

The Vista

National Park Service - Air Resources Division - Quarterly Review

Spring 1998

Something's in the Air

Message from the Chief

Christine Shaver

In this age of rapid-fire and fragmented communication, we seldom are fed more than sound bites. In the interest of providing a little more nutrition for inquiring minds, the Air Resources Division has decided to publish a quarterly newsletter. We hope to give our readers a little more information about what's happening with the National Park Service air resource program -- how and why our activities, park activities, and actions by others affect our ability to protect sensitive resources from the adverse effects of air pollution.

Collectively, we will be more effective in communicating with the public and decisionmakers if we increase our shared understanding of the kinds of information and tools available to reduce and prevent pollution in national parks. Together, we can identify -- and replicate -- the ingredients that produce results: Tangible results by removing tons of pollution from the air that envelops parks. Quintessential results by acquiring a fuller knowledge about how park resources respond to air pollution.

I hope you will enjoy reading this inaugural edition. We welcome your ideas on how we can make the next newsletter more informative, interesting or useful to you. We also solicit articles, letters and inquiries from our readers. ☆

Air Quality Victory for Shenandoah

Tonnie Maniero

Last July the Cardinal Glass Company proposed to build a new glass manufacturing facility 17 km north of Shenandoah National Park. The facility was the largest pollution source proposed this close to the park in a number of years. ARD and Shenandoah NP staff were heavily involved in reviewing information and analyses related to the proposed facility. Given the existing adverse impacts at the park, NPS expressed concern to permitting authorities in Virginia that Cardinal Glass was not proposing to use the best control measures available to minimize emissions. In addition, refined air quality modeling analyses performed by Cardinal Glass indicated acid deposition resulting from project emissions could be cause for concern. At a February 25 public meeting, it became very apparent that there was a great deal of local public opposition to the proposed facility. Residents stated that emissions from the facility would degrade their quality of life, and they also expressed concern about the effects additional pollution would have on Shenandoah NP. On March 3, Cardinal Glass withdrew its application for a construction permit citing the obvious public opposition to the project. Cardinal Glass is considering an alternate site in North Carolina for their new glass plant. The site is over 100 km away from any NPS Class I areas. ☆

Did you know that the average U.S. adult gets most of his/her annual ultraviolet dose while on vacation? And where does that average adult vacation? In National Parks, of course, where we saw 266 million visits in 1996. (See related article on the next page.)

Let the Sun Shine in - And We Will Measure It

[Kathy Tonnessen](#)

Measuring UV-B from the sun is part of a cooperative program with the EPA called the [Demonstration Intensive Site Project \(DISPro\)](#). The 14 parks participating in the program are: Acadia, Big Bend, Canyonlands, Denali, Everglades, Glacier, Great Smoky Mountains, Hawaii Volcanoes, Olympic, Rocky Mountain, Sequoia, Shenandoah, Theodore Roosevelt, and Virgin Islands National Parks.

The principal activity in 1997 and continuing this year has been the siting and installation of Brewer UV-B monitors in the parks. These instruments optically track the sun and measure a myriad of parameters, including visible and UV wavelengths of light, total column ozone, and concentrations of various gaseous species. With these instruments we will track changes in UV irradiance at the surface to understand seasonal and interannual changes in this stressor, that are caused by the depletion of ozone in the stratosphere. UV-B radiation has been implicated in human maladies, such as skin cancer and cataracts, and in effects on ecosystems, including freshwater biota and reef communities. There have been some experimental studies that link changes in UV irradiance with effects on amphibian populations. The challenge has been to get long-term data to determine if UV is really increasing in our park units. Some of the DISPro parks have recorded over a year of continuous measurements, a good start to that needed long-term record. We have completed UV monitor installation and training in all but four parks.

The plan is to provide each of the DISPro parks with a fully complemented air quality monitoring station to add to our information on long-term changes in atmospheric stresses. The "typical" station will include wet and dry deposition monitoring (part of the NADP and NDDN national networks), ozone monitoring, meteorological measurements, and visibility/fine particle monitoring. We are making progress in installing new instruments and coming up with a maintenance plan for these network additions. Contact

<http://www.aqd.nps.gov/ard1/gal/dispro1.htm> to access more information or UV monitoring data.

One of the primary objectives of DISPro is to relate human-caused stress to ecosystem change in representative environments through scientific research conducted in national parks. The EPA and NPS will soon fund five to seven proposals to perform research in parks on four major topics: (1) effects of UV-B on natural resources, (2) effects of ozone on vegetation, (3) effects of nitrogen on aquatic and terrestrial resources, and (4) extrapolation of point environmental measurements to larger scales. After a lengthy proposal preparation and review process, we have narrowed the field of proposals to the top seven. These projects will last from 1 to 3 years and will be coordinated through the EPA, Office of Research and Development.

Based on the research needs of the DISPro parks, DISPro's Oversight Committee recommended that EPA fund the development of amphibian survey methods in parks. Using sampling schemes relevant to different park ecosystems, we should be able to detect statistically significant changes in populations of frogs, toads and salamanders. Once population trends are identified, we will have a better chance of linking changes in biological populations with changes in physical, chemical or biological stresses. USGS-BRD researchers will begin work on these survey methods in spring 1998 at Big Bend, Shenandoah, and Great Smoky Mountains National Parks.

Our next quarterly report will include the list of winning proposals and a description of the type of research that will take place in selected DISPro parks. Look for a feature article on DISPro, along with a photo and data from our UV network, in the upcoming issue of "Natural Resources Year in Review."

For more information, call or email Kathy Tonnessen (303-969-2738, kathy_tonnessen@nps.gov). ☆

Do You Know?

- 1. Which National Park had the most exceedances of the National Standard for ozone pollution last summer?*
- 2. Which National Park had poor visibility last summer that was due to a nearby volcanic eruption?*
- 3. Where should you go to get away from ozone pollution? Rocky Mountain, Yosemite, Redwood, or Acadia National Park?*

(Answers found on page 10.)

EPA Proposes Significant NO_x Reduction in East

Brian Mitchell

The Air Resources Division recently supported the Environmental Protection Agency's proposed rulemaking to require significant reductions in nitrogen oxides (NO_x) emissions for eastern states. The proposal calls for a 1.6 million ton per year reduction in NO_x emissions in the region. This is an average reduction of 35% from all source categories, with a 69% reduction from the utility industry. Intended to benefit areas experiencing violations of the ozone national ambient air quality standards because of transported ozone and ozone precursors, the rulemaking would require State implementation plan revisions for 22 affected States and the District of Columbia. NPS's comments on the proposal included the recognition of collateral benefits to NPS units stemming from widespread NO_x reductions, such as reduced visibility impairment and nitrogen deposition in sensitive areas, while expressing concern about possible future emissions trading programs which could potentially allow increased emissions/impacts locally for regional reductions elsewhere. ☆

Snowmobiles Found to be more Polluting than Cars at Yellowstone NP

John Ray

Increasing snowmobile usage in Yellowstone National Park has led to unhealthy concentrations of carbon monoxide (CO), hydrocarbons (HC), and inhalable particles near the West Yellowstone entrance station. High CO concentrations can also occur along the road leading to Old Faithful. ARD and the Park sponsored a short study this winter by University of Denver researchers to measure the emissions of individual snowmobiles using a remote sensing device near the entrance station. The purpose of the study was to determine the actual emission levels and to see if oxygenated fuels reduced the CO emissions.

The emissions levels from snowmobiles were found to be extremely high compared to cars. The mean CO emissions were 1262 grams CO/mile and the mean HC emissions were 909 grams HC/mile. Snowmobile CO and HC emissions were found to be normally distributed. This is in contrast to the distributions of CO and HC from automobiles that are heavily skewed so that a few vehicles put out most of the CO emissions. Ninety percent of all automobiles emit less than 70 percent of the snowmobiles tested.

A few measurements were made on other modes of transportation in Yellowstone that make a significant comparison. The Ford Econoline conversion snow coach (155 grams CO/mile) is about typical for a new vehicle with emission controls. Besides carrying more passengers in more comfort, it is much cleaner in CO and very low in hydrocarbon emissions. The Bombardier snow coach (972 grams CO/mile, 80 gm HC/mile) is typical for an uncontrolled emission for a 4-stroke engine. From a pollution standpoint, the usage of these vehicles should be promoted instead of snowmobiles for transport into the park. ☆

Snow Sampling in the Rockies

Kathy Tonnessen

Six years ago the Air Resources Division and the U.S. Geological Survey, Water Resources Division, formed a partnership to characterize the regional variations in the distribution of snow chemistry all along the Continental Divide. The reason behind visiting 62 sites at maximum snowpack accumulations each year is to determine the changes in snow amount and chemistry that can contribute to total loading of nitrogen and sulfur to sensitive high-elevation ecosystems, including lakes, ponds, streams, soils and vegetation. This project was designed to detect trends in the emissions and transport of nitrogen and sulfur as air pollutants in the western United States. The snowpack is an excellent integrator of both wet and dry deposition during the winter period, running from about November until the end of March.

Each year since 1993 snow survey crews from the NPS, the USGS, and other cooperators have spent the latter half of March traveling to the 62 long-term sites to dig snow pits, take samples for chemical analysis, and characterize the stratigraphy and crystal structure of the snow, to provide information on the types of snowpack changes that might have occurred during the winter. We have included snow survey sites in four national parks in the Rockies: Glacier, Yellowstone, Grand Teton, and Rocky Mountain National Parks. These sites fit into a regional set of sites, all located in the alpine/subalpine zone at high elevation. Once the snow samples are taken to the USGS lab located at the Denver Federal Center, they are melted and analyzed for the following chemical constituents: major anions and cations, including sulfate and nitrate, trace metals, and sulfur isotopes. This year there were additional samples collected at a subset of sites for analysis of nitrogen isotopes. These isotopic signatures in snow are used to suggest the source of pollutants in the snowpack. The basic survey data have been used as the foundation of other, more site-specific research and monitoring efforts, such as an investigation of the impact of snowmobiles on snow chemistry in Yellowstone National Park. We have also used these snowpack data to validate the weekly

NADP wet bucket data collected at a number of high elevation sites in the Rockies. These snow survey data have also been used to understand the interannual variations in climate in the Rockies, including the importance of El Niño events in delivering water and chemicals to the high elevation region.

This region-wide effort has continued to deliver quality data through the efforts of many people in both the USGS and the National Park Service. We would like to acknowledge the work of the staff of the Air Resources Division and Rocky Mountain National Park for their work on this project. ☆

Natural Resources Intranet WEBSITE

Tom Dotts - Colorado State University

The Natural Resources Intranet web site (URL <http://www.aqd.nps.gov:82>) is available to NPS domain computers only. The site was originally created in order to post draft web pages for "Nature Net" (URL <http://www.aqd.nps.gov>), the Natural Resources public web site. But it has become useful for making internal information available to NPS personnel throughout the Park Service. Users need only have a web browser and access to DOI net (which most NPS facilities that are connected to the Internet have). Currently, the Natural Resources Intranet has posted useful information such as the ARD and GRD division calendars, NPS Talking Points, ARD Briefing statements, and online databases such as the Monitoring History Database or Geologist in the Parks Job search. If you haven't already, take a look at this site and bookmark it. Better yet, let us know what you think. The technology is here let's use it! Contact person is Tom Dotts (303) 987-6657. ☆

Our next issue of this publication will be available on our WEB Page.

Federal Land Managers Join Forces Under "FLAG" to Develop a Consistent Approach to AQRVs

Joe Carriero - Fish & Wildlife Service

Air resource managers from the Forest Service, National Park Service, and Fish and Wildlife Service are collaborating to make identifying and evaluating air quality related values more consistent. Air quality related values, or AQRVs, are natural and cultural resources that can be affected by air pollution. They include visibility, wildlife, vegetation, water, soils, and historical resources.

The Clean Air Act Amendments of 1977 gave Federal Land Managers (FLMs) an affirmative responsibility to protect the AQRVs of designated national parks and wilderness areas—called Class I air quality areas. Since the law was passed, the Forest Service, National Park Service, and Fish and Wildlife Service each has assumed its air quality responsibilities by developing distinct policies and procedures. Although many of the differences reflect agency objectives, some policies and procedures are unnecessarily different. This inconsistency has complicated permit applications and other processes intended to protect Class I areas. For years, some permit applicants and States have been outspoken in their displeasure with the different agency requirements.

Intent on resolving, or at least mitigating, this problem, air resource managers from the three agencies formed FLAG, the **F**ederal **L**and Managers **A**Q**R**V **W**ork **G**roup, in April 1997. Over the past year, FLAG members have been working to develop a set of recommendations applicable for addressing AQRV issues for all FLMs. FLAG efforts are focused primarily on four areas: (1) terrestrial effects of ozone; (2) aquatic and terrestrial effects of wet and dry pollutant deposition; (3) visibility; and (4) process and policy issues. Subgroups comprising agency air resource managers and subject-matter experts have been developing guidelines in each of these four areas.

FLAG is using a phased approach. Now in Phase 1, FLAG is addressing issues that can be resolved without the collection of new data. The *Phase 1 Report* will describe the procedures for identifying AQRVs; list sensitive AQRVs; define, when possible, the critical pollutant loads (or levels) likely to cause adverse impacts; and describe methods for evaluating the potential impacts of pollution sources on AQRVs in Class I areas. The intent is to build on the policies, procedures, and terms common to the agencies. These “commonalities” were identified in early FLAG planning sessions.

The *Phase 1 Report* will also provide guidance for Prevention of Significant Deterioration (PSD) permit applicants. When possible, this guidance will include screening level values, measures often requested by States, to facilitate the permitting process.

FLAG expects to publish the *Phase 1 Report* and advertise it in a *Federal Register* "Notice of Availability" in early 1999. The *Federal Register* notice will solicit public comment. Phase 2 of the FLAG effort will address the more complex issues and those that may require additional data collection.

In addition to the four subgroups, the FLAG organization includes Leadership and Coordinating committees. The Leadership Committee, responsible for providing direction to the workgroup, includes the air quality program chiefs from the participating agencies: Donna Lamb, Forest Service National Air Quality Program Manager; Chris Shaver, Chief of National Park Service Air Resources Division; and Sandra Silva, Chief of the Fish and Wildlife Service Air Quality Branch. The Coordinating Committee, responsible for communications within the workgroup, also comprises representatives from each agency: Rich Fisher and Bob Bachman for the Forest Service, Tonnie Maniero and Dee Morse for the Park Service, and Ellen Porter and Joe Carriero for Fish and Wildlife Service. Joe Carriero also serves as FLAG Project Manager. His duties include facilitating workgroup communications, preparing and leading workgroup meetings, writing general workgroup reports, and other administrative tasks. (Continued on next page)

The next all-member FLAG meeting will take place at the National Park Service Air Resources Division Office in Lakewood, Colorado, on May 19 and 20, 1998.

For more information on FLAG, contact Joe Carriero (303) 969-2809 or visit the FLAG webpage: <http://www.aqd.nps.gov/ard/flagfree>. ☆

Joshua Tree NP - Dodges a 730,000,000 Ton Bullet

John Notar

For several years, the Mine Reclamation Corporation (MRC) and Kaiser Steel Resources had proposed to develop a Class III nonhazardous solid waste landfill in an unused open pit iron ore mine located at Eagle Mountain in Riverside County, California. This is approximately 1.5 miles south of the wilderness boundary of Joshua Tree National Park. At full-scale operations, the landfill would accept an inflow of up to 20,000 tons of solid waste per day (1.0 ton every 4 seconds, 24 hours a day) from southern California. The landfill was proposed to operate for 80 to 100 years. In response to complaints filed by several public interest groups, on February 18 California Superior Court Judge Judith McConnell, in her final ruling, rejected for a second time the Eagle Mountain Landfill's Environmental Impact Statement (EIS). Judge McConnell ruled that the EIS failed to answer significant concerns and questions about the landfill's impact to the endangered desert tortoise and to "visitors, wilderness experiences" at Joshua Tree. Although the EIS indicated potential for impacts to air quality (specifically visibility) at the park from the landfill's fugitive emissions, Judge McConnell did not cite air quality as a reason to rule the EIS inadequate. Before the ruling, the NPS had entered into an agreement with MRC to fund the monitoring of air impacts at Joshua Tree. MRC has yet to decide whether to appeal the judge's ruling, or to reissue the EIS with additional information. Two other regional landfills are being proposed for southern California. Imperial County has recently approved one of them. ☆

SAMI Updates

Kathy Tonnessen

ARD and park staff participated in a briefing by Dr. Pat Brewer, Technical Coordinator of the Southern Appalachian Mountains Initiative, a regional partnership of states, Federal Land managers, the EPA, and environmental groups concerned with the impact of air pollutants on resources in parks and wilderness areas in the southeast. Dr. Brewer traveled to Denver for discussions concerning the progress since 1992 on SAMI projects, e.g., emission inventories, atmospheric modeling, and reports on aquatic/terrestrial effects of ozone and acid deposition, and visibility degradation in Class I parks and wilderness areas including Great Smoky Mountains and Shenandoah National Parks. She acknowledged contributions of park and ARD technical experts in guiding these projects and commented on the need for SAMI to have integrated assessment results by 1999 as input to state air pollution planning.

(And more...)

SAMI Workshop on Deposition Effects on Biota

SAMI held a workshop in Asheville, NC, to develop a "Request for Proposals" to conduct the regional assessment in the southeast on the effects of changes in acid deposition on aquatic resources. The effects subcommittee heard from some of the members on the current state of knowledge on effects of deposition on water chemistry and biota, with emphasis on work done in Shenandoah and Great Smoky Mountains National Parks. The group decided that the regional assessment needed to focus on the two NPS and seven USFS Class I areas in the SAMI region. SAMI will ask contractors to use models and existing water chemistry data to simulate changes in stream quality with projected changes in deposition inputs of sulfur and nitrogen. Subcommittee members heard from Dr. Art Bulger, University of Virginia, on the existing data bases on fish response to changing water chemistry. We agreed that the endpoints of the regional assessment needed to include the response of recreational fish resources (trout and small-mouth bass) and fish community composition to changes in deposition and water quality. ☆

Pitching Park Protection in the Permitting Process to EPA

Chris Shaver

On February 17th, Chris Shaver and Molly Ross (from the Assistant Secretary's office) made a presentation to EPA's Clean Air Act Advisory Committee (CAAAC) on how to improve the preconstruction review and permitting process for new sources of air pollution wishing to locate near Class I areas. EPA proposed regulations to streamline the permitting process two years ago, but the final rule has been delayed because of industry objections. EPA has accommodated many of industry's concerns but is holding reasonably firm on the proposed Class I area provisions (e.g., including early notification, analysis requirements for sources that might affect air quality related values, and better explanations from permitting authorities if they issue permits in spite of FLM objections). Industry has expressed fear that the federal land manager role is expanding; we discovered much of their fear is based on misperceptions. The purpose of the CAAAC presentation was to explain our role, including, the kind of information we can provide to permit applicants and the kind we need from them. Further discussions will occur with EPA and other stakeholders in an effort to resolve the remaining issue within the next few months. ☆

Gaseous Pollutant monitoring network information is available on the ARD Internet web site. Want to know where and what pollutants have been measured in the National Parks? A monitoring history database can be accessed interactively. Want to know the location of the monitoring station in a specific park? A picture and a map of the station are on the web site. Check it out at <http://www.aqd.nps.gov/ard1> and you'll be in the know. (John Ray)

The AQUIMS Project

Bruce Nash

Resource management decisions are often complex requiring information from many disparate sources and types of data. For example, interpreting air quality issues may require data and information on local and regional air quality, air pollution effects, and relative sensitivity of resources to different air pollutants. This information may exist in several formats including: books, paper-based documents, photographic slides, bibliographies, internet-based information, expert opinion, and spatially-referenced datasets. The AQUIMS (Air QUALity Information Management System) software provides an efficient, computerized framework for organizing these different data formats and for offering "expert interpreted" information.

AQUIMS, a collaborative project involving the National Park Service-Air Resources Division, Fish and Wildlife Service-Air Quality Branch, and Penn State University, can be used as a "stand-alone" system or in conjunction with Microsoft Office and the Internet. The AQUIMS software was written to manage air quality information, however, because the data entry and manipulation routines are subject-independent, AQUIMS can be used to manage information from other natural or cultural resources. Recently the NPS-Water Resources Division selected the AQUIMS software to manage information relating to water rights issues.

AQUIMS has an intuitive, "user-friendly" interface. After selecting a national park or national wildlife refuge, the user has access to: general site information, a local flora, annotated references on ozone and acid deposition effects, summary air pollutant monitoring information, general information on air pollution effects, slides of pollution-injured plants, spatially-referenced data, and embedded ozone effects and acid deposition decision support systems (DSS).

The knowledge bases for each were developed through knowledge engineering sessions with multiple experts using the NetWeaver software developed at

Penn State University. The ozone DSS provides the user with diagnostic assistance to identify and quantify ozone injury on native vegetation. Using water chemistry data and encoded knowledge of human experts, the acid deposition DSS characterizes lake/stream sensitivity to natural and anthropogenic acidity. Spatially-referenced data can be interpreted by the knowledge bases to produce spatially-referenced GIS data layers. Providing expert interpreted information in a quick and more complete manner makes AQUIMS a useful tool for resource managers and policy experts.

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NPS Points to Possible Source of Visibility Impairment in Grand Canyon

Don Shepherd

On August 19, 1997, DOI filed with EPA a certification of visibility impairment at Grand Canyon National Park and identified the Mohave Power Plant (MPP) as a suspected contributor. If EPA decides that some of the visibility impairment is reasonably attributable to MPP, the plant would be required to install the best available retrofit technology, which could mean the installation of sulfur dioxide scrubbers. In a meeting held January 8 and 9 in Las Vegas, EPA began the process of evaluating the impacts of the plant upon the environment and the local economy. Speakers at the meeting raised the following issues.

Environmental Concerns

The 27 year old MPP emits over 40,000 tons per year of sulfur dioxide and, when the installation of scrubbers at Navajo (AZ) and Centralia (WA) power plants is complete, will become the largest uncontrolled source

of sulfur dioxide in the western U.S. (MPP is also among the top 6% of carbon dioxide generators.)

Visibility: Project MOHAVE, is a joint study among DOI, EPA, and the plant owners. Preliminary analysis of Project MOHAVE data shows the MPP can have a perceptible impact on visibility at Grand Canyon under some conditions. Final results of the study, to be released this summer, should further clarify the impact of the plant emissions on visibility in the Grand Canyon.

Water: A unique coal slurry pipeline delivers coal from the Black Mesa mine to MPP 273 miles to the southwest. The coal is mixed with one billion gallons per year of water, and concerns have been raised by the residents of Black Mesa, the Hopi and Navajo Nations, that the pipeline is depleting the underlying Navajo Sandstone aquifer.

Economic Concerns

MPP is the sole customer for the Black Mesa mine, which represents the largest source of private income for the Hopi and Navajo Nations. The mine contributes \$15 million annually in royalties to the Hopi and Navajo reservations; 80% of the Hopis' annual budget comes from the plant and related mining operations. Mine jobs pay an average of \$55,000 a year in a region where unemployment hovers around 45%.

MPP is also a major contributor to the local economies of the Mohave Valley. Salaries at MPP are twice the Mohave County average, and the plant contributes over \$30 million to the local tri-state economy. Schools depend upon contributions from MPP to upgrade their educational facilities, and local businesses depend upon the cheap power provided by MPP and services they supply to the plant.

Owners of the plant are Southern California Edison (SCE), the Los Angeles Department of Water and Power, Nevada Power Company, and the Salt River Project Agricultural Improvement and Power District. Although the plant operator, SCE, has sold off its other generating facilities, it believes that the plant can become profitable with some "belt tightening." (A major

factor bearing upon the competitiveness of the plant is it's much higher than average cost of fuel, reflecting production and transportation charges by Peabody Coal Company.) However, the deregulation of SCE's major California market means that it must now compete with other utilities, and SCE contends that MPP would not be competitive if forced to install scrubbers.

In addition to the DOI assertion of visibility impairment due to MPP, EPA is also evaluating claims against MPP by environmental groups. In February of this year, the Grand Canyon Trust and the Sierra Club filed suit over Mohave's impact on air quality over the Grand Canyon and near the plant, including thousands of alleged violations of the plant's emission limits. EPA believes there is merit to many of the claims raised and has sent the plant's owners a request for information on its emissions, as provided by Section 114 of the Clean Air Act.

DOI will continue to work with the Navajo and Hopi Nations, the plant owners, EPA, environmental groups, and other stakeholders to refine its estimate of the impacts of the power plant's emissions on the Grand Canyon. At the same time, DOI will seek to better understand the impacts of emission control options upon the canyon, the power plant, and the people of the area. ☆

1995 Annual Data Summary Reports for the gaseous pollutant monitoring network were issued in March. These reports contain the finalized data for ozone, sulfur dioxide, and the meteorological sensors in summary tables and graphical format. Data disks distributed with the reports give park resource managers easy access to all the details. ARD expects to issue reports for 1996 and 1997 data during this calendar year. (John Ray)

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Answers

1. *Joshua Tree National Park*
2. *Virgin Islands National Park*
3. *Redwood National Park*

Help Us Name Our Newsletter

Dale Breitenfeld

Calling all creative thinkers. The Air Resources Division is sponsoring a "Name the Newsletter" contest. The winner will receive a very fine gift, along with the pleasure of seeing his/her artistic choice of words on our quarterly report masthead. What word or phrase do you think best described our organization? Put on those thinking caps and send your ideas to me at dale_breitenfeld@nps.gov. ☆

IS THERE SOMETHING YOU'D LIKE TO ADDRESS?

Contact Dale Breitenfeld if you have any questions or comments about this newsletter. You can also contact article authors directly.

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