The GMAO ocean retrospective analysis from the GEOS-5 coupled system

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The GMAO ocean retrospective analysis spans 32 years from 1979 to the present day. The reanalysis uses a coupled atmosphere-ocean model (MOM4 ocean model coupled to the GEOS-5 atmospheric model) and an ensemble optimal interpolation method to assimilate ocean and sea-ice observations while the atmosphere is constrained to the GMAO Modern-Era Retrospective analysis for Research and Applications (MERRA). We present our estimate of the ocean state through the analysis of typical diagnostics (e.g. heat and salt content, climate variability in several regions) and discuss its impact on seasonal forecasts. To evaluate the merits of the use of a more sophisticated data assimilation method, an analysis using a mixed resolution ensemble Kalman filter (in which background error-covariance estimates obtained from a lower resolution ensemble of coupled models is used to update a higher resolution model) is being carried out during the Argo period.