The MONITOR

A Newsletter for National Park Service Air Quality Site Operators

Spring 1998

Volume 1 Number 3

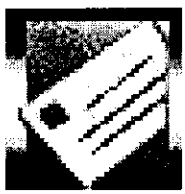
NETWORK NEWS

NPS monitoring stations go metric

As you know by now, to make all measurement units consistent throughout the monitoring network, all the station dataloggers were reprogrammed on January 1. All measurements that were formerly in English units were converted to their metric equivalents. Also, the ozone and sulfur dioxide measurements were changed from parts per million to parts per billion. This allows for more consistent data management and reporting, and will simplify future SOP development.

With all the changes, a few datalogger program errors occurred and we hope all were identified and corrected by Janaury 5. If you still have questions or concerns about a measurement at your station, please contact a field specialist at ARS.

Data packets needed



The Information Management Center (IMC) at ARS needs your help. The IMC collects, validates, and reports air quality data from network sites. Data validation for a site cannot occur until the IMC receives your monthly data report, so please mail your data packet to the IMC promptly.

What happens to your data packet once it's received? First, it is checked to ensure all documentation is included and complete. Next, the information in the packet is used to help validate the monthly data. All data are then plotted and reviewed by IMC and NPS ARD personnel. Data are finalized and reports are prepared and delivered within 60 days after the month of record. When data packets are received late, validation cannot occur in time for the monthly plot review. The validation cycle is then delayed 30 days until the next review is held. That means you won't get your data report for another month.

Data packets should be mailed twice a month. Packets for the beginning of each month through the 15th should be received at the IMC by the end of the month. Packets for the 16th through the end of each month should be received by the 15th of the following month. Refer to your standard operating procedures, section A.2 for details regarding the mailing schedule. Telephone Christy in the IMC if you have questions.

What's inside:

- Feature operator Shane Spitzer
- 3rd Quarter 1997 data collection summary
- 1995 annual data reports
- How an ozone analyzer works
- John's puzzle page
- New stations and Brewer update

Station operators visit ARS

Three ambient monitoring station operators visited ARS last November, while on their way to a UV-B Brewer workshop in Rocky Mountain National Park, Colorado. Since ARS is close by, it was an opportune time to tour the facilities and meet the people who receive station data.

Visiting operators were Andrea Blakesley of Denali NP, Bob Carson of Mammoth Cave NP, and Jim Renfro of Great Smoky Mountains NP. All three learned about the IMC and the processes the data analysts use to receive and validate data.

Seeing how your data are handled in the IMC can provide you with a better understanding of the importance of your instrument servicing and data documentation duties. If you ever have the opportunity to come and visit, just let us know. We'd love to see you here.

New member of IMC team

Christy Higgason joined ARS and the IMC recently. You may have already spoken with her on the telephone. As a data technician, Christy receives the data packets mailed to ARS, retrieves the data daily, and begins the preliminary data validation process.

Christy is responsible for ensuring that data packets are complete. After reviewing the packets, Christy sends all station operators postcards documenting what materials were received in the data packets and what is still needed. If you ever have problems with either completing or sending your data packet, please give Christy a call.

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JOHN'S PUZZLE PAGE

Puzzle Page Questions

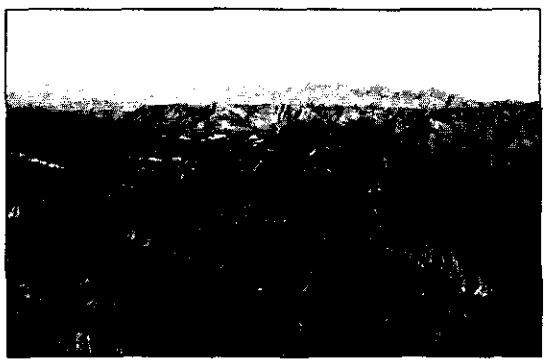
- Only one dam has been built in an established national park. What's the name of the park, and what is the valley (considered by many as one of nature's most beautiful) that is now underwater?
- Mount Whitney, the highest mountain in the contiguous United States, is in what national park?
- Who are the four Presidents immortilized at Mount Rushmore National Memorial?
- What national park has a lake 1,932 feet deep, the deepest of all national park lakes?
- What U.S. President was a seasonal ranger at Yellowstone National Park in the summer of 1936?
- "Denali" is the Native American name for Mt. McKinley. What is the English translation for Denali?

Get the answers when you phone in your multipoint results!

Cryptogram

A cryptogram is a coded message in which one letter is substituted for another. *Example:* Etgpyikybp = Multipoint.

Pcz BIQ yq uzqikbqymgz aku elbldybd ypq glbxq yb kuxqu pk "gzlsz pcze tbyeilyuzx aku pcz zbvkjezbp ka atptuz dzbzulpykbq."

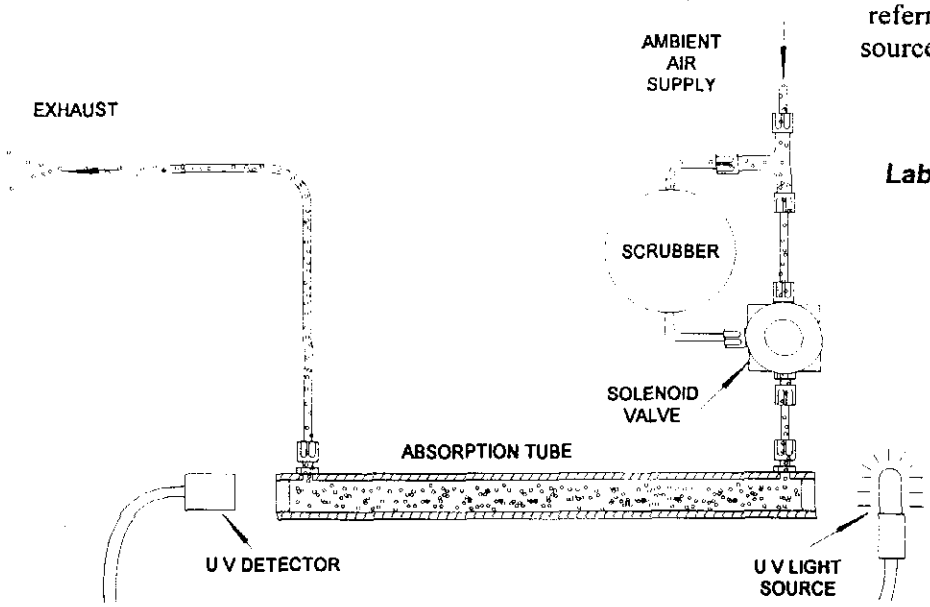


Name this park:_____

LAB TALK
How an ozone analyzer works

All the current NPS ozone analyzers work on the same principal, ultraviolet photometry. This UV photometric technique operates similarly, no matter what brand analyzer is at your station (Dasibi, Monitor Labs, TECO, or API). The technique is inherently simple, resulting in accurate readings and long-term instrument stability.

The ozone analyzing technique is based upon the principle that ozone molecules absorb UV light (254 nanometers wavelength). Basically, a column of air is illuminated at one end by an ultraviolet lamp, and the intensity of the lamp is measured at the opposite end by a detector. This measurement is performed within the sample tubes (absorption tubes) of the analyzer. Other critical components of the instrument include the solenoid valve, ozone to oxygen converter (more commonly referred to as a "scrubber"), UV source lamp, and detector.



Lab Talk continued on page 4....

SITE OPERATOR FOCUS

Shane Spitzer coordinates scientists and visitors at Shenandoah National Park, Virginia

Shane Spitzer performs a variety of duties at Shenandoah National Park, including maintaining monitoring equipment, processing data, coordinating research groups, and educating the public. The park encompasses 300 square miles, including 75 miles of the Blue Ridge Mountains. "I've been on every trail in the park at least 10 times," says Shane, an environmental protection specialist, "so I don't hike as much as I used to." He joined the park as a fisheries volunteer in 1991, while still in school, and two years later began working with air quality.

Shane oversees a variety of air quality, visibility, and water quality monitoring instrumentation for federal programs including the NPS, EPA, and USGS. The instrumentation includes carbon monoxide, nitrogen oxides, sulfur dioxide, and ozone analyzers; volatile organic compounds; an aerosol sampler; a full range of meteorological sensors; a transmissometer, and a nephelometer.

Shane Spitzer in his office at Shenandoah National Park.

Shane coordinates other researchers, including scientists from the University of Maryland and the University of Miami. All instrumentation currently being operated is located at Big Meadows. "In 1994 we had three monitoring sites, but we discontinued two and concentrated on the Big Meadows site. With the help of a large donation from a local power company, we were able to upgrade our equipment and add more parameters," says Shane.

He also performs public relations functions at the park including tours, lectures, and seminars. "I give tours to school groups;" says Shane, "the air quality site is pretty impressive to kids. We also have an outreach program that focuses on providing the public with knowledge of air quality issues."

In his spare time, Shane enjoys fishing and camping. "I fish as much as possible," he says. "My wife and I recently purchased a new house near the Shenandoah River, which allows me good access to the fishing waters." Fishing was also an interest in college; Shane earned a B.S. degree in Wildlife and Fisheries Management from West Virginia University. When not fishing, Shane sees that the many research and educational activities at Shenandoah are coordinated.

DATA COLLECTION SUMMARY

Data collection statistics for the 3rd Quarter 1997 (July, August, and September) are:

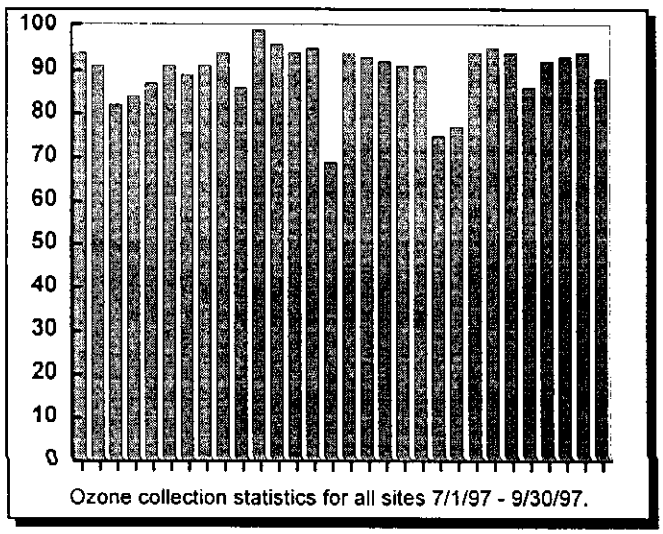
- Sites with final validation of ambient air quality parameter collection greater than 90% include:

Big Bend	Great Smoky Mtns. (Cove Mountain)	Pinnacles
Canyonlands	Great Smoky Mtns. (Look Rock)	Rocky Mountain
Death Valley	Joshua Tree	Sequoia-Kings (Lower Kaweah)
Glacier	Lassen Volcanic	Shenandoah (Big Meadows)
Great Basin	Mammoth Cave	Voyageurs
Great Smoky Mtns. (Cades Cove)	Mesa Verde	Yellowstone
Great Smoky Mtns. (Clingman's Dome	Mount Rainier	

- Sites with final validation of ambient air quality parameter collection greater than 80% include:

Chiricahua	Everglades	Sequoia-Kings (Lookout Point)
Craters of the Moon	Grand Canyon	Yosemite (Turtleback Dome)

- The entire network achieved 89.7% final validation of ambient air quality parameters.



Ozone collection statistics for all sites 7/1/97 - 9/30/97.

NETWORK NEWS continued from page 1....

1995 annual reports delivered

The 1995 annual data reports were delivered in early March. Data diskettes were only included in those reports delivered to station operators. All other reports included a postcard for recipients to mail back if they wish a diskette.

Lab Talk continued from page 3....

Each instrument cycle is completed within 10 to 20 seconds (instrument-specific) and contains two measurement half cycles. In the first half cycle, ambient air is directed by the analyzer's solenoid valve to the scrubber where any ozone present is converted to oxygen. All other constituents of the sample are not affected and are passed right through the scrubber. This ozone-free sample is directed through the absorption tubes where the UV source lamp illuminates the sample and the transmitted intensity is measured by the detector. The analyzer then stores this intensity value.

During the second measurement half-cycle, the solenoid valve directs the ambient sample directly to the absorption tubes. The UV source lamp illuminates this ambient sample and the detector measures the transmitted intensity. Any ozone present in the sample absorbs some UV light resulting in a lower intensity value as measured by the detector. This value is subtracted from the previously stored value and the resulting difference is the amount of ozone in the ambient sample.

This measured result is displayed on the instrument front panel, as a concentration such as 5 ppb (5 parts ozone in one billion parts of air) and presented as an electrical signal to both the datalogger and strip chart recorder.

NEWS FROM THE FIELD

New stations

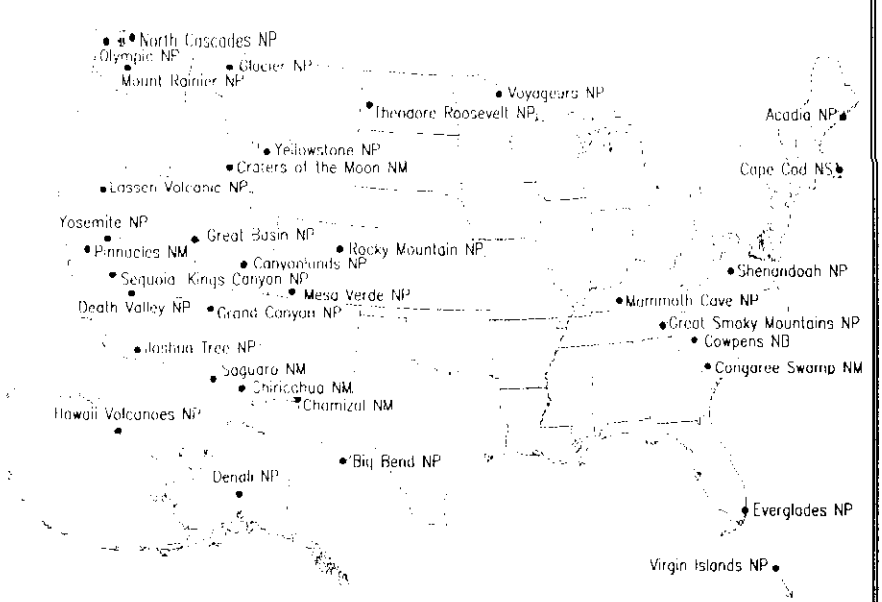
Station improvements since the last newsletter include: replacement of the shelter and electrical service upgrade at Denali, and installation of a new shelter and relocation and consolidation of the meteorological and air quality measurements at Acadia. Both stations required a significant field effort by both ARS and park staff and we appreciate the efforts of the park operators involved.

A new monitoring station was established at Virgin Islands National Park. The park received a typical ozone and meteorological monitoring station, a four module IMPROVE sampler, a nephelometer, and a NADP wet/dry sampler. Preparations were also completed for a Brewer UV Photometer. This station fills an important monitoring need in the Caribbean where very little air quality data exists. These improvements and additions to the network were made possible primarily by funding from the EPA DISPro program, which has also brought the Brewer UV-B instruments to the NPS.

Brewer update

As of March 1998, 9 of the 14 NPS Brewer instruments have been installed and 2 additional stations have been prepared for instrument installation. The remaining three stations are expected to be prepared during the late spring, 1998.

NPS Ambient Air Quality Monitoring Network



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The MONITOR is published quarterly (March, June, September, December) by Air Resource Specialists, Inc. under Contract CX-1270-96-007, for ambient air quality site operators in the National Park Service monitoring network.

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printed on recycled paper