

BNA Snapshot
Enforcement Technology

Key Development: Big data can lead to a “next generation” for environmental enforcement with better monitoring and reporting.

Impact: EPA is making electronic reporting the default in its rules.

What's Next: Cheaper sensors will make citizen monitoring more widespread, experts forecast.

By [Robert Thomason](#)

Oct. 22 — Using information technology to analyze large amounts of data from dispersed sources can lead to a “next generation” for environmental enforcement, Cynthia Giles, the Environmental Protection Agency assistant administrator for enforcement and compliance assurance, told a conference on “big data.”

Advanced monitoring of pollution is becoming more prevalent and less costly, she said. The data can be reported electronically once they are collected. In turn, the large amount of data can be analyzed to determine the areas that need more enforcement efforts, she said.

But Giles also said that increased transparency can lead to greater compliance and that regulators can make better use of the large amount of data to develop innovative new forms of enforcement. Giles made her points at an Oct. 22 conference on big data, a phrase that refers to large volumes of raw and unorganized data. The conference, “Big Data: A Game Changer for Environmental Managers, Advocates and Regulators,” was sponsored by the [Environmental Law Institute](#).

Giles described less expensive forms of monitoring that can provide real-time data about air and water quality to a wide variety of users. Companies and citizens alike are using small devices to make readings of various pollutants. Cell phone technology enables the devices to send out the readings immediately, and they can be reported in intervals of 15 minutes or less.

“It used to take a year to know what your pollution is,” Giles said.

More Citizen Data

Big data is becoming big, in part, because of the increase in the number of people with electronic devices.

A new class of users is the cadre of citizens monitoring air or water quality. Prior to Giles's remarks, Stephen Harper, director of environment and energy policy for Intel Corp., said his company has developed a small device that can fit on a backpack and test air quality.

He said 75 of these devices were used in Portland, Ore., to document poor air quality conditions.

However, Harper said these devices are not “regulation-ready,” meaning the less expensive models don't have the necessary precision to make legal cases.

When asked about the gap between citizen monitoring and the needs of government regulations, Giles said that the introduction of monitoring devices in the hands of laypersons gives a company the incentive to install its own, more accurate monitoring devices.

But Giles also said the EPA uses citizen data of this type as a screening device to assess whether a more vigorous examination is needed. In Buffalo, N.Y., for instance, citizens used monitoring

devices to bring benzene levels to the attention of the EPA, she said, which followed up on the citizen reports and found air quality issues.

Big data is more than numerical tables, and one of its forms is video. Giles showed a YouTube-style video of a company doing lead paint removal work without proper precautions. The particular video she presented had numerous, detailed and technically relevant comments on the violations being shown, and the EPA was able to initiate an investigation of the violation based on the video.

“Video is the compliance tool of the future,” Giles said.

Electronic Reporting

Once a large amount of data is collected, it should be made available in usable electronic form, Giles said. She said electronic submission is now becoming the default reporting mechanism of the EPA's rules.

But for many older operations, she said, paper reporting is still the norm. Increasingly, “smart tools” are able to transmit the data electronically more efficiently.

Giles said big data aren't the goal of environmental protection but rather a tool. “We need to use data analytics to find problems,” she said. “We need to use data analytics to find the serious violations.”

New York inspectors, she said, had been looking for fire code violations almost at random and were finding violations in only about 10 percent of the sites they visited. After they studied and analyzed data about illegal conversions of property use in the city and fires associated with them, they developed a more productive strategy for this use of their time. By concentrating on illegal conversions, about 70 percent of the sites they visited were found in violation.

Data Across Agencies

Karen Bassett, chief deputy director of the Arkansas Department of Environmental Quality, said it's important to look at various data sources for public policy and government responses. For instance, cleaners and paint shops have to register with the Labor Department but may not yet be in the reporting system of the environmental quality department, which would then contact them, she said.

Also, environmental data can be compared with public health records, matching air quality data with hospital admissions or water quality data with gastrointestinal diseases, according to Bassett.

Bassett said that when a tornado strikes, the state downloads the path and overlays maps of schools, water treatment plants and other facilities that could require rapid emergency response.

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