2023 June Sea Ice Outlook Submission Supporting Materials

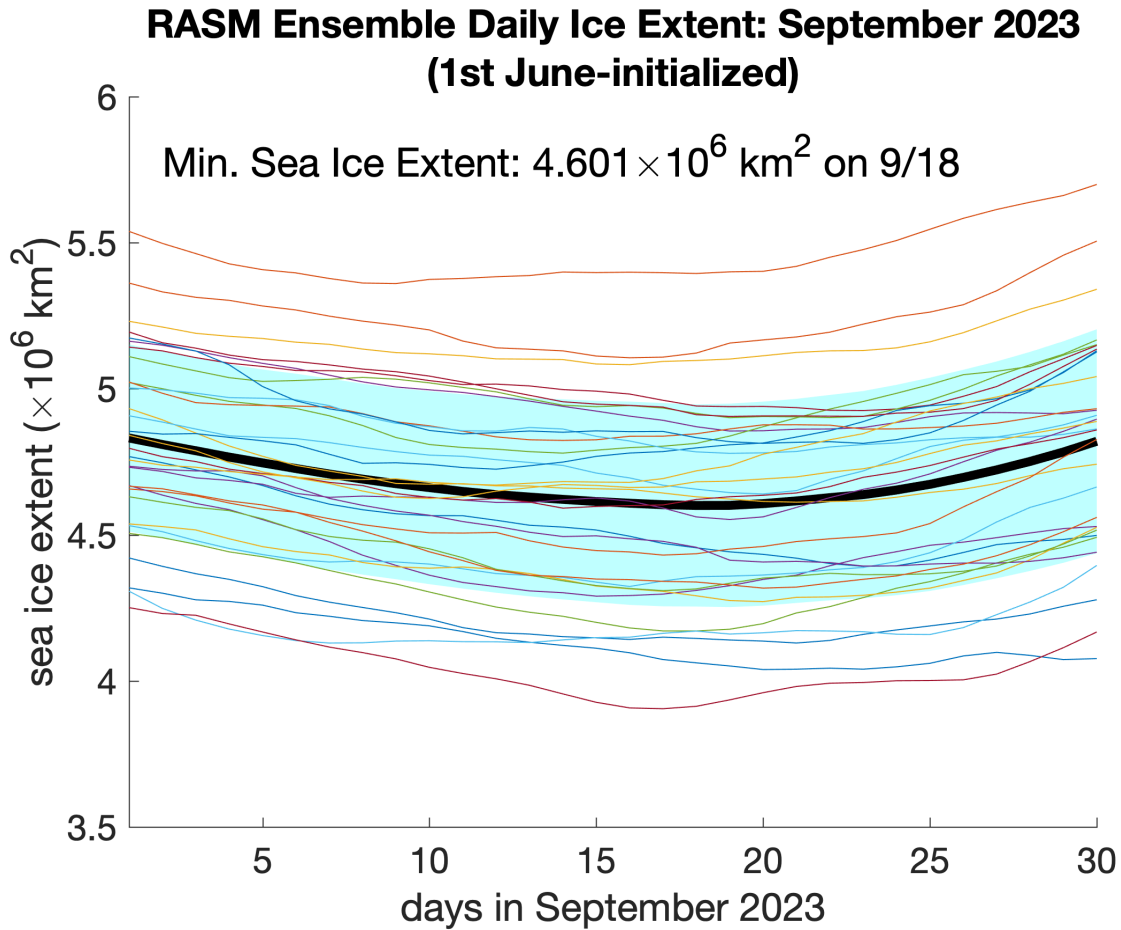## by

RASM@NPS (Maslowski et al.)

Figure 1. The RASM June-initialized ensemble forecast of daily pan-Arctic sea ice extent for the September 2023 Sea Ice Outlook in contribution to the Sea Ice Prediction Network. The thick black line is the daily ensemble mean sea ice extent for September 2023, color lines are for 31 individual ensemble members and the blue shading represents ±1 standard deviation from the ensemble mean. Minimum daily ensemble mean sea ice extent (4.601 million km²) is predicted on 9/18/2023.

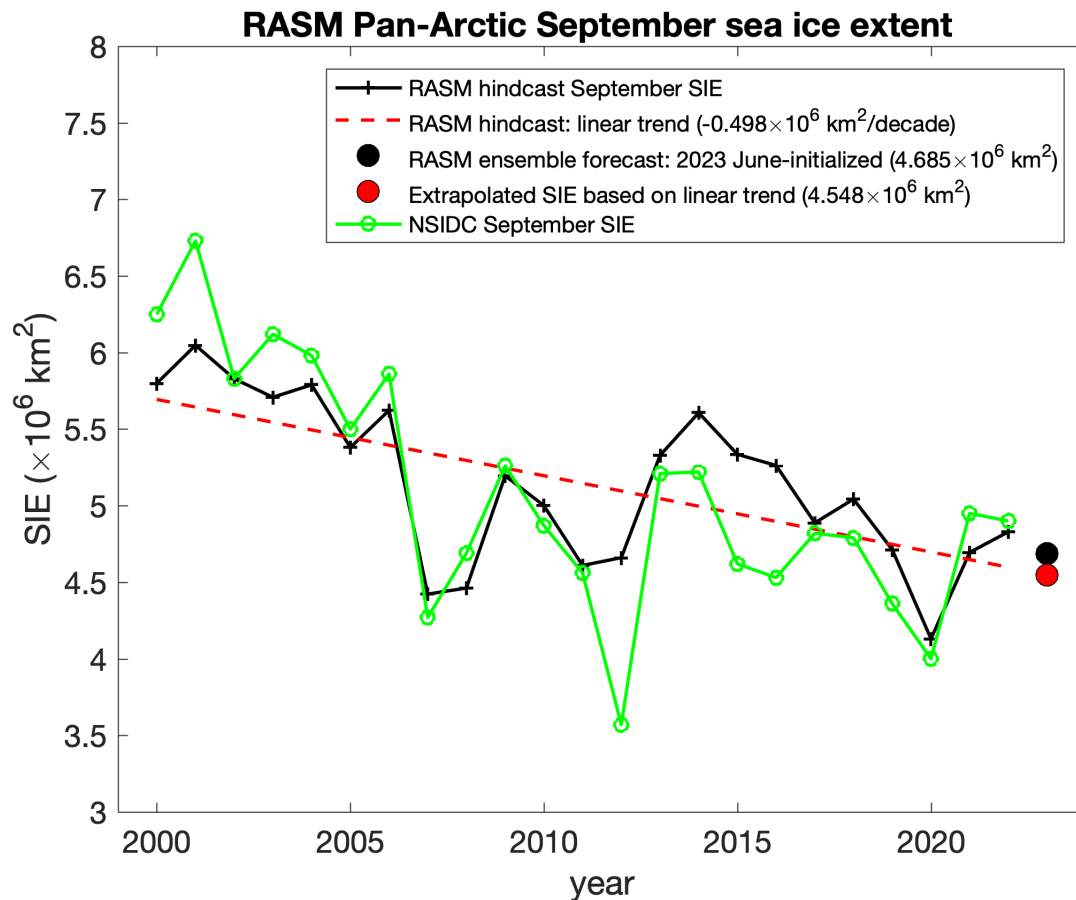Figure 2. The linear trend (red dashed; –0.498 million km^2/decade) of September mean sea ice extent (black solid) from the RASM hindcast simulation during the baseline period (2000-2022). The red circle is the extrapolated September 2023 sea ice extent value based on the linear trend calculated. The black circle is the RASM ensemble forecast for September 2023 reported to 2023 June call for Sea Ice Outlook. The pan-Arctic sea ice extent anomaly (subtracting the RASM September 2022 Outlook extent from the extrapolated September 2022 value) is –0.137 million km^2.
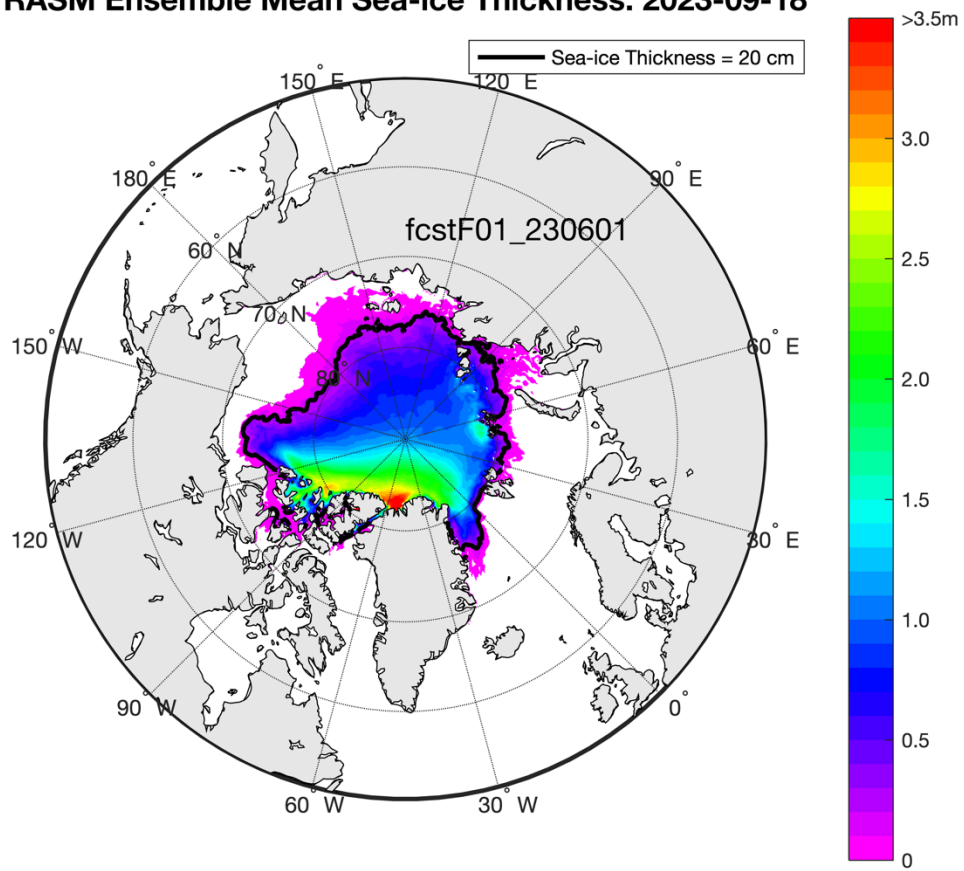
Figure 3. The RASM ensemble mean (31 members initialized on June 1, 2023) of sea ice thickness forecasted on September 18, 2023.
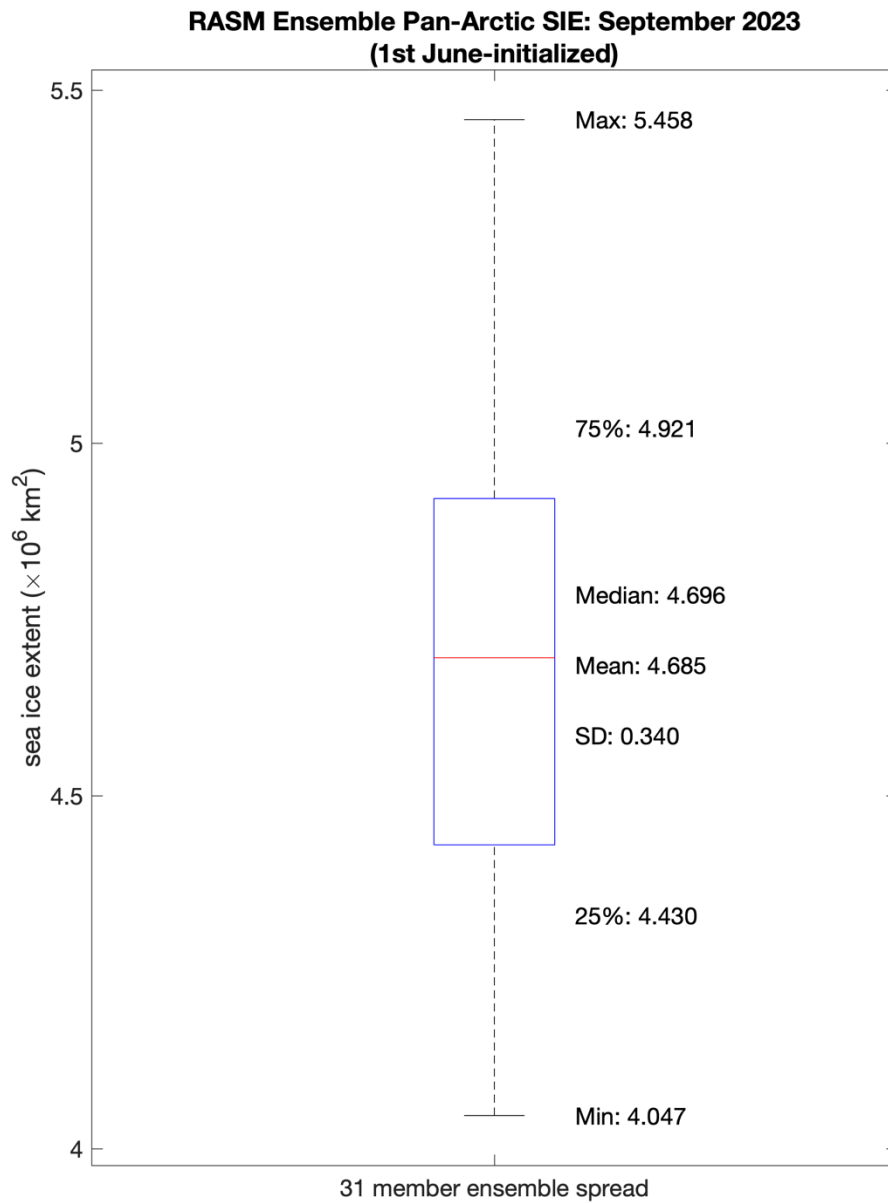
Figure 4. The ensemble spread of the RASM forecast (31 members) for September 2023 sea ice extent. On a box, the central mark (red) is the median, the edges of the box (blue) are the 25th and 75th percentiles (4.430 and 4.921 million km^2, respectively), and the whiskers extend to the most extreme (minimum and maximum) data points. Mean and standard deviation (SD) are also shown.