

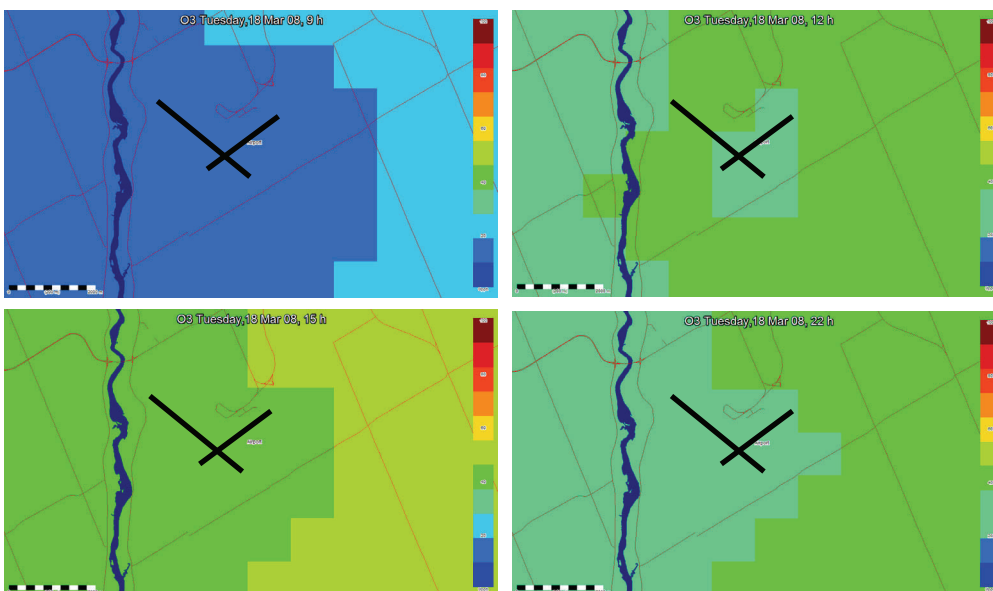


New Technologies for Airport Air Quality Mapping and Forecasting

A-MAPS Environmental is introducing new Air Quality monitoring approach to Canadian Airports. By application of satellite remote sensing technologies in combination with local National Air Pollution Surveillance (NAPS) and weather records, air and ground traffic data hourly concentration levels can be mapped of major air pollutants (NO_2 , NO , CO , O_3 and $\text{PM}_{2.5}$) within and around the airfield area. No costly Air Quality monitoring equipment and on site measuring programs are needed.

The Air Quality data can be displayed, manipulated and analysed (averages, maxima, histograms, correlations etc) through an **Interactive Graphical Interface**. Results can be presented as time series as well as in GIS mapping and tabular formats. Moreover, changes in air traffic and ground transportation can be simulated, to predict and display **health impacts** with respect to the air and ground traffic emissions. The interface can be installed as a standalone or as a web application.

This innovative Air Quality monitoring approach has been developed in cooperation with Ontario Ministry of the Environment, University of Waterloo and European Space Agency. Validation of this approach in terms of accuracy of the retrieved air pollutant concentration levels resulted in well acceptable error estimates: 10% for the real time observations and 30% for the forecasts.



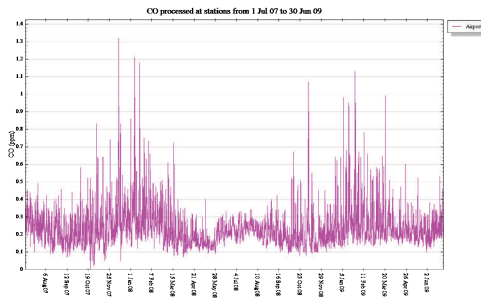
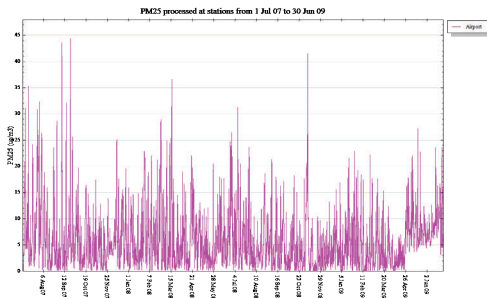
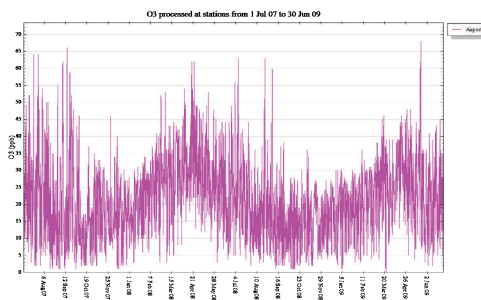
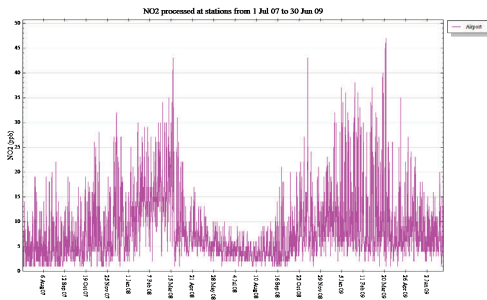
Four examples are showing ozone concentration levels between 9 am and 22 pm during a winter day at the Ottawa International Airport and in the neighbouring areas.

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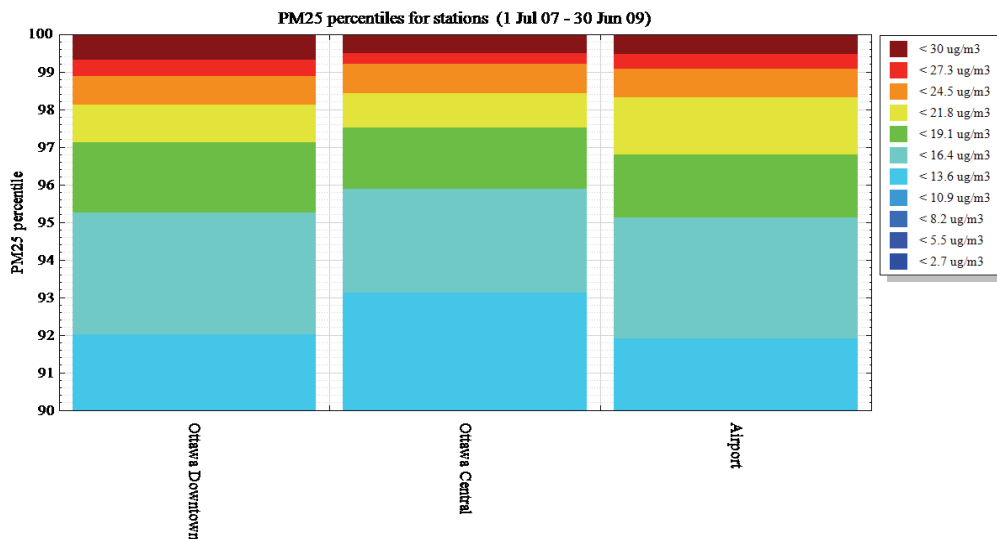
Examples Airport Air Quality Mapping and Forecasting



Time series:

NO₂, O₃, PM_{2.5}, AND CO CONCENTRATION LEVELS FROM JULY 2007 TO JULY 2009 AT THE **OTTAWA INTERNATIONAL AIRPORT**

Hourly fluctuations of the pollutant concentrations were derived from satellite observations and NAPS records.



Histograms:

PM_{2.5} CONCENTRATION LEVELS FROM JULY 2007 TO JULY 2009 AT THE **OTTAWA INTERNATIONAL AIRPORT**

Percentile pollutant distributions at the airport site are compared to the distributions in central and downtown Ottawa.