ARCTIC EXPLORER

Visualization of Sea-Ice Concentration along Arctic Shipping Routes

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The Arctic Seascape is **rapidly changing** [1]. **This has global implications** for trade and defense.

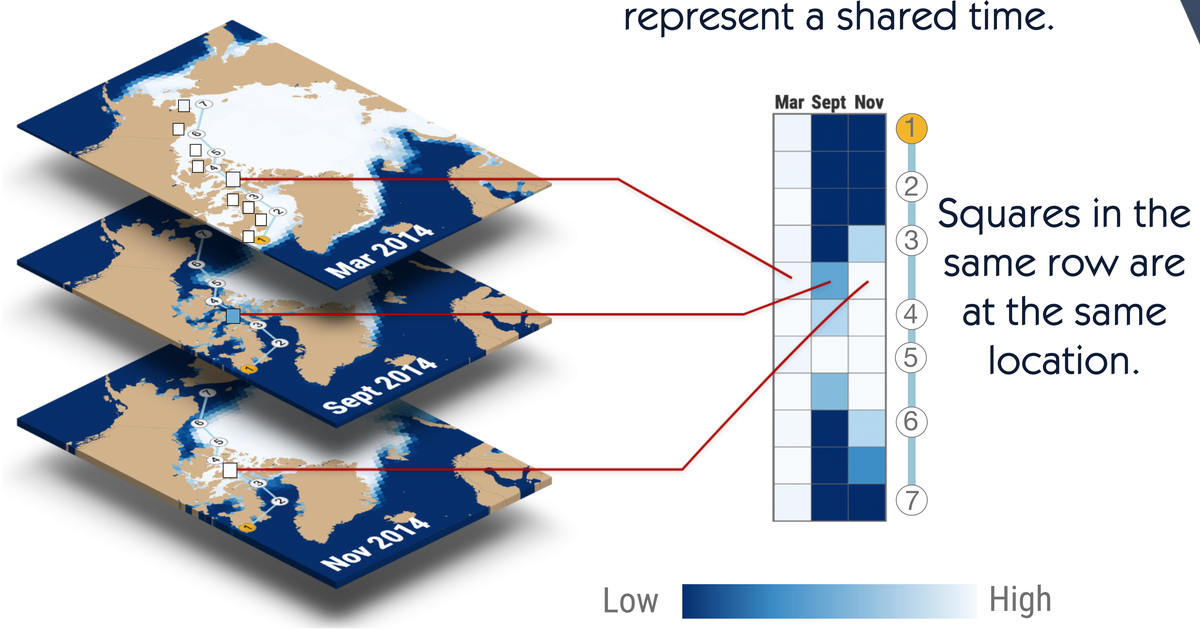
Arctic Explorer was built for researchers to understand how shipping routes through the Arctic have changed over time. It extends work done by C. Nobre in Ocean Paths [2].

Utilizing a **Temporal Ordered Spatial Matrix (TOSM)** [3], Arctic Explorer shows how the concentration of ice along a path changes over time.

This work revealed techniques to improve TOSM comprehension and accessibility.

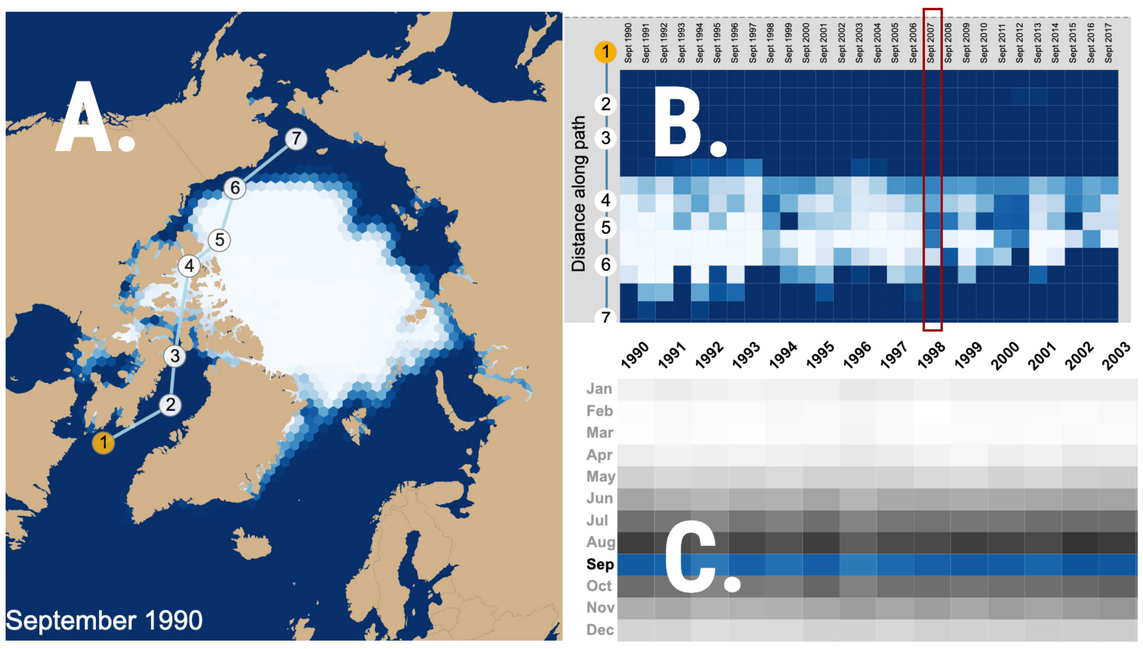
How to read the TOSM

Squares in the same column represent a shared time.



Color encodes an attribute of interest (sea ice concentration).

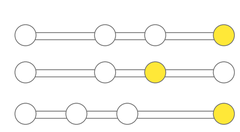
Tool Components



A. Map. B. TOSM. C. Heat Map Querying Interface. The tool visualizes sea ice concentration along the Northwestern Passage. The NW Passage opened to ships without ice breakers for the first time in 2007 (in red).

Contributions

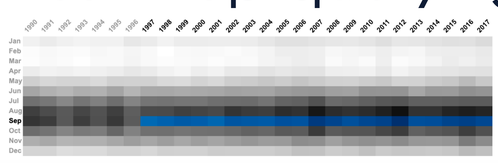
Interaction techniques



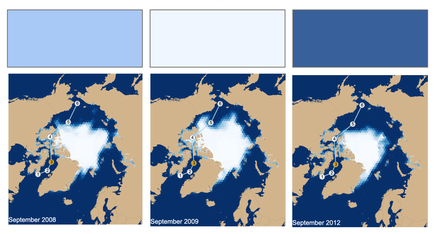
Interactive Path Legend

Path Highlight

Heat map querying



Map + Analysis Interface



These contributions aim to improve the comprehension of spatio-temporal data.

Future work will involve evaluation via MTurk.

Scan with camera for youtube demo.

Special thanks to our collaborators at the Golden Lab.

visualization design lab

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[1] S. Steinle, S. Reis, and C. E. Sabel. The Science of the Total Environment. 2013.
[2] C. Nobre, A. Lex. OceanPaths: Visualizing Multivariate Oceanography Data. 2015.
[3] MJ Kraak, D.E. Vlag. Understanding Spatiotemporal Patterns: Visual Ordering of Space and Time. 2007.