



The Monitor

For National Park Service
Air Quality Station Operators

SPRING 2004

NETWORK NEWS

DataView 2.0 coming this summer

ARS has made many changes to the DataView application that operators use to service their stations, and expects to release version 2.0 this June. Some changes will not be obvious, but they will make the application stronger and more troublefree for users and administrators. New obvious features of version 2.0 include:

- Reformatting and color has been added throughout to add clarity and speed up navigation.
- A Planner menu has been added to allow for scheduling and managing tasks (one-time or repeated).
- A Planner Reminder is visible upon login, showing scheduled tasks for the next month.
- Contacts is an added option under the References menu. Add your own contact information, including telephone numbers and e-mail addresses, to this list.
- The Alarms screen is separated into Alarms and Power Failures. You may work with these independently.
- The Current Averages screen displays Total Rain measured at the site for the past 7 days, 30 days, 60 days, and 90 days.
- The Station Log option under the Station Documentation menu has two added functions. Print the log by date, or filter displayed entries by log type.
- Checklists and multipoint tests are found on the same Site Visit Checklists screen. Multiple checklist/multipoint screens can be open at the same time and can remain open while other forms are open.
- The Strip Chart screen, under the Data Plots menu, allows saving of custom scales for individual parameters.

DataView 2.0 continued on page 2....

Monitoring network changes for 2004

Several site changes have occurred in the Gaseous Pollutant Monitoring Program network since The Monitor was last published. Three new sites have come online: Zion and Badlands National Parks received ozone and meteorological monitoring stations, and Wind Cave National Park received a CASTNet filter pack and meteorological monitoring station.

Two stations have been discontinued: Virgin Islands National Park no longer conducts ozone monitoring or CASTNet filter pack sampling, and Yukon Flats has terminated meteorological and CASTNet filter pack monitoring. Hawaii Volcanoes-Thurston Lava Tubes has also discontinued ozone monitoring, however, CASTNet filter pack sampling and meteorological monitoring continues for now.

A second generation portable air quality station has been developed, and three of these systems will be deployed in May 2004, in Mammoth Cave, Mount Rainier, and Olympic National Parks. These stations will be located in remote areas of these parks that do not have line power or telephone, and will measure ozone and meteorological parameters.

NETWORK NEWS continued on page 2....

What's inside:

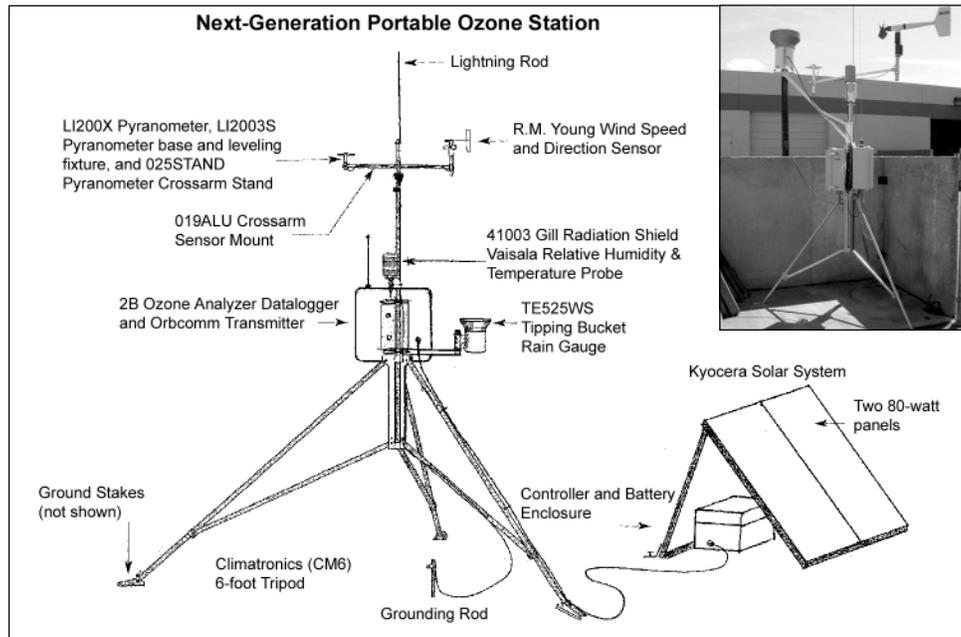
- ◆ Portable air quality stations redesigned
- ◆ New report formats take network approach
- ◆ Station Operator Focus - Nancy Nordensten at LAVO
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- ◆ Feature article - Web sites provide real-time data and a whole lot more
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- ◆ How Does That Work? Solar radiation sensors
- ◆ Puzzle Page
- ◆ Operator's Toolbox - CASTNet filter pack flow system

Portable air quality stations redesigned

A new version of the portable ozone air quality stations is ready for this summer's deployment. The new design is simpler, smaller, and less expensive, but it cannot support filter measurements.

The newer systems operate on battery and solar power, and include only one ozone analyzer. The older systems had two -- one for collection and one for calibration. The new system's analyzers will be calibrated pre- and post-field deployment. They will be installed during May at Mount Rainier, Olympic, and Mammoth Cave National Parks.

In addition, the five portable stations that were deployed last summer will operate again this summer at the same locations: Grand Canyon, Isle Royale, and Black Canyon of the Gunnison National Parks; Big South Fork National River and Recreation Area; and Lake Mead National Recreation Area.



New report formats take network approach

By now you should have received by e-mail your monthly data report for February. Unlike previous monthly reports, which were site-specific and in hardcopy form, the February reports are network-specific and are in electronic form. The NPS ARD directed a change to enable quicker turnaround time of data and operational information. The network-specific approach also enables site personnel to compare their site's air quality conditions with conditions of other sites in the region and in the network. The shortened reports contain no repetitive text month after month, and will be e-mailed to all site operators within 45 days following the month of record.

Annual data reports will also change beginning with the 2003 data report. These reports will also be more streamlined, and have a network-wide approach in its presentation of tables and graphics. The specific content of the annual reports is currently being developed. Look for your hardcopy in the mail late this summer.

DataView 2.0 continued from page 1....

- The Calibration Results screen, under the Data Tables menu, displays yellow warning flags. It also displays only one line for O3 calibration results (results from the calibration analyzer).
- A new Configure screen is available from the Admin menu, for administrators.
- All parameter units are pulled from the station's datalogger.

ARS will contact station operators with instructions for installing the new DataView version in June.

STATION OPERATOR FOCUS

Nancy Nordensten studies air, animals, and aspen at Lassen Volcanic NP

Nancy Nordensten has been a biological technician at Lassen Volcanic National Park, in northern California, since the fall of 2002. As such, she studies a wide variety of park resources, including air, animals, and aspen.

"I spend about one day a week servicing the air quality monitoring site; about a half day if everything goes right," said Nancy. "During winter we occasionally experience equipment problems due to the cold temperatures and wet weather. Often, four to five feet of snow make it necessary to snowshoe to the station."

Nancy spends most of her remaining work week researching and studying animals that live in the park, including surveying for bufflehead ducks, bald eagles, and peregrine falcons, as well as for small vertebrates (reptiles, amphibians, and small mammals) for the NPS' Inventory & Monitoring Program. The Inventory & Monitoring Program generates databases of information about natural resources, including species diversity, distribution, and abundance. This year, Nancy will support a new study on aspen stand mapping and health.

Her B.S. degree in resource sciences, from the University of California-Davis, prepared her well for her varied park responsibilities. Before landing at Lassen Volcanic, Nancy worked for the USDA-Forest Service and for a land trust. She enjoys the different mandate of the park service and the differences it makes in her work as a biologist.



Biological technician Nancy Nordensten studies a wide variety of plant and animal life, in addition to air quality.

Nancy often visits her family down in the Bay Area of San Francisco, or they come up to Mineral, the small town near Lassen Volcanic National Park (elevation 4,800 feet). "It's nice to get to a large town sometimes, but it's really nice to get back home as well," said Nancy. When not working, Nancy enjoys time with her dogs. "I don't hike much in the park during my free time, but I do like to hike and backpack, and the skiing is great here."

Lassen Volcanic is known for its diversity of plants and animals. With over 700 species of flowering plants and 250 vertebrates, Nancy is sure to find something else to study. Perhaps next year she'll study bees, beetles, and blue grouse.

DATA COLLECTION SUMMARY

Data collection statistics for July 2003 through December 2003 are listed below.

- Sites with at least 90% collection (final validation of ambient air quality parameters) include:

Acadia	Joshua Tree
Badlands	Lassen Volcanic
Big Bend	Mammoth Cave
Craters of the Moon	Mesa Verde
Denali	Olympic
Death Valley	Petrified Forest
Great Basin	Pinnacles
Grand Canyon	Rocky Mountain
Great Smoky Mountains	Theodore Roosevelt
Cades Cove	Voyageurs
Clingman's Dome	Yosemite
Cove Mountain	Turtleback Dome
Look Rock	
Hawaii Volcanoes	
Observatory	

- Sites with at least 80% collection (final validation of ambient air quality parameters) include:

Chiricahua	Sequoia-Kings Canyon
Everglades	Ash Mountain
Hawaii Volcanoes	Lower Kaweah
Thurston Lava Tubes	Lookout Point
Visitor's Center	Shenandoah
Mount Rainier	Yellowstone

- Sites less than 80% collection (final validation of ambient air quality parameters) include:

Canyonlands	Virgin Islands
Glacier	Yosemite
North Cascades	Merced River

- The entire network achieved an average of 89.1% final validation of ambient air quality parameters.

FEATURE ARTICLE

Web sites provide real-time data and a whole lot more

Web sites that provide data and information are available resources that can give you what you want, when you want it. One of these sites is the National Park Service Nature & Science Web site, and the other is the Gaseous Pollutant Monitoring Program (GPMP) Project Web site. Both of these sites are described below.

National Park Service Nature & Science

The NPS Web site is currently undergoing renovation, and much of it is already showing a fresh new look. Major components of the Nature & Science portion of the Web site are air, biology, geology, natural sounds, and water. Navigate to the air section at <http://www2.nature.nps.gov/air> and find links to Web cameras, publications, special studies, science & research, laws & regulations, critical issues, and additional information pages.

Web cameras operate at several parks throughout the country. Digital images taken by these cameras, and gaseous and meteorological data collected mostly from GPMP stations, are posted to the Internet in near-real time. Visibility data from instrumentation that operate as part of other monitoring programs, such as IMPROVE, may also be posted, allowing viewers to compare the current air quality statistics with the actual appearance of the park scene.

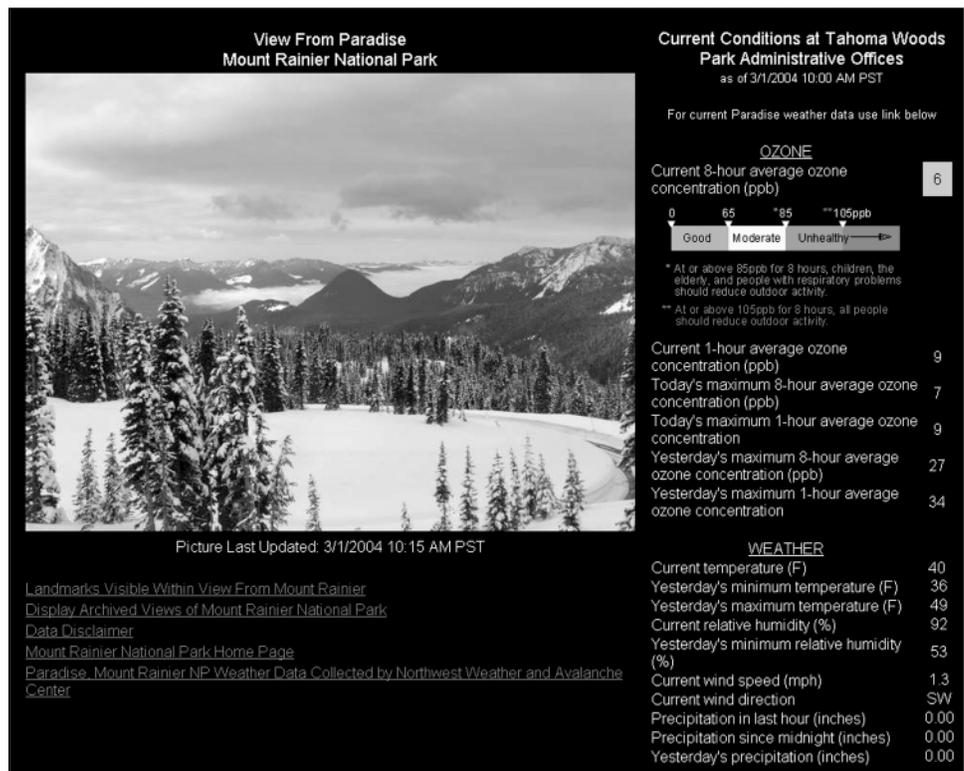
The data displayed on these Web pages relate directly to the digital image of scenic views, which often show the effects of air pollution such as visibility impairment.

National parks that post real-time images and associated air quality data to the Web site include:

An example National Park Service air quality Web camera page displaying the digital camera image of Mount Rainier National Park, for March 1, 2004, at 10:15 am. The page depicts a real-time view and air quality data collected from the GPMP ozone analyzer and meteorological sensors.

- Acadia National Park, Maine
- Big Bend National Park, Texas
- Grand Canyon National Park, Arizona
- Great Smoky Mountains National Park, North Carolina/Tennessee (2 locations)
- Hawaii Volcanoes National Park, Hawaii (data only, no image)
- Joshua Tree National Park, California
- Mammoth Cave National Park, Kentucky
- Mount Rainier National Park, Washington
- National Capital-Central, Washington D.C.
- North Cascades National Park, Washington
- Olympic National Park, Washington
- Point Reyes National Seashore, California
- Sequoia-Kings Canyon National Parks, California
- Theodore Roosevelt National Park, North Dakota

Depending upon the instrumentation at the site, posted data may include current levels of ozone, particulate matter, or sulfur dioxide air pollutants; visual range (determined from a nephelometer or transmissometer); and current weather parameters.



The high-resolution digital camera systems take images of a scenic vista typically every 15 minutes. The cameras are connected to computers that poll dataloggers, that store data collected from other monitoring instruments every hour. A telephone modem may be used to remotely poll the dataloggers if the camera and dataloggers are at different locations. Each Web camera computer then uploads a data file and an image file via FTP to a server at Air Resource Specialists, Inc. (ARS) in Fort Collins, Colorado. Every 15 minutes, the NPS Air Resources Division (ARD) Web server in Denver retrieves these two FTP files from the ARS server. Custom software on the ARD server uses the files to dynamically create updated Web pages, which are immediately made available to the public.

Digital images are updated every 15 minutes while the associated air quality data are updated every hour. In a separate process, ARS also uploads the GPMP ozone air quality data hourly to EPA's AIRNow Web site (<http://www.epa.gov/airnow/>) during the ozone season (May 1 through September 30). Real-time ozone and meteorological data will also soon be available on the NPS AirWeb at <http://www2.nature.nps.gov/air/data/current/index.htm>.

The NPS air quality Web camera pages are among the most popular and heavily visited of all Web pages on the air section of the NPS Nature & Science Web site. In March 2004, the NPS Web cameras logged about 800,000 visits. Like the Nature & Science Web site, the NPS Web camera pages are in the process of being redesigned. A prototype of the new design is available

at <http://www2.nature.nps.gov/air/WebCams/gsm/index.htm>. This redesign should be finalized and implemented by early summer.

Gaseous Pollutant Project Web Site

Station operators and administrative personnel also have access to a variety of project information and report products on the Gaseous Pollutant Monitoring Program (GPMP) Project Web Site. Site access at <http://ard-aq-request-air.resource.com/project> requires a user name (choose any name) and a password (npsair) for login. Keep in mind this Web site is for NPS personnel only, and is not in any way intended for public use or access.

The GPMP Project Web site can provide you with:

- Contact information for station operators and administrative personnel in the NPS (names, telephone numbers, and e-mail addresses).
- Site/instrument locations and panorama photographs.
- Program reports (weekly, quarterly, annual, data validation progress, site visit reports completed by the field specialist during twice-annual visits, etc.).
- Site visit information (current twice-annual visitation schedule).
- Program reference documents (standard operating procedures, task order summaries, calendar of past and future events related to the monitoring program).

Contact John Faust at ARS if you have any problems or questions with this Web site.

The National Park Service

GPMP Project Web Site

The National Park Service Air Resources Division Gaseous Pollutant Monitoring Program (GPMP) has contracted with Air Resource Specialists, Inc. (ARS) to provide network operations and information management support. The documents and deliverables posted on this project web site document the current project status. **Standard Operating Procedures:** These quality assurance documents are controlled documents that are updated periodically. It will be your responsibility to check this Web site occasionally, and verify document revision numbers, to ensure you are working with the most current document revisions.

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NPS GPMP Documents

- [Network Configuration](#)
- [Project Reports](#)
- [Site Visits](#)
- [Standard Operating Procedures](#)
- [Contract Task Order Summaries \(PDF\) File Size: 441KB](#)
- [Calendar of Project Events](#)

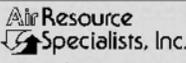
Required Plug-ins

- [Download Acrobat Reader](#)
- [Download QuickTime Movie Player](#)

Access Data

- [Access NPS Gaseous Pollutant and Meteorological Data](#)

ARS Contacts


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The GPMP project Web site is available to NPS personnel to find and view program information, reports, schedules, and more.



AIR QUALITY GLOSSARY

Fugitive emission - emissions which do not pass through a stack, chimney, vent, or other functionally equivalent opening.

For example, blowing dust from a mining operation would be a fugitive emission.

Light extinction budget - the percent of total atmospheric extinction (absorption and scattering of light by gases and particles) attributed to each aerosol and gaseous component of the atmosphere.

Natural visibility conditions - visibility conditions attributable to Rayleigh scattering and aerosol associated with naturally occurring phenomena that reduce visibility as measured in terms of light extinction, visual range, contrast, or coloration. Natural conditions are prehistoric and pristine atmospheric states (i.e., atmospheric conditions that are not affected by human activities).

Nitrogen dioxide - a gas (NO₂) consisting of one nitrogen and two oxygen atoms. It absorbs blue light and therefore has a reddish-brown color associated with it. NO₂ is emitted from combustion processes.

Volatile organic compounds (VOC) - Organic compounds that vaporize readily and contribute to the development of ozone. Many of the organic chemicals we use including basic chemicals found in living things, in products derived from living things (such as coal, petroleum, and refined petroleum products) and in chemically synthesized products, contain VOCs.

PUZZLE PAGE

M O N T H L Y R E P O R T
W Q L J N O I T A I D A R
E V G A C O N F I G U R E
B K O E S W E X B N J Q A
S T A L N S P V E A R H L
I E D M C E E M A N A T T
T G C O W A R N L C L O I
E R V O T E N A S Y O M M
S H L I N U E I T B S M E
L F D N O C E S C I J A D
K C A P R E T L I F O M A
P L N O R D E N S T E N T
P E T I S B E W P M P G A



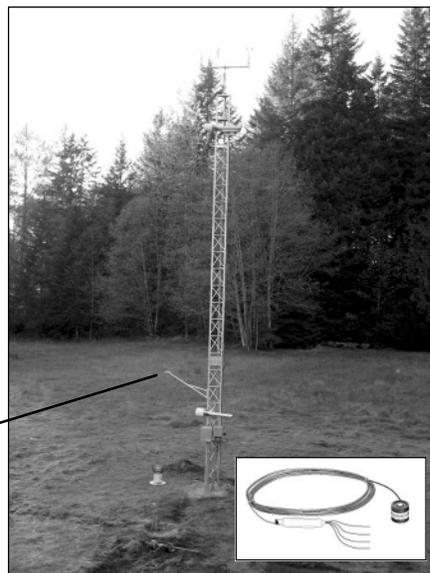
HOW DOES THAT WORK?

Solar radiation sensors

Solar radiation measurements are standard measurements made at NPS air quality stations. Solar radiation measurements log the amount of solar energy that reaches the earth and varies significantly depending upon latitude, time of year, and time of day. The sensor needs little maintenance, aside from occasional cleaning of the lens of dirt or snow.

At most NPS sites this measurement is made with a relatively inexpensive photodiode sensor, similar to a photo cell. The output of the sensor is proportional to the amount of solar radiation. The more solar energy that reaches the sensor, the higher the voltage output which is subsequently converted to energy flux units of watts/m². This sensor has reasonable accuracy through the wavelengths of the visible light spectrum, centered at 550 nanometers.

The solar radiation sensor is usually mounted 8 to 9 feet off the ground. In this photograph, it is located at the end of the white arm, on the meteorological tower.



Complete during your next multipoint! Find words associated with articles in this newsletter:

- | | |
|---------------|----------------|
| Mammoth | Nancy |
| Cave | Nordensten |
| GPMP Web Site | Real Time Data |
| VOCs | Planner Menu |
| Solar | Configure |
| Radiation | Web Sites |
| Flow | Monthly Report |
| Filter Pack | Second |
| Lassen | Generation |
| Volcanic | |



OPERATOR'S TOOLBOX CASTNet filter pack flow system

Nearly all NPS air quality monitoring sites include a CASTNet filter pack. These systems have been in place and sampling for many years, and are

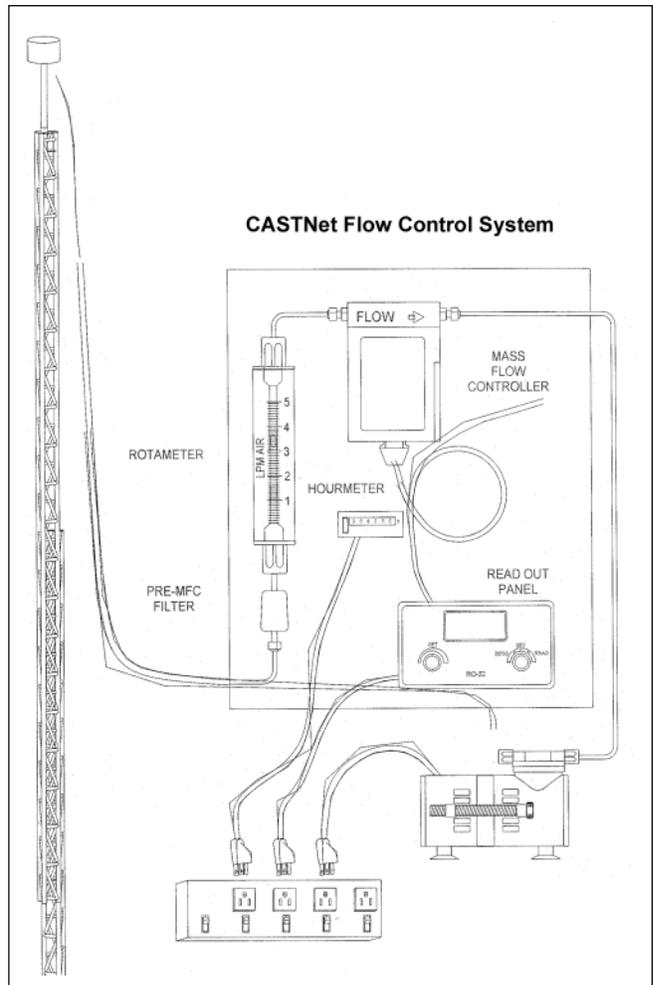
usually trouble free, however, there are a few things that can go wrong.

The sampling concept is pretty basic. A pump draws a continuous flow through laboratory prepared sample media, (the filter pack) where sulfates and nitrates and other aerosols in the atmosphere are deposited for subsequent laboratory analysis. It is necessary to know the flow rate (in liters per minute), and the sample time (one week, 168 hours) to calculate the total flow of air through the filter pack, so a concentration in micrograms/cubic meter can be determined. The flow controller electrical output logged on the datalogger provides the hourly averaged flow rate and the elapsed time hour meter provides the sample time.

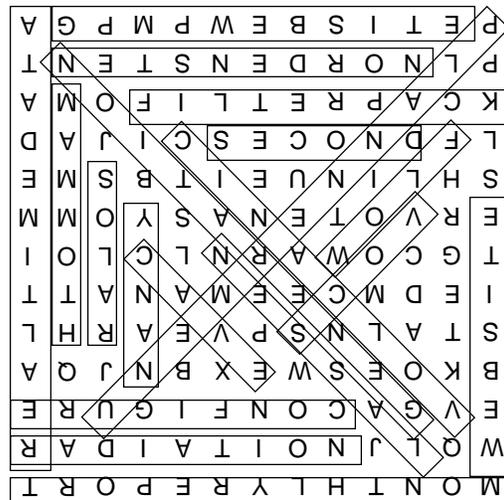
The most serious problems with the system are those that affect the measured flow rate. If a leak in the sample tubing or fittings occur, air flow will be recorded that doesn't actually go through the filter media. This will significantly affect the calculated concentration. The leak checks that operators perform every week should identify any leaks that occur. Please pay close attention to the MFC LEAK CHECK values. They should be very close (within .03 lpm) to the MFC (PUMP OFF) values. If a leak is detected, it is either in a fitting inside the filter pack box or somewhere along the sample tubing. Call ARS and we will direct you through troubleshooting procedures.

Ideally, the flow rate would be the same (1.5 or 3.0 lpm depending upon the site) at the beginning of the sample period as at the end, one week later. Occasionally, wet or humid weather may affect the filter pack restricting the flow through it, lowering the flow rate. ARS is in the process of testing the vacuum capacity of the sample pumps and replacing those that do not have adequate capacity. This will alleviate most of the variable flow rate conditions. If the flow rate does not recover to its desired set point when a new filter pack is installed, ARS has found accumulations of filter pack substrate inside fittings, or on the inlet of the flow controller screen. These accumulations restrict the flow rate, and can only

be resolved by replacing the clogged part. Again, call ARS should you experience this.



Puzzle answers...



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National Park Service
Gaseous Pollutant Monitoring Program

The
Monitor

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NPS Gaseous Pollutant Monitoring Program Network
<http://www2.nature.nps.gov/air/monitoring/index.htm>



The Gaseous Pollutant Monitoring Program network currently consists of 55 air quality sites that monitor gaseous and meteorological parameters in 45 parks. The network was established as part of a comprehensive NPS air quality program. Data from the program are used to:

- Establish existing or baseline concentrations
- Assess trends in air quality
- Judge compliance with national air quality standards
- Assist in the development of national and regional air pollution control policies
- Provide data for atmospheric research and model development
- Identify and monitor pollutants that have the potential to damage park resources