Supplementary Materials:
Ice Mass Balance During Sea Ice Lows

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S1 Supplementary figures

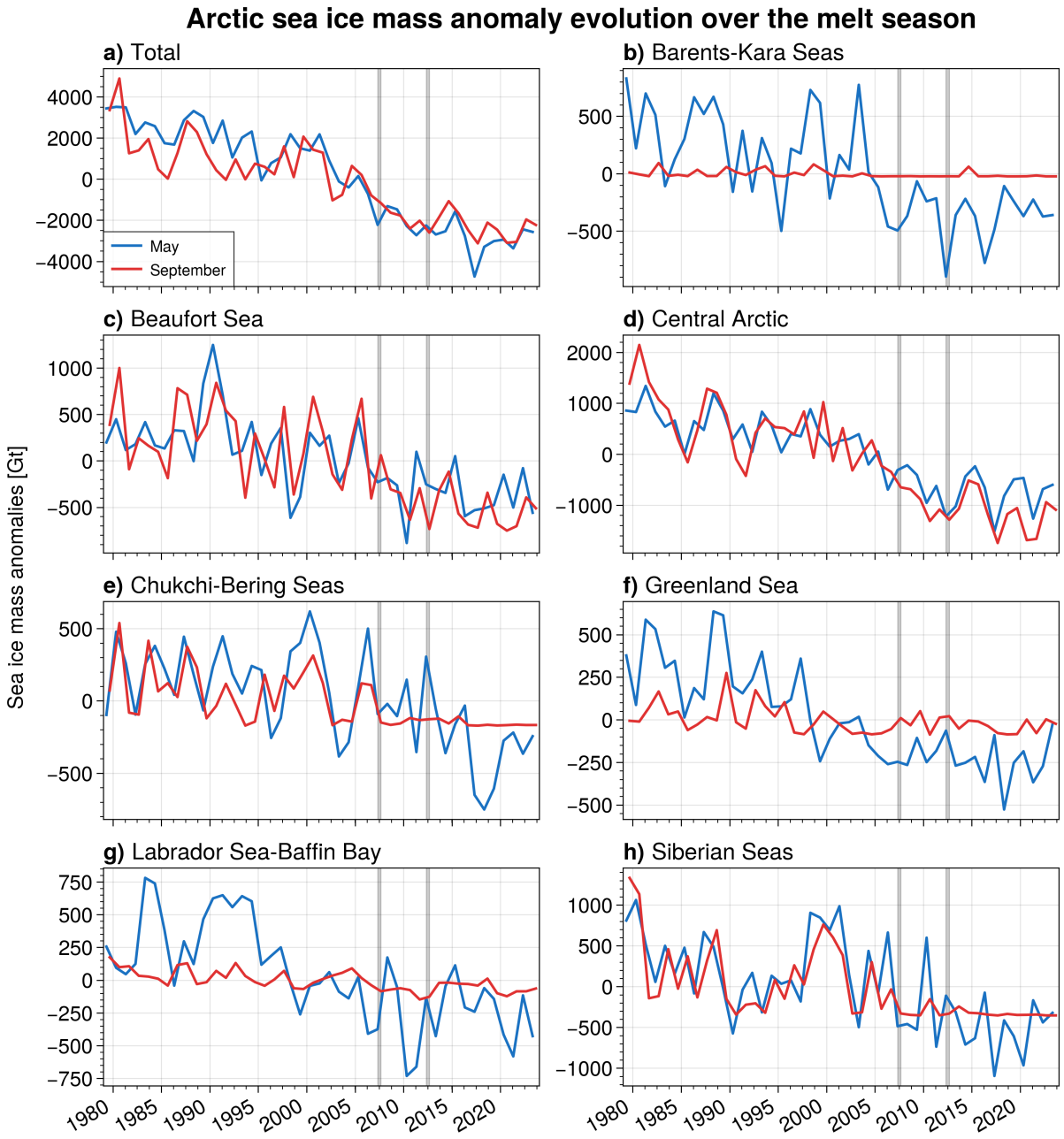

Figure S1. Sea ice mass anomalies, with respect to the climatological (1979-2023) seasonal cycle, at the beginning (May 1st, blue) and end (September 1st, red) of the melt season, for the total Arctic region (panel a) and each of the sectors (panels b-h). Sea ice lows are indicated with a vertical grey line.

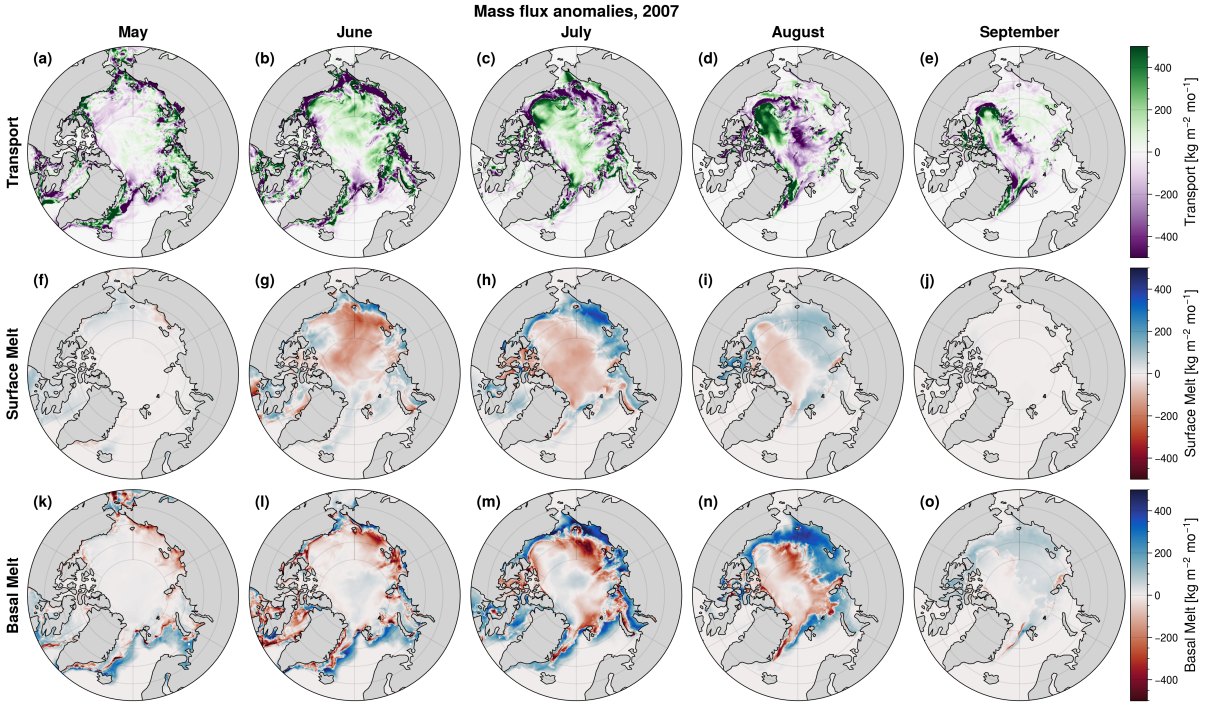

Figure S2. Monthly spatial anomalies relative to 1979-2008 climatological seasonal cycle of ice (a-d) mass transport, (e-h) basal melt, and (i-l) surface melt in the Arctic over the boreal summer 2007. Anomalies are shown for (a, f, k) May, (b, g, l) June, (c, h, m) July, (d, i, n) August and (e, j, o) September 2007. Negative anomalies indicate ice mass loss due to export or increase melt.

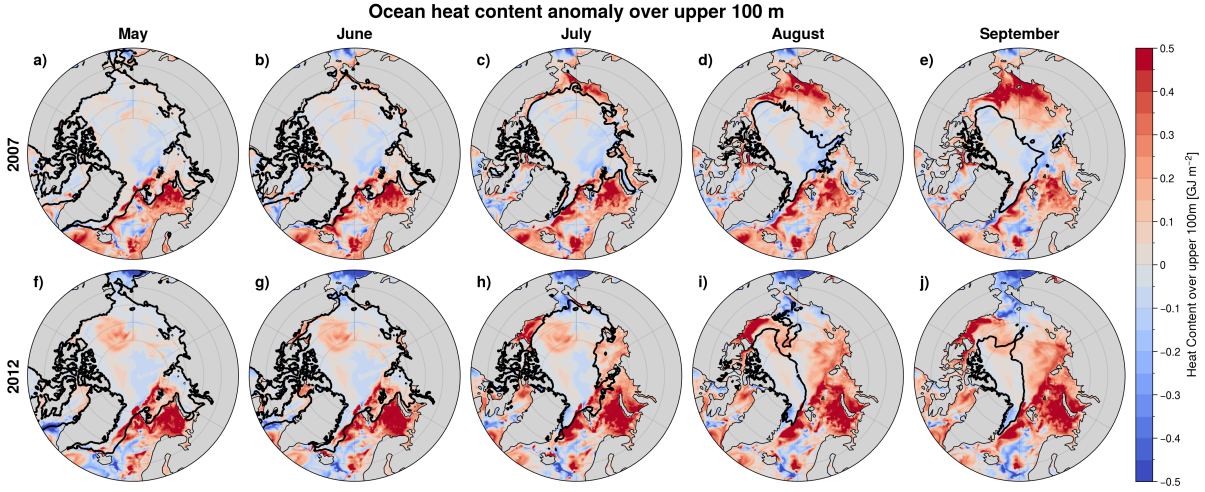

Figure S3. Ocean heat content (relative to freezing temperature, -1.85°C) anomaly over the upper 100 m of the ocean water column. Monthly maps over the melting season are displayed for 2007 (a - e) and 2012 (f - j). The black contour indicates the ice edge, defined as the location where sea ice concentration drops below 15 %.

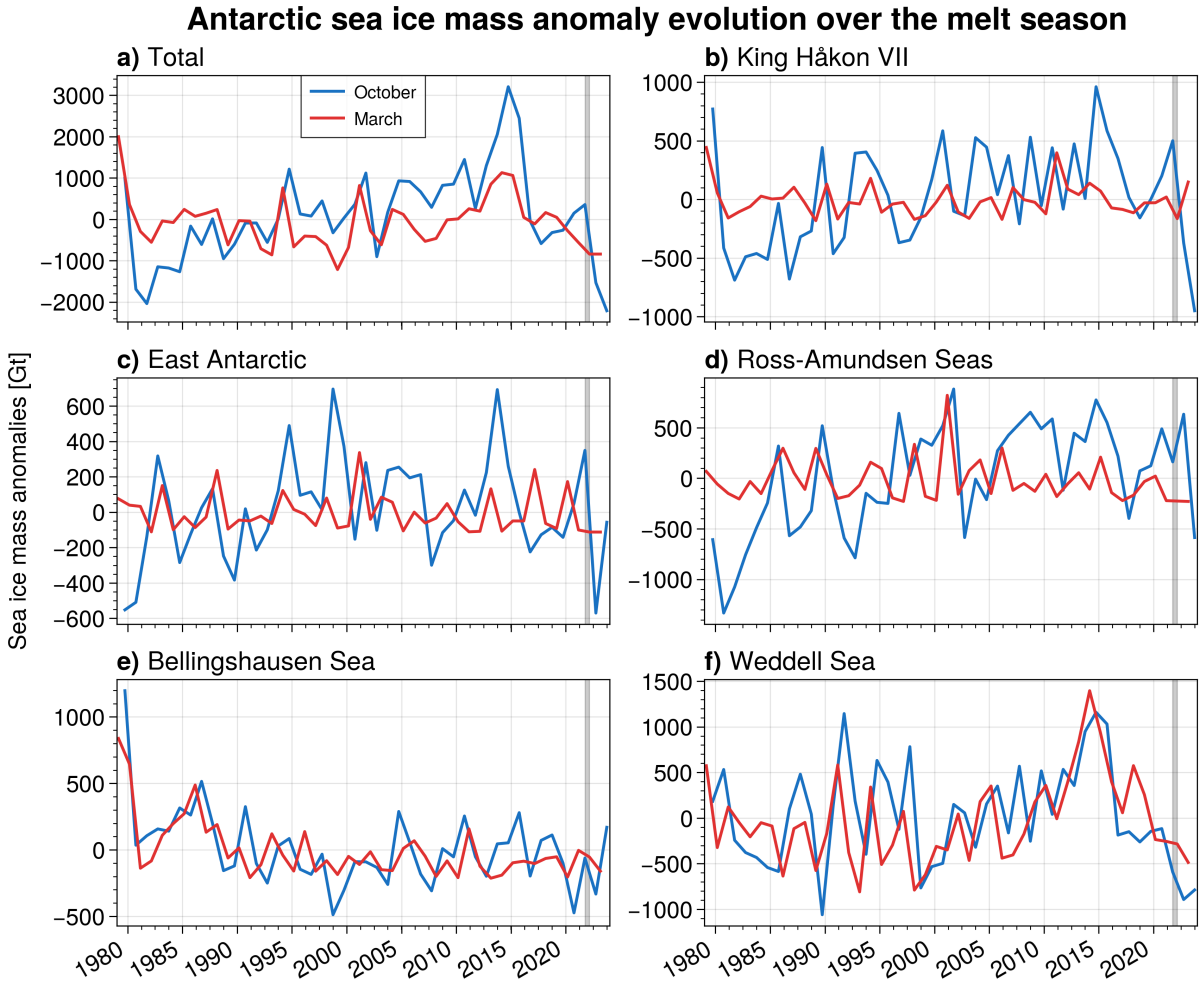

Figure S4. Sea ice mass anomalies, with respect to the climatological (1979-2023) seasonal cycle, at the beginning (October 1st, blue) and end (March 1st, red) of the melt season, for the total Antarctic region (panel a) and each of the sectors (panels b-f). The austral summer 2022 sea ice low is indicated with a vertical grey line.

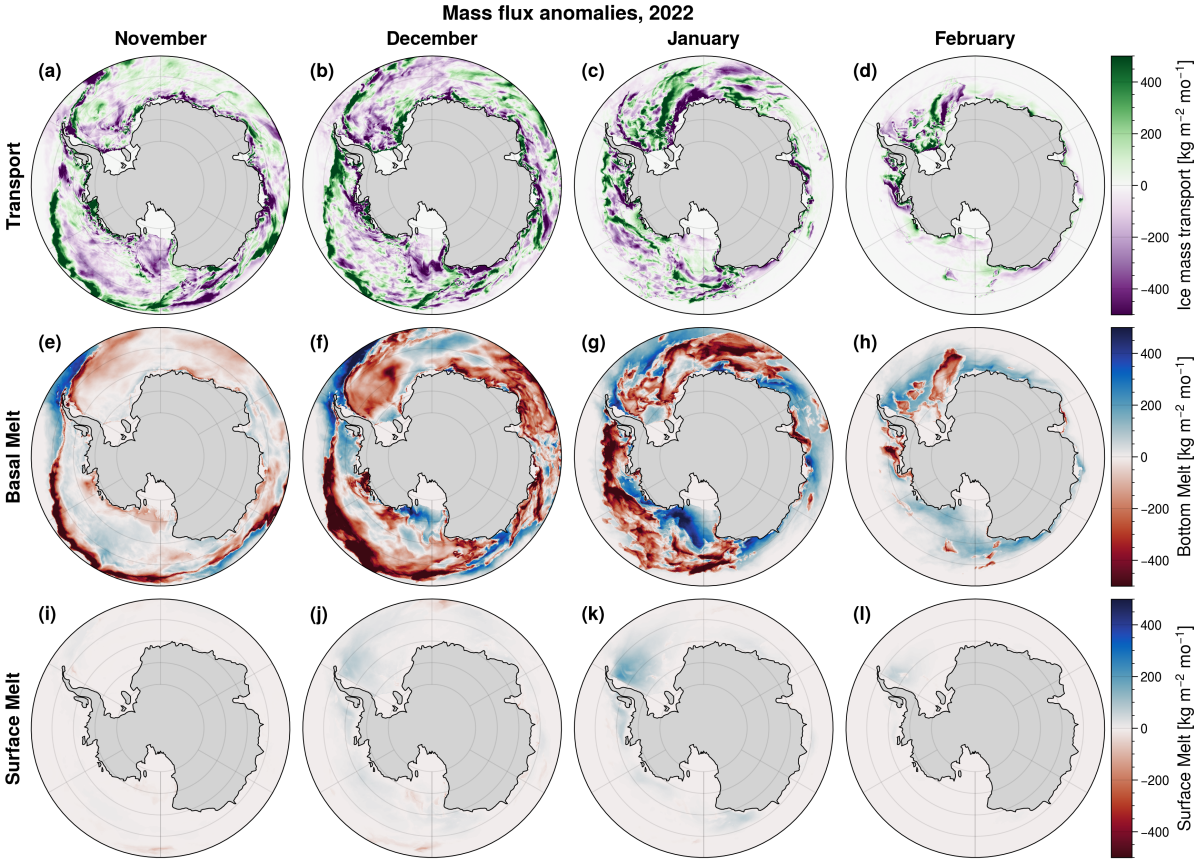

Figure S5. Monthly spatial anomalies relative to 1979-2008 climatological seasonal cycle of ice (a-d) mass transport, (e-h) basal melt, and (i-l) surface melt in the Antarctic over the austral summer 2022. Anomalies are shown for (a, e, i) November 2021, (b, f, j) December 2021, (c, g, k) January 2022 and (d,h,l) February 2022. Negative anomalies indicate ice mass loss due to export or increase melt.

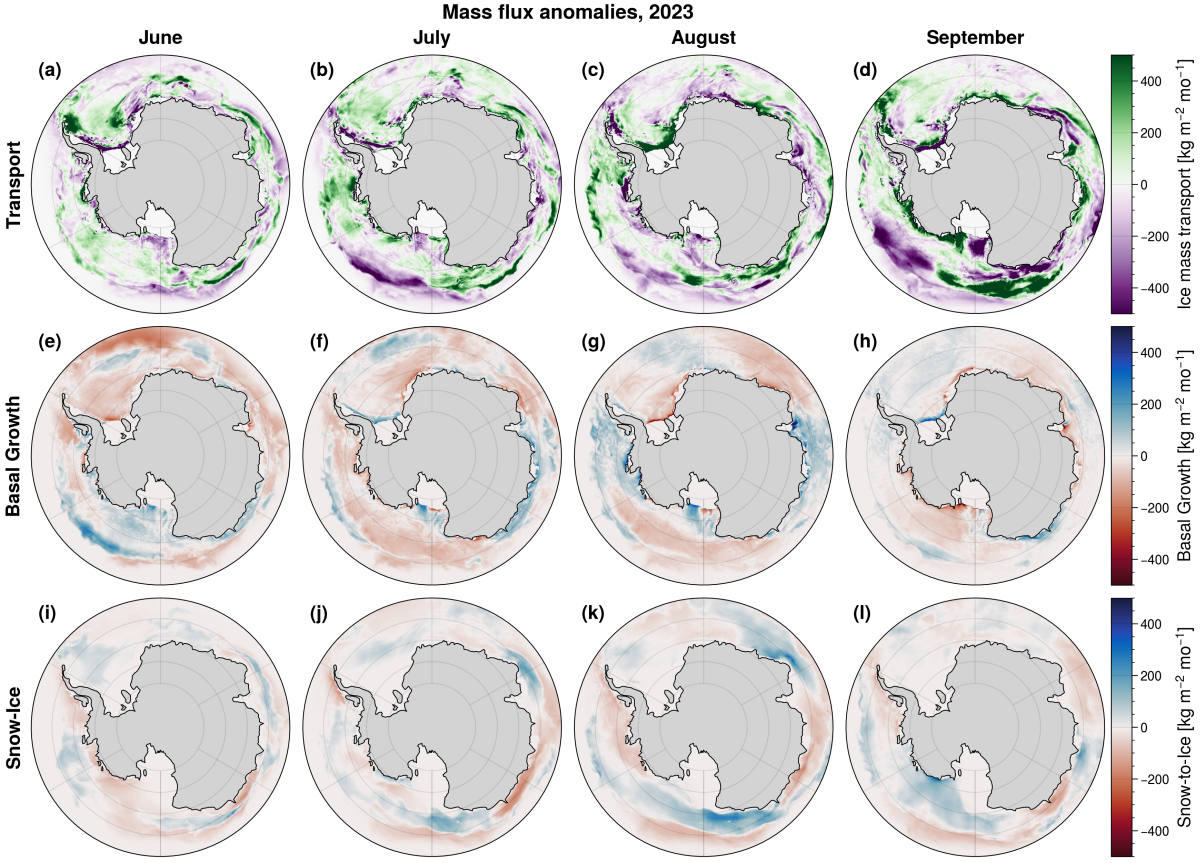

Figure S6. Monthly spatial anomalies relative to 1979-2008 climatological seasonal cycle of ice (a-d) mass transport, (e-h) basal growth, and (i-l) snow-to-ice conversion in the Antarctic over the austral winter 2023. Anomalies are shown for (a, e, i) June, (b, f, j) July, (c, g, k) August and (d,h,l) September. Negative anomalies indicate ice mass loss due to export or reduced growth.