Lessons Learned from the High-Resolution Air Quality Forecasting Demonstration During the 2015 Pan Am Games

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During the 2015 Pan Am Games, ECCC showcased the development of high-resolution versions of their air quality model and objective analysis (OA) tool, both at 2.5-km horizontal grid spacing. The combined model and OA tool enabled real-time predictions and analyses of pollutants at fine scale across the Greater Toronto Area. The resulting products were used by forecasters to inform decision-making for outdoor sporting venues during the Games. This presentation will summarize the development of the high-resolution version of the GEM-MACH model for the Pan Am Games, its performance during the Games, and lessons learned from the real-time forecasting experience. One case study will be presented highlighting the impact that the lake-breeze circulation has on forecasts for ozone over a large coastal city such as Toronto. Ongoing reruns of GEM-MACH for the Games period will also be highlighted, and current comparisons will be presented of predictions with observations for data collected by the CRUISER mobile laboratory along selected roadways and during the case study periods. Preliminary GEM-MACH simulations that include two-way feedbacks between chemistry and meteorology will also be showcased, illustrating how aerosol in an urban location can impact surface temperature and the local wind circulation.