Reply

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18 July 1991 and 5 August 1991

The arguments set forth by Murphy (1991a), regarding the desirability of expressing forecasts of rare and severe events (RSEs) in terms of numerical probabilities, are not theoretical in nature; on the contrary, they are arguments based on pragmatic considerations. Probabilistic forecasts are more useful than nonprobabilistic forecasts, and experience has shown that the uncertainty inherent in weather forecasts generally can be quantified reliably and skillfully by objective or subjective methods. Moreover, a probabilistic format for forecasts of RSEs provides a means of overcoming several practical problems—for example, overforecasting and the confounding of the roles of the forecaster and user of the forecasts—that frequently arise when forecasts are expressed in a traditional nonprobabilistic format.

Schultz (1991) raises a question about the interpretation of probabilistic weather forecasts. All proper forecasts—including probabilistic forecasts—necessarily relate to specific events. To define these events, it is necessary to specify their spatial and temporal domains. Precipitation probability forecasts are defined as forecasts of the occurrence of measurable precipitation at specific points (or at any given point) in a forecast area during particular time periods (usually 6 or 12 h in length). In the case of tornado forecasts, it seems reasonable to define the event as “one or more tornadoes in a specified area during a given time period” (e.g., see Murphy and Winkler 1982). An area definition for forecasts of tornado events seems appropriate, since it is frequently not possible for forecasters to distinguish between different points in an area when formulating their severe weather forecasts (as noted by Schultz). The dimensions of the area presumably depend upon considerations such as the predictability of the events on small spatial scales, as well as on the relative utility of forecasts defined on different scales (most users will prefer area forecasts that are defined for relatively small areas).

From an operational point of view, it would indeed be desirable to standardize the size of the area for which the events are defined. Such a standardization would simplify the processes of formulating and utilizing the forecasts. In general, the probability of an event increases—and the utility of the forecast to individual users decreases—as the size of the forecast area increases.

For a discussion of issues related to the definition, interpretation, and verification of point and area precipitation probability forecasts, the reader may also want to consult Murphy (1978) and some of the references cited in Murphy (1991b).

REFERENCES


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