



Urban Air Quality Forecasting in Canada

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Environment and Climate Change Canada has been providing air quality (AQ) forecasts for major Canadian urban centers since 2001. Over this period, the Canadian AQ Forecast Program has expanded and evolved. It currently uses the Regional Air Quality Deterministic Prediction System (RAQDPS) modelling framework. At the heart of the RAQDPS is the GEM-MACH model, an on-line coupled meteorology–chemistry model configured for a North American domain with 10 km horizontal grid spacing and 80 vertical levels. A statistical post-processing model (UMOS-AQ) is then applied to the RAQDPS hourly forecasts for locations with AQ monitors to reduce point forecast bias and error. These outputs provide the primary guidance from which operational meteorologists disseminate Air Quality Health Index (AQHI) forecasts to the public for major urban centres across Canada. During the 2015 summer Pan Am and Parapan Am Games, which were held in Ontario, Canada, an experimental version of the RAQDPS at 2.5 km horizontal grid spacing was run for a domain over the greater Toronto area. Currently, there is ongoing research to develop and assess AQ systems run at 1 km resolution.

This presentation will show analyses of operational AQ forecast performance for several pollutants over the last few years in major Canadian urban centres such as Toronto, Montreal, Vancouver, Ottawa, and Calgary. Trends in observed pollution along with short- and long-term development plans for urban AQ forecasting will also be presented.