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Shorter contribution

Testing of an operational statistical forecast guidance system

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Clarke (1978) suggests that 'the creation of an Australian counterpart (to the United States's MOS system) . . . will perhaps best be done at the regional level to meet regional problems'. Following Clarke's (1978) philosophy Stern's (1980) pilot system for the prediction of all the elements contained in a public weather forecast (see also Stern and Dahni 1981) was adapted and modified to the operational requirements of the Victorian Regional Forecasting Centre (RFC) in Melbourne. The methodology of the pilot system was preserved in its adaptation to the real-time environment. However, extensive changes to its structure were made to achieve generality, minimise data-base maintenance and size, and to allow its operation using an interactive computer — the Victorian Regional Office's TANDEM. This paper has three purposes, namely:

1. to record the fact of the implementation for the first time in Australia of an operational system providing comprehensive guidance for the prediction of all weather elements;
2. to present a preliminary assessment of its performance (restricted to Melbourne temperature estimates), which is given in Table 1;
3. to note that (as far as the authors are aware) the system is the only operational one anywhere based on analogue statistics, that is, with the guidance being derived via statistical analysis of synoptic analogues to numerical prognoses of the broadscale flow.

The assessment suggests:

(a) that even though extensive structural changes were made to the pilot model in the course of its adaptation, its level of performance is preserved in the operational system;
(b) that in providing guidance comparable in skill to that of predictions produced independently of it by the RFC, the system would be of assistance to forecasters;
(c) that the guidance provided is comparable in skill to the MOS forecasts.

The skill of the operational system, as indicated by the performance statistics given, may represent a significant understatement of its potential skill. The pilot model was developed to provide forecasts specifically for the month of October, and the operational system is based upon it. Table 2 suggests a strong seasonal dependence of the operational system's performance level relative to that of the RFC. It is therefore inferred that the development of optimum operating conditions for the operational system, by statistically screening potential predictors on a seasonal or monthly basis, will lead to a reduction of errors and result in the system performing throughout the year (relative to the RFC)

Table 1. An assessment of the performance of the operational system's (OS) minimum and maximum temperature forecasts (combined) for Melbourne (using 1980 data), examining three aspects, namely:
(a) Comparing its performancxe to that of the pilot model (PM) during spring*.
(b) Comparing its performance to that of the RFC over the year.
(c) Comparing its performance to that of MOS over the four mid-season months†.

Verification parameter	RMS error (°C)	Comparison shows significant difference in skill at 5% level (Yes/No)
(a) OS temperature	2.59	No
PM temperature	2.68	
(b) OS temperature	2.76	No
RFC temperature	2.63	
(c) OS temperature	2.85	No
MOS temperature	2.64	

* Data on pilot model only available for spring months.
† Data on MOS (Woodcock, personal communication) only available for mid-season months.

Table 2. An assessment of the relative performance of the operational systems (OS) minimum and maximum temperature forecasts (combined) for Melbourne (using 1980 data) and the RFC forecasts during:
(a) Spring (September, October, November).
(b) Other seasons.

Verification parameter	RMS error (°C)	Comparison shows significant difference in skill at 5% level (Yes/No)
(a) OS temperature	2.59	Yes
RFC temperature	3.02	
(b) OS temperature	2.78	Yes
RFC temperature	2.49	

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in the manner it now performs during spring. This work is proceeding, in addition to the system being extended to other forecast points.

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