Ocean-Atmosphere Interactions in CMIP5 Coupled Model Decadal Data

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The dynamics of ocean-atmosphere coupled covariances require investigation if they are to be used in strongly coupled data assimilation systems. The design of coupled DA systems will be most likely be based on the covariances of the individual model used. Investigation of the similarities and differences of ocean-atmosphere dynamics in different models and reanalyses can help inform the development of these systems.

The fifth round of the Coupled Model Intercomparison Project provides a large data resource with which to investigate ocean-atmosphere covariances in various coupled models. CMIP5 includes data from 27 institutes and 25 different models (plus variants). The core decadal runs in CMIP5 are 10- and 30-year hind-casts initialised with observed ocean states and forced with observed fields.

Results of an investigation of ocean-atmosphere coupled cross-covariances in a selection of contributing CMIP5 models will be shown, including SST-precipitation, SST-sea level pressure and SST-surface wind covariances. Ensembles of low- and high-frequency events are investigated for state-dependant coupled interactions.