

ENSO Prediction and Predictability at COLA

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The Center for Ocean-Land-Atmosphere Studies (COLA) anomaly coupled and interactive ensemble prediction systems are described. The purpose of this new interactive ensemble coupling strategy is to examine how stochastic "weather noise" impacts ENSO prediction skill and predictability. With this procedure multiple realizations of an atmospheric general circulation model (AGCM) are coupled to a single realization of an ocean general circulation model (OGCM). The only difference among each atmospheric model realization is in the initial condition. All other aspects of the model are identical. Each AGCM also experiences the same SST from the OGCM, but the OGCM experiences ensemble averaged fluxes calculated from all the AGCM realizations. Hence, the uncoupled atmospheric noise felt by the coupled system is significantly reduced. A large ensemble (480 cases) of retrospective forecasts for the period 1980-99 has been made with both the standard anomaly coupled and the interactive ensemble prediction systems. Based on a comparison of these retrospective forecasts, it is shown how reducing the atmospheric weather noise improves the forecast skill and extends the estimated limit of predictability. Given that the atmospheric noise is unpredictable, these results suggest that a "no-noise" scenario may be the best approach for real coupled ENSO prediction.