



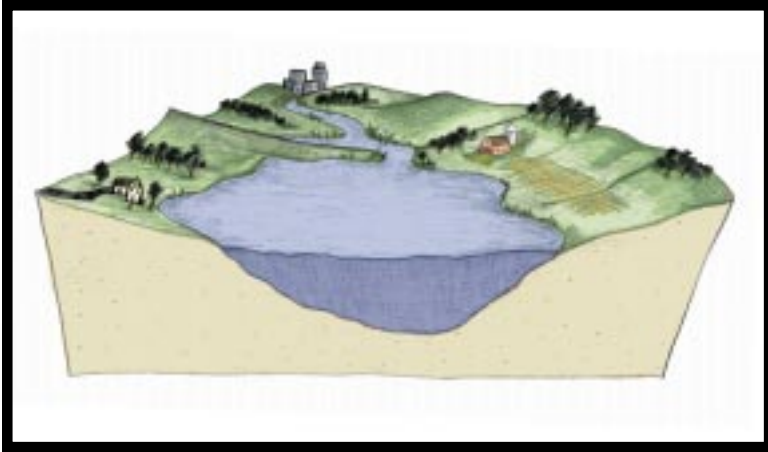
# What's a watershed?

No matter where you are in New Jersey, you are in a watershed. Watersheds are everywhere ... from your front doorstep to the local park to the shopping mall to the creek down the road. Watersheds are the link between our land, our water and our communities because the quality of our water is linked to how we use the watershed surrounding it.

*So what is a watershed?*



# What's a watershed?



A watershed is the area of land that drains into a body of water such as a river, lake, stream or bay. It is separated from other watersheds by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. For example, the watershed of a lake would include not only the streams entering that lake but also the land area that drains into those streams and eventually the lake. Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams.

# What's the water cycle?

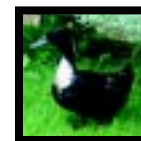
For millions of years, water has been used. It is constantly being recycled and reused. It is important to understand how water moves through the Earth's water cycle, which is defined as the movement of water from the Earth's surface into the atmosphere and back to the Earth's surface again.

When it rains, the rainwater flows over land into waterways or is absorbed by the ground or plants. Water evaporates from land and water bodies becoming water vapor in the atmosphere. Water is also released from trees and other plants through "transpiration." The water vapor from evaporation and transpiration forms clouds in the atmosphere which in turn provide precipitation (rain, hail, snow, sleet) to start the cycle over again. This process of water recycling, known as the water cycle, repeats itself continuously.

# What's your watershed address?

Where does the water that rains on your home go? After it leaves your lawn, street or sidewalk where is it headed? Does it flow downhill straight to a nearby stream or lake? Does it wander into a wetlands? Does it puddle in your backyard? Does it zip down a storm drain to a local creek?

That destination, whether it's a puddle, a pond, a bay or a lake, is your watershed address. It could be Duck Pond, Spring Lake, Millstone River, Barnegat Bay or Beaver Brook. Just like there are towns within counties within states, there are subwatersheds within watersheds within drainage basins. For example, the rain that falls on your driveway might flow into Lake Hopatcong, which flows into the Musconetcong River, which flows into the Delaware River. So your watershed address would be Lake Hopatcong, Musconetcong River, Delaware River even though your mail finds you through Jefferson Township, Morris County, New Jersey.



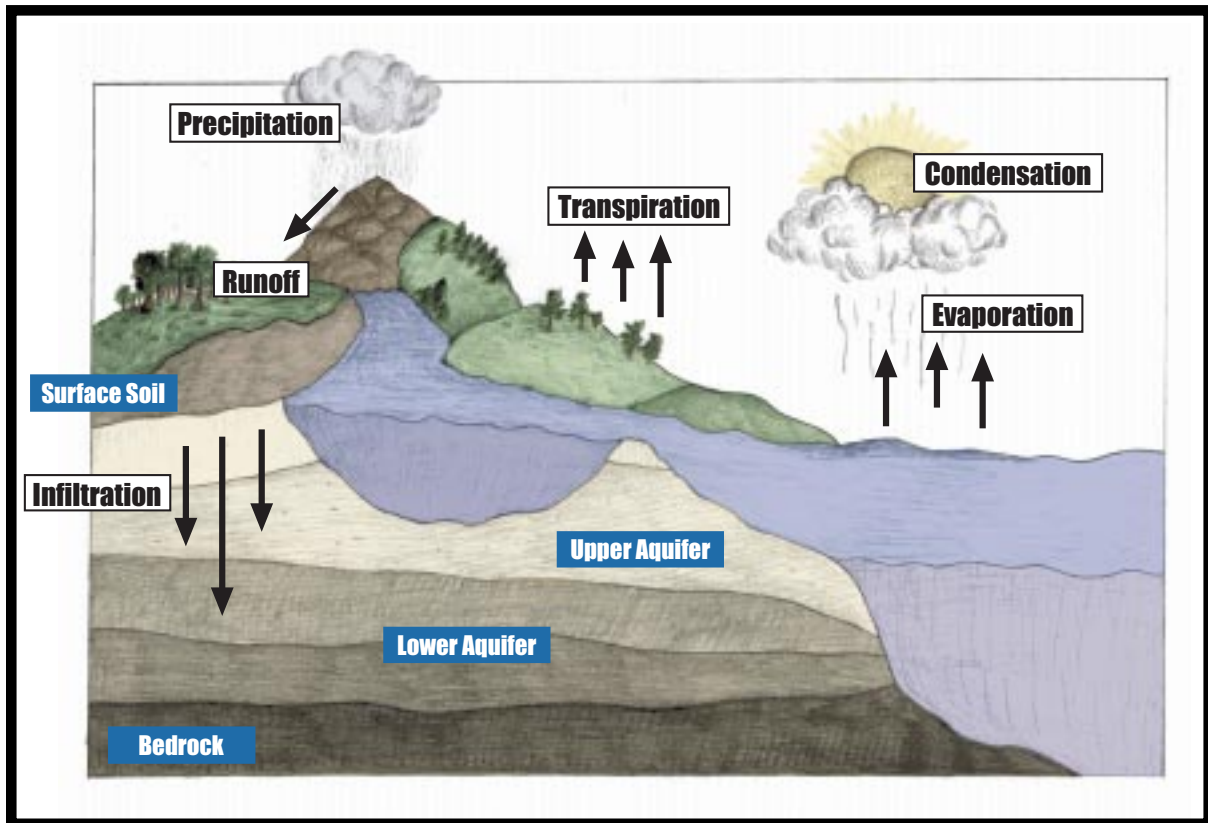
# What's ground water?

A sizable amount of rainwater runoff seeps into the ground to become ground water. Ground water moves into water-filled layers of porous geological formations called aquifers. If the aquifer is close to the surface, its ground water can flow into nearby waterways or wetlands, providing a base flow. Depending on your location, aquifers containing ground water can range from a few feet below the surface to several hundred feet underground. Aquifer recharge areas are locations where rainwater and other precipitation seeps into the Earth's surface to enter an aquifer. Contrary to popular belief, aquifers are not flowing underground streams or lakes.

Ground water moves at an irregular pace, seeping from more porous soils, from shallow to deeper areas and from places where it enters the Earth's surface to where it is discharged or withdrawn. A system of more than 100 aquifers is scattered throughout New Jersey, covering 7,500 square miles.

Why is ground water important?

Ground water is the primary drinking water source for half of the state's population. Most of this water is obtained from individual domestic wells or public water supplies which tap into aquifers. New Jersey agriculture also depends on a steady supply of clean ground water for irrigation.



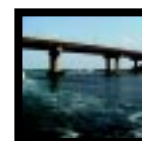
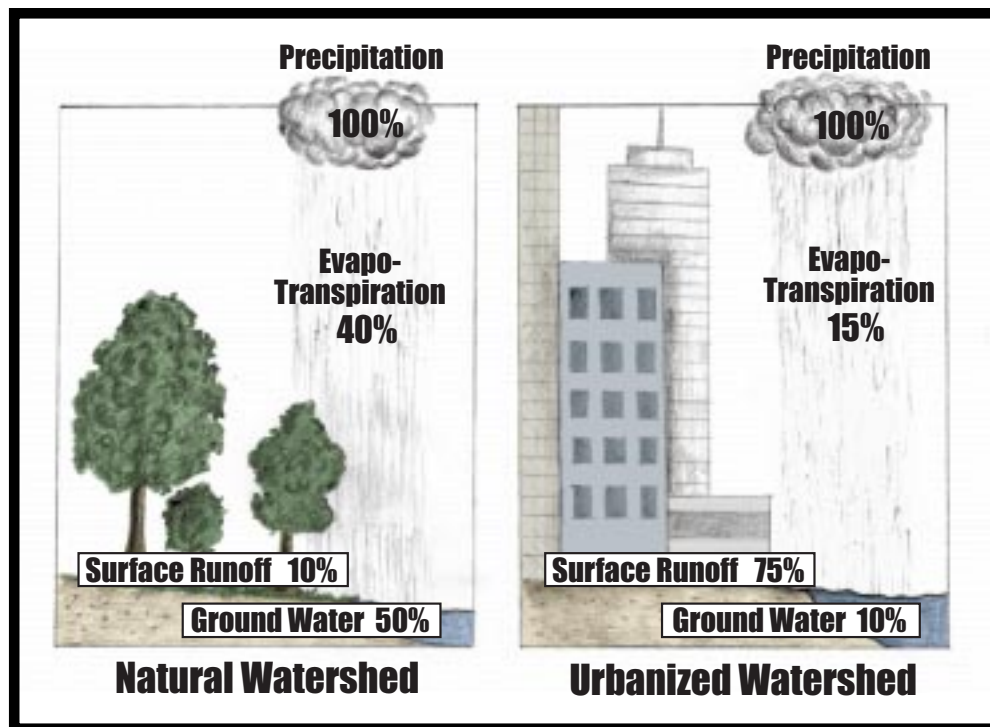
# How does urbanization change a watershed?

Urbanization (or development) has a great effect on local water resources. It changes how water flows in the watershed and what flows in the water. Both surface and ground water flow are changed.

As a watershed becomes developed, trees, shrubs and other plants are replaced with impervious surfaces (roads, rooftops, parking lots and other hard surfaces that do not allow stormwater to soak into the ground). Without the plants to store and slow the flow of stormwater, the rate of stormwater runoff is increased. Less stormwater soaks into the ground because the sidewalks, roads, parking lots and rooftops block this infiltration. This means a greater volume of water reaches the waterway faster and less water infiltrates to ground water. This in turn leads to more flooding after storms and reduced flow in streams and rivers during dry periods. The reduced amount of infiltrating water can lower ground water levels, which in turn can stress local waterways that depend on steadier flows of water.

In the stream, more erosion of stream banks and scouring of channels will occur due to volume increase. This in turn degrades habitat for plant and animal life that depend on clean water. Sediment from eroded stream banks clogs the gills of fish and blocks light needed for plants. The sediment settles to fill in stream channels, lakes and reservoirs. This also increases flooding and the need for dredging to clear streams or lakes for boating.

In addition to the high flows caused by urbanization, the increased runoff also contains increased contaminants. These include litter, cigarette butts and other debris from sidewalks and streets, motor oil poured into storm sewers, heavy metals from brake linings, settled air pollutants from car exhaust and pesticides and fertilizers from lawn care. These contaminants reach local waterways quickly after a storm.



# What's watershed management?

The watershed management approach seeks to effectively protect our water resources by taking into account the entire watershed. Successful watershed management requires the participation and involvement of the entire community within the watershed boundaries, including industry, government, business and citizens. Since everyone may contribute to watershed problems, all should be involved in identifying both the problems and the solutions.

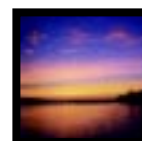
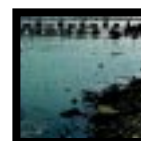
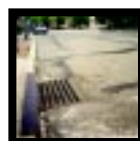
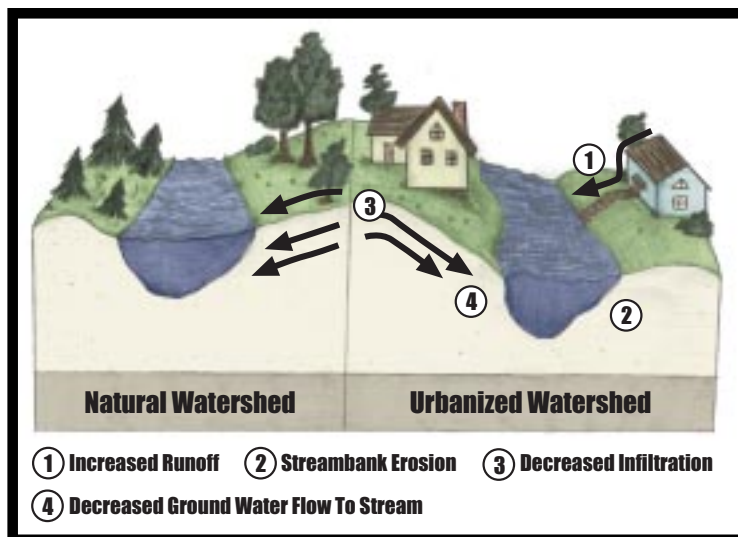
One of the first steps in watershed management is problem identification. Does the local lake choke with weeds in the summer? Are failing septic systems closing shellfish beds? Is increased runoff causing stream banks to erode?

Once the problems and their causes have been identified, practical solutions must be chosen. The watershed community must identify traditional or innovative solutions that will work in their area. These solutions can range from changes to municipal stormwater ordinances to homeowner education about lawn care to stream bank restoration projects.

Identifying which solutions are right for a particular watershed is a crucial component of the watershed management process. Different solutions work in different communities. Developed with the watershed community of industry, government, business and citizens, watershed management planning reflects the concerns and priorities of that community.

Once solutions have been identified, they must be implemented to be successful. This can be the most difficult part of the process. How can implementation be ensured? Who will carry out the plan? Is the community committed to implementing the plan? Are there resources available to do it?

The advantage of watershed management planning is that it addresses all sources of pollution within the watershed and is developed by the community most affected by it. Nonpoint source pollution is particularly suited to this approach because it is frequently beyond the scope of traditional regulatory programs. The plan can incorporate solutions ranging from change in local land use to integrated pest management. Each plan will uniquely fit the problems and solutions of its watershed.



# New Jersey's five watershed bureaus and 20 watershed management areas

## Northwest Bureau (609) 633-3812

- 1. Upper Delaware River
- 2. Walkill, Pochuck, Papakating
- 11. Central Delaware Tributaries

## Northeast Bureau (609) 633-1179

- 3. Pompton, Pequannock, Wanaque, Ramapo
- 4. Lower Passaic, Saddle
- 5. Hackensack, Pascack, Hudson
- 6. Upper and Mid-Passaic, Whippany, Rockaway

## Raritan Bureau (609) 633-7020

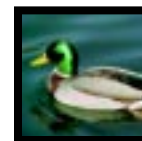
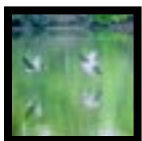
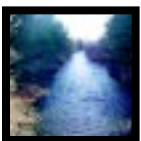
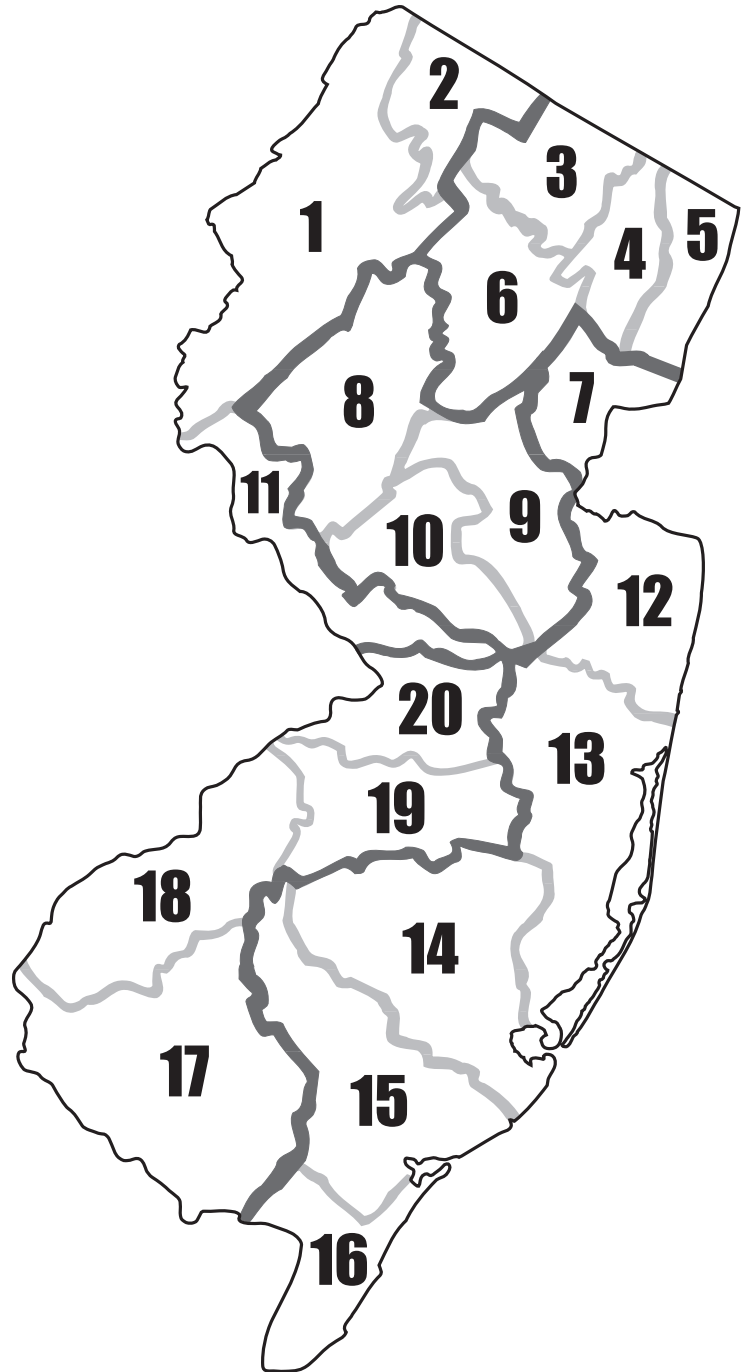
- 7. Elizabeth, Rahway, Woodbridge
- 8. North and South Branch Raritan
- 9. Lower Raritan, South River, Lawrence Brook
- 10. Millstone River

## Atlantic Coastal Bureau (609) 984-6888

- 12. Monmouth Watersheds
- 13. Barnegat Bay Watersheds
- 14. Mullica, Wading River
- 15. Great Egg Harbor, Tuckahoe
- 16. Cape May Watersheds






## Lower Delaware Bureau (609) 633-1441

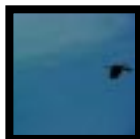
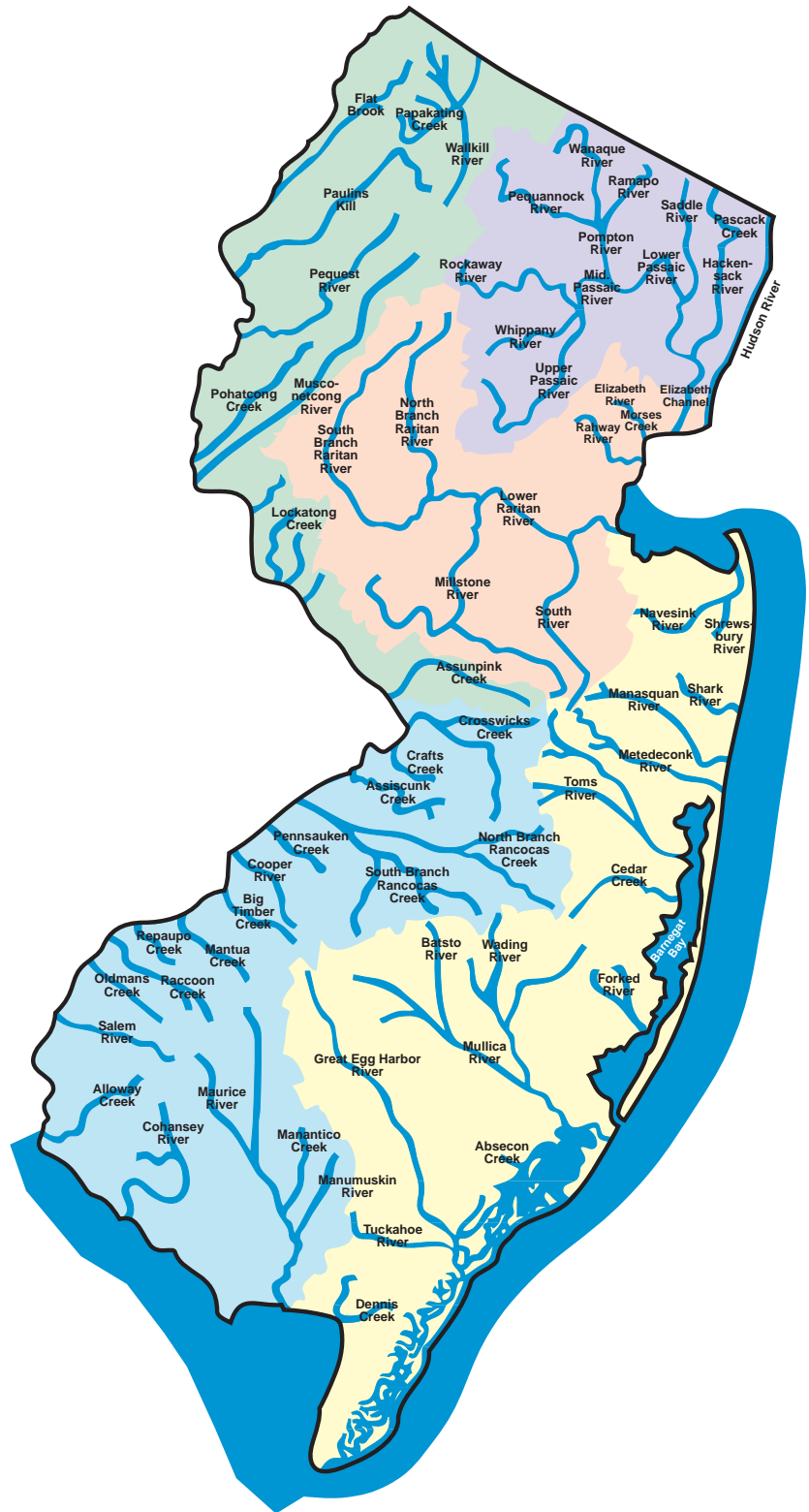
- 17. Maurice, Salem, Cohansey
- 18. Lower Delaware Tributaries
- 19. Rancocas Creek
- 20. Crosswicks Creek



# New Jersey's five watershed regions and major waterways

## watershed regions

-  Atlantic Coastal
-  Lower Delaware
-  Northeast
-  Northwest
-  Raritan



# **Watershed protection and nonpoint source pollution**

## ***what you can do today!***

One way you can protect your watershed is to reduce nonpoint source pollution. Nonpoint source pollution or “people pollution” is contamination of our watersheds, ground water, waterways and ocean that results from everyday activities such as fertilizing the lawn, walking pets, changing motor oil and littering. With each rainfall, pollutants generated by these activities are washed from the entire watershed into local waterways. They can also soak into the ground contaminating the ground water below.

But there is good news - in our everyday activities we can stop nonpoint source pollution and keep our environment clean. Simple changes in your daily lifestyle can make a tremendous difference in the quality of New Jersey’s water resources. Here are a few ways that you can reduce nonpoint source pollution:

**Place litter in trash receptacles.** Never throw litter, including cigarette butts and fast food containers, in streets or down storm drains. Recycle as much as possible.

**Avoid the overuse of fertilizers.** Do not apply them before a heavy rainfall. Do a soil test to see if fertilizers are necessary. Fertilizers contain nitrates and phosphates that, in abundance, cause blooms of algae that can lead to fish kills.

**Use alternative to pesticides whenever possible.** If you do use a pesticide, follow the label directions carefully. Many household products made to exterminate pests are also toxic to humans, animals, aquatic organisms and plants.

**Pick up after your pet. Pet owners should use newspaper, bags or scoopers to pick up after their pets and dispose of wastes in the garbage or toilet, not the storm drain.** Animal wastes contain bacteria and viruses that can contaminate shellfish and cause the closing of bathing beaches. Animal waste also contains nutrients that can cause algae blooms that are unsightly and can lead to fish kills.

**Do not feed ducks and geese.** Feeding ducks, geese and other waterfowl causes them to concentrate in small areas resulting in concentrated animal waste, causing the same problems as pet waste.

**Dispose of household hazardous waste properly.** Do not pour household hazardous products down any drain or toilet. Do not discard with the regular household trash. Use natural and less toxic alternatives whenever possible. Contact your County Solid Waste Management Office for information regarding household hazardous waste collection in your area. Many common household products (paint thinners, mothballs, drain and oven cleaners, to name a few) contain toxic ingredients. When improperly used or discarded, these products are a threat to public health and the environment.

**Recycle all used motor oil.** Do not dump used motor oil down storm drains or on the ground. Take it to a local public or private recycling center. Used motor oil contains toxic chemicals that are harmful to animals, humans and fish.

**Wash your car only when necessary.** Consider using a commercial car wash that recycles its wash water. Like fertilizers, many car detergents contain phosphate. If you wash your car at home, use a non-phosphate detergent.

**Treat your septic system with respect.** Avoid adding unnecessary grease, household hazardous products and solids to your septic system. Conserve water. Inspect your tank annually and pump it out every three to five years depending on its use. An improperly working septic system can contaminate ground water and create public health problems.

**Use marine sanitation devices and pump-out facilities at marinas when boating.** Observe the state’s no discharge zones. Dumping boat sewage overboard introduces bacteria and viruses into the water.



*For additional information please contact:*  
New Jersey Department of Environmental Protection · Watershed Management  
P.O. Box 418 · 401 East State Street · Trenton · New Jersey · 08625-0418  
609-292-2113 · [www.state.nj.us/dep/watershedmgt](http://www.state.nj.us/dep/watershedmgt)

