2021 July Sea Ice Outlook Submission Supporting Materials

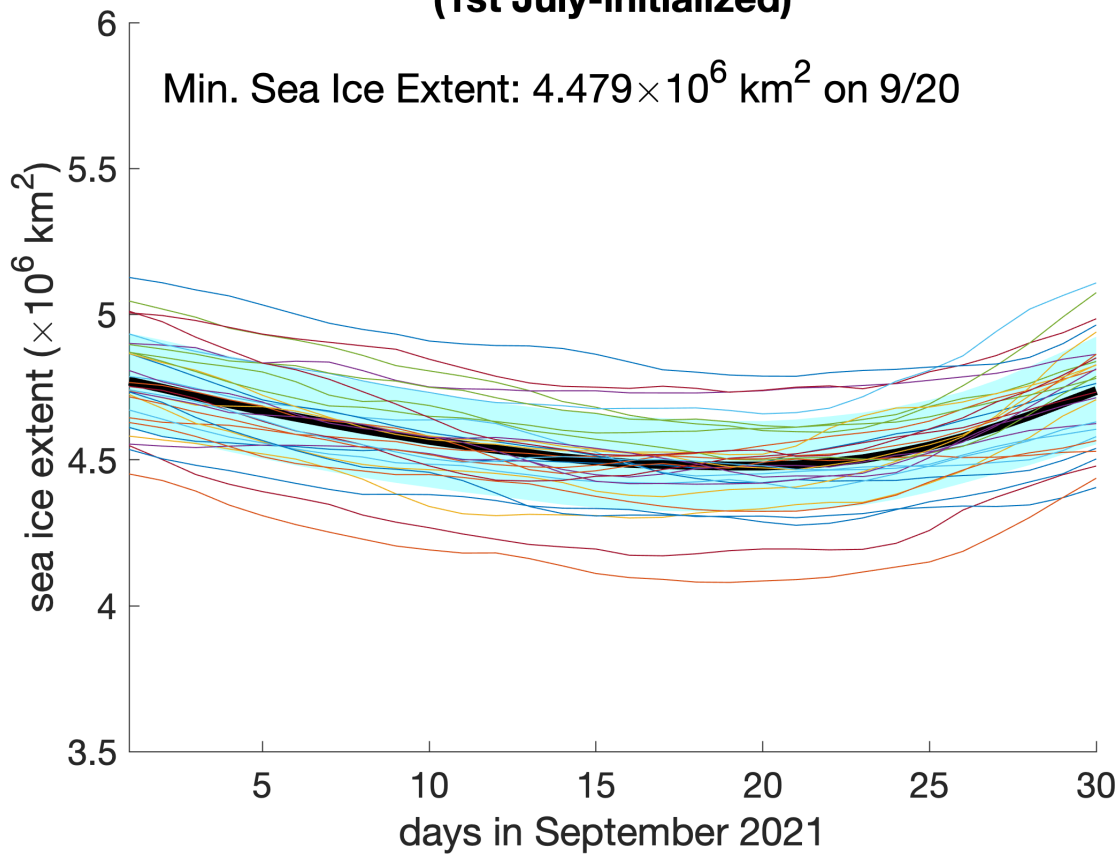## by

RASM@NPS (Maslowski et al.)

Figure 1. The RASM July-initialized ensemble forecast of daily pan-Arctic sea ice extent for the September 2021 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 2021, color lines are for 30 individual ensemble members and the blue shading represents ±1 standard deviation from the ensemble mean. Minimum daily ensemble mean sea ice extent (4.479 million km[2]) is predicted on 9/20/2021.

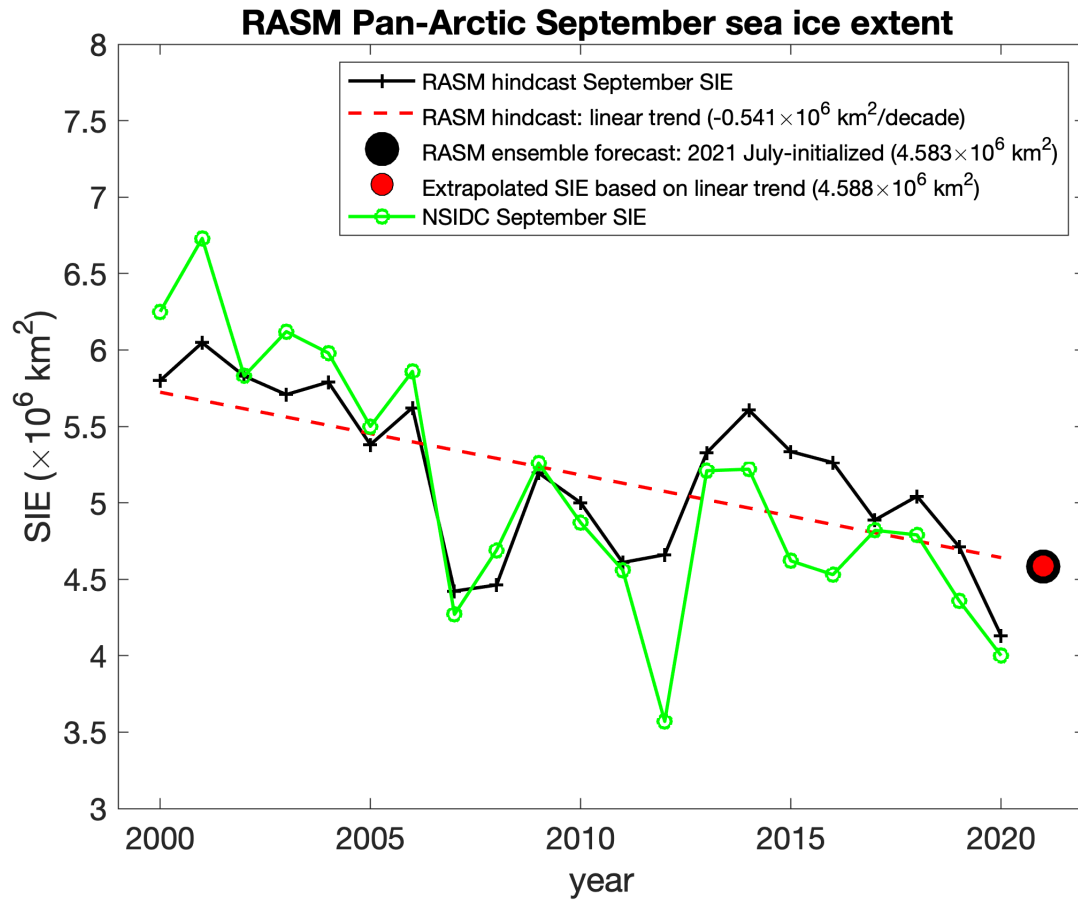Figure 2. The linear trend (red dashed; –0.541 million km² /decade) of September monthly mean sea ice extent (black solid) from the RASM hindcast simulation during the baseline period (2000-2020). The red circle is the extrapolated September 201 sea ice extent value based on the linear trend calculated. The black circle is the RASM ensemble forecast for September 2021 reported to 2021 June call for Sea Ice Outlook. The pan-Arctic sea ice extent anomaly (subtracting the RASM September 2021 Outlook extent from the extrapolated September 2021 value) is +0.005 million km².
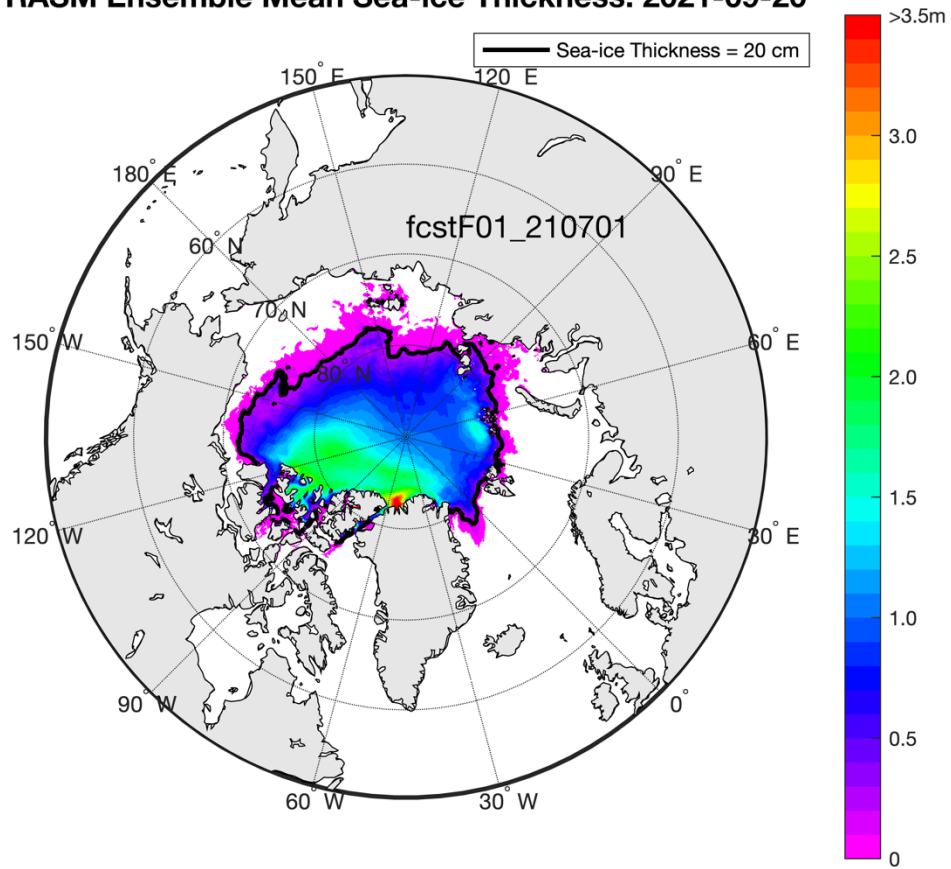
Figure 3. The RASM ensemble mean (30 members) of sea ice thickness forecasted on September 20, 2021.
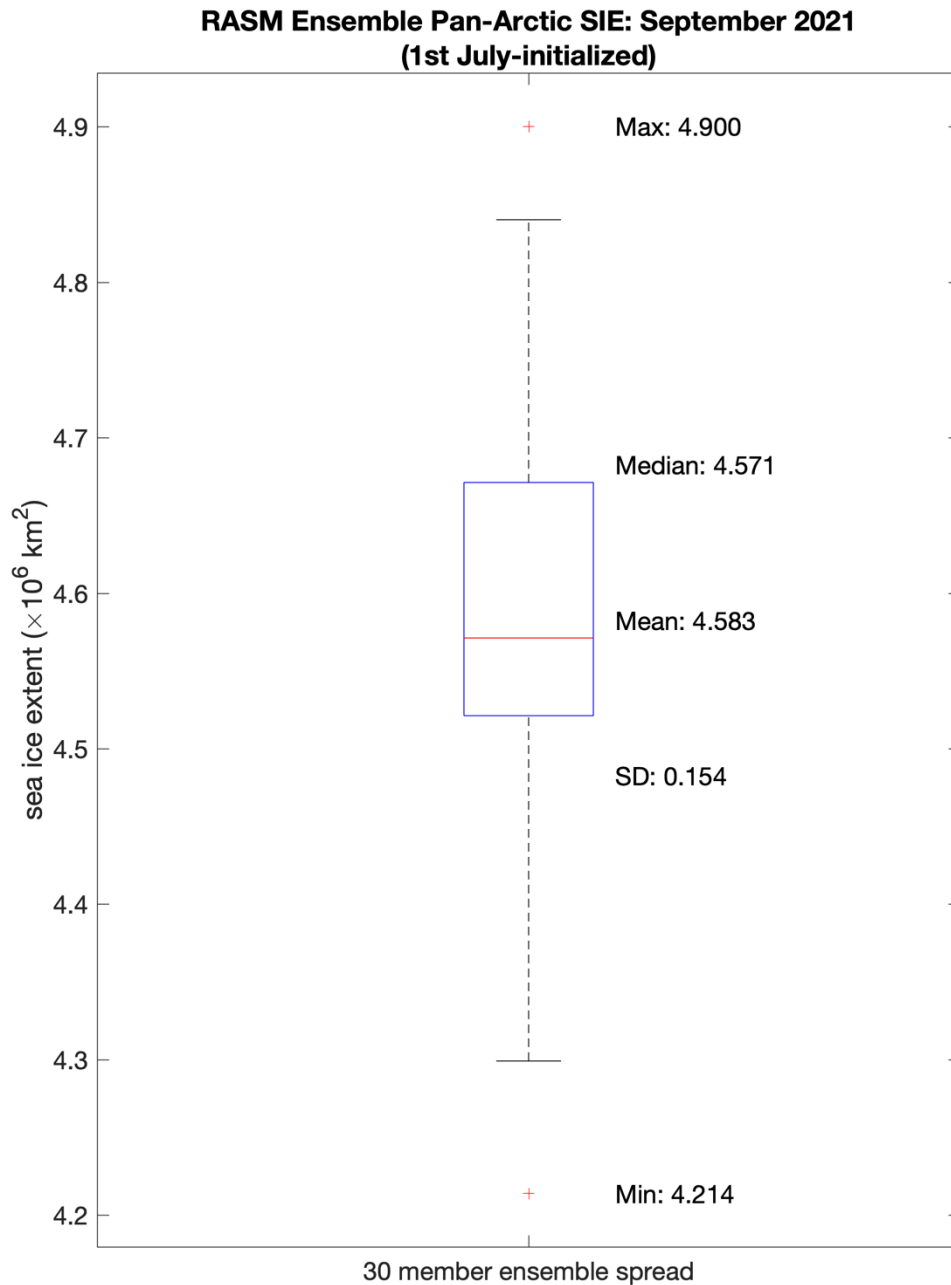
Figure 4. The ensemble spread of the RASM forecast for September 2021 sea ice extent. On a box, the central mark (red) is the median, the edges of the box (blue) are the 25th and 75th percentiles (4.52 and 4.67 million km^2, respectively), the whiskers extend to the most extreme, but not outliers, data points (4.30 and 4.84 million km^2) that falls within 2.7 standard deviation (SD) from the mean, and + (red) are outliers (i.e., minimum and maximum SIE predicted). Mean and SD are also shown.