AIR POLLUTION IN OUR PARKS

1999: A Record Year for Pollution in America's National Parks

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

The summer of 1999 proved to be one of the worst for our national park system due to the high concentrations of air pollution. During this time, America's national parks violated the federal standard for ozone smog on 209 days. As a result of our polluted national parks, natural visibility has been reduced significantly; native trout streams are incapable or less capable of hosting trout and other aquatic organisms due to the high levels of acid rain; and recorded ozone smog concentrations have been higher than in many of our metropolitan areas.

COAL-BURNING POWER PLANTS

Electric coal-burning power plants constitute our country's largest single source of air pollution. These plants are responsible for 64 percent of the sulfur dioxide (SO_2), 26 percent of the nitrogen oxide (NOx) and 33 percent of the mercury (Hg) pollution emitted nationally. This pollution causes acid rain, reduced visibility, ozone smog, and polluted waters, all of which have major impacts on our national parks and wilderness areas. This pollution is also a serious health concern. On days with high ozone levels, visitors to our national park's experience reduced lung function and may endure respiratory problems such as asthma.

GRANDFATHERED POLLUTERS

Coal-burning power plants that were either built or under construction at the time of the 1977 Clean Air Act amendments were granted an exemption, or "grandfathered," from meeting future Clean Air Act emission standards. These grandfathered plants were expected to retire at the end of their 30-year projected lives. Yet they continue to operate today, releasing four to 10 times more pollution than modern plants. These grandfathered plants constitute 52 percent of our country's energy generation, yet they produce 97 percent of the acid rain- and haze-causing sulfur dioxide, 85 percent of the ozone smog-causing nitrogen oxide, and 99 percent of the toxic mercury pollution from the utility sector.

HELPING OUR PARKS BREATHE EASIER

Air pollution in our national parks has become too large an issue to be solved at the state level. Federal lawmakers must support action that will close the existing loophole by requiring all coal-burning power plants to install the best available retrofit technology to meet modern pollution standards. Updating these plants is the most cost-effective way to reduce air pollution in our country. If all power plants were required to meet modern pollution standards, America's national parks would be relieved of up to 90 percent of acid rain, ozone smog, toxic mercury and haze - producing pollution from power companies. In addition, policies to stimulate investment in renewable energy resources, and to improve energy efficiency, are needed so that clean energy resources are available to replace the nation's aging power fleet as plants retire.

High levels of air pollution are damaging our most cherished American treasures. National parks and park visitors have suffered for too long from the emissions of the grandfathered coal-burning power plants. It is time the administration and Congress follow through on strict emissions laws that will help protect natural parks into the next millennium. Bringing these grandfathered power plants up to modern standards and developing clean energy resources will help to ensure a healthy national park system for generations.

"A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."

— Aldo Leopold

AIR POLLUTION IN OUR NATIONAL PARKS: 1999

INTRODUCTION

America's national parks have been described as the greatest set of outdoor classrooms the world has ever seen. President Theodore Roosevelt, one of the staunchest supporters of our national park system, believed that our national parks and wilderness areas were among the most important resources in our country:

> *"Nothing short of defending this country during wartime compares in importance with the great central task of leaving this land even a better land for our descendants than it is for us."*

Today many of us still agree with President Roosevelt, and we plan family vacations to visit our national parks for their unique beauty, lush vegetation, far-reaching vistas, abundant fish and wildlife, and to experience each of their endless and unique adventures.

Tragically, high levels of air pollution are invading many of our national parks and are harming the resources unique to our national park system.

Last summer proved to be one of the most heavily polluted summers ever recorded in our national parks. National park ozone monitors recorded 209 days where the air violated the federal 8-hour ozone smog health standard, and many parks recorded higher concentrations of ozone smog than our densely populated metropolitan areas.[1]

- On May 1, 1998, Acadia National Park was the *first place in the country* to record an ozone violation, and recorded higher concentrations of ozone smog than Boston and Philadelphia.[2]
- This summer, Great Smoky Mountains National Park recorded 52 days where the air pollution levels violated the federal health standard, therefore making the air unhealthy to breathe on one out of every three summer days.[3]
- In 1998, Shenandoah National Park recorded higher concentrations of ozone than any city in the Southeast except Atlanta, Ga., and Charlotte, N.C.[4]
- Natural visibility conditions in Grand Canyon National Park can stretch over 200 miles. Due to high levels of pollution, visibility on some days can be reduced to between 20- 50 miles.[5]

Many sources contribute to the air pollution problem, but coal-burning power plants are America's largest industrial source of acid rain, haze producing, ozone smog and toxic mercury pollution. Coal burning power companies that are granted an exemption from meeting modern Clean Air Act standards create the lion's share of this pollution. As a result of the pollution from grandfathered coal-burning power plants, human health and our national parks are suffering unnecessarily.

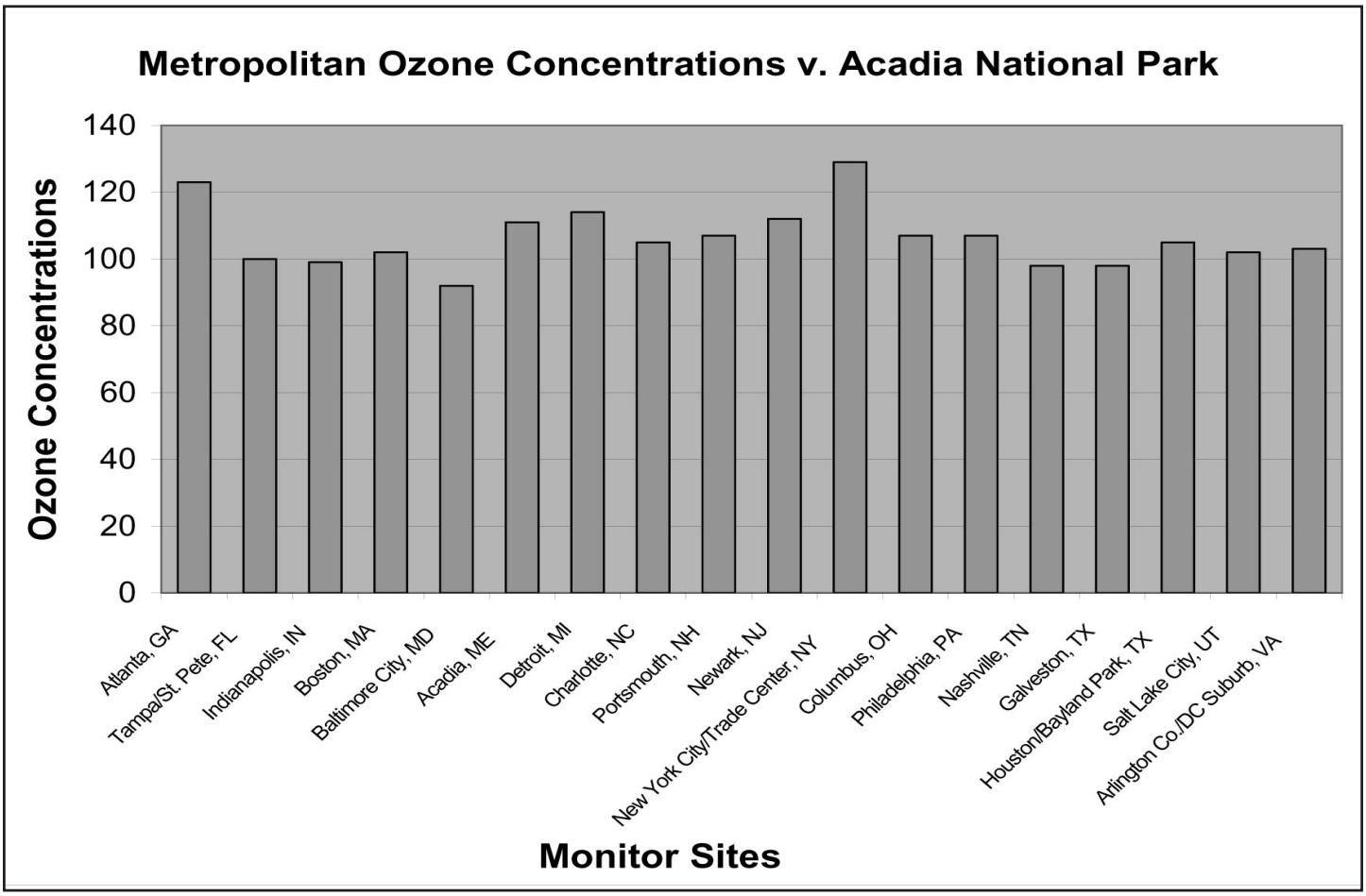
The Clean Air Act was written not only to protect human health, but also to vigorously protect our natural areas from increasing air pollution. This loophole in the Clean Air Act has failed to protect our national parks, and we need to fix this problem before they are harmed irreparably.

THE CLEAN AIR ACT AND OUR NATIONAL PARKS

> *"The Clean Air Act is in place to preserve, protect and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores and other areas of special national or regional natural, recreational, scenic or historic value."*

In 1970, Congress enacted the Clean Air Act to place national limits on the amount of pollution to be emitted from mobile and stationary sources. In 1977, lawmakers amended the act to help protect our national parks from air pollution, and other areas designated as Class I wilderness areas. Today there are 156 national and international parks, wildernesses and other areas designated by Congress as a Class I wilderness area to be protected by the 1977 amendments.

General provisions of the Clean Air Act set national air quality standards for certain types of pollutants, including ozone, sulfur dioxide, nitrogen oxide, particulate matter, lead and carbon monoxide. Since it was last amended in 1990, indications are that air quality in some of our national parks is getting worse. [6]



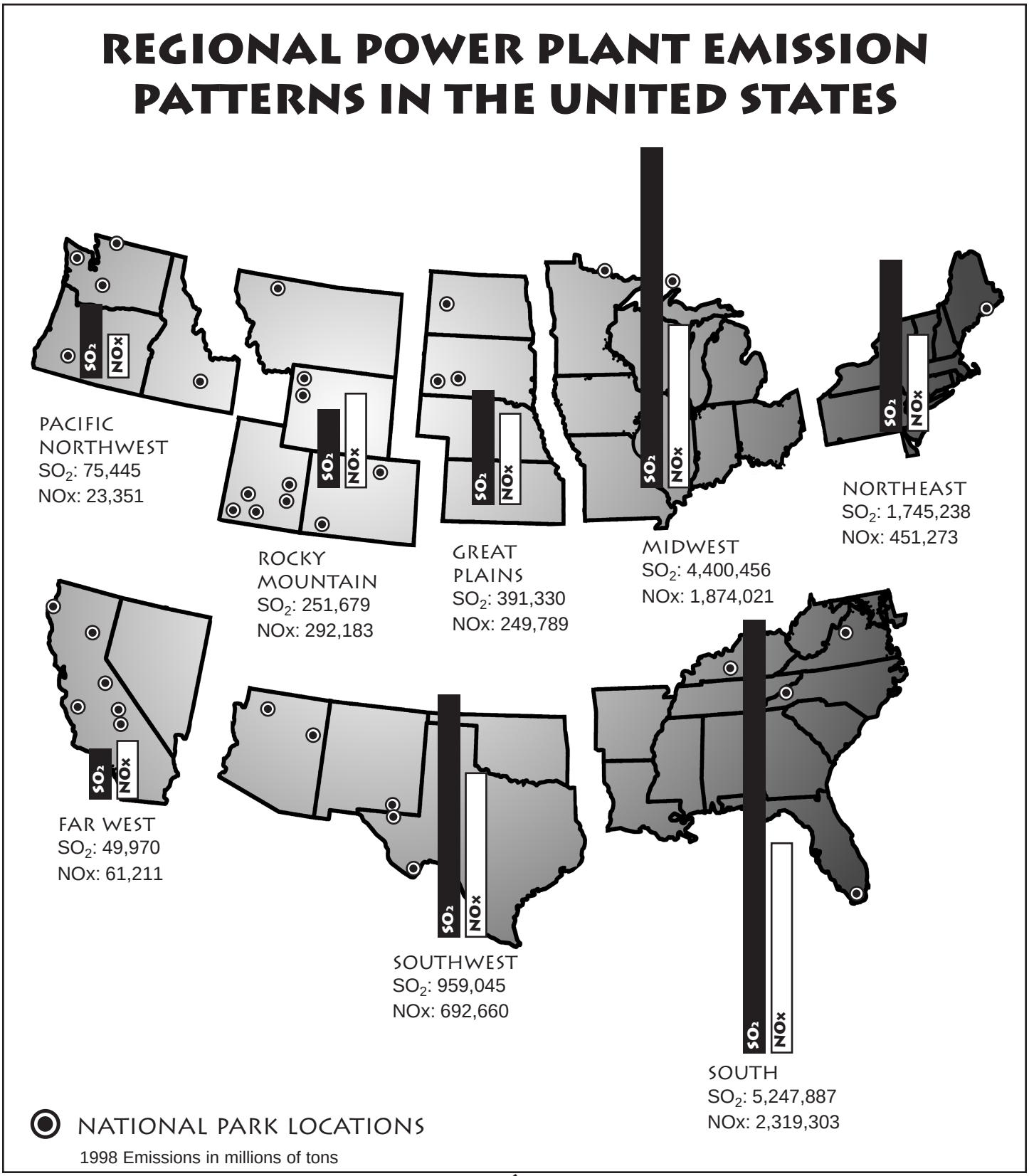
POWER PLANT CONTRIBUTION

Power plants burning coal and oil are responsible for 64 percent (more than 13 million tons) of the sulfur dioxide (SO_2), 26 percent (nearly 7 million tons) of the nitrogen oxide (NOx), and 33 percent of the mercury (Hg) pollution emitted nationally.[7] Sulfur dioxide from power plants is the major cause of both acid rain and poor visibility in our country. Nitrogen oxide emissions also contribute to poor visibility and acid rain, but the major byproduct of this pollutant is ozone smog. Mercury is a toxic pollutant that threatens human health, particularly children and women of childbearing age.

Although the 1990 Clean Air Act amendments have made progress in reducing power plant emissions, those emissions are now on the rise, as the amount of electricity generated from coal-fired power plants increased by almost 16 percent between 1992 and 1998. [8]

Power plant SO_2 emissions have increased every year from 1996 through 1998, rising more than 10 percent over 1995 levels. In 1998, power plants emitted 1.26 million more tons of SO_2 than they emitted in 1995.[9]

Since 1970, NOx emissions from all sectors of the economy have increased by 11 percent. NOx emissions from coal-fired power plants have increased at four times that rate (44 percent) over the same period.[10]



THE CLEAN AIR ACT AND THE GRANDFATHER CLAUSE

Today the vast majority of coal- and oil-fired power plants have avoided the most protective air emissions standards. When the Clean Air Act was enacted in 1970 and amended in 1977, it was argued that many of the nation's older power plants would be retired and replaced by cleaner, new power plants and therefore should be exempt from new emission regulations. However, for a variety of reasons, these plants have not retired or have updated their smokestacks. As a result of their grandfathered status, these plants pollute four to 10 times the amount allowed by plants required to meet modern CAA emission standards.

Nationally these outdated plants emit 97 percent of the acid rain- and haze-causing SO_2, 85 percent of the ozone smog NOx, and 99 percent of the toxic Hg pollution in the utility sector, while generating only 52 percent of the nation's electricity.[11]

Today there are hundreds of grandfathered power companies across the country. The high smokestacks installed on many of these facilities allow the acid rain, haze-producing and ozone smog pollution to travel hundreds of miles and invade the areas we visit to escape this pollution.

HUMAN HEALTH AND ENVIRONMENTAL CONCERNS

> *The National Park Service was established " … (t) o conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.*"
>
> *— National Park Service*

Because of the overwhelming amounts of air pollution in our national parks from power plants, it is becoming more and more difficult for the National Park Service to protect and preserve many of the treasures of our national parks.

VISIBILITY OF ACADIA NATIONAL PARK ON A BAD DAY.

VISIBILITY OF ACADIA NATIONAL PARK ON A GOOD DAY.

VISIBILITY IN OUR PARKS

One of the first things many of us envision when we escape to enjoy our national parks, forests and wilderness areas are the seemingly unending views one can experience from the top of a mountain. The ability to see clearly the features, colors and details of the spectacular scenery of our national parks and wilderness areas is fundamental to the experience of millions of people who visit these areas. Unfortunately, visibility in many of our mountain areas has decreased to a fraction of its natural range due to large amounts of haze-causing pollution from grandfathered coal-burning power plants.

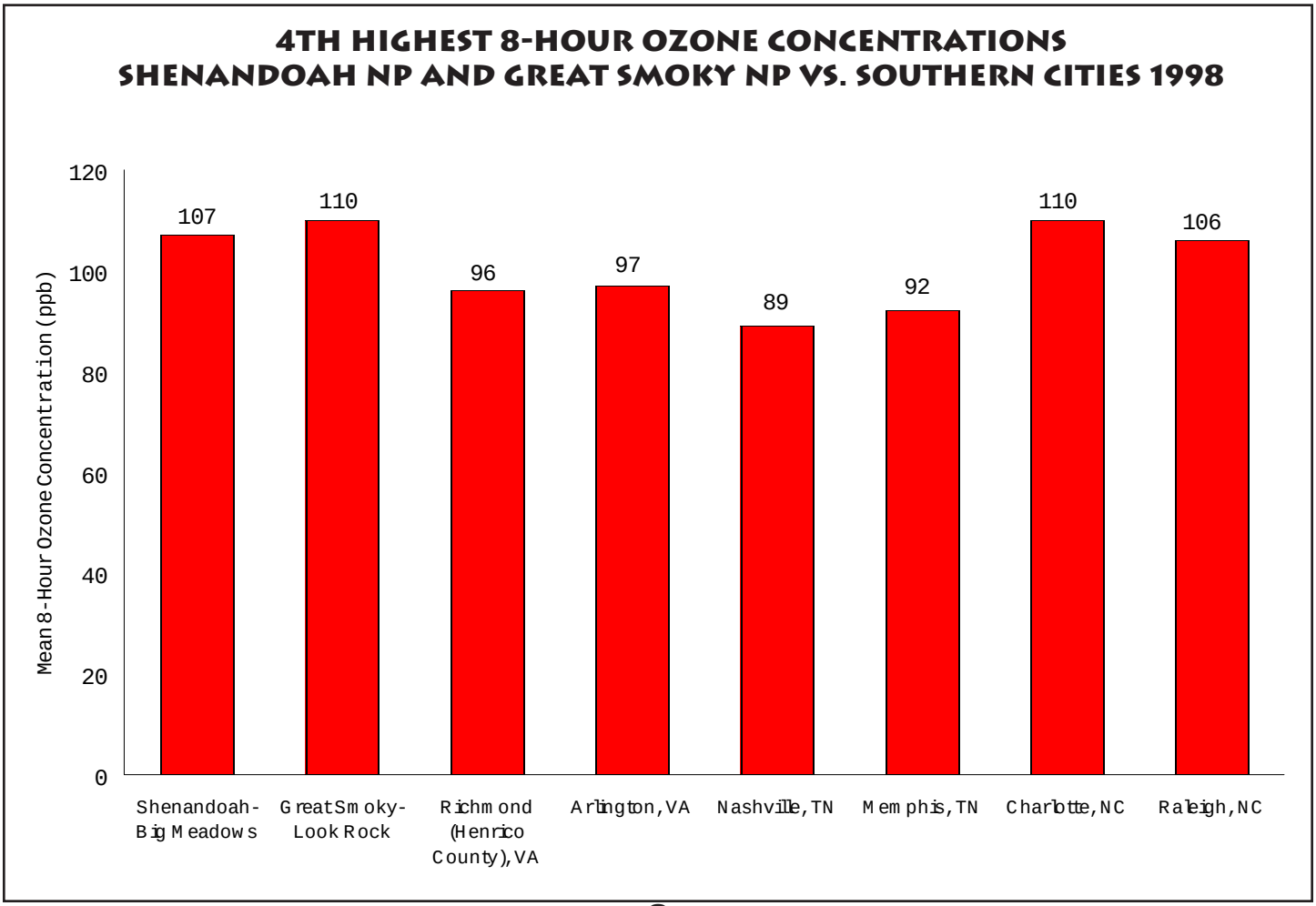
In many of our most cherished national parks, scenic vistas are routinely denied to visitors that have traveled hundreds of miles. Natural visibility in parks in the East is estimated to be between 60 and 100 miles, while in the West it is between 110 and 115 miles. Under natural conditions, sulfur accounts for only 10 percent and 5 percent of the visibility impairment in the East and West, respectively. Currently, sulfur pollution causes 60 percent to 90 percent of the visibility reduction in the East and about 30 percent in the West.[12]

In the last 50 years, visibility in Shenandoah and Great Smoky national parks has been reduced to one quarter its natural range due to high levels of air pollution.[13] Similarly, winter air pollution and visibility studies in Grand Canyon state that one particular power plant, Navajo Generating Station, can significantly contribute to the visibility reduction in the Grand Canyon.[14] Coal-burning power plants are our country's single-largest emitter of the haze and visibility causing air pollution.

TOXIC TRAILS

When we strap on our hiking boots and travel to the mountains to escape the dirty air of the city, the last thing we want to think about is air pollution. The outdoors provides a wonderful escape from the everyday pressures of modern life — our way to connect with the natural world in which we live. In 1998, approximately 30 million people visited our national parks and wilderness areas to enjoy some of the pristine trails, picturesque views and abundant wildlife, and to breathe clean air. Unfortunately, air pollution in some of our most secluded areas seriously affects our ability to breathe easily in these areas.

Studies done by Harvard University found that casual day hikers experienced reduced lung function on days where ozone levels within the federal health standard for ozone smog. They found that healthy hikers



experienced reduced lung function on days where ozone concentrations between 21 to 74 parts per billion (ppb). It is considered a violation of the federal standard for ozone smog on days that exceed 85 ppb. They also found that the volunteers studied, who have asthma, respiratory problems or experienced wheeze, were four times more susceptible to ozone than others.[15] Our national parks are not immune to this pollution — many visitors have reported respiratory problems on bad smog days and according to this Harvard study, ozone in our mountain rural areas are still harmful on days where ozone smog is recorded at levels below the federal health standard.

OZONE SMOG IN OUR PARKS

Last summer was a particularly bad summer for ozone smog throughout the national park system. National park ozone monitors recorded 209 days where the air violated the federal standard for ozone smog, and many parks recorded higher concentrations of ozone smog than the nation's densely populated metropolitan areas.

Ground-level ozone smog is formed when NOx and volatile organic compounds (VOC's) combine in the presence of heat and sunlight. The "smog season" generally runs during the hotter summer months of May through September. Tall smokestacks from many coal-burning power producers enable the ozone smog-causing pollution from power plants to be emitted at higher elevations, thus having the ability to travel hundreds of miles into our national parks.

As a result, national parks increasingly have come under attack from ozone smog transported from grandfathered coal-burning power plants.

The chart below shows the number of days our national parks violated the health standard for ozone smog. EPA studies indicate that ozone levels above 85 ppb. are harmful to your health and can cause shortness of breath, reduced lung function and may cause permanent lung damage.

1999 NPS MONITORING STATIONS EXCEEDING 85-PPB OZONE FOR THE MAXIMUM DAILY 8-HOUR AVERAGE

Validation Level National Park Unit	Total 8-hr exceedences	Max 8-hr O3 (ppb)	4th highest max. 8-hr O3 (ppb)
Acadia	5	111	93
Cape Cod NSS	12	116	101
Death Valley	1	89	--
Great Smoky Mts.	52	111	105
Lassen Volcano	3	94	--
Joshua Tree	32	123	101
Mammoth Cave	19	105	95
Rocky Mountain	1	85	--
Sequoia-Kings Canyon			
Ash Mountain	34	103	97
Lower Kaweah	38	108	98
Lookout Point	65	112	108
Shenandoah	15	101	93
Yosemite	4	89	85

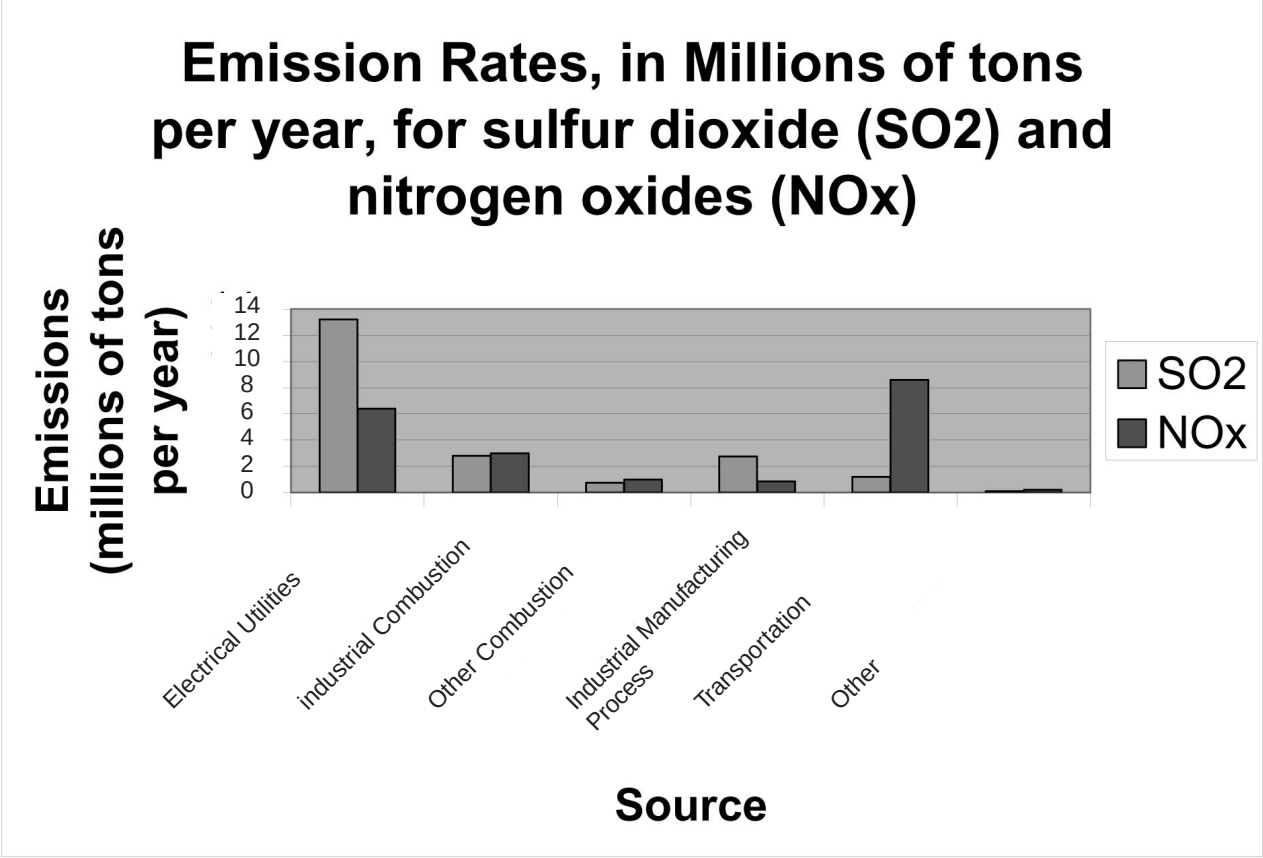
Please note: Validation level 0 indicates raw data. Counts of days with 8-hr average Ozone greater than 85 ppb may change after the data is fully validated. This table is updated monthly for May through Sept.

The National Ambient Air Quality Standard (NAAQS) for ozone is 0.8 ppm (>=85 ppb) over any 8-hr period in a day, using the 4th highest annual values averaged over 3 years. The table above counts the number of days that the max. daily 8-hr averages exceeded 85 ppb. The standard is based on a 3-year average of the 4th highest annual daily 8-hour average ozone concentrations.

ACID RAIN

When sulfate and nitrate particles combine with water molecules, a second problem endemic to the mountains is created: acid rain, snow, sleet and fog. A combination of high deposition and acid sensitive soils and bedrock makes several national parks particularly vulnerable to acid rain from coal-burning power plants. The most sensitive sites are located in the higher elevation areas such as the Adirondacks, mid-Appalachians and portions of southeastern Canada. Highly acidic water bodies are also found in the Upper Midwest, Florida and New Jersey's Pine Barren.

Because of the high concentrations of acid rain at some higher elevation national parks, many native trout species have become susceptible to fluctuations in acidity and other hard metals that leach into the streams from acid deposition.



In addition to chronic acidity, many lakes and streams become temporarily acidic during heavy downpours and snowmelts. This type of "episodic acidification" causes fish kills and often occurs at times of the year when young fish are most vulnerable.

Acid rain also strips away vital plant nutrients from the soils, thus posing a threat to future forest productivity.

Coal burning power plants are our country's largest single source of acid rain causing SO_2, which is the main chemical compound responsible for the formation of acid rain in our mountains and national parks. Power plants contribute to over 16 million tons of SO_2 annually, over 30% more than all other sources combined. The grandfathered coal-burning power plants produce 97 percent of the utility SO_2 pollution. De-grandfathering these plants will reduce up to 90 percent of their acid rain and haze causing SO_2.

MERCURY THREAT

One of the unique pleasures of traveling to some of America's natural park getaways is the opportunity to go fishing. Additionally, one of the pleasures of fishing is to cook what you've caught. Unfortunately, many lakes and streams are becoming polluted with mercury from coal-burning power plants.

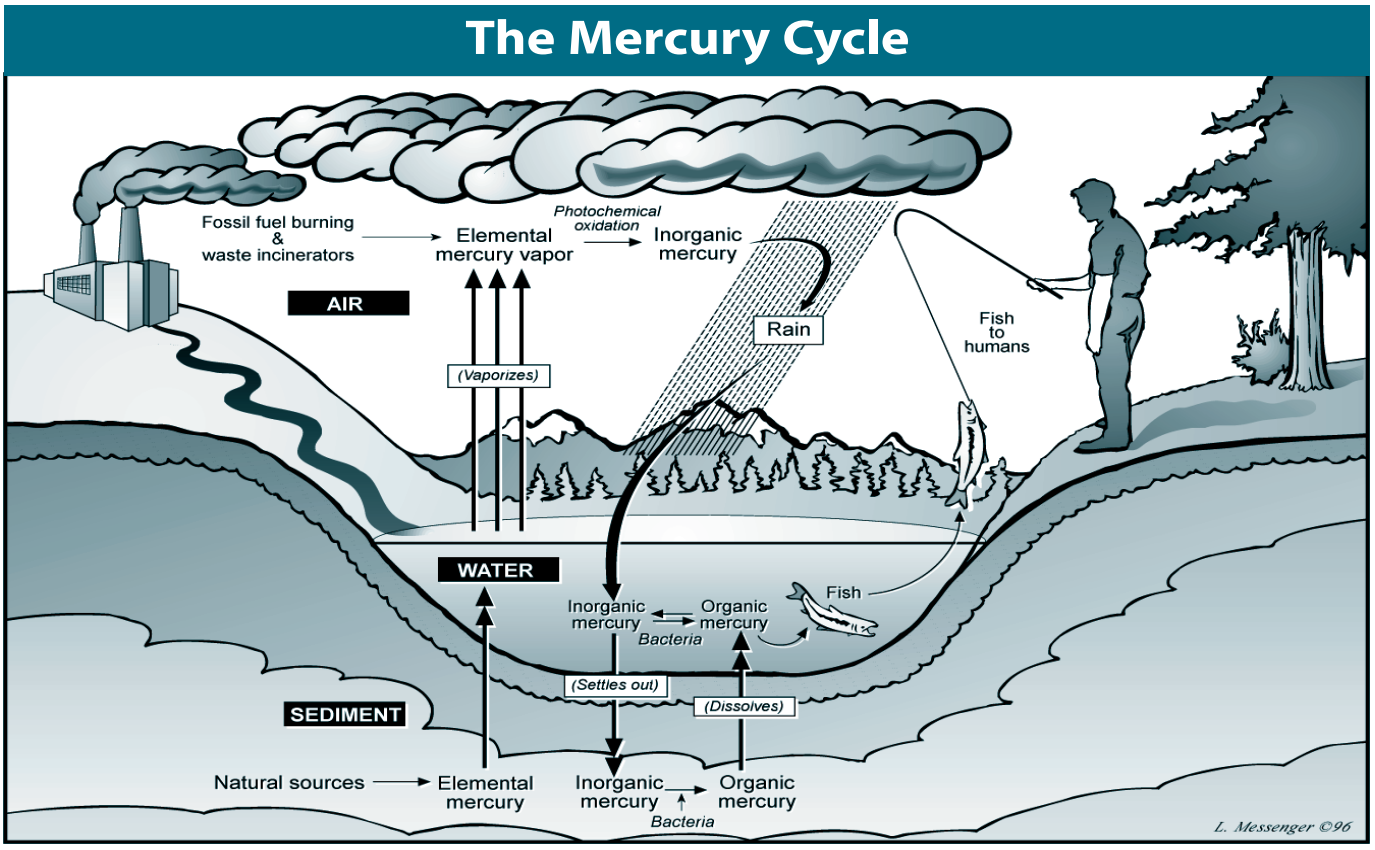
According to the Environmental Protection Agency, mercury from coal-fired power plants is the hazardous air pollutant of greatest public health concern from utilities. Mercury is a bioaccumulative chemical that becomes more toxic as it moves up the food chain.

Coal-burning power plants are the largest industrial source of mercury. As mercury is emitted from the these plants, the mercury in the air eventually is deposited into our waters and ultimately fish.

There are several chemical forms of mercury that can cause adverse health effects in humans. The organic form of mercury is the most toxic to humans and wildlife. Once in a lake or river, mercury is converted to organic mercury by bacteria and other processes. Organic mercury is easily taken up by plankton and small fish, thereby making its way into the food chain.

When larger fish eat the plankton and small fish, the mercury they consume is concentrated in fish tissue. As game fish at higher levels in the food chain consume smaller fish, the mercury accumulates in ever larger and moer dangerous amounts. This process, known as bioaccumulation, explains why bigger and older fish contain the highest levels of mercury.

Mercury is a neurotoxin that effects children and women of childbearing age. Even at small levels, mercury can interfere with the development of the nervous system, especially during prenatal development and



LORI A. MESSENGER

in early childhood. Eating mercury-contaminated fish is a major source of exposure for people. Predatory fish — fish like trout and bass that are at the top of the food chain — have some of the highest levels of mercury in their muscle tissue, levels that can be 1 million times higher than the mercury concentration in the water.

Coal burning power plants are responsible for 33 percent of the total mercury emitted by all known sources. They emit almost as much mercury as the next two biggest sources combined: municipal waste incinerators (19 percent) and coal and oil-fired commercial/industrial boilers (18 percent). In total, more than 99 percent of mercury emissions from power plants are from coal-fired plants.

The high smokestacks from coal-burning power plants also make it very efficient for mercury to travel long distances. Environmental Protection Agency data suggests that up to 50 percent of the mercury emitted from coal-burning power plants can travel up to 600 miles from the plant. Many of America's national parks are well within 600 miles of some grandfathered coal-plants, and they may be impacted by mercury pollution.

Today, electric power companies are not required to meet any mercury emissions standards, even though they are our country's largest contributors to this pollution. This is a problem that has already caused many states to order fish consumption advisories and fish warnings because of the high levels of mercury pollution. Because of this threat, we need to be sure that all coal-burning power plants are required to meet the same strict emission standards for mercury as other stakeholders are today.

The chart below lists popular sports fish that are commonly caught throughout the country, and are also the most susceptible to high concentrations of mercury pollution.

INLAND SPORT-FISH THAT ARE SUSCEPTIBLE TO HIGH CONCENTRATIONS OF MERCURY POLLUTION

Walleye	Largemouth Bass	Catfish	Whitefish
Pike	Smallmouth Bass	Yellow Perch	Brook Trout
Sucker	Lake Trout		

WHAT A DIFFERENCE ONE PLANT MAKES

In the West, there have been some great victories in cleaning up major polluters to our national parks. Most specifically the Grand Canyon and Mt. Rainier national parks have reduced emissions from two of their largest grandfathered polluters — the major acid rain, haze-causing and ozone smog polluters in their airshed. Updating these western plants will bring visibility conditions closer to natural levels, and will reduce the ozone smog- and acid rain-causing pollution that is also severely harming the park and its visitors.

MOUNT RAINIER NATIONAL PARK AND CENTRALIA POWER PLANT

Although the Pacific Northwest isn't considered to be a major coal-burning area, Mount Rainier National Park suffers from pollution from a particular coal-burning power plant.

The park is located approximately 50 miles northeast and upwind of the Centralia Power Plant. This coal-burning utility is the single-largest point source of sulfur emissions in Washington and in the western United States. Centralia emits approximately 69,000 tons of sulfur per year and has the capability to emit up to 100,000 tons of sulfur at full capacity. Emissions from the Centralia Power Plant alone contribute to more than one-third of the acid rain and haze-causing pollution in Mount Rainier National Park.[16] Recent collaborative efforts, however, among the power plant owners, non profit groups, state and federal regulatory agencies, and

PERCENTAGE OF CONTRIBUTION BY SPECIFIC POLLUTANT TO ANTHROPOGENIC LIGHT EXTINCTION IN THREE REGIONS OF THE UNITED STATES

	EAST	SOUTHWEST	NORTHWEST
Sulfates	65	39	33
Organics	14	18	28
Elemental Carbon	11	14	15
Suspended Dust	2	15	7
Nitrates	5	9	13
Nitrogen dioxide	3	5	4

SOURCE: National Acadmey of Sciences Protecting Visibility in National Parks and Wilderness Areas

the affected federal land managers will result in a significant reduction of sulfur dioxide emissions from Centralia by 2002.

PacifiCorp, one of the owners of the power plant, agreed to install scrubbers that would remove 90 percent of the allowable sulfur dioxide emissions by the year 2002. This undoubtedly will improve visibility in the park and reduce the particulate and acid rain pollution that harms human health and the environment. According to a National Park Service report, the Centralia Power Plant may impair the visibility in Mt. Rainier National Park more than one-quarter of the time. The report estimated that with the reductions PacifCorp is making (90 percent), obscured visibility will occur only 0 to1% of the time.[17]

GRAND CANYON NATIONAL PARK: MOJAVE POWER PLANT AND NAVAJO GENERATING STATION

Unquestionably one of the gems of southwestern America is the Grand Canyon. The Grand Canyon National Park's views are as awe-inspiring as any, as visitors revel in wonder about the history of the Colorado River and the power and time it took to form such an enormous canyon. Natural visibility at Grand Canyon stretches over 200 miles. But because of the high levels of air pollution at Grand Canyon, visibility can be reduced to below 50 miles.

Air pollution traveling from Southern California, Nevada, Arizona and Utah all contributes to visibility reduction in the park. Two power plants in particular have played a significant role in reduced visibility in Grand Canyon, and park supporters have achieved a significant victory in updating these plants, the largest point sources of air pollution to the park.

Located in Laughlin, Nev., approximately 75 miles west of the Grand Canyon, the Mojave Power Plant is a large 1,580-megawatt coal-fired power plant that emits nearly 40,000 tons of sulfur dioxide into the air each year. But as a result of an agreement between the plant owner, Southern California Edison Co., and a variety of nonprofit and local organizations, more than 30,000 tons of sulfur dioxide and other pollutants will be removed from southwestern skies annually.

As a result of this agreement, the plant will install dry scrubbers to reduce its current annual sulfur dioxide emissions of 40,000 tons by a minimum of 85 percent. The settlement also requires the installation of a baghouse (a giant fabric filter) that will dramatically reduce the plant's visible emissions. In addition, nitrogen oxide (NOx) emissions will be reduced significantly through the installation of new burners in the plant's two boilers.

Construction of the pollution controls will take an estimated three and one-half years, with the plant required to meet the new emission limits set out in the agreement by the end of 2005.

Similarly, the Navajo Generating Station (NGS) along the western rim of the Grand Canyon in Page, Ariz., also has been linked to some of the polluted haze that infiltrates the Grand Canyon and Canyonlands national parks. This coal-burning power plant has also made similar reductions in SO_2 to help reduce the amount of pollution that enters these national parks.

These two coal-burning power plants emitted nearly 80,000 tons of haze - producing SO_2 and 60,000 tons of ozone smog - causing NOx pollution in the Grand Canyon national park's airshed – by far the largest sources of pollution near the park.

Although the Centralia and Navajo plants will not be reducing their NOx pollution as a result of these agreements, this is definitely a good first step to help reduce the amount of pollution that affects our national parks. Their commitment to install the best available retrofit technology for SO_2 on these plants will reduce this pollution by 85 percent, and will undoubtedly improve visibility in one of America's most spectacular natural areas.

CONCLUSION

As America places increasing demands on electricity, and with the possible deregulation of the power plant industry, there will be an increasing demand for cheaper power from grandfathered coal-burning power plants. Although its argued that broad-reaching air pollution regulations may be different for different parts of the country, the impact the grandfathered plants have on national parks and human health crosses all borders.

The administration needs to follow through on its promises for a strong regional haze rule to issue best-available retrofit on older power plants to meet new source review standards. Similarly, Congress needs to pass legislation that will place significant cuts in SO_2, NOx and mercury pollution from the grandfathered coal-burning power plants. Doing so will inevitably reduce the amount of polluted haze, acid rain, ozone smog, and toxic mercury in national parks, and ultimately in the nation's cities and towns.

Cleaning up the grandfathered coal-burning fleet is necessary to the future health of the National Park System. This issue is close to the heart of nearly all Americans. If we don't take these steps today, the areas we set aside as natural treasures may be harmed irreparably.

SHENANDOAH NATIONAL PARK – FACT SHEET

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A place to escape the noise and congestion of cities:

- Shenandoah National Park attracts over 1.5 million visitors annually.
- Total park visitor spending in the counties surrounding the park exceeds $45 million a year.
- Natural visibility conditions or Shenandoah is 70-125 miles.

What most people do not realize is that there are days in the summer when the air quality in the mountains is worse than in some cities.

POOR VISIBILITY

Surveys indicate that the ability to see – and see clearly – the spectacular scenery of our parks and wilderness areas is very important to the millions of people who visit these areas. Unfortunately, clear days in the Southern Appalachians are fewer and farther between than they once were. Summertime visibility in Virginia's Shenandoah National Park is now less than one-quarter the natural range. Airport visibility studies indicate that the visual range in the east has declined by 60% on average from 1948 – 1983 (80% during the summer and 40% during the winter).

Shenandoah National park has among the highest levels of sulfur pollution (the primary pollutant contributing to visibility loss and regional haze) and ozone of national parks with monitoring equipment.

ACID DEPOSITION

The rate of acid deposition in Virginia's mountains is among the highest in the country. Currently 50% of Virginia's native brook trout streams have a reduced capacity to host trout populations due to acid rain, and 6% are incapable of supporting trout or other fish populations because of their chronic acid state. A recent study sponsored by Trout Unlimited found that if current acid deposition levels continue, the number of streams incapable of supporting fish populations is projected to climb to 35% by 2041. The study concluded that a 70% reduction in acid deposition would be required to preserve the 50% of Virginia's native brook trout streams that are currently "non-acidic" and fully capable of supporting fish populations.

DANGEROUS OZONE LEVELS

Like acid deposition, ozone concentrations in the mountains are among the highest in the country, where it is known to cause leaf damage and growth loss to trees and other plants. A decline of 26% to 51% in the growth rate of eastern white pines in the Blue Ridge Mountains from the late 1950's to mid-1970's has been attributed to ozone pollution. In Shenandoah National Par, tulip poplar, green ash, sweet gum, black locust, Eastern hemlock, Table Mountain pine, pitch pine and Virginia pine seedlings have all demonstrated growth loss at ozone levels below minimum federal health standards.

WHO CARES?

Last summer thousands of people who visit and enjoy Shenandoah National Park signed a petition asking congress to support or endorse legislation that would effectively update the grandfathered coal-burning power plants. Doing so is the most cost effective way to reduce this amount of acid rain, haze causing and ozone smog pollution.

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On May 1, 1998, the first exceedance in the nation of the 8-hour federal ozone standard was on Cadillac Mountain in Acadia National Park, Maine.

During the summer of 1999 ozone smog levels recorded at monitors in the park during several peak incidents rivaled (and even exceeded) levels recorded in Philadelphia and Boston metropolitan areas.

What's going on here? Maine is at the "end of the tailpipe" of all dirty power plants to the south and west. Depending on the way the wind blows on any given hot summer day, the Maine coast often records some of the highest harmful ozone levels in the East. Power plant pollutants follow the same routes downeast that millions of tourists follow every summer, hoping to fill their lungs with fresh air and enjoy the magnificent vistas offered by Acadia National Park. Unfortunately, when ozone smog has reached unhealthy levels in Acadia – the beautiful views are gone too. Air pollution has reduced average visibility in and around the park by up to 50%.

A recent report covered the results of research conducted from 1990-1997 on the ozone injury on vegetation in Acadia National Park (Kohut, R., and J Laurence, et al "Identification of Bioindicator Species for Ozone and Assessment of the Responses to Ozone of Native Vegetation at Acadia National Park."). The researchers wrote, "Acadia National Park experiences some of the highest concentrations of ozone on the East Coast. Since the National Park Service is charged with protecting the natural resources of the park, it is important to understand the actual and potential impacts ozone may have on the native vegetation of the park." Species that showed injury at average levels of ozone included black cherry, quaking aspen, white ash, jack pine, red pine, and mountain holly among other. Gray birch, small sundrops and bunchberry showed injury when ozone levels were elevated.

Due to concern about the threat of high ozone levels to public health, Acadia Park personnel post public health advisories throughout the park and have established a display in the visitor's center showing the negative impacts of ozone pollution on the park environment. The park also authorized an informational booth near the entrance to the visitor's center where volunteers distributed brochures and fact sheets on the biggest source of air pollutants harmful to downeast Maine – power plants.

Thousands of visitors have signed postcards and petitions asking policy makers to clean up old polluting power plants to help clear the air in one of this country's most-loved spots: Acadia National Park.

GREAT SMOKY NATIONAL PARK – FACT SHEET

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Authorized in 1926, Great Smoky Mountain National Park represents the heart of the Southern Appalachian ecosystem. This more than half-million-acre park is internationally renowned for its diversity of life, an attribute that is recognized through its designation as both an International Biosphere Reserve and a World Heritage Site. The park contains more species of trees than all of northern Europe, half of the old growth forest in the eastern United States, three-fourths of the spruce-fur forests in the Southern Appalachian mountains, and more wildflower species than any other U.S. national park

But a crisis in slow motion is under way. Air pollution is choking the life out of this national landmark, threatening the health of the park and those who visit it. The Great Smokies receive some of the highest levels of nitrate and sulfur deposition of anywhere in North America. Majestic vistas that once stretched 93 miles or beyond have been reduced by 60 percent year-round and a staggering 80 percent during summer months. The chemical haze that obscures views also damages plant life and threatens the health of all living things that depend upon the park.

Researchers in the park have documented damage to 30 different species of plants from ground-level ozone and observed another 60 species with ozone-like damage. Visitors who come to the park to breathe clean mountain air often find levels of pollution twice that of the urban areas they left behind. Ozone levels measured in the park are now consistently higher than those in many Southeastern cities. Average daily ozone concentrations in the park over the past eight years have been nearly two times higher than in the urban areas of Atlanta, Georgia; Knoxville and Nashville, Tennessee; and Charlotte, North Carolina.

Beyond the human health impacts of poor air quality, the region's economic well being will suffer significantly should park resources continue to decline. Air pollution is taking its toll on at least two important regional industries: farming and tourism.

A federally funded study of the effects of ozone pollution on crop productivity suggests that the 10 percent reduction in yield of seven major commodity crops in the Southeast – sorghum, cotton, wheat, barley, corn, peanuts, and soybeans – cost farmers between $213,149,000 to $353,318,000 annually.

Perhaps more significant is the potential loss to the area should traditional tourism begin to wane. Visitors to the region surrounding Great Smoky Mountains National Park generate approximately $1.1 billion annually and support at least 10,000 seasonal jobs. Great Smoky Mountains National Park hosts nearly 10 million visitors from around the world each year- more than any other U.S. national park.

Under the 1977 amendments to the Clean Air Act, national parks are considered Class I areas, meaning any existing or future pollution sources negatively affecting these areas should be regulated and remedied. While regulations proposed by the Environmental Protection Agency to implement the Clean Air Act continue to be challenged and delayed, scientific research indicates that even larger reductions will be necessary to protect these Class I areas.

ENDNOTES

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6. National Park Service, "Great Smoky Mountains National Park Management Folio #2," (1997).

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8. US PIRG and Environmental Working Group, "Up In Smoke," (compiled from USEPA data and US Department of Energy (DOE)).

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