854 VERIFYING THE ACCURACY OF EXPERIMENTAL DAY-11 TO DAY-14 WEATHER FORECASTS

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1. INTRODUCTION

In various papers, efforts have been made to explore how new technologies might be harnessed to integrate material from various sources on the web to generate new products.

The specific purpose of the present paper is to provide an update on this earlier work, in particular that work dedicated to generating experimental day-to-day weather forecasts at the 'outer limit' of potential forecast capability, namely, for Days 11-14.

2. BACKGROUND

A "real time" trial of a methodology utilised to generate Day-1 to Day-7 forecasts, by mechanically integrating (that is, combining) judgmental (human) and automated predictions, has been ongoing since 20 August 2005. Since 20 August 2006, forecasts have also been generated for beyond Day-7 (out to Day-10). Since 18 January 2009, forecasts have also been generated out to Day-14.

3. VERIFICATION

Figure 1 illustrates the 12-month 'running' average correlation coefficients (Days 11-14) between forecast and observed minimum temperature and maximum temperature, precipitation probability and precipitation amount, for Melbourne. For most of the period, the highest correlation coefficients (reflecting the most skilful forecasts) were those for maximum temperature. The lowest correlation coefficients (reflecting the least skilful forecasts) were those for precipitation amount.

Correlation coefficients for the four elements averaged about 0.12 during the first year of experimental forecasts to January 2010. However, the forecasts deteriorated in association with the recent La Niña event, to average only about 0.01 during the year to March 2011 before recovering once the event was over to average about 0.14 during the most recent twelve months to December 2012.

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To place the foregoing into perspective, Figure 2 illustrates the 12-month average 'running' correlation coefficients, for the lead times Day 1-4, Day 5-7, Day 8-10 and Day 11-14. As did the Day 11-14 set of forecasts, the Day 1-4, Day 5-7 and Day 8-10 sets of forecasts also temporarily deteriorated in association with the recent La Niña event.

Figure 3 illustrates the 12-month 'running' correlation coefficients, specifically for each of Days 11, 12, 13 and 14, between forecast and observed minimum temperature, for Melbourne. During the most recent twelve months to December 2012, the Day-11 correlation coefficient was an encouraging 0.27, but for Day-14 it was only 0.05.

Figure 4 illustrates the 12-month 'running' correlation coefficients, specifically for each of Days 11, 12, 13 and 14, between forecast and observed maximum temperature, for Melbourne. During the most recent twelve months to December 2012, the Day-11 correlation coefficient was an encouraging 0.30, but for Day-14 it was only 0.06.

Figure 5 illustrates the 12-month 'running' correlation coefficients, specifically for each of Days 11, 12, 13 and 14, between forecast and observed precipitation amount, for Melbourne. It may be noted that the precipitation forecasts were less skilful than those for temperature. To illustrate, during the most recent twelve months to December 2012, the Day-11 correlation coefficient was 0.13, whilst for Day-14 it was 0.12.

Figure 6 illustrates the 12-month 'running' correlation coefficients, specifically for each of Days 11, 12, 13 and 14, between forecast and observed precipitation probability, for Melbourne. During the most recent twelve months to December 2012, the Day-11 correlation coefficient was 0.16, whilst for Day-14 it was 0.08.

4. CONCLUDING REMARK

Lorenz suggested a limit of day-to-day weather forecasting skill out to Day-15. The performance of the experimental predictions during the “real time” trial reported herein suggest that it may not be long before Lorenz’s suggested limit is reached.

Figure 1 The 12-month 'running' average correlation coefficients (Days 11-14) between forecast and observed precipitation probability, precipitation amount, minimum temperature and maximum temperature, for Melbourne.

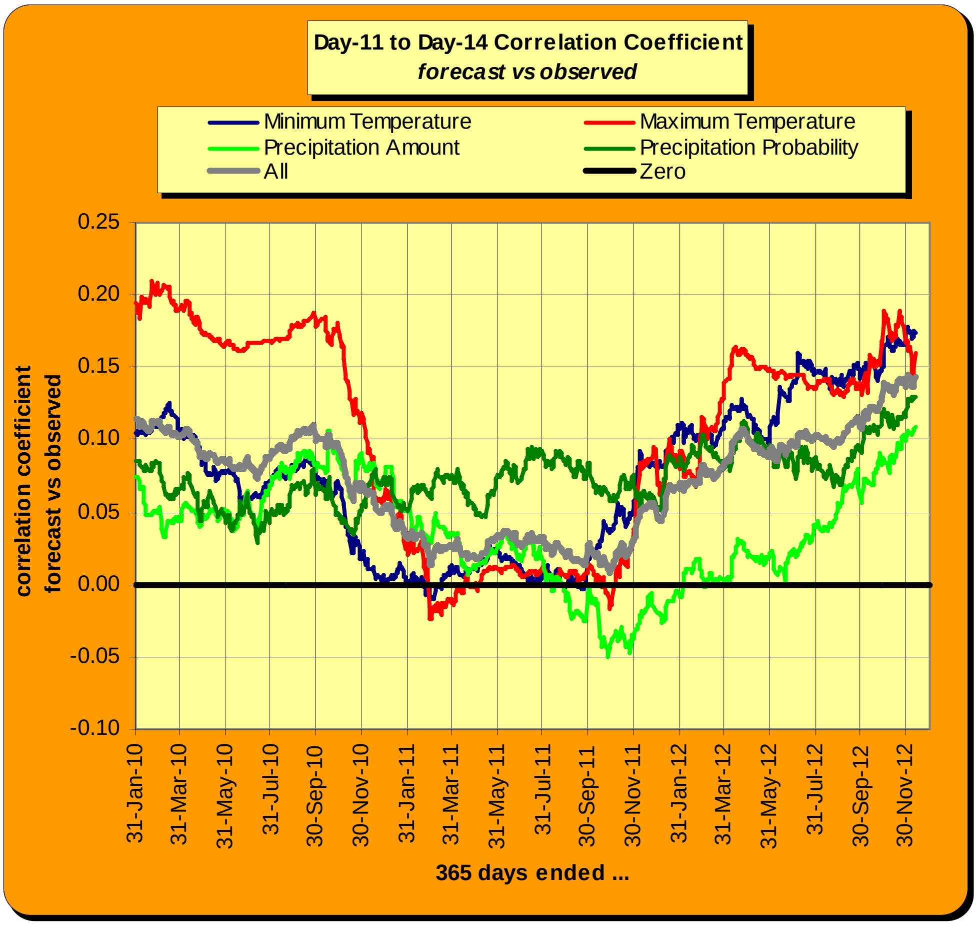

Figure 2 The 12-month average 'running' correlation coefficients, for the lead times Day 1-4, Day 5-7, Day 8-10 and Day 11-14, for Melbourne.

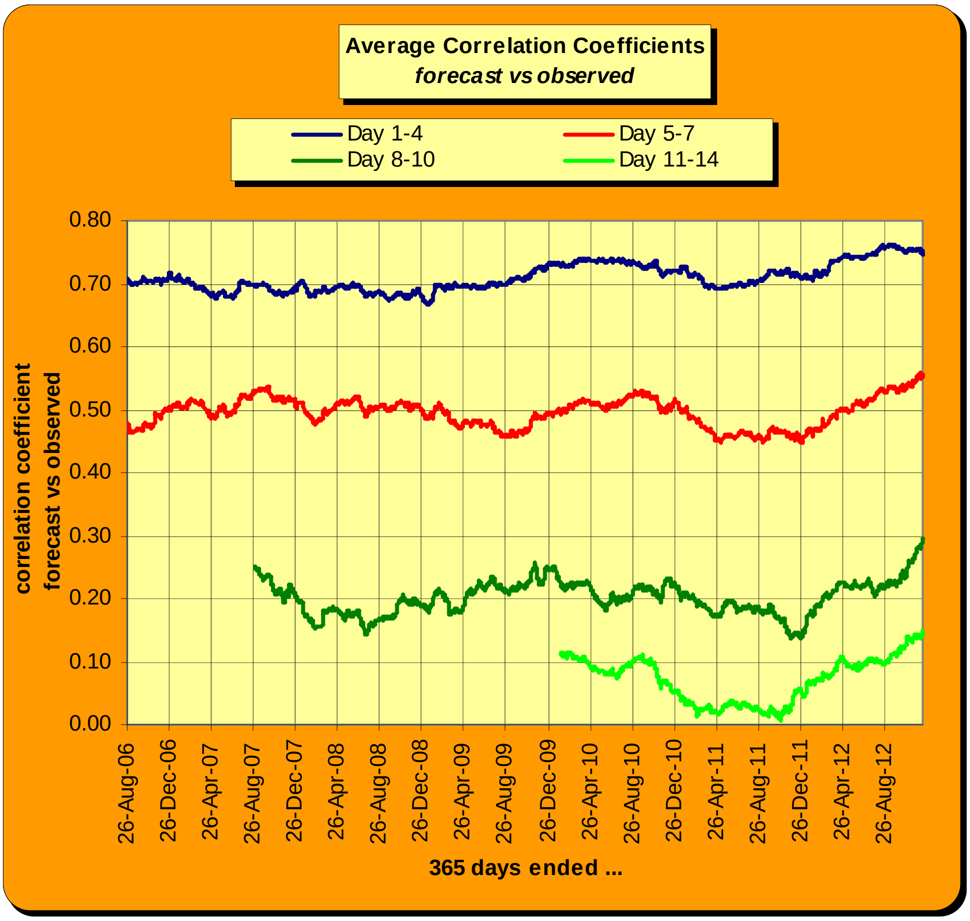

Figure 3 The 12-month 'running' correlation coefficients, specifically for each of Days 11, 12, 13 and 14, between forecast and observed minimum temperature, for Melbourne.

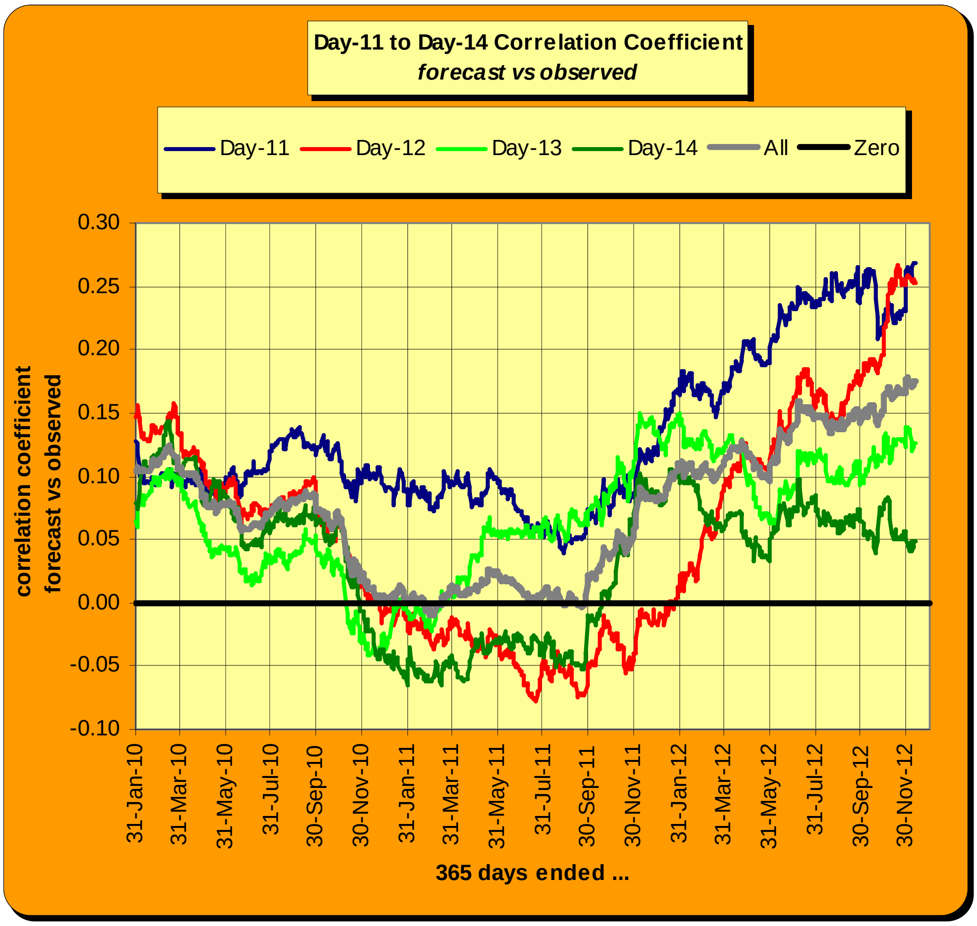

Figure 4 The 12-month 'running' correlation coefficients, specifically for each of Days 11, 12, 13 and 14, between forecast and observed maximum temperature, for Melbourne.

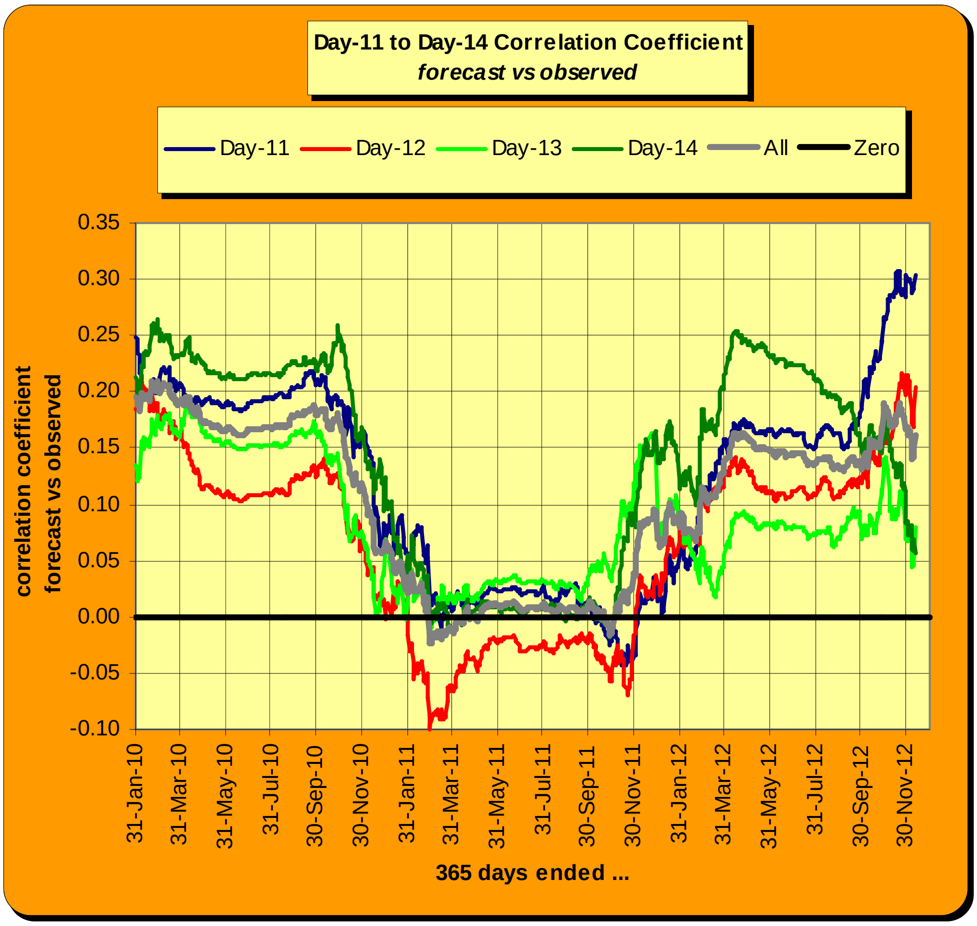

Figure 5 The 12-month 'running' correlation coefficients, specifically for each of Days 11, 12, 13 and 14, between forecast and observed precipitation amount, for Melbourne.

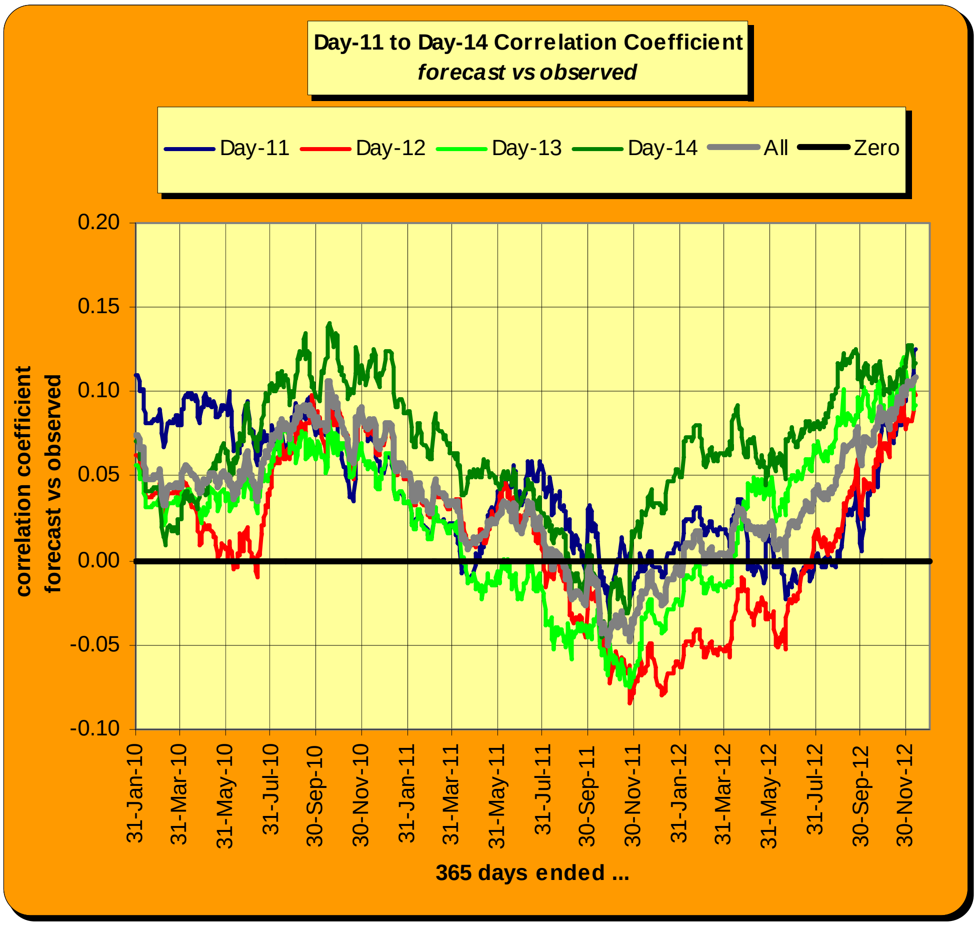

Figure 6 The 12-month 'running' correlation coefficients, specifically for each of Days 11, 12, 13 and 14, between forecast and observed precipitation probability, for Melbourne.