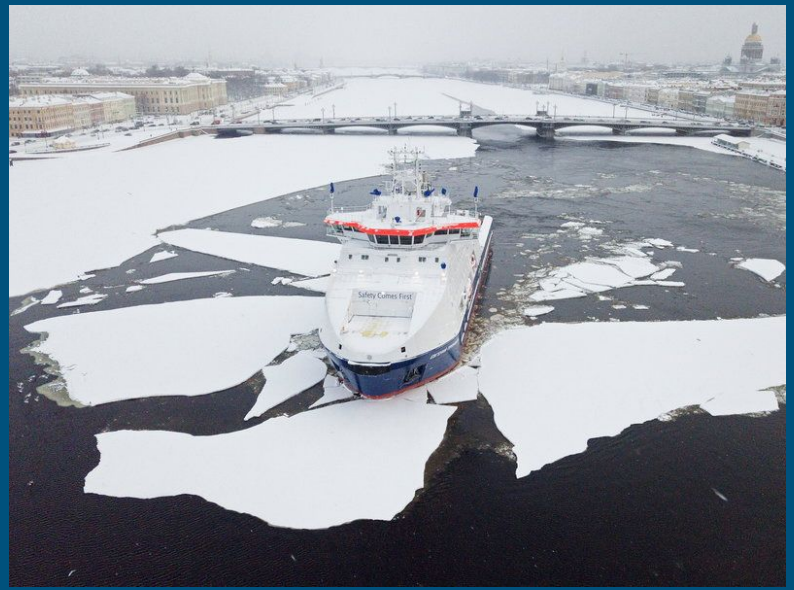
Finding Problematic Icebergs

Lenaya Flowers

Elements of Arctic Shipping Routes[1,2]

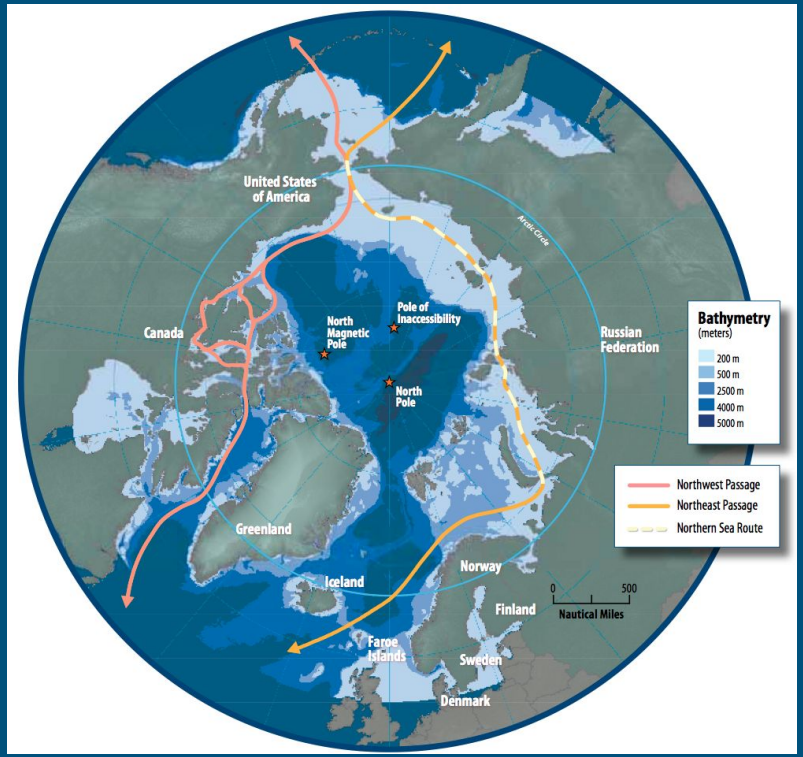
- Currently, Arctic Sea routes are passable 13-17 weeks per year. Towards the end of the 21st century, routes will be passable seasonally.
- As global shipping demands increase, passage between Europe and Asia can be reduce by around 40%, which can save fuel and reduce carbon emissions
- Maersk has begun using Arctic Shipping Lanes



Objectives

- Predict which icebergs have the potential of entering the Northwest Shipping Passage
- Showcase the dangers icebergs pose

Arctic Shipping Lanes[3]



Dangers of Icebergs[4]

- Up to 90% of the iceberg's mass is underwater.
- They can travel significantly south of the Arctic Circle
- There thousands of icebergs in the Arctic Ocean

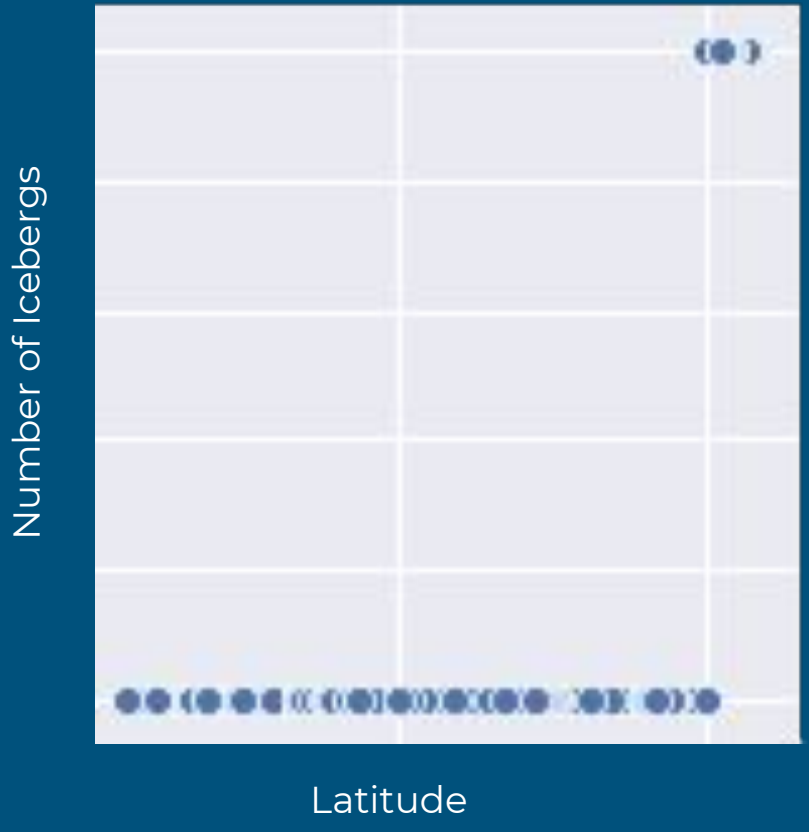
Predictions

Can we predict which icebergs will enter a shipping lane?

Various machine learning models can be employed to predict the chances of an iceberg entering a shipping channel.

Metric Used: Accuracy compared to a baseline model

Arctic Icebergs Drifting into Shipping Lanes



Metrics:

Accuracy ~ 98%

Validation ~ 72%

Continuation of Work

- Create a more robust model providing the entirety of a shipping lane
- Include additional factors such as weather, international claims, and potential Arctic drilling
- Continuing efforts in identifying environmental risks as shipping through the Arctic increases.

References

[1] Aksenov, Y et.al. On the future navigability of Arctic sea routes: High-resolution projections of the Arctic Ocean and sea ice. Marine Policy Volume 75, January 2017, Pages 300-317

[2] https://www.npr.org/2018/08/22/640679831/worlds-largest-shipping-company-heads-into-arctic-as-global-warming-opens-the-wa

[3] https://upload.wikimedia.org/wikipedia/commons/b/bc/Map_of_the_Arctic_region_showing_the_Northeast_Passage%2C_the_Northern_Sea_Route_and_Northwest_Passage%2C_and_bathymetry.png

[4] By AWeith - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=51789188

[5] https://www.navcen.uscg.gov/pdf/iip/Iceberg_Formation.pdf

Questions?