Predictability and Forecast Verification of El Niño Events

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The 1997/98 El Niño prediction and natural disasters over the coastal areas for China (the strongest storm surge in this century, the lighter than normal sea ice cover in the Bohai Sea, and so on) are reviewed. In fact, the prediction of El Niño has improved world wide. The 1997/98 El Niño prediction of the National Research Center for Marine Environment Forecasts was very successful.

Methods to make the El Niño prediction more reliable are discussed. A method of forecast verification was developed. For each test parameter, the following factors were tabulated: average deviation, mean absolute error, tendency correlation, anomaly correlation, absolute correlation, skill index, and ability index. The most successful El Niño predictions (correlation coefficients were 0.5–0.7 with six or more months lead) were those using statistical–dynamic methods, but they still exhibited the spring predictability barrier in February to April.

The primary objective of El Niño prediction is to improve the ability to predict sea surface temperature anomalies (SSTA). The analyses indicate that the correlation of SST between two or three continuous months is strong, and it shows that the regions with the strongest SST persistence are concentrated in specific areas. This demands more attention.

It is possible that operational El Niño predictions in the next few years should continue to be based on the statistical–dynamic methods rather than on the dynamic models.