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Measuring the impact of a new observing system lifetime on ENSO prediction - between ideas and realityh

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In this study we address the question of how long should a new observing system exists in order for its effect to be seen in ENSO forecast models.

The motivation comes from a set of experiments done within the ODASI consortium, where the effect of omitting portions of the TAO array on ENSO forecast skill is examined. In these experiments, it is found that both the eastern and western sections of the TAO array are important for forecast skill, with the western section contributing mostly to the skill in the central Pacific. However, due to the small number of ensembles and cases analyzed, the differences, while visible, do not attain statistical significance. Furthermore, the fact that the new observing system (TAO array) provides additional data only for a period of 10 years (1992-2002) raises the question of whether the dynamical forecast models could indeed show with certainty the usefulness of the TAO data.

We then use a simple ENSO model to consider the role of observing system lifetime in determining the new observations impact on forecast skill. It is found that when a new observing system is available for a short period (5-20 years), even within a simplified model framework, significant improvement in forecast skill is not guaranteed to be detectable. Furthermore, including seasonality in the analysis makes judgment of skill improvement even harder.