Seasonal to multi-decadal predictability of polar climate: the changing sea ice condition and its connection with the atmospheric circulations

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Among many changes observed in the Arctic climate system, the changing sea ice condition is definitely one of the most important and fast changing variable. With the help of the unprecedented collection of climate model outputs, also known as the WCRP-CMIP3 multi-model datasets we identified that six out of 23 models provided reasonable simulation of the Arctic sea ice condition (mean and seasonal cycle). The NCAR CCSM3 model is one the six. CCSM4 is a newer version of CCSM3, with improvements in all of the model components (atmosphere, ocean, land, sea ice). An initial analysis reveals that the observed decrease in the sea-ice extent and of the multiyear ice cover is well captured by the CCSM4. With six ensemble members available we are going to study the reduction of sea ice and the associated atmospheric circulations patterns simulated by CCSM4. The study will help us to understand the connections of the these two components of the Arctic Climate system, as well the feedback process quantitatively.