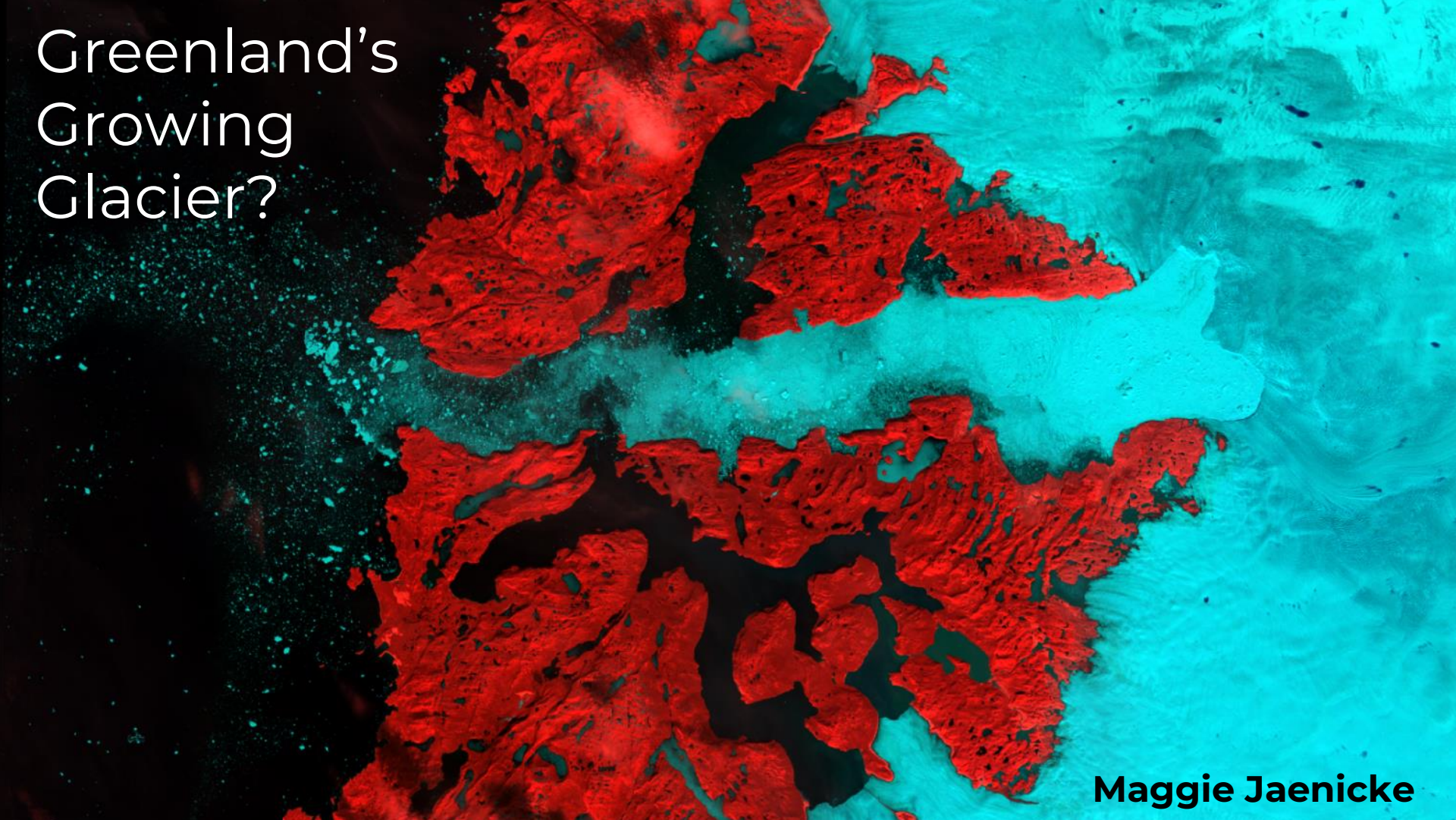
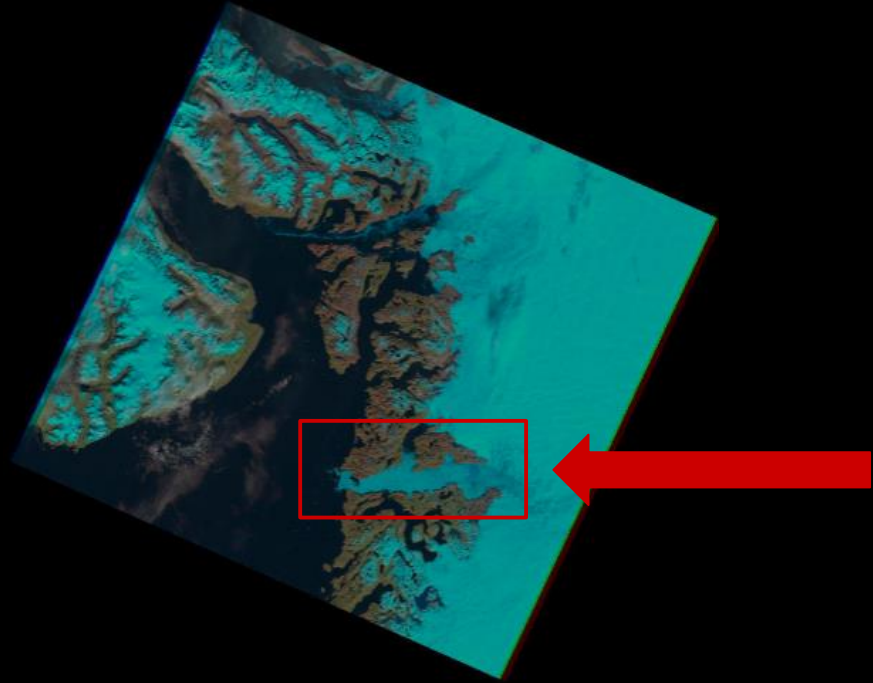


Greenland's Growing Glacier?



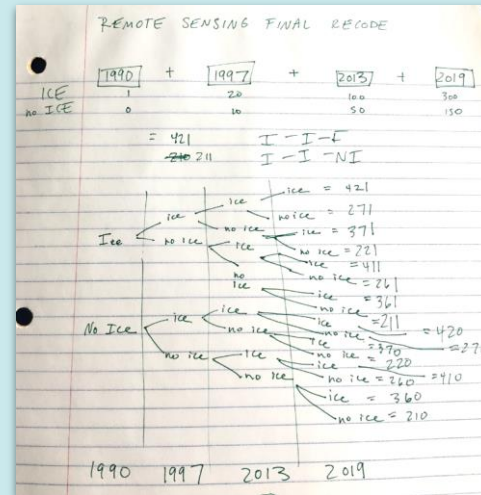
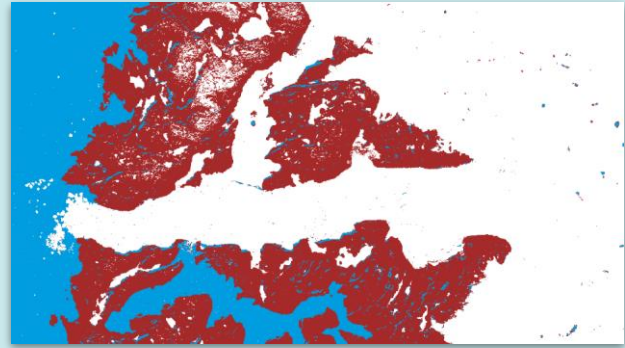
Maggie Jaenicke

- Landsat series, dating back 20 years to 1990
 - All images from late June of given year



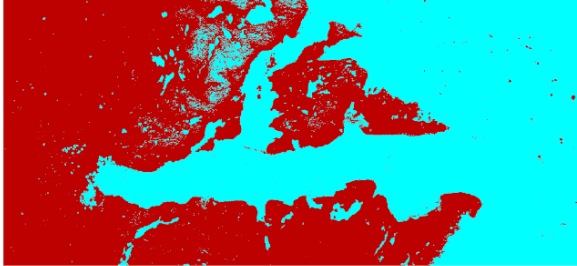
Procedure:

1. Obtain and stack 4 images (1990, 1999, 2013, 2019)
2. Subset and AOI
3. **Supervised classification** into 3 classes (land, water, ice) - minimum distance
4. Merge classes into **ice** and **non-ice**
5. **Recode** by year
6. Evaluate percentage ice (difficulties in pixel differences)
7. **Change Trajectory Analysis**

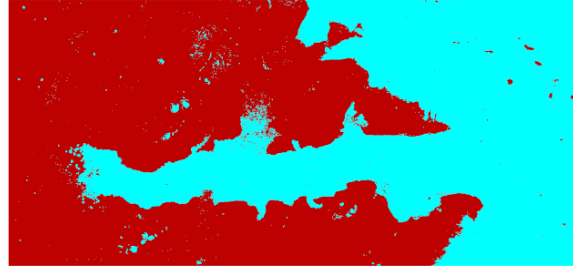


Ice Makeup of Jakobshavn Glacier, Greenland Over Time

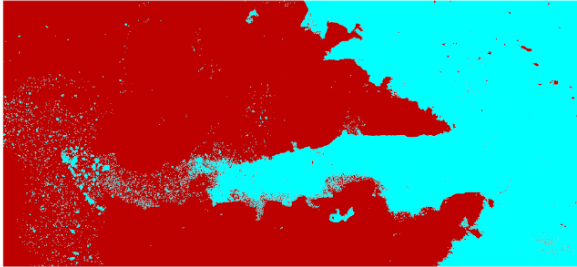
1990: 48.34% ice



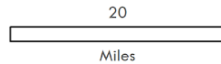
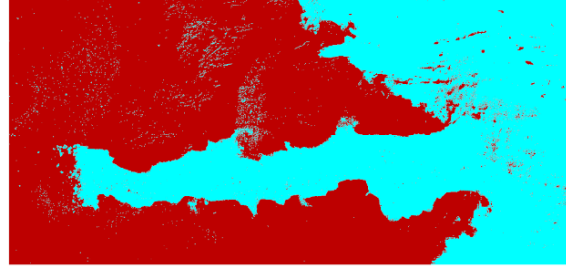
1999: 44.02% ice



2013: 38.01% ice



2019: 40.70% ice



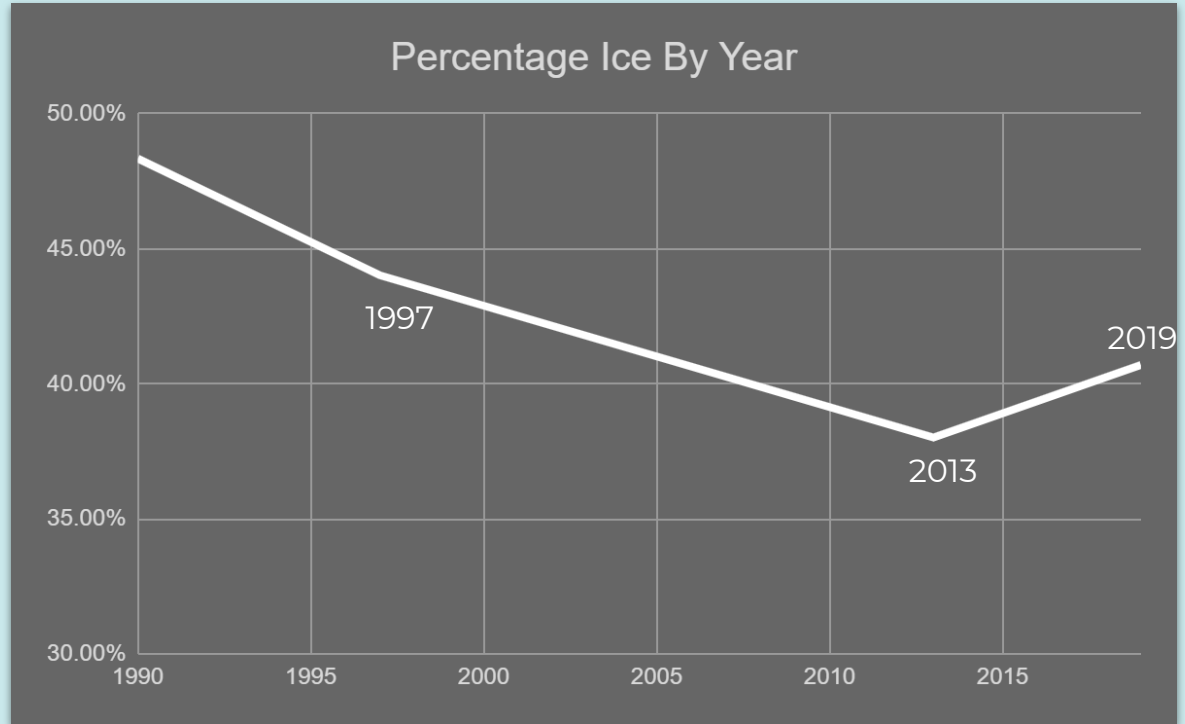
Map by Maggie Jaenicke using Landsat 5 TM
and 8 OLI imagery of Greenland.

1990: 48.34%

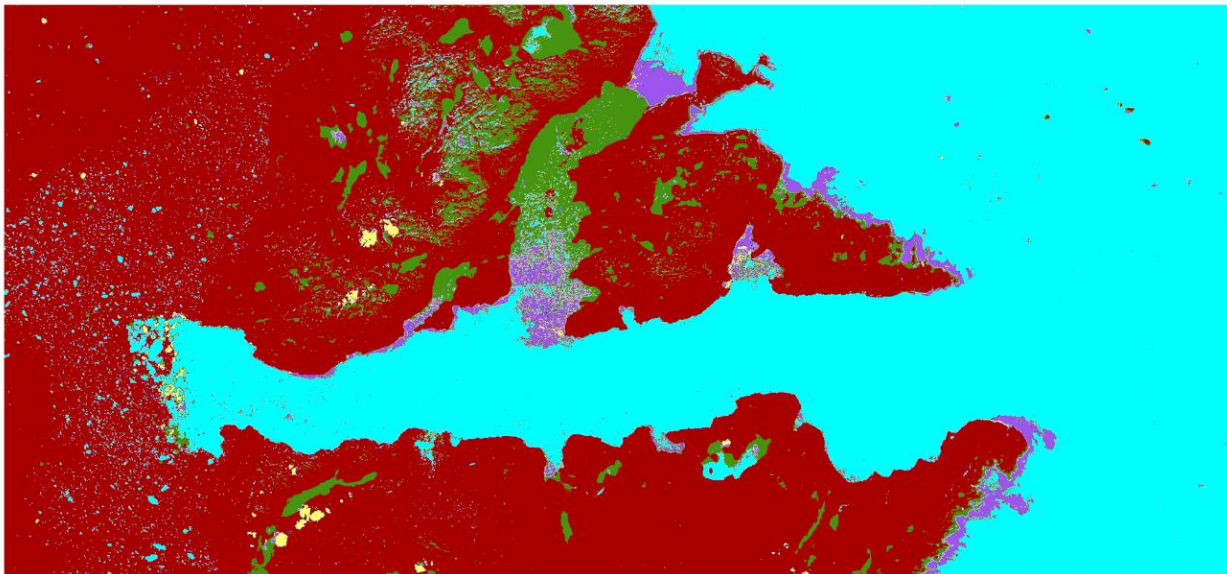
1997: 44.02%

2013: 38.01%

2019: 40.70%



Change Trajectory Analysis of Jakobshavn Glacier, Greenland, 1990-2019



10
Miles

Map by Maggie Jaenicke using Landsat 5 TM
and Landsat 8 OLI imagery of Greenland.

Why *is* Jakobshavn growing?

- Influx of cold water from the North Atlantic
- Switches about once every 20 years

“Why is Jakobshavn growing? The scientists point to a recent influx of unusually cold water from the north Atlantic pushing into the Arctic. This has been particularly marked in Disko Bay, which spills over into the Illulisat Icefjord, the glacier’s home. At a depth of 820 feet, temperatures have dropped two degrees Celsius since 2014. And that colder water has helped the glacier slow its melt and even grow slightly.”

This influx of cold waters isn't an isolated event: Thanks to a natural cycle in the Atlantic Ocean that switches back and forth between warm and cold about once every 20 years, cooler waters are penetrating far up the western coast of Greenland. But the phase will switch again at some point and warmer waters will return.”

<https://www.nationalgeographic.com/environment/2019/03/one-part-of-greenland-ice-growing/>