

6. NCore Sites

The National Core Monitoring Program (NCore) is an EPA initiative to redesign a portion of the National air monitoring network. The existing compliance oriented network is set up with a parameter specific design that is targeted at the relatively high concentrations near the NAAQS. The data from this network is not as accurate at the low levels needed for trends analysis and model validation. The single parameter design is also not well suited to multi-pollutant health studies, integrated model assessment or the analysis of source attribution through comparisons of co-pollutants from sources to receptors.

The NCore program has been designed around approximately 75 sites Nationwide that are sited to represent large urban areas away from significant individual sources. A smaller subset of these sites will be located in rural areas. The NYSDEC in conjunction with EPA Region 2 office has suggested 3 of the NYSDEC monitoring sites for inclusion in this new network. The sites are:

<u>AQS ID #</u>	<u>Site Name</u>	<u>General Location</u>
36-081-0124	Queens College	Located in Kew Gardens in Queens, NYC
36-055-1007	Rochester	Located Southeast of Rochester, NY
36-101-0003	Pinnacle	Located 15 mi. Southwest of Corning, NY

Pinnacle is the only rural site of the three and it was also selected as one of ten pilot NCore sites. This site has hosted monitoring appropriate for the objectives of the NCore program due to its involvement with several research programs so it was well suited to take on the more difficult monitoring parameters required from the NCore monitoring program. SUNY Albany ASRC researchers have been making low level trace gas measurements at this site for the past ten years. Home built analyzers for low level CO and NO_y were employed. These prototype instruments required extensive post sampling data processing. They measured “true” NO₂ using direct photolysis method. Commercially available instruments are used for monitoring low level SO₂, continuous particulate sulfate, and OC/EC particulate carbon. In addition, realtime ammonia data are collected using two different methods—NO chemiluminescence with catalytic conversion, and ion mobility spectrometer. The Queens site which was recently established is preparing to monitor for some of the NCore parameters.

The NCore program is not yet funded and the sites are not expected to be fully operational until January 1, 2011

NCore Monitoring Objectives

- a.) Timely Reporting of Data to the Public
- b.) Support for Development of Emission Strategies
- c.) Accountability of Emission Strategy Progress
- d.) Support for Long-Term Health Assessments

- e.) Compliance
- f.) Support to Scientific Studies
- g.) Support to Ecosystem Assessments

NCore Primary Monitoring Parameters

The NCore sites are required to be sited in conjunction with the PM_{2.5} FRM network, the PM_{2.5} speciation network and the PMcoarse network. These parameters will be supplemented with the NCore specific parameters that currently include NO_y, Low Level CO and Low Level SO₂. NO_y which is defined as the sum of all reactive nitrogen oxides includes NO, and NO₂, and other nitrogen oxides referred to as NO_z. The NCore program requires NO_y monitoring because it is the best indicator of the results from NO_x reduction strategies, it is valuable for ecosystem assessments, it is important for model evaluation and it supports NO₂ estimates for health effects studies.

CO is important to the NCore program because it is used in model evaluation, it is a surrogate for many combustion related pollutants, it is included in health effect studies and it can be used to assess control programs. CO is also monitored under the existing criteria monitoring program but NCore requires more accuracy at lower concentrations and siting that makes the data more representative of wider areas than the existing network.

SO₂ is important for model evaluation because of its role in sulfate formation which is a large percentage of PM_{2.5} mass particularly in the Northeast. SO₂ is also important for some health effect studies and like CO it must be monitored accurately at low concentrations to meet the objectives of the NCore program.

Nitric acid (HNO₃) and ammonia (NH₃) are both compounds of interest in EPA's NCore program but they are not yet required because the sampling methodology is not yet fully developed. Both compounds are useful for model evaluation because of their contribution to PM formation.

Currently trace level SO₂ instruments are deployed at two of the three proposed NCore sites (Queen's College and Pinnacle State Park). Also in operation at the Pinnacle site are a low level CO monitor and a NO_y instrument. The rest of the instrumentation will be deployed over the next two years in advance of the scheduled NCore start date.

7. Acid Deposition Monitoring Network

New York monitors and tests for acid deposition through the New York State Acid Deposition Monitoring Network, which was designed in 1985 to carry out requirements of the State Acid Deposition Control Act (SADCA). Measurements of acid deposition and related quantities are used to assess the effectiveness of sulfur control policy and other strategies aimed at reducing the effects of acid rain. Federal and State programs were implemented in recent years in recent years to further control emissions contributing to acid deposition. These include the NO_x and SO₂ Budget Trading Programs, and the proposed Clean Air Interstate Rule Trading Programs.

The network's objectives are to:

- provide a consistent, quality-assured, long-term acid deposition database;
- measure acid deposition in sensitive receptor areas;
- measure acid deposition in urban and upwind areas;
- use these data to perform spatial and temporal analyses of acid deposition, its precursors, and its effects; and
- track the effectiveness of programs to reduce acid deposition precursor emissions.

The monitoring network consists of 20 sites located throughout the state, in both rural and urban areas. Rainfall measurements are automatically recorded, but for other parameters, samples are collected manually from each site and then transported to our Rensselaer laboratory for the analysis of pH, conductivity, cation and anion concentrations. Ion chromatography is used for the measurement of cations and anions listed in Table 7.1.

Table 7.1 Acid Deposition Target Ions List

Anions	Cations
SO ₄ ⁻ sulfate	Na ⁺ sodium
NO ₃ ⁻ nitrate	K ⁺ potassium
NO ₂ ⁻ nitrite	NH ₄ ⁺ ammonium
F ⁻ fluoride	Ca ⁺⁺ calcium
Br ⁻ bromide	Mg ⁺⁺ magnesium
Cl ⁻ chloride	
HPO ₄ ⁻ hydrogen phosphate	

The following trends charts for selected parameters show the progress made over the years through regulations and effective control strategies.

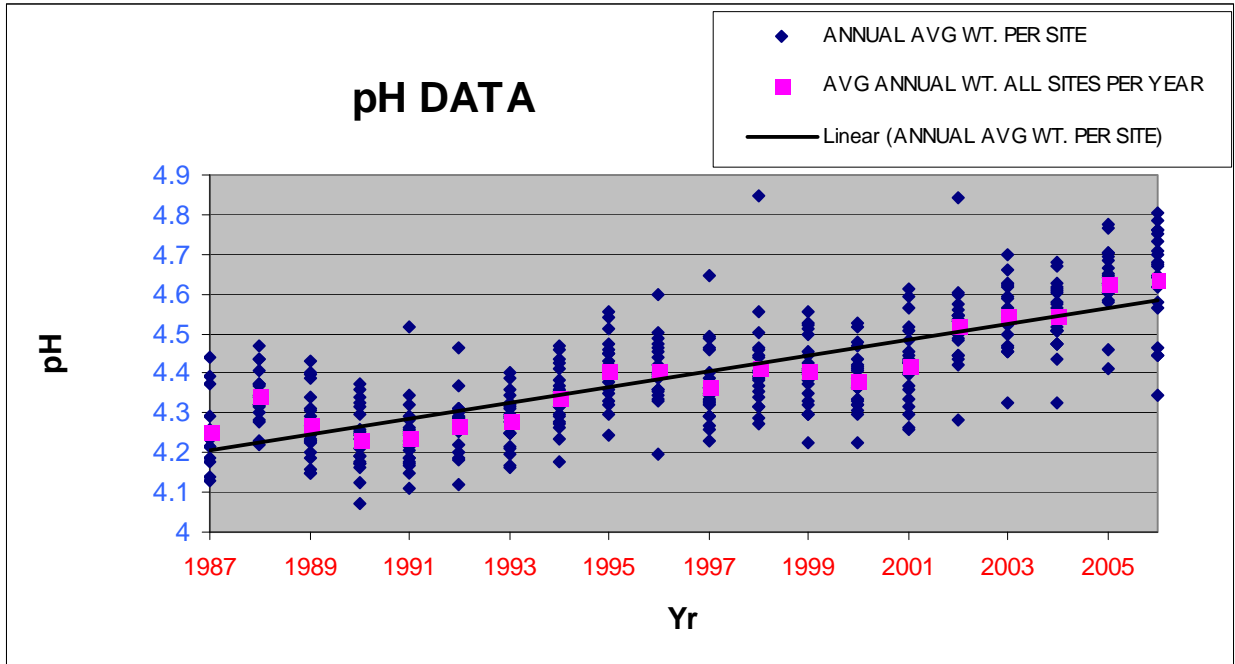


Figure 7.1 Statewide Concentration Trends Chart for pH

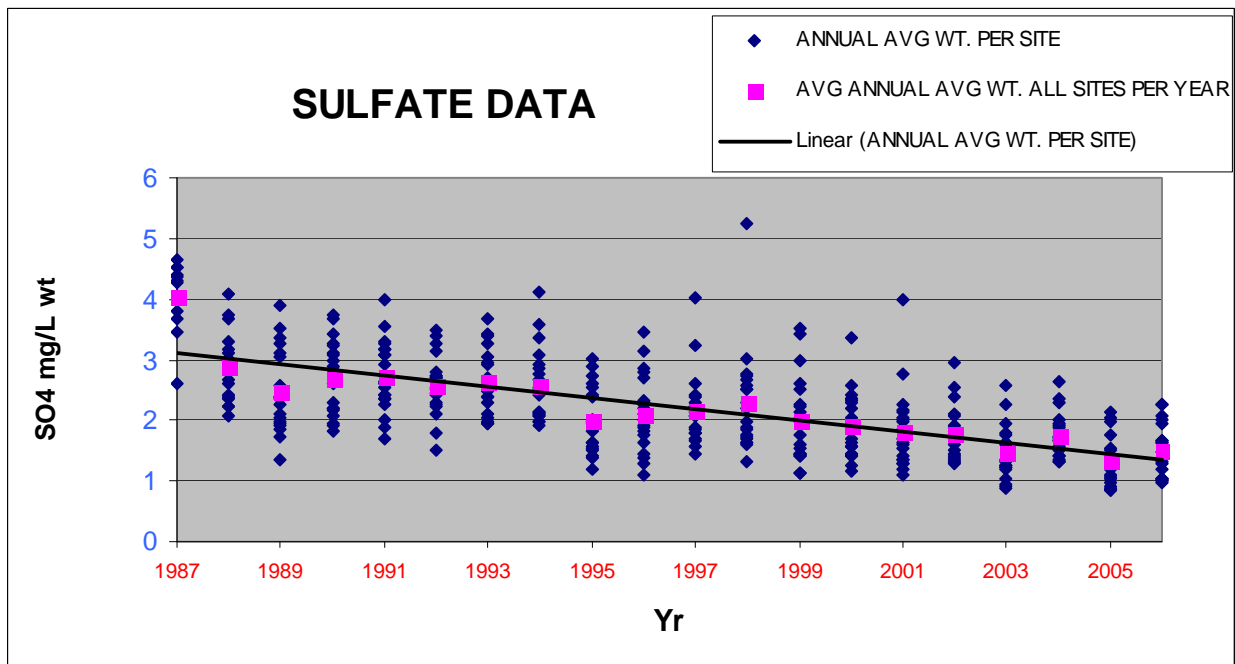


Figure 7.2 Statewide Concentration Trends Chart for Sulfate

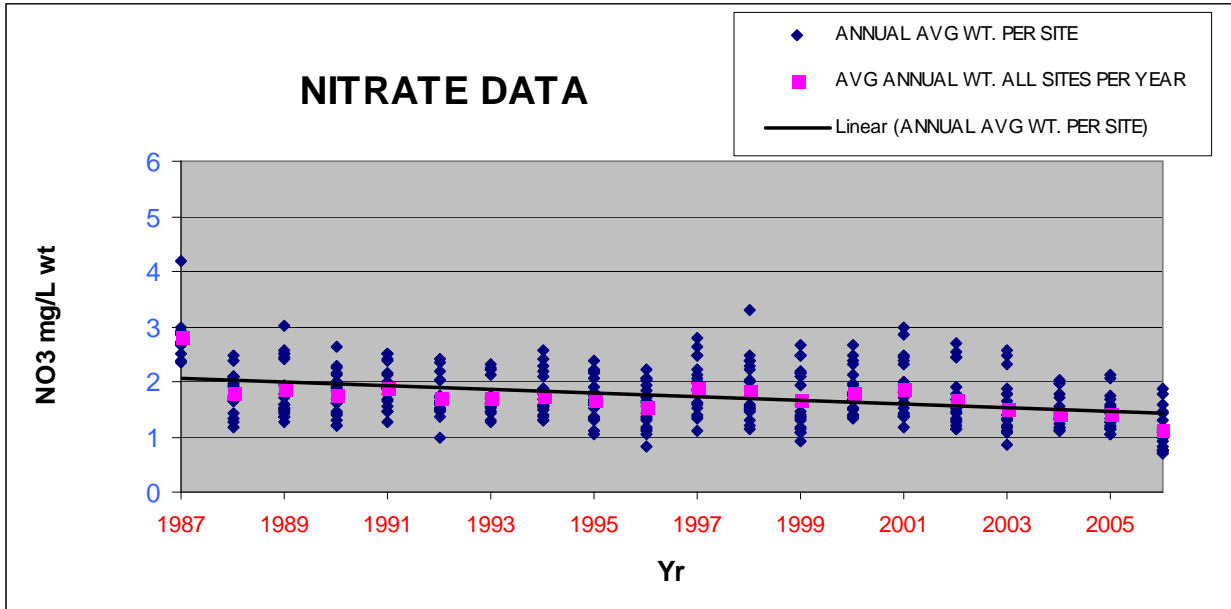



Figure 7.3 Statewide Concentration Trends Chart for Nitrate

The acid deposition monitoring program is entirely funded by State monies. A statewide map depicting the locations of the monitoring sites is provided in Figure 7.4.

 New York State Dept of Environmental Conservation
2009 Ambient Air Monitoring Network

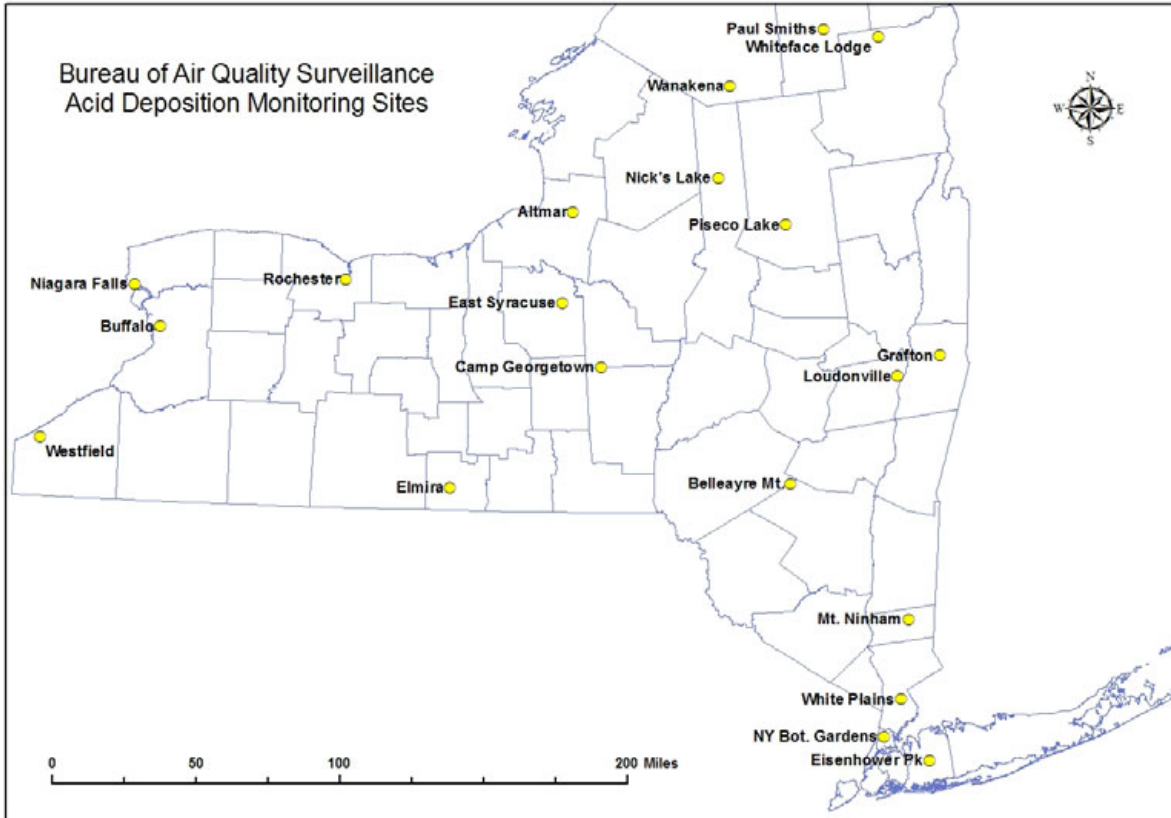


Figure 7.4 Location Map of Acid Deposition Monitoring Sites

8. Anticipated Changes in the Next 18 Months

8.1 Lead Monitoring

The newly implemented lead monitoring rule requires lead monitoring for sources that have the potential to violate the standard, that emit more than one ton of lead per year and to determine population exposure for areas with populations over 500,000. The implementation of the new monitoring requirements is being staged over two years. The EPA is requiring that the source oriented monitors are installed and operational by January 1, 2010 and the population oriented sites by January 1, 2011.

The NYSDEC has examined lead source emissions information and determined that no sources exceeded the threshold of one ton of lead emitted per year. One source located in Orange County was determined to have the potential to violate the standard due to the amount of lead processed at the facility and the past results from nearby ambient monitoring. The NYSDEC will continue to operate the ambient lead monitor that is already operating near that facility.

The NYSDEC will install the required population based lead monitors during calendar year 2010. These monitors will take advantage of the allowance for the submission of PM₁₀ lead data in place of TSP lead data. The NYSDEC acknowledges that the use of a PM₁₀ monitor for lead compliance monitoring will be discontinued and replaced with a TSP monitor if a three month average lead concentration from one of these sites exceeds 0.1 µg/m³.

The EPA has recently discussed the possibility of lowering the threshold at which a source's lead emissions will trigger the requirement for ambient lead monitoring. The NYSDEC will work to determine the accuracy of the lead emissions information for lead sources below one ton per year in the anticipation of a possible change in the lead monitoring rule. It is not likely that any monitoring rule change would affect the monitoring network in the current year. It is likely that a monitoring rule change would be implemented over a one to two year period. This delay is necessary to allow monitoring agencies sufficient time to locate new monitoring sites and to purchase additional monitoring equipment.

8.2 Special Purpose Monitors

As mentioned in previous sections, there are two EPA funded monitoring projects currently in progress. The field measurement portion of the Tonawanda Community Air Quality Study was concluded in July, 2008. A final report is due to be released in the near future, at which time a public meeting will also be held to disseminate the findings to the community. The New York State Ambient Mercury Baseline Study began in January, 2008 with the deployment of the MDN deposition sampling. The Tekran instruments for speciated mercury measurement were field deployed in the fall of 2008 after laboratory evaluation.

8.2.1 Tonawanda Community Air Quality Study

Although the EPA grant period concluded in July, 2008, the NYSDEC has made a commitment to the community to continue sampling at two of the four study sites with State monies for an additional year. Measurements for PM_{2.5}, VOCs and carbonyls will continue at two perimeter sites: Brookside Terrace West, and Grand Island Blvd. Meteorological data will be collected at the Town of Tonawanda Sewer Treatment Plant for the duration of the study. In addition, sampling for PAHs commenced in July 2008 at the Grand Island Blvd. site for a year's duration.

8.2.2 New York State Ambient Mercury Baseline Study

On March 15, 2005, EPA promulgated the Clean Air Mercury Rule (CAMR) which established a cap-and-trade program for the control of mercury and required States to create and submit a State regulation to implement the cap-and-trade program and distribute mercury allocations to affected units. NYSDEC finalized a mercury regulation to satisfy the requirements of CAMR, 6 NYCRR Part 246. Part 246 will achieve a 90 percent reduction from the coal-fired electricity generating units covered by the CAMR in two phases. Compliance with the first cap of 786 pounds per year for New York State begins on January 1, 2010. This study will allow New York State to establish a baseline of speciated mercury compounds in the ambient air and in wet deposition prior to implementing statewide emission control strategies.

NYSDEC was awarded an EPA grant to conduct this study at two existing urban sites: New York Botanical Garden in the Bronx (AQS Number: 36-005-0083), and Rochester (AQS Number: 36-055-1007) for a period of two years.

The Tekran Model 2537A, 1130 and 1135 Mercury Speciation Units are used to measure elemental, reactive gaseous and particle bound mercury species in the ambient air. The wet deposition collector system, manufactured by N-CON Systems Co. Inc., and equipped with a ETI NOAA IV Precipitation Gauge is collocated at each site.

Site preparation was completed and MDN wet deposition sampling began in January 2008. The two Tekran systems were deployed in the field and have been in operation since the fall of 2008. The instruments are sometimes problematic but with significant effort from operational staff, data collection has been acceptable.

8.3 Additional New Monitoring Sites

8.3.1 Rockland County Permanent Site

Final preparations for the establishment of a permanent site in Pomona are nearing completion. Continuous measurements of ozone and fine particulate will be conducted at this site.

8.4 Changes at Existing Sites

8.4.1 Schenectady

A suitable replacement site for the Schenectady monitor will be sought as the trailer that houses the monitoring equipment is deteriorating due to age and weather. The current site is also not as well suited for air monitoring due to nearby trees that have grown up over the years.

8.4.2 JHS 126

NYSDEC proposes that TSP lead sampling at this site be terminated at the end of 2009. The PM₁₀ lead measurements at IS 52 in the Bronx will provide the necessary lead monitoring in New York City as allowed by the new regulation.

8.4.3 Tonawanda

As part of the Community Air Quality Study the instrumentation at the original site located at the Town of Tonawanda Sewage Treatment Plant was moved to the Brookside Terrace West site. At the conclusion of the study, the original site was closed down, and was replaced by the Brookside Terrace site, which is now named Tonawanda II.

8.5 Other Monitoring Activities

8.5.1 Assessing Outdoor Air Near Schools

As part of a new air toxics monitoring initiative, EPA, state and local air pollution control agencies will monitor the outdoor air around schools for air toxics. EPA selected schools after evaluating a number of factors including results from an EPA computer modeling analysis, the mix of pollution sources near the schools, results from an analysis conducted for a recent newspaper series on air toxics at schools, and information from state and local air pollution agencies. The two schools selected in NY are Intermediate School 143 in New York and the Olean Middle School in Olean.

This collaborative study by EPA and DEC is expected to commence shortly where samples of outdoor air near the schools will be collected over 60 days. The air samples will be analyzed for volatile organic compounds (VOCs) at both schools. In addition, toluene diisocyanate (TDI) measurements will be made at the Olean Middle School. Levels of air toxics of concern will be reported and their potential for long-term health impacts will be evaluated. The information obtained will enable us to formulate follow-up actions to reduce levels of pollutants of concern, and to ensure that nearby industries are in compliance with clean air regulations.

8.5.2 Columbia County Air Study

Columbia County is located south of the Capital district and east of the Hudson River. It is primarily rural and residential. Prior to the introduction of the PM_{2.5} regulations, there were several PM₁₀ and TSP monitors located throughout the area. These monitors were discontinued when population oriented PM_{2.5} became the emphasis of particulate monitoring. Columbia county was not represented in the original PM_{2.5} network design.

Citizens and elected officials from the county have expressed concerns that the county was no longer being monitored for particulates. There are several industrial sources located to the west and there is concern that wind borne particulates are affecting residents in Columbia county. Officials approached DEC Region 4 requesting that the Department conduct particulate monitoring. As a result, an air study will be conducted at the Stuyvesant Town Hall, where a temporary shelter will be established. PM_{2.5} survey sampling will take place during the summer of 2009. Wind speed and direction will also be monitored at the site. The results will be made available to the public.

8.5.3 Summer Streets, NYC

As part of Mayor Bloomberg's efforts towards the greening of New York City, an experimental program, "Summer Streets", was held on three consecutive Saturdays in August, the 9th, 16th and 23rd in 2008. A 6.9 mile car-free route in Manhattan from the Brooklyn Bridge to 72nd Street, with connections to Central Park and other open spaces provided New Yorkers unprecedented access to the streets for exercise and exploration. NYSDEC operated a temporary air monitoring trailer at 28th Street and Park Avenue from the beginning of August through the second weekend of September to document the air quality benefits as a result of closing off streets to traffic during this period. The gaseous pollutants ozone (O₃) and oxides of nitrogen (NO_x), as well as fine particulate matter (PM_{2.5}) were continuously measured at this location.

While the short term study indicated a decrease in nitrogen oxides during the car-free hours, the other pollutants measured, fine particulate and ozone, did not show a discernible difference. The reduced NO_x level is a direct result of eliminating all traffic.

Due to the success of this experiment the Summer Streets event will return in 2009, and NYSDEC will again conduct air monitoring during this period.