

EGU22-4854

<https://doi.org/10.5194/egusphere-egu22-4854>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Thin and thick ice in the Beaufort Sea: A new regime with enhanced mobility

**Kent Moore**<sup>1</sup>, Mike Steele<sup>2</sup>, Axel Schweiger<sup>2</sup>, Jinlun Zhang<sup>2</sup>, and Kristin Laidre<sup>2</sup>

<sup>1</sup>Department of Physics, University of Toronto, Toronto, Canada (gwk.moore@utoronto.ca)

<sup>2</sup>Polar Sciences Center, University of Washington, Seattle, USA

The Arctic Ocean has seen a remarkable reduction in sea ice coverage, thickness and age since the 1980s. These changes are most pronounced in the Beaufort Sea, with a transition around 2007 from a regime dominated by multi-year sea ice to one with large expanses of open water during the summer. Here we show that during the summers of 2020 and 2021, the Beaufort Sea hosted anomalously large concentrations of thick and old ice. We show that ice advection contributed to these anomalies, with 2020 dominated by eastward transport from the Chukchi Sea, and 2021 dominated by transport from the Last Ice Area to the north of Canada and Greenland. Since 2007, cool season (fall, winter, and spring) ice volume transport into the Beaufort Sea accounts for ~45 % of the variability in early summer ice volume - a threefold increase from that associated with conditions prior to 2007. Impacts of these changes are likely to occur on stressed regional ice-dependent ecosystems.