

Supplementary Methods

This provides additional information on seasonality and sea ice extent to support the Methods section.

Mean seasonality

Models are included where seasonality is within $\pm 20\%$ of the satellite data (Comiso Bootstrap II) for the time period.

$$\text{Mean Seasonality} = \sum \frac{\text{SIE}_{\max}\{9\} - \text{SIE}_{\min}\{3\}}{n}$$

where seasonality is a measure of the annual variability of sea ice, $\text{SIE}_{\max}\{9\}$ is the maximum sea ice extent for September, and $\text{SIE}_{\min}\{3\}$ is the minimum sea ice extent for March, and n is the number of years.

Mean Minimum Ice Extent

Models are also required to have their mean minimum of the ice extent within 20% of the satellite data.

$$\text{Mean Minimum Ice Extent} = \sum \frac{\text{SIE}_{\min}\{3\}}{n}$$

Only models that fit both of the selection criteria are included in the model mean.

Of the 35 models available, 8 of them passed the above selection criteria and are highlighted in bold in Table S4. Sea ice climatologies and projections between the full ensemble of 35 models and the subset of 8 models were compared.