

Forecast skill

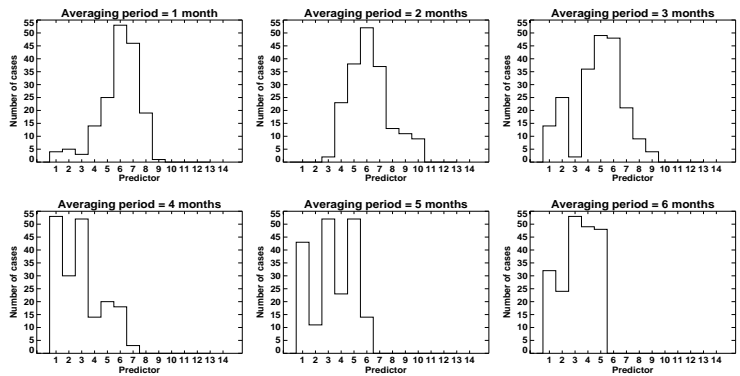
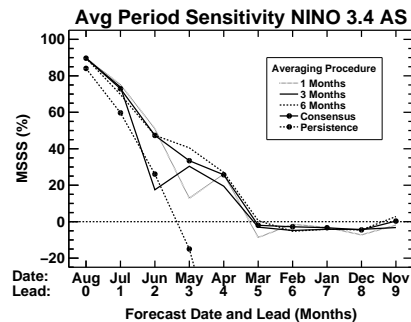
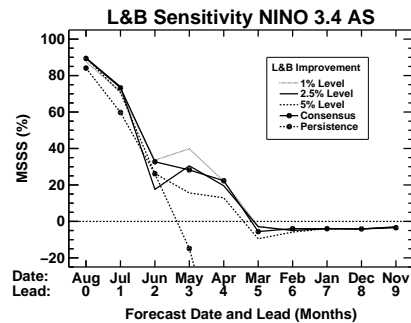
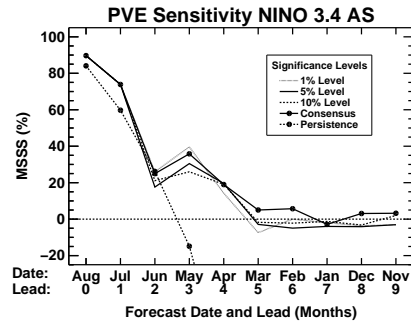
- Cross-validated 1950-2002 with a 5 year block eliminated at each stage.
- Up to 30% increase in MSSS over standard CLIPER.
- Skillful out to 6 months lead.
- 95% confidence intervals estimated using bootstrap.

$$MSSS = 1 - \frac{MSE_f}{MSE_{cl}}$$

Where MSE_f and MSE_{cl} are respectively the mean square errors attributable to the forecast model and the null model (zero anomaly).

Methodology

- Standard CLIPER model contains many arbitrary restrictions e.g. predictor screening at 5% PVE, 2.5% leaps and bounds (L&B) improvement on the addition of a new predictor, and intrinsic averaging period of 3 months for many of the predictors.
- Model formulation and skill can be sensitive to the above restrictions (see right). Variation results from changes in the model formulation. The histograms below illustrate changes in the relative importance of the potential predictors when the averaging period is varied.
- Eliminating predictor screening and constructing models with L&B improvements of 1, 2.5 and 5% for each averaging period of 1-6 months leads to 18 possible models.
- The consolidated CLIPER model forecast is the average forecast from these 18 models.
- For further details see 'A consolidated CLIPER model for improved August-September ENSO prediction skill 1950-2002' (in preparation for Weather and Forecasting).



Statistical-Dynamical Forecasts

- Dynamical forecasts from the UK Met Office Unified Model runs contributing to the DEMETER project show promise in predicting extremes in ENSO.
- Perform less well during intermediate years.
- Statistical models tend to underestimate extremes but often perform well for small excursions from the mean.
- Optimal method may be to combine predictions from both statistical and dynamical models.
- On going investigation aims to clarify this.

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