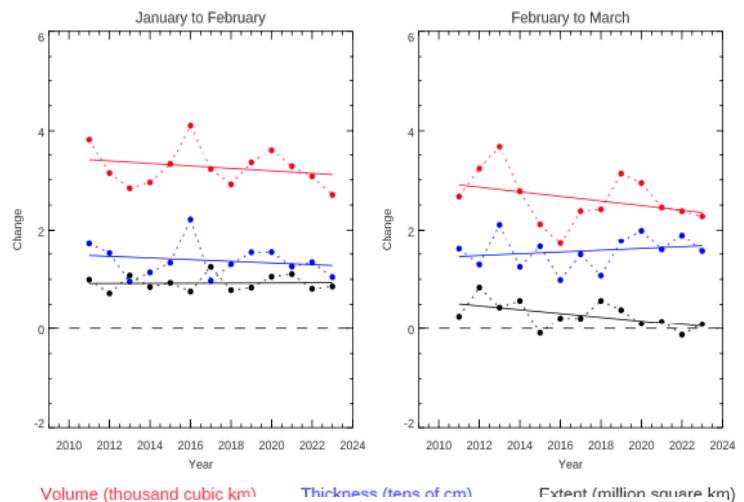


Sea Ice Volume

In the first quarter of 2023, sea ice volume increased from 19.05 thousand km³ in January to 24.01 thousand km³ in March. However, March sea ice volume was the second lowest on record after the minimum in 2021. This can be attributed to a combination of low sea ice extent (second lowest on record for March at 13.57 million km²), and below average sea ice thickness, at 1.77 m compared to a 2011-2023 of 1.79 m. In particular, the extent of first-year ice (FYI) and thickness of MYI were below average throughout the first quarter.

Between January and February, the magnitude of sea ice change has not shown a significant trend since 2011. Between February and March, volume has shown a decrease in magnitude since 2011, attributable to decreasing sea ice extent.



Sea Ice Thickness

In January to March 2023, sea ice thickness exhibited a decreasing trend in all months since 2011. Notably, thickness of MYI was below average in all months, and the second lowest on record in February and March, at 2.22 m (2.43 m average) and 2.43 m (2.65 m average) respectively. However, for FYI, thickness was around average in February and March, and above average in January at 1.32 m (average 1.28 m).

Sea ice thickness anomalies of up to -1 m were observed in areas north of the Canadian Arctic Archipelago and Beaufort Sea, areas that generally host older, thicker MYI. This anomaly has persisted since the beginning of the growth season in October 2022; it is likely that MYI that starts the season anomalously thin is likely to remain thin throughout the season due to reduced thermodynamic growth. This may therefore be contributing to the below average MYI thickness in February and March. On the other hand, anomalies of +1 m were observed in Fram Strait and the Barents Sea in January, which may be driving the above average FYI thickness in that month.

The causes of this could be attributed to anomalous air temperatures over the Canadian Arctic Archipelago in January 2023, possibly due to high sea level pressure. However, below average temperatures were not observed in areas of anomalously high sea ice thickness. This could be a result of high thermodynamic growth occurring in regions of thin FYI.

