U.S. DEPARTMENT OF COMMERCE
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OFFICE NOTE 255

# Practical Predictability

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This is an unreviewed manuscript, primarily intended for informal exchange of information among NMC staff members.

## 1. Introduction

Practical predictability refers to the application of some of the techniques, used in the investigation of the classical predictability problem by Lorenz, Leith, and Smagorinsky, to the assessment of the operational performance of weather prediction models. The results produced may provide useful adjuncts to or extensions of NMC's standard diagnostic and verification programs.

In this paper, we present the results obtained in our preliminary investigations. Specifically, we show: some statistical intercomparisons of the spectral and LFM models; some indication of the greater differentiation of analysis differences admitted by comparing dynamically significant terms rather than just basic fields; some statistics on the growth of error in spectral model forecasts; and finally, some examples of pseudo-statistical dynamic forecasts.

## 2. Statistical Comparison of the LFM and Spectral Models

The LFM and Spectral models are routinely integrated twice each day. The forecasts produced by the models differ for a number of reasons. The data-base available is different because the forecasts are initiated at times that differ by about 2 hours. The more complete data set available to the Spectral model is analyzed by the use of Hough functions and is global in its extent. The LFM analysis is produced by the method of successive corrections and extends over only North America. Finally, of course, the model formulations of numerics and of physical processes differ in many ways.

In spite of the differences, outlined above, we generally find the model predictions to be largely in agreement. Recently, however, we have noted some marked departures between the forecasts. It is in part to address this fact that we have statistically computed the relationships shown by the

FIG14 96 HOUR FORECAST ERROR

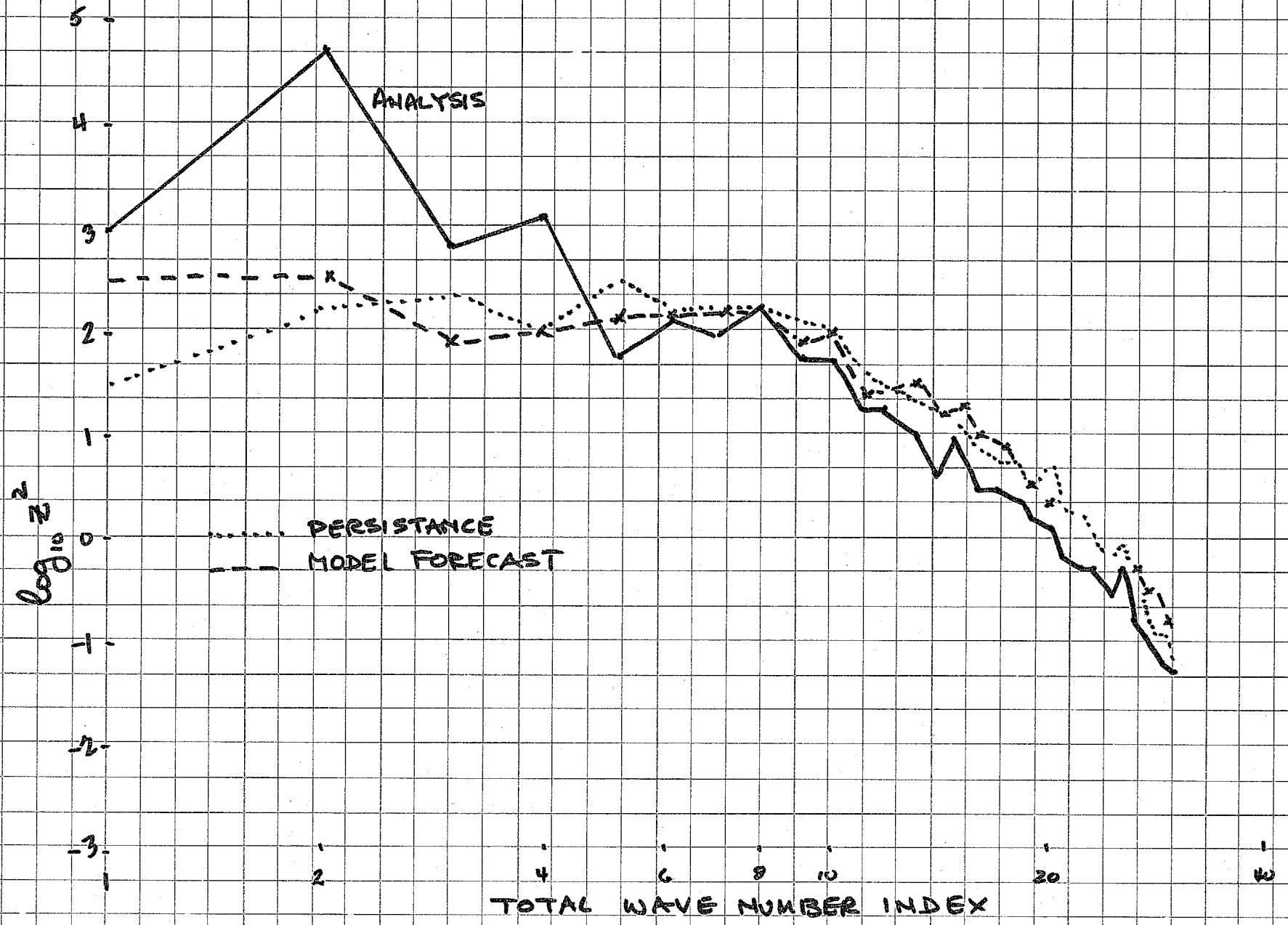


FIG 15 192 HR FORECAST ERROR