

## Evaluation of Turbulence Prediction over Washington, D.C.: Comparison of DCNet Observations and North American Mesoscale Model Outputs

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**Abstract :** Atmospheric transport of hazardous materials in urban areas is increasingly under investigation due to the potential impact on human health and the environment. In response to health and safety concerns, several dispersion models have been developed to analyze and predict the dispersion of hazardous contaminants. The models of interest usually rely on meteorological information obtained from the meteorological models of NOAA's National Weather Service (NWS). However, due to the complexity of the urban environment, NWS forecasts provide an inadequate basis for dispersion computation in urban areas. A dense meteorological network in Washington, DC, called DCNet, has been operated by NOAA since 2003 to support the development of urban monitoring methodologies and provide the driving meteorological observations for atmospheric transport and dispersion models. This study focuses on the comparison of wind observations from the DCNet station on the U.S. Department of Commerce Herbert C. Hoover Building against the North American Mesoscale (NAM) model outputs for the period 2017-2019. The goal is to develop a simple methodology for modifying NAM outputs so that the dispersion requirements of the city and its urban area can be satisfied. This methodology will allow us to quantify the prediction errors of the NAM model and propose adjustments of key variables controlling dispersion model calculation.

**Keywords :** meteorological data, Washington D.C., DCNet data, NAM model

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