



CMIP5 Decadal Prediction Experiments: What is the Skill of Prediction of Southern Ocean Sea Ice?

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Observations over the last 30 years have shown that the sea ice extent in the Southern Ocean has slightly increased since 1979 but climate models are often unable to simulate correctly this expansion. In this study, we analyse the evolution of sea ice around the Antarctic, simulated by different general circulation models involved in the 5th Coupled Model Intercomparison Project (CMIP5). On the one hand, historical simulations, driven by external forcing and initialized without observations, are examined. They provide information about the mean state, the variability and the trend of sea ice cover computed by each model. Results are then compared to observations. On the other hand, decadal prediction experiments, driven by external forcing and initialized through data assimilation of observations, allow us to assess the impact of the initialization method on the quality of predictions. This analysis shows that the initialization with available observations doesn't improve systematically the simulated 30-year trend of sea ice. Results depend on the model as well as on the geographical sector considered. Finally, despite the failing in the simulation of sea ice trends, some models initialized through data assimilation can provide significant correlation between simulated and observed sea ice extent up to 2 years ahead.