



31 October 2018

CALL FOR CONTRIBUTIONS

Summer 2018-2019 sea ice prediction experiment

Submission deadline: December 1st, 2018

Overview and objectives

The Sea Ice Prediction Network South (SIPN South) is pleased to invite contributors to participate to the **second coordinated sea ice prediction experiment in the Southern Ocean**. SIPN South is an international project endorsed by the Year of Polar Prediction (YOPP). Its goal is to make an initial assessment of the ability of forecasting systems to predict circumpolar-average, regional-average, and local Antarctic sea ice conditions, with a focus on the summer season. More information on the project can be found on the SIPN South website: <http://acecrc.org.au/sipn-south/>.

Last year, we received 160 forecasts from 13 contributors – in what was at that time the very first coordinated seasonal sea ice prediction in the Southern Ocean. **We warmly thank all contributors for their interests, efforts and feedbacks on this first experiment.** An extensive evaluation of this austral summer 2018 experiment has been conducted (Massonnet et al., 2018). While a few forecasts did have skill in forecasting the total Antarctic sea ice area, the skill was lower at the regional level. In particular, sea ice in the Ross Sea appeared to be very difficult to predict.

The culminating point of the SIPN South is the coordination of a sea ice prediction experiment aligned with the **YOPP's Special Observing Period** in the Southern Ocean. **The forecasts will not be used as operational support for the summer campaigns**, since there is not sufficient evidence that forecasts have the required level of skill for this purpose. Instead, **this second experiment is an opportunity to consolidate conclusions from last year, and increase our understanding of the nature of systematic forecast biases, with possible identification of their origins.** It is the accumulation of forecasts, year after year, that will eventually guide the developments needed to improve these forecasts, as seen in the case of seasonal Arctic sea ice prediction.

This document outlines the protocol for contributing to the summer 2019 experiment. The protocol is similar in many aspects to the one of last year, except that

- The targeted period is December-February, not just February as in the previous call;
- The deadline for submission is December 1st, not December 15th as last year;
- Sea ice areas should be given with four decimal digits, not two as last year.

All groups are invited to participate regardless of the approach they follow, as it is not clear today if one type of forecasting method is outperforming to another.

Diagnostics requested

Participants are asked to issue one, two or three of the following diagnostics, ordered by descending priority. The submission process is described at the end of this document. The diagnostics are:

1. High priority

Diagnostic: Antarctic (circumpolar) daily mean sea ice area¹ from December 1st 2018 to February 28th 2019 included (90 days).

Format: One text file with one row and 90 comma-separated values, each expressing daily sea ice area for the 31 + 31 + 28 days of the December-February period. Units must be 10⁶ km². Numbers must be rounded to four decimal digits and trailing zeroes must be included.

File name: <group-name>_<forecast-id>_total-area.txt

- <group-name> is the name of the participating group (University, Research Center, Institution)
- <forecast-id> is a 3-digit identifier for the forecast (001, 002, ...)

Remarks: Ensemble forecasts are welcome. Please keep one file per forecast and increment each time the <forecast-id> by one unit: 001 for the first forecast, 002 for the second, etc. If only one forecast is submitted, set <forecast-id> to 001.

Example: A fictitious example is given here for a group named "ucl" contributing three forecasts: <https://goo.gl/LLfQaD>.

2. Medium priority

Diagnostic: February Antarctic daily mean sea ice area per 10° longitude bin.

Format: A text file with 36 rows each displaying 90 comma-separated values following the same requirements as diagnostic 1. Each row corresponds to a 10° longitude bin. First row: 0° ≤ longitude < 10°, second row, 10° ≤ longitude < 20°, ..., 36th row: 350° ≤ longitude < 360°.

File name: <group-name>_<forecast-id>_regional-area.txt

Example: A fictitious example is given here for a group named "ucl" contributing three forecasts: <https://goo.gl/LLfQaD>

3. Low priority

Diagnostic: February Antarctic daily mean sea ice concentration

Format: A NetCDF file with 90 time steps (one per day in the December 2018-February 2019 period). Each time step displays the spatial field of sea ice concentration. The file format must follow the CMIP6 conventions:

¹ Sea ice area is defined as the oceanic surface covered by sea ice.

- Sea ice concentration is defined as the fraction of the grid cell covered by sea ice, is named `siconc`, and is expressed in %.
- Longitude and latitude are reported under variables `longitude` and `latitude`.
- A land-sea mask is provided through a variable named `sftof` that expresses the percentage of the grid cell covered by ocean (units %).
- Areas of grid cells are provided through a variable named `areacello` that expresses the area of the grid cell in m^2 .

File name: `<group-name>_<forecast-id>_concentration.nc`

Example: A fictitious example is given here for a group named "ucl" contributing three forecasts: <https://goo.gl/LLfQaD>

Verification products

The forecasts will be assessed against two observational references:

- The Near-Real-Time DMSP SSMIS Daily Polar Gridded Sea Ice Concentrations, Version 1 (Data Set ID: NSIDC-0081; <http://nsidc.org/data/nsidc-0081>).
- The OSI SAF SSMIS Sea Ice Concentration Maps on 10 km Polar Stereographic Grid (Data Set ID: OSI-401-b; <http://osisaf.met.no/p/ice/index.html#conc-ssmis>).

Both data sets are publicly available. Sea ice areas will be computed directly from the sea ice concentration fields.

Submission process

The submission of a forecast by a group is done in two steps.

1. First, the contributing group gathers the diagnostics (see "Diagnostics Requested" above) in an online archive of its choice. The archive must be accessible with a simple URL, so that the SIPN South leadership team can easily retrieve the information. A Google Drive, a Dropbox archive, WeTransfer or a public FTP are fine.
2. Then, the groups fill in an online form (<https://goo.gl/drTdGA>) where they provide meta-data such as forecasting method, contact information but also the link where their data can be retrieved from.

Groups are invited to send an e-mail to francois.massonnet@uclouvain.be upon completion of the submission process to ensure that the data and meta-data have been well received.

The deadline for submitting the online form (containing the link pointing towards the data) is the **1st of December 2018**.

Outcomes

The SIPN Leadership Team will process the forecasts that are available by December 1st and publish a summary note by the 10th of December. This note will describe how sea ice is

predicted to evolve over the next three months around Antarctica, according to the contributions that will have been received. Once the summer period is over, a full report will be published and made publicly available, in which forecasts will be inter-compared and assessed against observational references.

In addition, the forecast data will be available as was the case for last year (see Massonnet et al., 2018, for details).

Contact and questions

Any question, comment or feedback should be addressed to François Massonnet (francois.massonnet@uclouvain.be).

Good luck, and enjoy!

The SIPN South Leadership team
F. Massonnet, P. Reid, J. L. Lieser, C. M. Bitz, J. Fyfe, W. Hobbs

To go further

EGU Cryosphere blog article on SIPN South:

<https://blogs.egu.eu/divisions/cr/tag/sipn/>

Video summarizing SIPN South's first experiment:

<https://www.youtube.com/watch?v=MUeWapsdSwQ>

Full report of the first experiment:

Massonnet, F., P. Reid, J. L. Lieser, C. M. Bitz, J. Fyfe, W. Hobbs (2018). Assessment of February 2018 sea-ice forecasts for the Southern Ocean. <https://eprints.utas.edu.au/27184/>