

Board 1101: Predictability of the Minimum Sea Ice Extent from Late Winter Fram Strait Ice Export: Model vs Observations

 Thursday, 15 December 2022

 15:45 - 19:15

 *Poster Hall, Hall A (South, Level 3, McCormick Place)*

Abstract

Late winter coastal divergence along the Eurasian coastline (referred to as the ice factory) – or the Fram Strait ice export, a proxy for coastal divergence in the ice factory – is a skillful predictor of the minimum sea ice extent (Williams et al., 2016; Brunette et al., 2018; Sesternikov and, 1979). Coastal divergence leads to the formation of coastal polynya where new ice grows but to a thickness that is not large enough to survive the following summer melt. This signal is then amplified by the ice albedo feedback and leads to more open water at the end of the summer melt season. In this thesis project, we will identify if this source of predictive skill in the seasonal forecast of the minimum sea ice extent is present in General Circulation Models, more precisely in the CESM2-LE, GISS-E2.1-G, GFDL FLOR-LE, CNRM-CM6-1 and the CanESM5. Since even small biases in the large-scale atmospheric circulation simulated by a model can short circuit this coupling between dominant modes of atmospheric variability (NAO and AO), coastal divergence along the Eurasian coastline, Fram Strait ice export and therefore seasonal forecasting skill of the model, failure to reproduce this coupling observed in the real Arctic will be used to identify biases in GCM. Preliminary results show that subtle changes in the large-scale atmospheric circulation leads to opposite statistical relationship between Fram Strait ice area export, coastal divergence along the Eurasian coastline, and seasonal predictability of the minimum sea ice extent both in the CESM2-LE and the GISS-E2.1-G models. Differences are linked with the partitioning between recirculation within the Beaufort Gyre, ice exported through Fram Strait and ridging north of the Canadian Arctic Archipelago.

First Author



Sandrine Trotechaud

McGill University

Authors



Bruno Tremblay

McGill University



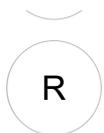
Joy Romanski

Columbia University



James Williams

Columbia University



[Anastasia Romanou](#)

NASA Goddard Institute for Space Studies



[Mitchell Bushuk](#)

NOAA/Geophysical Fluid Dynamics Laboratory



[William J Merryfield](#)

Canadian Centre for Climate Modelling and Analysis



[Rym Msadek](#)

CNRS/CERFACS

View Related
