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## 2023 September Call for Sea Ice Outlook Contributions

**September Call for Sea Ice Outlook Contributions**  
**September Report (Based on May, June, July, and August data)**  
**Submission Deadline: 6:00 p.m. (AKDT) Friday, 15 September 2023 (Firm)**

Dear Community Members,

Your participation in the Sea Ice Outlook (SIO) is always much appreciated. We encourage all past contributors to submit Outlooks this year and we also hope to see new participants. Please feel free to distribute this call to others who might be interested in participating in the SIO.

Questions can be directed to: Betsy Turner-Bogren, ARCUS ([betsy@arcus.org](mailto:betsy@arcus.org) (<mailto:betsy@arcus.org>)).

### Overview

Sea Ice Prediction Network (SIPN) team members announce the call for contributions for the 2023 Sea Ice Outlook (SIO) September report. The SIO provides an open process for those interested in Arctic sea-ice to share ideas. Four monthly reports during the sea-ice retreat season (June, July, August, and September) will include a variety of contributions—from advanced

numerical models to qualitative perspectives from citizen scientists—as well as brief related discussions. Plans for a brief Post-Season Report, with a focus on performance of Outlooks as compared to the observed sea ice minimum, will be developed at the end of the retreat season. The 2023 SIO effort is supported with funds from the NSF award to ARCUS #1331083.

The 2023 SIO solicitation is the same as 2022—contributors are asked to submit new outlooks for each month. No outlooks will be automatically carried forward from one month to subsequent monthly reports. For example, please do not submit outlooks developed in June (Based only on May data) or in August (Based only on May, June, and July data) to the September SIO. (See the tentative schedule linked below.)

Additionally, we encourage submissions to the associated effort of the Sea Ice Drift Forecast Experiment (SIDFEx); see details below under "Associated Effort - Sea Ice Drift Forecast Experiment."

**AUGUST SUBMISSION DEADLINE:** 6:00 p.m. (AKDT) Friday, 15 September 2023 (Firm)

- Contributions received after the deadline may not be fully incorporated into the Outlook report or discussion.
- Questions, including how to submit contributions that may not fit into the monthly report format, may be directed to Betsy Turner-Bogren, ARCUS (betsy@arcus.org (mailto:betsy@arcus.org)).

Sea Ice Outlook data resources are available via the National Snow and Ice Data Center (NSIDC) SIPN Data Set webpage (<https://nsidc.org/sipn/data>).

Tentative Schedule for 2023 SIO Monthly Reports ( PDF - 46KB ) (/files/sio/2023\_sio\_tentative\_report\_schedule\_per\_26\_july.pdf)

The 2023 SIO Solicitation Includes:

- Outlooks for pan-Arctic, pan-Antarctic, and Alaskan regional September monthly mean sea-ice extent, related uncertainty/probability estimates, and the optional submissions of sea-ice extent anomaly forecasts. We particularly encourage submissions for the Alaska region (i.e., Bering, Chukchi, and Beaufort seas).
- Estimates of Sea Ice Probability (SIP), defined as the fraction of ensemble members in an ensemble forecast with September ice concentration in excess of 15%.
- Estimates of Ice-Free Dates (IFD), defined as the first day that Sea Ice Concentration (SIC) drops below 15% ('IFD15'). A second metric we invite is the IFD calculated for an 80% SIC threshold ('IFD80').
- For August and September only: estimates of Ice Advance dates (IAD), defined as the first date (quantified as day of year) in the freeze up season (i.e., after the summer minimum) at which ice concentration first increases over 15% ('IAD15') and over 80% ('IAD80').
- Spatial fields of forecast's initial conditions, particularly sea ice concentration and sea ice thickness or ice thickness distribution, with the date of initialization documented. If forecasts are produced from multiple initializations, these could be the mean fields across your initializations or you can include each single initialization.
- Supplemental materials, including PDFs of any additional figures and/or text files,

Note: All participants whose methods provide information at the regional scale are again encouraged to provide full spatial fields. These submissions will allow organizers to compute metrics such as sea ice probability and first ice-free day for contributors, as well as additional regional analysis for the Sea Ice Outlook. (See submission instructions below.)

## 2023 Submission Instructions

### Instructions for Submitting Pan-Arctic, Pan-Antarctic, and Alaska Regional Outlooks

Contributors should use the **September Online Submission Form**

([https://docs.google.com/forms/d/1634rQGNHKQbu4ISMSySeztISqFlv9sk4-KZUln7Bv\\_8/edit?usp=drive\\_web](https://docs.google.com/forms/d/1634rQGNHKQbu4ISMSySeztISqFlv9sk4-KZUln7Bv_8/edit?usp=drive_web)), or alternative SIO form, to submit:

- Required core information for pan-Arctic Outlook projections using dynamical model, statistical, heuristic, and mixed methods. To be consistent with observations from the NSIDC Sea Ice Index extent, compute the total extent (sum of cell areas >15%) for each day and then average the extents from each of the days in the month into a monthly average extent.
- Information for pan-Antarctic and/or Alaska regional sea-ice extent projections using dynamical model, statistical, heuristic, and mixed methods. (Please see details below under "Instructions for Submitting an Alaskan Regional Outlook").
- Additional Outlook report details, including discussions and details related to uncertainties/probabilities. (Uncertainty values are solicited for the pan-Arctic only).
- Executive summaries describing in plain words your Outlook, contributing factors, and your methodology.
- Pan-Arctic sea-ice extent anomaly forecasts (See details below under "Instruction for Submitting Pan-Arctic Sea-Ice Extent Anomalies")
- Contributors who do not have access to the Google-based form or a Google account should request access to an alternative form and/or a PDF of the submission form, via email to [sio2023@mail.arcus.org](mailto:sio2023@mail.arcus.org) (mailto:sio2023@mail.arcus.org).

### Instructions for Submitting Supplemental Material

- Send supplemental material as an e-mail attachment sent to [sio2023@mail.arcus.org](mailto:sio2023@mail.arcus.org) (mailto:sio2023@mail.arcus.org).
- Please provide supplemental material as a single PDF (less than 20 MB).
- Clearly identify your contribution by using the same email address and group name as provided on the submission form so we can link it to your submission.
- Examples of supplement materials include: relevant figures, imagery, references, or further information about your methods.

### Instructions for Submitting Full Field of Sea-Ice Forecasts

- To contribute fields of SIP, IAD, IFD (or the daily sea ice concentration fields, from which we will calculate the SIP, IAD and IFD for you) and initial conditions, please upload to the SIPN data server using the same username and password of past years. If you are a new contributor of these fields and need to set up a new username and password, or have any queries on how to upload the data, please contact Ed Blanchard at [edwardbw@uw.edu](mailto:edwardbw@uw.edu) (mailto:edwardbw@uw.edu).
- For examples and further information on the SIP, IAD and IFD metrics, see: Metrics for the Sea Ice Outlook ([https://atmos.washington.edu/~ed/sio\\_metrics/index.html](https://atmos.washington.edu/~ed/sio_metrics/index.html)).

## Instructions for Submitting an Alaskan Regional Outlook

- Please submit a total extent for the Alaskan region, defined here as the combination of the Bering, Chukchi, and Beaufort seas. If possible, use the definition from the NSIDC Arctic sea-ice regional graphs and time series from the mask below, which is on the 25 km by 25 km polar stereographic projection used for the passive microwave satellite data.
- The mask is provided as a netcdf file here: NSIDC Regional Mask (NC - 2 MB) ([https://www.arcus.org/files/page/documents/28201/sio\\_mask.nc](https://www.arcus.org/files/page/documents/28201/sio_mask.nc)).
- Also tell us the maximum possible ice extent if every ocean cell in your Alaska region were ice covered. For example, if your model uses exactly the same grid as the satellite data, the area would be  $4.00 \times 10^6$  km<sup>2</sup>. The maximum possible extent is probably much larger than your actual Alaskan Regional Outlook. Be sure to exclude land and islands.
- Finally, with your entry, please include how you defined the Alaskan region: either say NSIDC definition, or if you must use your own definition, describe it.
- Enter your submission via the Google-based submission form under the "Outlook Prediction" header.
- For questions about the format of this request, please contact Walter Meier ([walt@colorado.edu](mailto:walt@colorado.edu) (<mailto:walt@colorado.edu>)).

Note: If you skip this step but provide full fields, we'll compute an Alaskan regional outlook for you.

## Instructions for Submitting Pan-Arctic Sea-Ice Extent Anomalies (Optional Submission)

This is an optional submission and it is recognized that not all SIO contributors will be able to provide anomaly forecasts. The request is motivated by the large spread in SIO predictions of mean September sea-ice extent. Some of this spread likely reflects inter-model biases, i.e., some models consistently overestimate ice extent while others underestimate it (relative to observations). The goal of this activity is to eliminate this source of inter-model prediction spread. The long-term mean is not a well-defined concept in a rapidly changing Arctic.

The pan-Arctic sea-ice extent anomaly is the departure of the contributors' September extent Outlook relative to the contributors' baseline trend, e.g., the trend in historical observations, model hindcasts, etc.

To calculate a pan-Arctic sea-ice extent anomaly:

1. Calculate the multi-year linear trend (slope) of September-mean extent from your baseline period. The linear trend will be different for each contributor due to inter-method/model biases.
2. Extrapolate the linear trend to calculate an extrapolated September 2023 extent value.
3. Calculate the extent anomaly value by subtracting the September 2023 Outlook extent from the extrapolated trend September 2023 value.

## Associated Effort - Sea Ice Drift Forecast Experiment

Contributions are again also invited to the Sea Ice Drift Forecast Experiment (SIDFEx), a community effort to collect and analyze sea-ice drift forecasts at lead times from days to a year. The forecasts target drifting sea-ice buoys. SIDFEx is aligned with the Sea Ice Outlook such that modeling groups contributing to the Sea Ice Outlook can contribute to SIDFEx relatively easily by computing trajectories for Lagrangian tracers. Results from the last years have been described briefly in the 2017–2022 Sea Ice Outlook Post-Season Reports. This time, we also invite suggestions for buoys or other easily tracked targets such as ships or field experiment sites to be added to the list of SIDFEx targets.

For further information, see the SIDFEx Homepage (<https://www.polarprediction.net/key-yopp-activities/sea-ice-prediction-and-verification/sea-ice-drift-forecast-experiment/>) or email the SIDFEx team.

For details on the design of SIDFEx and how to contribute drift forecasts, please download the following document. Background and Guidelines for SIDFEx Contributions

([https://www.polarprediction.net/fileadmin/user\\_upload/www.polarprediction.net/Home/YOPP/SIDFEx/SIDFEx\\_background\\_and\\_guidelines\\_20211207.pdf](https://www.polarprediction.net/fileadmin/user_upload/www.polarprediction.net/Home/YOPP/SIDFEx/SIDFEx_background_and_guidelines_20211207.pdf))

## SIPN

2023: September Report (</sipn/sea-ice-outlook/2023/september>)

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2023: July Report (</sipn/sea-ice-outlook/2023/july>)

2023: July Call for Sea Ice Outlook (</sipn/sea-ice-outlook/2023/july/call>)

2023: June Report (</sipn/sea-ice-outlook/2023/june>)

2023: June Call for Sea Ice Outlook (</sipn/sea-ice-outlook/2023/june/call>)

2022: Post-Season Report (</sipn/sea-ice-outlook/2022/interim-post-season>)

2022: September Report (</sipn/sea-ice-outlook/2022/september>)

2022: August Report (</sipn/sea-ice-outlook/2022/august>)

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2021: Post-Season Report (/sipn/sea-ice-outlook/2021/post-season)

2021: September Report (/sipn/sea-ice-outlook/2021/september)

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2020: June Report (/sipn/sea-ice-outlook/2020/june)

2020: June Call for Sea Ice Outlook (/sipn/sea-ice-outlook/2020/june/call)

2019: Post-Season Report (/sipn/sea-ice-outlook/2020/post-season-0)

2019: Interim Post-Season Report (/sipn/sea-ice-outlook/2019/interim-post-season)

2019: August Report (/sipn/sea-ice-outlook/2019/august)

2019: July Report (/sipn/sea-ice-outlook/2019/july)

2019: June Report (/sipn/sea-ice-outlook/2019/june)

2018: Post-Season Report (/sipn/sea-ice-outlook/2018/post-season)

2018: Interim Post-Season Report (/sipn/sea-ice-outlook/2018/interim-post-season)

2018: August Report (/sipn/sea-ice-outlook/2018/august)

2018: July Report (/sipn/sea-ice-outlook/2018/july)

2018: June Report (/sipn/sea-ice-outlook/2018/june)

2017: Post-Season Report (/sipn/sea-ice-outlook/2017/post-season)

2017: August Report (/sipn/sea-ice-outlook/2017/august)

2017: July Report (</sipn/sea-ice-outlook/2017/july>)

2017: June Report (</sipn/sea-ice-outlook/2017/june>)

2016: Post-Season Report (</sipn/sea-ice-outlook/2016/post-season>)

2016: August Report (</sipn/sea-ice-outlook/2016/august>)

2016: July Report (</sipn/sea-ice-outlook/2016/july>)

2016: June Report (</sipn/sea-ice-outlook/2016/june>)

2015: Post-Season Report (</sipn/sea-ice-outlook/2015/post-season>)

2015: DRAFT Post-Season Report (</sipn/sea-ice-outlook/2015/summary-draft>)

2015: August Report (</sipn/sea-ice-outlook/2015/august>)

2015: July Report (</sipn/sea-ice-outlook/2015/july>)

2015: June Report (</sipn/sea-ice-outlook/2015/june>)

2014: Post-Season Report (</sipn/sea-ice-outlook/2014/post-season>)

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2013: Post-Season Report (</sipn/sea-ice-outlook/2013/post-season>)

2013: July Report (</sipn/sea-ice-outlook/2013/july>)

2013: June Report (</sipn/sea-ice-outlook/2013/june>)

2012: Post-Season Report (</sipn/sea-ice-outlook/2012/post-season-0>)

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2012: June Report (</sipn/sea-ice-outlook/2012/june>)

2011: Post-Season Report (</sipn/sea-ice-outlook/2012/post-season>)

2011: September Report (</sipn/sea-ice-outlook/2011/september>)

2011: August Report (</sipn/sea-ice-outlook/2011/august>)

2011: July Report (</sipn/sea-ice-outlook/2011/july>)

2011: June Report (</sipn/sea-ice-outlook/2011/june>)

2010: Post-Season Report (</sipn/sea-ice-outlook/2010/post-season>)

2010: August Report (</sipn/sea-ice-outlook/2010/august>)

2010: July Report ([/sipn/sea-ice-outlook/2010/july](http://sipn/sea-ice-outlook/2010/july))

2010: June Report ([/sipn/sea-ice-outlook/2010/june](http://sipn/sea-ice-outlook/2010/june))

2009: Summary Report ([/sipn/sea-ice-outlook/2009/post-season](http://sipn/sea-ice-outlook/2009/post-season))

2009: Early September Update ([/sipn/sea-ice-outlook/2009/september](http://sipn/sea-ice-outlook/2009/september))

2009: August Report ([/sipn/sea-ice-outlook/2009/august](http://sipn/sea-ice-outlook/2009/august))

2009: July Report ([/sipn/sea-ice-outlook/2009/july](http://sipn/sea-ice-outlook/2009/july))

2009: June Report ([/sipn/sea-ice-outlook/2009/june](http://sipn/sea-ice-outlook/2009/june))

2008: Summary Report ([/sipn/sea-ice-outlook/2008/post-season](http://sipn/sea-ice-outlook/2008/post-season))

2008: July Report ([/sipn/sea-ice-outlook/2008/july](http://sipn/sea-ice-outlook/2008/july))

2008: June Report ([/sipn/sea-ice-outlook/2008/june](http://sipn/sea-ice-outlook/2008/june))

2008: May Report ([/sipn/sea-ice-outlook/2008/may](http://sipn/sea-ice-outlook/2008/may))

Contact: Betsy Turner-Bogren, [betsy@arcus.org](mailto:betsy@arcus.org)



(<http://www.nsf.gov/div/index.jsp?div=PLR>)



(<https://www.onr.navy.mil/>)



(<http://www.noaa.gov>)



(<http://www.doe.gov>)



(<https://nerc.ukri.org>)



(<http://www.polarprediction.net/yopp-activities/>)

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