Criteria pollutants and meteorological parameters automatic monitoring in boundary sites under QA/QC standards

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MILAGRO, an extensive air quality monitoring campaign, was conducted in the Mexico City Metropolitan Area (MCMA) during March 2006, in order to assess the air pollutants transport and their influence at regional and global scales.

In support of this campaign a number of criteria pollutants and meteorological parameters measurements were conducted in boundary sites of the MCMA in order to determine the surface conditions in these transition sites.

Methology

The boundary sites were selected based on results from previous studies, information provided systematically by the Mexico City Ambient Air Monitoring Network (Sistema de Monitoreo Atmosférico - SIMAT), pollutants trends and meteorological and climatic factors that participate in the dispersion and transport under different ventilation scenarios. It is worth to mention that the site selection was determined by consensus among researchers and meteorologists participating in the MILAGRO. Seven mobile units and two fixed stations were deployed for the continuous determination of criteria pollutants and meteorological parameters. The participating institutions were the Environmental Secretariat of the Federal District Government (GDF), the Environmental Secretariat of the State of Mexico Government, the Institute of Ecology of the State of Guanajuato, the Environmental Protection Agency of the of State of Nuevo Leon, the Ecology Council of the State of Hidalgo, the Sustainable Development Secretariat of the State of Queretaro, the National Autonomous University of Mexico (UNAM) and the National Institute of Ecology.

In order to warranty the pollutants concentrations measurements' quality and comparability, personnel from the SIMAT were in charge of all the calibrations at the designated monitoring sites (Table 1).

Data management consists of a First Level validation that includes the elaboration of automatic filters for out-of-range values and the designation of manual flags considering the trends of the measured parameters, operation logs and calibration reports.

It is worth to mention that the data handling methodology was reached by consensus among representatives of the UNAM's Atmospheric Sciences Center, GDF's SIMAT and the National Institute of Ecology. Data is being analyzed with statistical tools and comparisons are made against nearby SIMAT stations in order to advance to the next validation stage.

Conclusions

1. Ozone 1-hour average concentrations measured at the boundary sites are higher than those found in the urban SIMAT monitoring stations.
2. There are not significant differences in relation to CO measurements between the boundary sites and the SIMAT monitoring stations.
3. Atizapan airport, Avila Camacho and Corena sites presented 1-hour averages of NO2 concentrations similar to the SIMAT monitoring stations.
4. Despite the fact that the 1-hour averages SO2 concentrations presented similar values in all the sites, there were recorded episodes of concentrations higher than 100 ppb in all the boundary sites located in the north of the MCMA.
5. The highest PM10 average concentrations was recorded in Colegio Aleman and was due to the influence of a local source, soil movements of a nearby mall construction.