Impact of sea ice initialisation on sea ice and atmosphere prediction skill on seasonal timescales

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We present a robust assessment of the impact of sea ice initialisation from observations on the sea ice and atmosphere prediction skill. We ran two ensemble seasonal prediction experiments from 1979 to 2012: one using the highest possible quality for sea ice initial conditions and another where sea ice is initialized from a climatology, with two forecast systems. During the freezing season in the Arctic Ocean, sea ice forecasts become skilful with sea ice initialization until three to five months ahead, thanks to the memory held by sea ice thickness. During the melting season in both the Arctic and Antarctic Oceans, sea ice forecasts are skilful for seven and two months respectively with negligible differences between the two experiments, the memory being held by the ocean heat content. A weak impact on the atmosphere prediction skill is obtained.