Air Quality Division
March 1993 Monthly Report

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STATE ACTIVITIES

WESTAR: WESTAR held its annual business meeting in early March. Future WESTAR activities of particular interest to the NPS and other land managers of areas in the West include: (1) a study to develop a PSD tracking system for increment consumption and cumulative impacts on such areas (NPS and BLM are providing partial funding); and (2) a multi-agency effort to help resolve apparent conflicts between increased use of prescribed fire in wildland areas and attainment of PM-10 ambient air quality standards in areas of certain western States. Both projects will begin in earnest this summer. Preliminary plans for WESTAR's annual fall technical conference were also made, but more detailed plans (i.e., session agendas, presenters, time allotments, etc.) for the conference will be decided at the planning meeting to be held in late summer 1993. (Brian Mitchell)

MEETINGS AND CONFERENCES

VISIBILITY: Mitchell attended a specialty conference on visibility protection in British Columbia and the Pacific Northwest in Harrison, BC, Canada. Regulators at all levels of Canadian government probably benefited the most from this conference in that EPA, federal land managers, and State air quality personnel from the United States shared their experiences over the past 15 years to address visibility protection pursuant to the Clean Air Act Amendments of 1977. Canadian Federal and Provincial legislation has prompted efforts by Canadians to start developing plans to deal with visibility issues, and they should be able to "jump start" their efforts based on progress made in the U.S. to better understand the science of visibility and source-receptor relationships vis-a-vis visibility impairment. Not surprising was the fact that smoke from wood burning constitutes about 75 percent of the fine particulate matter emitted in BC and is a likely target for emissions reductions that will improve visibility in the province.

FIRE: Mitchell attended a symposium in Missoula, Montana, on "Fire in Wilderness and Park Management" the last week in March. He presented, as part of an air quality panel, a discussion on present and future air quality regulatory constraints with respect to use of prescribed fire. All papers presented at the meeting will be published and available by this fall.

OUTREACH ACTIVITIES

Request for Information on Air Quality Exhibits in the Southwest Region: Glen Kaye (Southwest Regional Chief of Interpretation) requested information concerning the location and status of air quality exhibits in the Southwest Region. A table delineating exhibit type, location, and status was sent to the region along with the protocol for obtaining air quality funding for the design and fabrication of air quality related exhibits.

Strategic Plan Implementation, Natural Resource Interpretation Committee Meeting: The Natural Resource Interpretation Committee met and discussed the production of the "Research In The Parks" traveling exhibit and reviewed the final draft of the Natural Resource Issue Interpretation Questionnaire. Construction of the "Research In The Parks" exhibit will be completed by May. The exhibit was designed for display at scientific meetings, with the purpose of stimulating interest in conducting research in the parks. The exhibit will be available on a loan basis through Nape Shelton (WASO

Wildlife and Vegetation Division). The committee also approved and finalized the Natural Resource Issue Interpretation Questionnaire. The questionnaire will assist the committee with the necessary information to make recommendations regarding changes in the substance, support, and administration of natural resource issue interpretation. The questionnaire is targeted for the park chief of interpretation and will be sent out to approximately 250 park units sometime within the next 2 months.

TECHNICAL SUPPORT

Grand Canyon National Park (NP): As part of an Environmental Assessment document, the AQD performed a dispersion modeling analysis to assess the potential impacts of a proposed asphalt batch plant at Grand Canyon NP. Based on the results of this analysis, we recommended that the plant be fired with propane (rather than fuel oil), and be located outside the park. Otherwise, the air quality impacts at the park could be "significant." (John Notar)

Pictured Rocks National Lakeshore (NL): At the request of the Midwest Region and the Denver Service Center (Central Team), the AQD modeled the potential impacts of the proposed Beaver Rim Road paving project at Pictured Rocks NL. The results of this analysis indicate that the road paving project and associated automobile traffic should not cause any significant air quality impacts. (Notar)

PLANNING AND ENVIRONMENTAL REVIEW

Erik Hauge participated in the first NPS combined (cultural and natural) resource management planning workshop in Tucson, Arizona, March 8-12. His presentation was on what the Air Quality Division looks for in a Resource Management Plan (especially the Project Statement(s)). He sat on a panel of Washington Office reviewers to answer questions from the other attendees, primarily from Regional Offices. He also participated in the group discussion on integrating resource management planning into other park activities. The participants in the workshop, under the guidance of Jen Coffey and Laura Feller of WASO, hope to produce a resource management planning workbook for NPS units.

Hauge reviewed 21 NPS draft planning documents, providing comments on 4. The draft Yellowstone RMP required revised language in the program discussion and project statement, including a correct Clean Air Act citation and more accurate description of the monitoring program. He recommended that one Crater Lake RMP project statement be eliminated which dealt with upgrading the airshed classification of the land added to a Class I area since 1977. Data regarding nearby air quality and acid precipitation monitoring locations and names of contacts at State air quality regulatory agencies were provided to the Midwest and Southeast Regional Office planners for Obed Wild and Scenic River and Saint Croix and Lower Saint Croix National Scenic Rivers, respectively, for inclusion in air quality monitoring project statements.

GASEOUS POLLUTANT MONITORING

Annual Data Summary Reports: Annual gaseous pollutant summary reports have been prepared for Badlands National Park (1991), Saguaro National Monument (1991), and Everglades National Park (1990 and 1991). 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 1 and 2 list the semi-annual calibration and maintenance visits conducted during March 1993 and those to be performed April through July 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 March 1993 indicated that all National Park Service areas with monitoring sites were below the ozone and sulfur dioxide National Ambient Air Quality Standards (NAAQS) during the month.

The primary and secondary NAAQS for ozone is 0.12 ppm not to be exceeded more that one time per year. Sulfur dioxide also has both primary and secondary standards. The annual average primary NAAQS for sulfur dioxide is 0.03 ppm and the 24-hour primary NAAQS for sulfur dioxide is 0.14 ppm. The secondary NAAQS for sulfur dioxide is a 3-hour standard of 0.5 ppm. The 24-hour primary standard and 3-hour secondary standard are not to be exceeded more that one time per year. A primary standard is for the protection of public health while a secondary standard protects the public welfare from any known or anticipated adverse effects from a pollutant. All national primary and secondary ambient air quality standards can be found in 40 CFR part 50. See attached table of National Ambient Air Quality Standards and PSD Increments.

The raw data for March 1993 indicate that the maximum ozone concentration for the gaseous pollutant monitoring network was 0.100 ppm measured at 1300 hours on March 28, 1993, in Mount Rainier National Park. The second highest concentration was 0.087 ppm measured at 0600 hours on March 6, 1993, at Everglades National park.

The maximum sulfur dioxide 1-hour concentration was 0.382 ppm measured at 0900 hours on March 15, 1993, in Hawaii Volcanoes National Park. (Bob Carson)

BIOLOGICAL EFFECTS PROGRAM

Meeting with Staff from University of Arizona, Cooperative Park Study Unit: Bill Halvorson, CPSU/University of Arizona, met with John Christiano, Tonnie Maniero, Bruce Nash, Mark Scruggs, and Kathy Tonnessen in Denver on March 2 to discuss the report prepared by the science review panel titled: "Review of the Air Quality Biological Effects Research Program - Saguaro National Monument." The content of the report and recommendations of the review panel were accepted by the AQD and will now go back to the panel members for final review. The final report should be available within the next few months and will discuss the types of research projects and approaches that should be implemented in the Sonoran Desert region. (Maniero)

AQD Staff Attend the Society for Northwestern Vertebrate Biology: The theme of this year's meeting was Declining Amphibian Populations, and the meeting included a symposium dedicated to amphibian monitoring in western national parks. Amphibian population decline has been observed worldwide, and possible causes include habitat degradation, introduction of exotic bullfrogs and fishes, acid deposition, exposure to other toxins, and reduced immune function. The symposium included presentations of research and monitoring results in Yellowstone, Grand Teton, Rocky Mountain, Glacier, Mount Rainier, Redwood, Sequoia-Kings Canyon, Olympic, and North Cascades National Parks. Although all these areas are considered "pristine" and are relatively undisturbed, amphibian decline has occurred in many of them. Accordingly, long-term amphibian monitoring sites have been established in a number of the parks. A standardized amphibian survey technique has been developed by the U.S. Fish and Wildlife Service, and this technique has been and will continue to be used in the parks. However, not all the parks include surface water chemistry monitoring in their efforts, and this must be done to rule out acidification as a contributing factor to species decline. (Maniero)

Hardwood Trend Plot Research Funded: The Biological Effects Program has approved

funding for two research projects at Shenandoah (SHEN) and Great Smoky Mountains (GRSM) National Parks. At SHEN, researchers from Penn State University will collect foliage from overstory black cherry, yellow-poplar, and white ash trees to quantify the extent of visible ozone injury. These data will be analyzed with ozone exposure data (provided by AQD-MDAB) to investigate the relationship between various ozone exposure statistics and foliar response. A similar study will be conducted at GRSM by researchers from Uplands Research Lab (GRSM) and Auburn University. Data from both of these studies will be used to refine the current recommendations for "trend plot" ozone injury surveys, and to document foliar injury at these parks. In addition, the investigators at GRSM and Auburn University will analyze data from the 1992 GRSM Biomonitoring Survey to determine the most efficient survey protocols for trail-based ozone injury surveys. Lastly, the GRSM project also includes funding to analyze and summarize the fumigation experiments that were conducted at the Uplands Lab from 1987-1992 by GRSM and Appalachian State University scientists. A related study funded by TVA and EPA will be conducted at GRSM sites (Cove Mountain and Uplands Lab) this summer. Researchers will measure the effect of ozone on the physiology of four species at these sites: red maple, red oak, tulip poplar, and black cherry. (Nash)

Lichen Study Completed at Grand Canyon: A lichen study partially funded by the AQD was recently completed for the Grand Canyon National Park. Marcus Boykin, an Arizona State University graduate student, conducted the study under the direction of Dr. Thomas Nash, Arizona State University. The floristic survey resulted in a checklist of 195 species, including nine new records for Arizona. Three common species collected at various locations along an elevational gradient were analyzed for the concentration of 28 elements. The analysis found that sulfur content was elevated above background levels but did not show a correlation with elevation. While the study concluded that air pollution is not currently affecting the lichen flora of the park, the information will provide a baseline for future air pollution effects studies. Linda Mazzu, Grand Canyon NP Resource Management Specialist, coordinated the study. (Ferrin)

AQD Staff Attends Meeting of NPS Inventory and Monitoring Committee: Kathy Tonnessen attended a meeting of the I&M Advisory Committee in Washington, D.C., March 30-31. After a tenure of 3 years on this committee, Miguel Flores requested that Tonnessen take over the responsibility for representing the AQD on the committee, which determines the funding priorities for this NPS systemwide program. The Committee discussed two draft RFPs: one prepared by Gary Waggoner (GISD) to begin vegetation mapping at natural resource park units, the other written by Bill Jackson (WRD) would select a contractor to begin systematic water quality monitoring in park units. In small workgroup meetings we discussed issues involving the role of the regional I&M coordinators, a data management plan for the I&M data, and scheduling of natural resource inventories in parks. There was considerable discussion of how the organization of the National Biological Survey would affect the NPS I&M program. It appears that the development of I&M protocols would fall under the mission of the NBS, while implementation in the field would continue to be the responsibility of the NPS. Therefore, there will continue to be a need for NBS staff to serve on the committee. (Tonnessen)

Lichen Workshop Proceedings Goes to the Printer: The workshop report generated as a result of the interagency lichen workshop, held in April 1991, was sent to the printer this month. Final editorial work was the responsibility of Bob Hamre, USFS Rocky Mountain Station. Publishing costs are being shared by the USFS and the NPS-AQD. When we receive our supply of this report, we will announce its availability via this monthly report. (Tonnessen)

Staff Attends Information Session on National Biological Survey: Mark Scruggs, Bruce Nash, Kathy Tonnessen, and Ellen Porter (FWS) attended a presentation by Dr. Ted LaRoe (FWS) at the Fish and Wildlife Service regional office in Lakewood March 16. Dr. LaRoe described the Department of the Interior plans to consolidate research biologists into a non-advocacy bureau within the Department to be called the National Biological Survey (NBS). The Biological Effects Research Program of the AQD will be affected by this reorganization within the Department and staff are now coming up with recommendations to submit to the NBS implementation team. On April 6-8 Kathy Tonnessen attended a meeting at the Denver Federal Center to discuss this new organization. (Tonnessen)

MODELING

Interagency Workgroup on Air Quality Modeling (IWAQM): The report on the IWAQM Phase 1 recommendation is undergoing final editing at EPA offices prior to their publication of the report. The IWAQM Phase 1 recommendation represents an interim approach that, given the constraints of practical limitations of resources and hardware and the necessity of selecting "off-the-shelf-techniques," can estimate the impacts of pollution from sources located more than 50 kilometers from areas of concern. The recommended modeling technique, MESOPUFF-II, is suitable for estimating the contribution of single or spatially distributed multiple sources to estimated pollutant concentrations at specific locations. We expect that this interim technique will be used by permitting authorities to assess impacts of new or modified sources of air pollution on Class I areas at least until the IWAQM Phase 2 recommendation is available in 1994.

VISIBILITY

Grand Canyon Visibility Transport Commission Support: Several tasks in support of the Grand Canyon Commission are underway: (Most tasks are in the preliminary stages.)

Source Apportionment - An attempt is underway to extend the simple source apportionment techniques which have been used for sulfate to other observables such as organic and light absorbing carbon and measured and reconstructed light extinction. As part of this task, statistical analyses of all measured particle species by year, season, and origin of air mass are being conducted.

Source apportionment techniques ranging from very simple to very complex are being applied to sulfates measured at Grand Canyon NP. Results from several techniques will be intercompared to better determine the strengths and weaknesses of the techniques.

Reconstructed Light Extinction - Light extinction measured in the IMPROVE Network by transmissometers is being compared to reconstructed extinction for all sites on the Colorado Plateau. Reconstructed extinction is calculated by summing the estimated light scattering or absorption by the measured particle species. The amount and direction of disagreement between measured and reconstructed extinction varies by site. Reasons are being researched.

Sulfate Acidity in Eastern U.S.: Sulfate data collected at State College, Pennsylvania, during the summer of 1991 are being analyzed. The goal is to determine how well sulfate acidity calculated by a new, simple technique using data from an IMPROVE sampler compares to more traditional methods used by Harvard University and other organizations. The ability to calculate sulfate acidity is important for visibility research, particularly in the Eastern U.S., because it determines how large the sulfate particle grows when exposed to high relative humidity.

TABLE 1
CALIBRATION AND MAINTENANCE VISITS

SITE LOCATION	VISITED BY	DATE
Haleakala NP	John Faust (ARS)	March 1-3
Acadia NP	Mitch Walker (ARS)	March 11-12
Rocky Mountain NP	Mike Bagby (ARS)	March 16-17
Shenandoah NP	Mark Tigges (ARS)	March 23-25

TABLE 2
SCHEDULED CALIBRATION AND MAINTENANCE VISITS

SITE LOCATION	TO BE VISITED BY	DATE
April Site Visits		
Big Bend NP	Mark Tigges (ARS)	April 12-16
Mesa Verde NP*	Mike Bagby and Robert Lehman (ARS)	April 12-16
Great Smoky Mountains NP	John Faust and Mitch Walker (ARS)	April 26-30
May Site Visits		
Craters of the Moon NM	Mike Bagby (ARS)	May 3-5
Joshua Tree NM and Death Valley NM**	Mark Tigges (ARS)	May 4-7
Denali NP & Pres	Mitch Walker (ARS)	May 12-14
Yosemite NP	John Faust (ARS)	May 17-21
Great Basin NP**	Bobby Carson (AQD)	May 18-19
Voyageurs NP	Robert Lehman (ARS)	May 19-21
Yellowstone NP	Bike Bagby (ARS)	May 26-28
June Site Visits		
Saguaro NM	Mitch Walker (ARS)	June 7-9
Redwood NP	Mark Tigges (ARS)	June 14-16
Mammoth Cave NP	Mike Bagby (ARS)	June 16-18
Grand Canyon NP	Robert Lehman (ARS)	June 21-23
July Site Visits		
Olympic NP and Mount Rainier NP	Mitch Walker (ARS)	July 4-10
Canyonlands NP	Robert Lehman (ARS)	July 7-10
Sequoia NP	Mark Tigges (ARS)	July 12-16
Everglades NP	Mike Bagby (ARS)	July 20-23

* New Trends Site Installation
** Trends Site Selection Trip

NATIONAL AMBIENT AIR QUALITY STANDARDS AND PSD INCREMENTS

micrograms per cubic meter [parts per million]

				INCREMENTS			
POLLUTANT	AVERAGING TIME	PRIMARY	SECONDARY	CLASS I	CLASS II	CLASS III	SIGNIF. (3)
SULFUR DIOXIDE	Annual Arith.	80 [0.03]	none	2	20	40	1
	24-hour (1)	365 [0.14]	none	5	91	182	5
	3-hour (1)	none	1300 [0.5]	25	512	700	25
TOTAL SUSPENDED PARTICULATE MATTER	Annual Geo.	none	none	5	19	37	1
	24-hour	none	none	10	37	75	5
PM-10	Annual Arith.	50	same	(4)	(4)	(4)	-
	24-hour	150	same	(4)	(4)	(4)	-
CARBON MONOXIDE	8-hour (1)	10000 [9]	same	none	none	none	500
	1-hour (1)	40000 [35]	same	none	none	none	2000
OZONE	1-hour (2)	235 [0.12]	same	none	none	none	none
NITROGEN DIOXIDE	Annual Arith	100 [0.05]	same	2.5	25	50	1
LEAD	Calendar Qtr.	1.5	same	none	none	none	none

(1) Maximum concentration not to be exceeded more than once per year.

(2) The standard is attained when the expected number of days per calendar year with the maximum hourly average concentrations above the standard is equal to or less than one.

(3) Significant levels should not be used for impacts on Class I areas.

(4) PM-10 increments under development.