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Title: Towards a National Earth System Prediction Capability
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Abstract:
The National Earth System Prediction Capability (ESPC) inter-agency program was established in 2010 as a coordinating effort to improve collaboration across the environmental research and operational prediction communities for the development and implementation of improved national physical earth system prediction. The Nation's security and economic well-being rely upon accurate global analysis and prediction capabilities for the physical environment over time scales of a few days to weekly, monthly, seasonal and longer lead times. The scope of this challenge necessitates broad participation from the meteorological, oceanographic, and climate science communities as many of the sources of predictability beyond synoptic timescales rely on coupled ocean-atmosphere and other earth system dynamical interactions. Specific conditions at these longer timescales exceed the limits of explicit predictability due to the chaotic nature of the dynamical system, resulting in a reliance on ensemble methods to create probabilistic forecasts. A central thesis of the National ESPC effort is that low order modes in the coupled earth system can be represented more accurately to improve ensemble-based, conditional probabilities when certain phenomena are present in the initial state, as has been indicated by observational correlations in the historical record. The National ESPC project was expanded in 2012 to include both Research mission agencies such as NASA and NSF as well as the original operational prediction agencies such as NOAA and the Department of Defense. This effort seeks to reduce technology barriers to collaboration among U.S. federally sponsored environmental science research activities through a common modeling architecture and community component models and to improve the transition of research advancements into operational prediction capability.
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