SESSION: (C1) Initialization initialization shock and model error (includes data assimilation)

(C1-04)

Sub-seasonal to Decadal Predictability and Prediction with an Ocean Eddy Resolving Global Coupled Model

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Increasingly, high resolution observations and coupled model experiments with eddy-resolving oceans indicate that western boundary currents are regions of strong ocean-atmosphere interactions that are critical components of the climatic mean state and variability. The high SSTs and strong SST gradients couple with the atmosphere to pump moisture into the marine boundary layer, accelerate winds, sharpen SST fronts, and introduce significant sub-seasonal to decadal climate variability that affects the frequency and intensity of extreme events (e.g., heat waves, cold spells, droughts, floods, extreme winds) at remote locations. These extreme events are embedded within sub-seasonal to decadal variability that may be predicted by global models. This talk documents a 30-year set of sub-seasonal to seasonal retrospective forecasts with an ocean eddy-resolving coupled model in comparison with a parallel set of retrospective forecasts with an ocean eddy-permitting coupled model used for the North American Multi-Model Ensemble (NMME) project. The forecast from both systems use identical initial conditions derived from CFSR and use the same modeling systems (CCSM4) except for resolution. On the decadal time-scale, the talk emphasizes identical twin predictability experiments with the ocean eddy-resolving model. Results include both sets of analysis focus on how the resolved ocean eddies affect prediction skill and predictability, particular emphasis is place on extreme events.