



1998
State of the New England
Environment Report



U.S. Environmental Protection Agency
Region 1, New England
#EPA901-R-98-001

**Please give us
your comments
on the 1998
State of the
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Open Letter to the People of New England

Our tiny corner of America embodies characteristics unlike any other — a combination of the conventional and the contemporary, the ingenious and the practical, the tempered and the natural. Our environment, our people, our commerce, our public institutions — all stand as testaments to the unique and vibrant nature of our region. It is our responsibility — EPA's and yours — to maintain and enhance the natural resources and environment which are foundations for much that is special about New England.

Four years ago, we committed to do our share by charting a course to make EPA, New England a laboratory for bold experimentation — a place where fresh, new, innovative ideas could be put to the test. We set that course believing that in order to deliver more effective environmental protection, EPA needed to adapt to changing times and circumstances. By and large, we have made a good start in meeting that challenge.

We can claim victory on a number of fronts. Many of our business assistance and alternative compliance programs — StarTrack, CLEAN, and New England Environmental Assistance Team among them — are now national models. Our emphasis on special places and communities — such as Lake Champlain, Long Island Sound, Casco Bay and the Charles River — has delivered tangible environmental benefits to those who live, work and play in them. Our use of stronger science and smarter economics has achieved cost-effective improvements from Stratford, CT to Burlington, VT. And our innovative use of traditional statutes such as the National Environmental Policy Act, Superfund, and the Clean Water Act have insured a cleaner, safer environment in places like Cape Cod, Nashua, New Hampshire and Mount Hope Bay.

"I find the great thing in this world is not so much where we stand as in what

direction we are moving," Oliver Wendell Holmes said. We at EPA's New England office share that sentiment.

To that end, we are working hard to increase EPA's presence in New England's communities; to stand tough on important environmental issues such as safe drinking water and clean air; to tackle new, troubling issues like sprawl development; and to improve our internal management systems so as to deliver more inspired, cost-effective service.

We will not meet these challenges without the help of eager, able, committed New Englanders. Environmental protection is not so much about laws and regulations and agencies as it is about people and their values, and their honest, hard work. We have benefited from, and continue to welcome, your ideas and your labor as we strive to ensure a healthier, more beautiful New England for generations to come.



John P. DeVillars
Regional Administrator
EPA's New England Office



This report is dedicated to the memory of

**Nancy Anderson
1922-1997**

As a research scientist, activist and founder of the New England Environmental Network at Tufts University, her tireless pursuit to highlight and inspire creative resolutions to environmental problems lit the fire of awareness and activism in generations of citizens in New England and around the world.

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Introduction

To be sure, the first quarter century of environmental protection in this country has been enormously successful. We've done a tremendous job tackling many of the big-ticket pollution problems - sewage treatment plants, industrial discharges and hazardous waste dumps, among them.

The benefits of this work are obvious. Rivers that were once veritable toxic stewards are now enjoyed by kayakers and fishermen. Many cities that were choked with smog are now clean enough for joggers and pedestrians. And, thankfully, we rarely hear horror stories of hazardous waste sites shutting down entire neighborhoods.

But as we look back on these successes, we must also recognize that our world is now much different than it was 25 years ago. Our collective environmental conscience is broader and deeper. The main engine for our economy has shifted from manufacturing to service industries and small businesses. New England, in particular, has seen an explosion in service-oriented businesses and tourism. And our landscape, regrettably, is changing as well — our populations continuing to move further and further away from cities, transforming dairy farms and open space into commuter towns.

As a consequence of these and other trends, our environmental problems have changed, as well. We are now finding that much of our pollution comes from ubiquitous and diffuse sources - agricultural runoff, faulty storm drains, small businesses and the ever-increasing number of miles we drive. Tackling these problems is a huge challenge, requiring both smart strategies and sophisticated tactics.

It is incumbent for us all to recognize that the solutions to the challenges of the 21st century will not be resolved with 20th century approaches. As Abraham Lincoln said, "As our case is new, so we must think anew and act anew."

The eight hundred professionals at EPA's New England office realize this. We're hard at work to develop creative strategies that will make environmental protection more efficient and effective as we tackle today's - and tomorrow's - environmental challenges. The success of these strategies will require innovative technologies, stronger science, enhanced use of economic tools and closer collaboration with environmental, business, political and community leaders.

Three of the primary areas EPA New England has focused its staff and resources on to meet these challenges are community-based environmental protection, fostering environmental innovation and streamlining how we do business.

Community-Based Environmental Protection

New England consists of ecosystems that by virtue of their ecological value, recreational value or proximity to large populations, hold a special significance to us. EPA is focusing particular attention and resources on these locations to achieve environmental improvements that may not otherwise occur through traditional environmental protection strategies.

Prominent Places

Much of what makes New England special are its lakes, rivers and bays, which bond and link various communities together. Prominent ecosystems such as

the Charles River, Casco Bay, Narragansett Bay and Lake Champlain are the focus of EPA initiatives that are collaborative and community-based. By enhancing coordination, pooling resources, building local capacity and sharpening our science work, EPA and its partners are delivering tangible environmental improvements to these areas that will result in expanded opportunities for swimming, fishing and other recreational activities.

Urban Areas

EPA recognizes that many urban areas have not received the attention they deserve from environmental protection programs of the past. To reverse this trend, we have launched an Urban Environmental Initiative, a Brownfields Program and enhanced enforcement and pollution prevention efforts in targeted urban neighborhoods. Working with local officials and

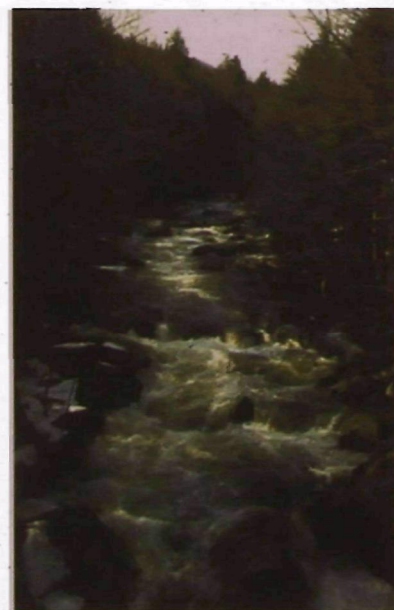


Photo: Ed Reiner

the public, EPA is focusing particular attention on revitalizing contaminated parcels so that they can bolster local economies rather than hinder them.

Sprawl

Development "sprawl" is a growing concern all across New England. Nonpoint pollution, water shortages, traffic jams and loss of open space can all be linked to poorly planned development. EPA is late to the game on this issue as is virtually everyone else. But we intend to catch up fast. Specifically, we are looking at such statutes as the National Environmental Policy Act (NEPA), Clean Air Act and the Safe Drinking Water Act to determine how they could better be utilized to facilitate development that does not contribute to sprawl. This will be the area in 1998 where we most expand our thinking and our actions.

Fostering Environmental Innovation

EPA's New England office is committed to fostering innovative technologies so that environmental protection can be achieved more effectively and at less cost. We also are pushing ourselves and those we regulate to come up with approaches that aren't necessarily in the rulebook, but that will deliver both substantially improved environmental performance and a reduced regulatory burden.

Center for Environmental Industry and Technology

EPA New England's Center for Environmental Industry and Technology (CEIT) has launched several programs to identify and promote promising environmental technologies that are more cost efficient and environmentally effective. In

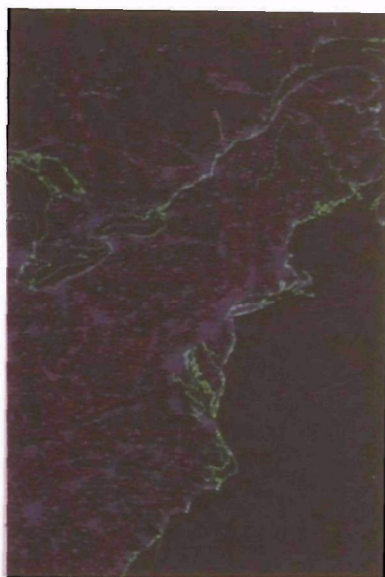


Photo: NOAA

A clear measure of urban sprawl is the amount of light from earth that is visible in space. Lights are presented in lighter blue areas.

an effort to get new technologies into the marketplace more quickly, CEIT has brought the New England states together to do cooperative reviews of innovative septic system technologies and site cleanup technologies and provided field demonstration opportunities for many new technologies. CEIT has also held several regional forums to match entrepreneurs with venture capitalists. These and other CEIT efforts will be expanded upon in 1998.

Project XL

If a company or community can show EPA they have a better way to protect the environment than the way the law requires, we'll make it happen. Through such programs as Project XL, we're willing to change the rules if companies can show us they'll achieve a superior envi-

ronmental outcome as a result. We recently signed one such XL agreement with a New Hampshire-based manufacturer, HADCO - the first such agreement in New England and second in the nation. We have several more under development. The XL program may also be used to help communities such as Manchester, N.H. come up with more environmentally effective alternatives to constructing a full build-out of expensive Combined-Sewer Overflows (CSOs). We have enlisted the help of the Conservation Law Foundation in this effort. Again, the prerequisite is that these alternatives generate a greater environmental benefit. When we can achieve enhanced environmental protection at less cost to the parties we regulate, it's a plus for everyone.

Climate Change

EPA-New England has developed a multi-pronged initiative to do our share to reduce greenhouse gas emissions and reverse the impacts of global climate change. The plan includes an education program to teach students at public schools about the issue and a regional effort to get all state and federal buildings to reduce greenhouse gas emissions to 1990 levels by the year 2005. By touting the potential cost savings, we're also persuading companies to adopt energy-efficient technologies through our WasteWiSe and GreenLights programs.

Streamlining the way we do Business

EPA-New England is streamlining its procedures so that we and those we regulate can achieve our environmental objectives more easily and so that EPA can operate more effectively and with clearer goals.



Photo: Roy Crysta

Photo: Matt Schwenberg

Photo: K. Kiley

Working With Businesses

EPA has launched numerous initiatives to encourage companies to do a better job regulating themselves and achieve greater environmental benefits at the same time. This allows EPA to devote more resources and staff to other activities where greater environmental benefits can be achieved. Our StarTrack and CLEAN programs are now being transplanted as national efforts for achieving greater environmental benefits than can be achieved through mere compliance with environmental laws.

Working With States

EPA is also streamlining how it does business with the states: This is being done primarily through Performance Partnership Agreements designed to allow EPA and the states to identify priority issues

and focus grant resources on those issues. These agreements also enable EPA and the states to develop integrated work plans so that federal and state efforts complement each other in addressing mutually agreed upon environmental goals.

Improving Our Internal Organization

EPA's New England Office has reorganized its staff to improve the agency's effectiveness in protecting the environment. By slicing our management staff in half and creating "state teams," "watershed teams" and "industrial sector teams," more EPA employees are now involved in direct delivery of environmental services. Borrowing a page from private industry, we're also offering incentives for employees, including bonuses for staff members whose work is exceptional. We've also replaced the traditional

single-media approach to our work with an integrated, multi-media approach that includes multi-media compliance inspections and pollution prevention assistance. Setting clear environmental goals - and assessing if those goals are being met - is a pivotal feature of all of these activities.

Moving Forward

We have made enormous progress over the past four years in our efforts to substantially reform and revitalize EPA. We've also been successful in strengthening core responsibilities such as enforcement and grants management. But we know that Will Rogers was right when he said that "even if you're on the right track, you'll get run over if you just sit there." And so, we move forward with energy and enthusiasm and, we hope, with your help.

Public Health and our Environment



"I am myself and what is around me, and if I do not save it, it shall not save me."
—José Ortega y Gasset

In preserving both our health and our way of life, we New Englanders depend on a clean and safe environment. The degree to which this region's environmental health remains clean relies on a number of interrelated factors — wind and water currents, settlement distribution patterns, and the nature of regional economic activity among them. Our environmental laws and regulatory approaches to implementing them must take into account these components and more in order to effectively protect the quality of public health and natural resources in New England. The past year has seen a number of strides in improving upon these efforts, with significant success.

A Breath of Fresh Air: Standards and Status

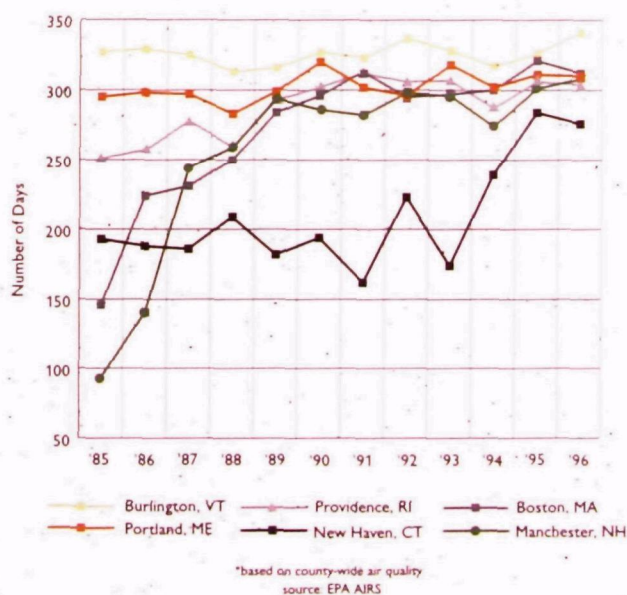
Thanks to regulations mandated by the Clean Air Act, overall air quality in New England has improved over the last decade (**Figure 1**). While this improvement is significant, many air pollution-related public health issues remain — such as asthma, a chronic respiratory disease that affects twenty to thirty million Americans (one out of every eight to twelve people). Occurrences of asthma can be greatly exacerbated by air pollution.

To better protect public health and the environment, air pollution standards should be regularly reviewed, and if

necessary, revised. In fact, the Clean Air Act requires EPA to review air pollution standards every five years. This happened in the fall of 1996, when a massive review of recent scientific data indicated that the standards for ozone and particulate matter (smog and soot) were not sufficient to protect the public's health with an adequate margin of safety. In response to this new data, EPA adopted revised ambient air quality standards for these pollutants in July of 1997 and President Clinton announced his support for these tough new air quality standards.

These new standards will reduce the number of premature deaths due to poor air

Figure 1. Days with Good* Air Quality



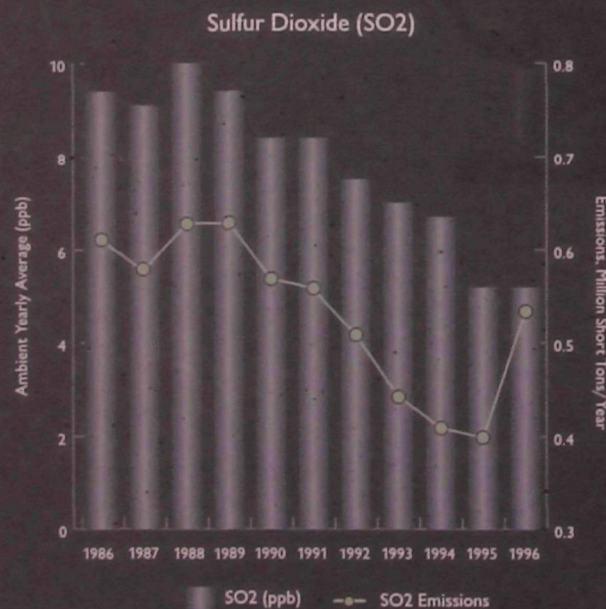
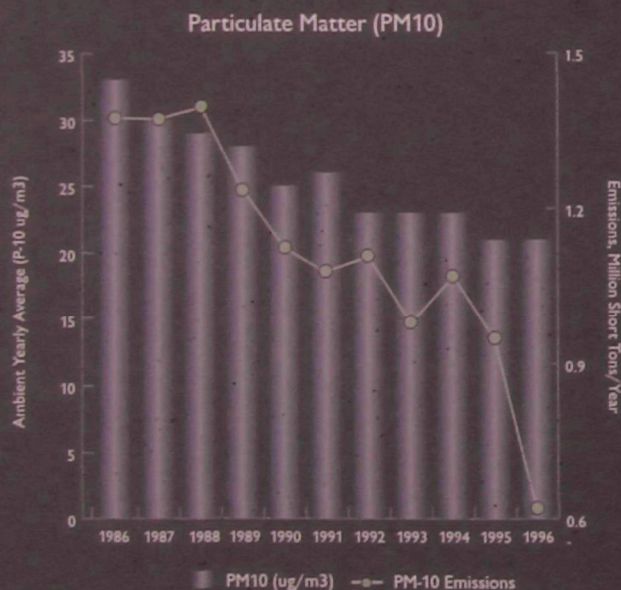
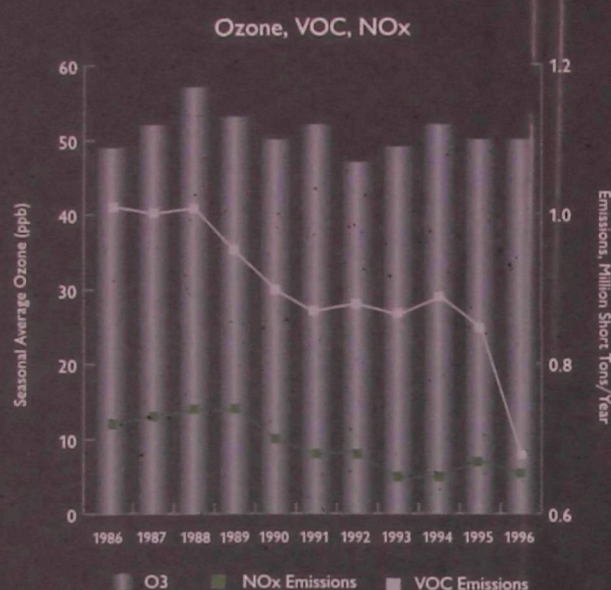
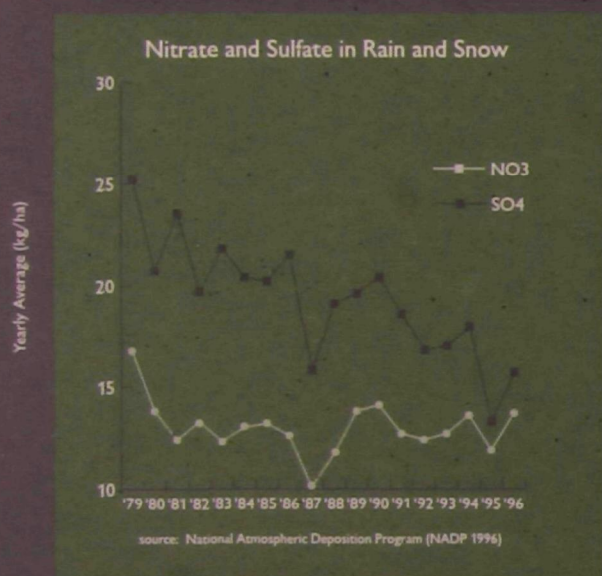
Anti-Idling Day

There are more than fourteen bus and truck depots within three-quarter miles of Roxbury's Dudley Square, housing more than 1,150 diesel vehicles. Diesel is considered to be the dirtiest of all fuels used in the United States, contributing about 80% of the particulate pollution that results from traffic. Given these figures, it might not be surprising that Roxbury has the highest asthma hospitalization rate in Massachusetts.

On October 22, 1997 more than fifty young people working with the Roxbury Environmental Empowerment Project (REEP), took to the streets to march for clean air and to issue pollution "tickets" to idling trucks and buses. EPA provided part of the funding for the event through its "Youth Educators for Asthma Prevention" environmental education grant program. Students from the Greater Egleston Community High School, Nathan Hale Elementary School, and Community Academy handed out tickets warning drivers of the Massachusetts state law (M.G.L. Ch 90, Sec. 16A) that prohibits engine idling for more than five minutes.

Figure 2. Changes in the Air Quality *

All sites in New England meet national ambient air quality standards for particulate matter (PM-10) and sulfur dioxide. A number of sites still violate the standard for ozone.



* Air quality data are yearly/seasonal means for selected air quality sites.
source: AIRS/NADP

Clearing Out Smog

The hazy, smoggy conditions that sometimes afflict New England are primarily caused by releases of two classes of air pollutants: volatile organic compounds (VOCs), and nitrogen oxides (NOx). These two components react in the presence of strong sunlight to form ozone, the principal ingredient of smog. The Clean Air Act Amendments of 1990 were designed to reduce smog by controlling emissions of nitrous oxides (NOx) and volatile organic compounds (VOCs)—both major components of smog.

quality by 15,000 people each year, and will cut the number of hospital admissions for children due to aggravated asthma by 250,000 each year. These regulations have major implications for New Englanders as well. Each year, 7,000 emergency room visitors — 2,300 of them overnight admissions — suffer from respiratory problems due to unhealthy air in the region. Moreover, the new standards will go a long way in reducing these visits by tackling a major cause of respiratory distress — smog.

Sunny summer days with very warm temperatures are much more likely to have high ozone levels than cooler days. (Figure 3). The highest concentration

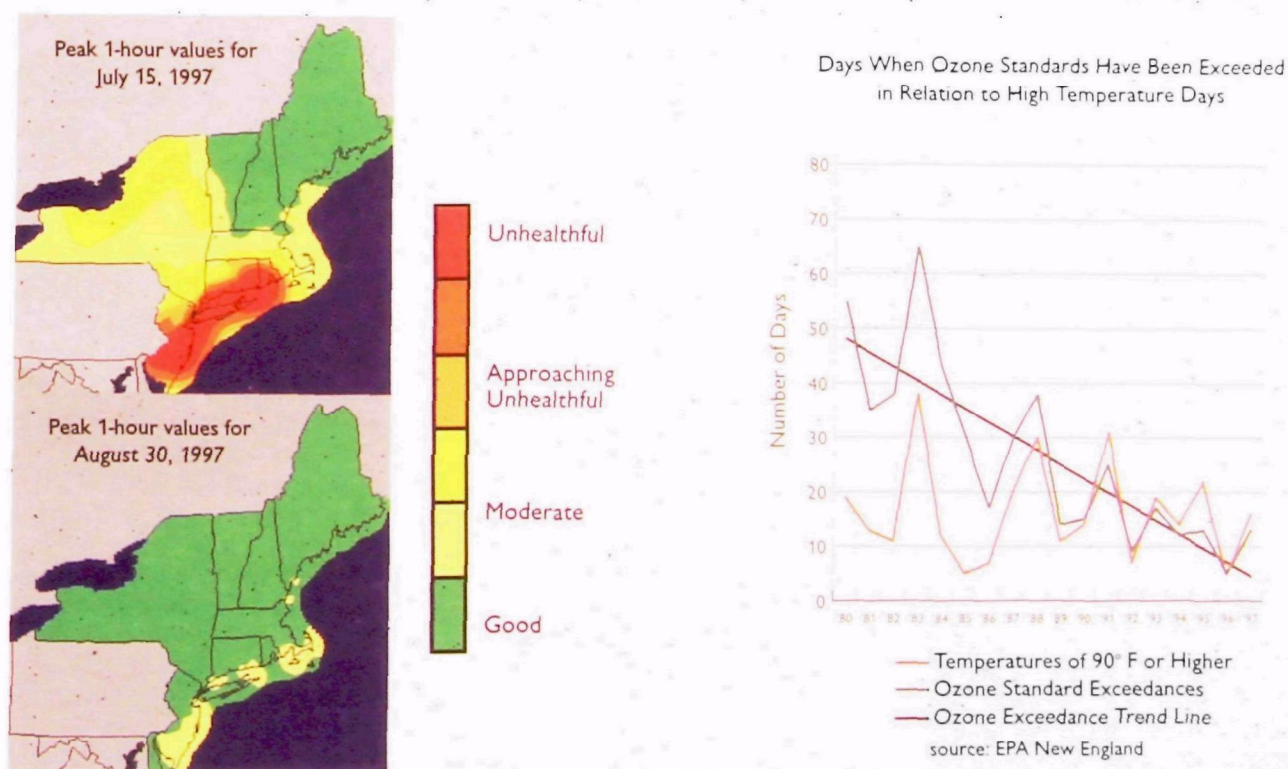
of ozone in New England occurs in coastal Connecticut, from Greenwich to Groton, primarily due to air pollution from industry, its 17 million residents and their cars, and the nearby Greater New York City area. Vermont has some of New England's best air quality and has not exceeded the ozone standard since 1991.

All New England states were required to develop regulations to control emissions of NOx from stationary sources (e.g., utility plants, industries) under the 1990 Clean Air Act Amendments. Substantial reductions in NOx emissions between 1990 and 1995 resulted from the implementation of these controls (Figure 4). Nevertheless, the ozone

problem persists, in spite of the large reductions in emissions.

Analyses have shown that NOx emissions can be transported much farther than VOC emissions, and therefore have the potential to cause air pollution hundreds of miles from where they are emitted. EPA's Ozone Transport Assessment Group (OTAG) has proposed additional reductions of NOx emissions in twenty-two states. Decreases in NOx emissions will also result in decreased acidity of rainfall, reduced greenhouse gas emissions, slower depletion of the protective stratospheric ozone layer, and lowered concentrations of fine particulates in the air.

Figure 3. Tracking Ozone in New England

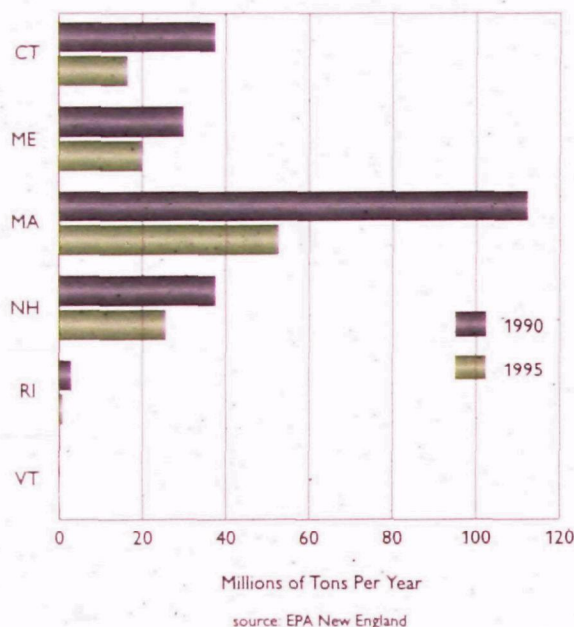


Real-Time Environmental Monitoring - Ground-Level Ozone Mapping

The ozone mapping system allows for the creation of accurate, animated and easy to understand ozone maps transmitted to the public on a daily basis during the ozone season (May through September) via the Internet and used during television news and weather reports. In 1998, the map will reflect the more stringent 8-hour ozone standard adopted by EPA in 1997. EPA's future plans involve expanding the geographic coverage of the map to include more states and also providing updated animations more frequently throughout the day. These maps may be viewed on EPA New England's web page.

www.epa.gov/region01/eo/ozone/

Figure 4. Change in NOx Emissions from Major Industrial Sources and Fossil Fuel-Fired Utilities



Hartford UEI - Reducing Risk of Childhood Asthma and Lead Poisoning

Children living in poor urban areas are especially at risk for asthma and lead poisoning. The Centers for Disease Control report that the asthma death rate for children nearly doubled between 1980 and 1993. Old, poorly maintained housing also exposes children to higher levels of lead-based paint. Although there has been a dramatic decline in blood-lead levels in the U.S. population as a whole, levels in children under the age of six who are poor, living in large metropolitan areas, or living in older housing, remain disproportionately high.

Reducing exposure to the environmental factors that contribute to lead poisoning and asthma is one of the goals of EPA-New England's Urban Environmental Initiative (UEI) in Hartford, Connecticut. EPA is working with grassroots organizations throughout Hartford to raise awareness about these health concerns. EPA is also assisting the University of Connecticut Cooperative Extension System to improve volunteer training programs and is supporting a comprehensive review of all existing environmental health data in Hartford. A coalition of city officials, health care professionals and community leaders is forming to evaluate these data, identify gaps, and collect new information.



Photodisc

Crystal Clear:

The Safe Drinking Water Act and Drinking Water Quality

The Safe Drinking Water Act Amendments of 1996 provide EPA with new regulations for ensuring the safety of public water supplies. The amendments were developed with significant input from water suppliers and state and local officials, and create multi-level partnerships to protect the already high quality of our drinking water (Figure 5).

The amendments include provisions detailing:

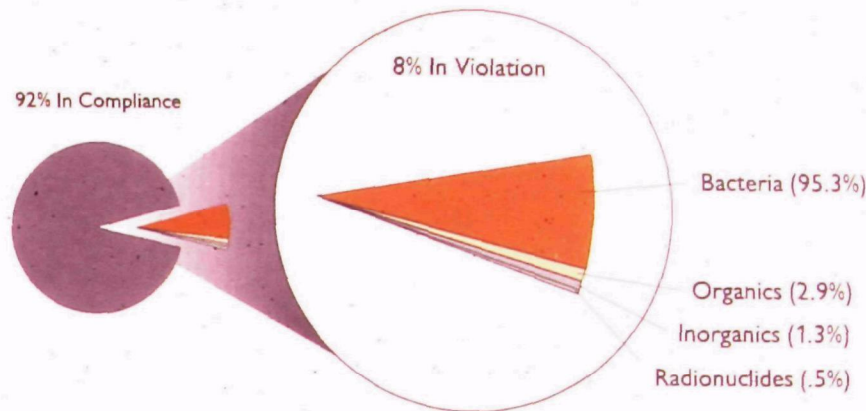
- Enhanced water purification systems management
- Source water protection activities
- Public right-to-know measures
- Increased state flexibility in implementing regulations
- Increased compliance relief and financial assistance to small systems

These new measures will go a long way in improving New England's already well protected water supplies. Unfortunately, 820 systems have failed to monitor or report their compliance data, making it difficult to paint the whole picture. More often than not, these are the region's smaller systems — those that serve less than 500 people. But while these smaller systems make up more than 77% of the region's water suppliers, they only serve around 20% of New England's population.

Getting a Handle on Pesticides: The Food Quality Protection Act

On August 3, 1996, President Clinton signed into law the most significant piece of pesticide and food safety legislation enacted in many years, the Food Quality Protection Act (FQPA) of 1996. The new law calls for major changes in pesticide regulation, particularly in two laws: the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act (FFDCA). The FQPA affords EPA unprecedented opportunities to provide greater health and environmental protection, including new safety standards for all pesticide residues in food, special provisions for in

Figure 5. Public Water Systems Meeting Drinking Water Quality Standards in 1997



source: EPA Safe Drinking Water Information Systems, 1997

More than 92% of the 4,638 community and non-transient community (e.g., day care centers) public water supplies in the region meet federal drinking water quality standards.

ants and children, specific limits on acceptable risk evaluation and standard-setting, aggregate assessments of pesticide risks, right to know provisions, endocrine disruptor research provisions, and new pesticide registration and regulation procedures.

Getting the Lead Out

After years of widespread commercial use, lead has contaminated nearly every part of the developed world, particularly urban areas. Although lead is now banned from use as a gasoline additive and from paint in this country, people can be exposed to lead from the air, drinking water, food, dust (indoors and out) and soil, and especially from lead in paint in older houses. In 1991, EPA published regulations to reduce the allowable levels of lead contamination in drinking water. Even with these new regulations, in some communities around Boston, one out of ten residents drinks water containing levels of lead higher than what EPA considers safe.

Average blood lead levels in the United States are less than one-third what they

were in the mid-1970's, and they are still declining. But research has established that there appears to be no threshold for many of lead's adverse health effects, and the Center for Disease Control continues to adjust their definition of "lead poisoning" to lower blood lead concentrations. Even at very low levels below the threshold for "poisoning," lead can affect childhood development including lowering of intelligence. Populations in local "hot spots," such as inner city neighborhoods, have higher exposures to lead, and lead in old paint remains one of the major contributors to elevated blood lead levels in children. Beginning with the Residential Lead Based Paint Hazard Reduction Act in 1992, EPA and HUD have worked closely to publish regulations and standards for lead in housing abatement, real estate and tenant notification and disclosure. State agencies have grants and technical support for their development of lead programs, and our partners also receive support for lead awareness outreach and education.

Maine's Answer to Radon

Knowing that the levels of radon found in homes in Maine are much higher than the national average, four Maine communities known as the Northern Oxford County Coalition (NOCC) worked with EPA and the Maine Bureau of Health Radiation Control Program to assess radon levels in four hundred homes. Tests showed that 27% of the homes were above EPA's recommended remedial action threshold and an open house was held for the community members to meet with radon experts and banks that offer low-interest loans for radon remediation.



Photo: Jim Berry

Radon: Exposing a Hidden Danger

Radon is a radioactive, colorless, and odorless gas that comes from the natural decay of uranium and can occur in soil containing dark shale, granite, and phosphate. It can be released into the air from radon-contaminated water. Radon commonly accumulates in homes or buildings through dirt floors, hollow-block walls, cracks in the foundation floor, walls, and openings around floor drains, pipes and sump pumps. Elevated levels of radon have been found in every state, and potentially in one out of every fifteen homes nationwide. Due to the geologic characteristics of New England, the average is approximately one out of four homes.

EPA estimates that between 7,000 and 30,000 lung cancer deaths are attributable to radon each year, making it the second leading cause of that disease. To tackle this problem, EPA provides grants to states to administer radon programs. We also develop public information programs with organizations such as the American Lung Association, Consumer Federation of America, and the National Association of Counties to increase

awareness of the problem, promote testing, encourage remedies, and build radon resistant homes.

Protecting Children's Health

Children today face a wide array of complex environmental threats to their health — from asthma-inducing air pollution, to toxic chemicals. Millions of children live near toxic waste dumps, hundreds of thousands are exposed to pesticides each year, and nearly a million children in the United States have dangerous levels of lead in their blood. What is more alarming is the fact that children have a special vulnerability to toxic substances. They are more heavily exposed to environmental hazards than adults, and their still-developing bodies are less able than adult bodies to neutralize and expel toxins. Damage to children's developing organ systems at an early age can often carry lifelong consequences.

To better protect the health of America's children, EPA developed the *National Agenda to Protect Children's Health from Environmental Threats* in 1996, which emphasized scientific, regulatory, and educational measures that the agency was to undertake. In May of 1997, EPA opened

the Office of Children's Health Protection to ensure the implementation of this agenda.

Here in New England, EPA is working to protect the environmental health of this region's children through the combined efforts of our Environmental Education, Indoor Air Environments, Regional Lead Initiative, Urban Environmental Initiative and Enforcement programs. The activities of each of these programs have both directly and, through the leveraged support of our partners, indirectly delivered significant environmental benefit for New England's kids.

Tips for a Healthy Indoor Environment

1. Don't allow smoking in your home
2. Test for radon
3. Have your heating system inspected annually by a professional, and install a carbon monoxide alarm
4. Read the label and follow the directions closely when using pesticides, cleaners and other household chemicals; then properly discard all unneeded pesticides, paint, and cleansers
5. Water leaks and water-damaged areas of your home should be repaired in order to eliminate the growth media for microbiological organisms
6. Keep pets away from sufferers of asthma and other respiratory disorders
7. Products containing formaldehyde should be aired-out before introducing them into your home
8. Have carpet with odor or mold removed and, if necessary, replaced with a good substitute
9. Keep small children away from lead paint and have them wash their hands after playing outside
10. Buy nontoxic cleaning products

The Beach Initiative

Beach closures and advisories occur when water sampling shows levels of bacteria exceeding the thresholds recommended by EPA. Sources of this contamination are usually wastewater treatment plants, combined sewer overflows, or storm water runoff. The number of beach closures varies each year, depending on the weather and on the operation of wastewater treatment facilities, making it difficult to compare closures from year to year. However, in 1996 we can report that there were over 196 closures in Connecticut, 152 in Massachusetts, 20 in Maine, and none in Rhode Island or New Hampshire. EPA's recently established Beach Initiative is working to protect the health of beach goers by providing improved test methods, beach pollution indicators, and more information to the public about the water quality of our beaches.



Photo: Roy Crystal

The Challenge of Global Climate Change



"You must do the things you think you cannot do."
— Eleanor Roosevelt

In his State of the Union Address, President Clinton described global warming as "our overriding environmental challenge." The President's statement echoed the findings of the Intergovernmental Panel on Climate Change (IPCC) — comprised of 2,500 of the world's top scientists in the field of global climate change — which indicated that humans are influencing global climate.

Modern industrial activity — particularly the burning of fossil fuels — leads to the emissions of "greenhouse gases," which trap the Sun's heat in the atmosphere and cause a steady, gradual warming of the Earth's surface temperatures. The average surface temperature is now a full degree Fahrenheit higher than it was at the beginning of this century and may

rise another two to six degrees over the next century (Figure 6). If this rate of temperature rise continues, scientists say we can expect more frequent intense weather events, such as heat waves, droughts and floods. They also predict sea level rise, accompanied by a significant loss of precious coastal resources — beaches, estuaries, and important wetlands among them. Tropical diseases like malaria will expand their range. In addition, by the year 2050, heat-related deaths in the U.S. could increase by up to 150 percent.

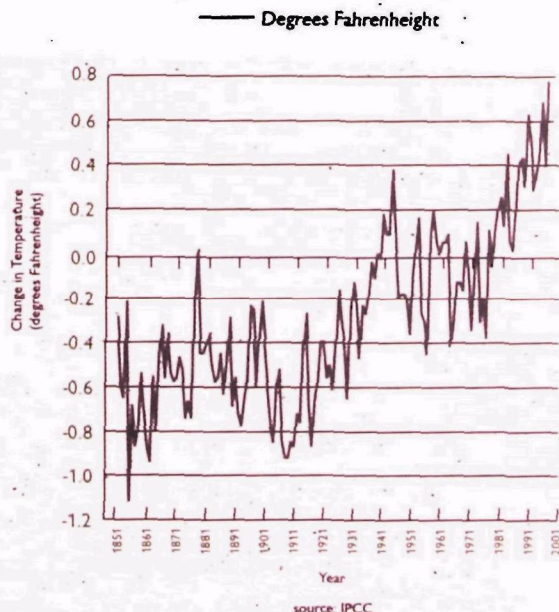
In December of 1997, nations from around the world met in Kyoto, Japan to discuss strategies to avoid global warming, and produced a treaty committing the nations of the world to reductions in

greenhouse gas emissions. If the U.S. ratifies this treaty, we will have committed to a target of reducing greenhouse gas emissions to 7 percent below a baseline based on 1990 levels by 2008-2012. To meet this commitment, we will be required to develop strategies that emphasize a cost-effective, common sense approach to achieve greenhouse gas reductions.

EPA's New England office is already working to do its part through our own Climate Change Action Plan, an aggressive, multi-disciplinary effort to reduce greenhouse gases without damaging the economy. As part of this plan, EPA will:

- Work with other federal agencies to reduce the U.S. Government's greenhouse gas contribution through energy efficiency measures and renewable power purchases.
- Make educational materials on global warming available to every state environmental agency, library, and school in New England.
- Collaborate with each New England state through the New England Global Warming Network to generate state and regional greenhouse gas inventories and reduction plans.
- Increase industry participation in EPA's voluntary greenhouse gas reduction programs that emphasize economically sensible activities.
- Develop transportation policies that demonstrate new technologies and programs to minimize pollution — including greenhouse gas emissions — from the transportation sector.

Figure 6. Changes In the Average Surface Global Temperature 1851-1997



Sprawl



"If you build it, they will come."
—Shoeless Joe Jackson, *Field of Dreams*, 1989

No Place Like Home

In less than half a century, our nation has been transformed. Eighty percent of all the physical structures in the U.S. have been built in the past 50 years, mostly outside of the traditional population centers. People are now living and working further from urban areas and consuming undeveloped land at rates greater than ever before. Of the 25 largest U.S. cities in 1950, 18 have lost population. That means people, the services they need, and the impacts of sprawl continue to be scattered farther away from once-thriving urban centers. In Massachusetts, most of the 147,097 acres (230 square miles) of land developed since 1971 have been at least twenty miles outside Boston (**Figure 7**).

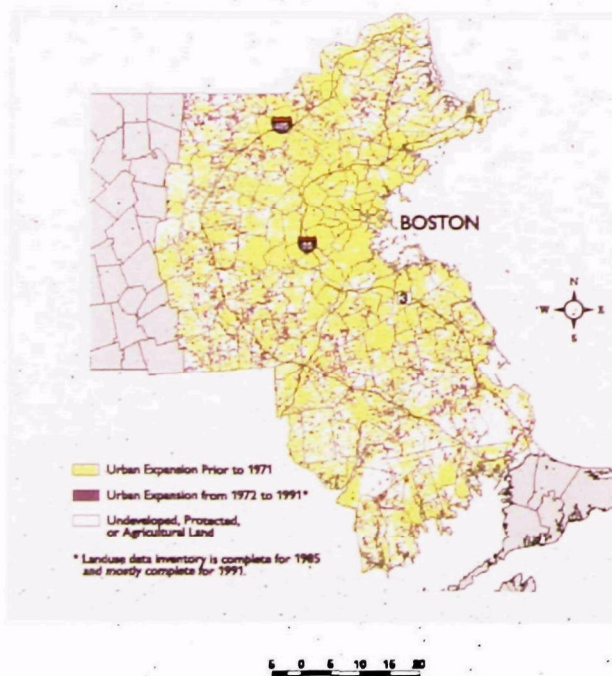
This pattern of growth has largely occurred in an unplanned, ad hoc fashion, and is, not surprisingly, referred to as *sprawl*. Forests are cleared and agricultural lands are subdivided into plots for housing developments, which are for the most part decentralized, and not part of a community center. Cars become the primary source of transportation. Strip malls, industrial parks and convenience stores spring up to serve new residents and municipalities are pressed to provide services to a more spread out population base. And when suburban areas become too developed for some residents, they move further away, continuing the cycle.

Sprawling Effects

As sprawl development spreads across New England, its environmental consequences become clear. Increased automobile traffic not only causes air pollution, but creates a number of other problems. Road pavements, parking lots, and roofs prevent runoff from seeping into the ground where it can be filtered. The dramatic increase in these impervious surfaces has increased pollutant loadings to surface water, and degraded wildlife habitat. Opening up previously inaccessible terrain with road or residential development divides ecosystems into fragments, reducing the available wildlife habitat. This impacts wildlife species by altering migration routes, eliminating breeding

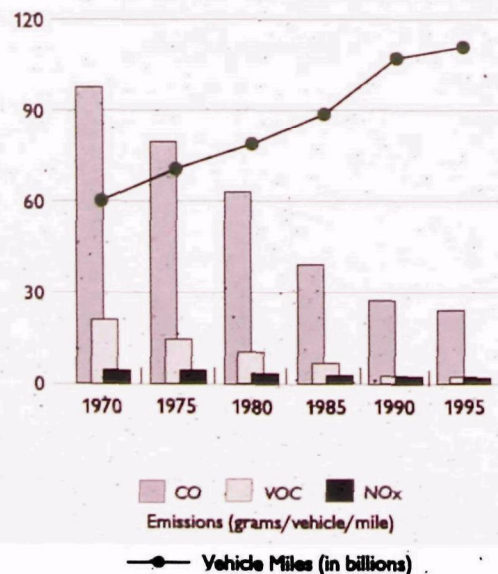
Figure 7. Indicators of Sprawl

Urban Sprawl in Eastern Massachusetts



source: Metropolitan Planning Commission, MassGIS, and EPAGIS

Lower Vehicle Emissions but More Vehicle Miles Driven



source: US EPA & Federal Highway Administration

City of Providence Vacant Land Task Force

Vacant residential lots — a product of urban flight — are neighborhood eye sores, magnets for illegal dumping of solid waste, and they attract rats. In 1996, the City of Providence established a citizen advisory Vacant Land Task Force to help address this serious environmental and community issue. Land use surveys were conducted by Brown University, in conjunction with the City Department of Public Works and four community agencies to identify public health and safety risks in the city's vacant lots. EPA provided funding to the city as part of its Urban Environmental Initiative (UEI) to support the efforts of the task force. Task force recommendations prompted city reforms and new environmental programs and services. As a result, Providence cleaned 220 vacant lots owned by the city and provided for regular maintenance funding for the future.



Photo: K.Kiley

grounds, and reducing rare ecosystems and allowing undesirable species to infiltrate ecosystems. A large number of New England's plants currently are at risk and in dire need of conservation efforts (**Figure 8**).

Solutions and Tools

Habitat Loss Prevention

EPA has a number of regulatory tools to help fight habitat loss caused by sprawl. The National Environmental Protection Act (NEPA) and Section 404 of the Clean Water Act give EPA the authority to consider cumulative impacts to wetlands and other resources associated with certain development projects. And, since many strategies to reduce air pollution also mitigate or prevent sprawl, plans to improve regional air quality also help us address problems created by sprawl on the ground. Local actions like directing and encouraging growth toward existing mixed-use development (known as "growth-centered planning") is another important tool in combating sprawl.

Rescuing Brownfields and Revitalizing Urban Areas

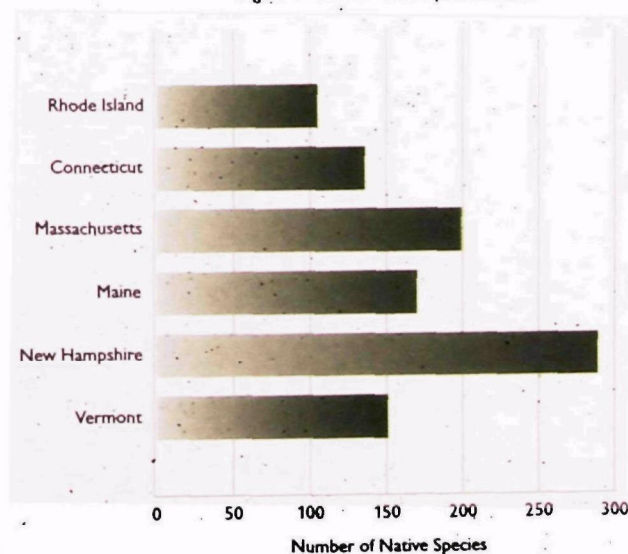
"Brownfields" are abandoned or under-used industrial or commercial sites, often in urban areas, where development is hampered by environmental contamination. Potential developers of these sites often fear the liability they may face because of hazardous waste at such sites and as a result, end up building in undeveloped areas — "greenfields" — thus con-

tributing to sprawl. There are over 10,000 such Brownfields in New England today.

EPA's Brownfields Initiative empowers states and communities to undertake economic redevelopment to prevent, assess, safely clean up, and sustainably reuse Brownfields. In doing this, EPA has funded 21 Brownfield Site Assessment Demonstration pilot projects in New England which allow states, tribes, and municipalities to explore innovative solutions. Additionally, in the fall of 1997, EPA-New England awarded grants of \$350,000 each to Boston, Massachusetts

and Bridgeport, Connecticut to establish revolving loan funds to clean up Brownfield sites. EPA has also initiated a Brownfields Targeted Site Assessment Program to help local communities assess abandoned sites and encourage their redevelopment and reuse. Old Town, Maine has taken ownership of the former Lily Tulip Plant on the Penobscot River, for example, after EPA assisted the city in investigating possible contamination problems. The city demolished the old buildings on the property and is now in the midst of reconstruction planning for this downtown parcel.

Figure 8. Vascular* Plant Species at Risk



* "vascular" refers to most common plants, excluding fungus, lichen and seaweed

source: Brumback, Mehrhoff, et al., 1997. Flora Conservanda.
New England Plant Conservation Program (NEPCoP, 1998)

New England's Ecological Health



"Each species, to put the matter succinctly, is a masterpiece. It deserves that rank in the fullest sense: a creation assembled with extreme care by genius."

—Edward O. Wilson

Pellegrino University Professor, Harvard University

For the past twenty-eight years, New England states, federal agencies, universities, industries, non-governmental organizations, and citizens have developed strategies for analyzing, controlling, and eliminating pollutants from our environment and our natural ecosystems — with significant progress. Parts of these efforts have required us to examine how pollutants alter ecosystems, and how these fragile systems can recover over time.

In our evaluation of the health of New England's ecological resources, we have found trends both heartening and disturbing. Most encouraging are our findings that many natural systems recover relatively quickly once pollutants have been reduced or eliminated. On the down side, we are finding that in many parts of New England, pollutants known and unknown are threatening the widespread health of fish and amphibian species.

Restoring New England Waters

Healthy aquatic ecosystems are particularly critical for maintaining the overall quality of the environment in New England (**Figure 9 and Figure 10a & 10b**). EPA has been working with a variety of organizations and partners to coordinate protection and restoration efforts for several of these. The experience we have gained from these efforts will help us extend ecosystem protection to many other areas of the region.

States assess waters based on both monitoring data and professional evaluation. Generally, about 33% of our river/stream miles, 67% of lake/pond acreage and 37% of estuarine square miles are monitored for various conditions. Biological monitoring programs, however, are not fully developed in most states, so only 11% of our rivers and streams are monitored for aquatic life use support. Therefore, EPA and state agencies are working to expand the number of waters monitored for biological communities and habitat. Statewide advisories restricting consumption of certain fish species, due to mercury levels, will continue to affect the use support status of our waters, particularly lakes.

Figure 9. Aquatic Life & Fish Consumption Are Limited in New England Waters

Impaired New England Waters

Designated Use (Measure of Impairment)	River/Stream Miles	Lake/Pond Acres	Estuarine Sq. Miles
Fish Consumption (Advisories)	34%	99%	1%
Shellfishing (Closures/Restrictions)	N/A	N/A	23%
Swimming (Beach Closures)	3%	17%	4%
Aquatic Life (Unhealthy Biological Communities)	11%	21%	10%

source: 1996 State 305(b) Reports and Fish Advisories

The Penobscot River

The Penobscot River basin is the largest in Maine, and the second largest in New England, covering nearly 8,600 square miles. On its main stem, the river has eleven dams, five pulp and paper mills, and thirteen municipal wastewater treatment plants. Members of the Penobscot Indian Nation, however, use the river ecosystem for sustenance and for cultural, spiritual, and recreational purposes. During the summer of 1997, EPA-New England assisted the Maine Department of Environmental Protection, the Penobscot Indian Nation, and NPDES permit holders in the largest cooperative water quality monitoring survey ever carried out in Maine. This study involved three paper companies — Great Northern Paper, Inc., Lincoln Pulp & Paper, and Champion International — and 13 municipalities along the river. This study has become a model for other government/business/tribal partnerships across the region.

Great Bay

New Hampshire's Great Bay is a tidally-dominated inland estuary, receiving drainage from seven large rivers and

Reducing CSOs to Casco Bay: A Success Story

In the late 1980s, the cities of Portland and South Portland discharged an estimated 1.22 billion gallons per year of untreated sewage, storm water and industrial waste from 77 combined sewer overflows (CSOs) into the waters of Casco Bay. Such discharges occurred during rainstorms, when storm water runoff is directly diverted into Casco Bay to prevent it from backing up into people's homes and businesses, or flooding out sewage treatment plants. EPA and the Maine Department of Environmental Protection undertook measures to significantly reduce the volume and frequency of CSO discharges into Casco Bay. The total volume of untreated CSO discharges has decreased by at least 50% and the total number of active CSOs had dropped from 77 to 51. Portland's goal for the year 2008 is to reduce the annual volume of CSO discharge from approximately 580 million gallons per year to 87 million gallons per year. South Portland also will continue to reduce CSO volumes by constructing separate storm sewers at selected locations in the city. The environmental benefits in reducing CSO volumes will be contributions toward improving aquatic habitat, as well as reopening closed shellfish beds and beaches in the Bay.



Photo: Jay Pimpare

Figure 10a. Causes of Water Pollution

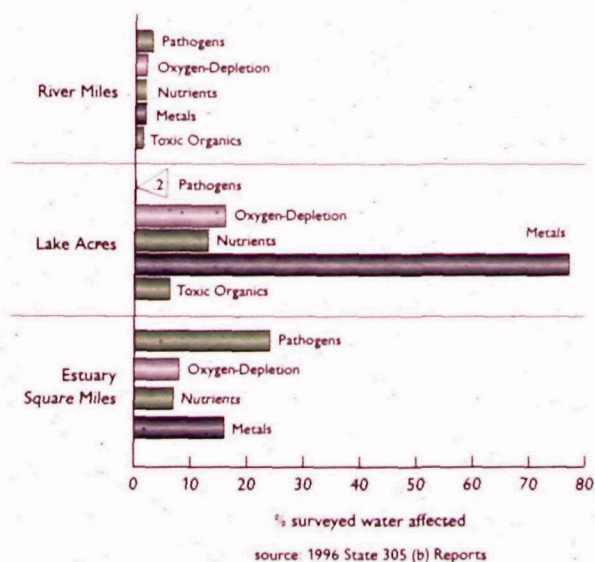
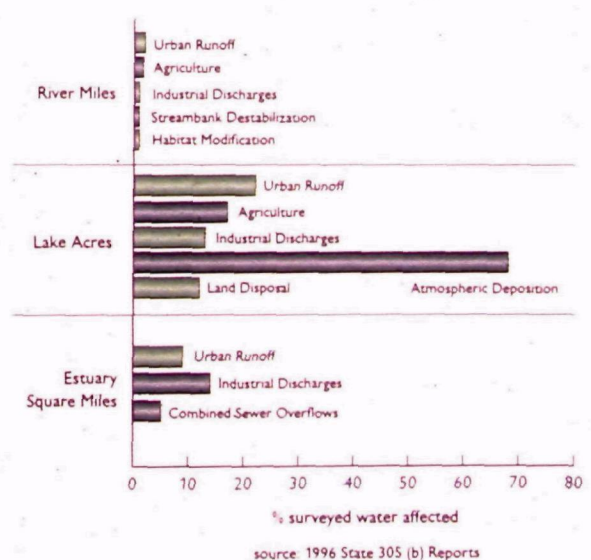


Figure 10b. Sources of Water Pollution



numerous small streams. Large fish and shellfish populations, bald eagles, ospreys, rare species and communities, and old growth forests are among the living resources found in this ecosystem. Although several million people live in close proximity of the New Hampshire coast, the Great Bay shoreline remains relatively intact and pristine.

All but one of the Bay's major rivers carry loads from sewage treatment plants, and the Bay is impacted by nonpoint source pollution as well. Most of the Bay's shellfish flats were closed in 1988, although some portions have been opened for limited times during recent years. In the summer of 1995, Great Bay was accepted into EPA's National Estuary Program (NEP), beginning a three-year effort to protect and restore its resources and aquatic values, with particular emphasis on shellfish resources. EPA conducted a reconnaissance of pollution sources, an ecological assessment of the area and a dye study to determine patterns of municipal pollution discharges in the Bay. Key habitats and resources of the ecosystem have been mapped, covering over 270,000 acres of land and water. Approximately 14,000 acres have been designated as high value habitats. The North American Wetland Conservation Council has provided over \$800,000 for habitat protection and additional strategies and opportunities have been identified for habitat protection.

The Merrimack River

Pollution problems on the Merrimack began more than 100 years ago with the

onset of the industrial revolution and have since taken their toll on the entire length of the river. To reverse this damage and restore the river, EPA initiated the Merrimack River Initiative, a multi-year, multi-agency, multi-stakeholder effort. Working together, hundreds of people pushed to solve challenges facing the 5,010-square mile Merrimack River watershed. This labor culminated in March of 1997, with the Merrimack River Initiative Management Plan, a comprehensive, watershed-based management approach to resource protection.

Seventy different projects and planning tools were used in the course of developing the Plan. Watershed maps for seven sub-watersheds were produced to encourage a watershed planning perspective for decision-making. Small grants were distributed to citizen groups, schools, local governments and businesses for watershed protection projects. Thirteen technical bulletins were developed, describing best management practices for specific user groups, including snow making, irrigation, turf management, laundry facilities, and sand gravel operations.

Long Island Sound

The Long Island Sound Study (LISS) is a research and management project that was founded in 1985. Long Island Sound was officially designated an *Estuary of National Significance* under the Clean Water Act Amendments in 1987, and the Long Island Sound Management Conference — the group overseeing environmental protection activities in the sound — was charged with developing a Comprehen-

Mount Hope Bay

Mount Hope Bay is a shallow estuary covering 15.6 square miles in the northeastern corner of the larger Narragansett Bay estuary. It receives freshwater from the Taunton, Lee, and Cole Rivers; supports a diverse community of pelagic and benthic fish; and has provided a rich nursery habitat for spawning fish. EPA-New England became very concerned about the Bay when a 1996 study by the Rhode Island Division of Fish and Wildlife's Marine Fisheries Office showed dramatic declines (as much as 86%) in finfish population sizes and a drop in species diversity. Numerous other regulatory and non-governmental agencies felt immediate action was needed to reduce impacts from the Brayton Point Station, a coal-fired electric power plant in Somerset MA which had increased its discharge of heated water by 40%. Thanks to the collective efforts of EPA's New England office, the Massachusetts Marine Fisheries Office, the National Marine Fisheries Service, the Massachusetts Department of Environmental Protection, and the Rhode Island Department of Environmental Management, the owner of the facility agreed to reduce plant coolant water usage and seasonal thermal discharges, thereby reducing the environmental stress placed on Mount Hope Bay fish populations.



Photo: Ed Reiner



Photo: Roy Crystal

sive Conservation and Management Plan (CCMP) for the estuary. To further the CCMP effort and assist in implementing the plan, Congress passed legislation in 1990 establishing an EPA Long Island Sound Office.

The LISS achieved two significant milestones in the past year. The LISS Policy Committee, composed of Connecticut and New York environmental commissioners and two EPA Regional Administrators, approved and adopted the Phase III Actions for Hypoxia Management and the Long Island Sound Habitat Restoration Strategy.

Hypoxia, or low dissolved oxygen, is the priority water quality problem affecting the Sound. Hypoxia occurs when too much nitrogen in the water fuels overabundant growth of planktonic algae, which utilize high amounts of oxygen during decomposition. The resulting lack of oxygen impairs the feeding, growth, and reproduction of the Sound's other aquatic life. The LISS developed a phased approach to reduce nitrogen loading within the Sound's drainage basin. Phase I froze nitrogen loads at 1990 levels, and Phase II focused on low-cost sewage treatment plant upgrades. Phase III calls for a 58.5 percent reduction in human-caused nitrogen loads by 2014. By reaching these goals, we expect that 75 percent of the areas that are unhealthy for fish and shellfish will recover.

Healthy wetlands and shoreline areas can filter nitrogen and other pollutants before they reach the Sound, and serve as important habitats for marine species

and other wildlife. The LISS Habitat Restoration Strategy establishes a goal of restoring 2,000 acres of Long Island Sound's coastal habitats and one hundred miles of rivers, complementing and supporting efforts to reduce hypoxia in Long Island Sound. Restoring degraded habitats also increases economic, recreational and educational opportunities. The Sound currently generates an estimated \$5 billion a year for the regional economy through commercial and recreational activities.

Tracking Mercury

Many of New England's freshwater fish are currently under consumption advisories because of high concentrations of mercury in fish tissue. Mercury contamination can cause serious neurological and developmental effects in animals and humans, which can include losses of sensory or cognitive ability, tremors, inability to walk, convulsions, and death. Recent data from Maine have also shown high concentrations of mercury in the feathers and blood of nesting bald eagles and loons.

The way in which mercury cycles through the environment is complex and our understanding of it is still incomplete. We do know that sources of mercury contamination primarily include atmospheric emissions from waste incineration, industrial processes, fossil fuel combustion, and routine discharges to receiving waters and spills. The New England states, eastern Canadian provinces, and EPA are

Rumney Marsh Restoration Plans

Rumney Marsh is located near Saugus, Massachusetts in the vicinity of Route 1 — one of the first commercial strip developments in the region. It is also part of the Rumney Marsh Area of Critical Environmental Concern (ACEC), described by the U. S. Fish and Wildlife Service as "one of the most biologically significant estuaries in Massachusetts north of Boston." Surrounded by commercial, industrial, and residential development, and crossed by several transportation projects, this marsh has been dredged, ditched, diked, and used as a dumping ground.

A watershed wetland restoration plan that includes the marsh is being developed by the Massachusetts Department of Environmental Management's ACEC Program Office and the Massachusetts Wetland Restoration and Banking Program, with participation from EPA and private, nonprofit, and other local, state, and federal agencies. Projects include marsh restoration, removal of approximately 18.5 acres of abandoned I-95 embankment fill, and construction of the first self-regulating tide gate in Massachusetts.

developing a joint Mercury Action Plan to reduce mercury releases to the environment. The plan will focus on regulatory strategies, pollution prevention opportunities, public outreach efforts, and monitoring and research needs.

Sad News: Amphibian Declines and Deformities

Deformities in the limbs, eyes, and other organs of amphibians such as frogs, toads, salamanders and newts have recently been reported in at least thirty-seven

states and three Canadian provinces. Since amphibians are considered to be good biological indicators of environmental health, understanding this development has become a national priority for several federal agencies and state programs. It is also receiving increased attention in the national news media, in part because its relevance to human health is still unclear.

EPA-New England is participating in efforts to understand the extent, severity and possible causes of amphibian deformities in New England and throughout North America.

The first confirmed report of amphibian deformities in New England was made by the Vermont Department of Environmental Conservation (VTDEC) in October 1996, in wetlands next to Lake Champlain. Subsequent surveys in the summer of 1997 in Vermont, Massachusetts, and New Hampshire, and additional reports from Connecticut and Maine, have confirmed deformities in northern leopard frogs, green frogs, bull frogs, wood frogs, gray tree frogs, mink frogs and spotted salamanders (Figure 11).

In addition to suffering deformities, a number of common species of amphibians, such as northern leopard frogs, are declining throughout their geographic range in New England. Drainage, habitat fragmentation, and filling of small water systems such as vernal pools and other wetlands have had dramatic effects on salamander, frog, toad, and newt populations. Ten out of the 14 native species of salamanders and newts are wetland dependent, and only one of the 13 native frog and toad species does not depend on wetlands for survival. Many species of turtles, such as the wood turtle and the endangered bog turtle, have also declined as a result of habitat fragmentation in the New England landscape. In many areas only old, non-breeding adults remain. When these individuals die, such species are likely to permanently disappear from their former range (Figure 12).

Figure 11. Types of Deformities in Frogs Summer, 1997

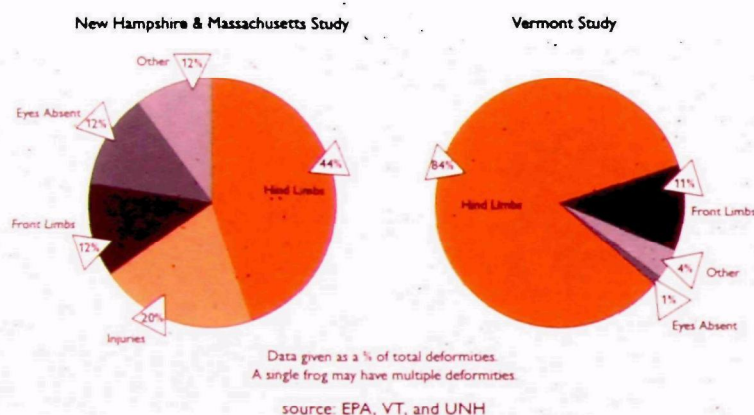
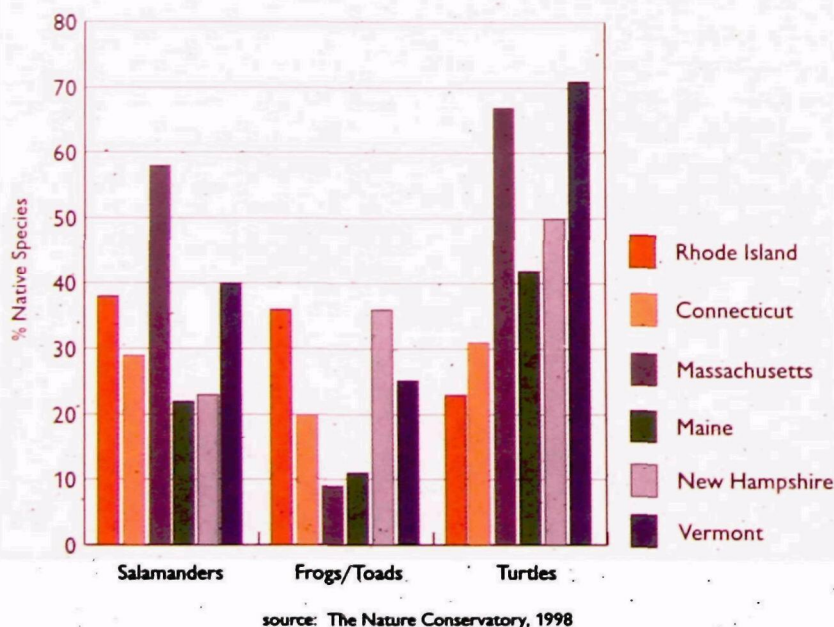


Figure 12. New England Amphibians and Turtles at Risk



Tips for a Healthy Outdoor Environment

1. Learn about organic gardening and natural pest management.
2. Use sand instead of salt on driveways and walkways in winter.
3. Take care of your septic system. If not maintained properly, it may be leaking bacteria and nutrients into the groundwater or streams, lakes and the ocean.
4. Never dump motor oil, antifreeze, transmission fluid, or other automobile chemicals into road gutters, storm drains, or catch basins.
5. Trickle irrigation is an effective way to water gardens, shrubs, and trees. Use perforated plastic pipes to apply water directly to the plants' root zone. This cuts water use between 30% and 70% and slows the growth of weeds. Water in early morning or late in the day and never during midday.
6. Use a broom instead of washing sidewalks, driveways, patios, and decks.
7. Do not plant trees or shrubs near drain lines since roots can clog them.
8. Make sure your car engine does not leak gas or oil.
9. Consider using ground cover plants as well as grass in your yard.
10. Choose permeable surfaces such as wooden decks, porous pavement, bricks, or stone, rather than solid pavement, to allow for maximum absorption of water into soil.



Photo: Matt Schweisberg

Water Levels and Adequate Flow

Although we have made great strides in reducing surface water pollution, our progress is threatened by the increasing diversion of water for snowmaking, hydropower generation, industrial and commercial use, agriculture, and municipal water supplies. Water withdrawals and flow alteration can significantly and sharply reduce stream and lake levels. Such disruptions in flow can contribute to the loss and diversity of aquatic species by reducing food supplies and altering habitat.

Hydroelectric power can be an efficient source of energy. Improperly managed dams, however, can degrade water quality and have a devastating effect on fish and wildlife. Dams can block the migration of fish and contribute to increased water temperatures, decreased levels of dissolved oxygen, and the accumulation of toxic compounds in sediments. This, along with industrial pollution has led to the loss of many native fish, such as salmon, shad, and sturgeon.

Dams must periodically be relicensed — once every few decades — by the agency that oversees hydropower, the Federal

Energy Regulatory Commission (FERC). Such relicensing presents an opportunity to address the environmental concerns mentioned above. In collaboration with Indian Tribes, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, state resource agencies, and non-governmental organizations, EPA-New England is part of a team to review hydropower projects and identify and establish ecologically critical flow levels in rivers, streams, and wetlands that may be affected by the project. In the past year, this team has been involved in a number of significant hydropower licensing cases:

- EPA participated in pre-licensing discussions concerning New England Power's Fifteen Mile Falls hydroelectric project located on the Upper Connecticut River — the largest hydropower project in New England. The resulting multi-party settlement agreement provides for flows and impoundment level controls that significantly improve fish and wildlife habitat and establishes permanent conservation easements on approximately 12,000 acres of land.

- FERC staff — reflecting the views of EPA, the Penobscot Tribe, the U.S. Fish and Wildlife Service, and others — have recommended against the construction of the new Basin Mills dam on the Penobscot River, which was once an important Atlantic salmon fishery in New England. Among other environmental concerns, a new dam would have jeopardized the ongoing efforts to restore wild salmon to the Penobscot River. The Commission has not yet issued a final decision, but EPA is hopeful that FERC will once again uphold the recommendation that the Basin Mills dam not be built.

- FERC denied the license application and ordered the decommissioning and removal of the Edwards dam — the first obstacle migrating fish encounter on the Kennebec River in Maine. This is a landmark decision by FERC and one watched closely by the entire nation. Removing the dam will enable striped bass, rainbow smelt, Atlantic and shortnose sturgeon to access their full historic range in the Kennebec.

The Charles River: A Progress Report

"Peace, like a river, ran through the city..."

—Paul Simon

The Charles River is one of the treasured open spaces in Massachusetts, enjoyed by tens of thousands of people a day from spring to fall, and contributing almost \$100 million to the economy through property values and recreational activity. At the annual Head of the Charles Regatta, the largest rowing event in the world, 5,000 rowers compete and hundreds of thousands more line the banks in celebration. Unfortunately, bacterial pollution from Combined Sewer Overflows (CSOs), contaminated storm drains, sporadic releases of oil and

chemicals, and polluted stormwater runoff has caused the Charles, like many urban rivers, to become severely degraded.

In 1995, we launched the Clean Charles 2005 initiative, aimed at making the river fishable and swimmable by Earth Day 2005. Since then, the amount of time the river meets swimming and boating standards has doubled. In order to improve on this progress, and meet our 2005 goal, EPA has undertaken a multi-point action plan for the coming year.

Boston University

In October 1997, EPA and the Department of Justice filed a civil judicial action against Boston University for alleged violations of both federal hazardous waste laws and the Clean Water Act (due to a leaking underground storage tank). As a result of the case, Boston University paid a penalty of \$253,000 — the largest environmental penalty against an academic institution in history — and is conducting two Supplemental Environment Projects (SEP) worth \$518,000 that will benefit communities along the Charles and in inner-city Boston. BU also installed a petroleum product recovery system around the site to remediate the groundwater that had been contaminated as a result of the leak.

One SEP, conducted with the help of EPA and the Charles River Watershed Association, will help control stormwater discharges into the Charles (a significant source of pollution) by constructing new stormwater controls at various sites on campus. The second project, in partnership with the South End - Lower Roxbury Open Space Land Trust, will rehabilitate a community garden in the Lower Roxbury area that has lead levels exceeding those recommended for growing vegetables. Thanks to the successful prosecution of this case, those who enjoy the Charles River, and who live, work and play in greater Boston will be able to treasure even cleaner recreational resources.



Photo: Ed Reiner



Storm Water Management EPA is working with each of the ten lower Charles Communities and four state agencies to create state-of-the-art storm water management plans by July, 1998.

Aggressive Enforcement and Assistance Enforcement has led to the discovery of more than 400 illegal discharges contributing more than 700 thousand gallons per day of sewage to the Charles and its tributaries. To date, a total of more than 20 million gallons per year of sewage discharge has been eliminated.

Report Card We have developed an annual "report card," grading the river's water quality on an annual basis. In 1996, the Lower Charles River received a grade of D, but by 1997, that grade improved to a C-. There is, however, still a long way to go.

Water Quality Flagging EPA and the Charles River Watershed Association are instituting a water quality and sampling program that will produce timely data about the condition of the river. Color-coded flags located at boathouses along the Charles will inform the public of the water quality on any particular day.

Relief from Sewer Overflows When it rains, millions of gallons of mixed sewage and storm water overflow into the Charles. EPA is pressing facilities to sharply control and reduce these CSO discharges.

Scientific Research EPA, the Commonwealth of Massachusetts, the Massachusetts Water Resources Authority and the Charles River Watershed Association currently support efforts to increase scientific understanding of the Charles River, including the most comprehensive study to date of water quality for the entire river.

Better Infrastructure Maintenance EPA and the Massachusetts Department of Environmental Protection are working with cities and towns along the Charles to increase inspection and maintenance of aging sewer systems.

Compliance and Pollution Prevention



"We abuse land because we regard it as a commodity which belongs to us. When we see land as a community to which we belong, then we may begin to use it with love and respect."

—Aldo Leopold

Our society has the technology and the ability to find creative ways to solve environmental problems that will ensure a clean and safe environment as well as economic stability. EPA's New England office works together with individuals, businesses, municipalities and other agencies to restore and preserve New England ecosystems and resources for sustainable, productive use. Our Assistance and Pollution Prevention Office works diligently to help thousands of businesses and municipalities meet—and exceed—environmental regulations through voluntary compliance assistance and pollution prevention programs. At the same time, EPA maintains a vigorous enforcement presence in New England to stop those who flout environmental regulations, recklessly pollute the environment and gain unfair economic advantage over those who operate by the rules. Both offices integrate and coordinate their activities to generate the maximum amount of environmental protection EPA can provide.

Getting the Green Back: Assistance and Pollution Prevention

If an ounce of prevention is worth a pound of cure, an ounce of pollution prevention may well be worth its weight in gold. Throughout New England, a growing number of businesses are improving their operations through pollution prevention, toxic use reduction, resource conservation, and recycling—and recognizing in the process that environmental stewardship is sound business strategy. To help even more companies realize this, EPA-New England's *Getting the Green Back* campaign is reaching out to businesses to help them improve environmental performance while preserving financial health.

Getting the Green Back highlights the work of EPA - New England's Assistance and Pollution Prevention (A&P2) Office, which offers a number of voluntary programs that emphasize compliance and pollution prevention assistance, regulatory flexibility, public recognition, environmental technologies, environmental management systems, and small business assistance. The philosophy behind these programs is that businesses and industries can be key players not only for New England's economy, but for her environment as well. By seeking to tap corporate innovations and professional knowledge, we believe that it is possible to bring about even greater environmental results.

In order to get the word out to businesses and municipalities, in 1997 EPA-New England conducted eighty-six workshops on issues ranging from pollution prevention in the metal plating industry to community right-to-know data. Our staff made more than 200 public presentations during the year to provide information about pollution prevention and compliance assistance. And, our New England Environmental Assistance Team's newsletter, *Pollution Prevention and the Bottom Line*, is now distributed quarterly to more than 3,000 businesses throughout the region.

Really CLEAN: Compliance Leadership Through Environmental Auditing and Negotiation

EPA-New England has launched the CLEAN (Compliance Leadership Through Environmental Auditing and Negotiation) initiative to promote pollution prevention and improved compliance for small metal finishers, printers, and

wood coaters. CLEAN offers small and medium-sized businesses free, on-site compliance and pollution prevention audits, with limited enforcement discretion for violations, in exchange for an agreement to correct violations and begin a "beyond compliance" project. CLEAN

U.S. v. Eklof Marine

In January, 1996, the *North Cape* oil barge, while being towed by the tugboat *Scandia*, spilled upwards of 828,000 gallons of oil off the coast of Rhode Island, causing tremendous environmental damage to coastal ecosystems in the area. In September 1997, the Eklof Marine Corporation, and its subsidiaries, Thor Towing Corporation and Odin Marine Corporation entered guilty pleas for their role in causing the spill and violating the Clean Water Act, the Refuse Act, and the Migratory Bird Treaty Act. In addition, Eklof's President and the tugboat captain pleaded guilty to violating the Clean Water Act. As part of the settlement, the corporate defendants are required to pay an \$8 million fine—the largest environmental criminal fine in New England history and the largest federal criminal fine under any statute in Rhode Island history. Under the terms of the settlement, the corporations are required to pay \$3.5 million as a federal fine and \$3.5 million as a state fine. One million dollars will also be allocated for improvements and remedial measures to the company's fleet. An additional \$1.5 million will be directed to the Nature Conservancy to acquire land along the coast of Rhode Island for conservation purposes.

C.M Almy and Sons

C.M Almy & Sons Inc. (CMA) is a 12 person company that manufactures high quality, handmade liturgical artifacts, including metal objects and vestments. Over the past two years, CMA has made some significant progress in reducing the amount of hazardous waste generated from its electroplating processes by undertaking P2 activities. CMA's actions have resulted in a 50% reduction in cyanide bath filter waste, a 90% recovery of their silver plating "dragout", and the elimination of their halogenated solvent use. CMA is now saving \$11,000 a year as a result. Michael Fendler, CMA's president, saw CLEAN as an opportunity to get a no cost, low risk compliance assessment, ensuring that its operations qualify for less burdensome and less costly "small quantity generator" rules. Our CLEAN assessment found CMA to be a clean, mean, P2 machine.

has conducted on-site assessments at metal plating businesses in New Hampshire and Maine, and at print shops in Maine. Funds are in place to expand CLEAN to other states and businesses.

StarTrack and Project XL: The Next Generation

In 1997, EPA-New England and its state partners continued to test the concept of third-party certification by working with eight New England companies who are participating in the StarTrack pilot project. StarTrack companies voluntarily agree to assess their environmental management systems and compliance performance, and to have this performance publicly certified by a third party. In return, EPA offers limited enforcement discretion, reduced inspections, and expedited permitting, with a goal of expanding the use of environmental compliance and management systems audits to improve environmental efficiency. In 1997, the eight StarTrack companies provided EPA with publicly available environmental performance reports.

Project XL (eXcellence in Leadership) encourages real-world tests of innovative strategies that achieve cleaner environmental results than traditional regulatory means. EPA will grant regulatory flexibility in exchange for the use of in-

novative approaches which result in superior environmental benefits. In 1997, a final project agreement was signed with the HADCO Corporation of New Hampshire which enabled the company to make smarter use of its metal-bearing sludge. Massachusetts DEP is also working toward a final project agreement to develop a self-certification program for small pollution sources. By the end of the year, several other XL champions will be helping EPA to find cleaner, more intelligent ways to protect our environment.

Community Involvement in Permit Discussions

In order to help people understand environmental issues facing urban communities in Chelsea, Revere, and East Boston, members of the EPA Urban Environmental Initiative (UEI) team are working with neighborhood representatives to help communities better understand how they can get involved in the EPA permitting process. In doing this, UEI organized a community workshop to explain and describe pending National Pollutant Discharge Elimination System (NPDES) permits for nearby oil tank storage facilities. Participants included the Massachusetts Department of Fish and Wildlife Riverways Program, the Chelsea Green Space and Recreation

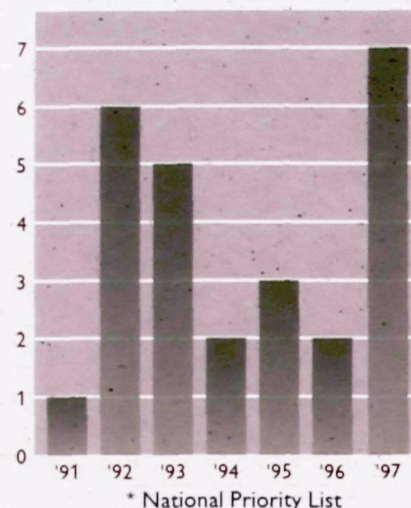
Committee, and the East Boston Ecumenical Council. The workshop demonstrated how community groups can interact with the federal government and paved the way for the establishment of an ongoing working group to make comments on future permits.

Putting Technology to Work: Superfund Reform Technology Initiative

To properly address the cleanup of an average hazardous waste site in New England, the time span between the initial investigation and the completion of cleanup can be more than ten years. What's more, the monitoring and remediation costs associated with cleanup of a site can be millions of dollars.

The savings can be remarkable. A recent EPA national assessment of 17 sites using innovative technologies estimated a savings of \$21 million or 62% over conventional technologies. In order to save both time and money at hazardous waste sites, EPA's New England office is serving as a catalyst for the development and use of promising new environmental technologies that will do the job faster and cheaper. In New England, about 60% of the Superfund sites are using innovative monitoring or remediation technologies.

Figure 13. Superfund NPL* Sites Cleaned Up



source: EPA New England Office of Site Remediation and Restoration

Enforcement: A Key Part of the Picture

Targeting Our Efforts

We make great efforts at EPA to partner with businesses, municipalities, and public agencies. But when that partnership is violated and that trust is broken — whether it is by negligence, or flagrant violation of environmental laws — there can be very significant consequences. To be sure, one of EPA's highest priorities is detecting and correcting environmental violations (Figure 14).

The strong enforcement of environmental laws serves a number of purposes. Enforcement maintains a level playing field, so that violators do not gain an unfair economic advantage over those who play by the rules. It reduces environmental risk. It deters violations by sending a clear message that those who do not meet environmental standards will pay an appropriate penalty. Additionally, enforcement requires violators to pay for the cleanup and repair the environmental damage caused by their actions.

EPA's New England office takes a strategic approach to our enforcement activities. In recent years, we have targeted our efforts toward a number of different

areas. Our Sensitive Ecosystem Team applies an integrated, multimedia approach to environmental problems in targeted geographic areas, including the Mystic River and South Coastal Massachusetts. The Urban Environments team pursues a community-based approach to urban environmental problems and improved the quality of life in New England's densely-populated areas — last year, over 400 inspections were conducted in urban areas. The Compliance Targeting team identifies large facilities with the potential for major violations, and our Industrial Sectors team focuses on compliance issues in specific industries, such as metal plating and chemical manufacturing.

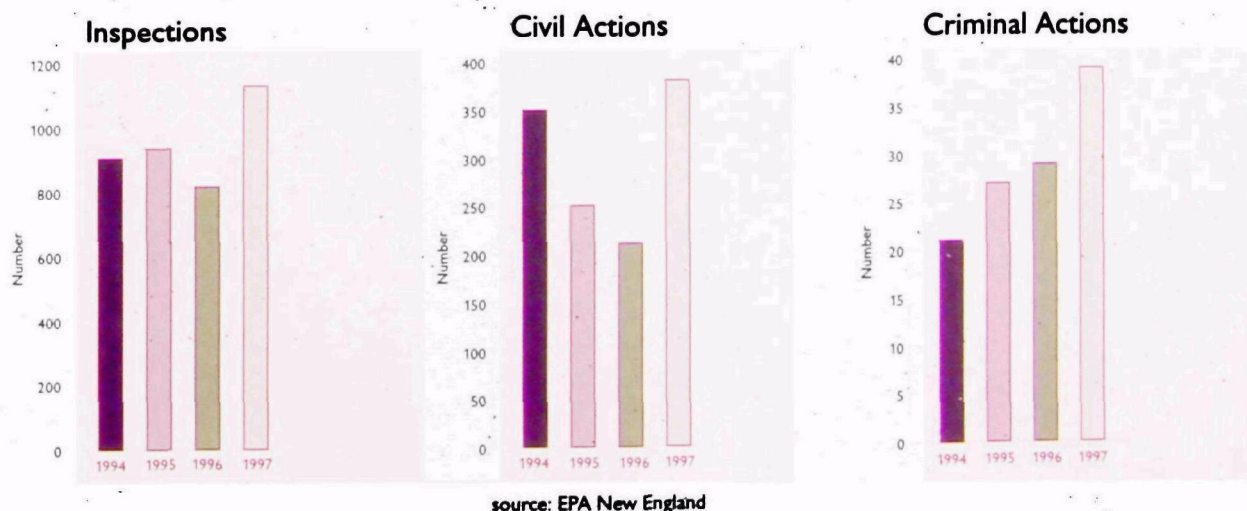
Often, EPA's Enforcement and Compliance Assistance staff work together for maximum impact. One example of this can be seen in our Chlorine Initiative. Most municipalities in the U.S. use chlorine as an integral part of their water and wastewater disinfection processes, but many fail to comply with the environmental standards regarding chlorine levels in receiving waters. To combat this,

EPA crafted a compliance strategy that used a range of enforcement tools — targeted inspections, penalties, and publicizing cases — along with compliance assistance tools — technical and regulatory assistance and pollution prevention advice. This combination maximizes the effectiveness of both approaches by providing incentives for municipalities to take advantage of compliance assistance opportunities, which in turn allows EPA to shift its attention towards those who ignore the law.

Getting the Job Done

In 1997, EPA's New England office collected nearly \$1.5 million in civil fines and proposed penalties of another \$3 million of the same. Additionally EPA funneled more than \$1.2 million towards Supplemental Environmental Projects — community-based environmental efforts ranging from the development of neighborhood parks to the installation of state-of-the-art pollution prevention technologies. In fact, 43% of EPA-New England's enforcement actions in 1997 resulted in ecosystem protection or environmental restoration and 39% produced

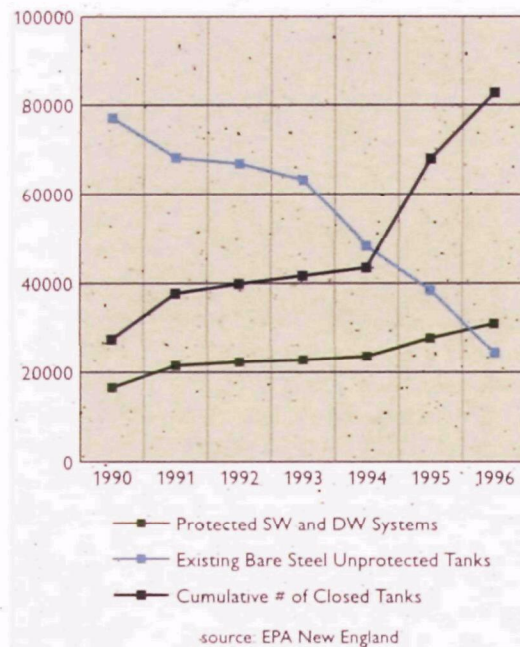
Figure 14: Compliance and Enforcement Accomplishments



Underground Storage Tanks: Don't Wait Until It's Too Late

Throughout New England, there are approximately 25,000 "bare steel, leak prone" unprotected underground storage tanks (USTs) in use by businesses, municipalities, and private citizens. Because they have no safeguards or warning systems to prevent leaks, these tanks are considered to be a threat to groundwater quality across the region. Petroleum or hazardous substances from leaking USTs are the most common causes of contamination of groundwater, the source of drinking water for nearly half of all Americans. To address this problem, EPA provides nearly \$5 million each year to the New England states for inspections, tank registration, training, emergency response staff, and oversight of cleanups. These programs have gone a long way in reducing the number of petroleum releases — now numbering more than 12,000 — in New England. EPA supports state efforts with our own UST program, which has conducted over 650 inspections over the past four years, issuing over 160 citations. This program uses a combination of compliance and technical assistance and limited enforcement forbearance to ensure that tank owners learn how to properly manage their USTs and avoid future violations. In addition to these efforts, EPA is also sponsoring the "Don't Wait Until '98" campaign, targeted at helping UST owners meet EPA's and the states' December 1998 deadline for upgrading or replacing unprotected tanks.

Figure 15. New England's Underground Storage Tank Program



The Groton Fuel Cell

EPA's National Risk Management Research Laboratory (NRMRL), at Research Triangle Park in North Carolina, has developed a technology to clean landfill gas, which is then used to create electricity. Landfills naturally emit methane, but these emissions contain corrosive compounds that, if left untreated, corrode fuel cells. EPA's NRMRL is lending this cleaning technology to Northeast Utilities to generate electricity in Groton, Connecticut, where it is fed into the grid. Although this small fuel cell is only providing the electrical needs of about 150 homes, it represents an important step in developing a clean technology. The technology captures natural emissions for productive use and significantly reduces the impact of greenhouse gases on the environment.



Photos: Jim Berry



Photo: Ed Reiner

improvement in human health or worker protection. Additionally, in 1997, our criminal enforcement program yielded *more indictments, convictions and sentences* for more than twice as many individuals and corporations than ever before. Last year, 13 criminal sentences were doled out, 26 criminal cases were referred to the U.S. Department of Justice for prosecution, and the region won the largest environmental criminal fine in New England history — \$8.0 million — for the Eklof Marine case.

Public Agencies

Public agencies have often lagged in compliance with environmental laws. To rectify this, EPA's New England office has established a cross-media team which has targeted both enforcement and compliance assistance to this sector. In 1997, the Public Agency Team, along with other members of our enforcement staff, conducted a total of 234 inspections of public agencies, resulting in a total of 116 enforcement actions. EPA often uses enforcement actions to leverage environmental improvements. For example, an EPA enforcement action against Haverhill, MA resulted in Haverhill's agreement to build a household hazardous waste collection center; to conduct quarterly hazardous waste collections; and to edu-

cate residents on techniques to reduce their use of hazardous materials in the home. EPA's Public Agency team has also focused on transportation departments and state universities in several states, and has found significant violations in such facilities. Continued enforcement against public agencies will send a clear message that governments must take environmental laws as seriously as the private sector.

Alternate Dispute Resolution Program

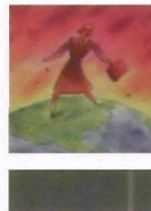
Our Alternate Dispute Resolution program is breaking new ground in promoting the use of mediation and neutral facilitation in the environmental law context. Having just completed its fifth year, the program has grown exponentially in the range of services provided and the volume of cases handled. In 1997, the Enforcement Office utilized alternative dispute resolution to resolve sixteen Superfund and seventeen non-Superfund cases. Cleanups at federal facilities are especially good candidates for the use of neutral facilitators, who are able to enhance communication with local citizens. The program is encouraging the inclusion of mediation provisions as part of settlement agreements in an effort to avoid disputes as well as resolve existing ones.

Massachusetts Military Reservation

The 22,000-acre Massachusetts Military Reservation (MMR), including parts of four towns in northwestern Cape Cod, has been used for industrialized military activities since 1935. It is currently used by the United States Coast Guard, the Massachusetts Army National Guard, and the Massachusetts Air National Guard and other organizations. The base is located over a sole source aquifer, the drinking water supply for upper Cape Cod communities. In 1978, a variety of contaminants from the base were found in the aquifer. The site was added to EPA's Superfund National Priorities List in 1989, and to date, over \$200 million has been spent on its cleanup. In 1997, EPA had to once again aggressively address pollution at this base.

In response to concerns that training activities at the base may be impacting the groundwater, on May 19, 1997, under the authority of the Safe Drinking Water Act, EPA ordered the suspension of the firing of live artillery, mortars, and lead munitions and the use of propellants and pyrotechnics in all training areas. This is the first time in history that military training has been suspended for environmental and public health reasons. In ordering the cease-fire, EPA required that a comprehensive groundwater study be undertaken, that lead from soil at small arms ranges be removed, and that the military undertake specific pollution prevention activities to prevent any potential future contamination for training activities. The study, which began last summer and will continue for another year, has produced evidence that explosives contamination may exist in soil and groundwater.

You and Your Environment



"Heaven is under our feet as well as over our heads."

—Henry David Thoreau

The abundance and diversity of habitat, plants, and wildlife in New England are a measure of the natural wealth of our environment. Working together, the people of New England can maintain and improve the condition of our wonderful surroundings with significant results.

Waste Not

One of the most important things we can do to protect the environment is to minimize the amount of waste we produce. Americans produce over 208 million tons of solid waste each year — 14 million of it here in New England. That's 4.3 pounds per person per day — more than any other country in the world. The good news is that as a nation, we have moved from recycling 11% of our trash in 1986 to our present recycling rate of 27%. EPA has set a national recycling goal of 35% by the year 2005.

In order to reach this goal, there are a number of measures we can take, all of which can be summed up with the familiar phrase, "Reduce, Reuse, and Recycle." There are hundreds of different products we can buy, household items we can recycle, and activities we can support to produce less waste. To raise public awareness about recycling, the theme for the first annual EPA-sponsored *America Recycles Day*, held on November 15, 1997, was "Keep Recycling Working: Buy Recycled."

In order to make recycling work, however, there must be markets for recycled products to transform curbside materials into material goods. More than 1,500 processors and manufacturers in New England now depend upon recyclables for their raw materials. EPA's New England office is working to expand this number and create and sustain markets to handle recyclables. Last year, we provided more than \$1.2 million to help fund innovative source reduction and market development grant programs. Additionally, EPA has been developing a recycling market infrastructure since 1994 through a program called Jobs Through Recycling (JTR). One JTR grant to the State of New Hampshire for start-up recycling businesses will generate over 100 jobs and divert 27,000 tons of waste into new products with recycled content.

EPA is also beginning to create new markets for commodities not yet recycled. Two collections for electronics equipment were piloted in 1997, with the aim of testing whether a collection program can be created for computers and other electronics. Over 20,000 pounds of "end-of-life" electronics were collected, including televisions, office equipment, computer systems, kitchen appliances, and various miscellaneous electronic equipment.

Citizens Working for the Environment

The Path to Greenways — Efforts Along the Quinnipiac

The Quinnipiac River flows through south central Connecticut, and is the focus of a number of inspirational citizen efforts. The Quinnipiac Linear Trail Advisory Committee recently completed a survey of the river's entire six-mile course through Wallingford, including the famous 90-acre Community Lake site, which is now being considered for restoration. The group intends to link its

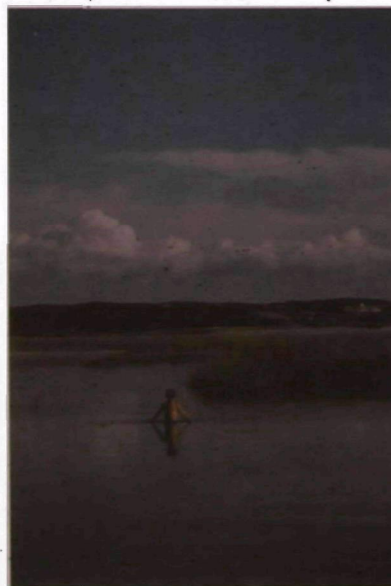


Photo: Roy Crystal

forts with those in other towns in order to form a recreational greenway that spans the watershed. This effort is widely supported within the community, and the group's membership already numbers over fifty active volunteers. One early benefit of the effort is that the trail committee has become an inter-generational team, bridging a division in the community that erupted last year when teenagers and senior citizens clashed over the recreational use of the downtown area.

The Quinnipiac River Watershed Association has undertaken extensive outreach activities to raise awareness of the Quinnipiac River and the issue of non-point source pollution. Thanks to EPA's Section 319 grant to the State of Connecticut, the Association has been

able to conduct five canoeing and three hiking events in the watershed to introduce people to the natural attributes of the river and its surrounding lands.

Norwalk River Watershed Initiative a National Model

The 62 square mile Norwalk River watershed is located in southwestern Connecticut and includes parts of seven communities in both Connecticut and New York. The river is one of several small tributaries in Fairfield County that drains into Long Island Sound. Proposed by the Long Island Sound Study as a pilot project to more actively involve communities in watershed protection efforts, the Norwalk River Watershed Initiative (NRWI) is a voluntary, community-based watershed planning effort. Designed to

address issues of water quality, habitat restoration, land use, flood protection, open space, and education and stewardship, the NRWI Committee consists of watershed residents, local officials, interested organizations, and state and federal representatives. To benefit the work of the NRWI, EPA, the USDA Natural Resources Conservation Service, and the Connecticut Department of Environmental Protection are providing both technical and financial assistance. The NRWI committee has already identified some preliminary implementation actions that will take place in the watershed, including restoration of vegetated riparian buffer zones along the river and its tributaries, adoption of consistent septic system maintenance ordinances among the seven watershed communities, and establishment of a volunteer water quality monitoring program.

Beachcombing for the Environment

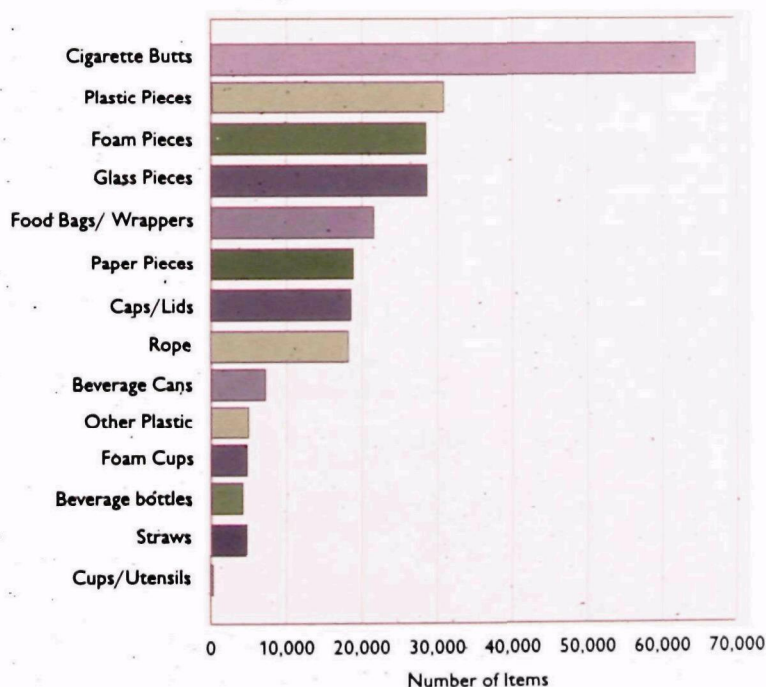
This year, an estimated 151,502 people across the nation participated in beach cleanup activities, including 11,170 from New England's coastal states. New England volunteers picked up 117,605 pounds of trash along 608.6 miles of beach. Beach debris can endanger marine wildlife; create the aesthetic degradation of ocean waters and beaches; cause economic hardships for coastal communities and the fishing industry; and endanger the health and safety of beachgoers. EPA is providing funding to the Center for Marine Conservation to select research sites to develop beach cleanup techniques and monitoring methods. A few of these sites will be in New England (Figure 16).

Pulling Together: Partnerships in the Pawcatuck Watershed

The Pawcatuck watershed is located in southwestern Rhode Island and portions of southeastern Connecticut and covers 194,000 acres, approximately one-quarter the size of Rhode Island. It is the home of the Narragansett Tribe and contains lands held by the Mashantucket Pequot Tribe. In 1989, EPA designated the watershed a "sole source aquifer," meaning its residents are totally dependent on the

Figure 16. Beach Debris Collected in 1997

9,948 volunteers picked up 108,430 pounds of debris on 456 miles of New England shoreline*



*8 volunteers in Vermont brought up 350 pounds of debris from one underwater site

source: Center for Marine Conservation

groundwater for their drinking water supply. The watershed also contains unfragmented, rare and critical habitats, and important wetlands. In 1996 it was designated as one of the state's nine highly valued Resource Protection Areas by Rhode Island's Resource Protection Project Workgroup, a collaboration among federal, state, local and private organizations. Federal agency partners have also targeted this watershed as one for coordinated support of protection strategies.

The Pawcatuck Watershed Partnership PWP is hosted by two local community-based organizations — the Southern Rhode Island Conservation District and the Wood-Pawcatuck Watershed Association, along with a number of local, state tribal and federal partners, including EPA. The PWP identifies management issues in the watershed — such as growth management, prevention of habitat fragmentation, deforestation, wetland protection, and planning ca-

capacity — and develops strategies to address these issues and improve the watershed's environmental quality. EPA is also working with the PWP on the issue of managing current and future water supplies.

No Discharge Area

In the fall of 1997, Rhode Island — as part of the Narragansett Bay Estuary Project Plan — applied for a No Discharge Area from EPA's New England office. As part of this designation, boats are prohibited from dumping treated or untreated sewage into the bay or in nearby tidal flats and salt marshes. Rhode Island is the first state in the nation to want all of its marine water — 400 miles of coastline, 96,000 acres of open water — marked as a No Discharge Area.

There are approximately 31,608 boats registered in RI — 26,697 are recreational — with an estimated 20,000 more unregistered. Discharged waste from these

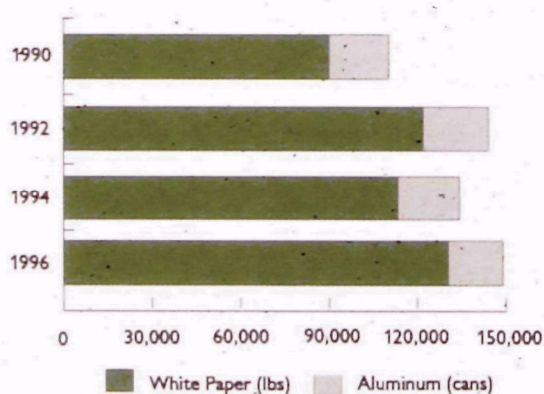
vessels and from those passing through the state can affect the quality of water in the Narragansett Bay, designated by the National Estuaries Program as "An Estuary of National Significance."

Before granting "No Discharge Area" status, EPA makes sure that there are adequate pumpout facilities available so that boaters are not inconvenienced by the new rules. The boaters connect a hose to a fitting on the boat's sanitation device and empty the contents into an on-shore tank for treatment at a sewage treatment plant. Over the past five years, the state of Rhode Island has worked very hard and hand in hand with marina owners, yacht clubs, municipalities, and environmental groups to ensure that funds from the Clean Vessel Act for the installation of pumpout facilities were used to their fullest. There are forty-three pumpout stations around Narragansett Bay, installed using Clean Vessel Act monies, along with additional private stations.

Tips for Waste Reduction

1. Buy recycled products
2. Think before you buy — try to reduce the packaging material you bring home from the supermarket and other stores. Bring your own bags and reuse them.
3. Find out about your community recycling program and how you can help. If your community does not recycle, form a committee, study the issue, and start a program.
4. Encourage a recycling program in your local school system
5. Increase the kinds of material your community recycles
6. Start a compost pile at home
7. Start regular household hazardous waste collection days in your community and dispose of household hazardous waste — such as used motor oil — properly.
8. Encourage others to recycle, reuse, and reduce their solid waste

Figure 17. EPA's New England Office Recycling Program



source: EPA New England

Agency Goals

A Growing Environmental Community

As all of us learn more about our environment, we also work together more effectively to protect it, enjoy its benefits, and ensure that its quality will be sustained for generations to come. At EPA, ensuring the environmental quality of the future is a critical part of our daily lives. We have adopted the following ten goals, and we ask that you join us in learning and working to protect the environment we all share.

1. Clean Air

The air in every American community will be safe and healthy to breathe, as determined by the latest, best scientific evidence. In particular, children, the elderly, and people with respiratory ailments will be protected from health risks of breathing polluted air. Strategies to reduce air pollution will also restore life in damaged forests and polluted waters.

2. Clean and Safe Waters

All Americans will know that their drinking water is clean and safe. Effective protection of America's rivers, lakes, wetlands, aquifers, and coastal and ocean waters will sustain fish, plants, wildlife, as well as recreational, subsistence, and economic activities.

Watersheds and their aquatic ecosystems will be restored and protected to improve public health, enhance water quality, reduce flooding, and provide habitat for wildlife.

3. Safe Food

The foods Americans eat will be free from unsafe pesticide residues. Children especially will be protected from the health threats posed by tainted food, because they are among the most vulnerable groups in our society.

4. Preventing Pollution and Reducing Risk in Communities, Homes, Workplaces, and Ecosystems

Pollution prevention strategies, risk management, and remediation strategies aimed at cost-effectively eliminating, reducing, or minimizing emissions and contamination will result in cleaner and safer environments in which Americans can live, work, and play. EPA will safeguard ecosystems and promote the health of natural communities that are integral to the quality of life in this nation.

5. Better Waste Management and Restoration of Abandoned Waste Sites

America's wastes will be stored, treated, and disposed of in ways that

prevent harm to people and to the natural environment. EPA will work to clean up previously polluted sites and restore them to uses appropriate for surrounding communities.

6. Reduction of Global and Cross-Border Environmental Risks

The United States will lead other nations in successful, multilateral efforts to reduce significant risks to human health and ecosystems from climate change, stratospheric ozone depletion, and other hazards of international concern.

7. Expansion of Americans' Right to Know About Their Environment

Easy access to a wealth of information about the state of their local environment will expand citizen involvement and give people tools to protect their families and their communities as they see fit. Increased information exchange between scientists, public health officials, business, citizens, and all levels of government will foster greater knowledge about the environment and what can be done to protect it.

8. Sound Science, Improved Understanding of Environmental Risk, and Greater Innovation to Address Environmental Problems

EPA will develop and apply the best available science for addressing current and future environmental hazards, as well as new approaches toward improving environmental protection.

9. A Credible Deterrent to Pollution and Greater Compliance with the Law

EPA will ensure full compliance with laws intended to protect public health and the environment.

10. Effective Management

EPA will establish a management infrastructure that will set and implement the highest quality standards for effective internal management and fiscal responsibility.



Photo: K. Kiley

EPA Contacts and Credits

<http://www.epa.gov/region01/>

For general information, customer assistance, to report a tip or complaint about a potential environmental violation or to request technical assistance from the New England Environmental Assistance Team:

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(888) EPA-REG1 (888-372-7341)

Emergency Response:
(for reporting spills/environmental incidents):
(800) 424-8802

EPA New England Office Library:
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