Introduction

Introduction

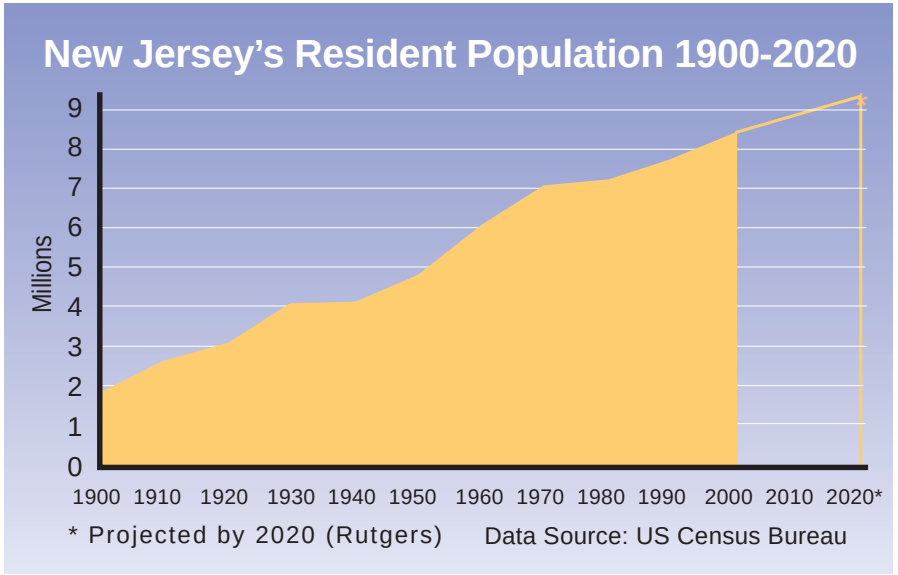
In our inaugural State of the Environment (SOE) report, *New Jersey's Environment 1998*, the New Jersey Department of Environmental Protection (NJDEP) reported that we had embarked on an innovative, results-based environmental management system that sets clear environmental goals and develops related measures to evaluate our progress in meeting these goals. This management system is designed to provide greater access to meaningful information on the quality of New Jersey's environment to all of our partners – the public, regulated parties, the environmental community, other state agencies, and local and federal governments – and report on collective progress in maintaining and improving it. This report highlights environmental progress that New Jersey has made in the areas of Clean Air, Clean & Plentiful Water, Land and Natural Resources, and Reducing and Preventing Pollution.

New Jersey continues to implement its results-based management approach through its participation in the National Environmental Performance Partnership System (NEPPS) and through its Strategic Planning process. A key focus is development and use of environmental indicators as measures of our progress in maintaining and protecting the environment. The New Jersey Center for Environmental Indicators, a partnership among NJDEP, Rutgers University/Cook College, and the University of Medicine & Dentistry of New Jersey/ Environmental & Occupational Health Sciences Institute, was established to advance our use of these indicators for scientifically sound decision-making. Further information about this unique Center can be found at http://scc.rutgers.edu/cei.

Recognizing the importance of county/local partnerships in results-based environmental protection, a new emphasis is being placed on state/county cooperative achievement of the environmental goals developed through the NEPPS planning process. This effort focuses on: determining what environmental data counties collect; exploring ways to aggregate county data for statewide indicators; encouraging the use of NEPPS goals and indicators in local environmental planning and management where appropriate; helping to prioritize delegated environmental activities through the County Environmental Health Act (CEHA); and achieving common goals through local partnerships. Top priorities for developing county level environmental indicators have been identified; they include air quality, open space preservation, and water quality.

Sustainability was described in *New Jersey's Environment 1998* as an emerging objective for environmental protection efforts. Sustainability is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (The World Commission on Environment and Development, 1987).

Figure 1



Governor Whitman's Executive Order #68 directs each state department to promote sustainability as a working philosophy and to embrace sustainability as an operating principle. In keeping with this directive, NJDEP continues to integrate sustainability and sustainable communities concepts into initiatives and day-to-day practices. The department recently led a state interagency effort to update and further develop sustainability goals and indicators for the 21st century. A report updating these goals and indicators, *Living with the Future in Mind, 2000: Goals and Indicators for New Jersey's Quality of Life*, was recently published (http://www.state.nj.us/dep/dsr).

To better integrate sustainability principles into day-to-day activities, this SOE report pays increased attention to areas of personal responsibility. The latest census revealed that New Jersey's population increased from 7,747,750 in 1990 to 8,414,350 residents in 2000 (**Figure 1**), an approximate 9 percent increase. The state's population is projected to grow an additional 11 percent in the next 20 years (Rutgers University's *Impact Assessment for the New Jersey State Plan,* September 2000). This presents challenges for sustainable environmental management in New Jersey.

Along with population increases, our use of resources and materials is rising in many cases. Data show that per person energy consumption has generally increased over the past several decades, both nationally as well as in New Jersey (**Figure 2**). The primary reason behind this increase is our growing demand for energy

consuming products including air conditioners, clothes dryers, freezers, large cars, large houses, color TVs, and computers. New Jersey's per capita energy consumption is lower than the rest of the country because of a more compact housing pattern (e.g., condominiums and apartments), a fair amount of mass transit, a lack of extreme climate, and a lack of the energy intensive industries found in some other states.

Potable water demand has also risen. In 1999, each person in New Jersey was estimated to use 157 gallons of water per day. As the population grows, total potable water usage has also grown in the state (see Figure 23 in the Water section of this report). Additionally, per capita solid waste production in New Jersey has risen (see Figure 35 in the Reducing and Preventing Pollution section).

This report provides general information on past trends and current environmental conditions in New Jersey. Although many current environmental conditions have been improved by our collective efforts, we continue to engage in daily activities that have the potential to negatively impact the environment. This report describes many of these activities and provides suggestions on how we can change our behaviors. Whether as individuals or as communities, we all influence the health of New Jersey's environment. By working together and taking personal responsibility, we all play a greater role in improving environmental conditions and the quality of life in New Jersey.

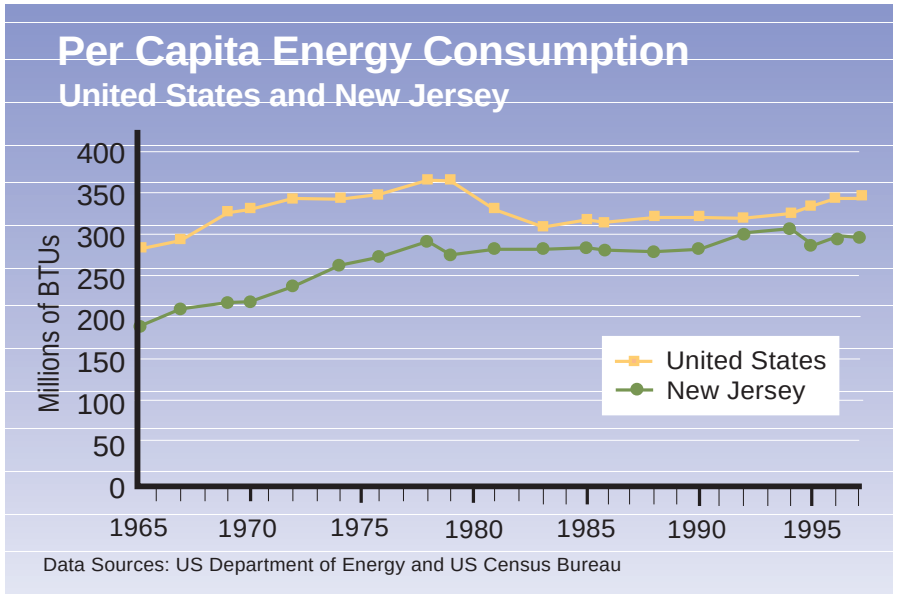


Figure 2

Profile of New Jersey Facts

New Jersey:

General

- ❏ is the fifth smallest state in the nation
- ❏ has a population of 8,414,350
- ❏ has the highest median household income (2000)
- ❏ has the second highest per capita income
- ❏ has 4.98 million acres of land
- ❏ is the most densely populated state in the nation (1,134.5 residents/sq. mile)
- ❏ has approximately 20 percent of its land area used by agriculture
- ❏ has more than 1 million acres (or 20 percent of its land area) of publicly owned open space and preserved farmland
- ❏ has 42 percent of its land area (both public and private) as forests
- ❏ has landscapes which range from the northwestern ridgetops, to the hardwood and evergreen forests in the Northern Piedmont, to the Pygmy Pine Forests and acid soils of the Outer Coastal Plain and Pine Barrens
- ❏ has 127 miles of Atlantic Ocean coastline
- ❏ has 1,871 square miles of freshwater and coastal wetlands, bays, estuaries, freshwater lakes and ponds
- ❏ has approximately 8,050 river and border river miles
- ❏ has 35,600 miles of roads and more highways per square mile than any other state
- ❏ has 5.9 million registered passenger cars
- ❏ has over 178,000 registered boats

Wildlife

- ❏ has more than 400 species of animals
- ❏ lists 20 percent of animal species as threatened or endangered

Plants

- ❏ has more than 2,200 species of native plants
- ❏ lists more than 15 percent of native flora as endangered
- ❏ lists 36 percent of native flora of conservation concern

Commercial Fishing

- ❏ is first in the nation in shellfish production (75,000,000 lbs/year)
- ❏ is the leading supplier of surf clams and ocean quahogs to both the nation and the world
- ❏ is home to 138 registered seafood wholesale houses that serve the Greater New York and Philadelphia areas
- ❏ exports about 48,000 metric tons of edible fishery products per year
- ❏ generates $100 million to the New Jersey economy annually from the commercial fishing industry

Recreational Fishing

- ❏ stocks more than 3.6 million fish in about 400 waterbodies
- ❏ has more than 181,000 licensed freshwater anglers
- ❏ has approximately 826,000 salt water anglers

Agriculture

- ❏ generated $829.5 million in farming cash receipts in 1999
- ❏ is ranked third in the country in the production of cranberries
- ❏ is ranked second in the production of blueberries, spinach and peaches in the U.S.
- ❏ is ranked third overall in farm product sales
- ❏ produces more than 100 different kinds of fruits and vegetables annually

Manufacturing and Industry

- ❏ generates more than $300.7 billion in total gross state product
- ❏ ranks ninth in the US in merchandise export totals to the world (1993-1999)
- ❏ ranks fourth in research and development
- ❏ ranks twelfth in total dollar value of exports
- ❏ major industries include chemical and pharmaceutical plants

Tourism

- ❏ is New Jersey's second largest industry, generating $127.7 billion in revenues and supporting 500,000 jobs

What Can You Do?

Learn

- ❏ Surf the NJDEP Web site (www.state.nj.us/dep). It offers:
  - ■ The latest news from NJDEP;
  - ■ A directory of contact information for NJDEP programs and staff;
  - ■ An easy-to-use guide to common NJDEP topics; and
  - ■ Specific information about environmental indicators.
- ❏ Call 609-777-3373 or visit the department's Public Access Center, located on the 1st floor, East Wing, of NJDEP Headquarters (401 East State Street, Trenton). It has numerous pamphlets, brochures and other resource materials about all facets of the state's environment.
- ❏ Subscribe to *New Jersey Outdoors*, NJDEP's quarterly 64-page magazine. Each issue is full of beautiful pictures and fascinating articles about preserving and protecting New Jersey's flora, fauna, open spaces, and historic sites; enjoying outdoor recreation and our state's special places; and more. Call 800-645-0038.

Practice

- ❏ New Jersey has 54 state parks and forests and recreational areas. Find one in your area at www.njparksandforests.org, then visit and enjoy it!
- ❏ Hang a Gone fishing! sign. Now you can get a license on line at www.state.nj.us/NJFish/.

Get Involved

- ❏ Visit www.state.nj.us/dep/calendar/ and take advantage of the opportunities for citizen participation listed in the NJDEP Calendar.
- ❏ Explore www.state.nj.us/dep/seeds/, an online catalog of environmental education resources—materials, lessons, seminars, projects and contests—available through NJDEP. Make use of these resources or share them with educators and youth leaders that you know.

Together, we're . . .

Making New Jersey a better place to live, work and raise a family.

Clean Air

GOAL: The air throughout the state will be healthful to breathe, and air pollutants will not damage our forests, land and water bodies.

Clean Air

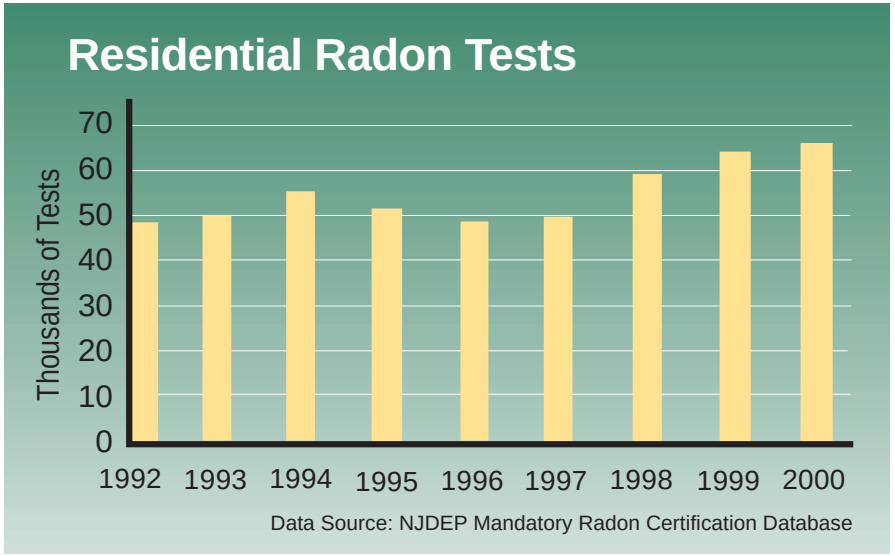
IMPORTANCE OF CLEAN AIR

Nationally, air quality health standards have been set for six of the most common air pollutants - ground level ozone, particulates, carbon monoxide, sulfur dioxide, nitrogen dioxide and lead. Above certain levels, these pollutants can damage the respiratory and cardiovascular system, as well as other organs. They can aggravate existing conditions such as asthma, and in extreme cases, even increase mortality rates. In addition to affecting air quality, certain pollutants can harm water quality and ecosystem health.

Since air pollutants can be transported across jurisdictional lines, a regional approach to solving some problems is necessary. New Jersey has developed regional strategies in cooperation with other states and is committed to reducing air pollution throughout the eastern United States, especially pollutants which contribute to ozone formation, acid rain, fine particulates, and mercury deposition.

Indoor air pollution is also a concern. Radon is a naturally occurring radioactive gas that is invisible and odorless. It is found in soil everywhere in varying concentrations. Radon gas moves through the soil beneath a building and may seep through cracks or other openings in the foundation. Just as radon comes from the decay of radioactive materials, it further decays, producing new, solid radioactive materials. These radon decay products can attach to other indoor air particles, such as dust and cigarette smoke. When inhaled, they become trapped in the lungs, where they emit radiation. This radiation can damage lung tissue and increase the risk of lung cancer. In fact, long term exposure to radon is the second leading cause of lung cancer in the United States. In New Jersey, radon is estimated to be responsible for up to 500 lung cancer deaths each year.

Figure 3A



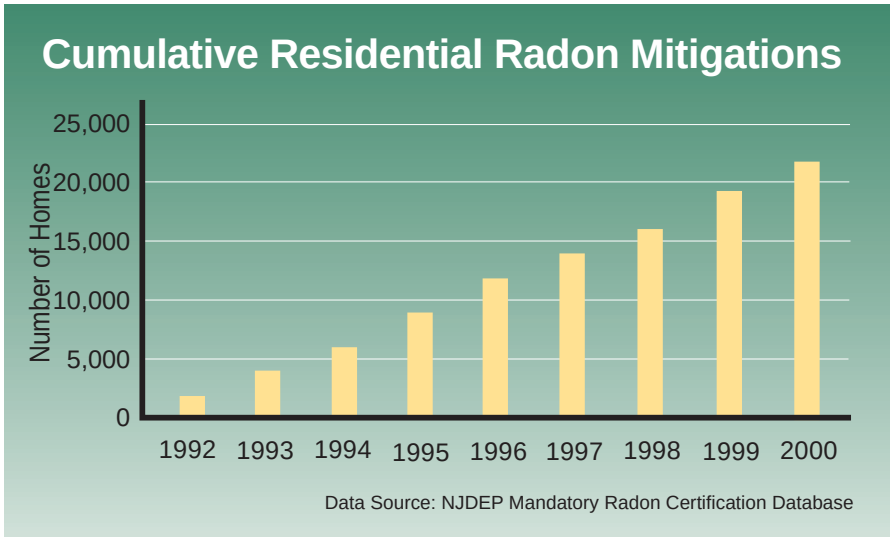


Figure 3B

A measurement test can determine if a building has elevated radon levels. During 2000, approximately 65,100 radon tests were conducted and 2850 radon mitigation systems were installed in New Jersey. As **figures 3A** and **3B** show, the number of radon tests remained steady from 1992 through 1997, with an increase in 1998, 1999 and 2000. The cumulative number of residential mitigation installations to reduce radon exposure levels reached a total of 22,123 in 2000.

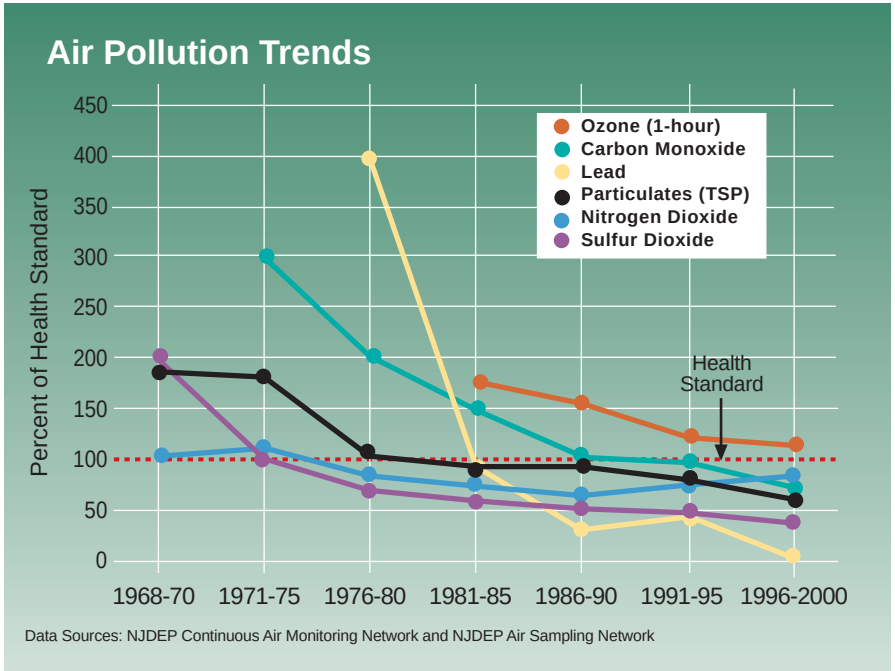
STATUS AND TRENDS

Programs to reduce pollution from industry and automobiles have addressed a large portion of New Jersey's air pollution problem. Air concentrations of the six pollutants for which the U.S. Environmental Protection Agency (USEPA) has set health standards have declined in New Jersey over the past 20 years, so that now most meet or are below these standards (**Figure 4**). As shown in this figure, levels of all pollutants are now below the relevant health standard (100 percent of standard) with the exception of ozone.

Ozone

Ground-level ozone, not to be confused with the ozone found in the stratosphere that shields us from the sun's harmful ultraviolet radiation, can affect respiratory functions and result

Figure 4

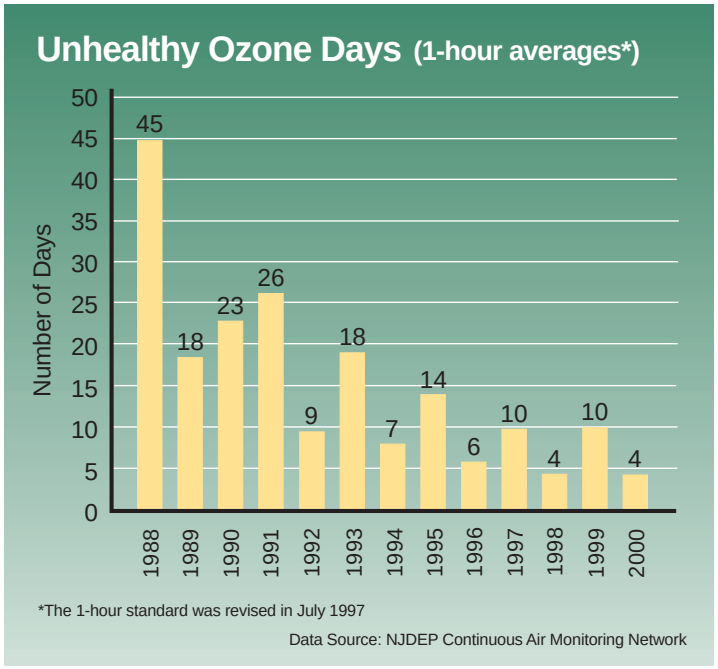


in increased asthma attacks. The national health standard for ground level ozone was revised in 1997. It was changed from a maximum 1-hour concentration of 0.12 parts per million (ppm) to a maximum 8-hour concentration of 0.08 ppm. Although several groups challenged the new standard, it was upheld by the U. S. Supreme Court in a February 2001 decision. In 2000, New Jersey exceeded the 1-hour ozone standard on 4 days (**Figure 5**); the new 8-hour standard was exceeded on 19 days (**Figure 6**). This year had the fewest number of exceedance days ever, under either standard, which suggests that substantial progress has been made in reducing ozone levels.

However, 2000 was an unusual year with very few days on which temperature and sunlight conditions were favorable for the formation of ozone.

The worst ozone episode in 2000 occurred in June (**Figure 7**) with ozone levels reaching the "very unhealthy" range in some areas and with "unhealthy" levels occurring from Washington, D.C. to Boston, Massachusetts. This is typical of most significant ozone episodes that cover large regions and result from emissions over very large areas that are transported on prevailing winds. Efforts to control ozone pollution in New Jersey have involved discussions with more than 37 states covering most of the eastern

Figure 5



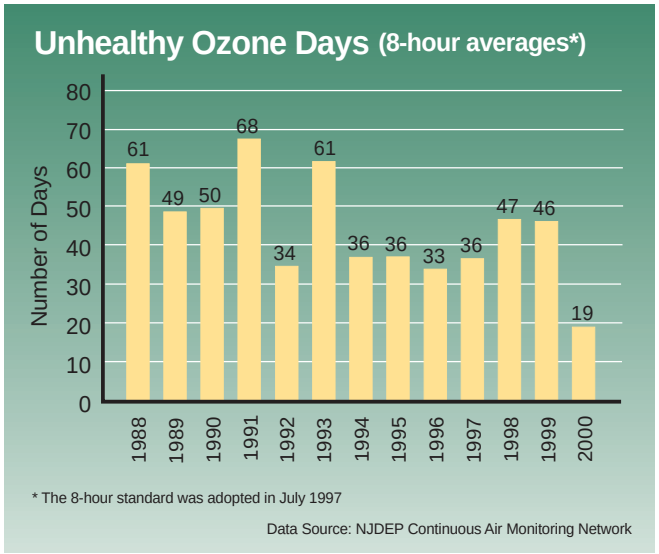
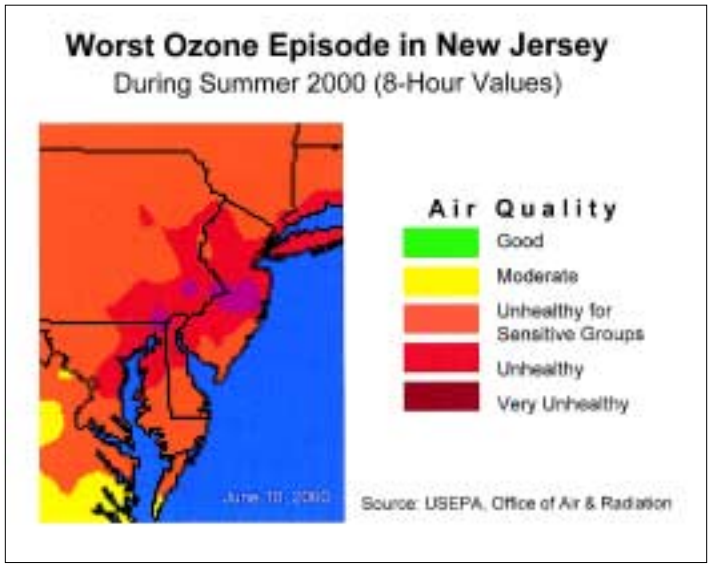


Figure 6

half of the country. Unlike other years, in which July is generally the worst month for ozone levels, cool and wet weather dominated the summer after June of 2000. Even under these unusual weather conditions, most New Jersey residents were exposed to unhealthy ozone levels on one or more of the 19 days on which the 8-hour standard was exceeded in 2000. Thus, ozone continues to be an air pollutant of significant concern in this state.

Unlike other air pollutants, the ozone found in the lower atmosphere is not emitted directly,

Figure 7

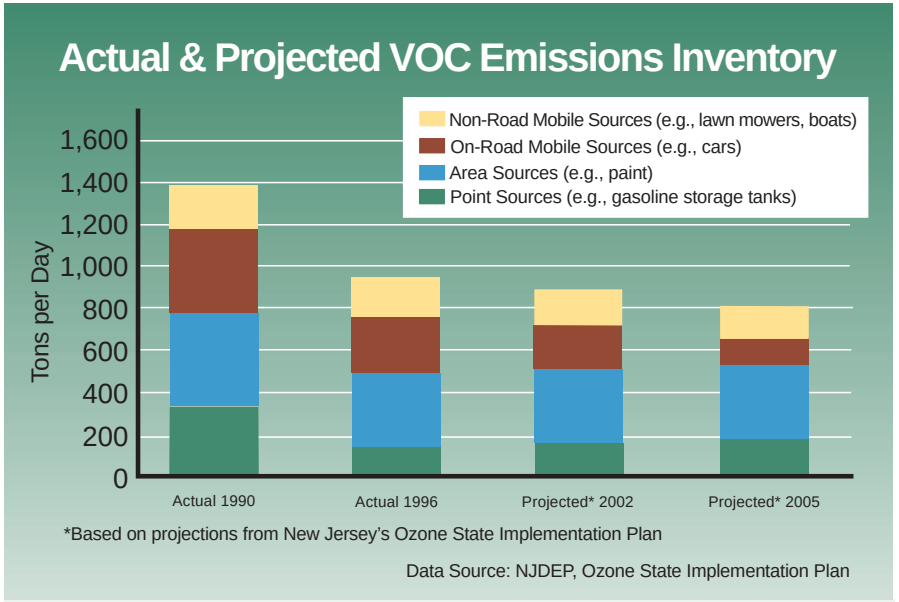


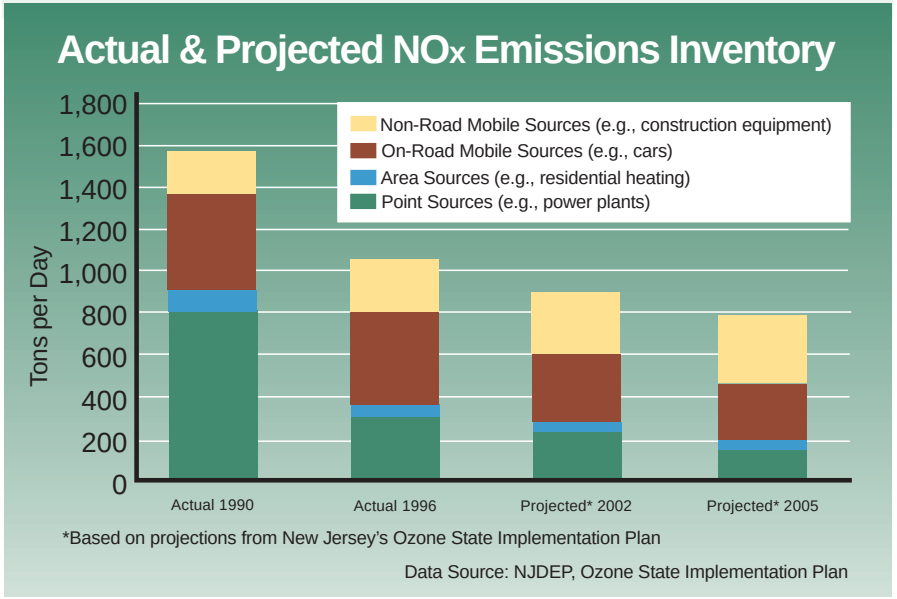
but forms from other chemicals in the air that react together on hot, sunny days. The primary pollutants that result in ozone formation are volatile organic compounds (VOCs) and oxides of nitrogen (NO_x). Figure 8 shows the four major source categories for these pollutants: 1. on-road mobile sources (e.g., cars, trucks and buses), 2. non-road mobile sources (e.g., industrial and farm equipment, trains, and lawn power equipment), 3. point sources (e.g., manufacturing and power industries) and 4. area sources (e.g., paints, consumer products and very small industrial sources). In 1996, the single largest category of ozone precursor emissions was on-road mobile sources, representing approximately 30 percent of the VOC emissions and approximately 44 percent of the NO_x emissions in New Jersey. From 1990 to 1996, the emission levels from all four source categories combined were estimated to have dropped approximately 30 percent for both VOC and NO_x emissions. Based on statewide projections from 1996 through 2005, which include adoption of various additional air pollution control strategies, these emissions are expected to decrease an additional 16 percent for VOCs and 29 percent for NO_x (**see Figure 8**).

Fine Particles

An emerging air pollution concern in New Jersey, as well as in other areas of the country, is that of fine particulates. Also known as PM 2.5, these particles have a diameter of less than 2.5 microns (one micron is one millionth of a meter). Their components include sulfates, nitrates, organic aerosols and elemental carbon. These particles are either emitted by the combustion of fuel or formed in the atmosphere from gaseous air pollutants, and can be inhaled deep into the lungs. Studies have shown that elevated concentrations of very small particles can have significant health effects including

Figure 8





increased mortality rates among some sensitive members of the population (e.g., people with existing heart disease). The national health standard for fine particles was set in 1997 at 15 µg/m³ (micrograms per cubic meter) for an annual average, and at 65 µg/m³ for a 24-hour average. States were required to begin monitoring for this pollutant by 1999. Three years of data are required to determine if the particle standards are being met, a process which states must complete between 2003 and 2005. **Figure 9** shows which of the annual averages for the state's 19 monitoring sites met the national standard in 1999 and which did not. As can be seen, it appears that PM 2.5 levels may not meet the health standard in the most urbanized parts of the state (Union, Essex and Hudson Counties).

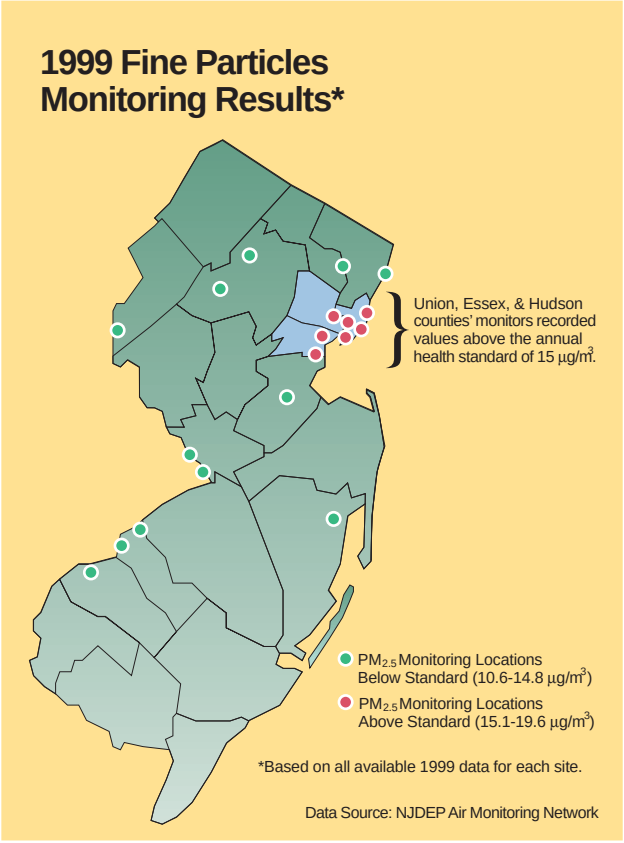


Figure 9

Air Toxics

The Environmental Protection Agency recently made available estimates of the 1990 and 1996 levels of more than 30 air toxics in New Jersey and the rest of the country. The data for New Jersey indicate that, for about a dozen of these pollutants, there are fairly widespread exposures to potentially unhealthful levels. The sources contributing to air toxics exposures in New Jersey can be sorted into the same categories described previously for the ozone precursors: 1. On-road Mobile Sources (cars, trucks and buses), 2. Non-road Mobile Sources (such as construction equipment, and lawn and garden equipment), 3. Point Sources (mainly large manufacturing facilities, power plants, and refineries), and 4. Area Sources (including thousands of small sources such as consumer product usage, dry cleaners, gas stations and residential space heating). The estimates provided for 1990 and 1996 indicate that mobile sources (both on-road and non-road) accounted for a substantial portion of the overall emissions in the state in the two study years (**Figure 10**).

Exposure to toxics in the air tends to be proportional to the overall emissions of the toxics. Comparison of 1990 to 1996 air toxics results shows that emissions have been reduced substantially in New Jersey over that six-year period. USEPA is now preparing estimates for every third year and it is expected that the 1999 results (which will be available in 2002) will show continued reductions in emissions and related exposure to air toxics in the state.

Air Deposition

Atmospheric deposition occurs when pollutants in the air fall on the land or water. The transfer of these pollutants can have negative consequences. Deposition can be either *wet* (snow, fog or rain) or *dry* (particles or gases) and either *direct* (from the air to the water) or *indirect* (pollutants settle on the land and are carried into a water body by runoff). Many different chemicals, including toxics such as mercury, PCBs, pesticides (e.g., chlordane), and nutrients such as nitrogen, can find their way onto our land and water via deposition. Toxics can be harmful to wildlife and people. For example, consumption of fish contaminated with mercury is a significant concern. Nutrients can cause eutrophication and degradation of aquatic ecosystems. In addition, air pollutants such as sulfates can result in acid rain. Both wet and dry air deposition are now monitored in a number of locations in the state. Measurement of the composition of fine particles (a major component of deposition)

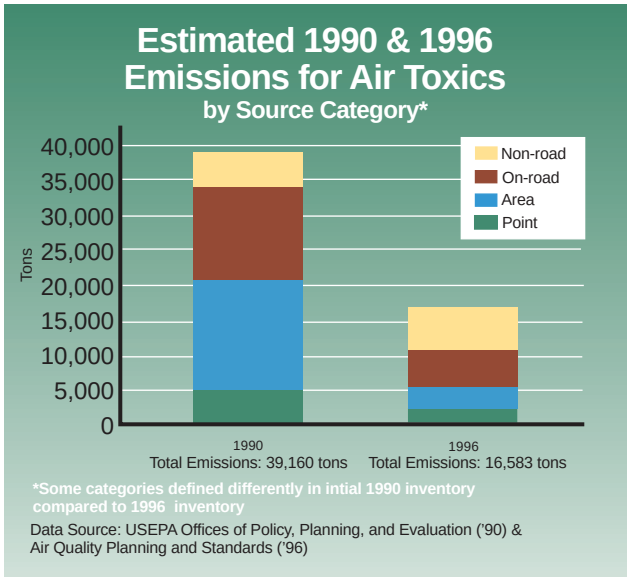
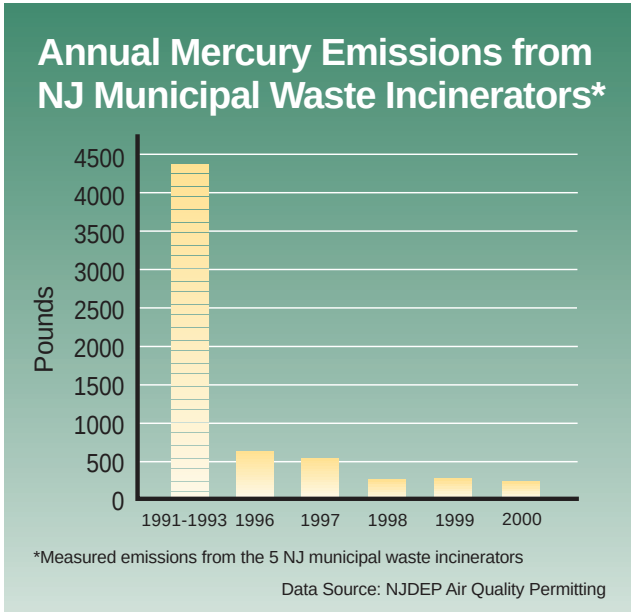


Figure 10

Figure 11



occurs at one site, the Brigantine National Wildlife Refuge.

To understand the extent of the problem in NJ, a nine-station NJ Atmospheric Deposition Network (NJADN) was established in 1998 to monitor the types and amounts of contaminants being deposited. Results to date include:

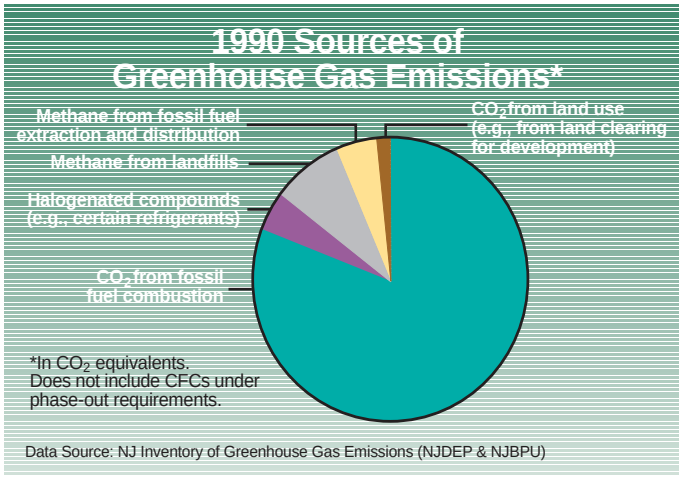
- ❏ The average wet deposition of mercury in New Jersey is around 15 micrograms/square meter/year. This is at the high end of the range of what other studies have shown for the Eastern U.S.;
- ❏ Wet deposition of nitrate appears high enough to potentially impact some watersheds; and
- ❏ Sulfate wet deposition levels are consistent with previous studies done in both New Jersey and throughout the US, and may be causing ecological impacts.

Analysis of the NJADN data will determine if continued monitoring of certain pollutants is needed, as well as which pollutants deposited from the air may provide significant loadings to specific watersheds.

One way New Jersey is working to reduce air deposition of important pollutants is to reduce their emissions in the first place. For example, the Mercury Task Force is developing recommendations to reduce mercury emissions. Some mercury emissions cause in-state deposition of mercury. Substantial reductions of mercury released to the New Jersey environment have already occurred. Through a combination of emission controls and source reductions, we have reduced mercury emissions from solid waste combustion by more than 90 percent since the early 1990s (**Figure 11**).

Global Climate Change

According to the International Panel on Climate Change, the primary cause of global warming during the last century is the anthropogenic input of greenhouse gases (GHGs) in the atmosphere. GHGs are chemicals that absorb infrared radiation in the form of heat, preventing the venting of this energy into space. A certain level of GHGs in the atmosphere is essential to maintaining the earth's temperature at a level that can support life. However, as the concentration of GHGs in the atmosphere increases, more heat is trapped and the overall global climate is altered.

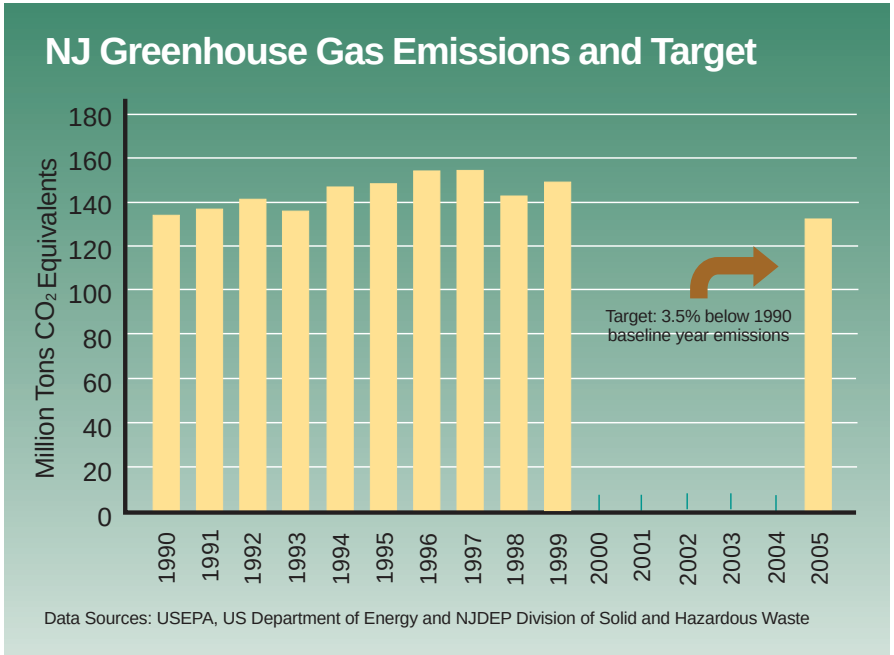


One of the most significant environmental impacts of global warming is sea level rise, which may have significant long-term environmental and economic impacts. In states and countries with extensive shore communities, such as New Jersey with its 127 miles of shoreline, a rising sea level places billions of dollars in coastal infrastructure and personal property at risk. New Jersey derives significant economic and recreational benefit from its coastal resources and we need to ensure this resource is protected.

New Jersey is one of several states to recognize that climate change is a global issue with local solutions and local benefits, but it is the only state in the nation with a specific goal for GHG reductions. We have incorporated that goal into our overall environmental planning process and the programs that support it through the adoption of the *New Jersey Sustainability Greenhouse Gas Action Plan* in April 2000. This plan can be found at http://www.state.nj.us/dep/dsr/gcc/gcc.htm.

Using 1990 as the baseline, the sources of GHGs in New Jersey are shown in **Figure 12**. More than 80 percent of the GHGs resulted from the combustion of fossil fuels to produce energy for heating, cooling, electricity and transportation. New Jersey's major sources of GHGs by sector were transportation (34 percent), residential (21 percent), industrial (17 percent) and commercial operations (16 percent). A combination of smaller sources in other sectors accounted for the remaining 12 percent of the state's greenhouse gas emissions. To address this, New Jersey has established a goal to reduce GHG emissions to 3.5 percent

Figure 13



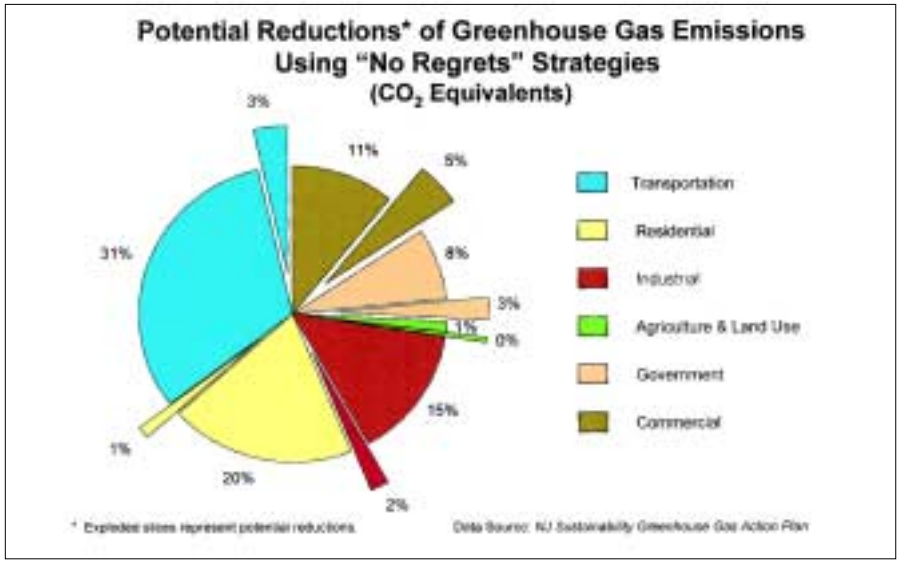


Figure 14

below the 1990 baseline by 2005, an estimated reduction of 20.4 million tons of CO_2 equivalents (**Figure 13**). By implementing the "no regrets" strategies within the GHG Action Plan, the potential reductions for each source and sector can be estimated (**Figure 14**). "No-regrets" means technologies that are currently commercially available, have relatively short payback periods (less than 4 years), and have other significant environmental benefits.

New Jersey is working on a variety of approaches, several of which are described below, to implement the strategies of the GHG Action Plan. Within state government, there is a Governor's Administrative Order for all state agencies to incorporate sustainability into their programs. State facilities will measure their progress by tracking their overall energy efficiency through their total energy use and total GHG emissions reductions. Another approach involves the voluntary signing by industries of the GHG Covenant, wherein they pledge to help New Jersey meet its GHG reduction goal through implementation of reduction strategies at their facilities. The GHG Covenant also has been signed with each of New Jersey's 56 colleges and universities, and the same approach is being linked to the new public school construction programs.

Taking action to reduce GHG emissions does not conflict with economic growth; in fact, these actions often benefit the state's economy by helping New Jersey businesses compete effectively in national and international markets. Those implementing GHG reduction strategies often save money as they become more energy efficient. Recent data show that more New Jersey products are being manufactured today than 30 years ago with the same amount of energy. New Jersey represents 3 percent of the US population but generates less than 2 percent of the total US GHG emissions. Our many innovative energy technology companies will also benefit economically as demand for their products—photovoltaic (solar) cells, fuel cells, microturbines, geothermal systems and more—grows in New Jersey and nationally.

Improving energy efficiency to reduce GHGs also advances a variety of other valuable environmental programs in the state, such as open space preservation, brownfields redevelopment and watershed protection. Successful GHG Action Plan implementation will advance pollution prevention methods to reduce air emissions, lower wastewater discharges, improve water quality, and lower waste generation. In addition, it could help to reduce New Jersey's contribution to global warming effects, protecting our coast against sea level rise.

What Can You Do?

Learn

- ❑ The quality of the air we breathe can vary greatly by location, season, time and weather conditions. NJDEP's continuous air monitoring system measures specific pollutants, compares them to national air quality health standards, and calculates and reports regional air quality on an hourly basis. Visit www.state.nj.us/dep/airmon/aqiscale.htm to learn what pollutants are measured and how the Air Quality Index (AQI) is calculated.
- ❑ All homes should be tested for radon and mitigated if the concentration is 4 pCi/L or greater. Visit www.state.nj.us/dep/rpp/ber/radon/ to learn why and to find out who New Jersey's certified radon testers and mitigators are.
- ❑ Think *Green Energy*. If you're building or renovating, you can reduce CO_2 and save money, too. To learn about green energy, visit www.repp.org/greene/greeneduhome.html

Practice

- ❑ Send a request to bamweb@dep.state.nj.us to be notified via e-mail whenever unhealthy air quality is being forecast for New Jersey. Or, check any of the following sources for the air quality forecast for your area:
  - www.state.nj.us/dep/airmon
  - 1-800-782-0160, for a recorded summary of the day's pollution forecast
  - New Jersey Network TV nightly news
  - Your local newspaper
- ❑ Select a power provider whose electricity comes from renewable resources (e.g., the sun, wind, or heat from the earth, also known as geothermal) rather than from coal, nuclear power plants, and other sources that generate pollution and toxic waste.
- ❑ Replace standard light bulbs with energy-efficient fluorescents to reduce carbon dioxide emissions by 500 pounds per year, per light bulb.
- ❑ Wrap your water heater in an insulating jacket to improve its efficiency and to reduce carbon dioxide emissions by up to 1,000 pounds per year.
- ❑ A car produces 20 pounds of carbon dioxide emissions for every gallon of gas that it uses, so when shopping for a new one, look for the most fuel-efficient.
- ❑ Buy energy efficient household appliances and electric (or manual) yard tools.
- ❑ Use water-based paints and environment-friendly cleaning solutions—you'll contribute less to air pollution and may save money too.

Get Involved

- ❑ The Ozone Action Partnership is a group of businesses and organizations that take voluntary steps to help reduce the pollution that forms ozone. NJDEP declares Ozone Action Days when it's forecasting exceptionally high concentrations of ground-level ozone. Then the Partnership's participating businesses notify their employees so they can telecommute, share rides to work, use mass transit, and take other steps to help reduce smog. Consider becoming a partner or encouraging your employer to become an Ozone Action Partner.

Clean & Plentiful Water

GOAL: New Jersey's rivers, lakes and coastal waters will be fishable, swimmable and support healthy ecosystems. Ground water will be a clean source of water. Every person in New Jersey will have safe drinking water. Adequate quantities of surface and ground water will be available for all needed uses.

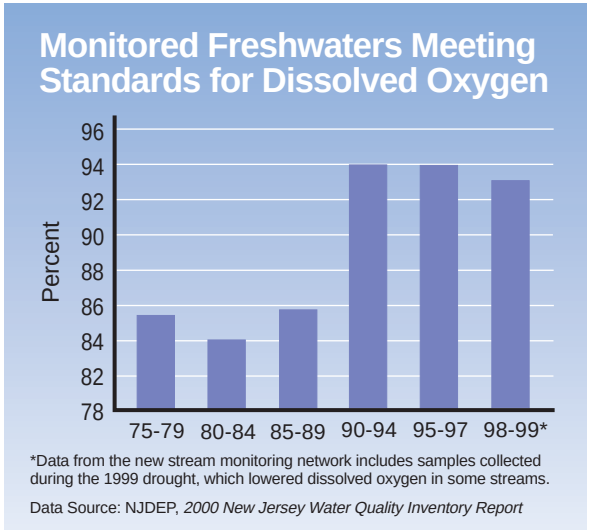
Clean & Plentiful Water

Surface Water

New Jersey's surface waters provide habitat and food for numerous species of wildlife and are an important source of drinking water and food for residents. In 1999, more than 96 million pounds of fish and 71 million pounds of shellfish were harvested commercially from New Jersey's coastal waters, with a combined value of $100 million. Fishing, swimming, and boating are favorite pastimes and are important to the tourism industry. Tourism in New Jersey coastal counties is a $12 billion industry that employs hundreds of thousands of people. Clean water is important economically and ecologically to the well-being of New Jersey.

Surface water quality has remained excellent in undeveloped areas such as the Pinelands and the Delaware Water Gap and has improved in rivers and estuaries. Largely as a result of upgrades to sewage treatment plants, New Jersey's surface waters typically meet or are better than required by our surface water quality standards for dissolved oxygen and ammonia. Dissolved oxygen is necessary for most aquatic life in rivers, estuaries and the ocean. The average concentration of dissolved oxygen in New Jersey rivers has improved from the 1970s to the 1990s (**Figure 15**). In the 1990s, between 93 and 94 percent of our monitored freshwaters met the dissolved oxygen standards.

Figure 15



Despite the severe drought conditions in 1999, which lowered dissolved oxygen in some small streams, the statewide average dissolved oxygen level was 9.8 parts per million (ppm) in 1998 and 1999. This concentration is significantly better than required by the standard of 7 parts per million established to protect trout reproduction. Concentrations of ammonia, which can be toxic to fish in elevated concentrations, were also significantly better than required by standards.

In response to improved water quality, many fish communities in northern New Jersey rivers are healthier now than in the 1970s, with relatively few fish communities classified as "poor" (**Figure 16**). Freshwater fish community data are available at this time for northern New Jersey; these data are now being collected in southern New Jersey as well. Fish community assessments indicate the diversity of fish present and do not consider fish consumption advisories. Over the past several years, New Jersey has upgraded trout classifications of 16 streams, including 13 that now support trout production.

Populations of aquatic insect larvae and other organisms that live in stream beds are also used to indicate the overall health of aquatic ecosystems. These bottom-dwelling (benthic) organisms act as indicators, like the proverbial canary in a coal mine, because they respond to improving or degrading conditions faster than fish populations. Benthic populations are examined for organisms that are sensitive to pollution and those that are tolerant of pollution. Statewide monitoring of these bottom-dwellers at about 800 stream locations initially showed that about 35 percent of New Jersey streams were not impaired, and the remainder were showing moderate or severe impairment. These results were used to set a target to increase the stream miles that are not impaired from 35 percent to 50 percent by the year 2005. Data collected from 1997 to 2001 indicate that, while unimpaired stream miles decreased marginally

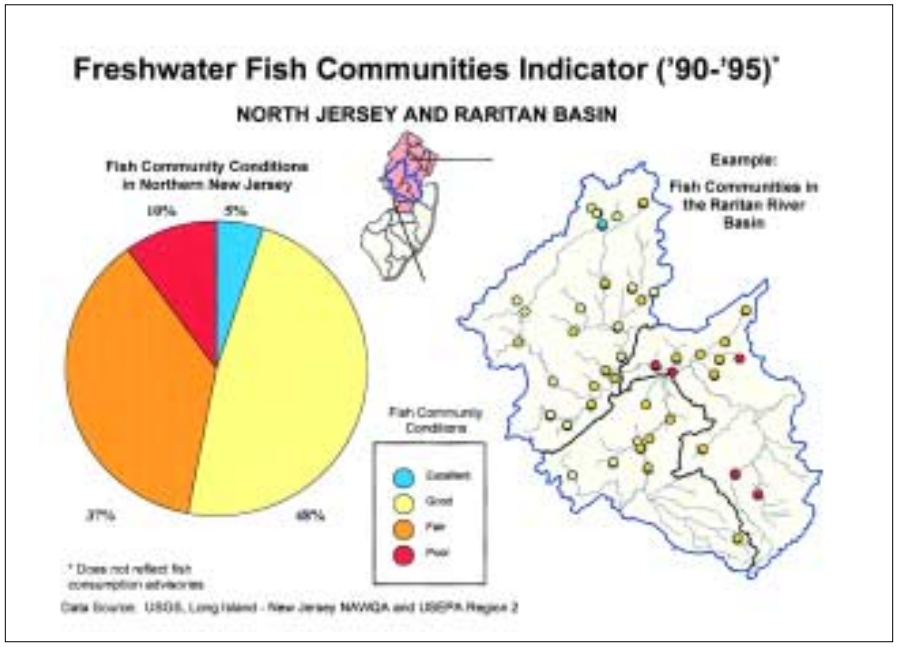
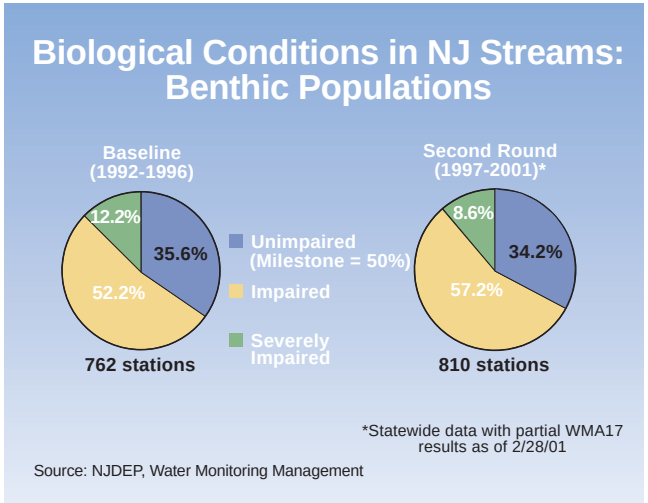


Figure 16

Figure 17



(from 35.6 to 34.2 percent), severely impaired stream miles also declined from 12.2 to 8.6 percent (an improvement). (**Figure 17**)

Benthic communities reflect many stresses on the aquatic ecosystem. Based on a study in northern New Jersey and Long Island, the most important factors that stress benthic communities are flow alteration, sedimentation, erosion, and loss of forest and wetlands. In this study, chemical pollution was not identified as a significant cause of benthic impairment. Natural factors such as droughts or floods can also stress aquatic communities. Development can impact aquatic ecosystems too. As watersheds are developed, stormwater can erode stream banks, releasing sediments that can smother aquatic plants and organisms. In addition, some streams have been channeled for flood control or development, removing the physical habitats used by aquatic organisms. While chemical pollutants in New Jersey streams and sediments have been monitored for many years, a statewide evaluation of stream habitat, flow and other stressors is now underway.

In coastal areas, a steadily increasing percent of available shellfish beds are open to harvesting—currently 88 percent (**Figure 18**). Notably, effective nonpoint pollution control programs have allowed the shellfish industry to thrive once more on the Navesink River in Monmouth County.

Beach closings for excessive bacteria concentrations at ocean and bay beaches have reached record low numbers in recent years (**Figure 19**). No beaches have been closed due to floatables since 1990. Statewide information on water quality at lake bathing beaches has now been compiled for the first time. Only 7 percent of our state's lake beaches do not have good enough water quality to support swimming. Water quality issues at these beaches will be addressed through watershed management partnerships.

Prior to 1991, 450 dry tons of sewage sludge were dumped in the ocean per day. Today, thanks to successful efforts to prevent toxics from tainting sewage sludge, more than 60 percent of it is beneficially used to fertilize crops, support landscaping activities, and reclaim damaged land. Much of this progress is the result of the $5 billion spent since 1972 to improve sewage treatment. Through an advanced pretreatment program, significant improvements have also been made to prevent or reduce industrial pollution and to improve treatment of industrial wastewater. Progress is also beginning to be made in addressing the pollution from combined sewers, which typically occur in older urban areas and convey both sewage and stormwater to sewage treatment plants. During storms, these collection systems can become overloaded, causing sewage and stormwater to be released to rivers and estuaries.

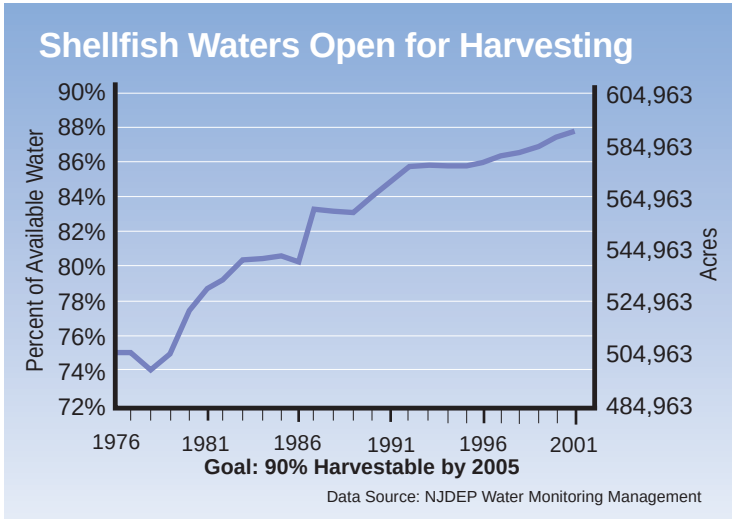
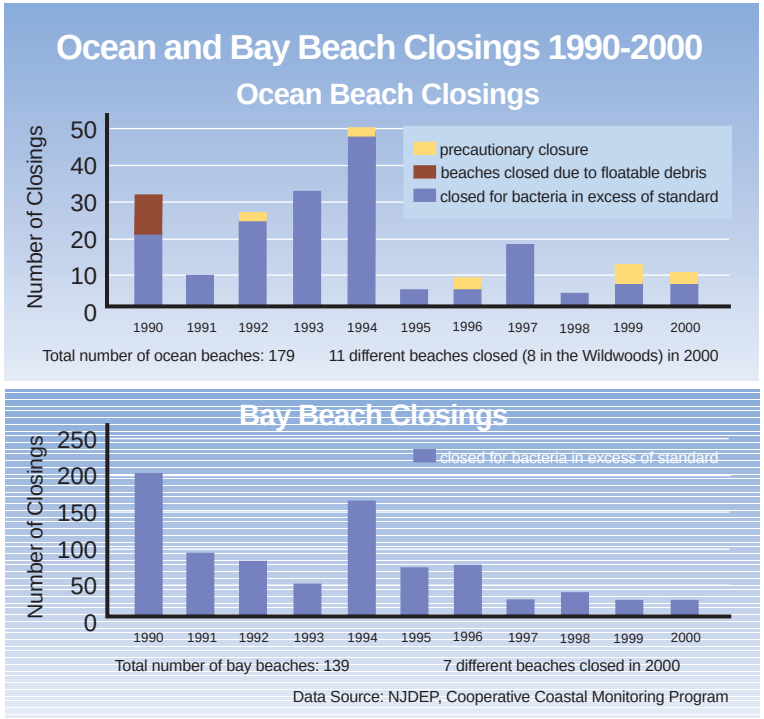


Figure 18

Watersheds are "nature's boundaries," encompassing the areas of land that drain into a body of water such as a river, lake, stream or bay. A watershed includes both the waterway and the entire land area that drains into it. We all live in a watershed. New Jersey's 151 watersheds have been grouped into 20 watershed management areas.

Despite significant improvements, many watersheds are harmed by various kinds of pollution. Some lakes and rivers have become overgrown with weeds and filled in with sediment. Erosion sends sediments into lakes and harbors, which then require dredging. Bacteria, particularly from stormwater, may at times force closures of beaches and shellfish beds. Although there are many fish in the state's waters that are generally healthful to eat, advisories to reduce consumption of some fish species due to toxic contamination, such as mercury, have been issued. Fish advisories apply to selected species, generally those fish at the top of the food chain. Additional information on fish advisories may be

Figure 19



found at www.state.nj.us/dep/dsr/njmainfish.htm

So far, management strategies have focused on wastewater from factories and sewage treatment plants. As significant progress has been made in addressing these point sources, nonpoint source and stormwater pollutants have become significant concerns. Nonpoint source pollution includes all sources that do not come from a pipe; it results from activities such as fertilizing lawns and golf courses, pet wastes, improper disposal of used motor oil and littering. With each rainfall, pollutants generated by these activities are washed into storm drains that flow into our waterways and ocean. In some places, high volumes of stormwater lead to frequent flooding. Wetlands can absorb floodwaters and filter polluted stormwater, but these benefits are lost if wetlands are filled or otherwise disturbed.

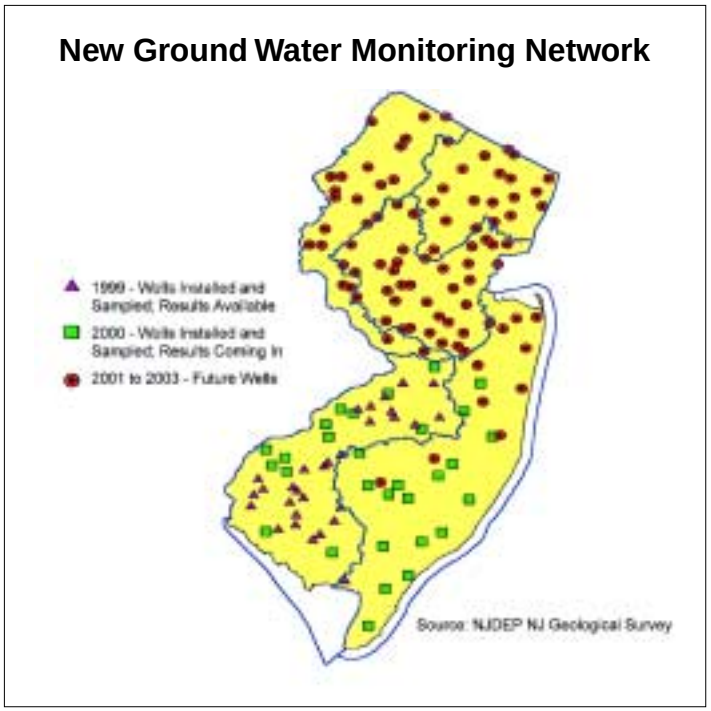
Ground Water

Ground water is a hidden resource. This underground water comes primarily from rainwater trickling downward through soil to where all the openings, such as pores, fractures and solution channels, are saturated with water. That process is called ground water recharge. Ground water generally moves very slowly from where it is recharged to where it discharges into streams, lakes and bays. During this journey, ground water can be intercepted by wells that draw water for purposes such as potable use and irrigation. It is an important source of drinking water and helps sustain streams, lakes and wetlands, particularly during dry times of year. Therefore, the quality and quantity of ground water influences surface water and the health of aquatic ecosystems. This is of particular significance in the New Jersey Atlantic Coastal Region and portions of the Delaware Region where up to 90 percent of the annual flow in these streams is from ground water sources.

Ground water quality is generally good in New Jersey. Industrial and commercial discharges to ground water are investigated and managed to protect ground water from point sources of pollution, such as leaking underground storage tanks, large onsite sewage disposal sources, and sanitary landfills. However, in some locations, ground water over large areas can be contaminated by nonpoint sources and naturally occurring contaminants. Nonpoint source impacts to ground water occur if pollutants from atmospheric deposition or pollutants associated with land use activities in Urban/Suburban and Agricultural areas enter the ground water system as recharge. Common nonpoint pollutants include fertilizers, pesticides and road salt. Our knowledge concerning the exact types of nonpoint source contaminants and the degree of their impact on our ground water resources is not complete. To help increase our understanding, a new network of wells is being established (**Figure 20**) to sample newly recharged water at the top of the ground water table. This network will help us evaluate the impacts of land-use on ground water quality. The shallow ground water tested in this network can be considered the doorway into our ground water system. First year results in southwestern New Jersey indicate that nutrient concentrations can exceed drinking water standards in some areas, and very low concentrations of certain pesticides and volatile organic compounds (below drinking water standards) can be detected in our shallow ground water system.

Additionally, some contaminants, such as radon, radium, and arsenic, occur naturally in ground water and can occur at levels that are a human health concern if the water is used for drinking. To protect the public health, the NJDEP continues to fund studies to better understand the occurrence of these contaminants in the environment. Elevated levels of mercury have been found in numerous private drinking water wells that tap into the Kirkwood-Cohansey aquifer system located in the Coastal Plain of southern New Jersey. This mercury was most likely introduced into the environment by human activities. Although wells that show no signs of mercury contamination far outnumber those that do, the NJDEP investigated the sources and distribution of mercury in this aquifer, informed the public about this potential health threat, and offered treatment options.

Figure 20



Ground water contamination by bacteria may also be a concern where ground water supplies drinking water to private wells, or if it contaminates shellfish harvesting waters.

Drinking Water

A major use of New Jersey's water resources is for drinking water supply. About 1.2 billion gallons of potable water are used in New Jersey each day with 88 percent of the state's population receiving its drinking water from public water systems, while the remainder is supplied by private residential wells. About half of the state's population receives its drinking water from surface water, the rest from ground water.

Drinking water is a direct route of potential human exposure to microbiological and chemical contaminants. To protect public health, both EPA and NJDEP have set standards for approximately 90 contaminants. Public water suppliers must monitor for these regulated contaminants, based on the type of water system and the source of the drinking water. Public water systems that serve homes are called community water systems. Since 1995, 97 percent or more of the community water systems in New Jersey have met the microbiological standards each year, and compliance with all of the chemical standards has improved from 89 to 93 percent in community water systems (**Figure 21**). Compliance with the microbiological standard is remarkably good and when a problem occurs, the systems fix it quickly.

New Jersey has focused particular attention on reducing exposure to volatile organic contaminants (VOCs), including solvents, degreasers and components of gasoline. In 1983, the New Jersey Legislature gave NJDEP the authority to require semiannual monitoring and the responsibility of developing the standards, or Maximum Contaminant Levels (MCLs), for these contaminants in community water systems. Today there are MCLs for 26 VOCs in New Jersey. Water quality, with respect to VOCs, has improved over time. By 1999, only 6 percent of community water systems had a sample that exceeded any VOC standard (**Figure 22**), and only one system had elevated concentrations for a long enough time to become a violation. Systems with a sample above the standard are required to increase monitoring for VOCs.

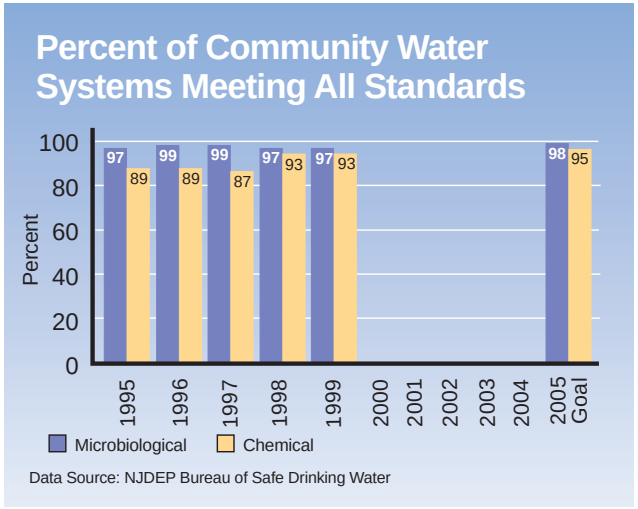


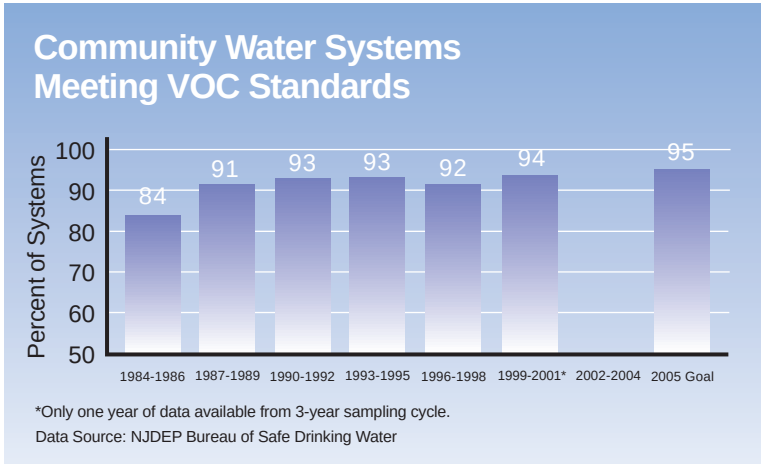
Figure 21

Over the last few years, NJDEP has become more concerned about naturally occurring radiological contaminants in drinking water systems. Community water systems have tested their water for radiological contaminants since the late 1970s. In 1996, New Jersey began analyzing radiological samples within 48 hours of collection and found elevated levels of radiological contaminants in drinking water samples. The contamination has been attributed to naturally occurring, short-lived radioisotopes such as radium 224. Radium 224 is most often found in the Kirkwood-Cohansey aquifer system of southern New Jersey.

Under this new testing method, samples from several community water systems were found to be above the drinking water standards. These systems are taking necessary steps, including public notification and inclusion in the purveyors' Consumer's Confidence Reports, to safeguard the public and are either removing the radiological contaminants from the water systems through additional treatment or using other sources of drinking water.

About 400,000 private wells in New Jersey serve approxi-

Figure 22



people. These wells must be tested for microbiological contamination and a limited number of other chemicals (e.g., nitrate) when a well is drilled, but subsequent monitoring is the responsibility of the homeowner. Some county and local health departments have required retesting of the well when the property is sold. The landmark Private Well Testing Bill, which requires testing of all private wells at the time of a real estate transfer was signed in to law on March 23, 2001 as P.L. 2001, Chapter 40.

Plentiful Water

New Jersey's homes, industries, businesses, and farmers use about 1.5 billion gallons of water each day, but the amount and where it's used changes with the seasons. For example, water use in the seasonal resorts at the Jersey Shore can double or triple during the summer. Agricultural use increases greatly during the growing season.

New Jersey's network of surface-water intakes, reservoirs, wells, and system interconnections generally provides adequate supplies for withdrawal for all uses (**Figure 23**). However, there are threats to our water supplies. These include droughts, inadequate ground water recharge, and local and regional overuse. During times of drought, the ability to meet all of the state's water needs while protecting the environment can be challenging. To meet this challenge a new plan is being devised to enable the state to better respond to water supply shortages caused by drought.

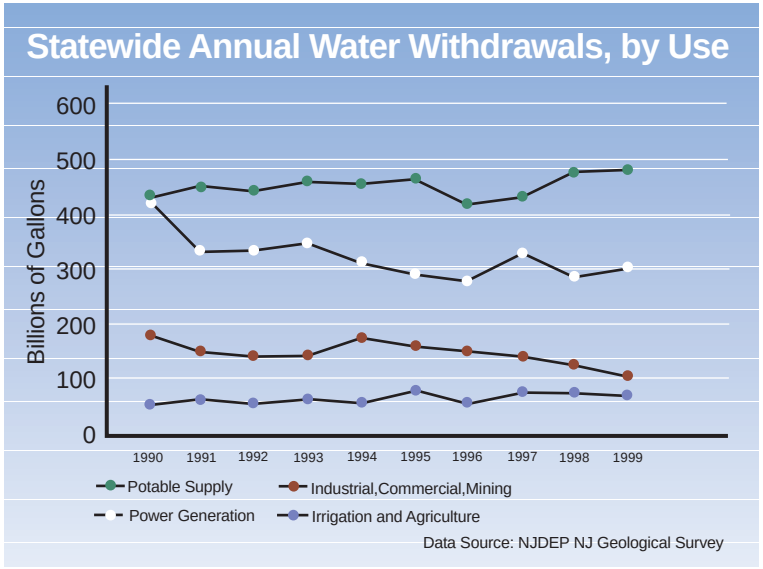
The new drought response plan includes dividing the state into six drought management regions (**Figure 24**) that reflect factors including the type of water resources used, climate, and interconnections between regions. The drought status of each region will be based on an evaluation of its water supplies. This approach will allow the targeting of conservation efforts to where they are most needed as supplies are stressed. Figure 24 also shows an example of the drought status for the Central Drought Region in January 2001.

Efforts are underway to identify an advance drought warning indicator. This indicator tracks long-term deficits in rainfall that will later cause diminished water supplies. Finally, a real-time drought monitoring network that allows instant access to data on stream flow and ground water and reservoir levels is being designed. This network will improve response time in determining when measures are needed to conserve water supplies and when they can be relaxed to avoid hardship.

Ensuring plentiful water for the future involves understanding where our water comes from. Much water in streams and all water in aquifers originates as recharge to the land surface. Most ground water eventually flows to streams, while much is captured by wells. Understanding the distribution and infiltration rates of ground water recharge areas is critical to conserving water supplies and ensuring their quality.

Changes in land use can diminish its capacity to recharge ground water. Land use planning needs to recognize the potential impact of changes in land use on the availability of water. Knowing where important recharge areas occur will allow for better decisions on appropriate development and open space acquisition efforts statewide. A statewide ground water recharge data coverage is now available through the NJDEP's GIS network; call 609-292-1185 for copies. Planners are using these data to help revise land use master plans and undertake other resource-based planning initiatives in many areas of the state.

A variety of other initiatives also help to ensure New Jersey's supply of clean



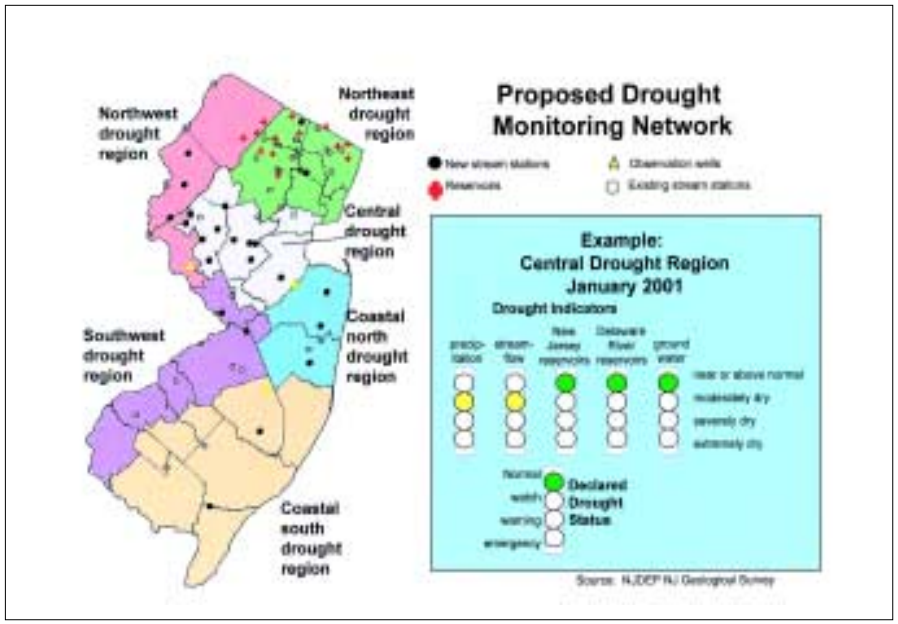
and plentiful water. For example, efforts to protect open space will also benefit aquatic communities and water quality. Following the 1999 drought, the beneficial re-use of wastewater on golf courses and for irrigation became a more important strategy to reduce demand on water supplies.

Strategies to Protect and Enhance Water Resources

Through statewide watershed management, New Jersey is implementing an integrated approach to maintain existing high quality surface and ground waters, clean polluted waters, protect aquatic ecosystems and enhance water supply protection. The issues affecting each of the 20 watershed management areas are being identified and will be prioritized. New Jersey has accelerated the watershed management program and has formed partnerships with municipal, county, state and federal governments, business and industry, environmental groups, and citizens in all watershed management areas (**Figure 25**). NJDEP and its partners will develop watershed management plans for each management area. The goal is to work with the watershed communities to reduce point and nonpoint sources of pollution, including air deposition, and to improve and enhance water resources for human and ecosystem use.

In 2000, NJDEP proposed the Water Quality and Watershed Management Planning Rules to facilitate the implementation of holistic watershed management throughout the state.

Figure 24



The department adopted provisions that require environmental evaluations for new discharges to ground water. These provisions apply to discharges to ground water of more than 2000 gallons per day, including developments of six or more residential units served by septic systems outside sewer service areas. Through Governor Whitman's Executive Order 109, the department began additional review of plans to expand sewer service areas and wastewater treatment plants. These reviews have led to innovative strategies to reduce impacts to water quality.

In 2001, the NJDEP will also propose two rules to improve management of stormwater from new and existing development: Stormwater Planning and Management Rules and the Municipal Stormwater Permitting Rules. As these rules are implemented, the impacts of stormwater will be reduced as each municipality prepares stormwater management plans, ordinances and provides local education.

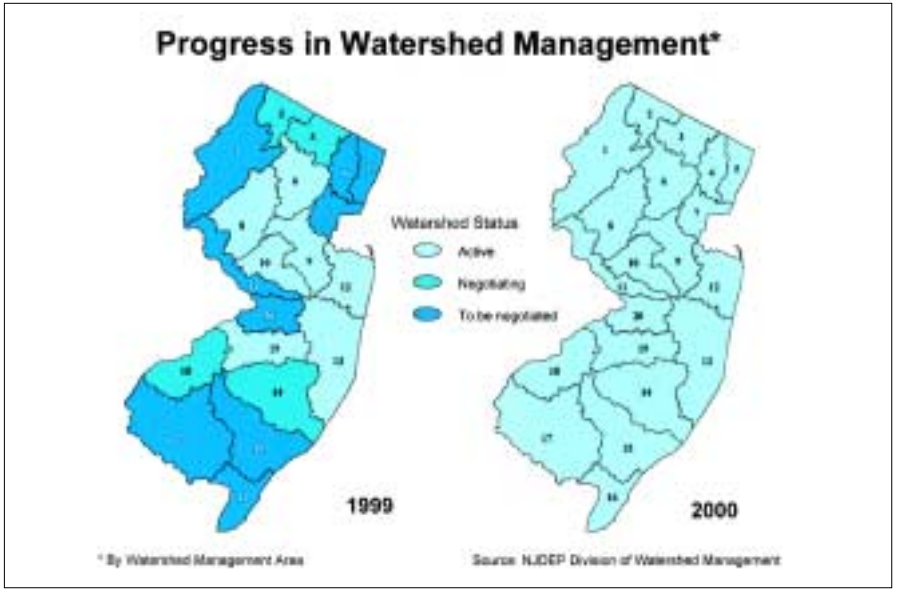


Figure 25

What Can You Do?

Learn

- ❑ Visit www.state.nj.us/dep/watershedmgt or call, toll-free, 877-WTRSHED (987-7433) to learn about watersheds—what they are, which one you live in, and when there are watershed events and meetings in your watershed.
- ❑ Read the annual *Consumer Confidence Report* written by your water utility to find out more about your drinking water quality or call NJDEP's Bureau of Safe Drinking Water (609-292-5550). Look for more information in *Statewide Water Quality Inventory Reports* and the *1996 State Water Supply Plan*. A hard copy of the 1996 edition of the former is available for $10 from NJDEP's Maps and Publications Office (609-777-1038; www.state.nj.us/dep/njgs/pricelst/deprprts.htm#swmp); the 1996 and later editions (not available in print) are on-line at www.state.nj.us/dep/dsr/watershed/waterteam. For a free copy of the *1996 State Water Supply Plan*, call 609-292-2113. All of these reports also are available at state repository libraries.
- ❑ Pesticides pollute water, whether they seep into aquifers gradually or are washed by rain into storm drains. Integrated Pest Management (IPM) involves the carefully managed use of an array of pest control tactics to achieve the best results with the least disruption of the environment. Call NJDEP's Pesticide Control Program (609-530-4070) for information about IPM or visit http://ipmworld.umn.edu/.
- ❑ When there's less precipitation than normal over an extended period of time, a drought can occur. Visit www.state.nj.us/drbc/drought/droughthpframeset.htm to learn more.
- ❑ Call 609-292-2113 for a copy of *The Clean Water Book: Choices for Water Resource Protection*. It describes many things you can do to prevent water pollution.

Practice

- ❑ Conserve water.
- ❑ Use biodegradable cleaners and laundry detergents to decrease water contamination.
- ❑ Minimize your lawn area by keeping some areas in their natural state. Plant native flowers, shrubs and trees—they're already adapted to your local environment. Use compost and mulch to improve soil health and reduce the need for pesticides and fertilizers. Practice IPM, but if you must use pesticides or fertilizers, note precautions and follow label instructions. Do not apply fertilizer or pesticides before a heavy rain; polluted runoff can cause significant damage to aquatic ecosystems.
- ❑ Don't put trash or motor vehicle fluids (e.g., oil, coolant) in the street or down storm drains—they'll eventually pollute a nearby stream, lake or beach.
- ❑ Clean up after pets to reduce bacterial contamination in stormwater.
- ❑ Do not feed waterfowl such as Canada geese; it encourages them to congregate and contribute to water quality problems with excessive levels of bacteria and nutrients.
- ❑ If you have a well, test your water annually for bacteria and nutrients. Call your local or county health department for assistance.
- ❑ Whenever possible, recycle your litter, motor oil, household hazardous waste, bottles, cans, and other trash, thus keeping them out of storm drains and local waterways.

Get Involved

- ❑ If you know that your town has sewage or drinking water infrastructure needs, encourage them to contact NJDEP to get more information on low-cost financing.
- ❑ Join local watershed associations, environmental groups or other service organizations involved in water resources. (Go to http://njenv.rutgers.edu/njdlib for a list of NJ Environmental Organizations, searchable by type and geographic area.)
- ❑ Participate in developing watershed management plans, volunteer monitoring, litter cleanups, storm drain stenciling projects, stream bank and wetlands restoration projects, and educational activities.

Land and Natural Resources

GOAL: The health, diversity and integrity of New Jersey's natural resources will be sustained. Natural and scenic landscapes will be preserved and every person will have the opportunity to visit an abundance of well-maintained parks, forests, wildlife areas and historic sites. The public will learn about natural and historic resources and have access to a wide variety of recreational experiences.

Land & Natural Resources

New Jersey is one of the smallest and most densely populated states in the United States, yet it is ecologically unique. Very different northern and southern plant and animal communities call the state home, making New Jersey's ecosystems among the most complex and diverse in the nation.

New Jersey is one of the leaders in statewide biodiversity initiatives. Biodiversity is more than just the number and variety of species; it also includes diversity in the genetic material that makes up those species. At a higher level, it includes the natural communities, ecosystems and landscapes of which species are a part. Biodiversity also encompasses the processes, both ecological and evolutionary, that allow life on Earth to continue adapting and evolving. In order to ensure biodiversity, the state has focused on species monitoring and the protection of plants, animals and ecosystems through land acquisition, conservation and management.

The loss of a species from an ecosystem in which it naturally occurs changes the interactions among the remaining species, as well as their interactions with their surroundings. For people, the loss of a species may mean lost sources of food, medicine, building materials and pest control. Many species that were nearly extinct in New Jersey a few years ago, such as bald eagles, also have an aesthetic and cultural value that is difficult to measure in dollars.

A significant environmental protection effort has been the imposition of restrictions on horseshoe crab harvesting in New Jersey waters in order to aid in the recovery of this ancient species whose numbers have been dramatically reduced in recent years. The harvest restrictions are expected to lead to increased spring spawning activity of horseshoe crabs along Delaware Bay and other New Jersey bay beaches. The recovery of the horseshoe crab is a critical link to the continued survival of other species. Each May, the Delaware Bay shoreline hosts one of the world's greatest bird migrations: red knots, ruddy turnstones and semipalmated sandpipers stop en route from South America to rest and feed on horseshoe crab eggs before continuing nonstop to the sub-arctic where they nest. If the supply of eggs is insufficient, the birds may not put on the weight they need to complete their journey or to nest successfully.

Many ecological communities within New Jersey are healthy and vibrant, while others require restoration and improved management to reverse declining environmental health. One sign of the fragile nature of our habitat is the number of threatened or endangered species that live in New Jersey. Species on the federal Threatened and Endangered Species list are at peril on the national level. New Jersey has its own Threatened and Endangered Species list. These species are in danger of vanishing from the state. (Swamp pink, a flowering wetland plant, is an example of a species that is found on both lists.) In most cases these species are in peril at the regional level as well.

The state has 2,215 known native plant species. Fifteen percent of our native flora is endangered in New Jersey. One percent (30 species) of our native plant species have already been lost from the state. A total of 36 percent of the state's plant species are of conservation concern. In other words, more than one of every three native New Jersey plants is at risk of becoming increasingly rare. Fifteen percent of New Jersey's native plants are also listed as endangered. Of all endangered plant species, only 19 percent have at least one population entirely on state-owned land (**Figure 26**).

New Jersey is also home to 90 mammal species, 79 reptile and amphibian species, about 325 avian species and more than 400 fish species. Approximately 1.5 million shorebirds and as many as 80,000 raptors make migratory stopovers here each year. Of the approximately 900 vertebrate species, 63 are listed as threatened or endangered. Bald eagles and peregrine falcons are examples of species on both the federal and state Endangered Species lists.

To sustain biological diversity, New Jersey must protect the habitats of the state's plant and animal species. NJDEP offers protection of endangered and threatened species habitat on a site-by-site basis by regulating some land development activities. However, the strongest protection that can be offered is acquisition of open space. Sometimes endangered or threatened species inhabit small, unconnected plots of land that are isolated from other existing public open spaces. The state and several nonprofit conservation groups work to identify and protect these unique, ecologically

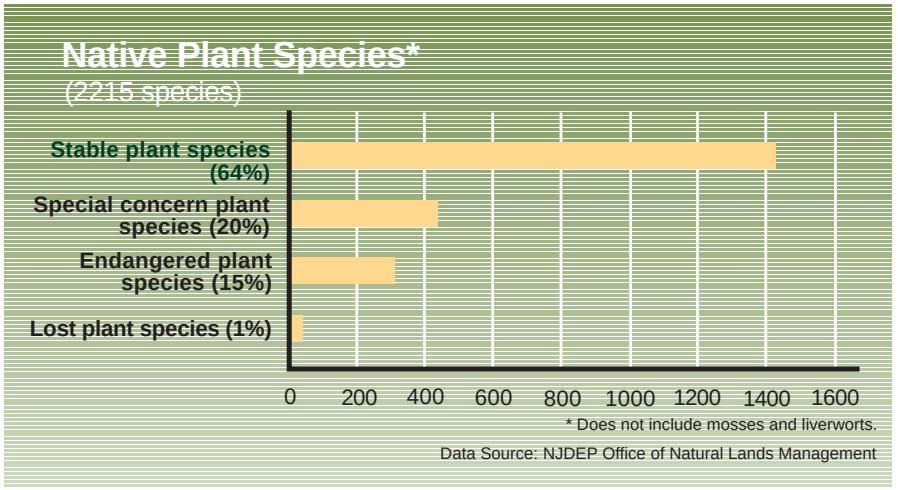


Figure 26

sensitive parcels. Through the Landscape Project and similar efforts, NJDEP is assisting communities with the identification and mapping of critical wildlife habitat. The keys to protecting endangered and threatened species are preserving both large and small parcels of open space and linking those open spaces with greenway corridors.

Large blocks of open spaces provide the variety of environmental conditions that plant and animal populations need for long-term survival. For example, some bird species cannot sustain breeding populations in forests smaller than 250 acres. Open space provides opportunities for forests to remain intact and mature. Greenway corridors provide opportunities for wildlife to migrate, nest, find mates and forage for food. Poorly planned land development can fragment forests and interrupt open space corridors. As land development intensifies in New Jersey's rural and suburban areas, more open spaces become fragmented. The cumulative impacts of development alter the ability of forests and wetlands to filter air and water, and to provide critical habitat.

Flora of the State

Through its Office of Natural Lands Management, the state directly protects rare species and manages for biodiversity on 31,284 acres in 42 sites. The sites range in size from 11 to 3,800 acres, and contain some of the state's rarest ecological communities.

A limited amount of botanical fieldwork by NJDEP and cooperators produced significant discoveries in 2000. Four endangered plant species, thought to be extinct in New Jersey, were rediscovered. They are: the seabeach amaranth (*Amaranthus pumilus*), last seen in 1913; the few-flowered tickseed (*Desmodium pauciflorum*), last seen in 1917; the prickly Florida blackberry (*Rubus argutus*), last seen in 1935; and the cut-leaf coast violet (*Viola brittoniana var. pectinata*), last documented in 1913.

A plant species believed to be lost from New Jersey, Labrador tea (*Ledum groenlandicum*), was rediscovered at a previously unknown location in Stokes State Forest. Of the 33 plant species ranked as lost by the Natural Heritage Program since 1984, this is only the third to be rediscovered.

Urban and Community Forestry

Urban and community forests are made up of street trees, open space, small forested areas, trees in municipal parks and playgrounds, and trees along highways and right-of-ways. They provide such diverse benefits as lowering energy costs, reducing air pollution, providing wildlife with food and shelter, decreasing soil and sediment erosion, and increasing property values, as well as making our communities pleasing places in which to live and work. Improving the health and diversity of New Jersey's urban and community forests benefits everyone.

Through its Urban and Community Forestry Program, which awards Green Communities, Tree Planting, and Stewardship Incentive Program grants, NJDEP assists cities and towns by providing technical support to municipalities, educational programs, and grants for tree planting, maintenance and tree management projects. In 1999 and 2000, these programs awarded more than $2 million to help NJ cities and towns create healthier environments.

The Bald Eagle

The numbers of bald eagle nests and young produced each year are indicators of availability and quality of large-area forest and aquatic habitats, as well as active management by biologists. Historic records estimate that there were 22 New Jersey nests through the 1940s, declining to a yearly average of 1 nest and no young through the 1970s. In 2000, there were 23 active nesting pairs of eagles that produced a record 29 young, for a productivity rate of 1.26 young per nest. The recovery resulted from the release of 60 young eaglets obtained from Canada (1983-1990), the phase-out of DDT and related chemicals, and the protection of active nests and intensive management of failing ones by biologists and landowners. The recovery of our bald eagle population represents a major success in preserving the state's natural heritage and biodiversity (**Figure 27**). However, while the number and distribution of nests continues to improve, habitat loss, human disturbance and man-made contamination (from environmentally-persistent compounds such as DDT and PCBs) threatened 14 of 23 nests in 2000, and remain significant threats to maintaining and enhancing NJ's bald eagle population.

Long-Legged Wading Birds

Long-legged wading birds, also known as colonial nesting waterbirds, are prominent members of estuarine ecosystems. They are important predators, feeding near the top of the food chain on a wide variety of forage fish and on marine invertebrates such as small crabs and mollusks. As relatively long-lived, high-level

predators, these waterbirds serve as valuable indicators of environmental quality, including: resource abundance and health; levels of toxic substances, such as organic contaminants and heavy metals; and levels of human disturbance.

NJDEP's Division of Fish and Wildlife has monitored the nesting populations of 8 long-legged wading bird species through a combination of ground and aerial surveys for the past two decades. Cattle, snowy and great egrets, black- and yellow-crowned night herons, and glossy ibis, as well as little blue and tri-colored herons are particularly good indicators of estuarine systems because they represent a feeding and nesting group of colonial water birds in the Atlantic Coastal ecosystem. Long-legged wading birds also provide an indicator of aquatic life designated use for tidal systems.

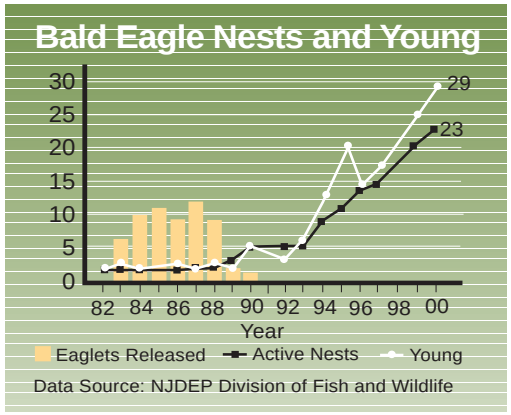


Figure 27

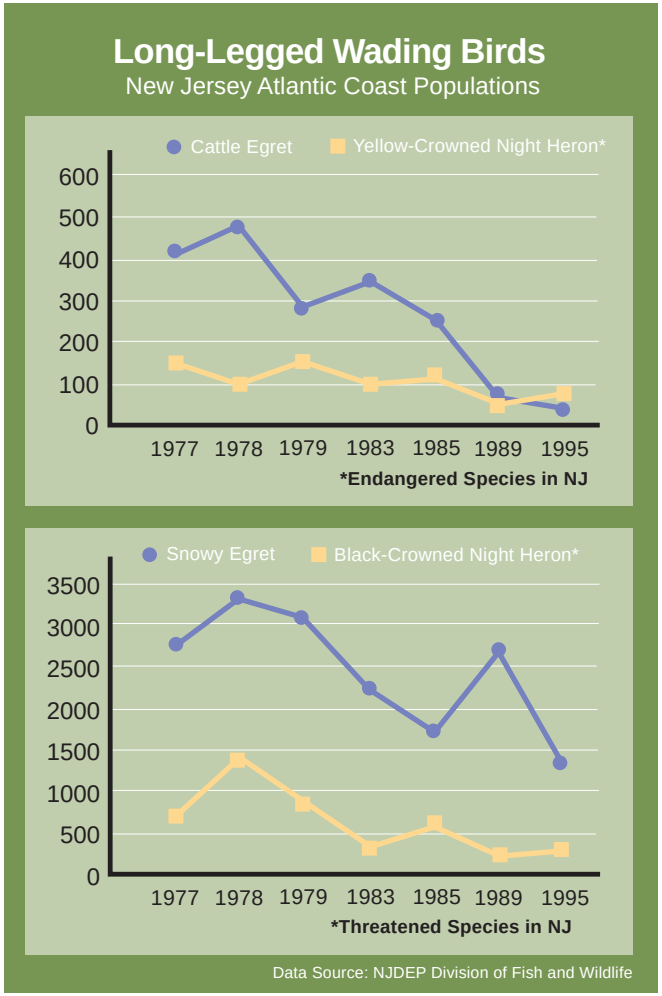


Figure 28

Long-term trends for the 19-year period (1977-1995) for 4 of these species are shown in **Figure 28**. Data show that 5 of these 8 species—cattle and snowy egrets, both night herons and the glossy ibis—declined along New Jersey's Atlantic Coast. The little blue heron and great egret populations remained fairly constant during this period. Only the tri-colored heron experienced a population increase.

Trends for the last 10 years of the period (1985-1995) show cattle egrets continue to decline. Although these data reflect a stabilization in the populations of the tri-colored heron, and yellow- and black–crowned night herons, the latter has failed to recover from a major population decline that occurred between 1978 and 1983. These more recent data also show that the glossy ibis, little blue heron, and great egret experienced modest population increases.

Scientists have found that, like New Jersey's populations, snowy egrets, black-crowned night herons, and glossy ibis populations are decreasing in other states along the Atlantic Coast. Some scientific data suggest these population decreases may result from pesticides and other environmental contaminants.

Nesting success of all colonial waterbirds can be severely reduced by specific types and excessive levels of human activity. Personal watercraft (e.g., Jet Skis) are a particular concern, as these vehicles interfere with waterbird feeding and nesting activities. NJDEP is administering New Jersey's first Marine Conservation Zone for the Sedge Islands of Barnegat Bay. This zone is designed to reduce environmental impacts of personal watercraft and better manage wildlife, recreation and traditional uses of the area.

Wetlands

Wetlands provide critical habitat for wildlife, filter surface water runoff, provide for flood control, and provide aquifer recharge functions. Disturbances of the wetlands—both permitted and unpermitted—affect their

ability to perform these important ecological functions. Compensatory mitigation is the creation, enhancement, or restoration of wetlands of equal ecological value to replace the loss of wetland habitat and function.

New Jersey's wetlands have been drained and filled since settlement by Europeans began in the 1600s, primarily for agricultural and construction purposes. Wetland scientists estimate that the state lost almost 40 percent of its wetlands between the 1870s and 1970s, with as much as 20 percent lost since the mid-1900s. In response to these dramatic losses, New Jersey passed the Freshwater Wetlands Protection Act in 1987, considered to be one of the most, if not the most, stringent wetlands laws in the nation.

Approximately 948,429 acres (19 percent of New Jersey's 4,984,338 acres of land) are wetlands. Of these, 739,160 acres are freshwater wetlands (15 percent of the state's land); the balance are coastal wetlands (4 percent of the state's land).

Permitted wetlands disturbances, in relation to wetland mitigation required, is an indirect measure of the net change in impacted wetlands acreage in New Jersey. From July 1, 1988 to June 30, 1999, a total of 1,638 acres of NJ freshwater wetlands were permitted to be disturbed, while a total of 920 acres of compensatory mitigation were required. This resulted in an estimated permitted net loss of 718 acres of freshwater wetlands (**Figure 29**). With the passage of New Jersey's Freshwater Wetlands Protection Act, the rate of freshwater wetlands losses has been significantly reduced over the past twelve years, compared to pre-1988 losses.

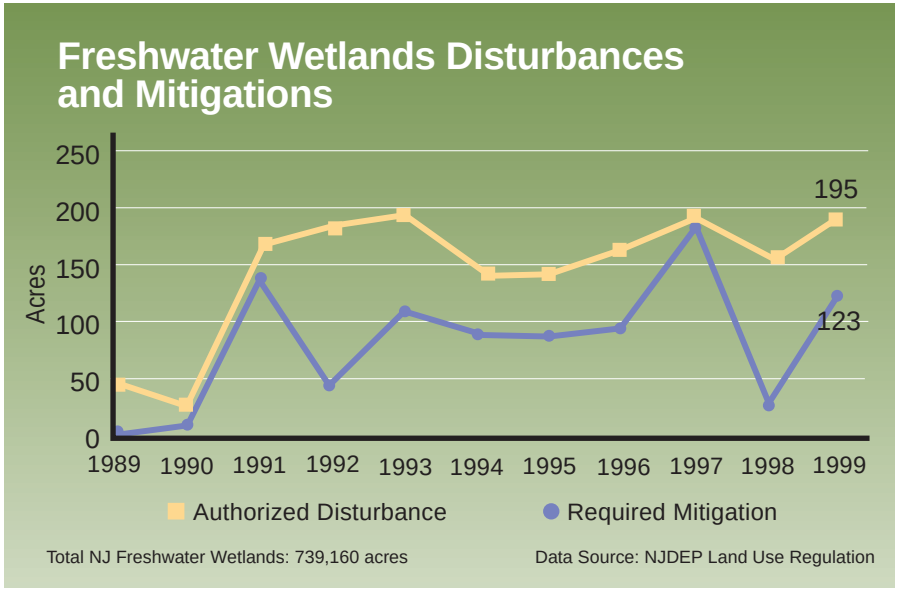


Figure 29

From 1992 to 1998, an estimated 204 acres of NJ coastal wetlands were permitted to be disturbed. Required mitigation for this disturbance consisted of approximately 17.5 acres of creation and 8,849 acres of enhancement (return of natural tidal flow to former salt hay farms). While there has been a net loss of coastal wetlands, an increase in the function and value of approximately 8,900 acres of coastal wetlands where enhancement and restoration projects are underway is projected.

NJDEP and its academic partners are conducting several important research projects to better assess NJ's wetland resources, including the identification of unique wetland plant and animal communities. This research is already helping land managers make better decisions about protecting and restoring wetland communities, including improved methods for wetland creation, restoration and enhancement.

Land Use/Land Cover Information

In recent years, the department has centered efforts on the development of key environmental data that are useful for citizens and communities throughout New Jersey. One of the most significant developments has been to update the state's 1986 land classification information using newer aerial photography from 1995 and 1997. This publicly available information (www.state.nj.us/dep/gis), allows users to assess many different facets of New Jersey ecosystems, including but not limited to, measurement of habitat fragmentation or change, the impact of impervious cover on water quality, and impacts of changing land uses on habitats such as wetlands and forests. The information can be examined at many different levels of scale (e.g., municipal, county, watershed, statewide) and is used for planning purposes in both the public and private sectors.

New Jersey continues to experience land use changes statewide that impact our ecosystems; however, the detailed land use/land cover data NJDEP has made available can provide citizens with important information about the types and locations of habitat changes. At the statewide scale, it is evident that between 1986 and 1995, New Jersey has experienced a net loss of agricultural lands, forested lands, and wetlands—important habitats for resident, as well as migratory, species (**Figure 30 A**).

If we look at the information by New Jersey Watershed Management Area (**Figure 30 B**), these trends may be a bit different. In the Walkill, Millstone, and Central Delaware Watersheds, for example, there has been a net increase in forested land. Citizens can use these data to determine in much finer detail where and what type of land use change is occurring in their communities and neighboring regions. One could determine the types of wetland habitats in their area or, for example, where they may locate Atlantic white

Figure 30 A

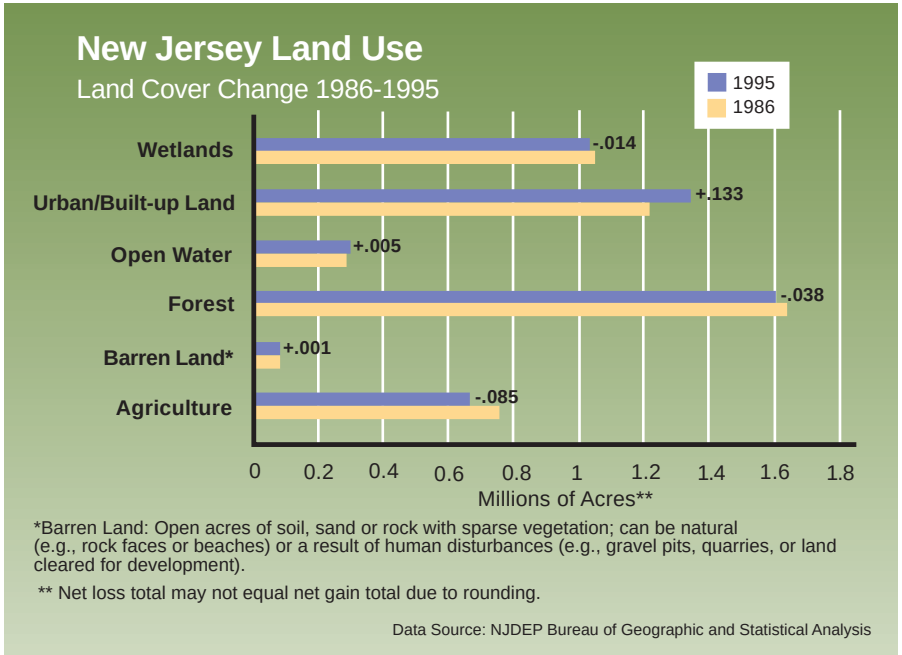
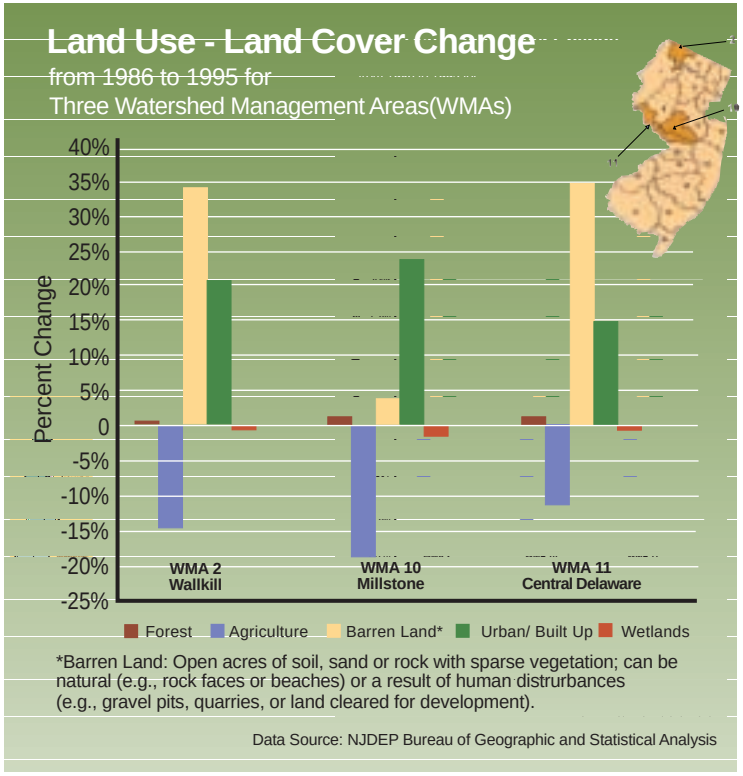


Figure 30 B



cedar wetlands or deciduous wooded wetlands. By analyzing these important data, participants at all levels of government can make informed decisions about their communities, as well as guide land management, conservation, preservation, and acquisition.

Open Space Protection

In November of 1998, New Jersey voters overwhelmingly approved a constitutional dedication of $98 million annually to preserve open space, farmland and historic resources, as well as to provide funds for recreation development projects.

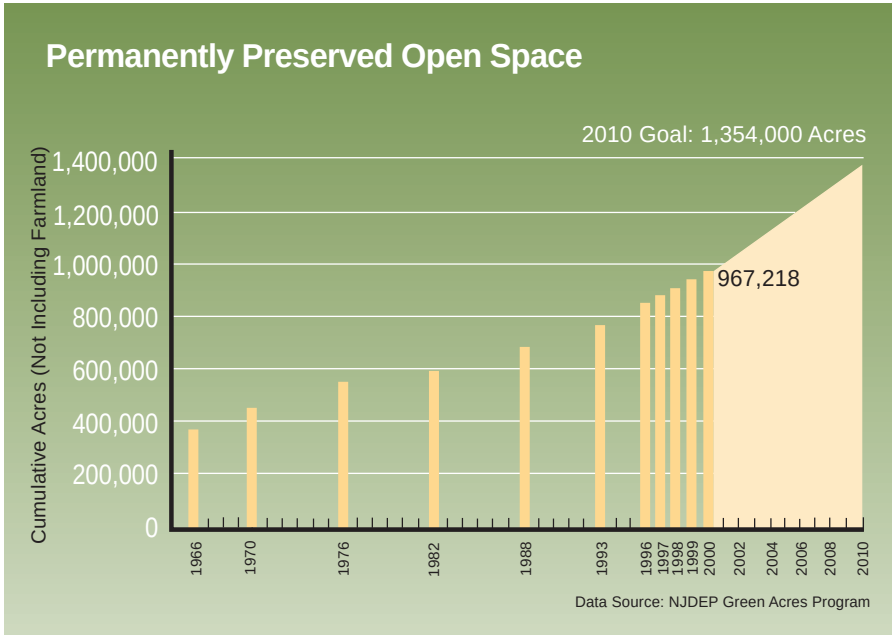
As noted in the Garden State Preservation Trust's January 2001 report, *Stewardship: Taking Care Of Our State Public Lands*, the state's local and county governments have also clearly demonstrated their commitment to preserving land and historic resources. By 1997, the year the Governor's Council on New Jersey Outdoors recommended preservation of an additional million acres in the state, the citizens of 53 local governments and 13 counties had voted to raise their own taxes to provide funds for land preservation and, in some cases, historic preservation purposes. Since the November 2000 election, a total of 146 municipalities and 19 counties now have dedicated taxes for land and/or historic preservation.

While this dedication of funding unquestionably represents New Jersey's largest financial commitment ever to preservation, it follows a long and distinguished history of public investment in land and historic preservation. New Jersey began its acquisition of public lands and important historic sites early in the 20th century, preserving many of its finest natural and historic resources. Included among the earliest lands purchased or donated were Bass River State Forest (1905), Washington Crossing State Park (1912), Stokes State Forest (1915), Swartswood State Park (1915), High Point State Park (1923) and Hacklebarney State Park (1924).

Since 1961, 9 publicly approved bond issues for land and historic preservation have provided $1.39 billion for the Green Acres program, $30 million for the Blue Acres program (flood-plain and coastal preservation), $200 million for the Farmland Preservation program and $60 million for Historic Preservation.

This substantial, long term dedication of funds for preservation represents, in part, New Jersey's response to an urgent need to protect its water supplies, protect wildlife habitats and greenways, enhance urban centers, and provide a broad array of recreational opportunities for all New Jerseyans. It also helps to preserve the state's agricultural land base. Clearly, New Jersey's investment in preservation is aimed at maintaining a high quality of life for all residents.

Figure 31



This expenditure of preservation funds also represents a major investment in sustaining our state's highly profitable tourism industry, which depends on the quality of our unique environmental, scenic, and historic resources. Last year, tourism in New Jersey reached a record high, generating $127.7 billion in revenues and supporting nearly 500,000 jobs (New Jersey Commerce and Economic Growth Commission).

The dedication and expenditure of preservation funds over the years has provided millions of New Jerseyans with substantial quality of life benefits. The stable source of preservation funding available now, over this decade, will substantially add to these benefits.

NJDEP manages much of the state's open space. The Division of Parks and Forestry is steward for 54 parks, forests and recreational areas; 57 historic sites and districts; 42 natural areas; marinas; reservoirs; a golf course, and other miscellaneous facilities. These areas total 346,194 acres and attract more than 15 million visitors annually. The Division of Fish and Wildlife manages 115 wildlife management areas totaling 271,399 acres.

Pursuing Our Open Space Goal

In her inaugural speech in January 1998, Governor Christine Todd Whitman set an ambitious open space goal for New Jersey when she launched an initiative to preserve a million additional acres of open space by 2010, with the first 300,000 acres to be preserved by 2002.

The goal of preserving a million more acres of open space was recommended by the Governor's Council on New Jersey Outdoors after holding public hearings and taking a comprehensive look at the preservation needs for ecological diversity, watershed protection, greenway corridors, conservation of farmland, historic preservation, and recreational open space.

When the Council made its recommendations in May 1997, New Jersey had 868,563 acres of open space already preserved; an additional million acres would result in a 2010 goal of 1,854,000 acres. Since half of the new acreage preserved would be permanently preserved open space and half of the new acreage preserved would be farmland, the open space goal is 1,354,000 acres. By the end of 2000, 967,218 acres of open space had been permanently preserved (**Figure 31**); as of February 2001, the acreage preserved had climbed to 975, 998 (approximately 19 percent of New Jersey's 4,984,338 acres of land).

In addition to NJDEP's Green Acres Program, the Environmental Infrastructure Financing Program has been expanded in order to provide supplemental financing for open space acquisition. Half-market rate loans to purchase land throughout New Jersey for water quality protection are now available through the Environmental Infrastructure Trust. In 2000, 34 applications totaling approximately $250 million were submitted to the Trust. Once approved, these applications would result in the preservation of an additional 12,000 acres of open space.

What Can You Do?

Learn

- ❏ Learn about the state's biodiversity by visiting an interpretive center; see *Hooked on Nature Centers* in the Winter 2001 issue of *New Jersey Outdoors* magazine (800-645-0038) for a review of some of the state's finest.
- ❏ Get the latest on New Jersey's frogs, lizards, salamanders, snakes, and turtles. Visit http://www.state.nj.us/dep/fgw/ensp/herpgide.htm to view the field guides produced as part of ENSP's Herp Atlas project.
- ❏ View wildlife at sites listed in the *Wildlife Viewing Guide*. (Call 609-292-9400 for information about purchasing the guide)
- ❏ Learn about open space preservation in New Jersey and link to partner organizations in preservation at the Green Acres Web site (www.state.nj.us/dep/greenacres).
- ❏ To find out about the Environmental Infrastructure Financing Program, a revolving loan program administered by NJDEP and the New Jersey Environmental Infrastructure Trust, an independent state financing authority, visit www.state.nj.us/dep/dwq/mface or call 609-292-8961; for information about the Trust, go to www.njeit.org/index2 or call 609-219-8600.
- ❏ For information about farmland preservation, visit www.state.nj.us/gspt.
- ❏ Visit www.state.nj.us/osp or call 609-292-7156 (NJ Office of State Planning) or 609-292-1143 (NJDEP Office of State Plan Coordination) for planning information.

Practice

- ❏ Help New Jersey's threatened and endangered wildlife by "adopting" a species. Call 609-984-6012 to receive a brochure that provides Adopt-A-Species program details and information about the various species.
- ❏ Keep personal watercraft away from shallow water estuarine areas. Use them only in deeper, open waters to minimize disturbance to sensitive species and their habitats—especially during the summer, one of the most critical times of the year.
- ❏ Create a backyard habitat. Plant flowers, shrubs and trees that provide food and shelter for birds and other species. Visit www.nhq.nrcs.usda.gov/CCS/Backyard.html for information and links to additional resources.
- ❏ Go outdoors. Hike, bike, spend the day at the beach, or picnic beside a lake. Glimpse a migrating hawk, fish for trophy-size trout, or canoe down a sparkling stream. Enjoy the natural beauty of New Jersey.
- ❏ Vote to voice your opinion on open space preservation ballot initiatives.

Get Involved

- ❏ Become an indispensable friend of a park, forest, natural area, historic site, interpretive center, or wildlife. Become a citizen scientist: help count migrating birds, reptiles, amphibians, bald eagles, bobcats or other wildlife through NJDEP's Citizen Scientist Program. Build protective fencing on dunes, provide educational programs, write newsletters, garden, restore a historic site, reenact military history, clear a trail or lead a hike. For information on volunteer opportunities, contact the Division of Fish and Wildlife (PO Box 400, Trenton NJ 08625) or the Division of Parks and Forestry (PO Box 404, Trenton NJ 08625) or visit their Web sites (www.state.nj.us/dep/fgw and www.state.nj.us/dep/forestry, respectively).
- ❏ Save open space—participate in the planning process through your local environmental commission, municipal planning board, or community-based organizations. Let your local planning officials and members of your community know about NJDEP's Land Use/Land Cover Data (www.state.nj.us/dep/gis) and encourage its use to make informed decisions.
- ❏ Work with your neighbors and local historic society to preserve historic districts and sites. Historic buildings may be eligible for special restoration funding assistance; for information, go to www.state.nj.us/dep/hpo.

Reducing & Preventing Pollution

Goal: Evolve the current system of pollution control into a system that prevents the generation of pollution. Maintain an integrated waste management system that ensures minimized waste generation and disposal; maximizes reuse and recycling; guards against future contaminated sites; and provides long-term capacity assurance that is protective of human health and the environment. Eliminate or reduce the risk to human health and the environment from known contaminated sites.

Pollution Prevention

Increasing efficiency while reducing emissions has become a fundamental goal of many businesses and manufacturers in New Jersey. Through the use of innovative technologies and pollution prevention initiatives, alternatives now exist for businesses seeking to reduce the amount of toxic materials they generate, use and ultimately need to dispose of. Pollution prevention results in more efficient production processes and safer products. By reducing quantities of waste that require treatment and control, manufacturers avoid the costly disposal of hazardous waste, simplify the process of complying with regulations and reduce pollution.

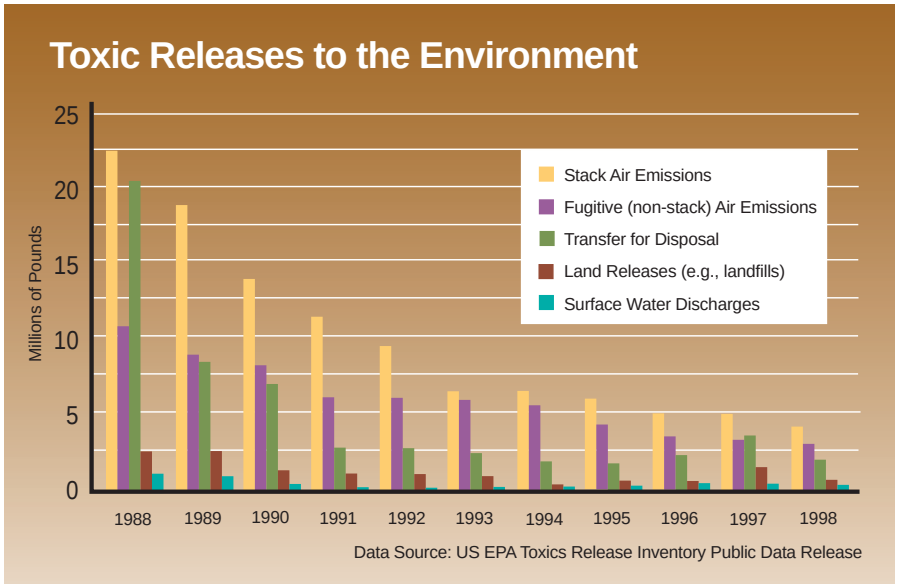
Pollution prevention studies have found that economic competitiveness and environmental protection go hand-in-hand. Cost savings of between three and eight dollars are projected for every dollar spent by industry and government on pollution prevention planning.

Laws requiring public disclosure of chemical releases by industry are an important factor in prompting them to seek ways to reduce emissions. There has been a marked and consistent decline in total releases to the environment from New Jersey manufacturing facilities over the past eleven years (**Figure 32**). Off-site transfers from manufacturing facilities are designed to reduce the potential negative human health and/or environmental impacts from an accidental chemical release at the facility. Additional or further management of these chemicals usually involves transfer for treatment (e.g., incineration), to a Publicly Owned Treatment Works (POTW), or for such beneficial reuses as recycling or for energy recovery. Over the past 11 years these transfers have fluctuated (**Figure 33**). Transfers to treatment and POTWs generally declined between 1988 and 1998. Transfers for recycling peaked in 1993 but have declined somewhat since then. Transfers to energy recovery increased from 1991 to 1995 but have decreased slightly since.

In an effort to essentially eliminate transfer of material for disposal, NJDEP is conducting a demonstration project to link different manufacturing facilities in such a way that the waste output of one facility will be generated and processed so as to become the raw material needed by another facility. If successful, this project would advance the concept of preventing pollution while promoting sustainable environmental management.

Although national "nonproduct output" (NPO) increased slightly from 1991 to 1997, New Jersey's focus on pollution prevention, which began in the late 1980s, may account for the NPO reductions reflected at the state level (**Figure 34**). These changes appear to be independent of changes in the state's economy as a whole. New Jersey has set a goal of a 50 percent reduction in NPO from 1993 levels by 2005. While the state experienced significant NPO reductions in the early 1990s, reductions

Figure 32



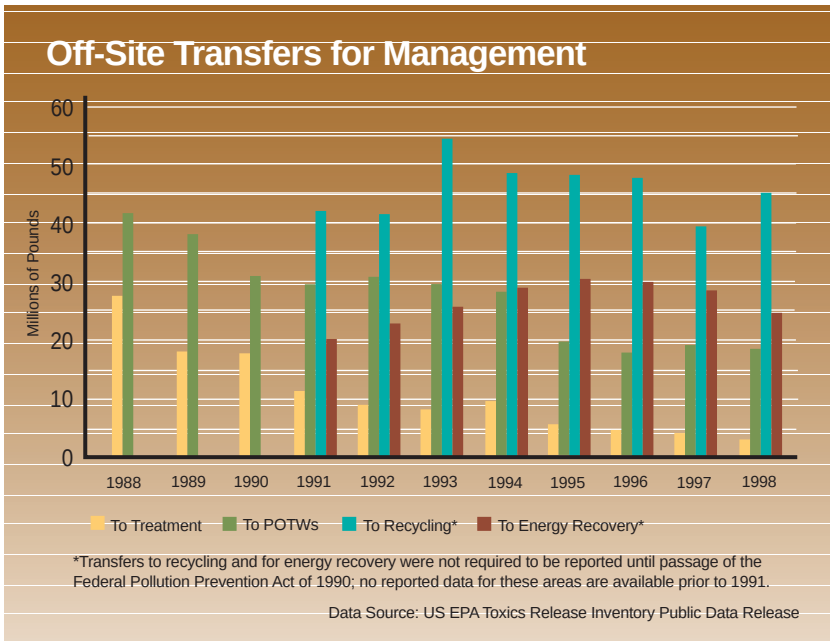
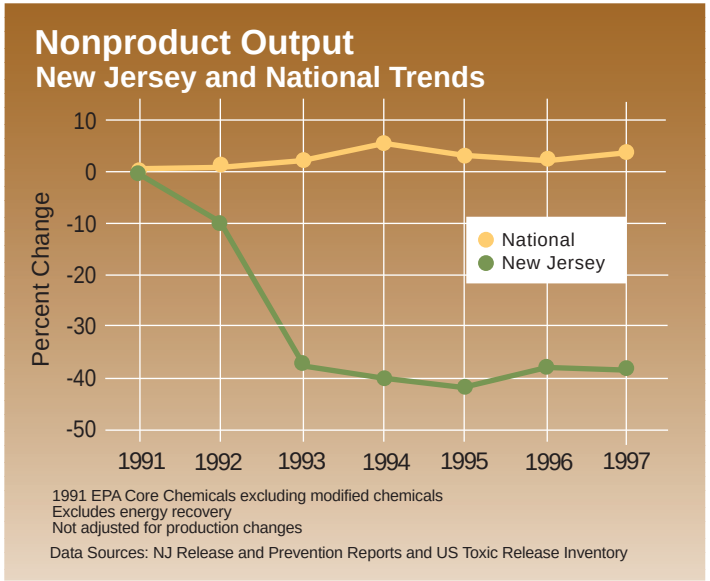


Figure 33

Figure 34



appear to have leveled off in recent years. Additional strategies may be needed to achieve the 50 percent reduction goal.

The New Jersey Pollution Prevention Act mandates pollution prevention planning for regulated industries but, unlike other regulatory programs, implementation is voluntary. The planning program requires hundreds of New Jersey manufacturing companies to develop materials accounting information. They first determine the amount of chemical that entered the facility and then subtract the amount of chemical that left it as either product or waste. The amount that is not contained in the product or consumed in the reaction is waste (pollution) that may be reduced by implementing pollution prevention initiatives. Studies of the planning program have shown not only significant benefits to the environment, but economic benefits to the industries as well. New Jersey's chemical manufacturing industries have been particularly successful at nonproduct output reduction compared to other industrial sectors in the state.

New Jersey has recently initiated a new program to further encourage industry to adopt results-based management principles. The Silver and Gold Track Program for Environmental Performance represents a broad step toward implementing a regulatory structure that requires accountability, measures environmental performance, provides operational flexibility and produces environmental results. The program consists of three "tiers" or "levels" of participation: Silver Track, Silver Track II and Gold Track. Covenants between NJDEP and program participants detail mutually agreeable environmental goals and milestones that go beyond environmental compliance requirements, as well as specific measures to be used to track progress and measure performance. In return for voluntarily agreeing to go beyond compliance, participants are offered regulatory incentives by the department.

Many programs in New Jersey encourage deployment of new technologies that allow businesses to reduce toxics and other waste products by operating more efficiently. New Jersey works closely with the business community, other states and, in some cases, other countries to solve environmental problems and develop new technologies. New Jersey is a national leader in maximizing the availability of information about innovative environmental and energy technologies and encouraging their commercialization and use. Currently, New Jersey has innovative technology partnerships with California, Illinois, Massachusetts, New York, Pennsylvania, and Virginia. In addition to interstate partnerships, New Jersey has international technology partnership agreements with Israel, Thailand, France, Canada, and the Netherlands.

Waste Management

In 1999, New Jersey produced approximately 17.2 million tons of solid waste. With a population of about 8.4 million, that translated to 4,095 lbs. (approximately 2 tons) of solid waste per person (**Figure 35**). New Jersey residents recycled about 9.5 million tons that same year, including industrial and commercial waste as well as municipal solid waste (garbage).

One of the state's main goals is "source reduction," the term for minimizing the amount of solid waste created in the first place. NJDEP continues to work with county and municipal government programs to encourage source reduction and to enhance recycling efforts. Among these initiatives are education programs on yard waste management, special household hazardous waste collection days, and programs to encourage the purchase of products made with recycled materials. The department also provides technical and other types of assistance to recycling businesses.

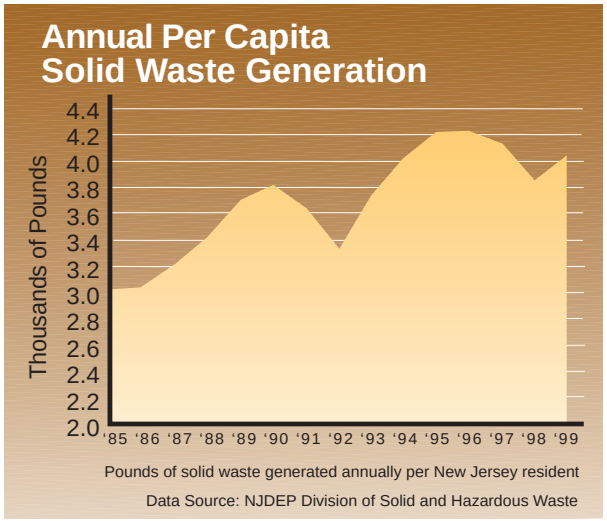


Figure 35

In 2000, $2.4 million was appropriated from the Sanitary Landfill Contingency Fund to provide financial assistance to counties for scrap tire management projects. The goals in administering this program are to collect and dispose of abandoned or illegally dumped scrap tires that are potential mosquito breeding grounds, thereby reducing the threat of the West Nile virus. NJDEP is also working with the Northeast Recycling Council and other states in a new initiative to establish a market development policy, and national product stewardship principles for used electronic parts from computers, televisions, etc.

New Jersey achieved its previous goal of recycling 60 percent of the total waste stream in 1997. Once county and municipal recycling programs started to collect plastics, tin and bimetal cans, white goods (e.g., refrigerators), used motor oils, yard waste, and other materials, a new recycling goal of 65 percent of the total waste stream by the end of the year 2000 was set. However, recycling rates declined to 55.4 percent in 1999 (**Figure 36**). Major factors in this reduction were the deregulation of the traditional solid waste system in the state due to a Federal Court decision in 1997 and the lack of grant money given to help fund local recycling programs (due to the legislative sunset of the tax that supported this initiative). The department is working to re-establish various recycling grant programs and market development initiatives in an effort to accomplish the goal.

The first priority of waste management in New Jersey is to reduce, reuse, and recycle as much waste as possible. Landfills, incinerators, transfer stations, and other facilities are required to safely dispose of the remaining waste. When the NJDEP was created in 1970, more than 300 landfills were operating in New Jersey with little concern for the environment. Prior to the 1980s, state-of-the-art incinerators did not exist (i.e., they had no air pollution controls and were not used to generate energy). New Jersey now has five state-of-the-art incinerators and 12 regional, state-of-the-art landfills. All are required by the department to employ the best available pollution controls.

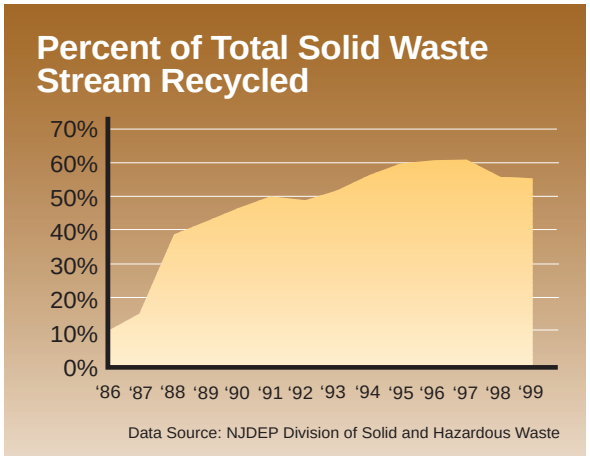


Figure 36

The safe disposal of hazardous waste is a special challenge. DEP requires that hazardous waste be identified during shipment. All facilities that generate, transport, treat, store or dispose of hazardous waste must be licensed. The department has established an effective cradle-to-grave tracking system for all hazardous waste shipments. All of these actions, as well as the pollution controls required on hazardous waste management facilities, protect the public from toxic waste.

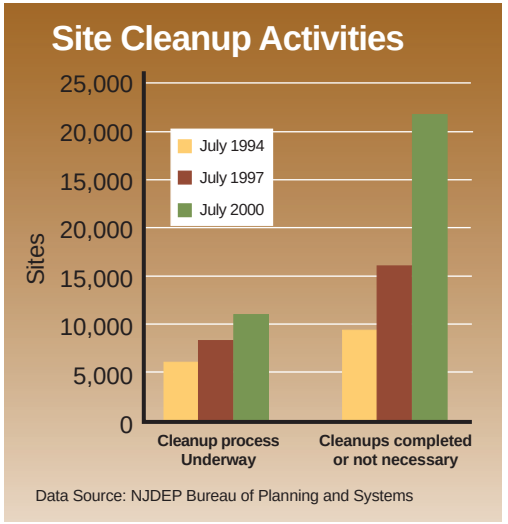
Remediating Contaminated Sites

Investigating and cleaning up contaminated sites across the state not only protects public health, but also helps renew old industrial tracts and ensures the safety of our residential neighborhoods. In addition, redevelopment associated with cleanup projects at brownfield sites brings the added benefit of economic stability to municipalities through new tax ratables and jobs.

Overall, remedial activities include identifying the source, nature and extent of any contamination at a site, and, if necessary, conducting appropriate cleanup work. Remediation addresses a wide variety of contaminated sites, ranging from leaking underground home heating oil tanks to large abandoned industrial sites with widespread contamination of soil and ground water. The number of active known contaminated sites and the number that are now considered remediated are used as indicators of environmental progress.

In July 1994, there were 6,070 active known contaminated sites in New Jersey (**Figure 37**). By July 2000, this number had grown to 10,688. The total number of active cases handled each year has also risen over time. As of July 1994, 9,326 sites had either been cleaned or investigations had determined that no cleanup was necessary. By July 2000, this number had risen to 22,340. Many of these sites required only assessments or investigations, not actual cleanups. Nevertheless, 12,212 of the completed sites had contamination requiring removal, treatment and/or containment, further illustrating the large number of areas tainted by hazardous substances that have been remediated to date.

Figure 37



Remedial actions can involve removing the source of contamination and decontaminating soil and water, allowing the site to once again be put to productive use. Often, the remediation involves capping the contaminated area, restricting future use for that property, or both.

Another recent indicator of progress is the "use criteria" met for each of the cleanups. For example, the future use of a property may be unrestricted if a complete cleanup was conducted and the most stringent (residential) soil cleanup criteria were met. However, if residential soil cleanup criteria were not met, there may be an institutional control (such as a deed restriction) put in place to limit the future use of the property, or an engineering control may be added to further restrict future use of the property. Of the 12,212 cleanups conducted to date, the department has detailed data on the use criteria met for 3,794 of the most recent cleanups. A large number—88 percent—have been complete cleanups, meeting residential standards where future use is unrestricted (**Figure 38**). The number of sites cleaned up, but where restrictions on future uses do exist, is much lower.

Another type of use restriction is the designation of Classification Exception Areas (CEA). These are defined, mapped areas where ground water quality standards are exceeded. Mapping the location and extent of the CEAs will minimize unsafe use of the ground water in that area. As of October 2000, a total of 1,117 CEAs designated during the course of remediation have been mapped on NJDEP's Geographic Information System. The department plans to make these data available on the Internet in the future. Currently, 91 percent of the known CEAs have been mapped by NJDEP; most are mapped within one to three months of being established. There is an effort underway to map all of the CEAs.

Along with this effort, the department adopted regulations in 1997 requiring electronic submission of all data related to contaminated site remediation. As a result, critical environmental information for remedial decisions will soon be available. Collection of these data will also assist to develop indicators of the environmental conditions of soil and ground water of the state. New Jersey is a national leader in this initiative. However, the project is still in its infancy; progress at this point is measured in the steady increase in the number of acceptable submissions of electronic data from responsible parties. The acceptability rate is currently at 92 percent, up from 54 percent just two years ago. The contaminant data are being used for focused projects already, and the next major step is development of the data for use by all department staff and, eventually, the public.

The department's incentive for compelling responsible parties to act was bolstered by dedicating a stable percentage of Corporate Business Tax revenue to publicly funded investigations and cleanups ($118 million since State Fiscal Year 1998 when the voter-approved funding began). Private parties responsible for past contamination continue to conduct the vast majority of work at thousands of tainted sites to avoid state action. This funding also has provided NJDEP with a reliable source of revenue to begin cleanup work at more than 50 new sites and pay for ongoing remedial projects at more than 200 active publicly funded sites across the state. Public funds are used when responsible parties are unknown, unable, or unwilling to conduct such actions.

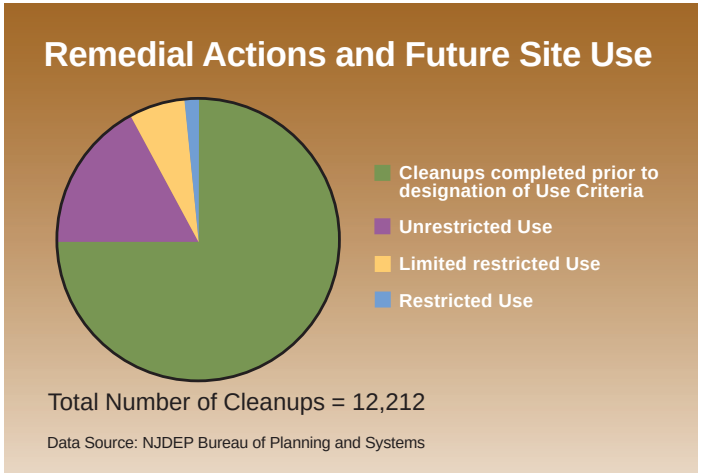


Figure 38

The most active initiative in site remediation involves working with responsible parties, developers, local officials, and individuals to remediate contaminated sites under the department's Voluntary Cleanup Program. NJDEP has been using the Voluntary Cleanup Program to stimulate brownfields redevelopment; the inventory of brownfield sites was 1,327 as of September 2000. A portion of the more than 2,000 voluntary agreements (MOAs) approved each year includes brownfield sites.

One of the major incentives for municipalities and private parties to get involved in brownfields redevelopment is NJDEP's Hazardous Discharge Site Remediation Fund, a grant and loan program that provides funding for investigations at contaminated properties they own. Towns use grant monies to quantify remedial costs at these sites, providing prospective developers with the information they need to make sound redevelopment decisions. Private parties can use these monies to conduct remedial work under the voluntary program at contaminated sites where they have some redevelopment interest. With the assistance of the New Jersey Economic Development Authority, more than $73 million has been provided to municipalities and private parties in grants and loans since 1994.

Another tool to provide information about brownfields remediation and

redevelopment opportunities is the i-MapNJ-Brownfields (www.state.nj.us/dep/srp/brownfields). This state web site offers an interactive mapping application that allows users to view related New Jersey data.

To further stimulate contaminated site cleanup and redevelopment, New Jersey enacted a reimbursement program for private parties that conduct voluntary cleanups at brownfield sites, a first in the nation. In October 2000, NJDEP presented developer Arc Properties, Inc. of Clifton with a check for more than $1 million to reimburse the company for a portion of the cleanup costs it incurred at the Berger Industries brownfield site in Edison Township. The reimbursement marked the first award under the state program established after the Brownfield and Contaminated Site Remediation Act was enacted in January 1998. Five other developers across the state have active Redevelopment Agreements with the state for brownfield projects, while more than 100 other projects are in the preliminary approval stages.

What Can You Do?

Learn

- ❏ Is there a brownfield near you? Visit www.state.nj.us/dep/srp/brownfields/video to view NJDEP's on-line video, *Renewing New Jersey's Brownfields: Repairing the Past, Preparing for the Future*.
- ❏ Find hazardous substance fact sheets at www.state.nj.us/health/eoh/rtkweb/rtkhsfs.htm or call the NJ Right To Know Program (609-984-3219) for information.
- ❏ Find out whether your local industry has made any reductions in emissions. EPA's Web site includes Toxic Release Inventory data on the type and quantity of toxic chemicals that are emitted from industrial facilities across the nation. Look for it at www.rtk.net/.
- ❏ NJDEP's Silver and Gold Track Program recognizes and rewards companies with excellent environmental records and community communications. Learn more at www.state.nj.us/dep/opppc, then encourage local companies to participate.
- ❏ Call the Site Information Program (800-253-5647) or visit www.state.nj.us/dep/srp for information on contaminated sites.
- ❏ To learn more about recycling, go to www.state.nj.us/dep/dshw/recycle.

Practice

- ❏ Compost at home; recycle at home and in the workplace.
- ❏ Purchase products containing recycled-content materials. This increases demand for recyclables placed at the curb, stimulates local economic growth, and closes the recycling loop.
- ❏ Practice low impact shopping. Purchase products that are durable, reusable, or packaged in bulk. Each means less waste for disposal.
- ❏ Leave your grass clippings on the lawn when you mow. They fertilize your lawn as they decompose, and not bagging them helps reduce the amount of yard waste at the curb for trash pickup.
- ❏ If you are a homeowner and have an underground storage tank for home heating oil, have the integrity of your tank professionally tested.
- ❏ Dispose of used motor oil, cooling fluids, and mercury-based batteries at a designated recycling center. Bring toxic household wastes to county hazardous waste collection centers on designated days. Contact your county or municipal government or check Earth's 911 (www.1800cleanup.org/) to find sites near you.

Get Involved

- ❏ Report environmental incidents impacting New Jersey (e.g., spills, discharges, suspicious activities involving potential pollutants) to NJDEP's toll-free 24-hour hotline at 877-WARNDEP (927-6337).
- ❏ Attend public meetings in your community regarding cleanup plans for contaminated sites to provide state and federal officials with appropriate input from a local perspective.

State of New Jersey

Donald T. DiFrancesco, Acting Governor

New Jersey Department of Environmental Protection

Robert C. Shinn, Jr., Commissioner

Acknowledgments and Comments

This report was prepared by the members of the NJDEP Steering Committee for New Jersey's implementation of the National Environmental Performance Partnership System (NEPPS), co-chaired by Leslie McGeorge (Environmental Planning and Science) and Bryan Ianni (Land Use Management). The members gratefully acknowledge the particular efforts of Alena Baldwin-Brown, and the reviews by NJDEP's Management Team and the Office of Communications. Contributors to this report include: Mike Aucott, Fred Bowers, Len Colner, Mike DiGiore, Anthony Fontana, Ernie Hahn, Jeff Hoffman, Joann Held, Marjorie Kaplan, Kerry Kirk-Pflugh, Anita Kopera, Sandy Krietzman, Janine MacGregor, Mike McLinden, Andy Opperman, Charlie Pietarinen, Athena Sarafides, Karen Schaffer, Mike Serfes, Ron Wienckoski, and Mike Winka.

The NJDEP welcomes comments on this report and suggestions for future reports on the State of New Jersey's Environment.

Comments can be submitted to:
NJDEP
Environmental Planning and Science
PO Box 418
Trenton NJ 08625-0418

This report may also be found on the NJDEP website at: http://www.state.nj.us/dep.

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01	View from a Toms River (Ocean County) bridge © by J. J. Raia
04	Marsh grasses at high tide in Taylor Sound (Cape May County) © by J. J. Raia
05	Morning sky at Supawna Meadows National Wildlife Refuge (Salem County) © by J. J. Raia
12	Summer fun at Point Pleasant Beach (Ocean County) New Jersey Outdoors photo contest entry by Nancy Goldstein Rothman
13	Sea Bright Beach (Monmouth County) © by J. J. Raia
19	Participants in DEP's Urban Fishing Program try their luck on the waterfront at Bayonne (Hudson County) Lynette Lurig, NJDEP Div. of Science, Research, and Technology
20	Delaware & Raritan Canal State Park (Somerset, Middlesex, and Mercer counties) Bruce Ruppel, NJDEP Div. of Science, Research, and Technology
21	Autumn at Ramapo Mountain Reservation (Bergen County) © by J. J. Raia
22	Area residents help "green" Jersey City by planting trees. NJDEP Div. of Parks and Forestry
23	Sighting young eagles is not the rarity it once was, thanks to DEP's Endangered and Nongame Species Program Larry Niles, NJDEP Div. of Fish and Wildlife
27	Canoeing New Jersey's waterways offers a myriad of recreational opportunities. New Jersey Outdoors photo contest entry by George Pierson
28	Corson's Inlet State Park (Cape May County) © by J. J. Raia
29	Campbell's Field, home of Camden's River Sharks, is a redeveloped brownfields site. Courtesy of Cooper's Ferry Development Association
33	Wawayanda State Park (Sussex and Passaic counties) © by J. J. Raia
34	Dawn on the Delaware River at Washington Crossing State Park (Mercer County) © by J. J. Raia
35	Mustard plants are being used as innovative remediation to remove lead from the Magic Marker brownfield site in Trenton. Courtesy of Isles, Inc.