

**Ensemble data assimilation in CCSM/POP and CAM**

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The Data Assimilation Research Testbed (DART) ensemble Kalman filter has been incorporated within the the Community Climate System Model (CCSM) V4.0 framework to allow the Parallel Ocean Program (POP2) to assimilate oceanic observations. As a step towards a fully-coupled modeling framework, each instance of the POP model uses a separate atmospheric analysis that was the result of a DART assimilation using the Community Atmosphere Model (CAM) Version 4. The DART/CAM assimilation uses all observations used in the NCEP/NCAR reanalysis as well as GPS radio occultations and results in an 80-member atmospheric reanalysis every 6 hours. This was originally created for a purpose other than coupled atmosphere/ocean data assimilation. Each member of the CAM assimilation is forced from below by the same ocean analysis. The Interactive Ensemble capability of CCSM advances 48 instances of POP using atmospheric forcings from the first 48 ensemble members from the CAM reanalysis. Each POP instance uses a different sample estimate of the atmospheric forcing - as is likely the case in a fully coupled atmosphere/ocean assimilation. At the end of each day-long POP advance, DART is used to assimilate all temperature and salinity observations available in the World Ocean Database. The assimilation has produced daily ocean states for 1998 through 2005, providing the basis to asses the short-term forecast fit to the observations as opposed to a third-party analysis, reanalysis, or synthesis; strategies for balancing the computational effort are also discussed.