

Value of Weather Forecasts under Cost-Loss Ratio Situation

Woo - Jin Lee

Korea Meteorological Administration

ABSTRACT

The skill scores of the weather forecasts are formulated in terms of the expenses under various decision making situations. These measures are dependent on the decision maker's interest which are characterized by the cost-loss ratio (α). The skill scores are applied to the hypothetical and real sets of weather forecasts.

The analysis with the hypothetical sets of weather forecasts shows that the skill score of categorical forecasts is less than or at best equal to that of probabilistic forecasts for any values of α . If probabilistic forecasts are completely reliable, the skill score is sensitive to the resolution of probabilistic forecasts for α near zero. The Brier skill score, a typical measure of probabilistic forecasts, have a deficiency in representing the economic value of probabilistic forecasts. The Brier skill score overestimates the economic value of probabilistic forecasts for α near zero and 1, and underestimates for α near 0.5.

The analysis with a set of probability of precipitation forecasts from a statistical model reveals that contributions by the atmospheric science, the operations research, and the statistical analysis are equal on the increment of the economic gain from probabilistic forecasts.