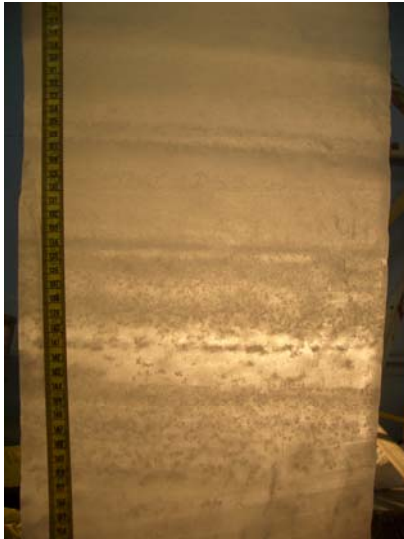


An Arctic Adventure for an Undergraduate Math Student

Megan Morris, Department of Mathematics, University of Utah, mmorris@math.utah.edu

As an eager but naïve freshman at the University of Utah, offered a chance to do research in mathematics, I had no idea what that would entail. Merely four months later I was in the Arctic with my mentor and collaborators studying sea ice as part of the National Science Foundation's Research Experience for Undergraduates (REU) program. Research in mathematics opened a door to my academic success and brought about countless opportunities, among which was my amazing adventure to Barrow, Alaska.

I started my college career thinking about research in another field but after meeting with my enthusiastic Calculus III teacher, Dr. Ken Golden, who later became my research advisor, I realized that research in mathematics encompassed so much more than studying equations and I quickly decided that I wanted to be a part that research community. Traveling to the Arctic was an amazing experience that I will never forget. I enjoyed every bit of the frigid conditions out on the sea ice, extracting core samples and blocks of ice. I had no idea how beautiful the snow covered landscape would be nor how beautiful the ice is.

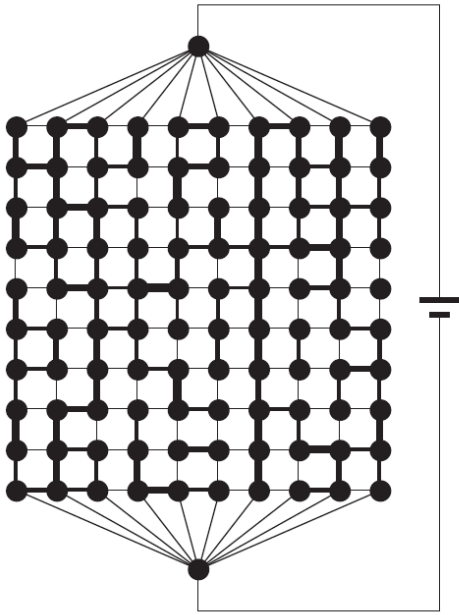


Cross section of sea ice block.



Sea ice on the Arctic Ocean off Point Barrow, Alaska.

Our adventure to the Arctic led to research of the fluid transport through sea ice. (Who knew that fluid flows through ice!) We developed a mathematical model to mimic this process. Simplifying the complex network of pathways through the ice as a grid of tubes, we were able to use physical laws of fluid flow to approximate permeability and flux through sea ice. Our work was published in a paper in the *Annals of Glaciology*. It was a great opportunity for me to be published as an undergraduate student.



Random pipe network model –
a grid of tubes to mimic sea ice channels.



Me on the ice.

After my experiences in mathematical research, I was enthusiastic to continue my mathematical adventures in the cold. I have now begun work towards a doctoral degree in mathematical biology and plan to further explore the diverse field of polar biology.