

Comments on "Extended-Range Forecasts with the GISS Model of the Global Atmosphere"

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I have the distinct impression, on reading the recent paper by Druyan *et al.* (1975), that an excessively generous standard of skill is being applied there. The important point is the definition of skill, about which we can agree only that skill is the incremental accuracy of the forecasts above what is achieved by some appropriate control forecast. A simple combination of persistence and climatology (such as persistence expectancy) comes immediately to mind. Since the derivation of the combination would be burdensome, most of us would accept the tougher of the above two as fair enough. At short range the choice would be persistence and at extended range, climatology. The cross-over point would depend on the element predicted.

Let us now examine the controls evidently used by Druyan *et al.*

1) With respect to temperature and zonal wind, persistence is used all the way out to 14 days. Ought not climatology to have been examined after the first few?

2) For time-mean sea-level pressure and 700 mb height, how about persistence for the first week?

3) In the discussion of the data in Table 1, skill is evidently attributed to the model for forecasting better than the worst it is capable of.

4) With respect to precipitation forecasts in the United States, the control seems to be chance, given the number of points (say, percentage of area) over which precipitation fell and the number of points it was predicted to fall. There seems to be no reference to the strong variability of the climatological frequency of precipitation in the United States, and it would probably be easy to devise a control forecast more difficult to beat. This objection aside, skill seems to be claimed in a number of instances in which the number of correct points exceeded the random number by 1 or 2. (One-tenth inch of precipitation in 24 h seems an inappropriate threshold for heavier values; the quantitative precipitation unit at NMC starts at 0.25 inch.)

It may well be, as the authors argue, that numerical predictions of this type constitute useful guidance to the forecaster, though this value is difficult or impossible to measure quantitatively. But in this event, is it not fair to attribute the utility at least as much to the art of the forecaster as to the "skill" of the guidance? Use in the operational mode would seem to be the appropriate way of forming a judgement of this value.

REFERENCE

Druyan, L. M., R. C. J. Somerville and W. J. Quirk, 1975: Extended-range forecasts with the GISS model of the global atmosphere. *Mon. Wea. Rev.*, **103**, 779-795.