Supplementary Materials for; Interannual and Decadal Variability of Sea Surface Temperature and Sea Ice Concentration in the Barents Sea
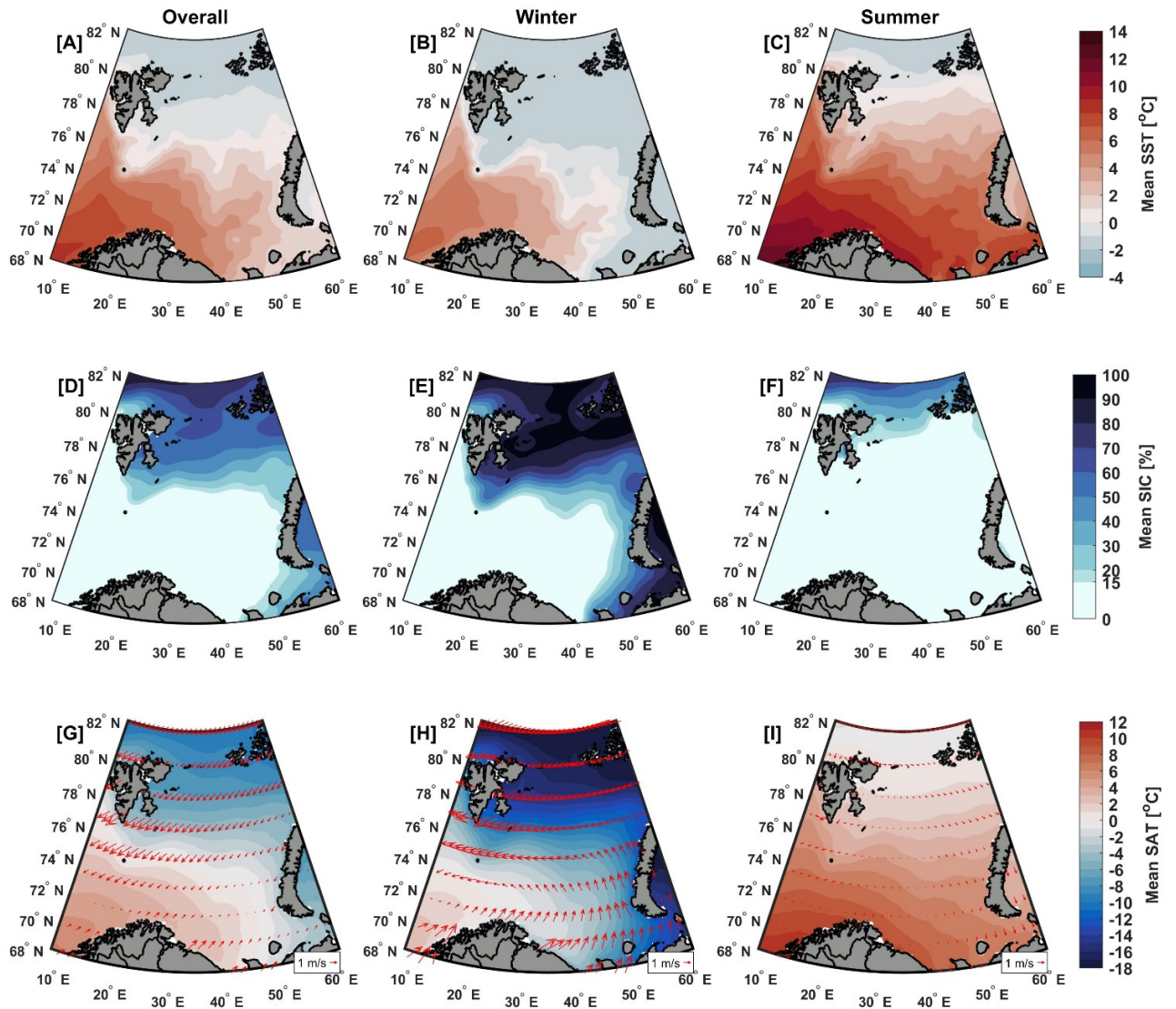

Figure S1. Spatial maps of climatological mean SST (upper panels), SIC (middle panels), and SAT with corresponding mean surface winds (arrows) overlaid (lower panels). (A, D, and G) overall, (B, E, and H) in winter, and (C, F, and I) in summer between 1982 and 2020.
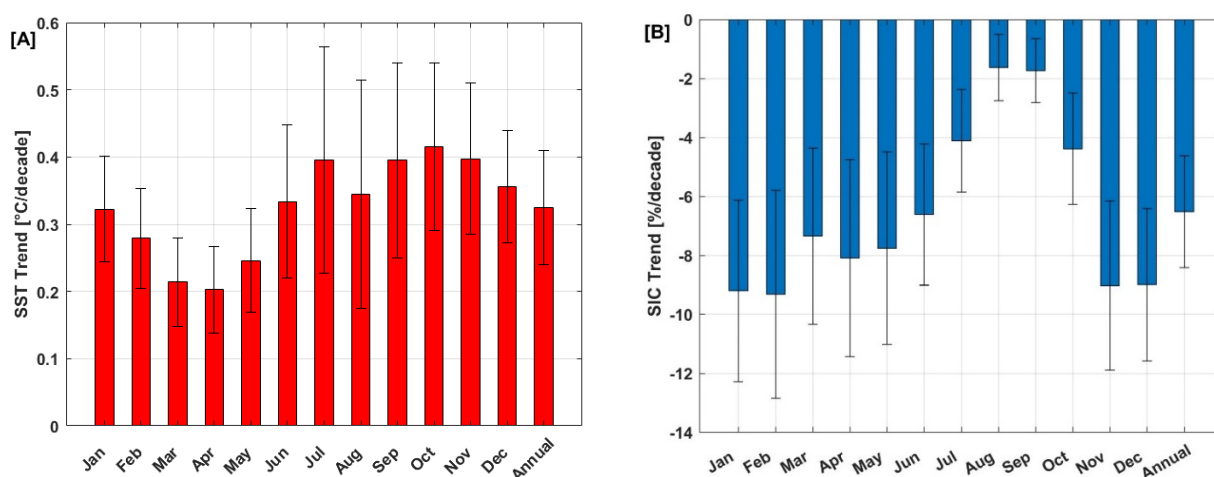
Figure S2. Monthly and annual trend of (A) SST and (B) SIC for the period 1982-2020. Error bars showing 95 % confidence intervals.
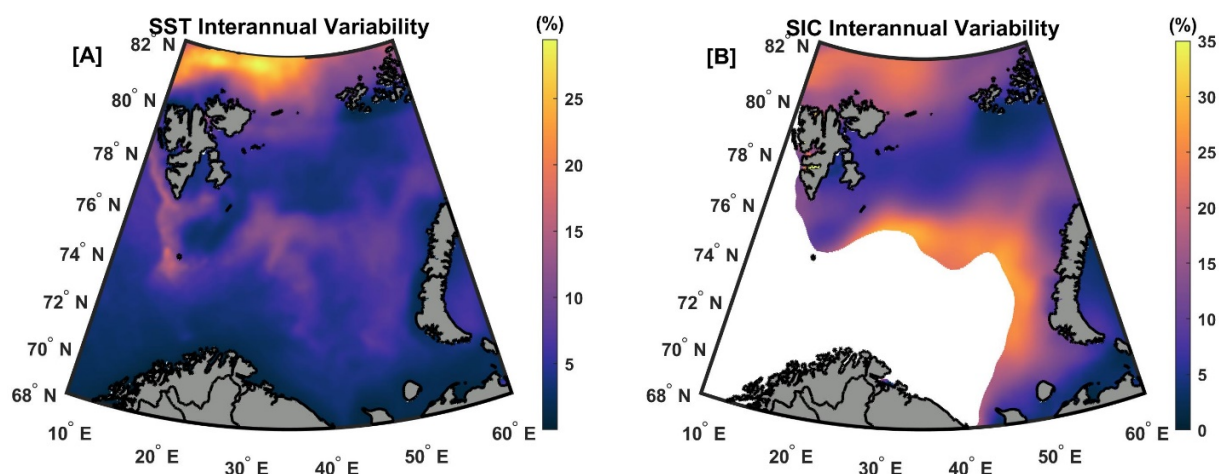

Figure S3. Percentage of the variance explained by the interannual variability of (A) SST and (B) SIC.
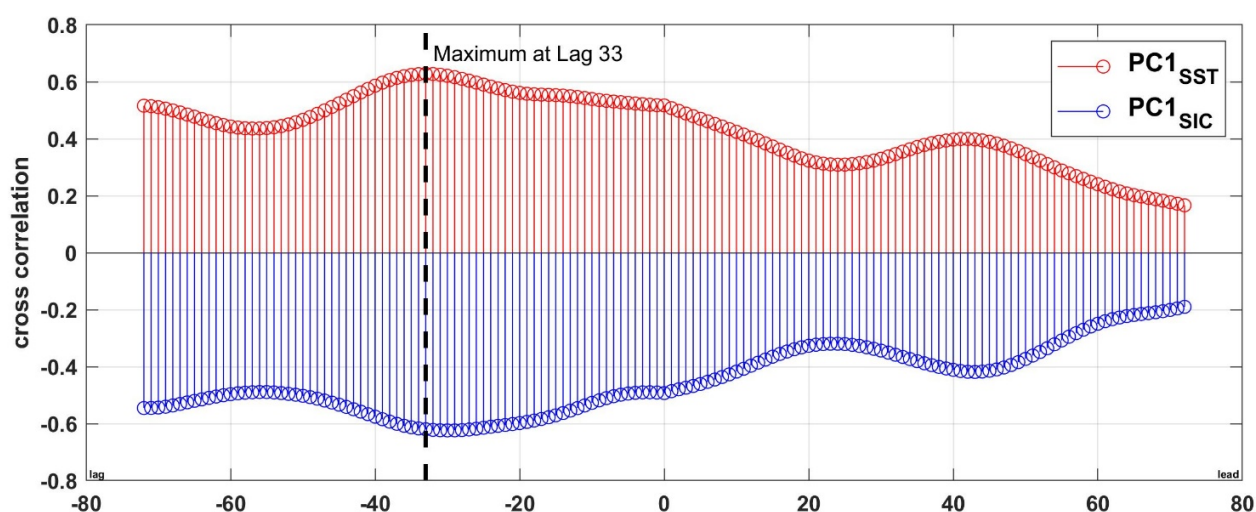
Figure S4. Lag-lead correlation of the first principal component of SST (red), SIC (blue), and AMO index shows a nearly symmetric shape centered around lag=33 months, suggesting that the coupled variability is characterized by a linear response of SST/SIC to AMO index.
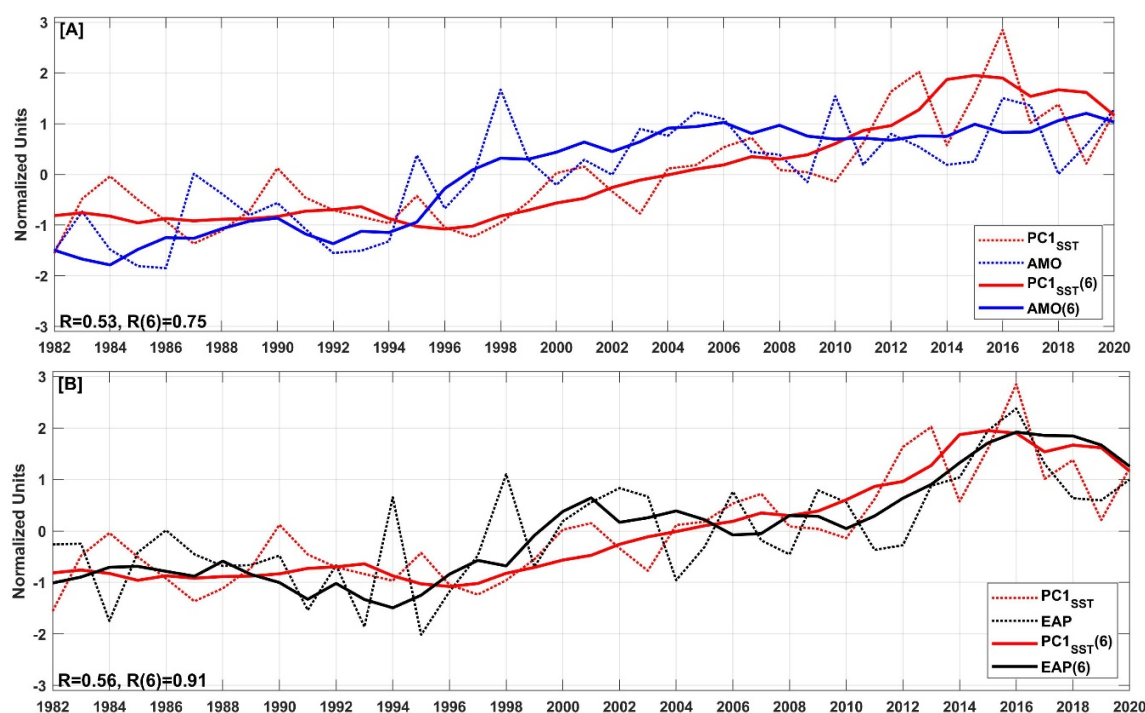

Figure S5A. Normalized annual time series of the first principal component (PC1) of the SST anomalies (red dotted line) along with (A) the AMO index (blue dotted line) along with (B) the EAP (black dotted line) over the period 1982-2020, along with their corresponding six-year running averages (solid lines).
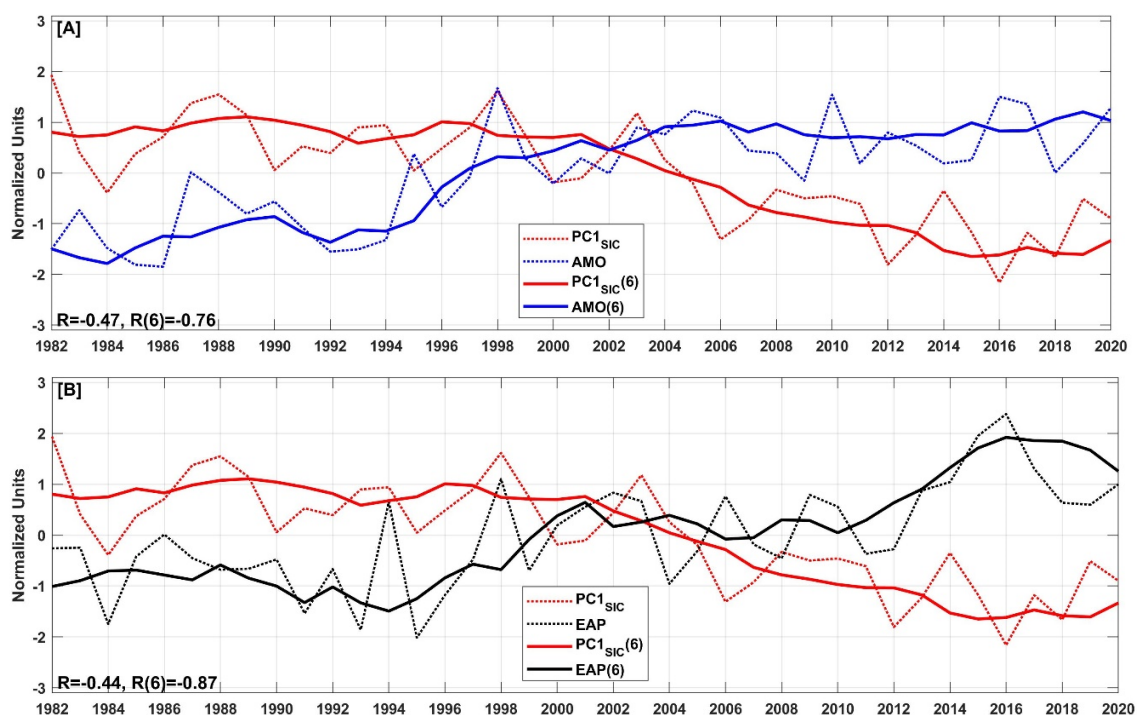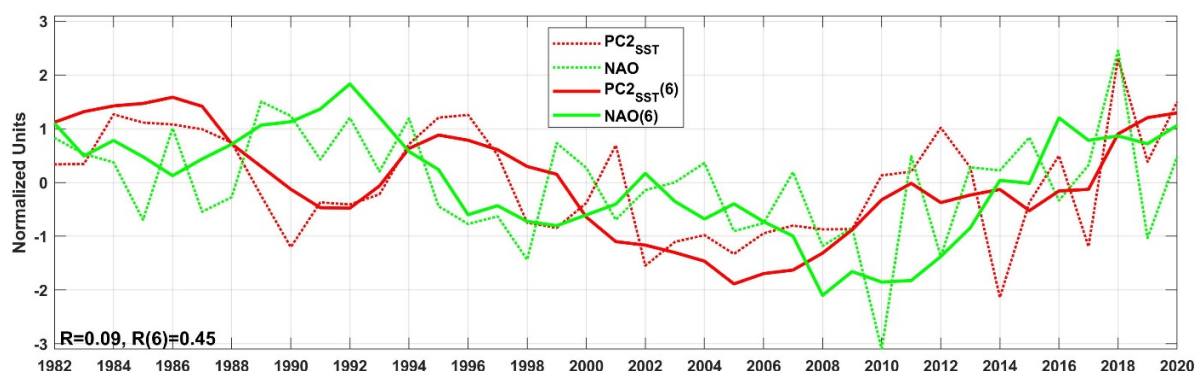
Figure S5B. The same as Figure S5A for SIC.

Figure S5C. Normalized annual time series of the second principal component (PC2) of the SST anomalies (red dotted line) along with (A) the NAO index (green dotted line) over the period 1982-2020, along with their corresponding six-year running averages (solid lines).
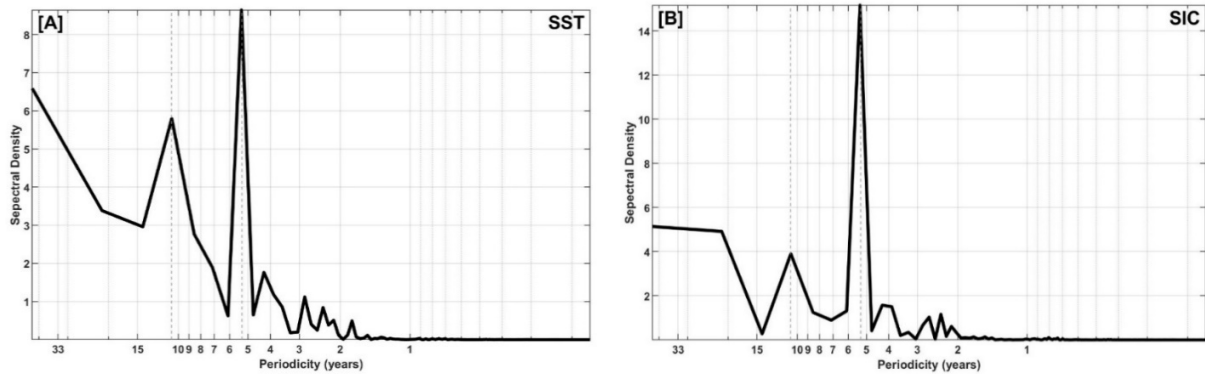
Figure S6. Power spectra of the filtered (13-month running mean) and de-trended monthly anomaly of the spatially averaged (A) SST and (B) SIC time series for the period from 1982 to 2020. The time series are smoothed using a 13-month running mean to remove signals with periods shorter than 1 year. The vertical dashed lines show the period of maximum variance centered at 5.4 and 10.7 years for SST and SIC.
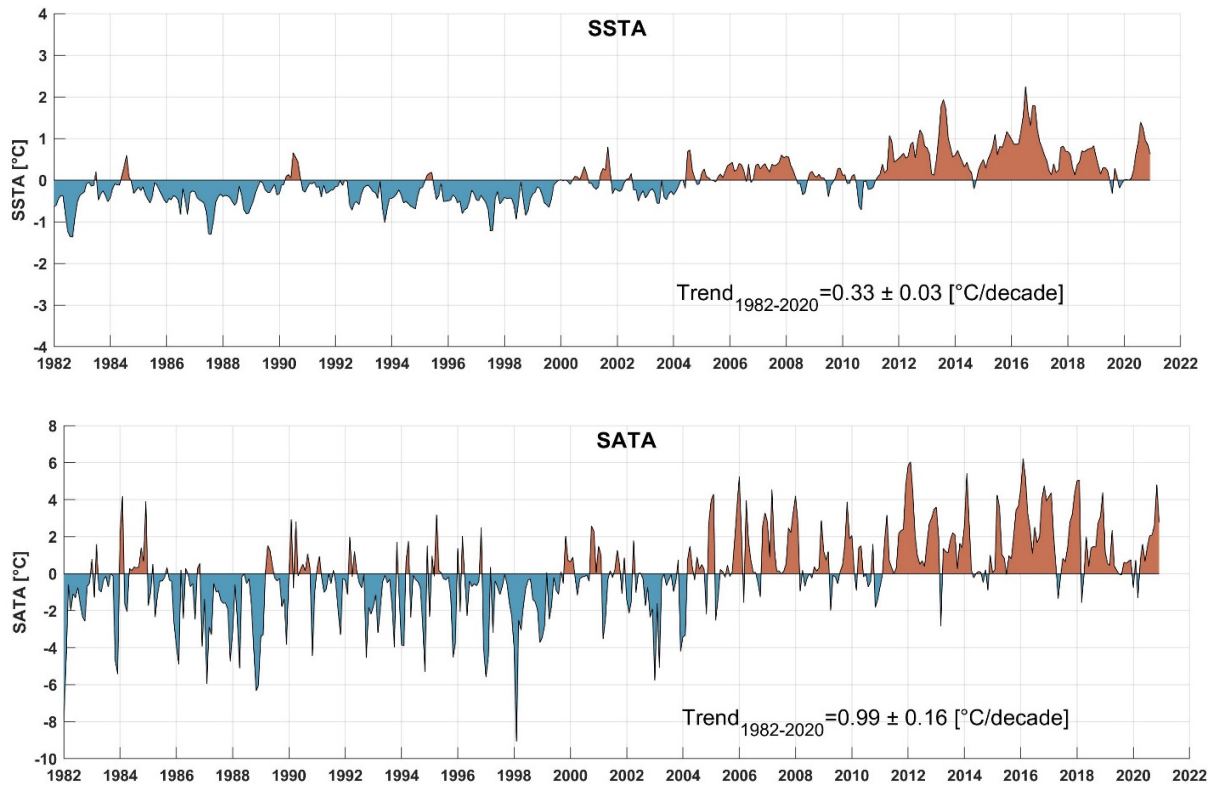

Figure S7 Simultaneous (a) SST and (b) SAT anomalies (in °C) over the period from 1982 through 2020. The spatially averaged time series showed significantly higher air temperature anomalies than SST during the last two decades, indicating the potential importance of changes in relevant atmospheric and oceanic processes.