



1999 State of the New England Environment

U.S. Environmental Protection Agency
New England Office

Cover artwork was based on a photograph (White Mt. National Forest)
taken by Jim Berry, EPA-New England

Open Letter to the People of New England

Today's most significant environmental challenges require EPA and state environmental agencies to adopt some very different strategies and approaches from those we have used in the past. And, most importantly, they require us to better connect our efforts to those of our citizens who are deeply involved in environmental issues in their own communities.

EPA-New England recognizes that need very clearly. This has led us to restructure our enterprise, use stronger science and smarter economics in our work, and most notably, to forge coalitions with others -- among them businesses, environmental advocates, and municipal leaders. All of this and more goes into our vision of EPA-New England as a laboratory for bold experimentation in new approaches to environmental protection.

Although we continue to learn and experiment, the results in this report show we are achieving some real success:

- An EPA-led community collaborative is bringing environmental improvements to the Charles River in Boston, as we move towards our goal of making it fishable and swimmable by Earth Day 2005.
- We are working with a dynamic group of New England mayors to clean up contaminated sites and re-energize urban economies. And our Urban Environmental Initiative has built community coalitions in Hartford, Providence, Boston and elsewhere to help neighborhoods in these cities win their battle against asthma and lead poisoning.
- Major clean-up agreements have been achieved in New Bedford and Pittsfield, Massachusetts and Burlington, Vermont through the involvement of local citizens, resulting in substantial environmental gains without years of costly lawsuits.
- Substantial improvements in environmental and economic performance are being achieved through our assistance and pollution prevention efforts--the most ambitious in the country.
- A targeted, risk-based enforcement strategy has led to more criminal penalties and more people going to jail for environmental lawbreaking than under any previous administration in EPA-New England's history.

Huge challenges still lie ahead: Sprawl and unplanned development are eating up our open spaces and wildlife habitat. Our waters are contaminated by stormwater run-off and other diffuse sources of pollution. Our health is threatened by persistent chemicals like mercury and excessive chlorine in our drinking water. And our planet is faced with the specter of climate change.

These problems will not be solved without a shared commitment and cooperative approach. As Benjamin Franklin, a son of New England, said in describing citizen activism in his times, "We must all hang together, or we shall all hang separately." That is true for us today as well. We must continue to work together to shape our vision and guide our efforts as we strive to bring common sense to common problems for the common good. That remains our firm commitment to all New Englanders.



John DeVillars
Regional Administrator
EPA-New England Office

Dedication



To the mothers of Woburn, Massachusetts who lost their children to leukemia and turned that loss into a campaign for environmental justice for us all; and to the hundreds of citizen activists across New England who carry that fight forward in their communities every day.

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address is referred to in the text

Introduction

**“Information is the currency of democracy.”
—Thomas Jefferson**

New England is a land of both tradition and innovation. Well established small-town democracy, a tradition of educational excellence and a heritage of cultural and intellectual leadership have lasted since the earliest days of English settlement here. At the same time, New England has also always been creating and inventing. From the revolutionary actions of Hancock and Adams, to the mechanical innovations of Eli Whitney, and the philosophy of Thoreau, up to the biomedical discoveries of the present day, New England has been a crucible for new ideas.

At EPA-New England, we have proudly adopted this heritage—keeping those traditions that work, while creating new approaches and new ideas to improve upon them. Over the last 28 years we have seen many successes in our mission of protecting New England’s environment and the health of the residents who depend upon it, and we value that tradition of success. But as new challenges occur, new approaches are needed. We at EPA-New England have committed ourselves to embracing the New England tradition of relentless experimentation and improvement. Our goal is to not only work for New England, but to also become, as New England has been many times, a place to develop ideas and models for the rest of the country.

One of our improvements began five years ago as a new tradition at EPA-New England: the annual *State of the New England Environment* report. This report has two aims. First, to present to the people of New England a picture of the current status of their environment: its present state, and the threats it faces. And second, to show what we at EPA are doing to meet those threats, and how we are making progress towards smarter, cleaner and cheaper environmental protection for the citizens of our region.

New Directions

Three themes stand out in this year’s report. First, EPA-New England is continuing to focus on the places of New England, measuring our success not by bureaucratic accounting, but on the effect we have on the places we are charged with protecting. We are continuing to expand our commitment to work in partnership with communities, businesses, and governments of New England. And finally, we are addressing new challenges and new issues that face our environment as we move into the next millennium.

New England Places

From the sandy shores of Cape Cod to the mountains of New Hampshire and Vermont, from the great north woods to bustling cities, New England’s places are rich and varied. At EPA-New England we are tailoring our approaches to the different challenges of our region’s diverse places. This year, one section of the *State of the New England Environment*

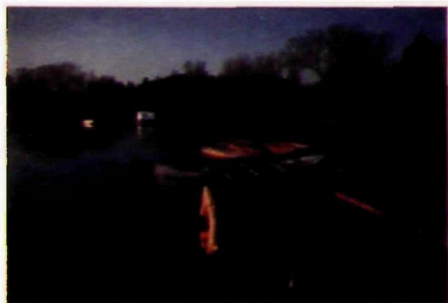


Photo: Roy Crystal

report focuses on the watersheds of New England. Each of us lives in a unique watershed— whether the historic and heavily settled Quinnipiac in Connecticut, or the wild and scenic Aroostook in Maine— and as we each learn about our own watershed’s heritage and the problems it faces, we can begin to take steps to preserve its value for future generations.

Another place where we have directed our activities at EPA-New England is the urban areas of New England. We are addressing lead poisoning and asthma that threaten especially the children of our cities.

Our brownfields program continues to help abandoned properties get cleaned up and put to beneficial use. We believe that these and other activities to make cities cleaner, safer and more livable are an important step in keeping New England strong.

Partnerships

One of the major efforts of the last five years at EPA-New England has been changing the relationships we have with the businesses and government facilities we regulate, with our state partners in environmental protection, and most importantly, with the citizens of New England. As highlighted in this report, our office of Assistance and Pollution Prevention is helping hundreds of businesses to not only comply with environmental regulations, but to make their environmental performance go beyond what the law requires. We are working closely with the states of New England on new ways to improve environmental regulation—for instance approving Massachusetts's Environmental Results Program under the federal project XL.

And we are seeing the benefits of getting residents in communities throughout New England to be more involved with our work. Cooperative agreements to clean up PCBs in Pittsfield and New Bedford, Mass, to remediate the Pine Street Barge Canal superfund site in Burlington, Vermont and to oversee cleanup at the Massachusetts Military Reservation would not have been possible without the active involvement of the local communities showing EPA how to do our job better. This year saw a number of projects, such as the many EMPACT projects, to bring more useful environmental information to the public. We continue to look for other ways to involve communities in our work.

New Challenges

While tremendous progress has been made on the environmental issues of the last twenty-five years, we are facing new challenges unimagined at the time the EPA was created. To address some of these challenges, EPA-New England has initiated programs on persistent chemicals like mercury, and addressed non-point source pollution in innovative ways like a tradable permit system in Wayland, Massachusetts. We are looking beyond our regional borders, working with Canada on transborder pollution issues, and cooperating to stop the smuggling of harmful CFCs. Through cooperative efforts, EPA-New England is also spreading the hard-won expertise of our staff and New England companies throughout the world.

This year EPA-New England took on a new threat: sprawl and unplanned development, unveiling our action plan for liveable communities at an EPA-sponsored conference in February, 1999. We see fighting sprawl as a prime example of our mission here at EPA-New England, because in the end, sprawl, like all environmental problems, is about the quality of our lives. Unchecked sprawl not only destroys open space, pollutes our water, and increases the air pollution from automobiles, but it also threatens the character and livability of the communities that make New England so special. By creating new and better ways to combat sprawl and other forms of environmental degradation, we are working to preserve the best parts of our New England traditions and way of life.

The tradition of citizen involvement in New England is the one we hold most dear, and we at EPA-New England want to see all of New England's residents take up that tradition. You, the reader can learn more about all of these issues through this report, through EPA's website and other resources listed at the end of this report, and through personally experiencing the great richness of New England's environment.

Public Health

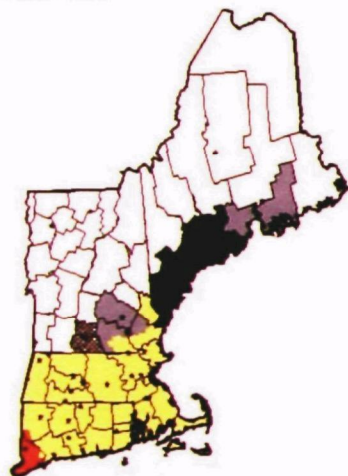
**“What is the color of wind?”
—Zen Koan**

Figure 1
Reductions in Non-Attainment* Areas for
the One-Hour Ozone Standard

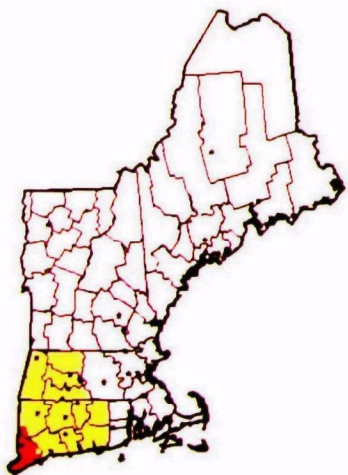
Clean Air Act Classifications

areas with
insufficient air
quality data but
previously
designated Non-
Attainment

severe-17
severe-15
serious
moderate
marginal



1990 Non-Attainment* Areas



1999 Non-Attainment* Areas

*not meeting standards
source: EPA-New England

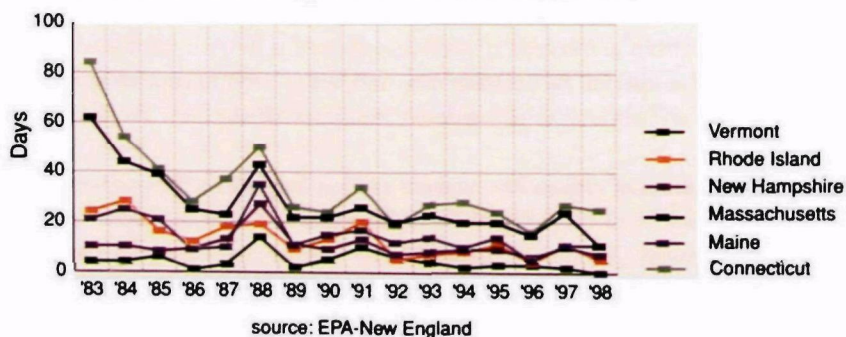
Over the past two decades, New England has made tremendous progress in improving its air and water quality; however, there is still much work to be done. Our greatest challenges are to achieve healthy air throughout New England, address toxic pollution problems such as mercury and other persistent toxic chemicals, clean up polluted areas, and target pollution prevention efforts that support our region's most important renewable resources and protect the health of all our residents.

Getting the Better of Ozone

When the Clean Air Act Amendments were signed in 1990, large areas in New England did not meet EPA's ambient air quality standard for ground-level ozone. At that time, the ozone standard was set at 0.12 parts per million (ppm) based on a one-hour average. Since then, there has been improvement in ozone levels throughout the region. Currently, the entire states of Vermont, Maine, New Hampshire, and Rhode Island—and portions of eastern Massachusetts—have air quality that is better than the one-hour ozone standard (**Figure 1**).

Two years ago, EPA announced a new national ambient air quality standard for ground-level ozone to safeguard the public against longer periods of ozone exposure. Ozone has been shown to cause inflammation and irritation of the respiratory tract, increasing respiratory infections and sensitivity to allergens. The new eight-hour standard is set at 0.08 ppm, averaged over an eight-hour period. During the 1998 ozone season (April through September), there were twenty-eight days when one or more ozone monitors in New England recorded levels above the eight-hour standard. Although the number of days in which ozone is over the limit varies from year to year due to climate conditions, there has been an overall downward trend in ozone levels in the New England states (**Figure 2**). This welcome improvement is a direct result of emission controls,

Figure 2
Unhealthy Days - Number of Days in New England
Worse than the Eight-Hour Ozone Standard



especially cleaner cars and cleaner-burning gasoline, and controls on industries that emit volatile organic compounds (VOCs) or nitrogen oxides (NOx) (**Figure 3**). Future efforts, including EPA rules to limit NOx transport, should make levels fall even further.

Dust in the Wind

High levels of exposure to particulate matter (PM) are known to increase the frequency of bronchitis, asthma attacks, and respiratory infections. Particulate matter is also correlated with increased mortality in the elderly, and has been linked to the development of cancer. A direct environmental impact of PM is reduced visibility. In 1997, EPA promulgated a new standard for particulate matter, covering PM 2.5—fine airborne particulate matter less than 2.5 microns in diameter. Previously, the standard was based on particles less than 10 microns in diameter (PM10). Over the next two years, EPA and the states will be establishing a National PM 2.5 Air Monitoring Network in New England consisting of nearly one hundred particulate monitors. In 1999, 67 PM 2.5 monitoring stations will be operating throughout New England (**Figure 4**). Data from these monitors will be used to measure trends and prioritize enforcement approaches, design control strategies, and undertake further research to better understand the complex nature and transport of fine particles in the region.

During 1998, the Connecticut DEP conducted a preliminary monitoring study in Westport, Bridgeport, and New Haven to obtain advanced PM 2.5 data and gain experience with the new monitoring equipment. Preliminary study results show that air quality for the neighborhoods represented by these sites was significantly better than the new daily (24-hour) standard, but barely better than the annual standard. EPA is already taking many steps to reduce public health risks from fine particulate matter through particulate emission reduction from stationary and mobile sources. One local example is a program to rebuild and retrofit buses used for public transportation in urban areas such as Boston, Hartford, New Haven, and Providence. EPA certification of the equipment used to modernize urban buses will ensure that the program will lower ambient levels of particulates in the air of our major cities.

Nitrogen Oxides: Less Pollution from Upwind

Last fall, to reduce the transport of ozone and ozone precursors across the eastern United States, EPA required twenty-two states and the District of Columbia to submit state implementation plans (SIPs) to reduce emission of nitrogen oxides (NOx), a major source of ground-level ozone in our environment. These requirements will significantly lower the amount of NOx transported into New England from Midwestern states, and should help dramatically reduce the amount of ground-level ozone in our region.

Most reductions will be made by Midwestern states. In New England, Connecticut, Massachusetts, and Rhode Island are required to develop NOx reduction plans under this program. Reducing NOx emissions from electric generating stations and large

Figure 3
Decreasing VOC and NOx
Emissions in New England

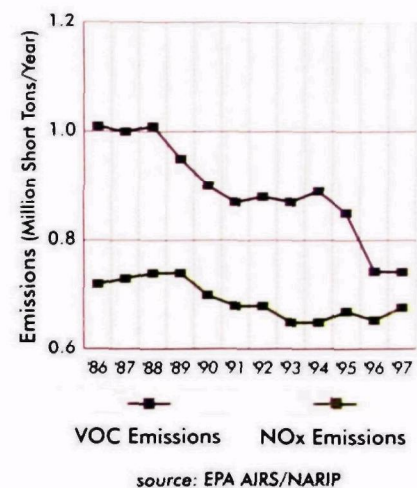
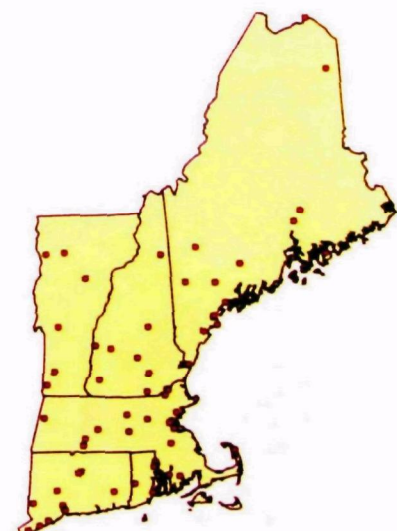
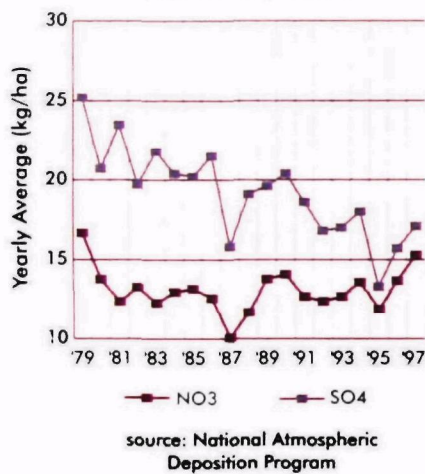


Figure 4
1999 Regional PM 2.5
Monitoring Stations



source: EPA-New England

Figure 5
Nitrate and Sulfate
Trends in New England
Rain and Snow



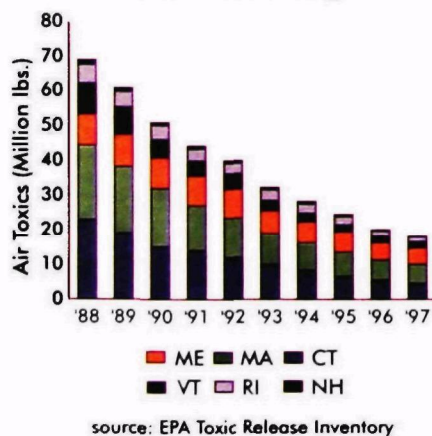
industrial stationary sources is expected to be the most cost-effective way to meet these requirements. EPA guidelines encourage the states to allow the trading of NO_x emission credits between facilities; these guidelines mesh with the regional NO_x trading program for the Northeast already developed by the Ozone Transport Commission, a commission established by the Clean Air Act of 1990 to coordinate regional efforts to address ozone in the Northeast. Trading emissions credits will allow the reductions to be made with the least overall economic cost.

Lowering NO_x emissions will also help to reduce other environmental damage associated with air pollution. NO_x emissions contribute as much as one-third of the total nitrogen loadings to estuaries and bays, accelerating eutrophication—the over-enrichment of aquatic ecosystems that causes oxygen depletion, die-back of underwater plants, and reduced populations of fish and shellfish. Nitrogen oxides also contribute to airborne particulate matter; regional haze (visibility) problems; global warming; acid rain; and acidification of lakes, streams, and soils (**Figure 5**).

Attacking Air Toxics

Since 1988, there has been a 73.6% decline in toxic air releases from manufacturers in New England. Toxic air pollutants are those that are known to cause cancer or other serious human health effects. The degree to which a toxic air pollutant affects an individual's health depends on many factors, including the quantity, duration, and frequency of exposure, the toxicity of the chemical, and the individual's personal susceptibility. The 1990 Clean Air Act Amendments list 188 toxic air pollutants that EPA is required to control, with standards for specific types of industries. As a result of this approach, EPA has successfully regulated 49 industrial categories and 155 toxic air pollutants. EPA estimates that the standards issued to date will result in the reduction of approximately one million tons of hazardous air pollutants nationwide. The Toxic Release Inventory (TRI) data show that major manufacturers reduced releases of air toxics by 25,400 tons between 1988 and 1997. This reduction was the result of a combination of government programs and industry initiatives, including emission controls for ozone and other pollution prevention efforts (**Figure 6**).

Figure 6
Air Toxic Emissions
are Decreasing



Air and Gasoline: Getting Better All the Time

Lead was taken out of gasoline starting in the 1970s and no longer poses a public health threat in fuels. However, many of the one hundred or more compounds that still remain in gasoline are toxic. When we refuel and drive our vehicles, small quantities of these toxic compounds are released into the atmosphere. Reformulated gasoline, which became available in early 1995, resulted in a significant reduction in the concentration of a number of toxic organic compounds, especially benzene, toluene and xylene. These compounds have serious immediate and long-term effects on human health, ranging from narcosis, nausea, and headaches, to severe blood disorders and leukemia. Since 1995, the concentration of these compounds has continued to decrease with a

29% reduction in xylene, a 16% reduction in toluene, and a 34% reduction in benzene. The control program has had a dramatic and positive effect on cleaning the air in New England. Additional reductions in the concentration of toxic compounds in gasoline are mandated for the year 2000, and should result in even lower concentrations of toxic organic compounds in our air. Although our gasoline is improving, it remains a very toxic substance.

MTBE: Balancing The Benefits

MTBE (methyl tertiary butyl ether) is a compound used in reformulated gasoline as part of the successful strategy described above to reduce toxic chemical and hydrocarbon emissions from gasoline. MTBE, however, creates an unpleasant taste and smell in drinking water even at low levels, and is a possible human carcinogen. In addition, MTBE is very soluble in water, so even small gasoline spills can put MTBE into groundwater, and then into drinking water obtained from wells. When the state of Maine discovered MTBE in many of its wells in the fall of 1998, Governor Angus King asked EPA to allow the state to stop using MTBE in its gasoline. EPA-New England agreed to let Maine "opt-out" of the MTBE requirement, provided that the state can work with EPA to find alternatives that offer the same air quality benefits as gasoline with MTBE. In November 1998, EPA commissioned the Clean Air Act Advisory Committee Panel on Oxygenate Use in Gasoline to study the potential health effects and risks of MTBE, while working hard to find alternate ways of reducing air toxics and ozone.

Lines of Defense: Protecting the Water We Drink

Protection of public drinking water supplies from contamination by microbes was a major theme of the recent reauthorization of the Safe Drinking Water Act. Over the past year, EPA-New England has begun implementing many of the provisions set forth in the Act by promoting an integrated, "multiple-barrier" approach to the protection of drinking water quality. Multiple-barrier protection is a combination of source water protection, filtration, chemical disinfection and distribution system safeguards that protect drinking water quality even if one of the barriers fails. EPA-New England has provided \$6.3 million in funding to the New England states under the Source Water Assessment Program to assess the threats to every public source of drinking water. EPA has also given \$63 million for states to fund improvements in drinking water treatment systems.

The Safe Drinking Water Act requires water suppliers to deliver Consumer Confidence Reports starting in 1999. These reports are designed to respond to the public's right to know by educating consumers about the source and quality of their drinking water. The reports provide a framework within which consumers can obtain information about their drinking water, including the source water, contaminants detected, health effects of contaminants when violations occurred, potential sources of detected contaminants, and availability of source water assessments.

Figure 7
Historical Trends in
Healthy* Air Quality Days

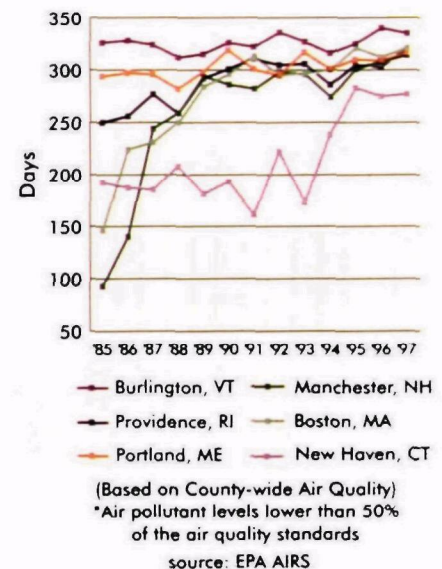
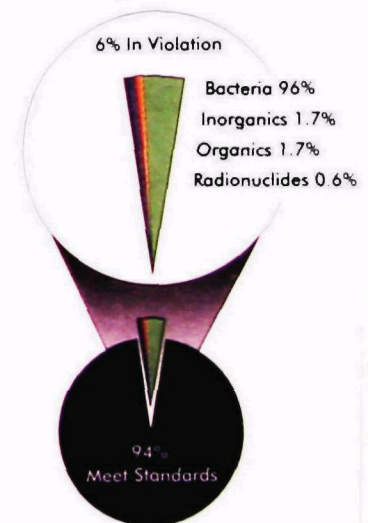
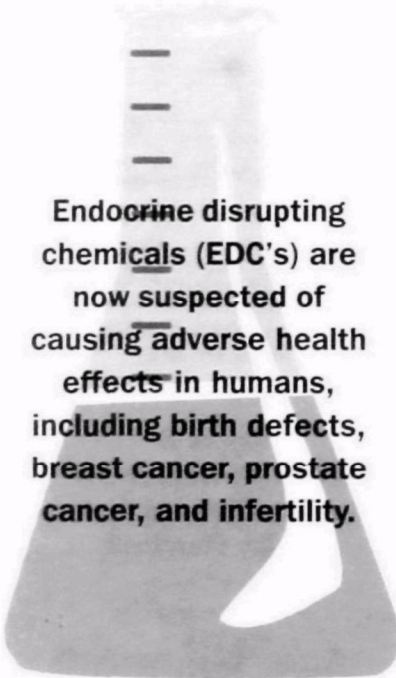


Figure 8
Public Water Systems
Meeting Drinking Water
Quality Standards



source: EPA Safe Drinking Water Information System, 1998



Endocrine disrupting chemicals (EDC's) are now suspected of causing adverse health effects in humans, including birth defects, breast cancer, prostate cancer, and infertility.

New Chemical Testing

Endocrine disrupting chemicals (EDCs) are a category of substances that mimic natural hormones in the body. These chemicals are used in thousands of common products, ranging from pesticides to plastics. They have been shown to cause developmental and reproductive abnormalities in wildlife, and are suspected of causing adverse birth defects, breast cancer, prostate cancer, and infertility in humans. Concern is growing about the presence of EDCs in food, water, and the environment. EPA is instituting a screening program to evaluate the health and environmental effects of 15,000 chemicals, each of which is produced in annual volumes exceeding 10,000 pounds. Chemicals that test positive will be subject to a series of additional tests, including specific tests to determine their reproductive, developmental, and behavioral effects. The program will also determine the effects of endocrine disrupters on ecological systems and wildlife and test combinations of chemicals. As our knowledge grows, we will be able to determine appropriate actions to deal with this potential threat. Additional information on this topic can be found on EPA's website (<http://www.epa.gov/opptintr/opptendo>).



The Problem with Mercury

At first glance, mercury is an attractive substance: shiny and slippery, it easily breaks apart and then recombines almost magically. It is a naturally occurring element that moves through the environment as a result of both natural and human activities. Unfortunately, it is also a dangerous and persistent toxic contaminant that accumulates in living tissues, a process known as bioaccumulation. Most of the mercury that contaminates our New England landscape is from air emissions that are subsequently deposited on land and in fresh water. The primary sources are incinerators and fossil fuel combustion facilities, both local and outside the region.

The primary source of mercury exposure in people is through the consumption of freshwater fish contaminated with methyl mercury. All of the New England states have issued fish advisories about how much and how often to eat locally caught freshwater fish. The typical New England consumer eating fish from restaurants or grocery stores is not in danger of consuming harmful levels of mercury, but individuals who depend on freshwater fish as a main part of their diet may be at risk. More information on fish and wildlife advisories can be found on EPA's website (<http://www.epa.gov/ost/fish>).



Historical data for the Lake Champlain Basin show that mercury pollution from rain and snow varies seasonally, with the greatest amount of mercury deposited from late spring through the fall. Lesser amounts of mercury are reported for the winter months. The amount of mercury in rain and snow measured at this site, located on the west face of Mount Mansfield, is enough to contaminate fish-eating predators, such as smallmouth bass, walleye, loons, and kingfishers. The pattern and amount of mercury deposition at this site are typical of other sites in New England.

EPA is implementing a host of regulatory control programs to reduce the emissions of mercury from municipal waste incinerators—the largest source of mercury emissions in the northeast—and other sources such as medical waste incinerators. It is expected that over the next three years these programs will result in a 90% decrease in mercury emissions from 1995 levels. EPA-New England has worked with all of the states in the region to develop additional strategies for reducing mercury emissions, including adoption of even more stringent controls of emissions, reduction of mercury in consumer products, and the virtual elimination of mercury emissions from hospitals. In addition, we have been a leader in monitoring mercury deposition, supporting a network of mercury monitoring stations throughout the region.

The Providence Initiative for Public Health

EPA's Urban Environmental Initiative (UEI) focuses on the unique environmental threats in urban areas. In Providence, Rhode Island, resources are concentrated on three fundamental environmental and public health issues facing local residents: prevention of lead poisoning, urban rivers and wetlands, and vacant lots. The Safe Housing Lead Task Force is developing a follow-up strategy to its report on lead poisoning prevention and lead-safe housing. A public campaign is underway to educate local residents about appropriate use of the Woonasquatucket and Blackstone Rivers, which recently achieved National American Heritage River designation. Finally, EPA is sampling soil for lead contamination on target urban vacant lots and working with community organizations, the Department of Planning, and local residents to transfer these lots to local residents at the cost of only \$1.00. In exchange for the reduced cost, residents have agreed to restore, revitalize, and maintain the lot in cooperation with the Providence Redevelopment Agency. UEI funds were also used to clean and remove illegally dumped materials from over 200 vacant city lots.

EPA is sampling soil for lead contamination on target urban vacant lots and working with community organizations, the Department of Planning, and local residents to transfer these lots to local residents at the cost of only \$1.00

Mercury At Home

Mercury is likely to be found in your home in thermometers, barometers, fluorescent lights, thermostats, and some types of switches. Whenever possible, it is a good idea to convert to a non-mercury containing product, such as an electric thermometer. Some states collect products containing mercury (e.g., unbroken fluorescent lamps) as part of their household hazardous waste collection program. Even small mercury spills must be properly cleaned up. Never use a vacuum, shop vac, or broom to clean up spilled mercury — a vacuum will spread the mercury in the air; a broom will spread it out and make it harder to collect. If a thermometer breaks on a smooth surface, use two stiff pieces of paper to scoop up all the beads into a sealable plastic container. If necessary, use an eye dropper to capture all the beads, then wipe the area with a damp sponge. All the clean up materials used (paper, dropper, sponge) and the contaminated portion of any rug or carpet should be placed in marked plastic containers and taken to a local mercury recycling site. If you have a larger spill, contact your local health department for the best cleanup method.

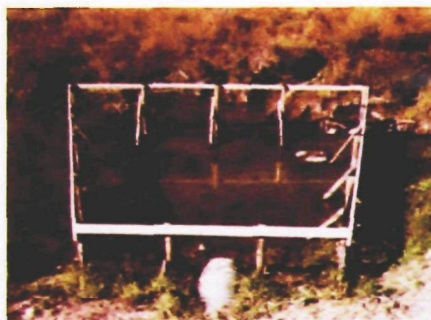


Photo: Skip Lisle-Penobscot Nation

Beaver Deceiver

The Penobscot Beaver Deceiver is a protective fencing that is constructed and used to protect culverts and adjacent roads from being dammed. This device has resulted in a savings of hundreds of thousands of dollars to the tribes, as well as assuring the protection of these streams and rivers.

Indian Country

EPA-New England's fundamental goal in working with New England's Native American tribes is to assist them in protecting tribal members' health and maintaining and restoring the natural integrity of their ancestral lands. Our major emphasis is close involvement with tribal governments in making environmental policy and management decisions. The first Tribal Agreement in New England was signed with the Houlton Band of Maliseet at a ceremony in December 1997. EPA-New England now has agreements with three of nine tribes, with another four expected soon. Direct electronic linkages have been instituted to expedite communication between tribes and EPA-New England staff. EPA and other federal partners are working with the Narragansett and Penobscot Nations to provide environmental data about tribal lands. The tribes received grants to establish programs and purchase equipment to map their lands, boundaries, and monitoring sites and will be a part of the New England air pollution monitoring network, which tracks particulate matter, mercury, ozone, and acid rain. This data may then be compared with New England's state air monitoring data to better understand the nature and transport of air pollution within Indian Country. Information and data from the Passamaquoddy cadmium study of livers and kidneys from moose and deer will be added to the network.

An example of another collaborative project between EPA and the tribes is Little Moccasins, which developed a lead poisoning prevention manual for tribal day care centers, clinics, and families and provides information about screening, healthy diet, and basic preventive steps, along with regulations and resources about lead poisoning. The Penobscot Beaver Deceiver, a protective fencing that is used to protect culverts and adjacent roads from being dammed, is being transferred to other Tribes across the U.S. The Mohegan Tribe is a leader in Indian Country in pollution prevention, mandating pollution prevention training for all employees and implementing one of the most comprehensive programs in the nation.

List of Tribal Governments

Tribal Governments:

- Aroostook Band of Micmac Indians
- Houlton Band of Maliseet Indians
- Passamaquoddy Tribe, Indian Township
- Passamaquoddy Tribe, Pleasant Point
- Penobscot Nation
- Wampanoag Tribe of Gay Head (Aquinnah)
- Narragansett Indian Tribe
- Mashantucket Pequot Tribal Nation
- Mohegan Tribe

EMPACT: Your Right To Know

The EMPACT (Environmental Monitoring for Public Access and Community Tracking) program is a result of President Clinton's right-to-know initiative. EMPACT's goal is to use the latest technology to bring individuals and communities environmental information they can understand and use every day. Almost all of the following projects use Web sites, public displays, and other innovative methods of bringing information to the public. EPA-New England has brought over \$5 million in EMPACT funds to the region (out of a total of \$37 million split among all ten regions and all of EPA Headquarters offices). The projects in New England include the following:

Other EMPACT Projects on the Boston Harbor/Charles River and the SUNWISE/Boston program are highlighted in the Stewardship and Children's Health sections of this report, respectively.

Marine Environmental Monitoring Network, Long Island Sound, CT

Sensors located on a buoy in Long Island Sound provide continuous real-time monitoring of water quality and the health of this important estuary. The project tests new techniques for measuring phytoplankton productivity and detecting hydrocarbons and pathogenic bacteria.

Air Quality Information, Portland, ME

EPA-New England is working in partnership with Maine's Department of Environmental Protection to establish an

ambient air pollution monitor in the City of Portland to measure the concentrations of eight different air contaminants. The Portland area exceeds ozone standards (maximum daily ozone value exceeded 150 ppb in 1997) and contains a diverse mixture of air pollution sources including petroleum product tank farms, a large pulp mill, significant emissions from traffic, and a number of small manufacturing facilities that contribute to ozone formation.

Sustaining Burlington, VT

Burlington, Vermont has made a commitment to become the most environmentally sustainable city in the nation. The EMPACT grant funds a program that includes an extensive public involvement process to inform local communities about collection, processing, and dissemination of data. In addition to web sites and other displays, an Eco-Detectives Club trains children and adults to collect and document information on local plants and animals and make this information available to the public.

Air Quality, Roxbury, MA

In 1992, the asthma hospitalization rate in Roxbury (a neighborhood of Boston, MA) was the highest in Massachusetts. The area has more than fifteen bus and truck depots, with more than 1,150 diesel vehicles within a mile and a half of Dudley Square in central Roxbury. The Roxbury EMPACT project measures eight air quality indicators. The air quality data, along with the training needed to interpret it, give residents who are most sensitive to air pollution—children, the

elderly, and those who are already sick—the information they need to make better health choices every day.

Lead Abatement Project, Boston, MA

In partnership with Boston University School of Public Health, Dept. of Environmental Health and the Bowdoin Street Health Center, EPA-New England is working on this door-to-door sampling project in the Dorchester/Roxbury community of Boston with local high-school students to teach them lead-testing and landscaping techniques. Their knowledge is put to work to analyze lead content in soil from neighborhood lots, teach about the dangers of lead exposure, and provide low-cost approaches to cleaning up lead contamination in yards through landscaping techniques. The project reduces lead exposure in the neighborhoods, provides training to local youths, and serves as a model for other inner-city communities as a self-sustaining lead exposure reduction program.



Photo: Juliet Stone

Local youths participating in Dorchester/Roxbury Lead Abatement Project

Children's Health

**"I was born part of this earth."
—Daniel Western**



SUNWISE/Boston

Although one in five Americans develops skin cancer, it is our children who are most at risk. Eighty percent of lifetime sun exposure occurs before the age of 18, and one or two severe childhood sunburns can double the risk for melanoma later in life. Because of the thinning of the natural ozone layer due to CFC use, UV exposure at ground level is increasing, amplifying the potential for health problems from sun exposure. The good news is that simple steps, followed early and consistently, can help individuals avoid UV-related health problems.

Boston is one of three cities to pilot a new EPA environmental and public health education program for elementary school age children. The program's goals are to familiarize children with the use of the UV Index daily in the classroom (using either the Internet or the local paper), to educate them about the sun's damaging rays with classroom materials and teach simple steps to avoid overexposure to the sun, and to encourage school administrators to adopt sun safety policies and practices such as creating shade cover in outdoor areas.

President Clinton called healthy children and strong families fundamental to the future of our nation, emphasizing that protection of the environment is critical to our children's health. Pound for pound, children eat more food, breathe more air, and drink more fluids than adults, and their developing systems make them even more vulnerable to environmental hazards. While we are seeing progress on many environmental problems, current statistics about increasing rates of asthma among young children and relatively constant rates of lead poisoning in many urban areas in New England have caused serious concern. We must increase our vigilance, and protect children from chemical residues on their food, ensure that the air they breathe — both within their homes and outside — is as safe as possible, and that the tap water in their homes and schools runs pure and clean.

Lead Poisoning: A New England Challenge

One of the most severe threats to children's health in New England is lead poisoning, which can cause lifelong developmental and intelligence problems. Because of the large number of older houses that may contain lead-based paint or lead solder for pipes, New England faces a particularly serious problem. EPA-New England has made the prevention of childhood lead poisoning a major priority—activities described elsewhere in this report include the Roxbury/Dorchester EMPACT lead abatement project, the Little Moccasins project, and the UEI Providence lead-testing initiative, as well as the Manchester Child Health Champion project described below. An enforcement settlement with the Rhode Island Department of Transportation will fund a \$438,500 project to remove lead from day care facilities in Rhode Island. It is expected that approximately 120 day care facilities serving approximately 8,000 children will participate in the project. EPA continues to take emergency removal actions to de-lead specific sites. EPA has also produced "English as a Second Language" teaching materials with lead as a subject. These materials are used to teach English to non-native speakers while also giving them information about lead poisoning dangers.

Home Away from Home: Environmental Care for Schools

Making sure that our schools are safe and healthy places for children is the focus of EPA-New England's safe schools initiative. A longer school day, coupled with the need for extended hours of daycare for families with working parents, has meant that many of our children are spending up to eleven hours every day in school during the academic year, and more children are enrolled in American schools than ever before. One of every five New Englanders works in a school building as a student, teacher, or member of the school staff. Potential hazards include unhealthy air, the presence of asbestos, and hazardous chemicals from chemistry labs, art supplies, cleaning equipment, and auto repair classes.

A Special Tool Kit

EPA-New England's Indoor Air Quality (IAQ) Tools for Schools kit is one effective way to identify potential causes of the poor indoor air quality that affects children's health and learning. The kit includes checklists for different members of the school community; suggested action plans for resolving problems, and a communications guide for coordinating the efforts of teachers, boards, parents, and the rest of the community. The program's partners—including the New England chapters of the American Lung Association, the state-based Coalitions of Occupational Safety and Health, the Environmental Health Policy Program at the Tufts University School of Medicine, and the Harvard School of Public Health—have sponsored dozens of workshops and conferences introducing the IAQ Tools for Schools approach to various segments of the education community. "Taking Action," EPA's new nationwide training video on implementing the IAQ Tools for Schools Kit was filmed by the crew of the popular series "This Old House," using the Little Harbour School team in Portsmouth, New Hampshire. Throughout the region, more than sixty schools and school systems are implementing the IAQ Tools for Schools program. Participants include the Massachusetts Health Department, local health departments, and the Maine Governor's School Facilities Commission. Polaroid Corporation has initiated an "Adopt-a-School" training program among its corporate environmental managers to support the use of the IAQ Tools for Schools kit.

Child Health Champions

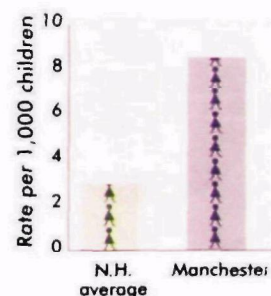
Manchester, New Hampshire is one of eleven Child Health Champion national pilot communities engaged in an aggressive local campaign to reduce environmental health risks facing its children. With the help of \$135,000 in EPA funding from our Office of Children's Health Protection, a group of organizations representing a broad spectrum of the Manchester community—from the health department to a local theater group—was formed to help the city's children have a strong and healthy future. In addition, an innovative EPA agreement with the city (over sewer rebuilding required by the Clean Water Act) will bring approximately \$500,000 for children's health programs to Manchester over the next five years.

The city's Child Health Champion project offers young families information about how to create a healthy home, right from the start. The project offers free smoking cessation classes, so that the children in close contact with adults who smoke will not be at risk from the effects of exposure to secondhand smoke. The project also provides in-home services to reduce asthma allergens and lead dust. The local chapter of the Audubon Society is offering free after school eco-health programs to children who need a safe place to go while their homes are being cleaned. The community's theater group is producing a show that helps young families understand what they can do to reduce children's environmental health risks. Working together, Manchester's Child Health Champions have become a national model that demonstrates how a community can come together to make a difference for their children.

SUNWISE tips:

- Read the UV Index daily
- Wear sunglasses that block UV radiation
- Always use sunscreen when outside on a sunny day
- Wear a hat with a brim
- Wear light clothing to protect your skin from strong sun rays

Figure 9
Elevated Blood Lead Levels in Children*



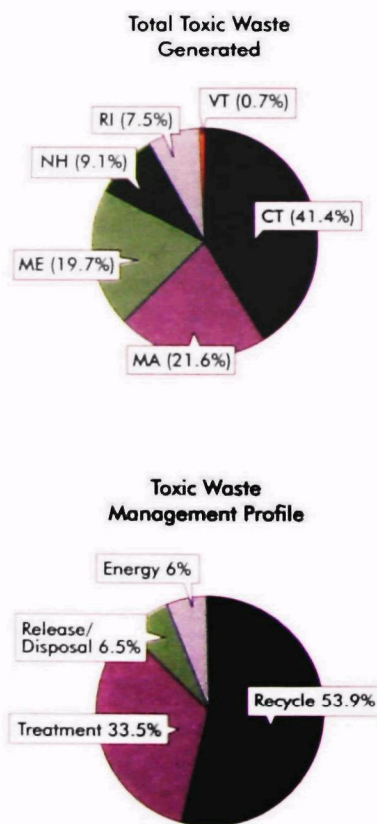
*children less than 6 years of age with blood lead levels greater than 15 ug/ml gl for 1994-1995

sources: Manchester Health Dept., NH Dept. of Public Health Services

Stewardship in Action

“We need to imagine a prosperous commercial constructed that it mimics nature at every step, a symbiosis

Figure 10
New England Toxic Waste
Where Generated;
How Managed



Total Waste Generated =
499.4 Million lbs

source: EPA Toxic Release Inventory

EPA-New England is charged with ensuring that businesses, government agencies, and individuals are fulfilling their environmental responsibilities. We are entering our twenty-eighth year of vigorously enforcing federal environmental regulations through civil and criminal enforcement actions. Environmental issues today are increasingly complex, and we continually strive to develop enforcement strategies that utilize our resources efficiently, maximize deterrence, and yield the greatest environmental and human health outcomes. These are the results that our residents want and care about, and they are at the center of all our protection efforts.

At the same time, EPA-New England's Assistance and Pollution Prevention (A&P2) staff assists New England businesses, municipalities, tribes, federal facilities, and others to adopt and thrive on environmentally sound practices and measures to attain or exceed environmental standards. We build alliances with the regulated community to promote an understanding of EPA regulations and develop innovative approaches to environmental protection. Our goal is to complement traditional approaches to enforcement and environmental compliance, and to improve the environment by providing information and assistance necessary to help members of the regulated community become better environmental stewards.

Assistance for Best Performance

In 1998, the A&P2 office responded to over 13,600 requests for assistance, sponsored 70 workshops, and spoke at more than 250 outreach events. We conducted 143 on-site visits to assist the regulated community, as well as additional visits to provide other forms of assistance such as educating businesses about available assistance programs. In March 1998, EPA-New England worked with the White House to host a regional conference with Vice President Al Gore and EPA Administrator Carol Browner. The conference was designed to address barriers facing innovative environmental technologies and to present new approaches for environmental protection. The day-long event brought together 500 environmental and business leaders from New England and across the United States. Participants worked together to develop recommendations ranging from third-party certification of environmental performance to financial mechanisms for promoting environmental technology.

EPA-New England began the second year of its innovative StarTrack program, piloting a new paradigm for environmental management. Based on the same concept as our country's system of financial audits, the program requires participating companies to have their compliance with environmental laws certified by independent third parties. Companies must have shown a commitment to environmental excellence, by implementing a formal Environmental Management System (EMS), and issue public environmental performance reports. In return, they will gain relief from scheduled inspections (though

culture that is so intelligently designed and of company and customer and ecology.”
—Paul Hawken

EPA will continue spot-checking), receive expedited permits, and earn public recognition as an environmental leader. As companies shift to this model, this will allow EPA staff to devote more time and resources inspecting the companies with the worst performance records. StarTrack is developing strategies to continue program expansion, and has drawn interest from other organizations and efforts, including the National Academy of Public Administration and the President's Council on Sustainable Development.

EPA's Project XL initiative continues to encourage companies, states, and communities to propose innovative mechanisms for achieving superior environmental results. One XL project approved in 1998 is the Massachusetts Environmental Results Program, which replaced conventional, time-consuming, state-issued permits for each individual business with uniform industry-wide environmental performance standards that each business must certify they are meeting. Current sectors included in this program are printers, dry cleaners, and photo processors representing 10,000 Massachusetts companies. The Massachusetts model is being evaluated around the nation as the next wave of smart environmental regulation.

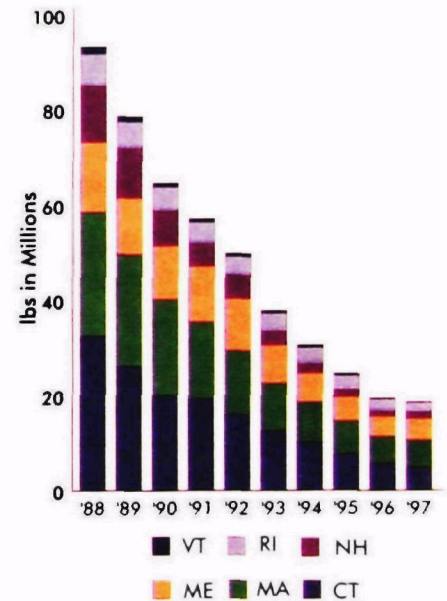
EPA-New England's Emergency Planning and Community Right-to-Know (EPCRA) Team has developed a strong and exciting partnership with the Chelsea, Massachusetts public high school. Students were trained to use computer tools to assess potential hazards from accidental releases of chemicals in their community. The students worked with the city's emergency response officials and companies in the area to assess hazards and develop emergency response plans. As a result of the project, 60 Chelsea companies have come into compliance with EPCRA over the past year (only two companies were in compliance with the Act before the students began this effort). The Chelsea project is being discussed on the national level as a successful model for other communities.

Better Measurement, Evaluation, and Communication

EPA New-England's Office of Environmental Stewardship has several efforts underway to evaluate compliance with environmental regulations. This is a multi-faceted effort to use more sophisticated analytical tools to improve our ability to evaluate compliance rates, learn more about root causes of noncompliance, and understand the role of corporate management in environmental compliance.

One example is EPA's work with United Technologies Corporation (UTC), aimed at evaluating the root causes of noncompliance by the regulated community and assessing the subsequent effectiveness of formal Environmental Management Systems (EMS) to address the problem. As part of the settlement of an EPA-New England initiated enforcement action against UTC, the corporation agreed to develop and implement an EMS at nineteen of its New England business units. After several years of implementation, the corporation and EPA developed a partnership to evaluate the effectiveness of these EMS.

Figure 11
Historical Trends
in Toxic Releases
 (Total to Land, Air and Water)



source: EPA Toxic Release Inventory

PCB Cleanup in Pittsfield

In September 1998, EPA-New England, in association with the U.S. Department of Justice, state agencies in Massachusetts and Connecticut, and the City of Pittsfield, reached an agreement in principle with General Electric (GE) over cleaning up PCB contamination in Pittsfield, Massachusetts and the Housatonic River. The agreement requires GE to provide for substantial investments in the cleanup of the Housatonic River, the GE plant site and other contaminated properties, as well as brownfields redevelopment in Pittsfield and compensation for natural resource damages.

The negotiating process was long and often difficult. However, the dedication of local representatives and the negotiating parties finally paid off. With the assistance of outside mediators, an agreement was reached that avoided decades of costly litigation, and was hailed by business, environmental and community groups as a solution that addressed all of their concerns. The agreement was a major victory for EPA-New England's approach of negotiating where possible while remaining committed to pursue whatever alternatives are necessary for strong, successful environmental protection.

Citizen's Coordinating Council will serve as a focal point for community participation and ensure that the cleanup is managed in a fully collaborative and cooperative manner.

This analysis is the first of its kind focusing on multiple facilities within a single corporation and evaluating the effectiveness of EMS. The results of this study will help shape the future of compliance activities and environmental management.

In addition, the Office of Environmental Stewardship is identifying measures of important environmental and human health outcomes achieved by our state partners not currently captured by the Region's data collection systems. For example, inspections of gas stations by state agencies were not previously recorded in EPA's databases, but in 1998, state inspectors in New England conducted 5,962 vapor recovery inspections/visits at gas stations and conducted 1,217 inspections of underground oil and gasoline storage tanks. EPA and the New England states are looking for ways to better measure the effects of inspections and other activities on compliance rates, and ultimately on environmental conditions.

Creating Synergy for Enforcement and Compliance Assistance

In the past few years, EPA-New England has stepped up its enforcement effort against public facilities in New England, filing more than two hundred cases against public agencies in response to serious noncompliance with environmental regulations. In March 1998, complaints were filed against the Rhode Island Department of Transportation (RIDOT) for violations of hazardous waste laws and the Clean Water Act. The most serious violations involved RIDOT's improper handling and storage of large amounts of hazardous waste in a building in Providence, Rhode Island. EPA inspectors found 938 containers filled with various hazardous materials, including waste paints, solvents, and thinners. Most of the hazardous waste was ignitable; hundreds of containers were open, spilled or leaking, and the facility had no fire alarm system or fire extinguisher on site. The complaint was settled with RIDOT agreeing to pay fines and fund two environmental projects, the total reaching over \$500,000. RIDOT will spend \$438,500 on a project to remove lead paint in Rhode Island day care facilities (described in our children's health section of this report). RIDOT will spend an additional \$15,000 to conduct two 1-day environmental compliance training sessions for municipalities in Rhode Island.

EPA has leveraged this action to encourage future public agency compliance in the region by sending 1,700 letters to agencies in New England describing the circumstances involved in the Rhode Island case. Most importantly, the letters also contained compliance assistance information, including Internet addresses where interested parties can find statute-specific compliance information and listings of available workshops and training sessions. Response has been extremely positive, with standing-room-only attendance at the first of these training sessions.

Protecting Drinking Water for Eastern Massachusetts

Boston's drinking water treatment system is operated by the Massachusetts Water Resources Authority (MWRA) and serves approximately two million people. For over

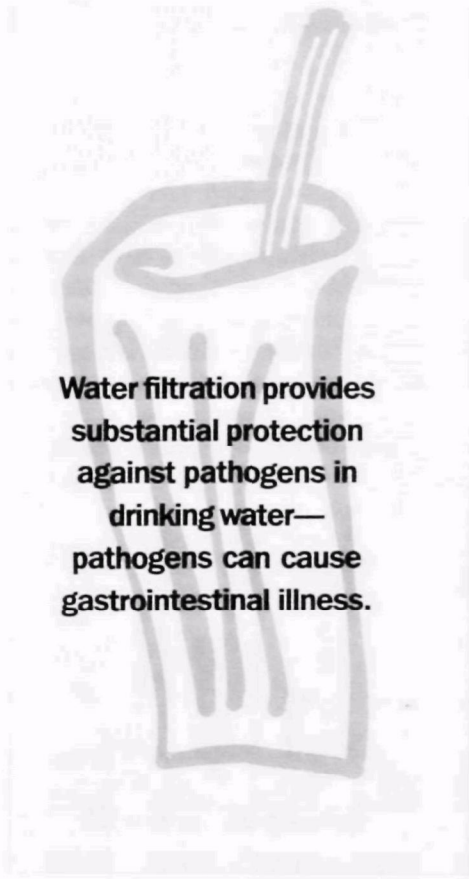
five years, the MWRA has been violating the Safe Drinking Water Act by not filtering its drinking water. Filtration provides substantial protection against pathogens in drinking water. Pathogens can cause gastrointestinal illness in healthy people, especially sensitive people, such as those with underdeveloped or compromised immune systems (e.g., the elderly, the very young, chemotherapy patients, AIDS patients) and the seriously ill. Filtration also makes it possible for water systems to use far less chlorine, which is important because the chemical byproducts of chlorine disinfection have been linked to cancer and reproductive problems in women. The Safe Drinking Water Act requires filtration for any major supplier unless they meet strict standards for the effectiveness of their disinfection system; requirements the MWRA has never met since the Act went into effect.

After negotiations with the MWRA failed, in 1998 EPA-New England, along with the Department of Justice, filed suit against MWRA for violations of the Surface Water Treatment Rule under the Safe Drinking Water Act requirements. Court hearings are scheduled for spring 1999. Continued oversight of state enforcement of this rule is an ongoing priority in the region. This program is consistent with our focus on the most important environmental and public health issues—particularly those that have a strong impact on children—and with our effort to secure the greatest public benefit from our enforcement resources.

Special Superfund Stories

The New Bedford Harbor and Pine Street Canal Superfund sites are examples of successful efforts in community participation and consensus-building in the Superfund program. In both cases, community dissatisfaction with the traditional Superfund process prompted EPA to create new mechanisms to include community and other voices, resulting in solutions that all parties could accept.

New Bedford Harbor is part of Buzzard Bay in Massachusetts, which has been designated as one of the nation's most significant estuaries. However, sediment in the harbor has been contaminated with extremely high levels of PCBs, leading to a fishing ban and threatening the health of those who use the harbor. Originally, EPA proposed dredging and on-site incineration of highly PCB-contaminated "hot spot" sediments. In response to vehement local opposition to on-site incineration, EPA helped to create a Community Forum to undertake the long and arduous process of building a consensus for site cleanup. In 1998, the Forum reached consensus on both the 5-acre "hot spot" cleanup and the 200-acre, \$130 million harbor-wide remedy. The consensus included an innovative approach to contain and consolidate the dredged sediments in several confined disposal facilities. The joint effort of many people and organizations made New Bedford Harbor a national model demonstrating that the Superfund program can work within a community to achieve consensus on controversial, but essential decisions.



Water filtration provides substantial protection against pathogens in drinking water—pathogens can cause gastrointestinal illness.



Photo: Jim Keleher

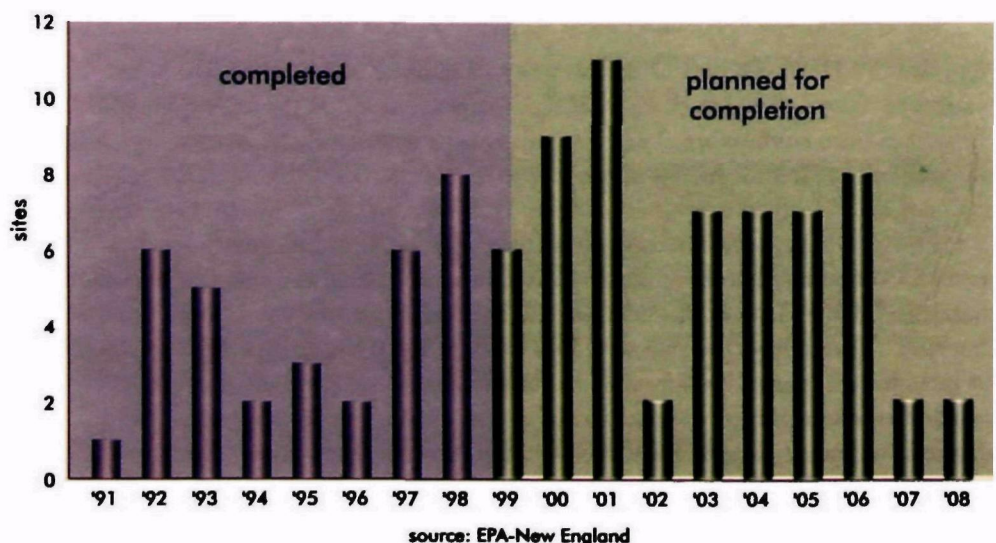
With funding from the EMPACT Program, EPA-New England and the Charles River Watershed Association have initiated an effort to collect water quality samples at key locations along the Charles River and then post water quality alert flags at boathouses announcing the results. The team is planning to install real-time water quality monitors linked to the world wide web, enabling people to view the amount and quality of water flowing into the Charles on their computer screens.

EPA-New England also used a community-based consensus process to develop a proposal for cleaning up the Pine Street Canal in Burlington, Vermont, another controversial Superfund site. For over seventy years, a gas plant located on this site dumped large volumes of waste into the adjacent wetlands and canal, seriously contaminating groundwater and harming wildlife. EPA's original plan was met with massive community opposition for being too expensive and intrusive. After months of controversy, the Pine Street Barge Canal Coordinating Council was created as a way to begin a mediated process that ensured meaningful involvement of all parties, including multiple agencies and local interests. In May 1998, this Council was able to reach consensus on a site cleanup plan which includes construction of an underwater cap over contaminated sediments in the canal, wetlands restoration, and long-term groundwater monitoring—at a cost of about one-tenth of the original proposal. In addition, the responsible parties made voluntary contributions of nearly \$3 million in additional projects of significant environmental benefit to the Burlington area. The plan has received overwhelming community support and political support from Vermont's congressional delegation, the governor, and the mayor of Burlington.

Coming Soon: A Fishable and Swimmable Charles

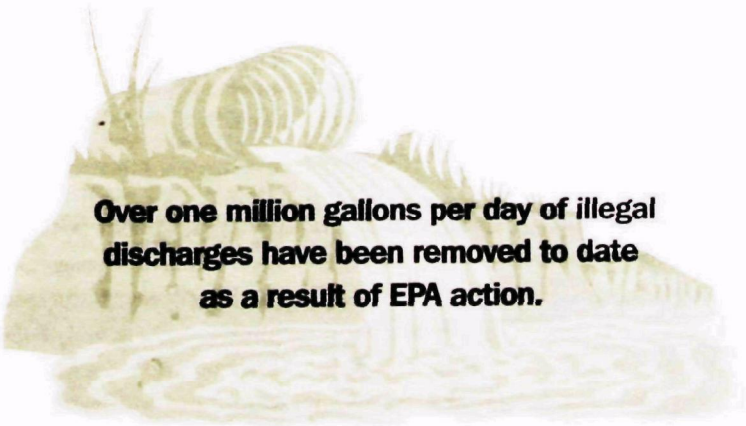
Efforts to restore the Charles River to fishable/swimmable standards are making steady progress. Each of the nine lower watershed communities has developed a

Figure 12
Superfund National Priority List Sites - Clean Up Action Construction



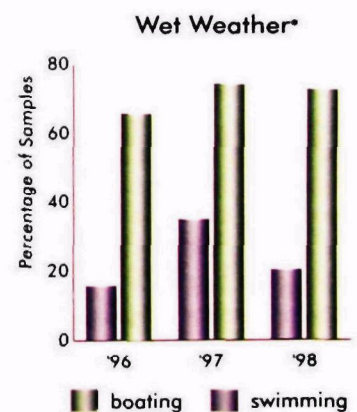
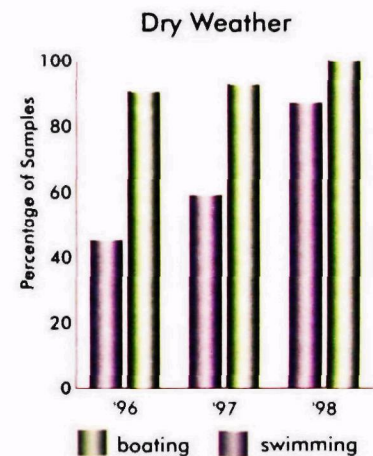
stormwater management plan and continues to identify and eliminate illicit discharges of sewage through storm drains. Through coordination between EPA and the Massachusetts DEP, the Charles River communities secured \$75 million in state revolving loan funds over the past year to finance stormwater treatment and eliminate illegal discharges. Over one million gallons per day of illegal discharges have been removed to date as a result of EPA action. EPA-New England's A&P2 staff developed a program to provide the nearly one thousand auto care and repair facilities in the lower Charles watershed with information about proper stormwater and drainage management. To encourage compliance, EPA-New England's enforcement office notified all facilities in the watershed that they had sixty days before EPA inspections would begin. When inspectors made their rounds, they found most facilities were in very good order.

With the help of the EMPACT Program in the region, EPA-New England and the Charles River Watershed Association have initiated an effort to collect water quality samples at key locations along the Charles River and then post water quality alert flags at boathouses announcing the results. The team is planning to install real-time water quality monitors linked to the World Wide Web, enabling people to view the amount and quality of water flowing into the Charles on their computer screens. An EPA grant to the Watershed Institute, a local environmental education and advocacy group, will help design a series of field study projects that will allow high school students to track the recovery of the river by assessing various animal and plant species in and along the river.



Over one million gallons per day of illegal discharges have been removed to date as a result of EPA action.

Figure 13
Progress in the
Charles River Basin
Samples Meeting Fecal
Coliform Standards



*wet weather samples were collected after a minimum of 0.5" rainfall.

source: Charles River Watershed Association

Global Partnerships

**“Nature is the common, universal language, understood by all”
—Kathleen Raine**

Freon Smugglers Convicted

Freon, or CFC-12, used as a coolant and as a propellant in aerosol, destroys the planet's protective stratospheric ozone layer, which screens harmful UV radiation from reaching ground level. Strict controls on CFCs were established by the international Montreal Protocol enabling legislation in the U.S. After a two-year investigation, EPA-New England's Criminal Investigation Division recently led an effort with the U.S. Customs Service, IRS, and Environment Canada to put an end to a Freon smuggling operation in New Brunswick, Canada and Bangor, Maine. In 1993 and 1994, 245 tons of CFC-12 were illegally imported through Houlton, Maine, and then sold for use throughout New England. The owner of the business involved had not obtained the consumption allowances required by the Clean Air Act to import the product, nor had he paid the more than \$1.6 million in excise taxes due. The owner received a fifteen-month jail sentence along with fines for his role in the offense, and the broker in the operation was sentenced to eight months incarceration. This was the first CFC smuggling case prosecuted in New England, and the first time EPA-New England and Environment Canada's Atlantic Region conducted a coordinated investigation and successful joint prosecution of a transboundary environmental crime.

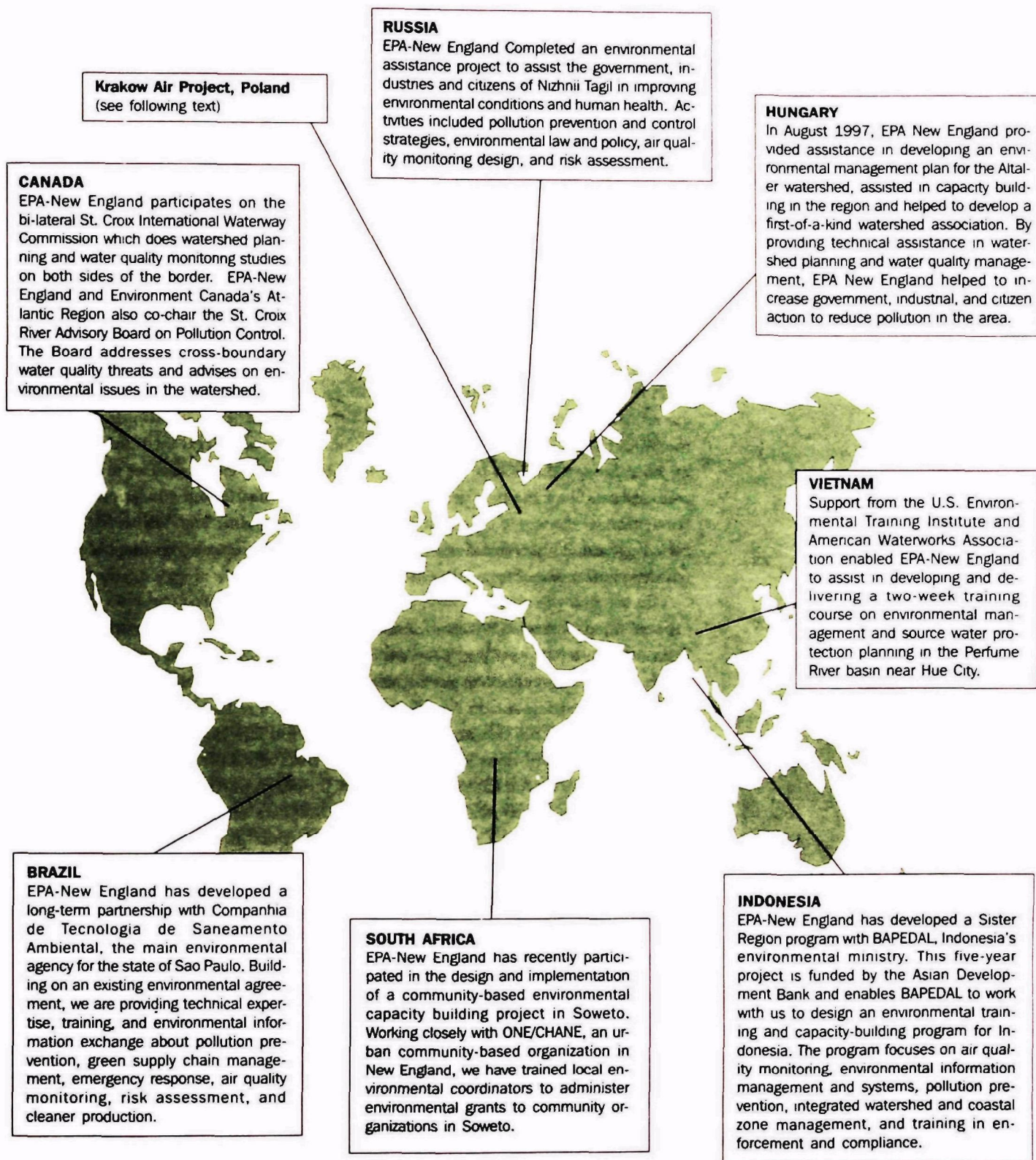
Because the environment does not stop at our nation's borders, protecting public health and natural resources requires the cooperation of other countries. Transboundary pollution of air and water from Canada and other regions of the world directly affects the environment and well-being of people who live in New England. Global problems, like ozone depletion and human-induced climate change, affect us all. EPA-New England is making sure that we are active not only here in New England, but as part of a connected world.

For example, the Canada-United States Joint Inland Pollution Contingency Plan, developed by EPA and Environment Canada, uses our country's National Response System as a basis for joint operations in the event that an accident in either country would impact the other. EPA-New England has worked with Vermont, New York, and the province of Quebec to conduct oil spill and chemical release exercises—bringing together the local, state, and federal agencies that would immediately be involved at the scene of a spill or release in the Lake Champlain area.

Yankee Know-How

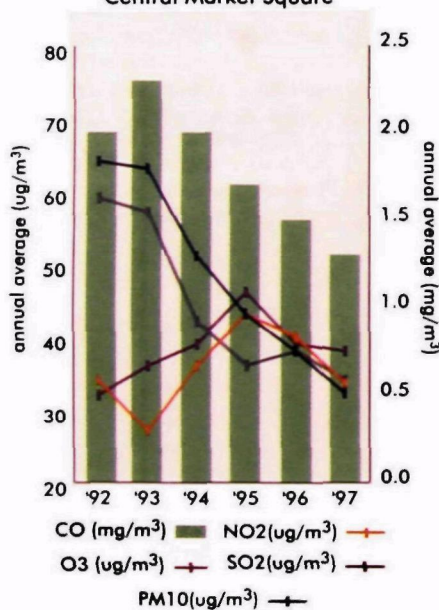
In addition to addressing specific threats to our region, EPA-New England is working to spread expertise and technology developed here to the rest of the world. The U.S. is seen worldwide as a leader in environmental protection, with New England in particular known as a center of environmental technology businesses. We work closely with EPA's Office of International Activities in Washington, D.C., the U.S. Agency for International Development (USAID), the World Bank, and other partners to identify priority areas for programs to share environmental technologies.

By introducing the use of environmental technologies that benefit both the environment and the economy, EPA-New England has helped to build successful environmental training programs in Hungary, Poland, Russia, Brazil, and Indonesia. EPA-arranged exports of innovative environmental technologies to Brazil, Poland, Portugal, and Lithuania have paid dividends for New England's environmental industry through increased exposure to new markets, opportunities to demonstrate innovative technologies abroad, and expanded access to buyers of environmental technology overseas. We have promoted the principles of pollution prevention throughout the international community, while at the same time strengthening our scientific and technical base at home.



Spanning the Globe: Our International Project Areas

Figure 14
Krakow, Poland
Air Quality
Central Market Square



source: Krakow Air Monitoring Network

Due to an expanded central heating system for the center city area, both sulfur dioxide and particulate matter concentrations have been significantly reduced since the monitoring network was installed in 1992. However, the areas of the city where soft coal is still the predominate source for residential heating have not experienced a similar decline. The reduction in carbon monoxide is a result of a traffic ban in the central business district.

Global Warming: We're All in this Together

EPA-New England has a region-wide initiative to reduce greenhouse gas emissions and help reduce the impacts of global climate change. We are developing greenhouse gas emissions inventories with the region's federal facilities to determine which measures can be implemented to reduce emissions from federal facilities. Additionally, we have funded states to prepare their own greenhouse gas emissions inventories and action plans. Over the past year, EPA-New England distributed educational materials about climate change to all public libraries and most public high school libraries in New England. This information is also available through our web page (<http://www.epa.gov/region01/steward/cchange/index.html>).



One of the programs EPA-New England is promoting to reduce greenhouse gases is ENERGYSTAR, a program that provides information about how to reduce energy needs, and thus greenhouse gas emissions, from buildings and equipment. In 1998, ENERGYSTAR participants in New England achieved a reduction of 995.3 million pounds of carbon dioxide annually and 6.7 million kilowatt hours of energy use—a cost savings of more than \$31 million a year from all of the 225 companies that are now part of the Green Lights/ENERGYSTAR Buildings partnership. This greenhouse gas reduction is the equivalent of taking 99,000 cars off the road—or planting 136,000 acres of trees. The State of New Hampshire and the cities of Boston and Cambridge, MA are among the new participants that have joined the ENERGYSTAR Buildings program along with a dozen other companies, hospitals, schools, and government agencies.

Krakow Air Quality Monitoring Project

The city of Krakow, Poland has some of the worst air pollution in Central and Eastern Europe. The burning of inefficient high-sulfur brown coal for home heating; pollution from cars, trucks, and buses; and industrial emissions from steel mill operations are all responsible for the problem (**Figure 14**). In 1991, EPA developed a bilateral environmental assistance program with the Polish government, with authority and funding under the Support for Eastern European Democracy (SEED) Act. Equipment for continuous air monitoring, manufactured in New England, was installed in the city. EPA-New England provided assistance to local authorities in ways to address air pollution. As a result of the project, the Polish government is now considering alternative transportation control policies and strategies, including a program to phase out lead in gasoline over the next several years and strategies to reduce the use of soft coal for home heating. Increased capacity at the local level to assess mobile source pollution will enable city officials to improve monitoring of threats to public health and develop an effective emission inventory system.

New England's Ecosystems

“Eventually, all things merge into one, and a river runs through it.”
—Norman Maclean

New England is blessed with clear mountain streams, fertile river valleys, numerous lakes and ponds, vital urban rivers, and coastal estuaries teeming with life. The terrestrial areas—mountains, woodlands, meadows, and marshes—that surround these waters form a network of habitats that make up our region's watersheds. Clean water, productive land, and healthy habitats depend on the quality of the sixty-five watersheds within the 14 major river basins in our region (Figure 15).

The Watershed Idea

A watershed is a geographic area consisting of all the land that drains to a particular body of water. Watersheds vary in size, shape, and complexity. All terrestrial animals—including human beings—live in a watershed and have a direct impact on the quality and quantity of water and other natural resources in that watershed. Watershed management is based on understanding each watershed as a single hydrologic and ecological system, and involving the people who live and work there in decisions about its use and management.

No single agency or group, however, can be responsible for this extensive task. There are over 350 active watershed groups, including various state, local, and regional partnerships, working on watershed issues in New England. EPA-New England was a major participant in coordinating the Northeast Watershed Roundtable, designed to encourage dialogue and build new relationships between government and other organizations and to develop creative ways to address water quality, instream flow, riparian buffers, watershed planning, habitat restoration, growth management, and wetlands protection. Along with a great deal of excitement and enthusiasm, the Watershed Roundtable is generating the Northeast Watershed Strategy—an action plan and set of recommendations for protecting and restoring New England's watersheds.

Watershed Resource Guide

The Watershed Resource Guide is a directory that lists current documents published by EPA on watershed management for the public to read and use. The guide covers six categories: watershed planning and management, drinking water, non-point source pollution, watershed education, volunteer monitoring, and habitat. Copies of the guide and the documents it describes are available at no cost to anyone with an interest in protecting our surface water and groundwater supplies by calling 1-888-372-7341. We hope that the publications in this guide will be requested and used throughout New England by watershed associations, town officials, conservation commissions, students, and anyone else interested in understanding the watershed approach.

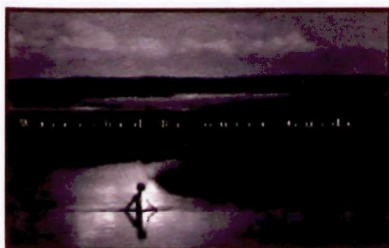
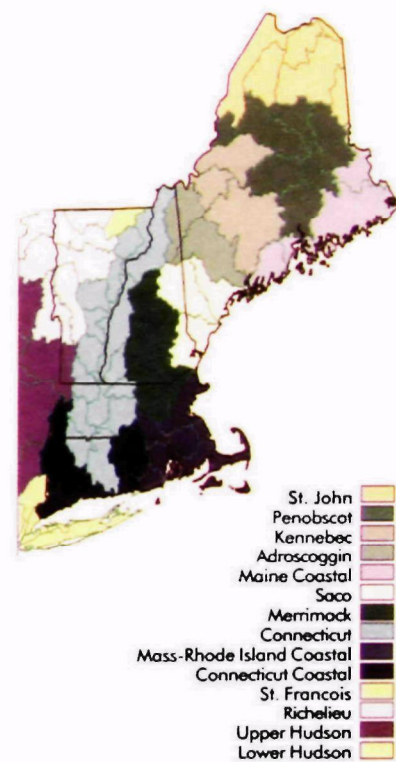


Figure 15
Major River Basins in
New England



source: EPA-New England

Aquatic Life & Fish Consumption in New England Waters

States, federal agencies and local organizations are making coordinated efforts to assess the conditions of our waters. Nutrients, bacteria, metals, organic chemicals and destruction of shoreline and natural habitats are generally at the top of the list of causes of impairment to New England waters. Although we are reducing point sources of pollution, non-point sources continue to present a challenge to local, state and federal agencies. We need more pollution prevention and innovative approaches and technology to reduce non-point source stresses.

Statewide fish advisories to limit consumption due to mercury continue in all states except Rhode Island and remain a national concern.

Impaired New England Waters

Designated Use (Measure of Impairment)	River/Stream Miles	Lake/Pond Acres	Estuarine Sq. Miles
Fish Consumption (Advisories)	83%	90%	1%
Swimming (Beach Closures)	6%	16%	3%
Aquatic Life (Unhealthy Organisms, Poor Habitat)	7%	20%	9%

Source: State 303(b) Reports

EPA-New England is actively participating in the Clean Water Action Plan announced by Vice President Gore in 1997 on the 25th anniversary of the Clean Water Act. The plan is designed to build on the success we've had in cleaning the nation's waters over the previous years, and to more aggressively clean up remaining problems. The Plan's three major goals are to enhance protection from the threats to public health that are posed by water pollution, to more effectively control polluted runoff, and to promote water quality on a watershed basis. In New England, we will be working together with other federal agencies, Indian tribes, the states, communities, and their citizens to tackle outstanding water quality issues, emphasizing innovative approaches to pollution control wherever possible.

Nutrients: Too Much of a Good Thing

As part of its Clean Water Action Plan, EPA is initiating a new national nutrient criteria program to develop region-specific nutrient target ranges for phosphorus and nitrogen. Excessive phosphorus is the primary cause of eutrophication in freshwater lakes, streams, and rivers, while in coastal and marine systems, nitrogen is the main contributor. Symptoms include extensive algal blooms, low levels of dissolved oxygen (resulting in fish kills), high turbidity, and loss of submerged aquatic vegetation. Nutrients reach New England's waters from sewage treatment plants, stormwater runoff from developed areas, leachate from septic systems, agricultural runoff, and in the case of nitrogen, atmospheric deposition. Many streams and rivers in New England have been altered by construction of flood control or hydroelectric dams, exacerbating the effects of nutrient enrichment and resulting in eutrophication.

A study conducted by the U.S. Geological Survey (USGS) in streams in Connecticut from 1980 to 1992 found decreases in ammonia and phosphorus levels although the total nitrogen concentrations were unchanged. These changes came after more effective wastewater treatment was installed and significant improvements in water quality resulted.

From 1992 to 1995, the USGS as part of its National Water Quality Analysis (NAWQA) program sampled 61 stations for nutrient concentrations in Connecticut, Massachusetts, Vermont and New Hampshire. In general, nutrient concentrations for both nitrogen and phosphorus were higher in streams draining predominantly urban areas, than in streams draining agricultural or forested areas. The median concentration of total phosphorus in urban streams exceeded the commonly used benchmark of 0.1 mg/l, indicating the potential for eutrophic conditions. More information on NAWQA can be found on the following website (http://www.rvares.er.usgs.gov/nawqa/nawqa_home.html)



Free Flowing Waters

Restoring the ecological integrity of our rivers is a major objective of the Clean Water Act. A critical step in achieving this goal is removal of obstructions to migrating anadromous fish such as Atlantic salmon, shad, and alewives, which live as adults in saltwater, but migrate up rivers and streams to spawn. EPA-New England has been involved in river

restoration throughout the region. It participated in a multi-agency team that helped the Federal Energy Regulatory Commission (FERC) in its decision to deny relicensing and order the removal of Edwards Dam on Maine's Kennebec River; this will allow striped bass, rainbow smelt, and the endangered shortnose sturgeon to access their historic ranges on the river. EPA also supported the Coastal America Initiative to remove three dams on tributaries to the Penobscot River, and was a key participant in the settlement process for the relicensing of the Fifteen Mile Falls Project on the Upper Connecticut that will generate funds for river restoration and dam removal.

In addition to hydroelectric dams, a growing problem threatening improvements to river and stream water quality is the ever-increasing withdrawal and diversion of water for snowmaking, industrial and commercial use, agriculture, and municipal water supply. Besides habitat loss, the loss of the seasonal respite afforded by natural flow fluctuations can weaken native species, deplete their food supplies and make them more susceptible to disease. EPA-New England is working with the six New England states and the New England Interstate Water Pollution Control Commission to develop a set of standards to deal with flow restoration and to ensure that anti-degradation regulations and policies adequately address activities that have an impact on water quality.

The Massachusetts Watershed Initiative

For the past two years, EPA-New England has been an active participant in the Massachusetts Watershed Initiative, a multi-agency partnership including state and federal representatives, watershed councils, and community partners. It was organized to develop plans and target agency resources toward protecting aquatic ecosystems and restoring water quality to fishable and swimmable status throughout the state's watersheds. EPA participation involves assistance for citizen volunteer monitoring efforts, conducting water quality and sediment toxicity sampling, Geographic Information System (GIS) support in developing watershed maps and data layers, and training volunteers to collect data on point and non-point sources of pollution.

Our American Heritage Rivers — The Connecticut and the Blackstone/Woonasquatucket

The American Heritage Rivers Initiative is designed to help communities revitalize their rivers—and the streets, historic buildings, natural habitats, and parks along their shores—in celebration of river history and heritage. The goal of the program is to coordinate the existing programs and funding of the federal government to improve the delivery of services to rivers and river communities. EPA and other federal agencies work cooperatively with state agencies and local individuals and organizations to restore and enhance the river services that are valued by both humans and wildlife. New England is proud to be home to two of the fourteen nationally designated American Heritage Rivers, the Connecticut River and the Blackstone/Woonasquatucket Rivers. For general information on the American Heritage River Initiative, visit EPA's Rivers website (<http://www.epa.gov/rivers>).



Photo: Roy Crystal

Pollutant Trading: Sudbury River

When Congress Group Ventures wanted to redevelop an old Raytheon site in Wayland, Massachusetts, they faced a problem: the development would require a small water treatment plant, but because the Sudbury River was already overpolluted with phosphorous, by law they could not be granted a permit for the plant.

EPA-New England came up with an innovative permit for the development. Under the terms of the permit, the developer can go ahead with the development, but for every pound of phosphorous discharged from the development, they must eliminate three pounds from elsewhere in the watershed. This will be easily accomplished by connecting some of the many leaky septic systems in the area to the development's treatment plant. This innovative permit allows the development to go forward, increasing the town's tax rolls and allowing the reuse of an old site instead of developing open space elsewhere. At the same time, the development will actually leave the river cleaner than before. EPA-New England is looking forward to applying this approach elsewhere in the region.

Disappearing Shiners

Historically, the bridge shiner (*Notropis bifrenatus*), was one of the most common minnows in Massachusetts ponds, but the species is intolerant of nutrient over-enrichment from failing septic systems; runoff from golf courses, roads, lawns, and other shoreline development; water level manipulation; and introduction of non-native plants and fish. Recent surveys by the New England Aquarium of sixty-nine sites in eastern Massachusetts failed to find bridge shiners in 75% of the ponds where they were formerly found. EPA's EMAP (Environmental Monitoring Assessment Program) recently found bridge shiners in only two of twenty-five lakes surveyed in the state, suggesting an even greater decline. Massachusetts has designated it a Species of Special Concern. EPA-New England is helping to develop the tools needed to manage wastewater flow and promote less dense pondside development and natural vegetation buffer zones around undeveloped ponds to maintain healthy shiner habitat and pond ecosystems for the future.



Photo: Amelia Katzen

The Connecticut River is New England's longest river, stretching approximately 410 miles from the Canadian border through New Hampshire, Vermont, Massachusetts and Connecticut to Long Island Sound. Communities along the river identified sixteen different projects, including agricultural preservation and natural resource protection; habitat restoration, riverbank stabilization, and water quality protection; and urban riverfront revitalization as part of its bid for heritage designation. The Upper Connecticut River Project is a local, federal, and state partnership focused on reducing bank erosion, water contamination, identifying and cleaning toxic hot spots, restoring natural streamflow characteristics, making the river swimmable in all places, reducing the impact of invasive species, and improving the resident and anadromous fisheries and fishing opportunities. EPA-New England has helped fund a study to analyze the river's flow regimes and the impact of these regimes on its physical and biological functions, and provided technical assistance in establishing a website (<http://www.crjc.org>) for the Connecticut River Joint Commissions.



The Blackstone and Woonasquatucket Rivers flow into Providence Harbor, meeting to form the head of Narragansett Bay. The rivers represent an extraordinary range of environmental conditions—from pristine rural landscapes to densely populated inner-city neighborhoods of Worcester and Providence. More than a century of industrial manufacturing has left toxins embedded in river sediments and degraded wildlife habitat along the shore. American Heritage River designation is helping to reclaim the rivers as community assets by improving water quality, preserving historical and natural resources, and rejuvenating neighborhoods along the riverfront through federal, state, and community efforts.

Watershed Stories:

The Hoosic River

The Hoosic River watershed covers 720 square miles. The river's tributaries begin in the Green Mountains of Vermont, the Taconics of New York, and the slopes of Mount Greylock, the tallest mountain in Massachusetts. As a member of the Hoosic River Watershed Team, EPA-New England has provided technical help to the Hoosic River Watershed Association and the Massachusetts Department of Environmental Protection in conducting water quality sampling and analysis for PCBs, heavy metals, and other toxic substances, developing watershed maps, and facilitating an inter-agency Watershed Ecosystem Partnership to promote ecosystem preservation and restoration of the Hoosic River Watershed.

The Salmon Falls-Piscataqua River

EPA-New England has initiated a targeted approach to improve water quality in the Salmon Falls/Piscataqua River that forms a portion of the border between Maine and New Hampshire. EPA funding enabled the New England Interstate Water Pollution Control Commission to perform an economic analysis of various treatment alternatives for the municipalities discharging wastewater to the river. As the pressure for more development increases, however, the biggest challenges for protecting water quality will

be from diverse non-point sources of pollution. The river has already exceeded the amount of phosphorus it can tolerate. EPA-New England, the states, and other federal partners such as the Natural Resources Conservation Service (NRCS), will work with communities to control pollution from non-point sources and minimize future costs of wastewater treatment.

The Pawcatuck Watershed

The Pawcatuck watershed has been targeted as one of EPA-New England's Special Places, with several centuries of historical resources in a remarkably rural and unspoiled natural setting. It is rich in Native American sites, family-owned farms, small-scale industrial villages, summer colonies, and a vital, picturesque downtown area. The watershed supports a high diversity of species, including neotropical migrant birds, freshwater mussels, river invertebrates, reptiles, and amphibians. Covering about one fifth of Rhode Island, it nevertheless contains about 70% of Rhode Island's rare species and natural communities. The future of the Pawcatuck watershed, however, is not secure. Human population growth is leading to accelerated non-point source pollution and to habitat fragmentation. Control over many of the existing and potential threats to the environment will increasingly depend on those who live and work there. EPA-New England is participating in the Pawcatuck Watershed Partnership, a new effort to protect this watershed, promote sustainable economic vitality, and maintain healthy communities in this unique and special place.

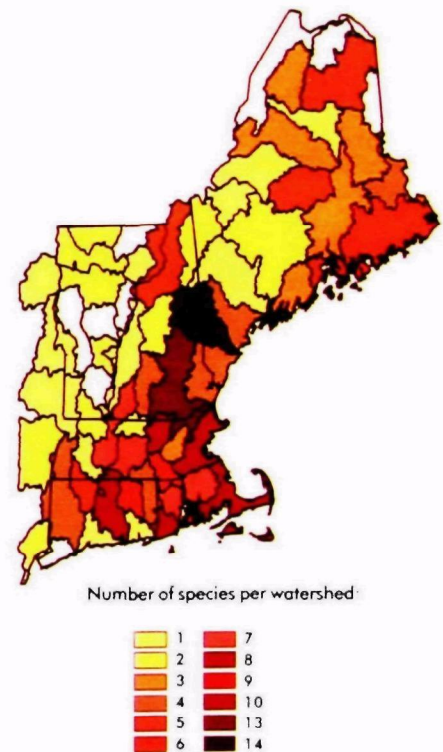
The Quinnipiac Watershed

The Quinnipiac River in south central Connecticut suffers from its historic contamination, heavy development, dense population, and the high demand for its water. The river continues to be degraded by stormwater runoff and excessive water withdrawals from the river and underlying groundwater. EPA-New England along with the Connecticut Department of Environmental Protection is working with the communities along the river to improve the condition of the watershed and reduce non-point source pollution in its river and tributaries. Activities include efforts to increase recreational access to the river, write model river ordinances, restore fish passage, and improve water quality.

National Estuary Program

During the past decade, EPA's National Estuary Program (NEP) has become a model for watershed/ecosystem-based environmental management. In New England, these projects have resulted in comprehensive conservation management plans involving local residents, agencies, and organizations in Massachusetts Bays, Buzzards Bay, Narragansett Bay, Casco Bay, Great Bay, and Long Island Sound. Working with local communities, participants in each of these major estuaries designed strategies to restore water quality and safeguard coastal ecosystems and embayments, maintain the region's historically strong shellfishery, and conduct monitoring studies to identify and eliminate sources of toxic and nutrient pollution.

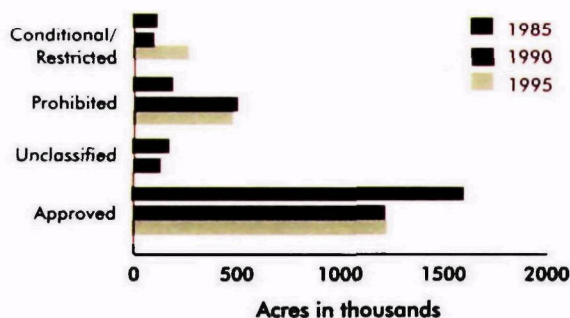
Figure 16
At-Risk Fish, Mussel, and other
Freshwater Invertebrate Species



source: The Nature Conservancy and the
International Network of Natural Heritage
Programs and Conservation Data Centers

Areas with globally at-risk freshwater species require greater conservation attention to protect from the effects of sprawl and other environmental degradation.

Figure 17
Estuarine Shellfish Water Acreages
in New England



source: National Oceanic and Atmospheric Administration, 1995



Photo: Ed Reiner

Partners in Flight

Birds are a central element of New England's biodiversity. They are vital to our economy through their control of agricultural pests, they provide enjoyment and recreation to millions of people, and they serve as critical indicators of environmental quality. While northern New England woodland species were generally increasing over the last decade, southern New England woodland species, especially ground and low nesting species have been declining. Factors include the increasing fragmentation and urbanization of our landscape and possibly increased predation by raccoons, crows and domestic cats. Migratory bird populations are also declining as a result of habitat fragmentation in New England breeding grounds, deforestation in their Central and South American wintering grounds, and pesticide poisoning. In response to these trends, a coalition known as Partners in Flight (PIF), including EPA-New England, was established in 1990 to improve monitoring, research, management, and education programs about birds and their habitats.

The projects under the National Estuary Program have far-reaching, long-term benefits to local residents and watersheds. For example, the New Hampshire Estuaries Project's work has made it possible to reopen large portions of the Seabrook Middle Ground clam flat for recreational harvest for the first time in a decade. The Middle Ground flat is the most productive softshell clam flat in the state. The New Hampshire Estuaries Project has been directly involved in water testing, pollution source identification, and pollution reduction efforts in partnership with local and state agencies, towns, and a large number of individual volunteers. Significant improvements in water quality resulting from increased municipal sewerage coverage in the Town of Seabrook and other pollution control measures around Seabrook Harbor have made clamming on the flat possible once again.

Reconsidering the North Woods

Although essentially healthy, New England forests are under constant attack by a variety of pests, pathogens, and ecological and anthropogenic stresses. Forest health monitoring throughout the six states has shown that the region's forests are also experiencing damage from ground-level ozone pollution. Research has suggested that increases in temperatures and changes in precipitation regimes could harm forests growing in marginal conditions and those forests which could not endure more serious summer drought. Depending on the type of tree species and the specific growing conditions, some forests may continue to grow and function well, while others may decline in health or die. Spruce, which is important to New England's timber industry, is likely to decline in response to warming and drying.

Use of pesticides, especially herbicides, in forests has been a significant issue for several years in New Hampshire, Vermont, and Maine. Major concerns include pesticide drift from target application areas, impacts of the chemicals on public health and the environment, and clear-cutting and other forest management practices that use herbicides to suppress hardwoods and enhance conifer competitiveness. The New Hampshire Pesticide Control Board recently revised its rules to provide more notification and greater opportunities for public input. Vermont has initiated a moratorium on the application of herbicides as a forestry practice, which will remain in effect until 2003. Although the Maine Board of Pesticide Control rejected a petition to ban aerial application in 1995, the Board is sensitive to forest herbicide issues and has begun to implement improved notification and oversight measures. EPA is responsible for regulating pesticide use and funding the New England states to implement these pesticide regulations.

Liveable Communities

There is an old saying that some of the best things in life are free. Clean air cannot be bought in a store. Neither, we are realizing, can livable and sustainable communities. New England has a rich heritage of well-designed communities—our human-scale colonial villages and our urban neighborhoods like Boston's North End are seen as national models for patterns of living that are both environmentally sound and foster a sense of community among the residents. But as our population and economy continue to swell, many of these qualities are being compromised by haphazard, sprawling development. Poorly planned development has serious adverse impacts that affect the environmental integrity and quality of life of our communities. Open space disappears, waterways become polluted, roads become clogged even as people must drive farther and farther, with more driving threatening air quality gains. Worst of all, our sense of place and connection with our neighbors is eroded. Brownfields, properties abandoned because of real or perceived contamination, are left in the inner cities, while fields, farms, and forests continue to be lost.

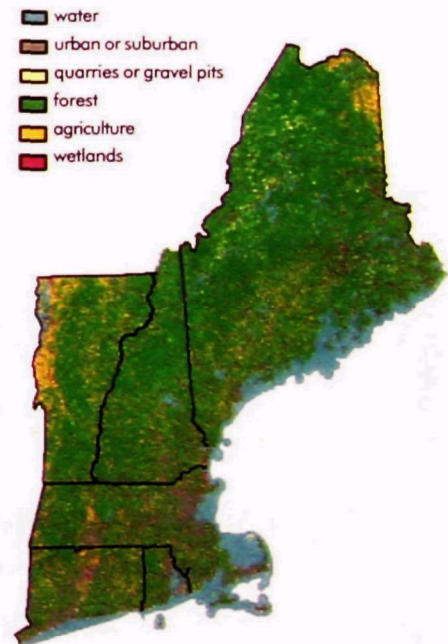
EPA-New England believes that it has a responsibility to help communities grow in a way that protects our most valuable natural resources. In the fall of 1998, EPA-New England developed its action plan for liveable communities and released it at an EPA-sponsored smart growth conference in February 1999.

Because land-use decisions are made on a local level, a major component of the Action Plan is building the capacity of local communities to better manage growth. We will be designing a Smart Growth training program, and bringing it to towns and municipalities throughout New England and training them in tools to manage growth. We will also be awarding \$300,000 in liveable community grants to projects that combat sprawl, and will be working to see our state partners target their resources toward smarter growth initiatives. Finally, EPA-New England's Action Plan includes our federal partners in the Departments of Transportation and Housing and Urban Development. We have signed an agreement to build on the elements of President Clinton's Livability Initiative and target federal resources for smart growth in New England.

EPA-New England is committed to seeing all of our programs encourage better planning and growth. We will continue and expand our Urban Environmental Initiative and Brownfields programs to encourage development within cities rather than in undeveloped open space. We will be aggressively using our review authority for federally funded projects and wetlands impacts to oppose those projects that encourage sprawl. And we will be working to give states clean air credits for transportation policies that encourage compact development and reduce vehicle miles traveled.

Working together, we can ensure that the settlements we leave our grandchildren will be as livable, as environmentally sound, and as full of a sense of community as the ones our grandparents left us in New England.

Figure 18
New England Land Use



source: Multi-Resolution LAND Characteristics

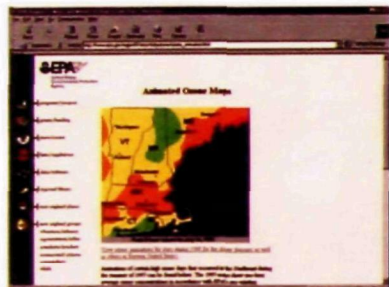
EPA's Websites

Want to know about your environment? Visit EPA's websites and find out.

EPA-New England is <http://www.epa.gov/region1> ►

Teacher Resource Center (<http://www.epa.gov/region1/students>)

Information for teachers on Regional/National programs and videos, curricula and grants that are available along with information for students including environmental careers, internships and student centers.



Press Releases (<http://www.epa.gov/region1/pr>)

Peruse through a comprehensive listing of all press releases from EPA-New England in chronological order —allows for an easy search.

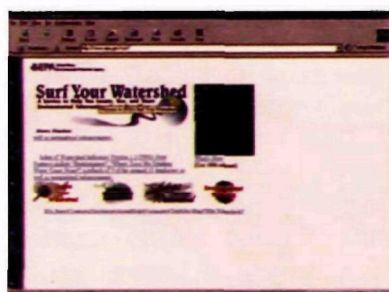
◀ **New England Ozone (<http://www.epa.gov/region1/oms>)**

For help in coping with changes in air quality, daily information regarding ground-level ozone concentrations and smog can be found through the use of color maps provided each summer day.



Superfund Site Information (<http://www.epa.gov/region1/remed/superfund>)

The Superfund web page will help answer your questions, provide guidance and opportunities for community members to be better informed and involved with Superfund sites in New England.



EPA Headquarters (<http://www.epa.gov>)

EPA's National website provides information on EPA programs and projects, laws and regulations, publications, links to EPA regions and much more.

◀ **Surf Your Watershed (<http://www.epa.gov/surf>)**

A service to help you locate your watershed, gather environmental information about your place and ways in which each of us can protect and restore our own watershed.

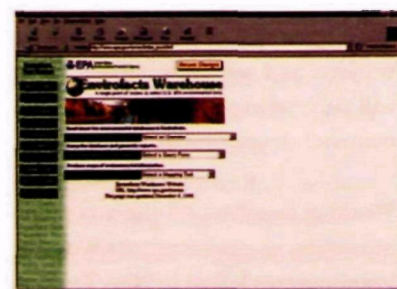
KIDS Page (<http://www.epa.gov/kids>)

Lots of fun and interesting things to read and do for kids including information on air, water, plants & animals, garbage & recycling and you & your environment.



Envirofacts (<http://www.epa.gov/enviro>) ►

Search the Envirofacts Warehouse to retrieve environmental information and generate maps on topics including Superfund sites, drinking water, toxic and air releases, hazardous waste and Biennial Reporting System data, water discharge permits, and grants information.



EPA-New England Contacts

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Emergency Response:

(for reporting spills/environmental incidents):

(800) 424-8802

EPA-New England Library:

(888) EPA-LIBR (888-372-5427)

Websites listed in this report:

EPA-Office of Prevention, Pesticides and Toxic Substances

www.epa.gov/opptintr/opptendo

USGS-National Water-Quality Assessment Program

www.vares.cr.usgs.gov/nawqa/nawqa_home.html

EPA-Office of Water, Consumption Advisories

www.epa.gov/ost/fish

EPA-American Heritage Rivers

www.epa.gov/rivers

EPA-New England Office, Global Climate Change

www.epa.gov/region01/steward/cchange

Connecticut River Joint Commissions

www.crjc.org

Form Approved

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