Learning in the frozen lands of the Inuit

Iqualit (“city of many fishes”) is the capital of Nunavut, the largest and northernmost territory of Canada and home of the Inuit. Iqualit is located at 63.75° N, in the Arctic bioclimate subzone D, as defined by the Circumpolar Arctic Vegetation Map (https://www.caff.is/flora-cfg/circumpolar-arctic-vegetation-map). This small city, of only 7000 inhabitants is the most populated of the region. A remote, seaside gem in the heart of the tundra. I arrived to Iqualit the 2nd of March of this year and stayed there for a week, as a participant of the 1st International Arctic Field School (IAFS). This ambitious program, organized by the researchers Marie-France Gévry and Pascale Ropars from Laval University and sponsored by the Canada First Research Excellence Fund and 13 other partners, brought together 30 international and local students and over 20 mentors with a key objective: training the future generations on the environmental and socio-economic challenges linked to an Arctic Cryosphere that is undergoing drastic and long-lasting changes.

The IAFS program combined lectures with groups exercises and field excursions. A first core of lectures focused on the physical and biological components of the Arctic ecosystems. Florent Domine from Laval University explained the features of the Arctic snowpack, its complex interactions with the vegetation and the soil, and how the diminishment of the snowpack leads to the enhancement of global warming. Murray Richardson and Keegan Smith from Carleton University described how the snowpack is shaped by the wind and how the snow depth varies over the land, which determines the amount of fresh water available to the human populations during the summer. Daniel Côté from Laval University presented the many optic techniques to measure snow properties, including inventions of its own. Jean-Michel Lemieux from Laval University focussed on the hydrology of the Arctic and highlighted the importance of groundwater as an alternative drinking source for the northern communities, especially in the context of climate change and its negative impact on surface waters. Margareta Johansson from Lund University and Anne-Marie LeBlanc from the Geological Survey of Canada gave lectures on permafrost, its distribution, its geological properties, its landscape features and its rapid thaw due to climate change. Murray Humphries from McGill University and Vicky Sahanatien from the Nunavut Wildlife Management Board told us about the regional terrestrial and aquatic wildlife, the trophic relations between the different species and their vulnerability to climate change. We completed modelling exercises in teams to deepen into the groundwater hydrology and permafrost-snow interactions. In the field, we learnt how to describe a snow profile and how to measure snow depth and snow water equivalent. We also trained on monitoring water quality in one of the local lakes, where we measured salinity, oxygen and light penetrance.

A second core of lectures focused on the local communities: their ways of living, their issues and the profound transformations they are going through as a consequence of climate change and a radical “Westernization” of the traditional societies. I especially enjoyed this part of the program because it focused on what fundamental research often overlooks: people. Guy Doré from Laval University...
presented the challenges of building on permafrost, the damages that permafrost thaw is causing on infrastructures and the current solutions to the problem. Jean Allen from Indigenous and Northern Affairs Canada and Amy Caughey from the Government of Nunavut told us about food security, the monitoring of contaminants in country food and the importance of educating the citizens on food quality and eating healthy. Trevor Bell from Memorial University presented SmartICE, a program developed with the community members to monitor the ice thickness and, based on the results, inform the population about the safety of travelling on the sea ice. Jason Carpenter from the Nunavut Arctic College presented the Environmental Training Program (ETP), which provides local students with a strong training on environmental sciences and a higher education Diploma. We were fortunate to spend the week with students from this program, most of them from Nunavut. They told us about their culture and their experience as participants in the ETP. Jamal Shirley from the Nunavut Research Institute presented the ongoing research projects in Iqalit and emphasized the importance of engaging the members of the local communities on the projects and to inform them about the results. The mayor of Iqaluit, Madeleine Redfern, and Mary Ellen Thomas from Nunavut Research Institute told us about the demography of Nunavut communities and their social organization. And of course, we experienced ourselves the fascinating Inuit traditions! We built an Iglu together. We listened to the traditional throat singing and played Inuit games. We rode on snowmobile over the sea ice and we ate Char, whale and Caribou, among many other exiting activities.

The IAFS was an invaluable experience both professionally and personally. I hope the program grows and continues in the future. The Canadian Arctic is a land full of beauty, both in its nature and in its people. I thanks once more to Marie-France and Pascal for the excellent organization of the program, the Swiss Polar Institute for its economic support and the Association of Polar Early Career Scientists for the extensive advertising of the program.