



## Air Quality Division October 1992 Monthly Report

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### STATE ACTIVITIES

AOD Participates in WESTAR Technical Conference: Brian Mitchell, Tonnie Maniero, and Shirley Clark (PNW Region AQC) participated in the WESTAR Fall Technical Conference. One session was devoted to the topic of Forest Health and Air Quality. The U.S. Forest Service (USFS) is proposing to greatly increase prescribed burning in a number of western States. The significant amounts of smoke associated with the increased burning threaten ambient air quality standards, visibility in class I areas, and existing PM-10 nonattainment areas. Mitchell represented the NPS on a panel discussion of the prescribed fire issue. He expressed concern about visibility impairment that could result from increased burning, and also advised the States to consider the health risks associated with smoke prior to making any major policy changes with respect to regulation of smoke from wildland areas.

Mitchell and Maniero gave presentations in a subsequent session on Federal Land Management Issues. Mitchell discussed the shortcomings of PSD in providing protection for class I areas, and he identified ways that the States and Federal Land Managers (FLMs) could work together to improve air quality in these areas. Maniero discussed the potential biological effects associated with air pollution, and she outlined the information that applicants need to include in their PSD permit applications to allow the FLMs to adequately assess the potential effects of increased emissions on

biological resources in class I areas. Bob Doty, USFS, discussed the lichen manual which will result from the 1991 Lichen Workshop co-sponsored by the AOD Biological Effects Program and the USFS. State representatives expressed interest in receiving copies of the manual as soon as it is available. Finally, Janice Peterson, USFS, presented the report, "Guidelines for Evaluating Air Pollution Impacts on Class I Wilderness Areas in the Pacific Northwest." This report identifies sensitive air quality related values and pollutant thresholds of concern in USFS class I areas in Washington and Oregon.

### OUTREACH ACTIVITIES

Strategic Plan Implementation, Natural Resource Interpretation Team: The Natural Resource Interpretation Team had their first organizational meeting. This team is charged with designing a traveling natural resources exhibit for professional society meetings and making recommendations regarding changes in the substance, support, and administration of natural resource interpretive programs. Dee Morse is the Team leader. A work plan for the Team was developed and task assignments were made and approaches to developing the required products were discussed.

Visibility Data for Bryce Canyon National Park: The park interpretive staff called the AOD and requested seasonal average visibility conditions for Shenandoah and Bryce Canyon National Parks. The park staff is compiling

information comparing the visibility at Bryce Canyon with an eastern park unit. Seasonal visual range averages reconstructed from fine particulate data were determined for both park areas and sent to Bryce Canyon staff. (Morse)

## **PLANNING AND ENVIRONMENTAL ASSESSMENT**

Craters of the Moon National Monument (CRMO): Erik Hauge met with Superintendent Jarvis and other Monument staff members to discuss preparation of an Air Quality Management Plan (AQMP) for the Monument. Adoption and implementation of the AQMP will involve a regional cooperative effort among the various FLMs, the State of Idaho, local communities, industries, and citizens. Compilation of data (monitoring, etc.) has begun. Hauge also visited Idaho National Engineering Laboratory, USFS, U.S. Fish and Wildlife Service, and Bureau of Land Management offices and monitoring sites to discuss the AQMP and to record the types of instruments and the parameters being measured in and near the Monument.

City of Rocks National Reserve (CIRO): Hauge visited the Reserve and photographed some scenic views from the Reserve to prominent features outside the Reserve. He then met with Superintendent David Pugh to discuss: the air quality elements of the Reserve's Master Plan; a proposal to discuss with the State of Idaho possible redesignation of the Reserve to class I; and a proposal to establish a clean air cooperative effort involving CIRO, CRMO, and Great Basin National Park.

Oil and Gas Leasing Proposals: Hauge has received several USFS and Bureau of Land Management draft Environmental Impact Statements (EISs) for proposed oil and gas leasing near various NPS class I areas. In almost every instance, the air quality discussions are inadequate. NPS's comments have included requests for the EISs to identify: the nearest class I areas to the lease areas; the potential air pollution that can be emitted by a single well, a field of wells, and a basin of

wells; and a cumulative air quality analysis, including modeling, monitoring, mitigation measures, and resource impact analyses. Hauge is arranging a meeting between Environmental Protection Agency, USFS, and NPS personnel to resolve these air quality related issues.

U.S. - Canada Air Quality Agreement: With the assistance of Research Branch and other AQD staff, Hauge prepared comments on the first progress report on the agreement. Comments included information on NPS air program functions such as visibility monitoring, air pollution effects research, and permit review, as well as existing or potential transboundary air pollution and acid deposition issues, which could impact U.S. or Canadian national park units. Several areas, which were inadequately covered in the progress report were discussed in the comments, such as the lack of information on fine particulate sampling, critical loads, deposition monitoring, transboundary air pollution in the West, regions of concern, ozone impacts in forests, and episodic acidification.

## **PERMIT REVIEW AND TECHNICAL SUPPORT**

During October, the Policy, Planning, and Permit Review Branch reviewed permit applications for the new air pollution sources listed in Table 1, which are proposed near NPS areas. Please contact the staff person identified for more specific information regarding these projects. In addition, John Notar provided the following technical assistance.

- Discussed EIS issues with Santa Monica Mountains National Recreation Area's Tony Gross regarding a large housing tract to be built next to the Park. Discussed the need for offsets of NO<sub>x</sub> and VOC emissions to reduce impacts from ozone.
- Continued review of visibility modeling issues for the Healy Clean Coal Project.
- Met with the Ozone Injury to Trees Com-

mittee, considering the temporal and spatial variation of ozone concentrations within a sampling area. Presently reviewing stagnation events during the monitoring period of a similar study.

- Continued reviewing PLUVUE II model and user's guide in cooperation with EPA OAQPS.

## **GASEOUS POLLUTANT MONITORING**

Annual Data Summary Reports: 1991 annual gaseous pollutant summary reports have been prepared for Grand Canyon, Guadalupe Mountains, Great Smoky Mountains (Cove Mountain), and Lassen Volcanic National Parks. Final ozone, sulfur dioxide and/or meteorological data are included, as well as graphs and summaries of the data. These reports were sent to the parks and the respective Regional Air Quality Coordinators.

Calibration and Maintenance Visits: Tables 2 and 3 list the semi-annual calibration and maintenance visits conducted during October 1992 and those to be performed November through January 1993. Visits will be scheduled with the site operators by the visitor. Site operators, park Superintendents and Regional Air Quality Coordinators will be given a 2-week written notice of the site visit. (Ron Lawler Heavner)

Quality Assurance Audits: Table 4 is a tentative schedule of system and performance audits by Ogden Environmental and Energy Services through December 1992. These are tentative dates. Parks should refer to written notification by Ogden Environmental for actual dates. Parks should receive written notification from Ogden Environmental at a minimum of 2 weeks prior to the visit. (Carson)

NAAQS Exceedances: The raw data for October 1992 indicated that Hawaii Volcanoes National Park (HAVO) may have exceeded the 24-hour National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (0.14 ppm) during the month. HAVO recorded 1 day

above the 24-hour NAAQS with an average concentration of 0.219 ppm on October 13, 1992. The maximum concentration recorded during the 24-hour period was 0.669 ppm at 0600 hours. HAVO may have also exceeded the 3-hour sulfur dioxide NAAQS (0.5 ppm) two times on October 13, 1992. The 3-hour sulfur dioxide NAAQS may have been exceeded from hours 0500-0700 with the site recording a 3-hour average of 0.535 ppm, and hours 0700-0900 recording a 3-hour average of 0.564 ppm. All other NPS areas with monitoring sites were below the ozone and sulfur dioxide NAAQS during October. (Carson)

## **BIOLOGICAL EFFECTS**

Division Seminar: "Biological Effects Research at Great Smoky Mountains National Park (GRSM)": Bruce Nash presented a seminar to the AQD which reviewed the status of the GRSM fumigation study, hardwood trend plots, and "bio-indicator" survey. The fumigation facility has been "winterized" and the Principal Investigator is now analyzing data and preparing a series of technical reports. Preliminary data from the 1992 trend plots indicate that foliar injury was present on black cherry, sassafras and yellow-poplar; however, at levels generally less than that recorded in 1991. The "bio-indicator" survey, completed in September 1992, will provide data on incidence and severity of foliar injury on black cherry and tall milkweed plants located along selected GRSM trails, as well as important information for future survey design. Bruce outlined plans for a complete review of the hardwood trend plot protocols, which will begin with a special meeting in November 1992 at the George Wright Society Meeting in Jacksonville, Florida.

Mr. Trent Procter (USFS) Visits AQD: Mr. Procter, an air resource specialist with the USFS in Porterville, California, visited the AQD to discuss Project FOREST. Project FOREST is a multi-agency monitoring and research effort which is investigating the effects of ozone on ponderosa and Jeffrey pines in the Sierra Nevada, California. Sequoia-

Kings Canyon, and Yosemite National Parks are currently participating in Project FOREST. The Research Branch has provided funding and expertise to this effort and is currently evaluating its future role in the project. (Nash)

NPS Participates in USFS Symposium, Air Pollution Effects on Terrestrial and Aquatic Ecosystems in New England and New York: Randy Ferrin (AQD, Biological Effects Program) cochaired a symposium and workshop sponsored by the USFS, October 19-23 in Waterville Valley, New Hampshire. Mary Foley, NARO, and DeNise Cooke, MARO, also represented the NPS at this symposium. Nearly 100 people attended the research symposium. Topics included deposition, air pollution effects on soils and ecosystems processes, aquatic effects, direct effects on plants, and monitoring programs. Several Park Service cooperators presented papers including Bob Kohut of Boyce Thompson Institute and Stephen Norton of the University of Maine. The intent of the symposium was to provide a forum for information exchange on air pollution effects in the northeast. A follow-up to this research symposium is planned for FY 94, with the NPS as a possible cosponsor. The workshop's objective was to develop a 5-year plan for refining the USFS's Eastern Region PSD screening document. The output of the workshop will be a monitoring and inventory plan for sensitive indicators in the USFS's three class I areas in New England, to be available by spring 1993. (Ferrin)

Research Branch Staff Presents Seminar at University of Colorado, Boulder: Kathy Tonnessen presented a seminar to a Department of Geography class at the University of Colorado on October 16. This class, on the subject of Mountain Geography, was designed to give juniors and seniors an introduction to physical and biogeochemical processes in mountainous areas of the world. Kathy presented an overview of resource management issues of concern to the NPS, with an emphasis on external threats to park ecosystems. She presented a case study of the use of science to determine the cause of visibility degradation in the Grand

Canyon, and the policy responses to the WHI-TEX research program. (Tonnessen)

Research Branch Meets at Fort Collins: The Research Branch (RB) of the AQD met for a planning session on the Foothills Campus of Colorado State University on October 8. Administrative issues, including the FY 93 budget, the agenda for the annual Air Quality Coordinators' Meeting, and RB participation in the resource management training course (January 1993) were discussed. We reviewed the current and planned programs in Biological Effects, Modeling, and Visibility Research and Monitoring. The Lakewood contingent toured the audio-visual facility at the Foothills campus and discussed plans for production of a video on ozone-vegetation interactions. (AQD-RB)

USGS Researchers Present Information on the Characterization of Baseline Geochemistry in Alaska: Dr. James Crock of the Geochemistry Branch of the U.S. Geological Survey presented a seminar to the AQD staff on October 7 based on a comparison of three studies of baseline geochemistry in Alaska: Denali National Park and Preserve, Wrangell-St. Elias National Park and Preserve, and Kenai National Wildlife Refuge. Similar methods were used for the collection, processing, and analysis of conifer needles, moss, lichen, and surface soils to determine the concentrations of trace elements and sulfur. The data collected at WRST are also presented in a draft report, "Element Concentrations and Baselines for Moss, Lichen, Spruce, and Surface Soils, in and near Wrangell-Saint Elias National Park and Preserve, Alaska," currently being reviewed by AQD, park, and regional office researchers. This site-specific study was initiated in 1990 to provide a trace element baseline prior to the construction of a small, coal-fired power plant in the vicinity of WRST. This facility, planned by the Department of Defense, has since been cancelled. In general, the elemental composition of vegetation and soils at all sites was similar to natural background values found at unaffected sites in Alaska. (Tonnessen)

Papers and Articles by Research Branch Staff Are Published: Bruce Nash is the coauthor of a paper recently published in *Environmental Toxicology and Chemistry* 2:1093-1104 (1992), titled "Forest Health Along a Wet Sulfate/pH Deposition Gradient in North-Central Pennsylvania." In this paper, Bruce and his coauthors, Don Davis and John Skelly of Penn State University, describe their findings on the status of oak/hickory forests along an east-west gradient of sulfate deposition on the Allegheny Plateau of Pennsylvania. In spite of the large loadings of wet sulfate in this region, the researchers were not able to document differences in forest response to this pollution input.

Kathy Tonnessen had an article published in the September 1992 issue of the NPS publication, the *Courier*. This article, "Anatomy of a Success," was part of a special issue dedicated to the subject of the use of scientific research to support resource management decisions in the NPS. Kathy describes the cooperative program by the staff of Sequoia-Kings Canyon National Parks and the California Air Resources Board to study the effects of acid deposition on a subalpine watershed, Emerald Lake watershed, located on the western slope of the Sierra Nevada. (Nash, Tonnessen)

#### METEOROLOGY AND MODELING

The Interagency Workgroup on Air Quality Modeling (IWAQM) interim recommendation document, on methods to model sources farther than 50 kilometers from class I areas and methods to estimate regional haze impacts, is being reviewed by the respective IWAQM agencies. The recommended procedures can also be used to estimate depositional impacts of  $\text{SO}_4^-$  and  $\text{NO}_3^-$ . After the agency reviews have been completed, the procedures will be published by the EPA.

#### VISIBILITY

Conference on Visibility and Fine Particles,

Vienna, Austria: Kristi Gebhart and Bill Malm participated in the international Conference on Visibility and Fine Particles in Vienna, Austria, September 14-20. The conference was attended by approximately 100 scientists from 24 countries. The Europeans were in general interested in light extinction as it pertains to climate change, while the North Americans were more interested in degradation of scenic vistas. However, informal observations of the visibility in Europe were that it is at least as bad or worse than the Eastern United States.

AQD Papers presented there included:

Gebhart K.A., Malm W.C. and Day D. "Examination of the Effects of Sulfate Acidity and Relative Humidity on Light Scattering at Shenandoah National Park"

Iyer H.K. and Gebhart K.A. "Cluster Analysis of Trajectories with Applications to the Study of Source Receptor Relationships"

Malm W.C., Trijonis J., and Sisler J. "Assessing the Effect of  $\text{SO}_2$  Emission Changes on Visibility"

Molenaar J.V., Malm W.C., and Johnson C.E. "Visual Air Quality Simulation Techniques"

Molenaar J.V. and Malm W.C. "Ambient Optical Monitoring Techniques"

Pitchford M.L. and Malm W.C. "Development and Applications of a Standard Visual Index"

Sisler J.F., Malm W.C., Molenaar J., Cahill T., and Eldred R. "Relative Importance of Soluble Aerosols to Spatial and Seasonal Trends of Impaired Visibility in the United States"

Conference proceedings will be published in an upcoming issue of *Atmospheric Environment*.

TABLE 1

<u>PROJECT</u>	<u>LOCATION</u>	<u>MAJOR COMMENTS</u>	<u>CONTACT</u>
Florida Mining and Materials (cement plant modification)	14 km SE of Chassahowitzka WA	Major increase in NO <sub>x</sub> ; no significant impacts expected at the wilderness area	Rolofson
Weyerhaeuser Paper Company (pulp mill expansion)	113 km SW of MORA	Significant increase in NO <sub>x</sub> and SO <sub>2</sub> emissions. Reiterated concerns about possible nitrate and sulfate impacts at the park; supported State's post construction monitoring requirements.	Morse
Auburndale Power Partners (150 MW cogeneration facility)	105 km SE of Chassahowitzka WA	Major NO <sub>x</sub> and SO <sub>2</sub> emitter; no significant impacts expected at the wilderness area.	Notar
Lee County Incinerator (municipal waste incinerator)	88 km NW of EVER	SERO requested review of mercury impacts at EVER. Although mercury bioaccumulation is a concern, facility should actually reduce overall mercury emissions; no significant impacts expected at the park.	Bunyak
Seminole Fertilizer (plant modification)	120 km SE of Chassahowitzka WA	Significant increase in SO <sub>2</sub> ; no significant impacts expected at the wilderness area.	Maniero

TABLE 2

<u>SITE LOCATION</u>	<u>VISITED BY</u>	<u>DATE</u>
Acadia NP	John Faust (ARS)	October 5-7
Big Bend NP	Mark Tigges (ARS)	October 13-14
Indiana Dunes NL	Robert Lehman (ARS)	October 13-15
Guadalupe Mountains NP*	Mark Tigges (ARS)	October 15-16
Denali NP & Pres	Robert Lehman (ARS)	October 21-23
Redwood NP	Mitch Walker (ARS)	October 22-23

\* Gaseous pollutant monitoring equipment was removed

TABLE 3

<u>SITE LOCATION</u>	<u>VISITED BY</u>	<u>DATE</u>
<b>November Site Visits</b>		
Mount Rainier NP**	Mark Tigges and Mike Bagby (ARS)	November 3-6
Olympic NP	Mark Tigges and Mike Bagby (ARS)	November 8-9
Point Reyes NS*	John Faust (ARS)	November 15-17
Craters of the Moon NM	Ron Lawler Heavner (AQD)	November 16
Sequoia-Kings Canyon NP	Mitch Walker (ARS)	November 16-20
Saguaro NM	Mike Tigges (ARS)	November 16-20
<b>December Site Visits</b>		
Voyageurs NP	Mitch Walker (ARS)	December 1-4
Pinnacles NM	Mark Tigges (ARS)	December 7-9
Canyonlands NP	Bobby Carson (AQD)	December 8-9
Joshua Tree NM	Mark Tigges (ARS)	December 10-11
Mammoth Cave NP	Mark Tigges (ARS)	December 14-17
Grand Canyon NP	Mitch Walker (ARS)	December 14-17
<b>January Site Visits</b>		
Yosemite NP	Mitch Walker (ARS)	January 11-15
Olympic NP and Mount Rainier NP	Robert Lehman (ARS)	January 18-22
Canyonlands NP	John Faust (ARS)	January 18-21
* Gaseous pollutant monitoring equipment will be removed		
** Gaseous pollutant monitoring equipment will be installed		