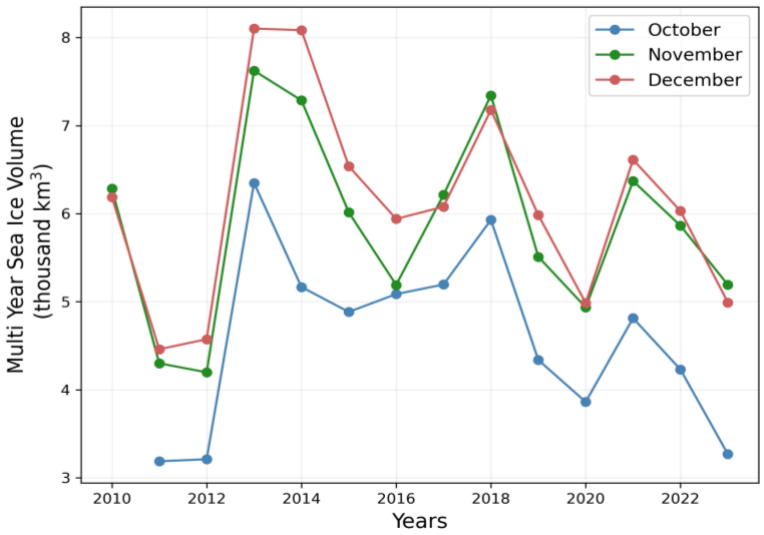
Sea Ice Volume

In the last quarter of 2023, sea ice volume increased from 5.74 thousand km^3 in October to 15.4 thousand km^3 in December. However, for October, November and December, sea ice volume was below the average for the CryoSat-2 record (2010-2023), particularly in October. This can be attributed to lows in both the extent and thickness of multi-year ice (MYI); in October, the extent of MYI was the lowest on record, at 2.37 million km^2 compared to the average of 3.27 million km^2. Furthermore, the volume of MYI ice in December was the 4th lowest on record at 4.99 thousand km^3.
Interestingly, the volume of first-year ice (FYI) in the last quarter of 2023 was high, with November and December having the highest FYI volume since the CryoSat-2 record began, at 6.13 and 10.4 thousand km^3 respectively, indicating a recovery since the Spring low FYI volume. This also suggests that the overall below average sea ice volume is being driven by reductions in MYI.



Sea Ice Thickness

Similar trends to sea ice volume were observed for sea ice thickness from October to December 2023, with above average FYI thickness and below average MYI thickness. In November, FYI thickness was the second highest, at 0.98 m, and in December was the highest on record, at 1.21 m. MYI, on the other hand, was the lowest on record for December, at 1.84 m. This suggests the trend of reducing sea ice age in the Arctic is being observed in reduced thickness of MYI.
Persistent negative sea ice thickness anomalies of up to 1 m were observed from October to December north of the Canadian Arctic Archipelago. This could be attributable to warm temperature anomalies in that region causing a reduction in sea ice thickness. It is possible that the consistent negative anomalies north of the Canadian Arctic Archipelago observed from October to December may persist throughout the growth season; MYI ice in this region can be inhibited from thermodynamic growth due to being thicker than FYI.
Positive thickness anomalies were observed in the Kara and Laptev Sea, which similarly could be linked to temperature trends in that region, with low temperature anomalies observed.