

Extended Forecasting

SOME NEW PROGRAMS IN OPERATIONAL EXTENDED WEATHER FORECASTING

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ABSTRACT

This report examines the accuracy of winter operational forecasts of temperature and wind speed for daily projections of 4 to 9 days, and of 5-day mean temperature for the period 10 to 14 days in advance. The daily forecasts were better than climatology out to about day 9 for temperature and to day 6 for wind. Skill over persistence was shown for the 10 to 14 day mean temperature predictions.

1. INTRODUCTION

Industrial users of weather forecasts have frequently expressed the need for improvement, especially of forecasts in the longer ranges. The gas and electric utility industry is one such user that makes considerable use of climatic and operational weather forecast information. In recent years there has been a steady improvement in the National Meteorological Center's (NMC) 3 to 5 day weather forecasts (2); much of this can be related to implementation of the global spectral model (3). Early awareness of this improvement, particularly in temperature, led to several operational forecast programs conducted primarily for the Washington (D.C.) Gas Light Company (WGL) by Intercon Weather Consultants, Inc. (IWC).

2. NINE-DAY TEMPERATURE AND WIND FORECASTS

The first of these programs, undertaken during the 1980-81 heating season, was for daily projections of 4 to 9 days, where day 1 is the day on which the forecasts are prepared. (The NMC considers day 1 to be the day after forecast preparation.) Weather parameters forecast were daily minimum, maximum and average temperature. Also included were forecasts of average daily wind speed, considered by the gas utility industry to be important with temperature for daily gas sendout. The purpose of this program was to determine the daily limit of skill over climatology and to see whether the extended forecasts had economic value to clients. Forecasts were prepared twice weekly using guidance from NMC's global spectral model run at 0000

GMT. A more detailed description of this program, including procedure, forecast examples and verification, has been described previously (4, 5). The gas control superintendent of WGL found these extended forecasts to be of considerable use in managing the company's gas storage supply, thus leading to an estimated saving of several million dollars to its customers. As a result, this forecast service was continued during the 1981-82 heating season.

Little difference was found in skill of the forecasts between the two winters. Verifications for both heating seasons have been combined and are shown in Figure 1 for temperature and Figure 2 for wind speed. Because of the rather limited data sample, a smoothed version of the skill curve has been added to each graph. It can be seen (Figure 1) that the average daily temperature forecasts had skill to about day 9 when compared with a forecast of climatology.

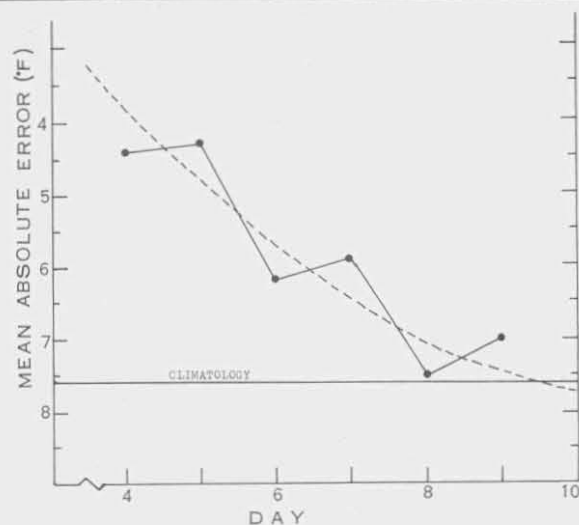


Figure 1. Mean absolute error (°F) for 61 extended temperature forecasts (solid) and smoothed version of skill curve (dashed) for Washington, D.C., December 1980-March 1981 and December 1981-February 1982, for projections of 4 to 9 days. Error produced by a forecast of climatology is shown as a horizontal line.

