ABSTRACT

Forecasting the areal extent of dense fog is of great importance to the aviation, ground and marine communities as it can result in delayed operations, damage and injury causing losses of millions of dollars each year. Therefore, fog forecasts for large areas are critical to many users and often result in the issuance of special weather statements after significant fog has formed or is expected to occur.

Despite the use of numerical model output and sophisticated mesoscale models, improved forecasting of fog and its areal extent remain elusive. Attention has instead focused on the development of site specific climatologies, checklists and fog typing forecast schemes. Given the National Weather Service's modernization efforts and mesoscale emphasis, improved forecasts of fog formation and its areal extent are needed.

A methodology is presented to improved these forecasts by considering fog impacts, climatology and physiographic factors in relation to the dynamic-synoptic regime. To illustrate the method and assess its usefulness a case study is presented for 6-8 March 1994 for the central gulf coast. The hindcast dynamic-synoptic analysis indicated that periods of significant fog developed first as a localized radiative event and then developed into a widespread advective-radiative event with upslope and sea-fog contributions. Reductions in visibility were often quite varied across the region during the event.

An appreciation of the fog's formation and evolution through application of the method described would have provided more specific predictions of the fog's mesoscale distribution and formation mechanisms. The results of this study would suggest that further efforts concentrate on the development of forecast techniques that would better evaluate the formation and areal extent of dense fog.