



Verification of extreme events in numerical weather prediction

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Extreme events are a challenge for numerical weather prediction and verification. By definition such events occur rarely, making statistically significant results difficult to obtain. Furthermore, scores tend to degenerate to trivial values in the limit of low rates of occurrence. One way of approaching the problem is to statistically evaluate events which are rare but not extremely so (occurring once or twice a year) using specifically designed scores such as the symmetric extremal dependency score (SEDI), and to study the most extreme events on a case-by-case basis. Results from both methods applied to forecasts from ECMWF's Integrated Forecasting System are discussed. The benefits of probabilistic vs deterministic forecasts of extreme events are illustrated using the potential economic value (PEV) metric. Insights obtained from evaluation of storm events both in the tropics and extra-tropics are presented. The question of scale-dependence of forecast skill in space and time is addressed by applying the Fractions Skill Score on the verification of 24-h precipitation forecasts against gridded precipitation analyses derived from radar, satellite, and raingauge data.