



Big Lake Ice and Snow Thickness

Airianna Frank, Aurora Frank, Jeremiah Druck, Aiyana Jackson, Bradyn Luke, Cody Tuttle, Shelly Erick
John Fredson School, Venetie, Alaska



Introduction

We think that it is important to know about ice because thin ice is not safe. We use the ice to travel on for hunting in the winter. We also go ice fishing in the spring.

This has been a very cold year with very cold temperatures. It has made it so we don't have water at the school sometimes or at the washeteria. We wonder if this has made a difference in how thick the ice got on Big Lake where we have been doing our Fresh Eyes on Ice measurements.



Our ride out to Big Lake.

Drilling holes in the ice with an ice auger.

Measuring the ice thickness with an ice gauge.

A view of our study site, Big Lake, in November 2021.

Dr. Chris and Terri checking the ice safety.

Lake ice with no snow on it yet.

Question

How did the ice and snow thickness compare between last year and this year?

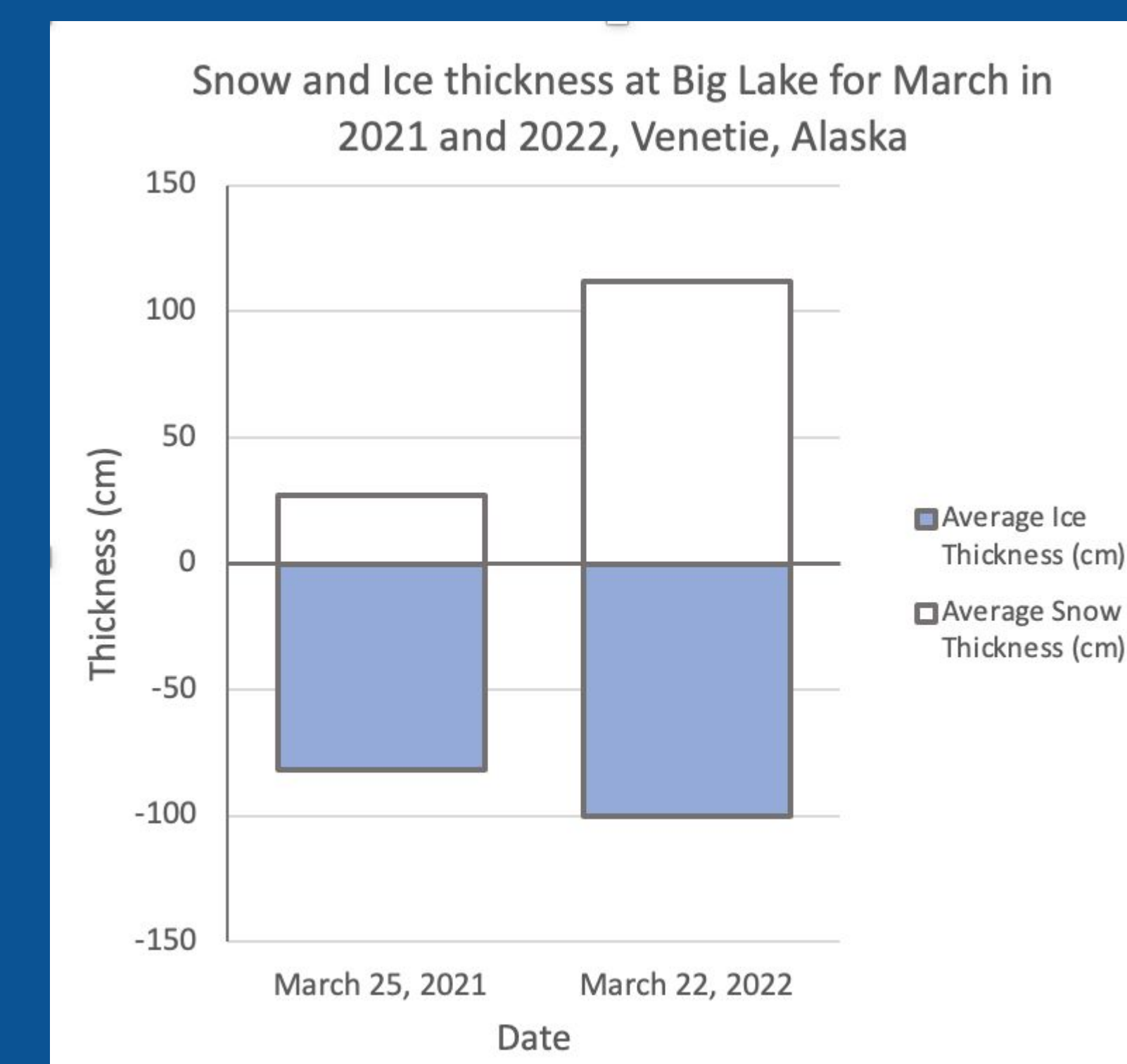
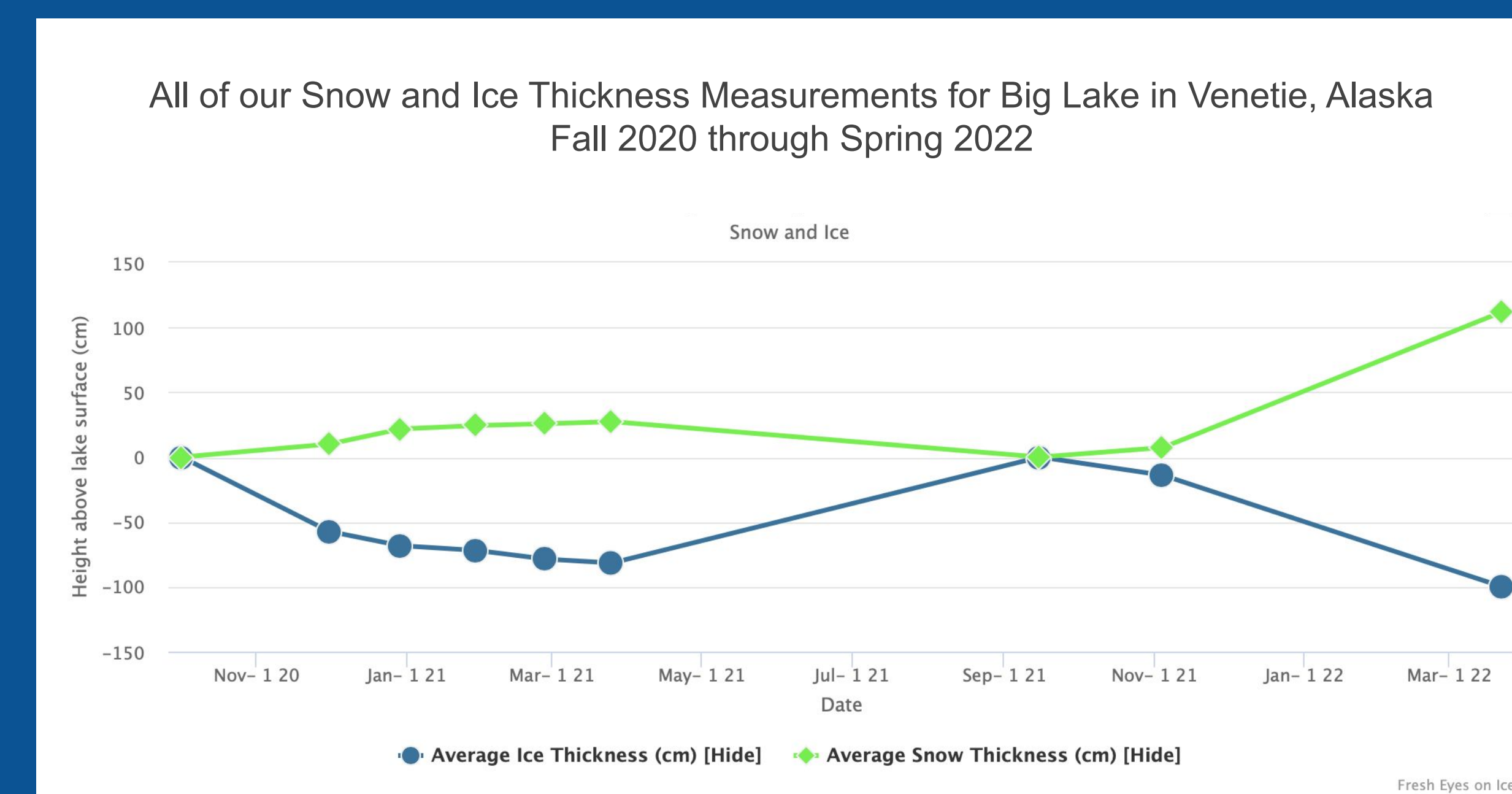
Hypothesis

We think the ice is thicker this year compared to last year. We think this because the winter was colder than last year. We think the snow thickness will be greater than last year because there is more snow than we can remember in the past.

Methods

- We went out to Big Lake every month or as often as we could with COVID19 and cold weather this year and last year.
- We measured the snow thickness using the GLOBE protocol. We drilled a hole in the ice with an auger and measured the ice thickness using the Fresh Eyes on Ice protocol.
- We did this in three spots each time we went out.
- We got weather data from akclimate.org and calculated the average temperature for a month in the fall before all the snow came and spring for last year and this year.

Results



- We found that in the last week of March in 2021, the snow was 27 cm thick and the ice was 82 cm thick. In the last week of March 2022, the snow was 112 cm thick and the ice was 100 cm thick.
- The ice was 18 cm thicker this year.
- The snow was 85 cm deeper this year.
- The temperatures were colder in the fall this year, but not the spring.

Comparing the temperatures in the fall and spring of last year and this year.

Year	Average Temperature in November	Average Temperature in March
Last year (2020-2021)	-5.0 F	-1.5 F
This year (2021-2022)	-8.4 F	0 F

Conclusions

- The ice was thicker this year because the temperatures were much colder than last year.
- The fall temperatures were colder this year compared to last year, but not the spring temperatures.
- We think the cold coming before the big snow this year helped to make the ice very thick.

We Still Wonder

- I wonder how long it takes for the lake to actually freeze up (Aiyana).
- I wonder how thick the ice can actually get (Airanna).
- I wonder how big the ice can get on the river and on the lake (Bradyn).
- I wonder if the moving water in the river affects when it freezes (Terri).
- I wonder if the ice will keep growing this spring (Jeremiah).
- I wonder how long will it take for the ice to all melt (Aurora).
- If the ice melts earlier now does that change when the ducks and geese will come?

Acknowledgements

Thank you to our teachers Terri Mynatt, Julienil Abrinica, KMarie Zambas, and Donna Levesque for inspiring us to be our greatest scientist selves. We thank the UAF scientists who came to Venetie to help us: Chris Arp, Allen Bondurant, Katie Spellman, Dana Brown, Helena Buurman, Jame Rine, and Kyle Jones. We thank our community members who have helped us on this project either helping get us out to the Lake, or by sharing their long-term knowledge of the land and ice with us: Tim Thumma, Lance Whitwell, Kyle Alexander, Manuel Gamboa. Funding for our work and travel is from the University of Alaska Fairbanks Fresh Eyes on Ice project and Arctic and Earth SIGNs project and GLOBE Regional Student Research Symposium funding.

