

Earth System Prediction Capability Decadal Variation Demonstration

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The Earth System Prediction Capability is a program to meet broad but specific agency requirements for an earth system analysis and prediction framework to support one-day to decadal, global prediction at appropriate horizontal and vertical resolution including the atmosphere, ocean, land, cryosphere and space.

The charter defining the Earth Systems Prediction Capability (ESPC) inter-Agency Program is to create a high-resolution, extended range, coupled atmosphere, ocean, land, ice and space modeling capability that will produce more accurate and longer range predictions for use in tactical to strategic decisions affecting the economy and protection of the US population. One major thrust of this effort is to extend range by exploring sources of predictability at the intra-seasonal to inter-annual (ISI) timescales. Sources of predictability include portions of the earth system that exhibit longer scale inertia or memory, processes that involve coupled feedback, and events that respond strongly to changes in the external forcing. An Interim Science Steering Group and inter-Agency Development Team have suggested that there are five grand challenge demonstrations that would be suitable for validating this approach and aid in the improvements to the building blocks for extended range Forecast Systems at the Operational Prediction Centers. These demonstrations would also help inform decision makers on future needed infrastructure and technologies as well as potential for improved national prediction capability.

One of these demonstrations focuses on Decadal Variation with an emphasis on the Atlantic Meridional Overturning Circulation. A Science Team and Science Plan are being developed for this demonstration. Close collaboration with the US AMOC Science Team and the IPCC AR5 CMIP decadal prediction effort is sought. The Demonstration will support high resolution coupled models and reanalyses covering the first decade of the RAPID/MOCHA observations. The Demonstration hopes to leverage and supplement existing efforts of the US AMOC Science Team. The goal of the Demonstration is to show an initial capability for operational decadal prediction by 2018, with an emphasis on forecast capacity and metrics for what is predictable.