

**The New Jersey  
Environmental Primer  
2007**



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State of New Jersey

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## **About the New Jersey Environmental Primer**

The **New Jersey Environmental Primer** was produced by the New Jersey Commission on Environmental Education and the Interagency Work Group on Environmental Education. It is being distributed by the New Jersey Department of Environmental Protection (DEP).

Its purpose is to establish a common understanding among New Jersey residents of 21 topics and issues that are either a high priority for government and environmental leaders or are commonly used in environmental literature and media reports. The primer explains these terms with simple definitions or descriptions. A state Web site link follows each term so that readers may obtain additional information about the topic.

The New Jersey State Legislature established the commission and work group in 1996 (N.J.S.A. 18A:6-91.1 et seq.) to implement a master plan for environmental education in New Jersey, which provides “an understanding of - as well as support, direction, guidance and monitoring for - the delivery of environmental education for all ages throughout the state.” These groups are “in but not of” DEP with support provided by the department’s environmental education staff.

### **The New Jersey Commission on Environmental Education and the Interagency Work Group on Environmental Education**

[www.nj.gov/dep/seeds/njcee/](http://www.nj.gov/dep/seeds/njcee/)

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2007

Dear Reader:

You are now the owner of a copy of the **New Jersey Environmental Primer**.

According to the Random House College Dictionary, a *primer* is “any book that teaches elementary principles.”

If you are an **adult**, this primer provides you with short descriptions of 21 important environmental terms that you may read about in the newspaper or hear referenced on the evening news.

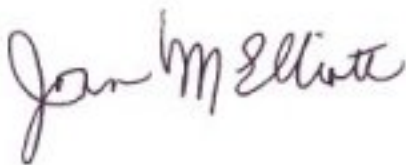
If you are an **older student**, this primer provides you with an easy way to impress your friends, parents and teachers with your knowledge and environmental savvy. Besides, it’s cool to be concerned about the environment!

If you are a **younger student**, this primer can be shared with a teacher or parent. Ask them to read it with you and have them explain and discuss the topics in which you have an interest.

A greater understanding of these important environmental topics will help nurture informed community involvement, as well as encourage public stewardship.

Please refer to the **New Jersey Environmental Primer** regularly and lend it to neighbors, friends and relatives.

Sincerely,

A handwritten signature in black ink that reads "Joni M. Elliott". The signature is written in a cursive style with a large initial "J" and "E".

Joni Elliot, Chair  
The New Jersey Commission on Environmental Education



## The New Jersey Environmental Primer

**AIR TOXICS:** Air toxics are a large group of air pollutants that are emitted into the air sometimes in quantities large enough to cause adverse health effects in people. Potential effects range from lung irritation to birth defects and cancer. There are no national air quality standards set for these pollutants. The federal Environmental Protection Agency has established national air-quality standards for six pollutants designated for special treatment by the federal Clean Air Act. These include ozone, sulfur dioxide, carbon monoxide, nitrogen dioxide, particulate matter and lead.

In 1979 the State of New Jersey adopted a regulatory approach to air toxics reduction, which now includes air-pollution-control technology, pollution prevention and air-toxics monitoring. The DEP is also conducting a study in Camden, New Jersey, which is designed to identify the air toxics of greatest concern and ways to reduce exposure to those pollutants.

Air Toxics in New Jersey, DEP ([www.nj.gov/dep/airtoxics/](http://www.nj.gov/dep/airtoxics/))

Camden Waterfront South Air Toxics Pilot Project, DEP ([www.nj.gov/dep/ej/airtoxics.html](http://www.nj.gov/dep/ej/airtoxics.html))

**BIODIVERSITY:** Biodiversity refers to the number and variety of living organisms and ecological communities. Scientists study biological diversity on many different levels, ranging from complete ecosystems to individual genes and strands of DNA.

In New Jersey, the state's Natural Heritage Program identifies significant natural areas through an inventory of rare plant and animal species and rare and representative ecological communities, and analyzes the status and preservation needs of these species and communities. A highly diverse ecosystem helps to maintain the health of the environment.

New Jersey Natural Heritage Program, DEP

([www.state.nj.us/dep/parksandforests/natural/heritage/index.html](http://www.state.nj.us/dep/parksandforests/natural/heritage/index.html))

**BROWNFIELD:** A brownfield is an abandoned or under-used industrial or commercial site where expansion or redevelopment of the site has been hindered by environmental contamination or the perception of contamination. Brownfield sites exist in urban, suburban and rural communities.

The cleanup and redevelopment of these sites often are vital to the economic health of communities. Such redevelopment also preserves open space and stems sprawl. Studies show that for every acre of brownfields redeveloped, four acres of open space are spared from development. DEP has enhanced its Brownfields Program to bring relief to neighborhoods blighted by these contaminated sites.

Brownfields Program, DEP ([www.nj.gov/dep/srp/brownfields/](http://www.nj.gov/dep/srp/brownfields/))

**BUFFER:** A buffer is a vegetated area adjacent to cultivated fields or along streams, rivers, lakes, ponds, reservoirs and wetlands. A buffer can prevent excessive nutrients, sediments and organic matter from polluting nearby water sources by filtering these pollutants from stormwater. Shade from buffer plants moderates air and water temperatures and encourages plant and animal diversity by providing different habitats. Buffers also keep streambanks stable and help prevent erosion. Their natural organic matter provides food and habitat for aquatic life.

**Stormwater and Nonpoint Source Pollution, DEP** ([www.njstormwater.org/](http://www.njstormwater.org/))

**DIESEL EMISSIONS:** Diesel emissions is the exhaust produced by diesel-powered trucks, buses and off-road vehicles such as construction equipment. These emissions are among the air pollutants that pose the greatest risk to public health. The exhaust includes fine particles known as soot, which are known to trigger asthma

attacks and can cause lung cancer, heart disease and premature death. Research has shown that these fine particles are harmful to people because they bypass the body's natural defense mechanisms and penetrate deep into the lungs.

In New Jersey an array of strategies are being pursued to reduce diesel emissions and the health problems they cause. These include mandatory tailpipe emission controls on diesel vehicles; a tougher inspection program for diesel vehicles; and enforcement of the three-minute idling restriction for diesel vehicles not in motion.

**Stop the Soot, DEP** ([www.nj.gov/dep/stopthesoot/](http://www.nj.gov/dep/stopthesoot/))

**In Pursuit of Clean Air - Fine Particulate Initiatives, DEP** ([www.nj.gov/dep/ipoca/finepart\\_nj.htm](http://www.nj.gov/dep/ipoca/finepart_nj.htm))

**ENDANGERED AND THREATENED SPECIES:** Endangered species are those wildlife species in New Jersey that are in immediate danger of extinction because of a loss of, or change to, their habitat or threats due to predation, competition, disease, disturbance or contamination. Threatened species are those species that may become endangered if their conditions continue to deteriorate. There are currently 73 wildlife species listed as threatened or endangered in New Jersey.

Endangered and Nongame Species Program, DEP ([www.nj.gov/dep/fgw/ensphome.htm#pdf](http://www.nj.gov/dep/fgw/ensphome.htm#pdf))



**Treefrog, *Hyla andersonii***

**ENVIRONMENTAL JUSTICE:** Environmental justice refers to the idea that all individuals, groups or communities deserve protection from environmental hazards regardless of their race, ethnicity or economic status. Various national studies show communities of color and low-income communities are exposed to a disproportionate amount of industrial pollution and other environmental hazards. Promoting environmental justice means that no population of people should be forced to shoulder a disproportionate share of burdens from pollution or environmental hazards due to a lack of political or economic strength.

New Jersey is presently under an Executive Order to ensure environmental justice in the state. The order requires all Government agencies, departments, boards, commissions and other bodies to provide meaningful involvement in decisions that may affect environmental quality and public health. It also increased multi-lingual communications and community involvement in decision-making, created an Inter-agency Task Force to provide coordination of efforts to address potential environmental injustices and created a process by which residents can petition government to address local environmental injustices.

**Environmental Justice Program, DEP** ([www.nj.gov/dep/ej/](http://www.nj.gov/dep/ej/))

**GREEN DESIGN:** Any structure that is designed, built, renovated, operated or reused in an ecological and resource-efficient manner is referred to as having green design. Green buildings are designed to meet certain objectives such as protecting occupant health; improving employee productivity; using energy, water and other resources more efficiently; and reducing the overall impact to the environment. The United States Green Building Council's Leadership in Energy and Environmental Design (LEED®) Green Building Rating System is currently the nation's recognized standard for green building.

In 2000, the New Jersey State Legislature enacted the Educational Facilities Construction and Financing Act, which includes support for energy-efficient design. In 2002, the state came under an Executive Order requiring all new school designs to incorporate the LEED rating system so that the facilities achieve maximum energy efficiency and environmental sustainability.

**New Jersey Schools Construction Corporation** ([www.njscc.com/Main/index.asp](http://www.njscc.com/Main/index.asp))

**New Jersey Green Homes Office - Department of Community Affairs**  
([www.nj.gov/dca/dh/gho/index.shtml](http://www.nj.gov/dca/dh/gho/index.shtml))

**GREENHOUSE GASES:** Greenhouse gases (GHGs) are gases that collect in the atmosphere and act like the glass walls of a greenhouse, trapping heat on the earth's surface. Some GHGs in the atmosphere are essential to maintaining the earth's temperature at a level that can support life.

However, many scientists believe that the causes of recent global climate change are certain human activities that increase the level of GHGs in the atmosphere. Activities that burn fossil fuels (coal, oil, natural gas) include driving and producing electricity.

**Climate Change Program, DEP** ([www.state.nj.us/dep/dsr/climate/climate.htm](http://www.state.nj.us/dep/dsr/climate/climate.htm))

**GROUND WATER:** Rainwater that seeps into the ground becomes ground water. It moves into water-filled layers of underground geologic formations called aquifers. If the aquifer is close to the surface, its ground water can flow into nearby waterways or wetlands. Aquifers can also extend to several hundred feet below the surface.

A system of more than 100 aquifers is scattered throughout New Jersey, covering 7,500 square miles. Ground water is the primary drinking-water source for half of the state's population. Recent changes to the state's Stormwater Management Rules provide for new building practices that will maintain the flow of rainwater into aquifers when new construction occurs, a major step toward maintaining adequate ground water supplies.

**Watershed Management, DEP** ([www.nj.gov/dep/watershedmgt/index.html](http://www.nj.gov/dep/watershedmgt/index.html))

**Stormwater and Nonpoint Source Pollution, DEP** ([www.njstormwater.org/](http://www.njstormwater.org/))

**HABITAT:** Habitat is the area where a population of living things (human, animal, plant, microorganism) live, as well as its surroundings. Loss of habitat and fragmentation of existing habitat due to land-use changes in New Jersey are among the greatest risks to the state's populations of fish and wildlife.

**New Jersey Comparative Risk Project, DEP** ([www.state.nj.us/dep/dsr/njcrp/](http://www.state.nj.us/dep/dsr/njcrp/))

**Fish and Wildlife, DEP** ([www.nj.gov/dep/fgw/](http://www.nj.gov/dep/fgw/))

**HIGHLANDS:** The New Jersey Highlands comprise a 1,250-square-mile area in the northwest part of the state noted for its scenic hills, forests and lakes. The region lies within portions of seven counties and 87 municipalities and is part of a larger Highlands region stretching from Connecticut and New York through New Jersey and into Pennsylvania. The region is a vital source of drinking water for over 5 million people. It has the greatest diversity of natural resources of any area in the state, more than 70 percent of its lands are environmentally sensitive and it harbors 23 of the state's threatened or endangered species. In the summer of 2004, in response to increasing development within the region, the state enacted the Highlands Water Protection and Planning Act to protect the area's natural resources.

**New Jersey Highlands Council**

([www.state.nj.us/njhighlands/](http://www.state.nj.us/njhighlands/))

**IMPERVIOUS AND PERVIOUS SURFACES:** An impervious surface does not allow water to drain through it into soil. Roads and parking lots made of concrete or asphalt, as well as rooftops and swimming pools, are examples of impervious surfaces. A pervious surface is porous and allows water to pass through. Such surfaces include sand, soil, gravel or stones, grass and other types of vegetation.

While impervious surfaces such as bedrock occur naturally, increasing development in New Jersey has altered the proportion of impervious and pervious surfaces in the state. With more impervious surfaces, less water from storms and snowmelt absorbs into the ground, which reduces groundwater supplies. The increase of runoff leads to



flooding, increased erosion, degraded habitat, and the altering of natural stream-flow patterns.

**Clean and Plentiful Water, DEP** ([www.nj.gov/dep/cleanwater/](http://www.nj.gov/dep/cleanwater/))

**INVASIVE SPECIES:** Invasive species include plants, animals, insects and other organisms that have been accidentally or deliberately introduced into an area in which they did not evolve and have the potential to threaten or destroy native species or the ecosystems on which they depend.

Prominent invasive plants in New Jersey include purple loosestrife - which invades wetlands and competes with native wetlands species - and the Norway maple, a tree that invades undisturbed woodland habitat and displaces native tree species. Invasive animals include the hemlock woolly adelgid, an insect that causes defoliation of the state's hemlock stands, and the Asian longhorn beetle, which is devastating urban hardwood street trees in northern New Jersey.

**New Jersey Comparative Risk Project, DEP** ([www.state.nj.us/dep/dsr/njcrp/](http://www.state.nj.us/dep/dsr/njcrp/))

**NONPOINT SOURCE POLLUTION:** Nonpoint source pollution is any pollution not associated with a distinct discharge point such as a smokestack or pipe. Nonpoint source pollution in water occurs when rainfall or snowmelt moves over the ground or through storm drains, carrying natural and man-made pollutants. These pollutants eventually wind up in lakes, rivers, bays, coastal waters and ground water. Nonpoint source water pollutants include excess fertilizers, pesticides and herbicides; dumped oil, grease and toxic materials; animal waste; sediment from construction sites and eroding banks; and litter.

Nonpoint source pollution is the biggest threat to the water quality of many of New Jersey's water bodies. Its collective impact threatens aquatic and marine life, recreational water activities, the fishing industry, tourism and drinking-water resources.

Nonpoint sources of air pollution include mobile sources, such as cars and trucks, which emit air pollutants that degrade air quality.

**Basic Watershed Information, DEP** ([www.nj.gov/dep/watershedmgt/basicinfo2.htm](http://www.nj.gov/dep/watershedmgt/basicinfo2.htm))

**Nonpoint Source Pollution Control Program, DEP** ([www.nj.gov/dep/watershedmgt/nps\\_program.htm](http://www.nj.gov/dep/watershedmgt/nps_program.htm))



**PARTICULATE MATTER:** Particulate matter is solid particles or liquid droplets found in smoke, dust or ash. It can also come from grinding or chipping operations and from condensed vapor. People are also exposed to fine particles through daily activities such as dusting, smoking, vacuuming and cooking. Of special concern for human health are fine particles that result from fossil-fuel combustion. Because these particles are so tiny, they can become lodged in a person's lungs, interfering with lung function. In general, people most affected by particulate matter include young children, asthmatics, the elderly, smokers and people with lung or cardiovascular diseases.

In New Jersey, controls are in place to minimize particulate matter being produced by large industrial facilities, and new standards for diesel fuels are expected to further reduce the release of particulate matter from truck emissions.

**Camden Waterfront South Air Toxics Pilot Project, DEP** ([www.nj.gov/dep/ej/airtoxics.html](http://www.nj.gov/dep/ej/airtoxics.html))

**Fine Particulates - In Pursuit of Clean Air, DEP** ([www.nj.gov/dep/ipoca/finepart.htm](http://www.nj.gov/dep/ipoca/finepart.htm))

**SMART GROWTH AND SPRAWL:** Smart growth is the term used for well-planned, well-managed development in areas of the state where existing infrastructure can be used to support growth. Such growth

preserves open space, farmland and the quality of environmental resources. Planning for smart growth prevents sprawl, which is ill-conceived land use and poorly designed development that threatens drinking-water supplies, consumes open space, spoils landscapes and creates traffic congestion.

**Anti-sprawl Information, DEP** ([www.nj.gov/dep/antisprawl/](http://www.nj.gov/dep/antisprawl/))

**Office of Smart Growth, New Jersey Department of Community Affairs** ([www.nj.gov/dca/osg/smart/index.shtml](http://www.nj.gov/dca/osg/smart/index.shtml))

**STORMWATER:** Water from rain and snow that flows off buildings, homes, parking lots and streets is known as stormwater. This water, also referred to as runoff, travels along gutters, into catch basins and through storm drain pipes and ditches. Most stormwater eventually discharges into streams, rivers and the ocean without being treated by water treatment plants.

The state recently adopted two sets of stormwater rules to protect water quality and to preserve the integrity of drinking-water supplies statewide. The rules will require new development to adopt strategies that allow stormwater to replenish underground aquifers and require 300-foot buffers to filter out pollution around more than 6,000 miles of high-quality waterways.

**Stormwater and Nonpoint Source**

**Pollution, DEP** ([www.stormwater.org](http://www.stormwater.org))

**Clean and Plentiful Water – Stormwater,**

**DEP** ([www.nj.gov/dep/cleanwater/stormwater.html](http://www.nj.gov/dep/cleanwater/stormwater.html))



**WATER SUPPLY:** Water supply refers to the sources of ground and surface water that provide drinking water for residents, communities and businesses. The state's goal is to ensure that an adequate, safe and reliable water supply is provided for the residents of the state.

Water supply management refers to the balancing of water allocations among water users and water uses to provide for a sustainable water supply.

**Water Supply Planning, DEP** ([www.nj.gov/dep/watershedmgt/water\\_supply\\_planning.htm](http://www.nj.gov/dep/watershedmgt/water_supply_planning.htm))

**Water Supply Administration, DEP** ([www.state.nj.us/dep/watersupply/index.html](http://www.state.nj.us/dep/watersupply/index.html))

**WATERSHED:** A watershed is the area of land that drains into a particular body of water such as a river, lake, stream or bay. It is separated from other systems by high points in the area such as hills. It includes both the waterway itself and the entire land area whose streams and rainfall eventually drain into it.

**Watershed Management, DEP** ([www.nj.gov/dep/watershedmgt/index.html](http://www.nj.gov/dep/watershedmgt/index.html))

**WETLANDS:** Wetlands are areas saturated by surface or ground water for at least some part of the year that have vegetation suited to these soil conditions. They also can be known as swamps, bogs, fens, marshes and estuaries. Wetlands protect drinking water by filtering out pollutants and sediments and soaking up stormwater runoff. They also reduce flooding, release stored flood waters during droughts and provide valuable wildlife habitats.

**Land Use Regulation Program, DEP** ([www.nj.gov/dep/landuse/](http://www.nj.gov/dep/landuse/))



# Environmental Education in New Jersey

## **Why is environmental education important in New Jersey?**

Listen to local and national news on the radio. Watch television shows. Read the newspaper or search the Internet. Children and neighbors talk about it and government officials and scientists debate policies to protect it. The environment has become a part of everyday discussions for New Jersey citizens.

The state's residents, and people everywhere, need to be more aware of the environmental issues with which environmental professionals are grappling. More importantly, people need to understand the basic functions of nature and how their personal decisions and daily activities can affect the earth's natural systems and possibly human health. Only with a greater understanding of, and involvement with, many of these issues can they truly be addressed or resolved.

## **What is the goal of environmental education?**

Environmental education focuses on the intricate and complex relationships that exist between nature and people.

The goal of environmental education is to increase the public's understanding of ecological systems and human dependence on the earth's natural resources (air, land and water). Environmental education helps people make informed, scientifically based decisions, which protect the environment and minimize stress on the earth's resources.

## **What types of environmental education programs exist in New Jersey?**

Environmental education content in formal education (pre-school through university levels) can include the sciences; land use and geography; conservation, agriculture and natural resource management (water, soils, forestry, habitat, air and minerals); energy; environmental health; government policies and laws; careers; technology use and community service.

Programs for families, individuals, adult professionals and youth typically focus on environmental topics, policies and laws; nature study and stewardship; citizen action and volunteerism; passive outdoor recreation and creative arts.

Educators who work with people of all ages get excited about practicing environmental education because it engages and challenges learners, improves student performance, focuses on real world problems and solutions, and familiarizes residents with their community and surroundings.

## **Who provides environmental education programs?**

Classroom teachers; environmental educators; park naturalists; nature center, museum, aquarium and zoo staff; soil conservation district and cooperative extension staff; companies, utilities and government representatives; scientists; college and university staff; youth leaders and parents all help conduct or support environmental education throughout New Jersey.