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Sea ice and atmosphere interactions and predictability: preliminary results using HadGEM3

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Arctic sea ice extent has steadily declined in the past 30 years. Aside from the global impact on climate change, regional information on the sea ice presence and on its impact on oceanic and atmospheric patterns has witnessed a growing interest. There is a growing need for seasonal-to-decadal timescale climate forecasts to help inform local communities and industry stakeholders.

Here we examine the influence of sea-ice thickness observations on the predictability of the sea-ice and atmospheric circulation. We perform paired sets of ensembles with the HadGEM3 GCM starting from different initial conditions in a present-day control run. One set of ensembles start with complete information about the sea-ice conditions, and one set have degraded information. We investigate how the pairs of ensembles predict the subsequent evolution of the sea-ice, sea level pressure and circulation within the Arctic and beyond with the aim of quantifying the value of sea-ice observations for improving predictions.