

Uncertainties in Prediction – An ENSO Perspective

Arun Kumar
Climate Prediction Center
College Park, MD
arun.kumar@noaa.gov

Uncertainty is a fundamental property of coupled model prediction systems. The origins of uncertainty are embedded in the sensitivity of non-linear dynamical systems to initial conditions, and the fact that initial conditions for different components of Earth system – atmosphere, ocean etc. – cannot be specified with perfect accuracy. In dynamical prediction systems uncertainty in the specification of initial conditions are incorporated in the framework of ensemble of forecasts. During the forecasts, growth in the uncertainties in initial conditions leads to forecast divergence, and ultimately, is responsible for eventual uncertainties in the future outcomes. This is the fundamental reason for considerable spread that is evidenced in the form of ENSO plumes, and in predicting the amplitude of ENSO for individual events. In this presentation, basic concepts for the origins of uncertainty in forecast systems, with a specific focus on ENSO prediction, will be discussed.