Frost Impressions of ACCESS-S2 Antarctic Sea Ice Forecast

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ACCESS-S2

The Australian Bureau of Meteorology's current seasonal prediction system. Replaced ACCESS-S1 in October 2021. Same model configuration:

- Global Atmosphere 6.0 (GA6) N216 (~60km) 85 levels.
- Global Land 6.0 N216 4 levels.
- Global Ocean 5.0 1/4° 75 levels.
- Global Sea Ice 6.0 (CICE 4.1) 1/4° 5 ice categories.

Initial conditions (hindcast):
S1: ERA-interim + Met Office FOAM (includes sea ice)
S2: ERA-interim + BOM analysis (doesn't include sea ice)

Data

ACCESS-S2 and S1 hindcasts (1981–2014 and 1990–2012, respectively). Initialised at the 1st of every month.
Observations: NSIDC CDRv4 sea ice concentrations.

Metrics

Sea Ice Extent: Area covered with at least 15% sea ice.
RMSE: Root Mean Squared Error of sea ice concentration anomalies.
IIEE (Integrated Ice Edge Error): Area in which model and observations disagree on the presence or absence of sea ice (concentration >15%).

Results

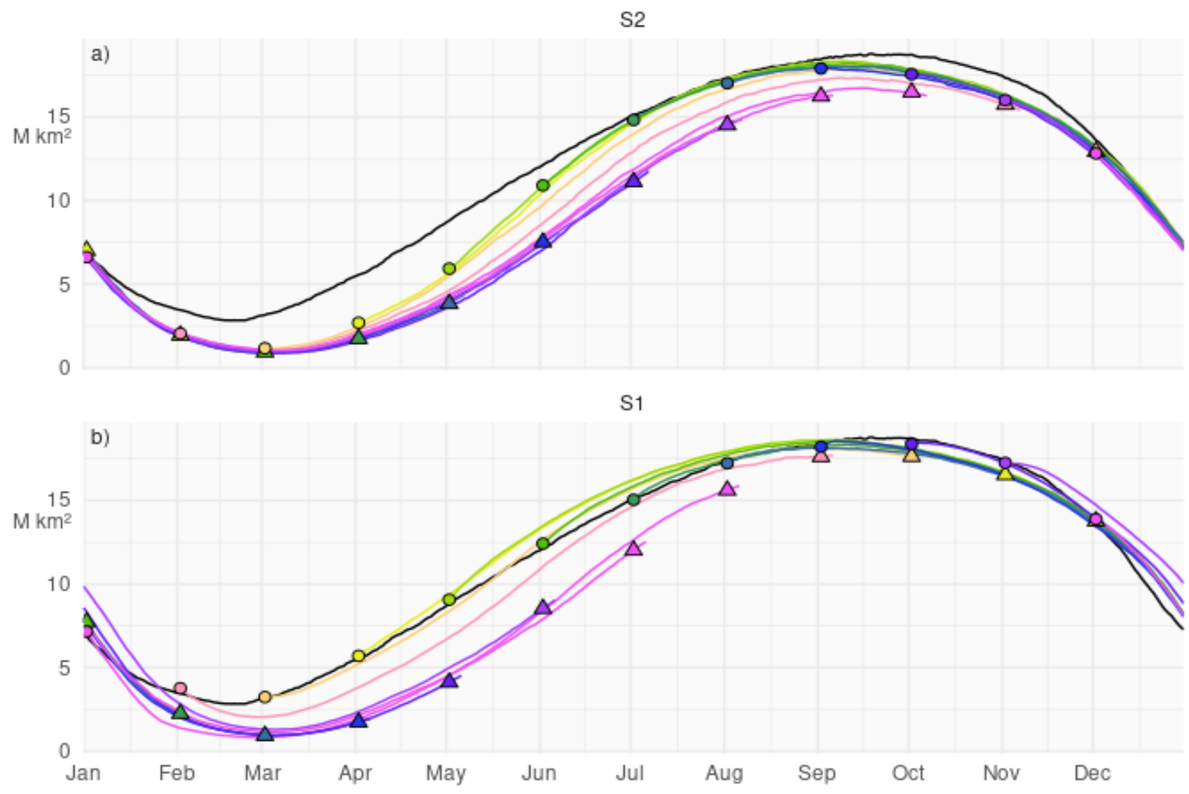

Figure 1: Median sea ice extent for al hindcasts initialised the first of the month for ACCESS-S2 and ACCESS-S1 in colours representing the start month. In black, the median sea ice extent of NSIDC CDR.

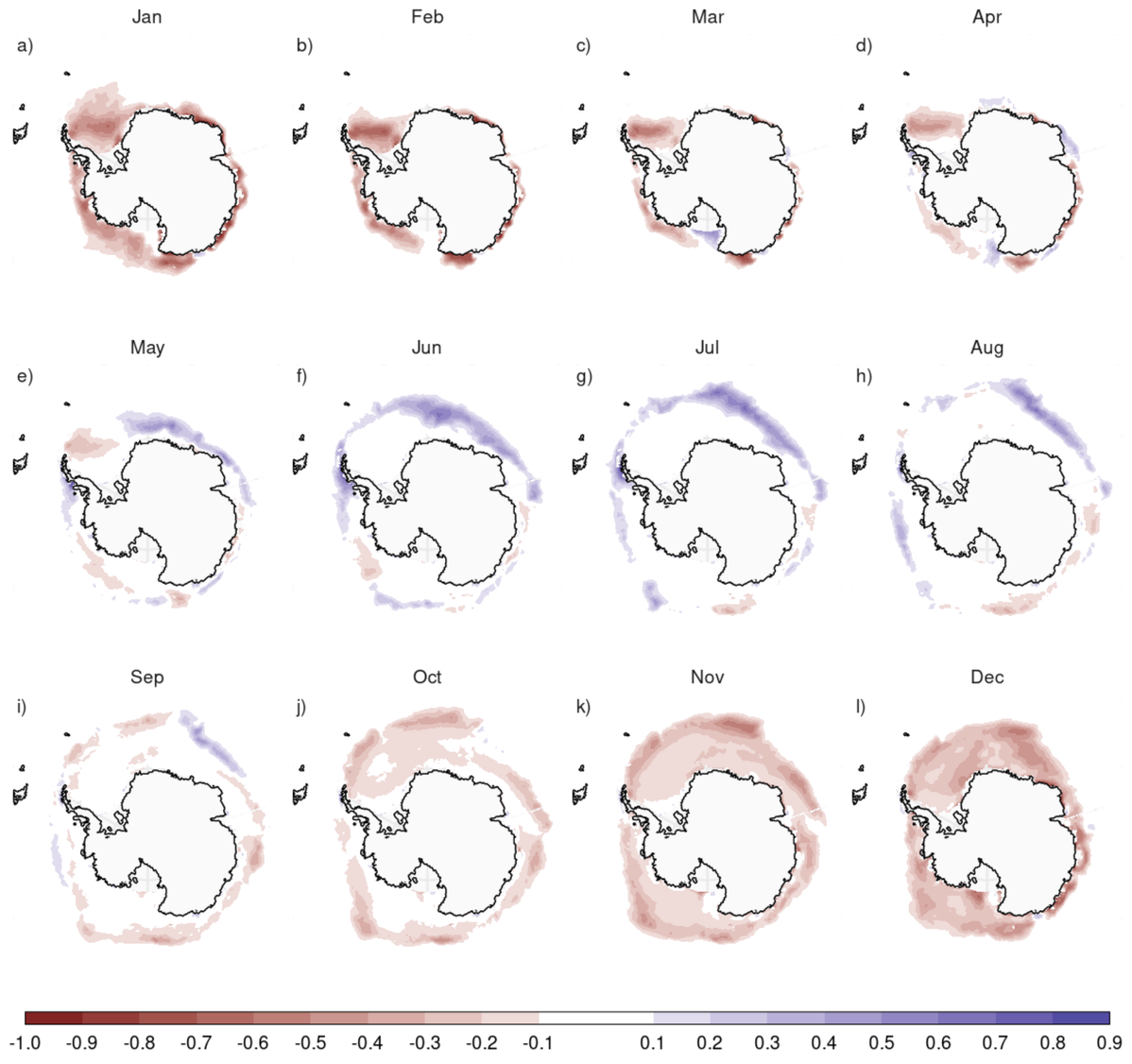

Figure 1: ACCESS-S2 sea ice concentration bias with NSIDC sea ice concentration.

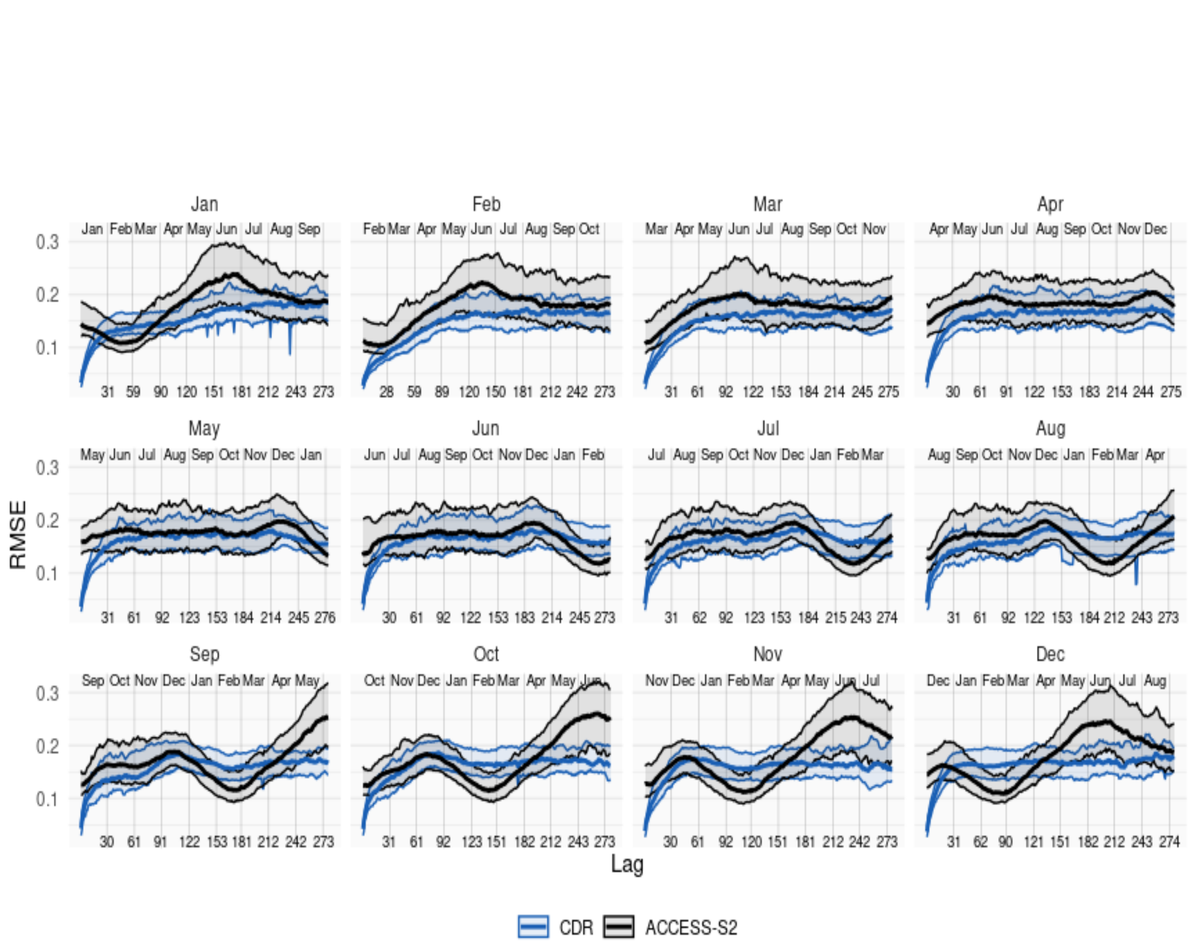

Figure 1: Median and 95% coverage of sea ice concentration anomalies RMSE as a function of forecast lag for all forecast initialised on the first of each month compared with a reference forecast of persistence of anomalies.