Air Quality Division
February 1993 Monthly Report

Mailing Address:
National Park Service - AIR
P.O. Box 25287
Denver, Colorado 80225

Delivery Address:
National Park Service - AIR
Room 215
12795 W. Alameda Parkway
Lakewood, Colorado 80228

Phone:
303 969-2070

FAX:
303 969-2822

John Bunyak Selected as Branch Chief: Air Quality Division Chief John Christiano announced the selection of John Bunyak as Chief, Policy, Planning, and Permit Review Branch to fill the vacancy created following the resignation of Chris Shaver. Prior to his selection as Branch Chief, John had served as the AQD's Environmental Engineer since 1982, when he joined the National Park Service. His major responsibilities included providing technical supervision of the AQD's permit review function, and reviewing the best available control technology analysis contained in permit applications for sources which could impact NPS units. From 1977 to 1982, John worked as an Environmental Engineer in the Air Branch of the Environmental Protection Agency's Regional Office in Dallas, Texas. John's major responsibilities pertained to Federal new source review (NSR) programs and consisted of such duties as processing air permit applications, managing EPA contracts, and coordinating the delegation of NSR programs to the States. John has a B.S. degree in Environmental Engineering from The Pennsylvania State University and is a registered professional engineer in the State of Colorado.

John Ray Joins AQD Staff: John Ray joined the AQD in late January after accepting the position of atmospheric chemist with the Monitoring and Data Analysis Branch. John received his Ph.D. in chemistry from Michigan State University in 1978. Since that time John has worked for various private, academic, and Federal institutions, including Denver University and the University of Colorado's Cooperative Institute for Research in Environmental Sciences. Much of John's past research has focused on the measurement of ozone and other oxidants and trace gases in the troposphere. He has numerous publications documenting the results of his research efforts. John has developed and modified methods for the measurement of ozone and other gases for use in aircraft or ground-based stations. John will be responsible for the AQD's quality assurance efforts, as well as the integrated measurement program for trace gases. John can be reached at (303) 969-2072.

PERMIT REVIEW AND TECHNICAL SUPPORT

During February 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.

OUTREACH ACTIVITIES

Air Quality Video Tape: The production of an air quality video tape by Colorado State University entitled "Looking Through the Atmosphere" was completed and sent to the AQD for distribution. The video is targeted for National Park Service employees and focuses on the mechanics of visibility impairment in NPS units Servicewide. The production of a second video entitled "Sights Unseen" should be completed in the next month and it will focus on visibility conditions and trends in wilderness areas and NPS units throughout the country. The video "Looking Through the Atmosphere" is available from the AQD on a request basis.

Yosemite National Park Request for Air Quality Interpretive Materials: The AQD received a request from Deb Pfenninger (Physical Science Technician, Yosemite NP) for a set of the air quality core slides. The slide set was sent to the park and will be used in the development of an air quality presentation. Air quality related interpretive materials are available from the AQD upon request.

Brendhan Zubricki Visits AQD: Mr. Zubricki, the new NPS Air Quality Coordinator for the Southeast Region, spent a day with the AQD on February 26. We discussed the organizational structure of the AQD and the permit review process and updated Mr. Zubricki on the status of the fumigation, trend plot, and biomonitoring studies sponsored by AQD at Great Smoky Mountains National Park. We also discussed various areas of mutual concern, including potential research projects, current permit applications, and measures to reduce air pollution within parks, such as NPS employee car pooling. (Nash)

GASEOUS POLLUTANT MONITORING

Annual Data Summary Reports: Annual gaseous pollutant summary reports have been prepared for Badlands National Park (1989 and 1990) , Rocky Mountain National Park (1991), and the Yosemite Valley (1991) site at Yosemite National Park. 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.

Great Smoky Mountains NP Ozone Fumigation Data: David Joseph completed the analyses and summaries of the chamber and treatment averages of the 1992 hourly ozone fumigation data collected during the fumigation experiments at Great Smoky Mountains NP. The analyses were transmitted to Jim Renfro at the park and Dr. Howard Neufeld of Appalachian State University. The 1992 data summaries for the Cove Mountain, Look Rock and Uplands sites were prepared and sent to Dr. Art Chappelka of Auburn University and Jim Renfro.

Shenandoah Ozone Data Summaries: David Joseph completed analyses and summaries of 1992 Big Meadows, Dickey Ridge, and Sawmill Run site data. These summaries were sent to Dr. John Skelly of Penn State University and Julie Thomas at the park.

Calibration and Maintenance Visits: Tables 2 and 3 list the semi-annual calibration and maintenance visits conducted during February 1993 and those to be performed March through June 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)

NAAQS Exceedances: The raw data for February 1993 indicated that all National Park Service areas with monitoring sites were below the ozone and sulfur dioxide National Ambient Air Quality Standards during the month.

On February 9, 1993, elevated ozone concentrations were observed ahead of an approaching cold front at Mammoth Cave National Park and Great Smoky Mountains National Park. Monitors at both of these site recorded their maximum ozone concentrations for the month of February 1993 during the same hour; Mammoth Cave NP recorded an hourly ozone concentration of 0.063 ppm at 1600 hours CST and Great Smoky Mountains NP (Look Rock station) recorded an hourly ozone concentration of 0.070 ppm at 1700 hours EST. The Shenandoah National Park (Big Meadows) site recorded its maximum

February concentration one day later on February 10, 1993, measuring 0.068 ppm at 1100 hours.

Higher than average ozone values were also observed on February 28, 1993, with the Voyageurs National Park and Indiana Dunes National Lakeshore sites. Voyageurs NP recorded an hourly ozone concentration of 0.060 ppm at 1400 hours and Indiana Dunes NL recorded an hourly ozone concentration of 0.075 ppm at 1600 hours.

Hawaii Volcanoes National Park recorded a maximum hourly SO_2 concentration of 0.695 ppm on February 1, 1993, at 0900 hours. (Bob Carson)

North Atlantic Regional Experiment: John Ray attended a planning meeting on February 23-24 hosted by the NOAA Aeronomy Lab in Boulder, CO, for the summer 1993 intensive of the North Atlantic Regional Experiment (NARE). Most of the NARE observations will be within and east of the Gulf of Maine. In combination with the Gulf of Maine Ozone Study (GOMOS) experiment in the Gulf of Maine area, the 1993 NARE and GOMOS intensives should add greatly to the understanding of ozone precursor processing and transport that lead to high ozone levels at Acadia National Park.

The monitoring site at Acadia would provide data as a surface site in the area. The Maine Department of Environmental Protection hopes to support canister sampling of Non-Methane Organic Compounds at Acadia and a low-sensitivity nitrogen oxides (NO/NO_y) analyzer, if one can be obtained. Listed below is the NARE Schedule:

Aug 5, 1993	Start measurement intensive
Aug 10	Start of aircraft observations
Aug 25	Research ship in the area
Sept 2	End of intensive
Jan 19, '94	Workshop to review data
Sept 5, '94	Present papers at Japan IAMAP meeting

Meeting with Harvard School of Public Health Personnel: John Ray and Miguel Flores met with Dr. Petros Koutrakis and Mike Wolfson from the Harvard School of Public Health on February 18 to discuss the results of our ozone passive sampler study conducted during the summer of 1991. The results of this study, which were first determined to be of little value due to sampler contamination, are being re-examined to understand better what went wrong during the study, salvage some of the data, and assist us in designing a new study. Dr. Koutrakis discussed some of the experimentation and research currently being conducted by Harvard using passive samplers and annular and honeycomb denuders. Denuders are glass tubes that can be connected in series to sample gases such as ozone, sulfur dioxide, nitric acid, and ammonia by coating the inside of the denuder with different compounds. The AQD is considering further experimentation using these devices, possibly as early as this summer.

Ozone Monitoring at Acadia National Park: John Ray and Miguel Flores met with Superintendent Bob Reynolds and other park personnel (Larry Bobinchuck, Bob Breen, and Charlie Jacobi) and representatives from the Maine Department of Environmental Protection (DEP) on February 18 to discuss ozone monitoring at the park and the forthcoming Gulf of Maine Ozone Study (GOMOS). Due partially to the DEP's loss of funding for the wet deposition site at Acadia, the DEP is interested in taking over the operation of the ozone monitoring station at the park if the NPS is willing to fund the costs for wet deposition sampling. The park and the State are also interested in finding a permanent location for the present site, since the current site is on a leach field that must be serviced periodically. The meeting attendees agreed in principle to transfer the operation of the station to the State DEP, pending a resolution of some issues (e.g., State's use of data without notifying the park, amount of park staff time required to operate the instruments and assist in the data validation process) and the drafting of a Memorandum of Agreement delineating each party's role. With respect to the GOMOS study, the State expressed an interest in performing additional ozone precursor sampling at the park during this summer's intensive study that will include aircraft and ship monitoring. The study is being conducted to obtain additional information to feed into ozone modeling efforts associated with the 1995 State Implementation Plan revisions. Sampling at Acadia during the intensive will tie Acadia into this future work. The DEP has requested funding from EPA's Regional Office to conduct NMOC canister sampling. The DEP requested AQD assistance in locating a low-sensitivity nitrogen oxides monitor for use at Acadia. The DEP agreed to operate the instrument at Acadia if one is acquired for the study.

BIOLOGICAL EFFECTS PROGRAM

ForestHealth Expert Advisory System Interim Report: ForestHealth is a computerized expert advisory system that is being developed by Dr. Michael Saunders and Mr. Bruce Miller of Penn State University and Bruce Nash (AQD-Research Branch). In 1992 the system was successfully used at Great Smoky Mountains and Shenandoah National Parks to ensure consistency and accuracy of foliar injury ratings in the hardwood trend plot studies. The ForestHealth system is described in an Interim Report, and in a paper published in the Canadian Journal of Forest Research, both of which are available from the AQD. (Nash)

AQD Hosts Dr. John Turk (USGS) for Seminar on Snow Chemistry: John Turk of the Water Resources Division, USGS in Lakewood, Colorado, has studied the chemistry of snow and lake water in the Colorado Rockies in an effort to detect the effects of air pollutants. He presented these data at an AQD seminar on February 10. His analysis of naturally-occurring sulfur isotope concentrations in the snowpack indicates that the area downwind of the Yampa River Valley is currently being affected by emissions from the Craig and Hayden power plants, located on the western slope of the Rockies. There is some indication that snow falling in the western part of Rocky Mountain National Park is incorporating sulfate that originated from the burning of coal in these plants. During spring 1993 the USGS will expand this snow survey work to include sites along the Continental Divide from New Mexico to the Canadian border (including Glacier, Grand Teton, Rocky Mountain and Yellowstone National Parks) to identify other "hot spots" where air pollution may be affecting snow chemistry. (Tonnessen)

Research Branch Staff Meets with Other EOS Investigators: On February 6-7, Kathy Tonnessen met with other NASA Earth-Observing System (EOS) researchers from University of California, Santa Barbara, University of Arizona, and University of Colorado in Boulder for their semi-annual program meeting. Currently there are plans for different countries to send up earth probes throughout the 1990s, but the actual NASA-EOS satellites are not going to be launched until the late 1990s. The focus of much of the field research within the next few years is on sites in the Sierra Nevada (some in Sequoia & Kings Canyon National Parks and Yosemite National Park) and in the Rockies (with complementary sites in Rocky Mountain National Park). The EOS also has foreign sites in the Tien Shan of Kazakstan and China, and the Andes of Chile. Some of the researchers conducted reconnaissance trips to those locations this past spring. There has been considerable progress made by the graduate students in coming up with algorithms to interpret Thematic Mapper scenes from the current LANDSAT. A number of the investigators are coming up with models of snowmelt, snow accumulation, and water routing through the small, headwater basins of interest. This work will help us to predict the amount and chemistry of snowmelt runoff based on remotely-sensed images that can give us snow-covered area, snow density, and, perhaps, contaminants in the snow.

Field Trip to Niwot Ridge, Long Term Ecological Research Site on the Front Range, Colorado: On February 9, Randy Ferrin and Kathy Tonnessen joined a group of snow researchers from the University of Colorado, University of California, U.S. Geological Survey, and National Center for Atmospheric Research on a tour of the facilities at the Mountain Research Station (9500') and Niwot Ridge (11,500'), a long-term ecological research site maintained by the University of Colorado on the Front Range of the Rockies. Researchers sponsored by the National Science Foundation are conducting alpine ecosystem research at the "tundra lab" site, with a current emphasis on the importance of atmospheric nitrogen inputs to the snowpack. NOAA has installed meteorological equipment and a trailer housing instruments to measure carbon dioxide, nitrous oxide, methane, numerous CFC species, and ozone. It is hypothesized that the soils at this alpine site are presently nitrogen saturated, since nitrate is observed in surface runoff during the spring. Researchers want to determine if the loading of nitrate and ammonium (about 50:50) from the atmosphere is the cause of this "saturation."

Lichen Training Session: Randy Ferrin, Biological Effects Program, attended a lichen training session at the Santa Barbara Museum of Natural History. The class was instructed by Ms. Charis Bratt of the Museum's Botany Department. Ms. Bratt has done considerable work with lichens in California, including the Channel Islands. The primary focus of the class was the taxonomy of lichens with special emphasis on lichens known to be sensitive to air pollution. A portion of the class was spent identifying 30 specimens using the taxonomic features of growth form, color, vegetative characteristics, and reproductive structures, as well as simple chemical tests. Participants were instructed in the protocol for preserving and labeling lichens for herbarium collections. A field session was held at several locations in the Los Padres National Forest. The session included a discussion on the use of transects to monitor lichen growth and vitality. This training will allow AQD staff to assist park staff in planning for studies of lichen populations where appropriate.

TABLE 1
PERMIT APPLICATION ACTIVITY

PROJECT	LOCATION	MAJOR COMMENTS	CONTACT
BMW (automobile assembly plant)	112 km SE of GRSM	Major VOC and NO_x source; no significant impacts expected at the park; however, reiterated our concern that new sources in the vicinity of the park could exacerbate the existing adverse effects; again recommended source obtain emission offsets.	Bunyak
Black Hills Power and Light (80 MW coal-fired power plant)	60 km SW of DETO; 135 km NW of JECA; 158 km NW of MORU; 175 km NW of WICA; 215 km NW of BADL	Major SO_2, NO_x, CO, and PM source; no significant impacts expected at NPS units; recommended better SO_2 and NO_x controls; clarified air quality dispersion modeling and air quality related values analyses requirements.	Bunyak
Hess Oil (refinery modification)	5 km SE of CHRI; 15 km SE of BUIS; 65 km S of VIIS	Major NO_x and CO source; due to northeast trade winds, no significant impacts expected.	Notar

TABLE 2
CALIBRATION AND MAINTENANCE VISITS

SITE LOCATION	VISITED BY	DATE
Everglades NP	John Faust and Dave Dietrich (ARS)	February 8-10
Pinnacles NM	Mark Tigges (ARS)	February 9-10
Lassen Volcanic NP	Mark Tigges (ARS)	February 11-12
Indiana Dunes NL	Mitch Walker (ARS)	February 25-26
Hawaii Volcanoes NP	John Faust (ARS)	February 24-27

TABLE 3
SCHEDULED CALIBRATION AND MAINTENANCE VISITS

SITE LOCATION	TO BE VISITED BY	DATE
March Site Visits		
Haleakala NP	John Faust (ARS)	March 1-3
Acadia NP	Mitch Walker (ARS)	March 10-12
Rocky Mountain NP	Robert Lehman (ARS)	March 16-17
Shenandoah NP	Mitch Walker (ARS)	March 22-26
Craters of the Moon NM	Mike Bagby (ARS)	March 29-31
April Site Visits		
Big Bend NP	Mark Tigges (ARS)	April 5-7
Mesa Verde NP (site installation)	Mike Bagby and Robert Lehman (ARS)	April 5-9
Great Smoky Mtns. NP	John Faust and Mitch Walker (ARS)	April 19-23
May Site Visits		
Joshua Tree NM	Mark Tigges (ARS)	May 5-7
Denali NP and Pres.	Mitch Walker (ARS)	May 12-14
Yosemite NP	Robert Lehman (ARS)	May 17-23
Voyageurs NP	John Faust (ARS)	May 19-21
Yellowstone NP	Mike Bagby (ARS)	May 26-28
June Site Visits		
Saguaro NM	Mitch Walker (ARS)	June 7-9
Mammoth Cave NP	Mike Bagby (ARS)	June 16-18
Grand Canyon NP	John Faust (ARS)	June 21-23