Contrasting the Skills and Biases of Deterministic Predictions for the Two Types of El Nino

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The tropical Pacific has begun to experience a new type of El Nino, which has occurred particularly frequently during the last decade, referred to as the central Pacific (CP) El Nino. Various coupled models with different degrees of complexity have been used to make real-time El Nino predictions, but high uncertainty still exists in their forecasts. It remains unknown as to how much of this uncertainty is specifically related to the new CP-type El Nino and how much is common to both this type and the conventional Eastern Pacific (EP)-type El Nino. In this study, the deterministic performance of an El Nino Southern Oscillation (ENSO) ensemble prediction system is examined for the two types of El Nino. Ensemble hindcasts are run for the nine EP El Nino events and twelve CP El Ni˜no events that have occurred since 1950. The results show that (1) the skill scores for the EP events are significantly better than those for the CP events, at all lead times; (2) the systematic forecast biases come mostly from the prediction of the CP events; and (3) the systematic error is characterized by an overly warm eastern Pacific during the spring season, indicating a stronger spring prediction barrier for the CP El Nino. Further improvements to coupled atmosphere–ocean models in terms of CP El Nino prediction should be recognized as a key and high-priority task for the climate prediction community.