



Error growth characteristics from operational forecasts

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Forecast errors are due to both model errors and errors in the initial state. The determination of the relative importance of these error sources has significant implications for the design and improvement of the forecast system. Many studies that have attempted to determine the dominant error sources are based on the assumption that model error and initial error exhibit significantly different error-growth characteristics (e.g., exponential growth for initial errors, linear growth for model errors). However, error growth characteristics can be quite sensitive to the error metric. In this study, the characteristics of operational forecast error growth and forecast difference growth are examined and compared. Forecast differences are used to explore the validity of assumptions about the nature of internal error growth. These diagnostics are examined in terms of spatial scale and vertical level, and the relative importance of errors in the mass and wind fields is explored. The relationships between these diagnostics and “drift” and “shadow” calculations are addressed as well.