



Bias adjusted precipitation threat scores

F. Mesinger

Earth System Science Interdisciplinary Center, Maryland, USA (fedor.mesinger@noaa.gov)

For appraisals of skill of quantitative precipitation forecasts almost exclusively threat - also known as critical success index - or equitable threat score (ETS), along with the bias score, are used. While there is no confusion as to what information the bias score is giving, there is a problem as to the meaning of the ETS: it can be improved by increasing the model's bias beyond unity. Thus, depending on bias as it does, ETS is neither an overall measure of the skill, nor it is a measure of the model's placement accuracy. Methods have been proposed to account for the impact of bias on threat score (TS) or ETS, so as to arrive at a threat score which given the model's placement performance would have occurred if the model bias was unity. To the extent this "bias adjustment" is satisfactorily done, one ends up with a measure that shows the model's skill in placing precipitation, information clearly of a higher value than that of the ETS. Available bias adjustment methods are summarized, and a new method is proposed that removes a weakness of a method proposed previously by Mesinger and Brill (2004), denoted TSA by Baldwin and Kain (2006). The new method is based on the assumption that the change in the area of hits per forecast area reduced by the area of hits is linearly related to the difference between the observed area and the area of hits. Examples of threat and bias adjusted threat scores obtained by various methods are shown.