

A DYNAMIC AIR POLLUTION PREDICTION SYSTEM FOR CAPE TOWN, SOUTH AFRICA

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The Dynamic Air Pollution Prediction System (DAPPS) is a joint research and development project among five South African organisations aimed at developing an air pollution predictive system by combining a prognostic mesoscale meteorological model, a photochemical dispersion model and a comprehensive emission inventory. DAPPS is being implemented in metropolitan Cape Town. Source emission types include industrial, petrol and diesel powered motor vehicles, domestic wood and paraffin burning and biogenic emissions from the natural environment. An emission inventory captures the chemical, spatial attributes and temporal attributes of these sources. The Penn State/UCAR MM5 mesoscale model, nested to 3 km, is used to predict gridded 12 hour, 24 hour and 36 hour meteorological fields. Emission scenarios are compiled for typical weekdays, Saturday and peak holidays, and Sunday. These data, with daily-predicted meteorological data, are input to the Comprehensive Air Quality Model with Extensions (CAMx) to estimate air pollutant concentrations over the metro area for the following day. Forecast information is conveyed with an Air Pollution Index (API) via a web site. The API is based on the health risk of exposure to combinations of pollutants. A Haze Index (HI) is used to convey forecast visibility degradation or atmospheric haze, based on the concentrations of haze precursors at various levels in the near-surface layer. The information generated by DAPPS can be used to manage activities impacting on air quality and to assess development options. It will allow individuals to manage activities with a knowledge of expected air quality and related health issues.