



Decadal prediction: Closing the gap between climate projections and seasonal forecasts

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Seasonal prediction is essentially an initial value problem, where as the climate projections of the IPCC are primarily a boundary value problem. Decadal prediction is both. Presented here are seasonal-to-decadal hindcasts performed with the IPCC version of the MPI-OM/ECHAM5 climate model, covering the period 1960-2005. Initial conditions for all hindcasts are obtained from coupled simulations in which model SST are relaxed towards observations. Radiative forcing is as observed or following the IPCC A1B scenario.

Tropical Pacific and Indian Ocean SST variations are well predicted out to 6 months in advance. Decadal prediction skill is demonstrated in the Tropical Pacific, Indian Ocean and in the North Atlantic Sector. The mid-1970's climate shift in the Pacific, for instance, is well predicted. Decadal hindcast skill in the Pacific and North Atlantic exceed that due only to external radiative forcing, whereas in the Indian Ocean external radiative forcing contributes most to hindcast skill. For the next decade we predict a weakening of the MOC, little change in Tropical Pacific SST, and an overall delay in the anthropogenic induced global warming, particularly over the Northern Hemisphere.

The role of high versus low latitudes in the initialisation technique, and the sensitivity to the treatment of salinity are investigated in additional experiments. Sensitivity to model formulation is also assessed with experiments using another model (NEMO/ECHAM5).