



TEACHERS AND RESEARCHERS
EXPLORING AND COLLABORATING



HIGH ARCTIC CHANGE 2021

With PolarTREC Alum Teacher Mark Goldner
& Team Researchers Dr. Julie Brigham-Grette,
Kelly McKeon and Xander Kirshen

July 26, 2021



What is PolarTREC?

- ❑ Since 2004, the Arctic Research Consortium of the United States (ARCUS), a non-profit organization, has been administrating the PolarTREC Program.
- ❑ PolarTREC is professional development for U.S. middle and high school teachers and informal STEM educators. They are paired with researchers for 3-6 week research experiences in the polar regions.
- ❑ Over 150 educators from around the United States have joined scientists in the Arctic and Antarctica to learn about science, the polar regions, and to share what they have learned with their students and communities.



*25 Years of Connecting Arctic
Research*
www.arcus.org

Questions

During the Presentation:

- Type your question into the text chat box and we will insert your question when the right opportunity arises.
- Don't worry! If we haven't been able to ask your question during the presentation, we will save it for the end.
- At the end of the presentation, we often open the webinar up to family and friends who want to say "Hello" or have any last minute questions for the presenters.

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PolarTREC Teacher Mark Goldner
Researchers Dr. Julie Brigham-Grette,
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UMassAmherst

PUBLIC SCHOOLS of
BROOKLINE

Ny Ålesund, Svalbard

International research base at 79°N latitude



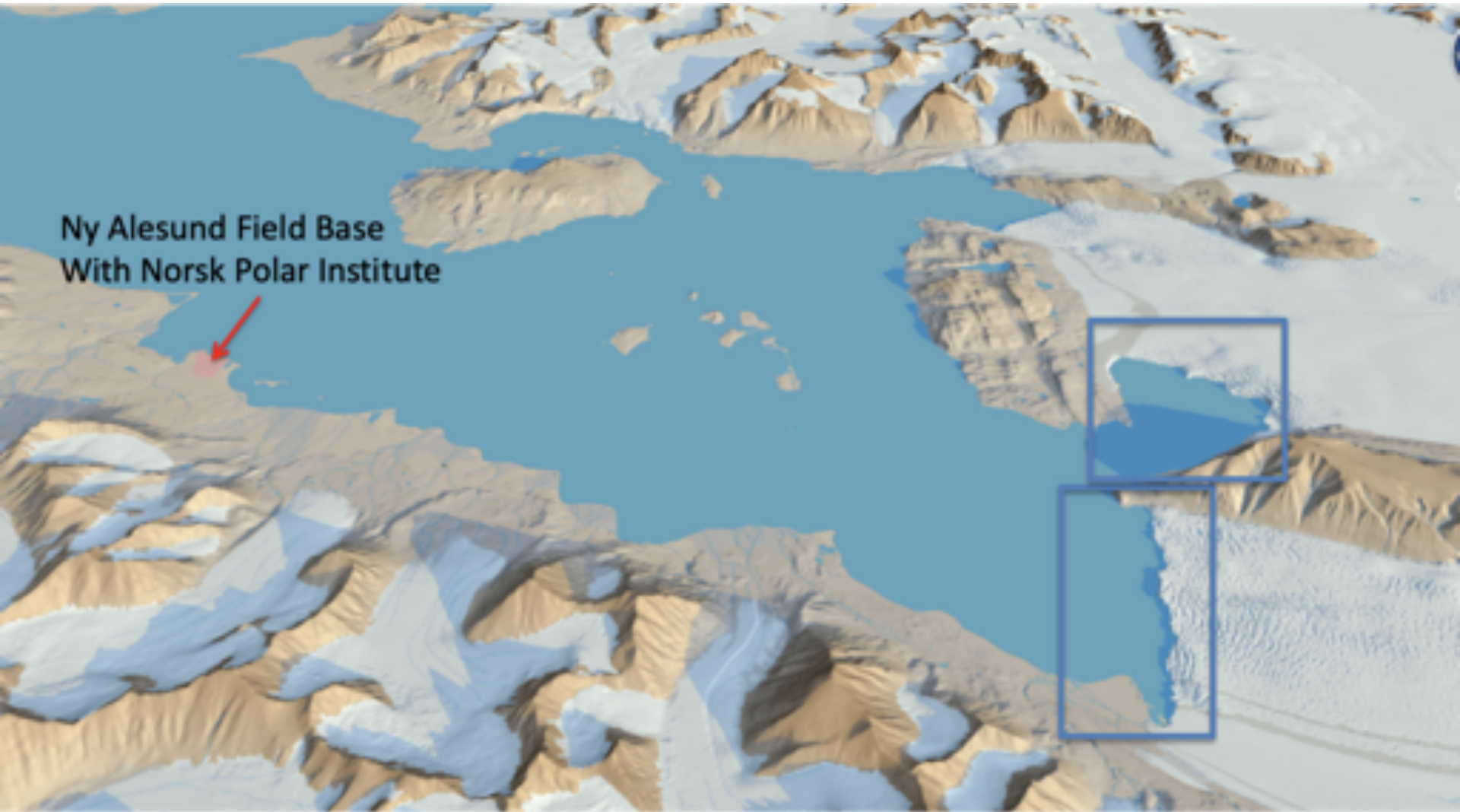
Ny Ålesund, Svalbard

International research base at 79° N latitude



Kongsfjord

Ny Alesund Field Base
With Norsk Polar Institute



Our daily “commute”



Our daily “commute”



Why are we doing this research?

The New York Times

July 22, 2021

Climate Crisis Turns World's Subways Into Flood Zones

Los Angeles Times

JULY 12, 2021

California hit by record-breaking fire destruction: 'Climate change is real, it's bad'

The Washington Post

July 7, 2021

Pacific Northwest heat wave was 'virtually impossible' without climate change, scientists find

The Boston Globe

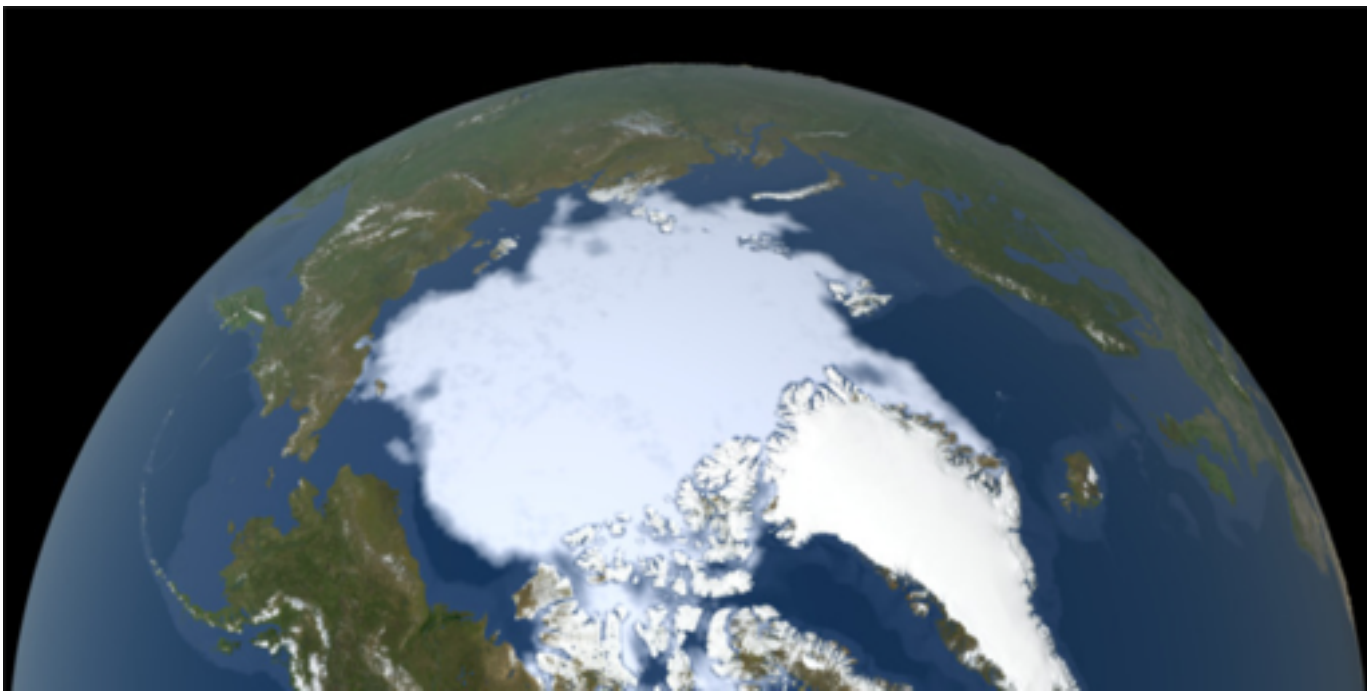
July 24, 2021

Welcome to the Climate Apocalypse. (It will get worse.)

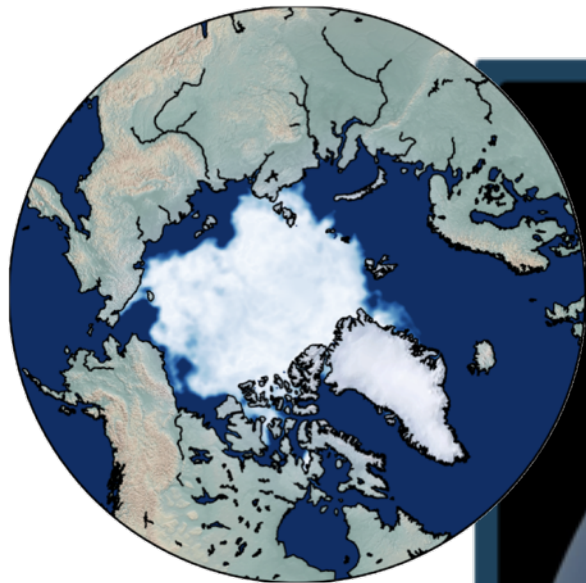
**“What happens in the Arctic,
doesn’t stay there.”**

-Boston Globe, July 24

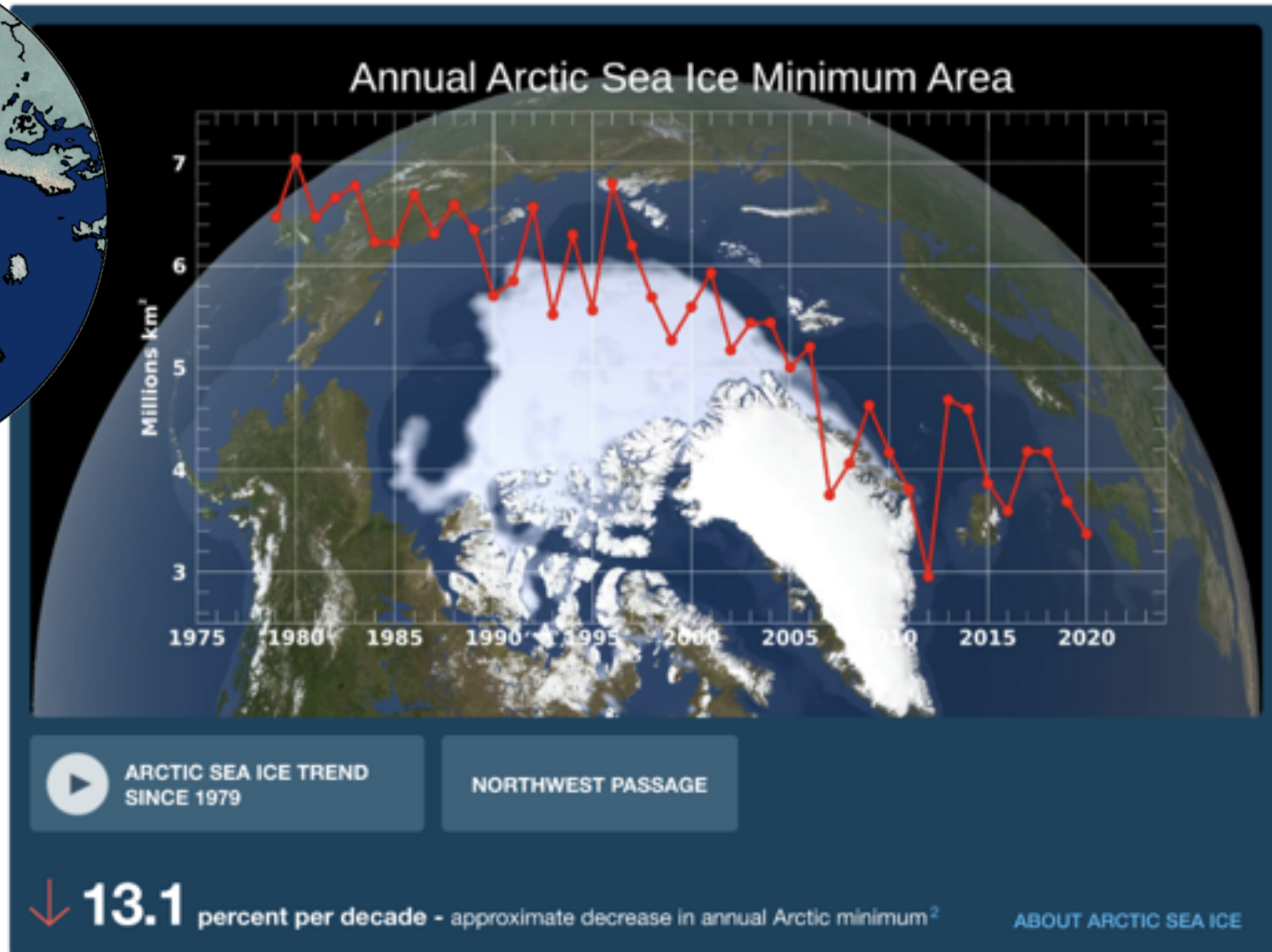
[\(https://www.bostonglobe.com/2021/07/24/science/welcome-climate-apocalypse-it-will-get-worse/\)](https://www.bostonglobe.com/2021/07/24/science/welcome-climate-apocalypse-it-will-get-worse/)



How is climate change affecting the Arctic?



September 1988



NASA, July 2021

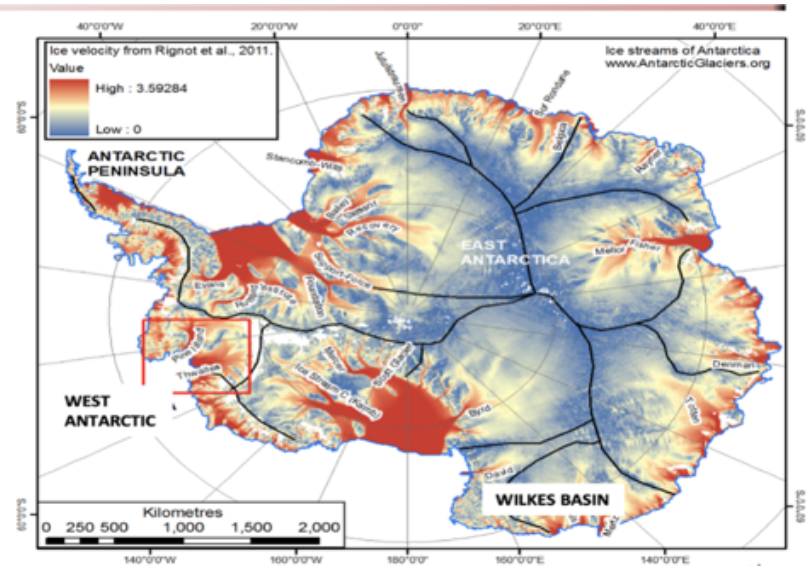
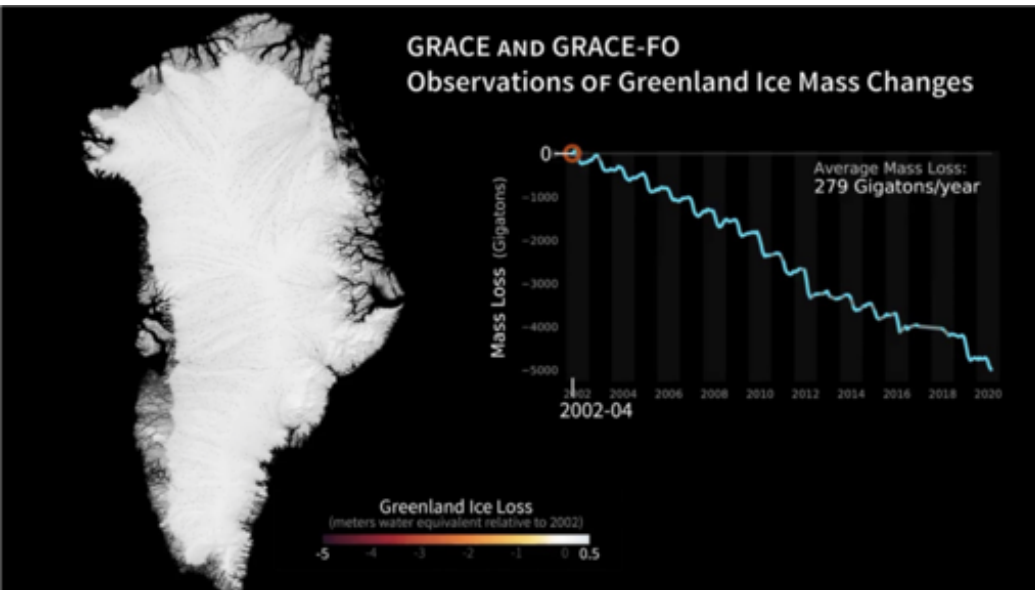
Ocean acidification: The evil twin of climate change!

CO_2

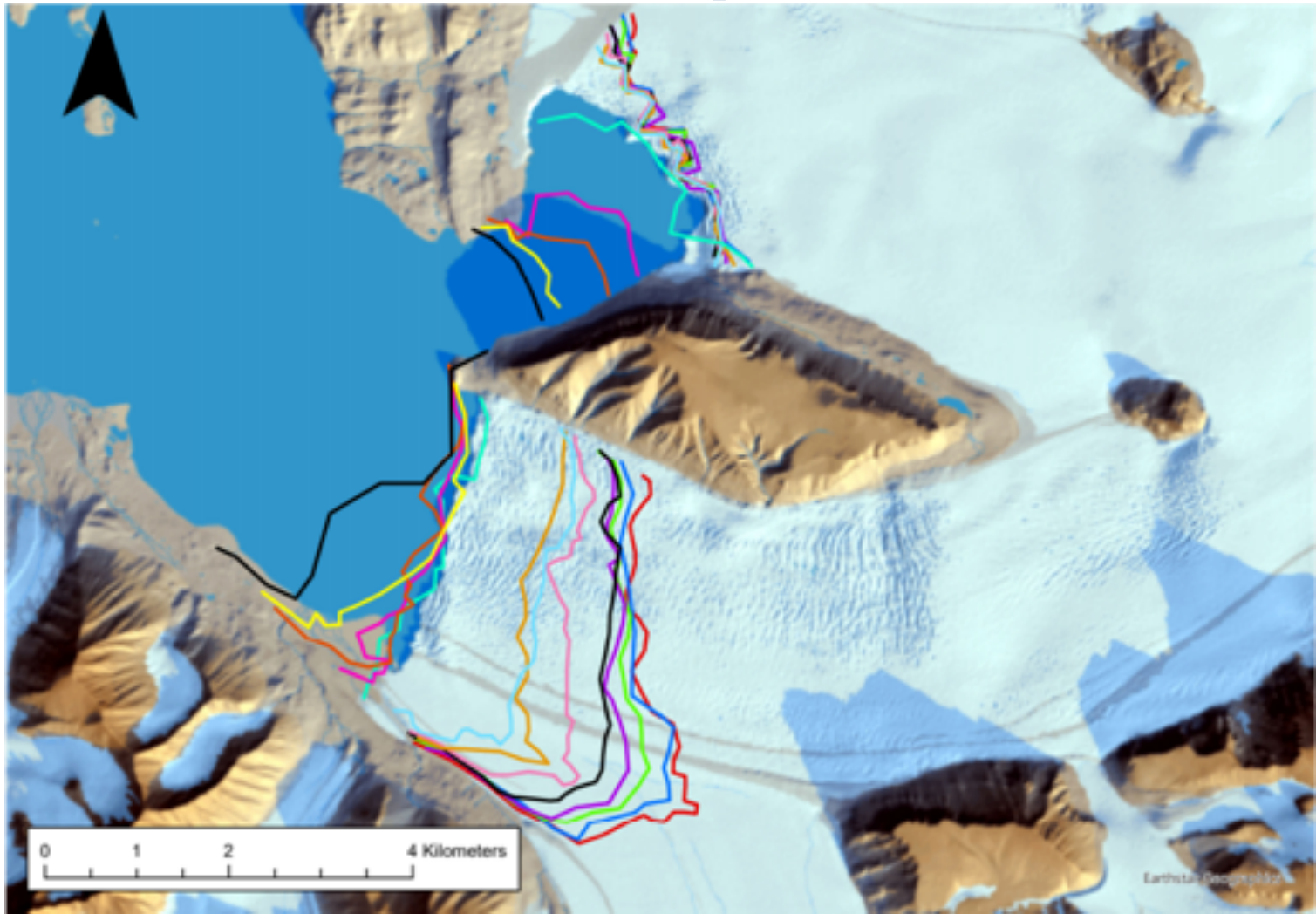


Severe pteropod shell damage already seen today in Polar waters

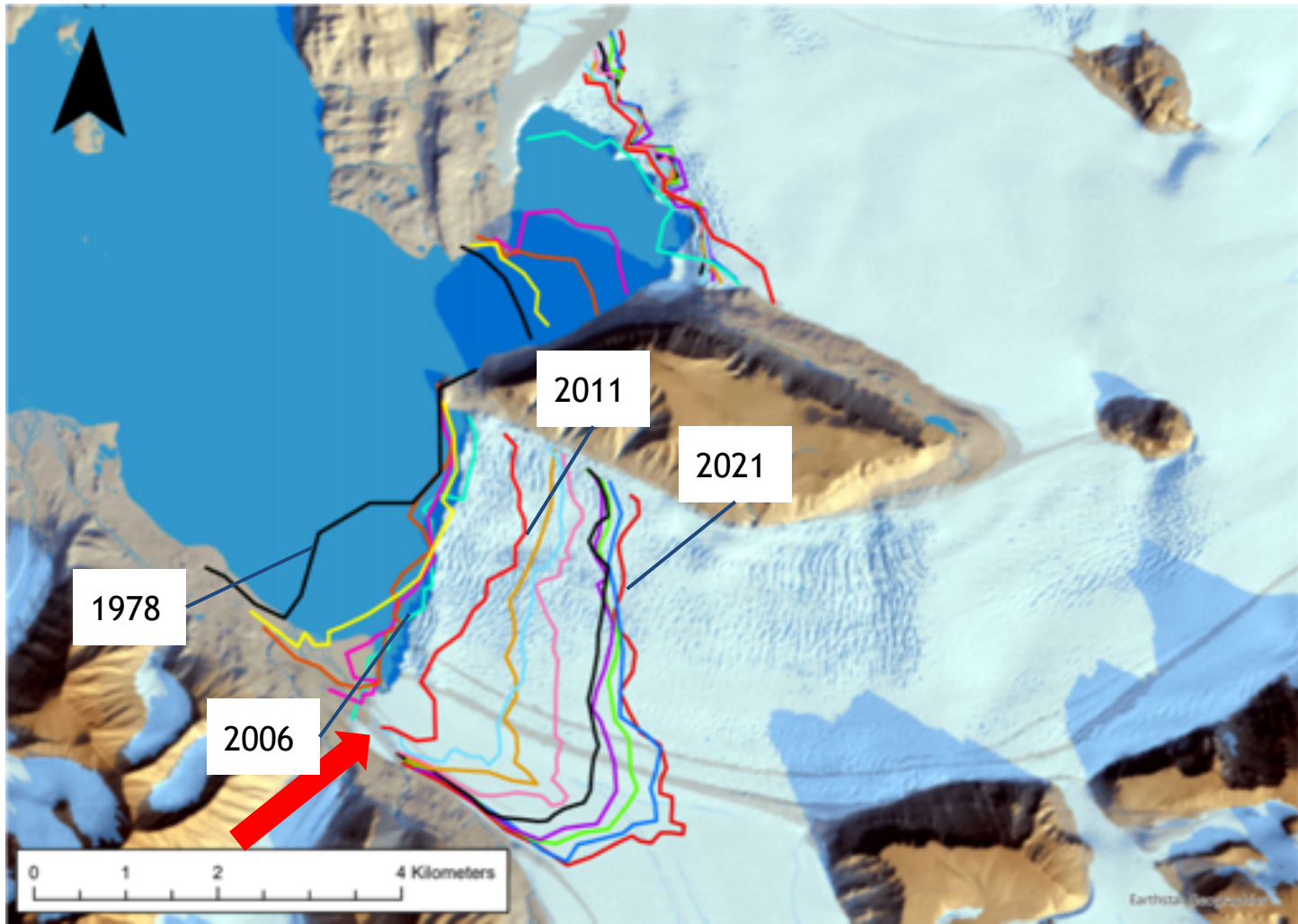
Polar Warming = Global Sea level rise



What we're learning from the recent past

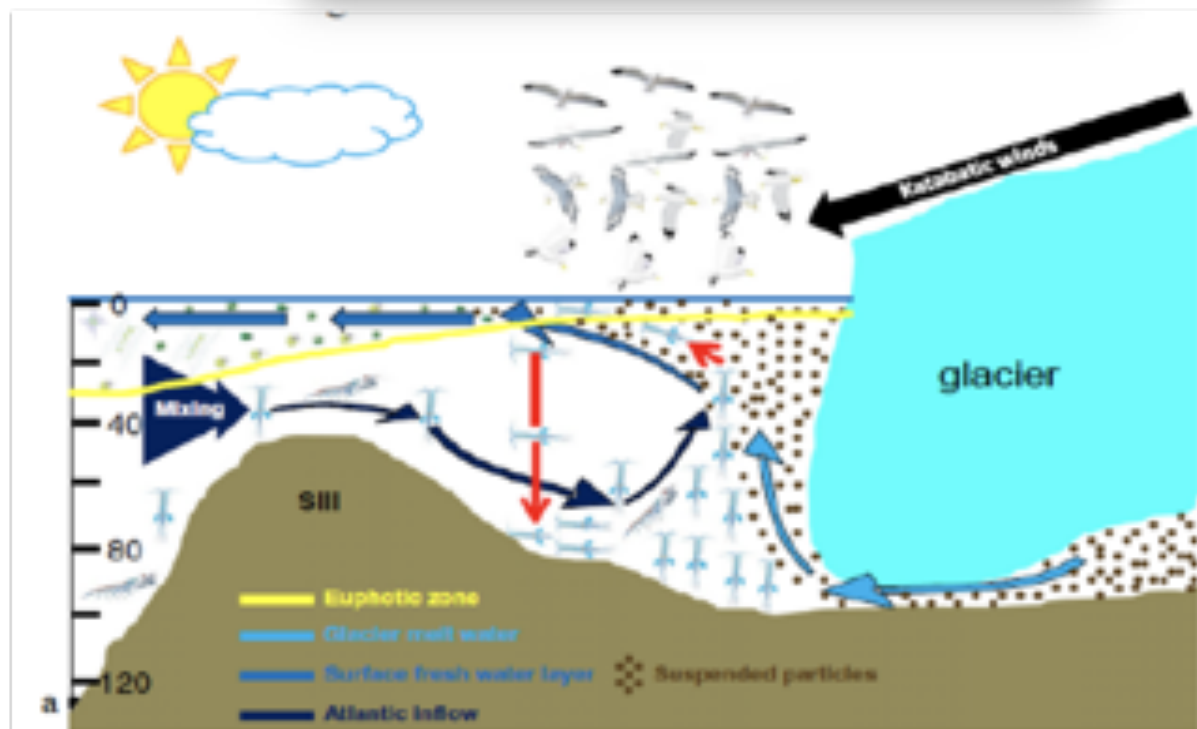


What we're learning from the recent past



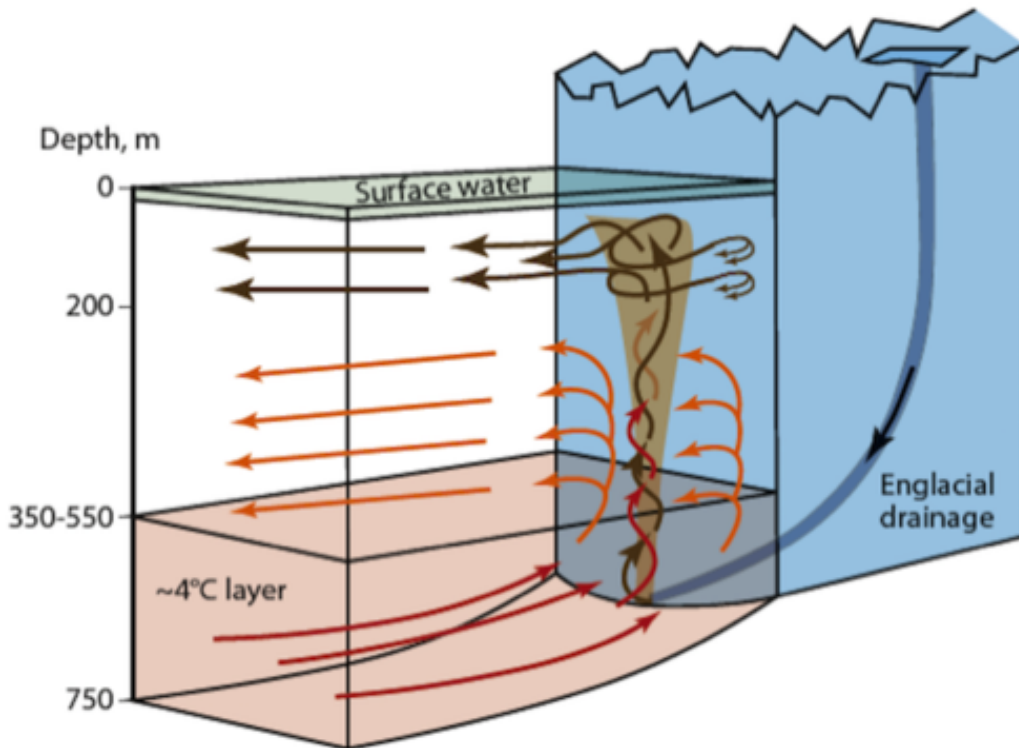
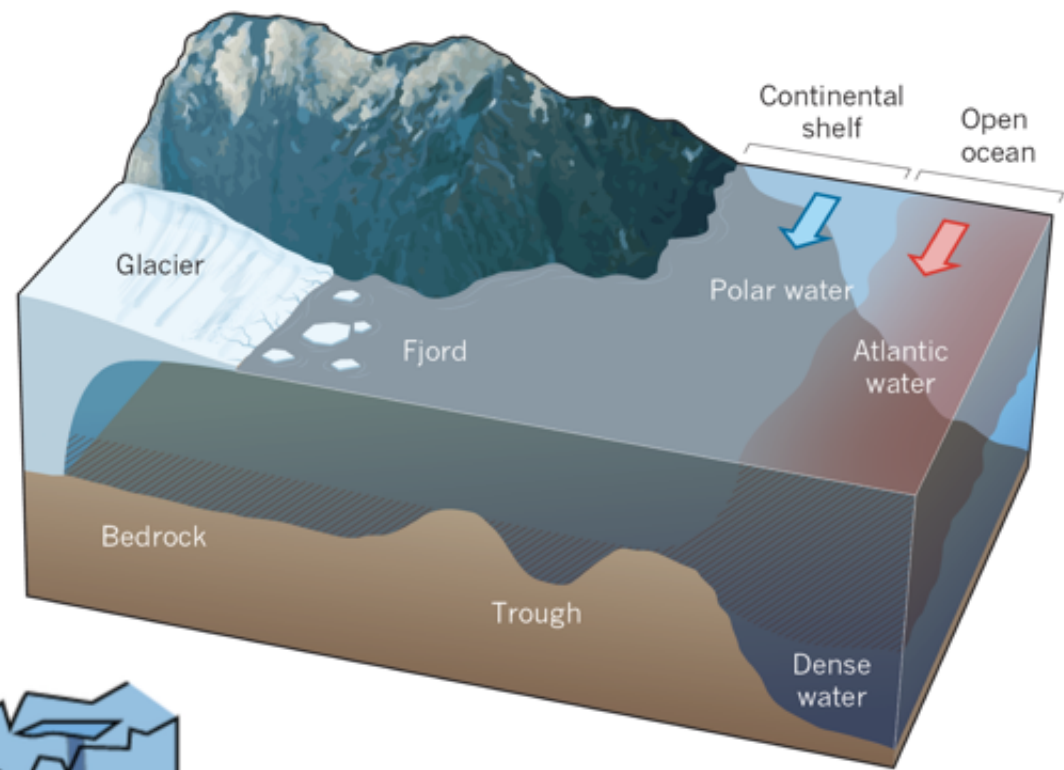


Morphology of the ice and presence of seabirds, mark areas of significant glacial jets (birds pick off helpless zooplankton stunned by osmotic shock)



Sediment plume





Straneo et al, 2013 Nature

What stories do icebergs tell?



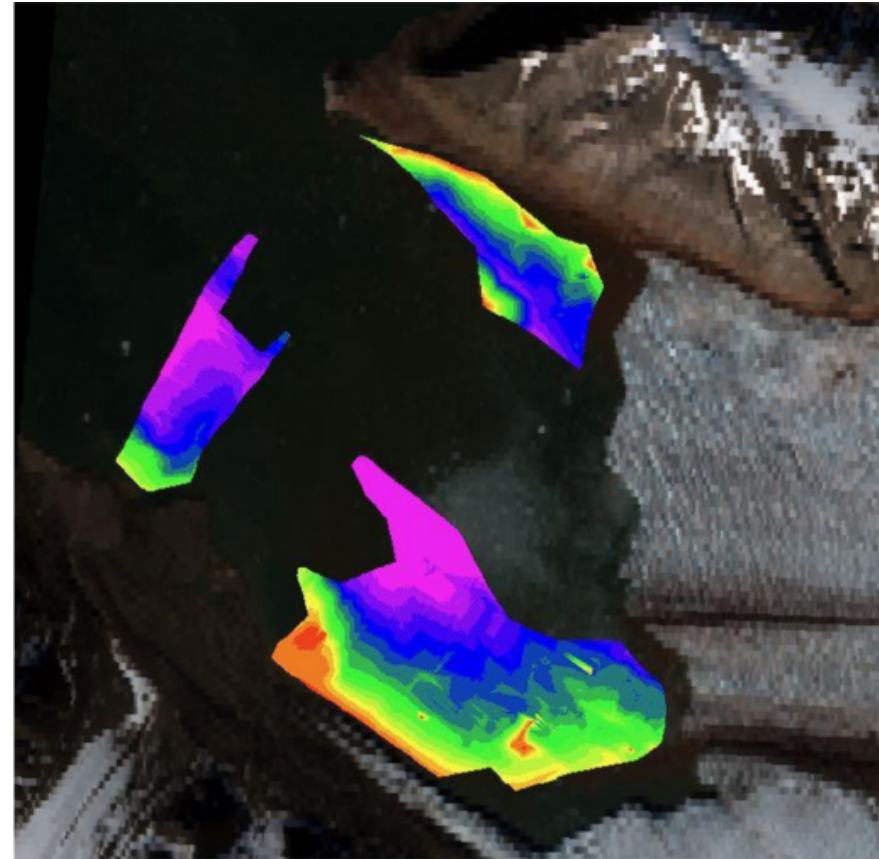
What stories do icebergs tell?



Oceanography Data



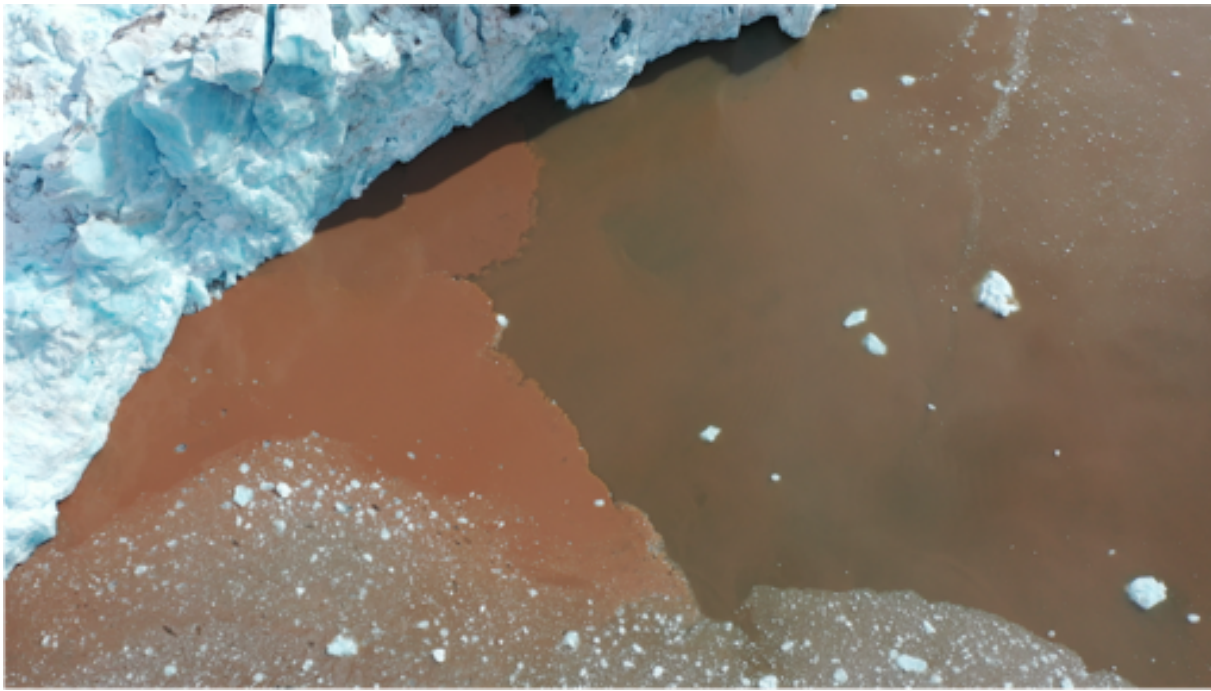
Bathymetry



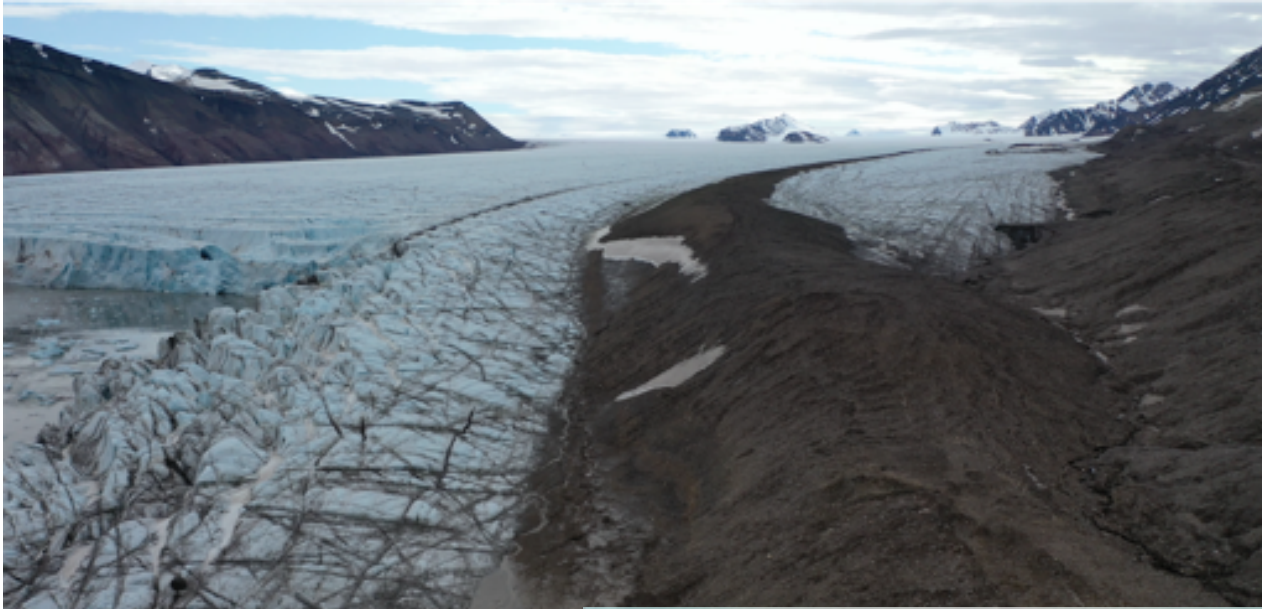
Bathymetry



Drone flying



Drone flying



So what?



What can we do?



Thank You
for attending!



UMassAmherst

An archive of the event will be available shortly.
<http://www.polartrec.com/polar-connect/archive>