



Sampling Uncertainty in Verification Measures for Binary Deterministic Forecasts

I. T. Jolliffe and D. B. Stephenson
United Kingdom (ian@sandloch.fsnet.co.uk)

Numerous verification measures are in use for deterministic forecasts of binary events. Sampling uncertainty associated with such measures is important when attempting to assess whether there are differences in skill between different forecasting systems, for example, but has often been neglected in the past. There has been greater awareness recently of the importance of sampling uncertainty but it is often not appreciated that a number of different data generating processes (sampling schemes) are possible for the counts in tables formed by binary events and their forecasts, and that any inference about the measures needs to take into account which sampling scheme is in operation. The first part of this presentation examines the implications of different sampling schemes on the uncertainty associated with some commonly used measures such as the hit rate (probability of detection) and threat score (critical success index).

An additional complication affecting sampling uncertainty is that data may have serial dependence rather than the usual assumption of independence. In the second part of the presentation the effect of serial dependence on performance measures is investigated using Markov chain simulation, and illustrated with some rainfall data. Serial dependence is shown to potentially have a greater effect on sampling uncertainty than differences in sampling schemes.