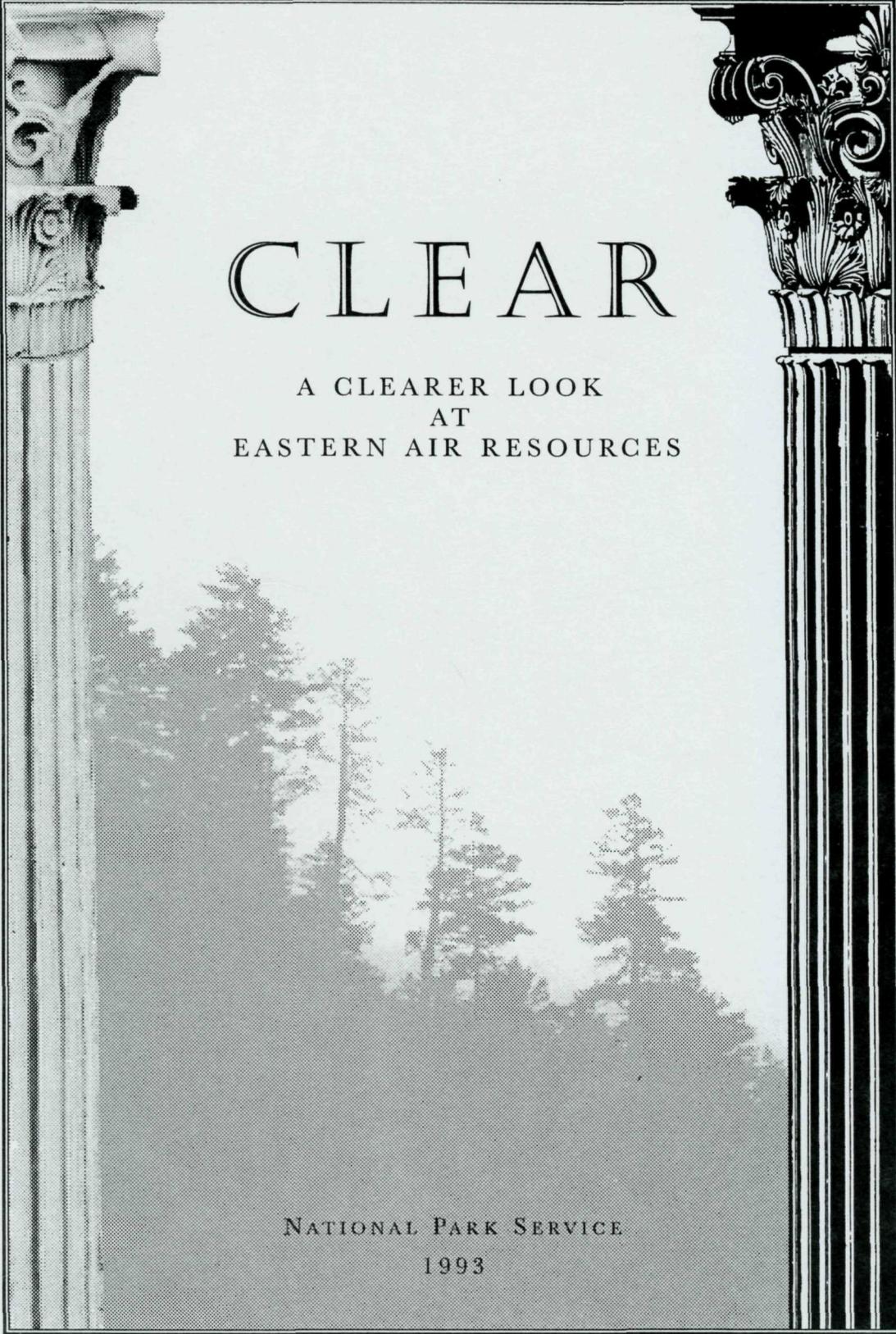


CLEAR

A CLEARER LOOK
AT
EASTERN AIR RESOURCES



NATIONAL PARK SERVICE
1993

Excerpt from
On the Pulse of the Morning

Maya Angelou

The horizon leans forward,
Offering you space
To place new steps of change
Here, on the pulse of this fine day
You may have the courage
To look up and out and upon me,
The Rock, the River, the Tree, your country.

CLEAR

A Clearer Look
at
Eastern Air Resources



National Park Service
1993



*What do monuments and milkweeds,
streams and scenic vistas, poplars and public
enjoyment all have in common?*

All are examples of resources which the National Park Service has
been charged with preserving and protecting for future generations.

Unfortunately, air pollution is impacting all these resources. In

recognition of this direct threat, the National Park Service

is committed to leading the way to cleaner air for

the national parks, for the visitors we serve,

and for the nation's resources

as a whole.

APPROVED:



Director

OCT 8 1993

Date

RECOMMENDED:

Regional Director, Mid-Atlantic Region
Regional Director, Midwest Region
Regional Director, National Capital Region
Regional Director, North Atlantic Region
Regional Director, Southeast Region

Associate Director, Cultural Resources
Associate Director, Natural Resources

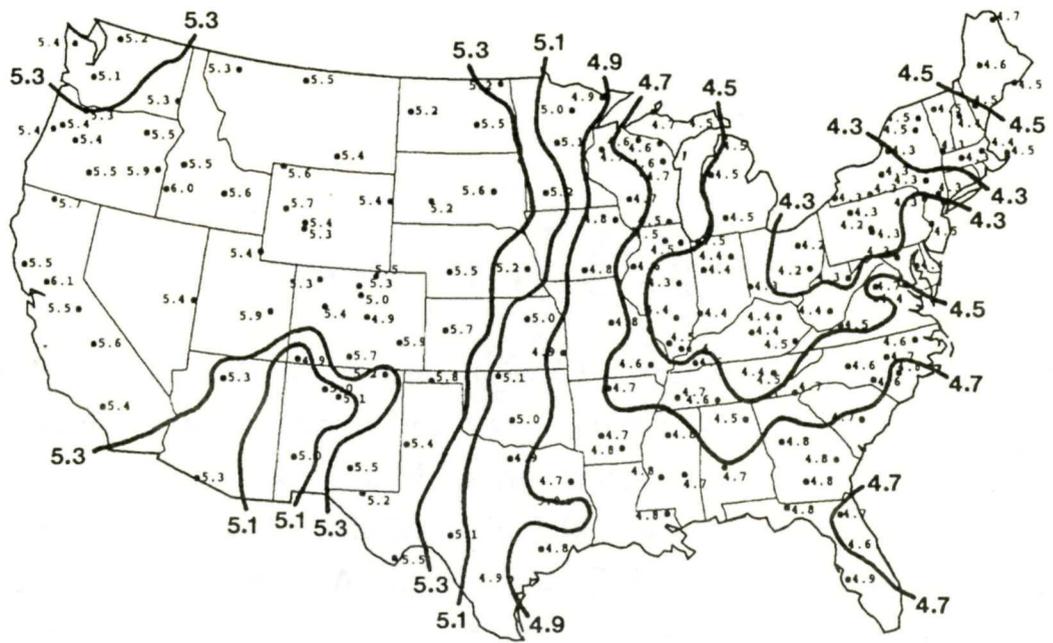


1. Rochambeau Monument, Lafayette Square, Washington, DC

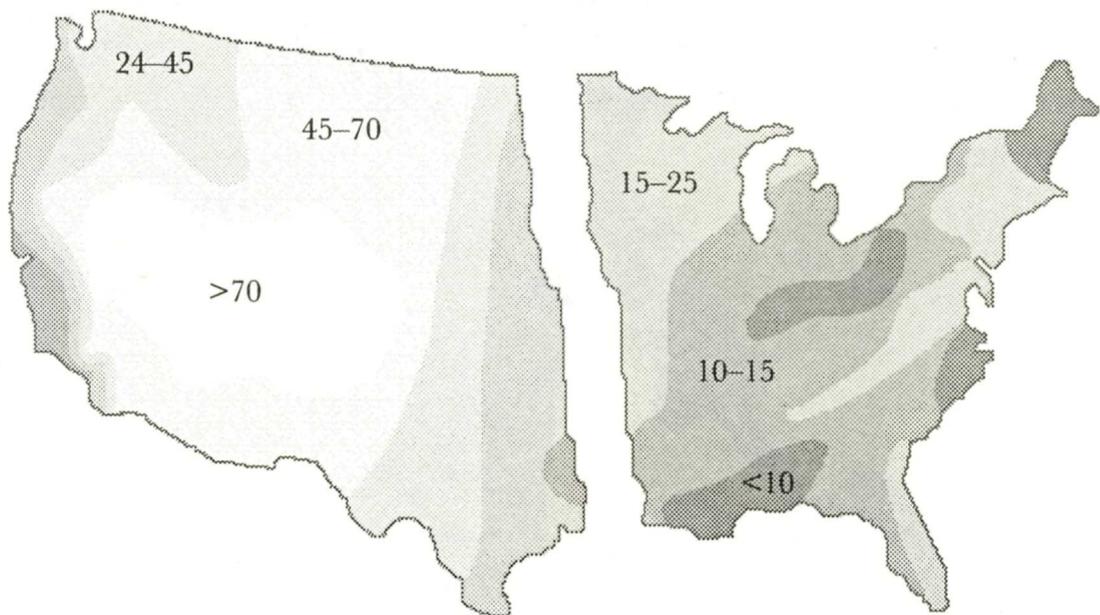
INTRODUCTION

The purpose of the Clearer Look at Eastern Air Resources (CLEAR) strategy is to initiate actions that preserve and protect the air resources in all eastern national park system units, those park units east of the Mississippi River that include the National Park Service (NPS) Mid-Atlantic, Midwest, National Capital, North Atlantic, and Southeast Regions. Under the leadership of the NPS Director and the five Regional Directors, the National Park Service will lead the nation by consistent and widely endorsed actions that are based on a vision of resource preservation, coupled with efficient energy use. Through the cooperative and united efforts of NPS employees, other federal agencies, states, municipalities, and the public, the National Park Service will seek to minimize air pollution impacts to natural and cultural resources, to protect the health of park visitors and employees, and to enhance visitor enjoyment.





2. Rain acidity, 1992 annual average precipitation weighted pH



3. Average summer visual ranges (miles)

BACKGROUND

Some of the nation's most beautiful and diverse resources are found in parks east of the Mississippi River. From the bald mountains of Acadia National Park, Maine, with its fragile subalpine vegetation and maritime boreal forests, to the historic marble monuments in the nation's Capital, to the natural diversity and biological productivity of Great Smoky Mountains National Park, Tennessee, the National Park Service is entrusted with many of the nation's most cherished resources.

Modern human activities, such as transportation, power generation, chemical production, and manufacturing, produce many types of air pollution, including nitrogen oxides, sulfur oxides, volatile organic compounds, ozone, particulate matter, and acid deposition. The National Park Service recognizes that these various forms of air pollution are substantially threatening the cultural and natural resources and the human health and enjoyment of resources throughout the eastern United States. In the western United States, pollution sources near park areas are relatively recent phenomena. In contrast, park resources in the eastern United States have been exposed to increasing man-made emissions for many decades.

Examples of how air pollution is threatening park natural and cultural resources are as follows:

- NPS air quality monitoring has shown that Great Smoky Mountains National Park and Shenandoah National Park, Virginia, have the highest nitrate and sulfate concentrations in the monitoring network. These concentrations contribute to acid deposition and visibility impairment.
- Stream acidity in Shenandoah and Great Smoky Mountains National Parks has reached levels at which sensitive native fish species begin to die.
- Ozone concentrations at Acadia National Park have violated federal standards that are established to protect human health, and routinely have exceeded the health standards set by the state of Maine.
- Thirty plant species are known to exhibit visible injury from high levels of ozone at Great Smoky Mountains National Park.
- Most species of lichen that once inhabited Cuyahoga Valley National Recreation Area, Ohio, and Indiana Dunes National Lakeshore, Indiana, are no longer found there, including all the species that are sensitive to sulfur dioxide.
- Summertime visibility in the Southeast has decreased 80 percent over the last 45 years, and is impaired 90 percent of the time.
- Acid deposition can severely corrode bronze statues in cities and on battlefields.
- Marble monuments erode when exposed to rainfall at low pH levels, erasing commemorative inscriptions and sculptural detail of artistic importance.

The National Park Service is proposing a strategy to address these problems by reducing air pollution for all parks east of the Mississippi River. The CLEAR strategy proposes four critical types of actions, with short-term and long-term components, that are based on the National Park Service Organic Act of 1916, the *NPS Management Policies* (1988) and other guidelines, and the Clean Air Act of 1970, as amended in 1977 and 1990, to accomplish this goal.

The CLEAR strategy will specifically guide the National Park Service on a path to responsible air resource preservation using the following components:

• LEAD BY EXAMPLE:

Adopting pollution prevention practices

• BROADEN THE SUPPORT:

Increasing public and employee understanding of these issues and opportunities

• NO PARK IS AN ISLAND:

Gaining strength and support from interactions with other resource managers, the Environmental Protection Agency, and state agencies

• KNOWLEDGE FOR PRESERVATION:

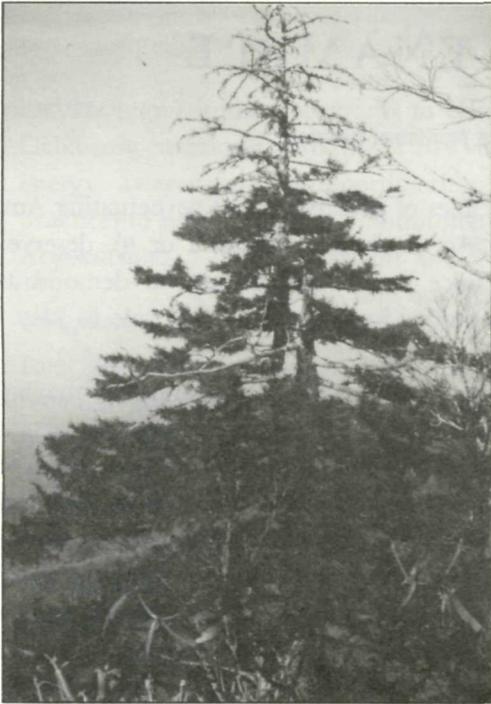
Acquiring the necessary scientific knowledge to enhance the understanding of the problem and to document improvements

The National Park Service established a servicewide air quality program in the late 1970s. Ongoing program activities will provide the technical information and support for the CLEAR strategy and include the following:

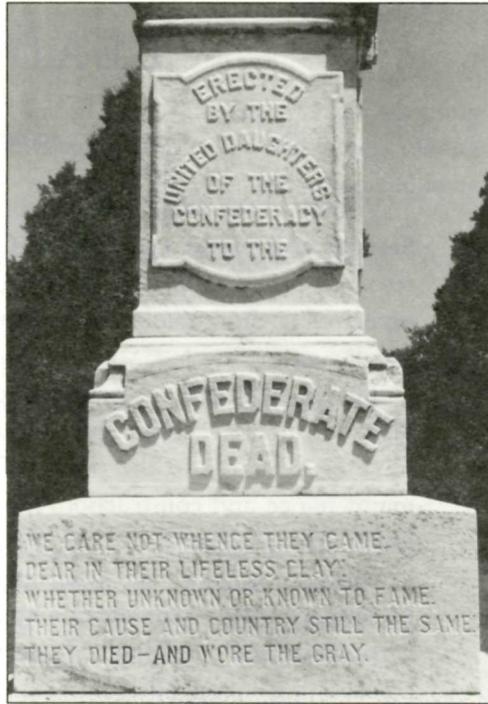
- Conducting research on the effects of air pollution on park resources
- Monitoring air quality and visibility
- Providing interpretive exhibits and materials to inform the public about air pollution issues in parks
- Working with the states and other federal agencies to ensure that NPS concerns are considered in developing public policy, legislation, and regulations
- Participating in reviewing permit applications for sources planning to locate near national park system units

These servicewide efforts, with an emphasis on Class I areas (those park units that are given the greatest degree of air quality protection) in the 1980s, have not been standardized or vigorously applied in managing all park areas. The CLEAR strategy provides the vehicle in which air resource management will be institutionalized into the operations and activities of all park units east of the Mississippi River.





4. Air pollution may be contributing to forest dieback at Great Smoky Mountains National Park



5. Eroded marble monument at Manassas National Battlefield



6. Ozone injury to ash at Indiana Dunes National Lakeshore



7. Corroded bronze figure, New Jersey Monument, Valley Forge National Military Park

LEAD BY EXAMPLE

Adopting pollution prevention practices

Visitors to the parks learn about the principles of preserving and perpetuating America's heritage. All units, regardless of Clean Air Act designation (Class I or II), deserve equal resource protection. The National Park Service has an opportunity to demonstrate this aspect of environmental leadership. NPS operations have an important role to play in improving air quality.

The highest level of conservation practices must be integrated into NPS management activities to more consistently protect park resources against air pollution impacts and to serve as examples to the public of the agency's commitment. Internal operations such as maintenance and construction, fire management, energy use, waste disposal, and transportation management should be conducted in the most efficient and least polluting manner.

Some parks are already asserting leadership in minimizing emissions from NPS operations. Examples of improving air quality include using natural gas-powered vehicles, encouraging carpooling and recycling, supporting the actions of others that reduce air pollution, constructing energy efficient facilities, and educating visitors about air pollution impacts and the importance of reducing those impacts.

The following action items are a few examples of how the National Park Service intends to address pollution prevention practices in parks and to promote the awareness of resource sensitivity through park operations.



8. Battlefield tour bus at Gettysburg National Military Park, 1920s

ACTION ITEMS

1. DEVELOP and initiate programs to reduce air pollution in park units, such as adopting California emission standards for NPS vehicles, encouraging employee carpooling, creating energy awareness, and coordinating planning efforts and other pollution-reducing practices to support agency commitment to improving air quality.

Responsibility: All Parks in the Mid-Atlantic, Midwest, National Capital, North Atlantic, and Southeast Regions, and Cooperators
Timeframe: Ongoing

2. IDENTIFY opportunities to share expertise and other resources between and among regional and park operating divisions and investigate ways to coordinate air quality management activities between them.

Responsibility: WASO, Regions, Parks
Timeframe: FY 94

3. USE resource protection authority of the National Park Service Organic Act to promote the importance of protecting natural and cultural resources in Class II areas from air pollution impacts. Explore increased air monitoring data exchanges with existing state and federal monitoring programs or begin new monitoring efforts at appropriate units to better characterize air quality for all national park system areas in the region.

Responsibility: WASO
Timeframe: FY 95

4. DEVELOP a funding and action plan that addresses agency needs to carry out this strategy, including staffing and funding for regions and parks.

Responsibility: WASO, Regions
Timeframe: FY 94

5. EMPHASIZE transportation planning within parks and with surrounding park neighbors to minimize emissions in the vicinity of sensitive resources.

Responsibility: Parks
Timeframe: Ongoing

6. CONDUCT emission inventories and energy efficiency audits for all parks.

Responsibility: Regions, Parks
Timeframe: FY 94

7. PROMOTE incentive fee structures for visitors, tour bus operators, concessioners to discourage pollutant emissions within park boundaries.

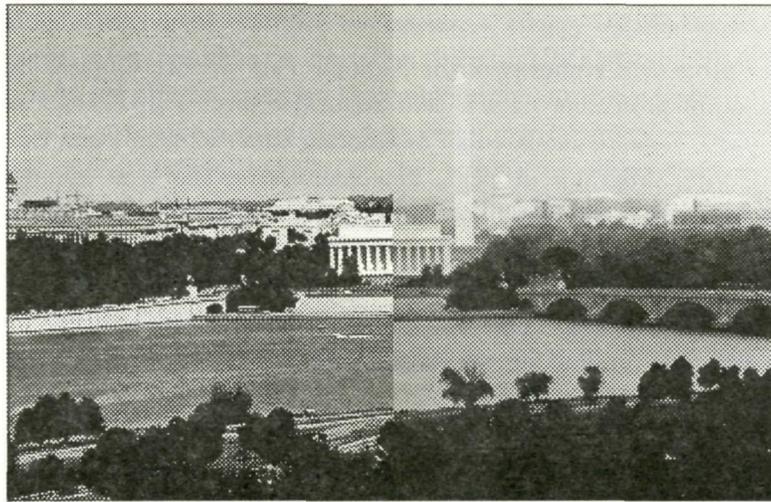
Responsibility: WASO, Regions, Parks
Timeframe: FY 94 – 95



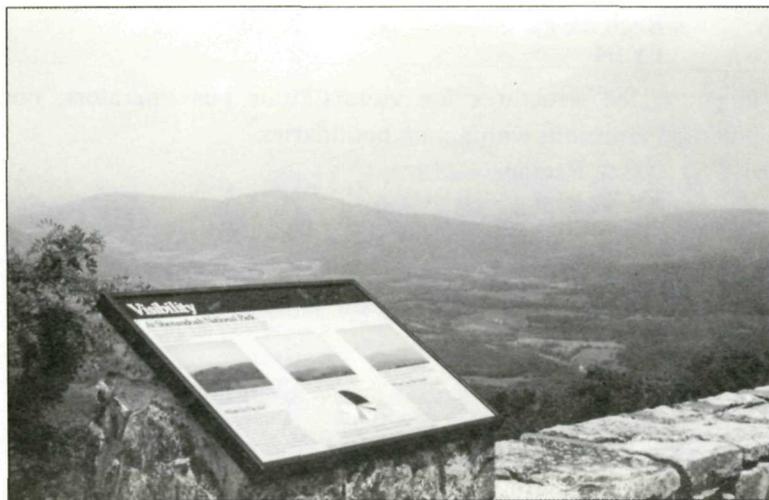
BROADEN THE SUPPORT

Increasing public and employees understanding of these issues and opportunities

The public must become more aware of how air pollution is affecting park resources and what is being done to address the air resource problems. The National Park Service has little direct authority to remedy existing or to prevent future external activities that damage park resources. Air pollution, however, does not stop at artificial boundaries. The public must play a key role in bringing about actions to protect resources. Therefore, in order to promote public awareness of air pollution effects on park resources and the NPS efforts to remedy and prevent such damage, the following action items should be activated.



9. View of the National Mall on a clear (left) and a hazy (right) summer day



10. Interpretive wayside exhibit at Shenandoah National Park

ACTION ITEMS

1. DEVELOP a coordinated air resource educational and interpretive strategy which sets objectives, identifies audiences, and establishes actions. Integrate this strategy with air resource management activities. Though focusing on park resources, the pervasive nature of air pollution impacts should also be emphasized.

Responsibility: WASO, Regions
Timeframe: FY 94

2. USE air resource interpretive materials developed by the Air Quality Division and Preservation Assistance Division as a basis for developing park-specific interpretive programs that describe air pollution impacts.

Responsibility: WASO, Regions, Parks
Timeframe: FY 94 – Ongoing

3. DISSEMINATE information and educational materials to schools, media, and the public through park and regional environmental education and public outreach programs.

Responsibility: Regions, Parks
Timeframe: FY 94 – Ongoing

4. WORK in partnership with cooperating associations, friends of the park organizations, state agencies, and others to extend air resource interpretation beyond park boundaries.

Responsibility: Regions, Parks
Timeframe: FY 94 – Ongoing

5. ENSURE that air resource management training opportunities are made available to park interpreters and resource management personnel.

Responsibility: WASO, Regions
Timeframe: FY 95

6. IDENTIFY in the FY 95 budget air resource information in the parks as classroom program.

Responsibility: WASO
Timeframe: FY 95

7. DISSEMINATE information to park managers about their responsibilities under the Clean Air Act and opportunities for action. Educate park managers in legislative and planning authorities, negotiation strategies, sources of information and technical assistance.

Responsibility: WASO, Regions
Timeframe: FY 94

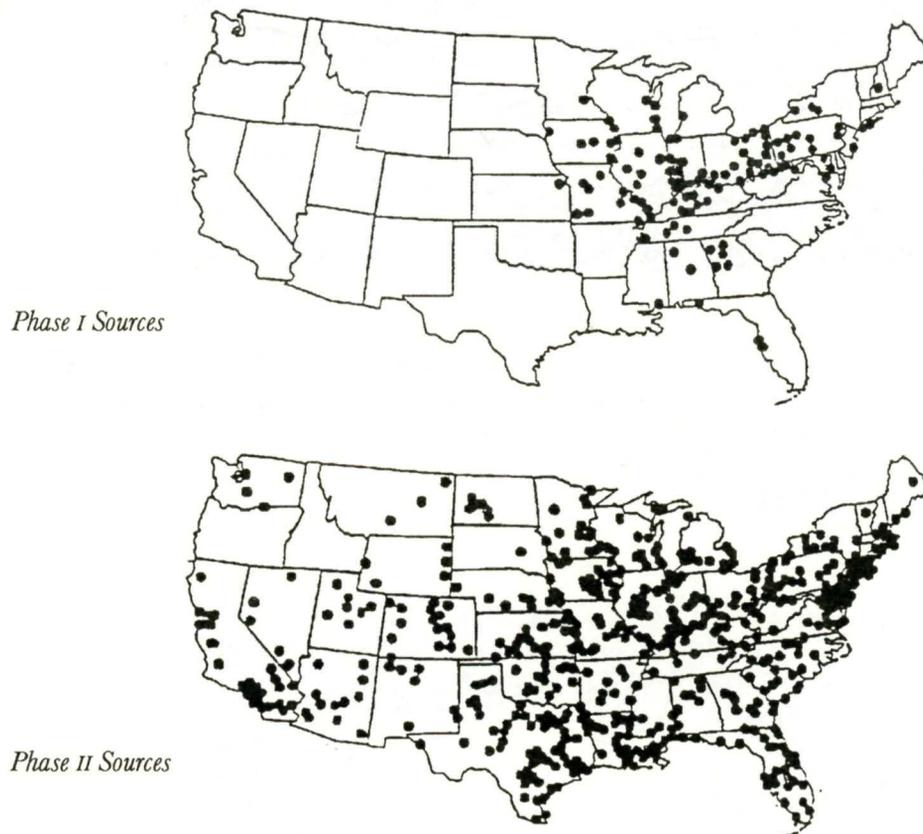


NO PARK IS AN ISLAND

*Gaining strength and support from interactions with other resource managers,
the Environmental Protection Agency, and state agencies*

Pollution emitted over large regions affects the quality of air in parks. The Clean Air Act regulates sulfur and nitrogen emissions from industrial and utility smokestacks; these regulations are more stringent for proposed sources and Class I areas. Current legislative and policy frameworks do not explicitly provide tools to protect cultural resources or natural resources in Class II areas from air pollution damage.

Even with Clean Air Act controls, some existing pollutant sources are not required to get new air pollution permits and others that are not covered under the acid rain provisions. These sources may actually contribute the largest share of pollutants that are imported into both Class I and II areas. In addition, vehicle emissions contribute approximately 50 percent of the nitrogen oxides and volatile organic compounds that are emitted in the eastern United States. Controlling vehicular emissions should be explicitly incorporated into park planning and management decisions. Congestion management and other air quality aspects of the



11. Location of emission reductions provided by the 1990 Clean Air Act Amendments for 110 point sources in 1995 (Phase I) and more than 2000 additional sources before 2010 (Phase II)

1991 Intermodal Surface Transportation Efficiency Act (ISTEA) legislation provide new opportunities for including NPS resource management concerns in transportation policy decisions and for developing alternative management strategies for parks.

ACTION ITEMS

1. CONSIDER redelegation of the Clean Air Act federal land manager responsibility and authority to Director, National Park Service, to increase effectiveness and timeliness of actions.

Responsibility: WASO, DOI
Timeframe: FY 94

2. EXPAND and strengthen the policy statement found in *NPS Management Policies* (Chapter 4, page 17) to include air resources management for Class II areas based on the National Park Service Organic Act, the National Environmental Policy Act, the Clean Air Act, and the 1991 ISTEA legislation.

Responsibility: WASO, DOI – Assistant Secretary for Fish and Wildlife and Parks
Timeframe: FY 94

3. WORK with states to expand informally the protection of the Clean Air Act to Class II areas by actively participating in state planning processes, by educating states about the importance of natural and cultural resources in all parks, by recommending state air quality monitoring to be located in Class II parks, and by including Class II parks in the new source permit review process.

Responsibility: WASO, Regions
Timeframe: FY 94 – Ongoing

4. ENHANCE NPS participation in municipal and state air resource programs (regulatory and advisory boards) and in regional transportation planning. Develop coordination information (responsible parties in states and counties, points of contact, sources for technical information and grants, etc.) for both rural and urban parks in the eastern United States. Encourage state authorities to conduct meetings and visits in parks.

Responsibility: WASO, Denver Service Center, Regions
Timeframe: FY 94 – 96

5. PROMOTE NPS participation in federal interagency efforts to maximize interchange of technical information, to coordinate multi-park and multi-region approaches to emissions modelling and control, and to promote cultural and natural resource management considerations in developing definitions of “adverse effects.”

Responsibility: DOI, WASO, Regions
Timeframe: FY 94 – Ongoing

6. DEVELOP guidelines for air quality management plans for cultural and natural resources in Class II areas.

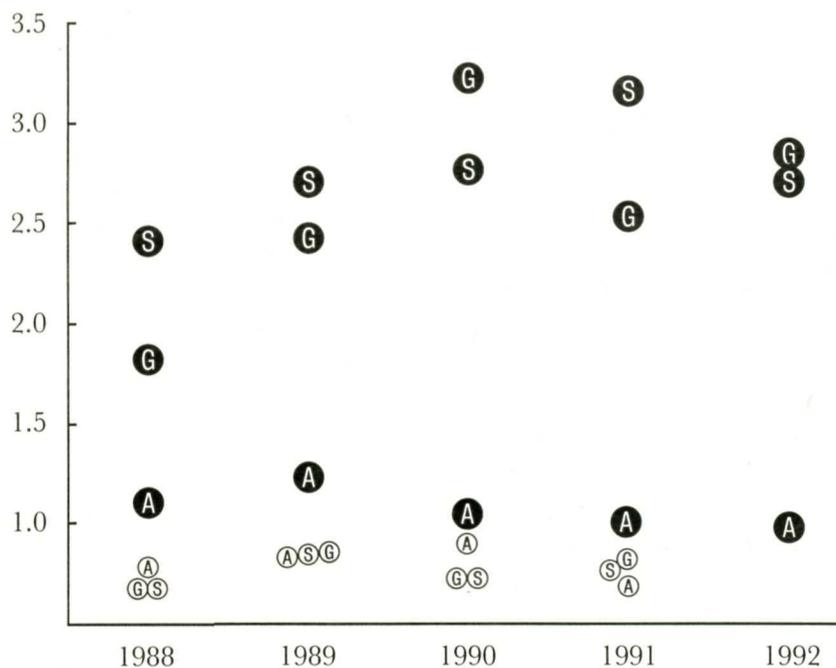
Responsibility: WASO
Timeframe: FY 95



KNOWLEDGE FOR PRESERVATION

*Acquiring the necessary scientific knowledge to enhance our understanding of the problem
and to document improvements*

Preserving the resources of the eastern national parks has become increasingly difficult given the intensity of land development at park boundaries, increased visitation, and rapid urban-industrial development. Even those parks in the most remote areas are affected by air pollution that is transported long distances from urban-industrial areas. Too often the National Park Service finds that a lack of basic resource data and a lack of understanding certain natural and physical systems leave the National Park Service ill-equipped to assess the impact of existing or increased levels of air pollution on natural, cultural, and visual resources. Effective resource preservation requires a solid understanding of the nature of the resources, their environment, and their interaction.



12. Sulfur in fine particles at Acadia (A), Great Smoky Mountains (G), and Shenandoah (S) National Parks. Seasonal average concentrations in $\mu\text{g}/\text{m}^3$; summer values on dark background, winter on white.

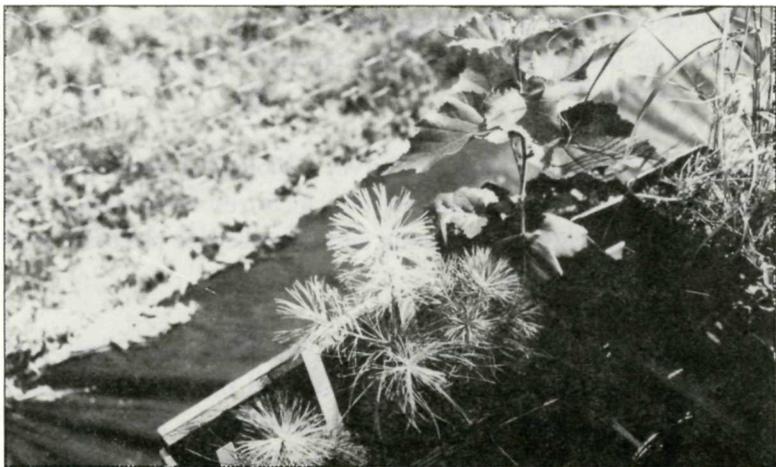
ACTION ITEMS

1. IDENTIFY sensitive park resources and track changes in their condition over time.
Responsibility: WASO, Regions, Parks
Timeframe: FY 94 – Ongoing
2. DOCUMENT pollution levels in parks and monitor changes over time.
Responsibility: WASO, Regions, Parks
Timeframe: FY 94 – Ongoing
3. IDENTIFY emission sources contributing to pollutant exposures in parks. Increase monitoring in parks near source areas, such as Indiana Dunes National Lakeshore and Cuyahoga Valley National Recreation Area.
Responsibility: WASO, Parks
Timeframe: FY 94
4. DETERMINE cause-and-effect relationships between varying levels of air pollutants and effects on natural, cultural, and visual resources.
Responsibility: WASO
Timeframe: Ongoing
5. DEVELOP and INITIATE ecotype-specific protection strategies which use common ties between parks in the same geographic region (e.g., Southeast Appalachian Air Quality Management Action Plan).
Responsibility: WASO, Regions
Timeframe: FY 95
6. DEVELOP the ability to predict the long-term effects on natural, cultural and visual resources of proposed changes in emissions that affect the ambient air quality in national park system areas to be used in air resource management decisions.
Responsibility: WASO
Timeframe: FY 95
7. DEVELOP through the National Biological Survey a biological research program dedicated to assessing air quality impacts to sensitive biological resources and to determining the long-term ecological implications of existing and increased air pollution levels.
Responsibility: WASO, Regions
Timeframe: Ongoing
8. COOPERATE in developing atmospheric models that place individual parks in a larger geographic context, in order to evaluate issues beyond the immediate park area such as regional haze and the transport of Ohio Valley emissions to Shenandoah National Park and Acadia National Park. NPS leadership of the Interagency Working Group on Air Quality Modelling needs to continue at the current intensity.
Responsibility: WASO
Timeframe: Ongoing





13. Fumigation chambers at Great Smoky Mountains National Park



14. Seedlings inside fumigation chamber at Acadia National Park

APPENDICES

A. BUDGET IMPLICATIONS

B. NPS INVOLVEMENT IN AIR
QUALITY PROGRAMS

C. CLEAR STRATEGY COMMITTEE



APPENDIX A.

BUDGET IMPLICATIONS

The CLEAR strategy includes action items to be accomplished over a 5 – 10 year period. Some elements of the strategy can be accomplished with existing resources; others depend on increased funding and staffing to be effective. Some of these actions, such as instituting energy efficiency measures, could save money, as well.

ACTIONS THAT REQUIRE NO ADDITIONAL RESOURCES

Lead by Example

- Encourage NPS personnel to reduce air pollution
- Improve information exchange and coordination within the National Park Service
- Increase managerial accountability for air resource management
- Develop strategies to reduce in-park traffic emissions

Broaden the Support

- Establish role for air resource interpretation
- Develop NPS educational and interpretive strategy

No Park is an Island

- Redelegate Clean Air Act federal land manager authority
- Develop policy statement for Class II areas
- Participate in federal interagency efforts
- Cooperate in interagency atmospheric modelling efforts

Knowledge for Preservation

- Work with National Biological Survey to identify resource management information needs for ecological systems
- Enable efficient information transfer to park managers from National Park Service and other federal monitoring and research programs

ACTIONS THAT REQUIRE ADDITIONAL, ONE-TIME
SUPPLEMENTARY RESOURCES

Lead by Example

- Invest in zero/low-emission vehicles
- Retrofit facilities for energy efficiency
- Reconfigure in-park traffic patterns to protect sensitive resources
- Retrofit/replace park utility systems for reduced emissions

Broaden the Support

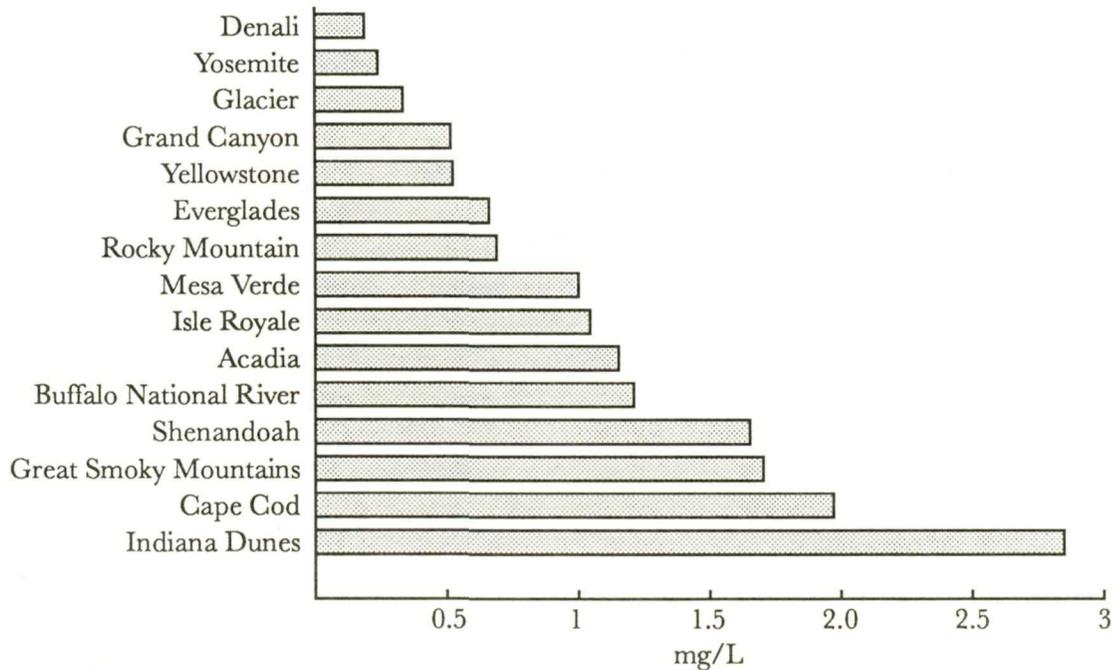
- Develop budget request for air resource management interpretation initiative
- Provide briefings on Clean Air Act responsibilities and opportunities to NPS managers
- Train park interpreters in air resource management issues
- Produce additional interpretive and educational materials

No Park is an Island

- Enhance NPS participation in state pollution control and planning processes
- Develop multi-park air quality management plans

Knowledge for Preservation

- Develop Ecosystem-specific programs



15. Sulfate in rain, 1991 annual average precipitation weighted concentration in mg/L

ACTIONS THAT REQUIRE SIGNIFICANT
LONG-TERM INVESTMENT

Lead by Example

Develop an action plan to fund new resource management strategies
Fund air resource technical staff in all regions

Broaden the Support

As part of parks as classrooms program, emphasize the need for air resource information
Update educational materials and training for NPS interpreters

No Park is an Island

Work with states to expand protection to Class II areas

Strategy Four – Knowledge for Preservation

Acquire pollution monitoring data, \$50,000 – \$100,000/unit if not available from state

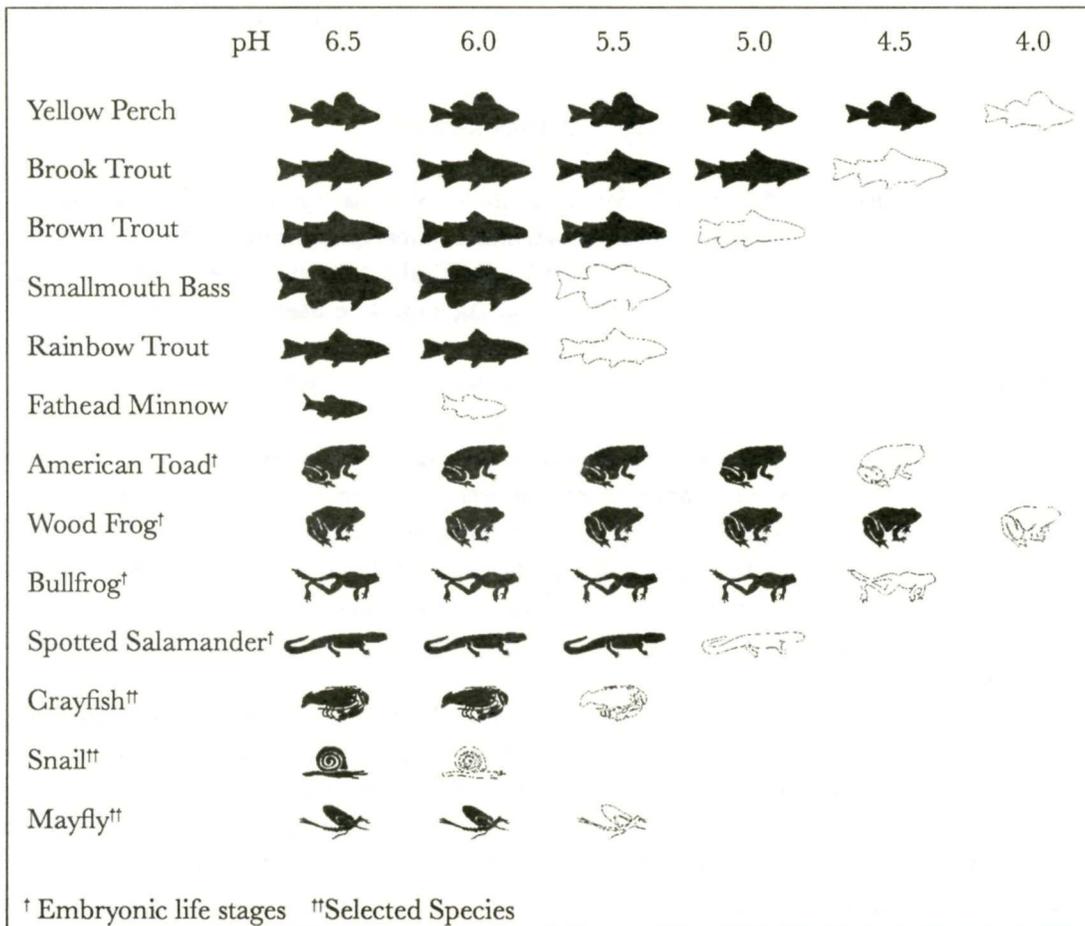
Increase air monitoring capabilities	
monitoring instrumentation	\$ 1,000,000
2 staff specialists	<u>\$ 150,000</u>
estimated total	\$ 1,150,000
Increase technical staff capabilities	
WASO–AQD, 5 staff specialists	\$ 300,000
Increase research funds for cultural/visual impact studies	
research	\$ 2,000,000
2 physical scientists	<u>\$ 150,000</u>
estimated total	\$ 2,150,000



APPENDIX B.

NPS INVOLVEMENT IN AIR QUALITY PROGRAMS

The National Park Service participates in several air quality programs at the national, regional and local levels. This involvement helps to protect park resources from air pollution sources outside park boundaries. The following are a few examples of these programs.



16. Sensitivity of selected organisms to stream and lake acidity

NATIONAL PROGRAMS

U.S./Canada Air Quality Agreement — Transboundary air pollution can cause significant harm to resources of vital environmental, cultural, and economic importance, and to human health. The U.S. and Canadian governments have entered into an agreement to establish a practical and effective instrument in addressing shared concerns regarding transboundary air pollution.

New Source Review Reform — The Environmental Protection Agency conducts workshops to streamline and simplify its new source review process. The National Park Service is actively interested in these proceedings to ensure that any revisions to the new source review regulations provide greater protection for national park system areas in general, and Class I areas in particular.

National Acid Precipitation Assessment Program — In the 1990 Clean Air Act Amendments, Congress reauthorized NAPAP and charged it to assess the costs, benefits, and effectiveness of the acid rain control program, and to determine the reductions in emissions that are needed to prevent adverse effects. NAPAP was also directed to establish a coordinated program of research and monitoring that addresses current and future priorities aimed at reducing remaining uncertainties regarding acid rain effects.

REGIONAL PROGRAMS

Southern Appalachian Mountain Initiative (SAMI) — SAMI is a regional initiative consisting of representatives of eight southeastern states (Alabama, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia), the National Park Service, the U.S. Forest Service, and the Environmental Protection Agency. The SAMI mission is to identify reasonable measures to remedy existing and to prevent future adverse impacts from human-induced air pollution on the air quality related values of Class I areas in the southern Appalachians.

Southern Appalachian Man And the Biosphere (SAMAB) — SAMAB was created in 1988 to provide solutions for resource management and economic development problems in the region, which are accomplished through participating and cooperating with eight federal agencies and nongovernmental organizations. The SAMAB members promote wise use of the region's renewable resources, environmental awareness, environmentally safe economic development, and scientific research that will be helpful in understanding the region's resources.

The Southern Oxidants Study (SOS) was initiated in 1988 to elucidate the formation, fate, and effects of photochemical oxidants in the South and to develop strategies for their management. The SOS has two goals: to gather data and refine numerical models for understanding the formations of ozone and other photochemical oxidants and their effects on human health, forestry, and agriculture in the southern United States; and on the basis of the understanding developed, to evaluate alternative strategies for managing oxidants and their effects on public health and vegetation in the southern states.

Environmental Assessment for the Southeast (EASE) — The EASE mission is to integrate the

capabilities of government, private, and academic organizations for assessing atmospheric emissions and the effects of ecological systems in the southeastern United States. EASE will assess environmental risks and consider the associated socioeconomic consequences as well as analyze options for and assist in developing resource management strategies.

Northeast States Coordinated for Air Use Management (NESCAUM) — NESCAUM is a consortium of 8 Northeast states (Connecticut, Rhode Island, Maine, Massachusetts, New Hampshire, New Jersey, New York, and Vermont) that the Northeast governors created to evaluate and coordinate air pollution regulatory actions. Members include the directors of the 10 state air pollution regulatory agencies.

State Implementation Plans (SIPs) in regional programs — State offices determine how to control pollution emissions within their boundaries to meet the federal guidelines that the Clean Air Act established. The National Park Service participates in reviewing these plans; additional effort could be expended in this area.

Regional Air Quality Management Plans (AQMPs) — Park units (Class I and II) join to address regional air pollution impacts on their common resources. Example: Southern Appalachian Air Quality Management Plan, to be prepared for Great Smoky Mountains National Park, Blue Ridge Parkway, and Shenandoah National Park.

LOCAL PROGRAMS

NPS AQMPs — These plans are an addenda to the resource management plans for parks. Each park sets the priority for developing an air quality management plan based on the threat of air pollution impacts on resources. Example: Colonial National Historical Park air quality management plan; Shenandoah National Park and Great Smoky Mountains National Park are drafting air quality management plans.



APPENDIX C.
CLEAR STRATEGY
COMMITTEE MEMBERS

DON CASTLEBERRY	Regional Director, Midwest, Coordinator
BOB REYNOLDS	Superintendent, Acadia National Park, Chair
JAMES P. BENNETT	Midwest Region Air Quality Coordinator, Research Ecologist/ Unit Leader, Great Lakes Cooperative Park Studies Unit
DENISE COOKE	Natural Resource Specialist, Air Quality Coordinator, Mid- Atlantic Region
MARY K. FOLEY	Regional Chief Scientist, North Atlantic Region
DEE MORSE	Environmental Protection Specialist, Policy, Planning and Permit Review Branch, Air Quality Division
JOHN SHORT	Research Soil Scientist, Center for Urban Ecology, National Capital Region
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JULIE THOMAS	Environmental Protection Specialist (Air Quality Manager), Shenandoah National Park
BRENDHAN ZUBRICKI	Air Quality Coordinator, Southeast Region

FIGURE CREDITS

1. Photo S. Sherwood
2. Source: National Atmospheric Deposition Program
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10. Photo J. Thomas
11. Source: Environmental Protection Agency
12. Source: NPS Air Quality Division
13. Photo J. Renfro
14. Photo M. Foley
15. Source: NPS Air Quality Division
16. Source: U.S. Fish and Wildlife Service

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

