# Evolution of the Canadian Operational Air Quality Forecast Systems: Addressing Today's Needs and Preparing for Tomorrow

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The current suite of operational tools supporting Environment and Climate Change Canada's air quality forecast program is known as the Regional Air Quality Deterministic Prediction System (RAQDPS). As of 2016, this system uses the GEM-MACHv2 model in a 10km limited-area configuration over North-America to produce 48-hour forecasts of hourly concentration fields of $O_3$, $PM_{2.5}$, $NO_2$, and other pollutants, twice daily. Other operational subsystems include the emission pre-processor, statistical post-processing, surface analysis, a verification system and various products and dissemination streams. In addition, a twin system known as FireWork that includes estimated wildfire emissions is operated during the fire season (April to October).

The current system is designed to support the Air Quality Health Index (AQHI) program. The evolution of the operational air quality systems are closely linked to progress in air quality modelling science, but also to the evolution of operational weather modelling systems and computing capacity. From an end-user perspective, changes are also occurring as to how relevant air quality information is accessed, and what role third parties are playing.

A global description of the RAQDPS will be provided, along with a discussion on performance based on operational verification. Future perspectives for the operational systems will be discussed.

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