August 2024 SIO Report (Released August 30 2024)

Executive Summary

We would like to heartily express our gratitude to the SIO community for contributing seasonal forecasts to the SIO in 2024. The June–September SIO reports will be limited to the pan-Arctic forecasts while we work to secure funding to support the continuation of the SIO. Please note that all the contributed data (e.g., Alaska, Antarctic and spatial forecasts) will be shared and discussed in a post-season report (in early 2025). So please submit your forecasts as usual and we acknowledge that real time sea-ice forecasts are invaluable for advancing our understanding and continuing the SIO record.

For the August Outlook, we received 24 contributions of September pan-Arctic sea-ice extent forecasts; of these, eleven included predictions of pan-Arctic sea-ice anomalies, ten included predictions for the Alaska region (Bering, Chukchi, and Beaufort seas), and eight included predictions for pan-Antarctic sea ice. The August 2024 median forecasted value for pan-Arctic September sea-ice extent is 4.27 million square kilometers with an interquartile range of 4.11 to 4.54 million square kilometers. This is about 200,000 square kilometers lower than the June median and about 250,000 square kilometers lower than the July median, which reflects the faster than average ice loss during July. The lowest sea-ice extent forecast is 3.71 million square kilometers and the highest sea-ice extent forecast is 5.23 million square kilometers. These extremes are actually higher, particularly on the low end, than the estimates from July.

Fourteen groups submitted September-mean Arctic sea-ice extent anomalies. These 12 forecasts range from -0.22 to +0.71 million square kilometers with a median of +0.21 million square kilometers, continuing to suggest like earlier forecasts from this summer that the 2024 September Arctic extent will likely be above the long-term trend line.

This September Outlook Report was developed by lead author Walt Meier, National Snow and Ice Data Center at the University of Colorado with contributions from Uma Bhatt, University of Alaska Fairbanks (anomaly analysis, report coordination, and editing), Matt Fisher, National Snow and Ice Data Center at the University of Colorado (submission management and image creation), Edward Blanchard-Wrigglesworth, University of Washington (report coordination and editing), Mitch Bushuk, NOAA's Geophysical Fluid Dynamics Laboratory, Stacey Stoudt and Audrey Taylor, ARCUS (report coordination and editing).

Note: The Sea Ice Outlook provides an open process for those who are interested in Arctic sea ice to share predictions and ideas; the Outlook is not an operational forecast.

Pan-Arctic Forecasts (Walt Meier)

The August 2024 Outlook received 24 pan-Arctic contributions (Figure 1). This year's median forecasted value for pan-Arctic September sea-ice extent is 4.27 million square kilometers with an interquartile range of 4.11 to 4.54 million square kilometers. This is lower than the 2022 (4.83 million square kilometers) and 2023 (4.60 million square kilometers) August median forecasts for September. The August 2024 median forecast of 4.27 million square kilometers is also slightly lower than the June and July 2024 median forecasts of 4.45 and 4.48 million square kilometers. This reflects relatively rapid ice loss during the month of July, resulting in August Outlooks revising estimates downward. The lowest sea-ice extent forecast is 3.71 million square kilometers, from the RASM@NPS submission); the highest sea-ice extent forecast is 5.23 million square kilometers, submitted by BCCR. Particularly on the low end, the range is smaller than in July and now none of the submissions predict a September extent lower than the record low of 3.57 million square kilometers in 2012. The observed extent values are from the NSIDC Sea Ice Index (Fetterer et al., 2017), based on the NASA Team algorithm sea ice concentration fields distributed by the NASA Snow and Ice Distributed Active Archive Center (DAAC) at NSIDC (DiGirolamo et al., 2022; Meier et al., 2021).

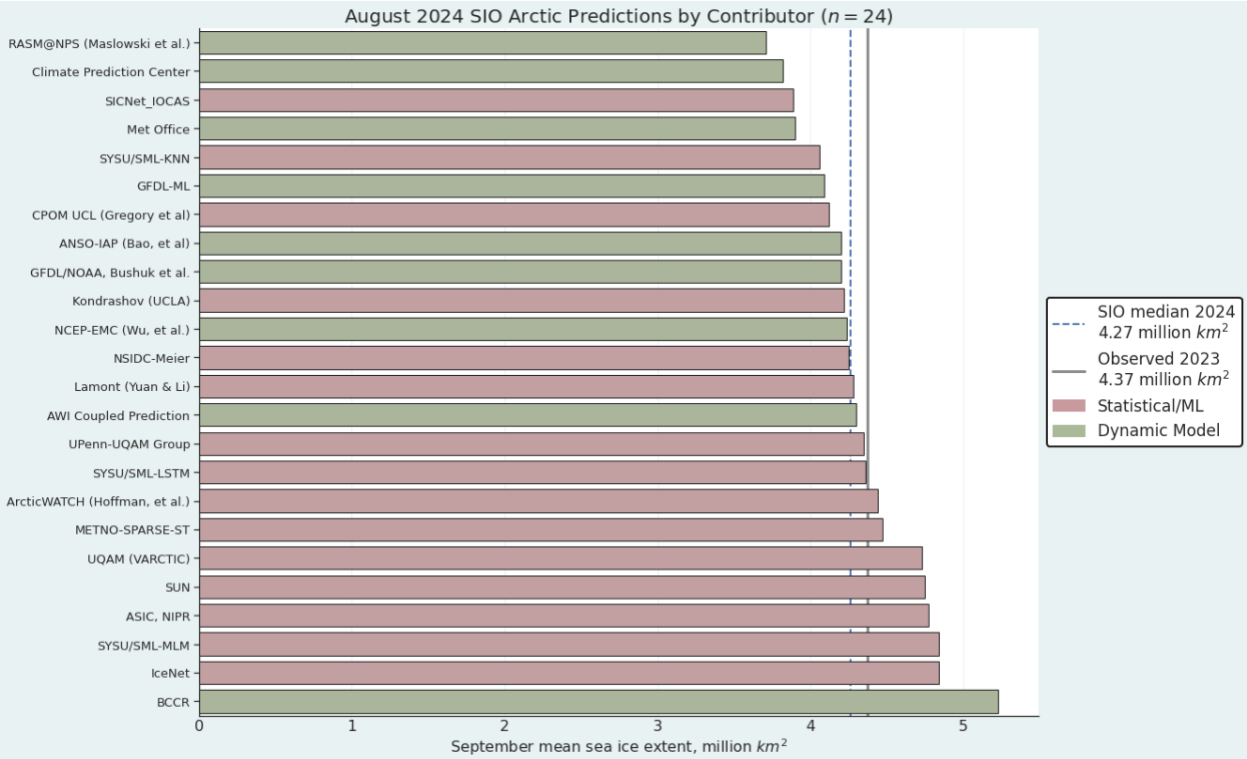

Figure 1. Distribution of SIO contributors for August estimates of September 2024 pan-Arctic sea-ice extent. No Heuristic methods were submitted in August. "Sun" is a public/citizen contribution. Image courtesy of Matthew Fisher, NSIDC.

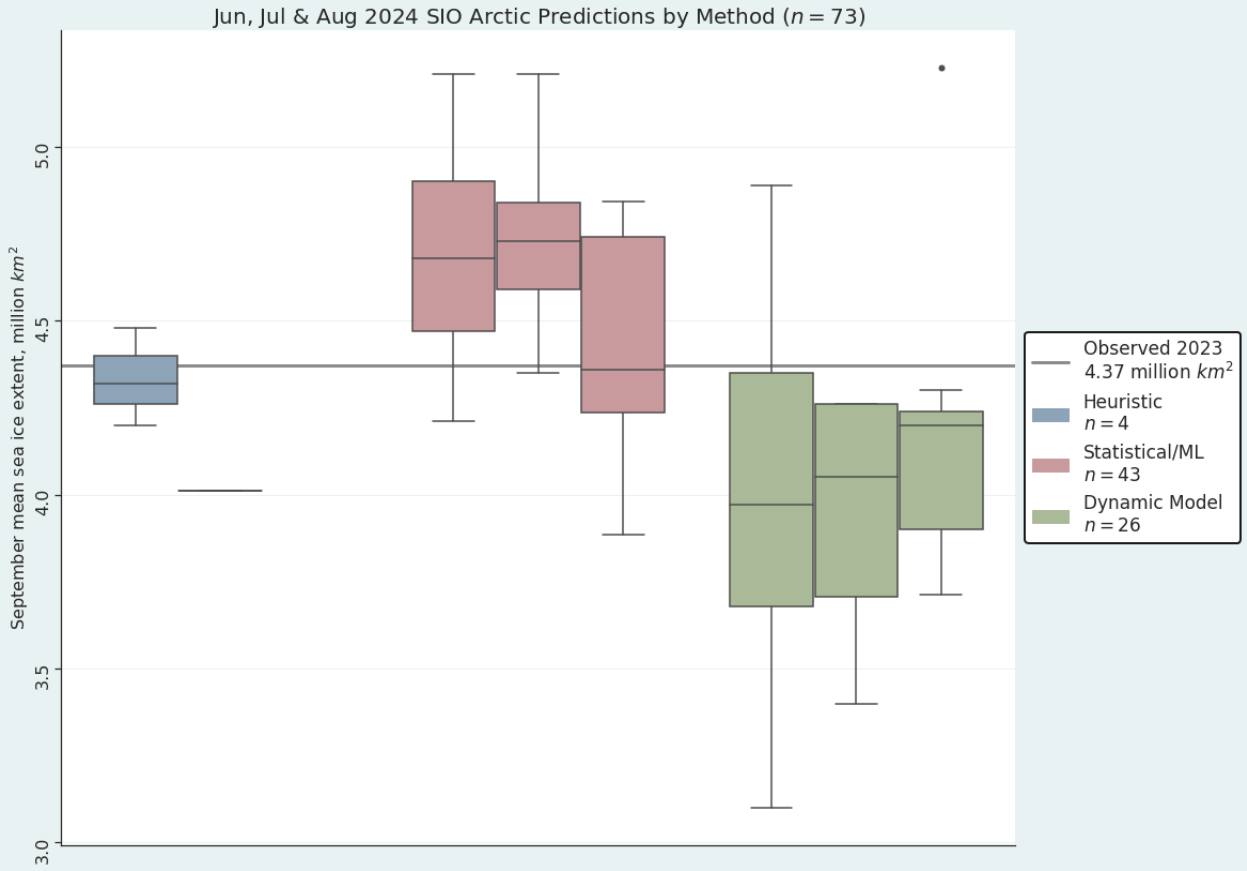

Figure 2. June, July, and August 2024 pan-Arctic Sea Ice Outlook submissions, sorted by method. Image courtesy of Matthew Fisher, NSIDC.

Pan-Arctic Sea Ice Extent Anomalies

This is the fourth year that the SIO has solicited forecasts of September mean sea-ice extent anomalies. The pan-Arctic anomaly is the departure of the contributors' September extent Outlook relative to their adopted baseline trend (e.g., the trend in historical observations, model hindcasts, etc.). This is motivated by the prospect of reducing SIO extent forecast uncertainty that may originate from models having different trends, mean states, and post-processing methodologies. The 12 anomaly forecasts range from -0.22 to +0.71 million square kilometers, with 9 above and three at or below the contributors' baseline (Figure 3, top). The observed anomalies range from -1.25 (2012) to +0.82 (2006) million square kilometers (Figure 3 bottom) and are calculated as the difference from the 2005–2023 linear trend. The pan-Arctic 2024 August SIO anomaly forecast has a median of +0.21 and an interquartile range of +0.035 to +0.42 million square kilometers. This median anomaly forecast has declined throughout the summer from +0.40 in June to +0.30 in July to +0.21 million square kilometers in August.

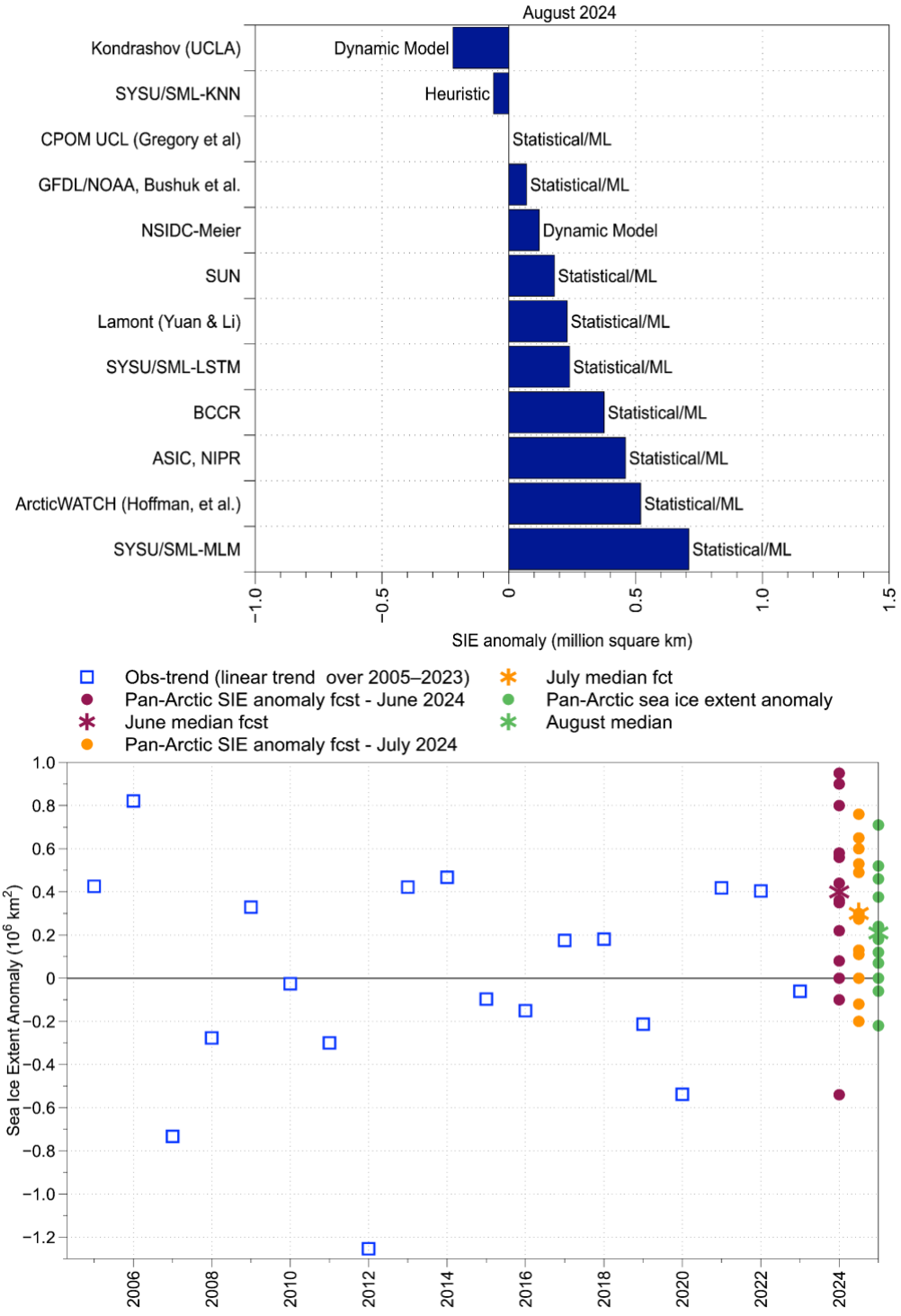

Figure 3. Anomaly pan-Arctic August 2024 forecast ranked by submission (top) and observed anomalies from the 2005–2023 linear trend with August 2024 forecasts (bottom). The median June 2024 forecast was 0.21 million square kilometers.

Current Conditions

For the 2024 SIO season we will refer readers to available resources for current conditions. The National Snow & Ice Data Center's 'Arctic Sea Ice News & Analysis' summarizes the current state of the sea ice and associated conditions (https://nsidc.org/arcticseaicenews/). The NOAA NWS Alaska Sea Ice Program (ASIP) provides current conditions in the Alaska seas (https://www.weather.gov/afc/ice). Rick Thoman provides regular climate summaries including focal topics of sea ice in his substack blog (https://alaskaclimate.substack.com/).

References

DiGirolamo, N., C. L. Parkinson, D. J. Cavalieri, P. Gloersen, and H. J. Zwally. (2022). Sea Ice Concentrations from Nimbus-7 SMMR and DMSP SSM/I-SSMIS Passive Microwave Data, Version 2 [Data Set]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.5067/MPYG15WAA4WX. Date Accessed 08-2-2024.

Fetterer, F., K. Knowles, W. N. Meier, M. Savoie, and A. K. Windnagel. (2017). Sea Ice Index, Version 3 [Data Set]. Boulder, Colorado USA. National Snow and Ice Data Center. https://doi.org/10.7265/N5K072F8. Date Accessed 08-2-2024.

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Contributor Full Report PDFs and Supplemental Materials will be shared in the postseason report.

Report Credits and Suggested Citation

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