Air Quality
Sensors
Part 2

Findings from the 2013 EPA Air Sensors Workshop

This is the second of a two-part series of articles reporting on findings from the U.S. Environmental Protection Agency’s (EPA) workshop, Air Sensors 2013: Data Quality & Applications.

The workshop, Air Sensors 2013: Data Quality & Applications, was the third in a series of next-generation air monitoring workshops and brought together representatives from EPA, academia, sensor developers, community environmental advocacies, citizen citizens, and state and regional air quality offices.

In part one of the series (published in the January 2014 issue of EM), the articles described the goals of the EPA and its next-generation air monitoring research, an introduction to emerging technology, sensor data handling considerations, and quality assurance options relative to sensor calibration. Part 2 presents findings and discussions on five critical topics discussed at the workshop:

1. Procedures and concepts of laboratory-based sensor performance evaluations;
2. The role and opportunity of citizen science involving air quality sensors;
3. Understanding data quality and its application for correct sensor use;
4. Key considerations in the development of sensor data clearinghouses; and
5. Regulatory considerations in the selection and use of air quality sensors.

In the first article, Long et al. share EPA’s perspective on how

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one might conduct sophisticated laboratory-based sensor performance characteristics. Framed around well-established Federal Reference Method (FRM) guidelines, the described procedures offer an insightful description of how one might examine lower cost sensors and establish such traits as detection limits, response times, and precision.

In the second article, Rebecca French shares great insight on the opportunities, issues, and solutions for citizen science air quality monitoring. Citizen science opportunities are rapidly expanding and the author provides examples of approaches that are being used to integrate citizens and communities in environmental awareness research.

Next, Dye et al. provide practical wisdom on how one should approach low-cost sensor data when applying this information to real-world environmental air quality issues. The authors point out the role data quality might play in various sensor scenarios, ranging from research to environmental awareness, hot spot identification, personal exposure monitoring, and environmental justice.

Next, Philip M. Fine and Andrea Polidori indicate that the development of common sensor information access points (or clearinghouses) is one of great potential benefit to both sensor users and developers. They describe the value of such clearinghouses where shared information about topics such as citizen science study designs and sensor performance and capability statements could be made publically available.

Lastly, Robert Judge and Chet Wayland provide a framework to this whole discussion relative to what state and federal regulators must know about data quality. They define the tremendous opportunities that air quality data from these sensors might provide, as well as the issues they present to all parties if the quality of the data being generated by such sensors is unknown.