

Sea Ice Outlook
2020 June Report
Individual Outlook

Name of contributor or name of contributing organization:

BSC (Acosta Navarro et al.)

Is this contribution from a person or group not affiliated with a research organization?

Name and organization for all contributors. Indicate primary contact and total number of people who may have contributed to your Outlook, even if not included on the author list.

Acosta Navarro J.C, Bilbao R., Wild S., Lapin V., Tourigny E., Sicardi V., Ruprich-Robert Y., Amaral-Ramos A. Echevarria P., Cruz-García R., Arsouze T., Doblas-Reyes, F. and Ortega P

Do you want your June contribution to automatically be included in subsequent reports? (If yes, you may still update your contribution via the submission form.)

Include this submission in the June report only.

What is the type of your Outlook projection?

Dynamic Model

Starting in 2017 we are accepting both pan-Arctic and pan-Antarctic sea ice extent (either one or both) of the September monthly mean. As in 2016, we are also collecting Alaskan regional sea ice extent. To be consistent with the validating sea ice extent index from NSIDC, if possible, please first compute the average sea ice concentration for the month and then compute the extent as the sum of cell areas > 15%.

a) Pan-Arctic September extent prediction in million square kilometers.

b) same as in (a) but for pan-Antarctic. If your method differs substantially from that for the Arctic, please enter it as a separate submission.

15.7

c) same as in (b) but for the Alaskan region. Please also tell us maximum possible extent if every ocean cell in your region were ice covered.

"Executive summary" of your Outlook contribution (using 300 words or less) describe how and why your contribution was formulated. To the extent possible, use non-technical language.

This contribution is part of a larger APPLICATE (EU-funded H2020 project) contribution involving four research centers. The same approach used to produce this individual contribution has been used to produce a retrospective decadal prediction system with EC-Earth , which shows significant skill to predict September Sea Ice Extent over the period 1960-2019.

Brief explanation of Outlook method (using 300 words or less).

Initialized climate model (EC-Earth3.3) in November 2019. Ten members were produced in total. We provide the ensemble mean of the raw forecasted SIE values.

Tell us the dataset used for your initial Sea Ice Concentration (SIC).

The forecast (EC-Earth3.3) uses sea ice concentration initial conditions from an ocean-sea ice (NEMO36 - LIM3) reconstruction in which only ocean temperature and salinity are restored to ORAS4 values (Balmaseda et al., 2012), both at the surface and below the mixed layer. The ocean-sea ice model is forced with ERA5 (Hersbach et al., 2020) surface fluxes. No direct assimilation of Sea Ice Concentrations was performed.

Balmaseda M.A., Mogensen K.S., Weaver A.T., 2012, Evaluation of the ECMWF Ocean Reanalysis ORAS4. Quart J Roy Meteor Soc DOI 10.1002/qj.2063.

Hersbach, H., Bell, B., Berrisford, P., Hirahara, S., Horányi, A., Muñoz-Sabater, J., Nicolas, J., Peubey, C., Radu, R., Schepers, D., Simmons, A., Soci, C., Abdalla, S., Abellan, X., Balsamo, G., Bechtold, P., Biavati, G., Bidlot, J., Bonavita, M., De Chiara, G., Dahlgren, P., Dee, D.,

Diamantakis, M., Dragani, R., Flemming, J., Forbes, R., Fuentes, M., Geer, A., Haimberger, L., Healy, S., Hogan, R.J., Hólm, E., Janisková, M., Keeley, S., Laloyaux, P., Lopez, P., Lupu, C., Radnoti, G., de Rosnay, P., Rozum, I., Vamborg, F., Villaume, S. and Thépaut, J.-N. (2020), The ERA5 Global Reanalysis. Q J R Meteorol Soc. Accepted Author Manuscript.
doi:10.1002/qj.3803

Tell us the dataset used for your initial Sea Ice Thickness (SIT) used. Include name and date.

As for SIC, no direct assimilation of Sea Ice Thickness observations was done to initialize the forecasts.

If you use a dynamic model, please specify the name of the model as a whole and each component including version numbers and how the component is initialized:

[DynamicModelType]

If available from your method.

a) Uncertainty/probability estimates:

Median

5

Ranges

Arctic: 4.1-5.8 Million sq km | Antarctic: 14.4-16.4 Million sq km

Standard Deviations

Arctic: 0.6 Million sq km | Antarctic: 0.6 Million sq km

b) Brief explanation/assessment of basis for the uncertainty estimate (1-2 sentences).

The forecast consist of 10 members, the range is taken from the lowest and highest values.

c) Brief description of any post processing you have done (1-2 sentences).

We provide the raw forecasts, so no post processing of the data has been performed.