strength and creep of the ice samples, using the *KNEKKIS* apparatus. This experimental set up was supposed to represent situations where icebergs scoured the seafloor and collected rocks, and to see how that affected the strength properties of the ice. The analysis was not completed when I left, but Igor, along with the help of another student, planned to finish up the experiments the following week.

KNEKKIS *apparatus with a control sample*

Ice samples with pebbles embedded

During that time, I also took part in a safety course that taught students how to prepare for fieldwork and excursions in the northern environment. I knew some of the basic information through my own experiences with winter activities but also learned a lot about the more local hazards, such as glacier crevices, avalanches, and polar bears. We also went to the shooting

range (which was just passed the international seed vault) to learn gun safety and determine if we could safely operate a rifle. Rifles and flare guns are required when leaving the town, due to the presence of polar bears. I never saw a polar bear, but I was also never too far from town.

Even though the town is relatively small, there is still so much to do, especially if you enjoy the outdoors. One weekend I was able to join a group of students that had planned to hike up one of the mountains just outside of town. We went at the end of my second week there, and by that point, daylight was starting to become limited, so we started the hike at the break of daylight (we left around 9:30 am) and returned with the help of headlamps in the late afternoon. At the top of the mountain, it was very windy with blowing snow, so visibility was poor, sadly, it was too difficult to take pictures of the view. If I had been in Svalbard longer and perhaps with a bit more sunlight, I would have loved to go on some more adventures around the area. While there, I also had the opportunity to see an ice-strengthened sailboat that was in dock in Longyearbyen. As an amateur sailor myself and studying in the field of ship structures in ice, it was fascinating to get to see the sailboat and talk to one of the crew members on the boat. Being able to take part in field and lab experiments at UNIS and explore Longyearbyen was such an incredible experience, now I just need an excuse to go back during the light season.

On the way back to town at the end of the hike with the help of headlamps

Visiting the ice-strengthened sailboat