Predictability in a changing climate - comparison of intraseasonal to seasonal forecasts in a pre-industrial versus modern background climate

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Two sets of "perfect model" ensemble forecasts are generated, branching from long simulations of the Community Climate System Model (CCSM, Version 4) run for fixed pre-industrial and late 20th century conditions of atmospheric composition. Forecasts are initialized from a subset of years exhibiting both extreme phases of ENSO and neutral years. Forecasts are initialized for Northern Hemisphere winter (1 December) late spring (1 May) and summer (1 July) situations. From these simulations, changes in climate predictability on sub-seasonal to seasonal and longer time scales will be examined. Ensembles are constructed by perturbing only the land surface, to examine how uncertainties in soil moisture and other land state variables propagate into the atmosphere on short time scales, and eventually throughout the atmosphere and into the ocean on longer time scales. In addition, maximally-perturbed ensembles will be integrated, where land initial states are taken from different years - this will allow investigation of the land surface's impact on predictability beyond the Global Land-Atmosphere Coupling Experiment (GLACE-2) protocol. In all cases, predictability changes attributable to a changing background climate will be assessed.