



ENSO and tropical Pacific metrics for coupled GCMs

Eric Guilyardi (1), Andrew Wittenberg (2), and the ENSO metrics work group of the CLIVAR Pacific Panel Team
(1) IPSL/CNRS - UPMC, LOCEAN, Paris, France (eric.guilyardi@locean-ipsl.upmc.fr), (2) GFDL, NOAA, Princeton, USA

The wide diversity of El Niño simulations in coupled GCMs contributes to large uncertainties in projections of future tropical climate variability and its global impacts. Uncertainty in the future of ENSO arises not only from diverse model biases, but also from the diverse and inconsistent metrics used to evaluate ENSO from study to study. To better coordinate future studies, the CLIVAR Pacific Panel asked a group of ENSO experts to propose a set of standard ENSO metrics, to aid in diagnosing and understanding inter-model differences and assessing simulation quality.

Here we present these proposed metrics, which span aspects of the tropical Pacific mean state, annual cycle, and ENSO. Examples are given of “user profiles,” in which some metrics are emphasized depending on the judgement or interests of a particular investigator. Applying the metrics and user profiles to “weight” the various AR4 models’ ENSO amplitude responses to elevated CO₂, we find that the future ENSO amplitude projections depend strongly on the chosen user profile. We suggest that given our current state of understanding of ENSO, an important first application for community ENSO metrics may be to identify models that don’t pass key performance thresholds.