

Preventing Polluted Runoff

Everybody's Business



**pet waste, fertilizer,
chemicals, auto fluids**

Homeowners can prevent polluted runoff by using fertilizers and chemicals sparingly, maintaining septic systems, and picking up pet waste.



**nutrients, pesticides,
sediment**

Farmers can prevent polluted runoff by managing soil and animal feeding operations and buffering streams with native trees and plants.



**oil, heat, road salts,
sediment, chemicals**

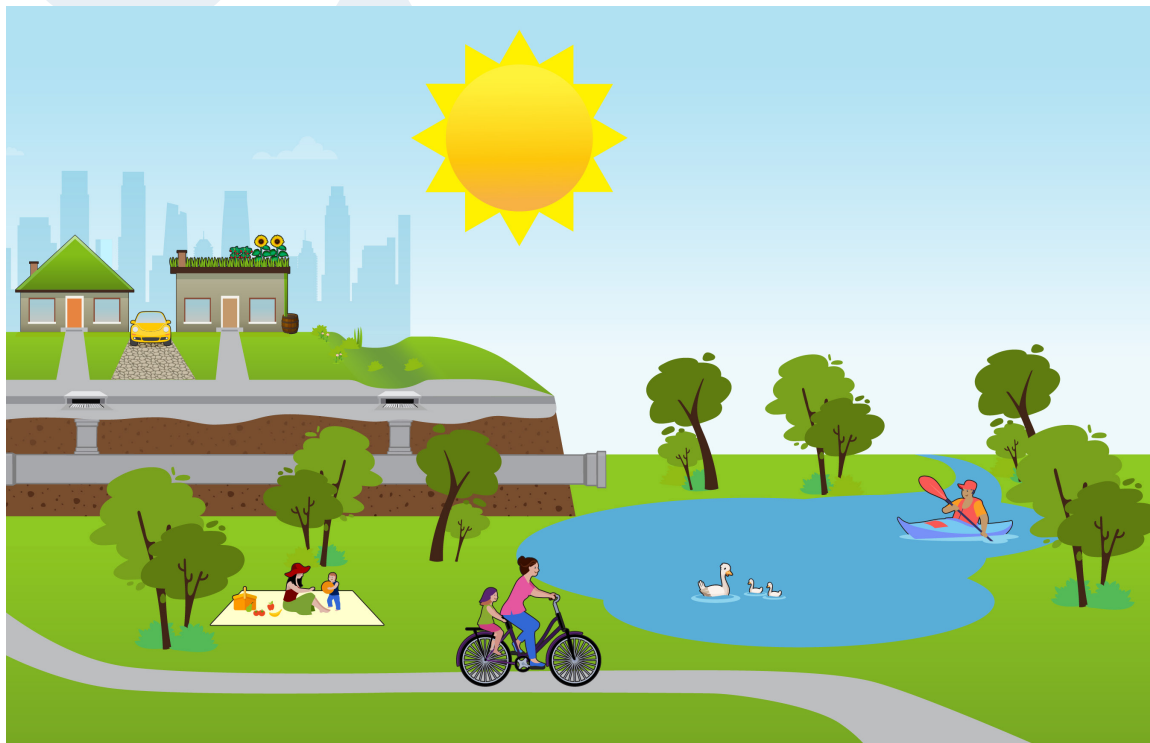
Developers and planners can prevent polluted runoff by using low impact development and providing structural and nonstructural controls.

INNOVATIVE SOLUTIONS BENEFIT THE COMMUNITY

As storm sewer systems across the country age and continue to be tested by extreme weather, many communities are investing in green infrastructure as a resilient and effective approach to managing the impact of stormwater. Green infrastructure practices such as rain

gardens, green roofs, and permeable pavements help reduce and treat stormwater where the rain falls, while providing numerous community benefits.

Innovative green infrastructure solutions are wise investments that complement more traditional sewer system components. Together they can work efficiently and effectively to manage the impact of stormwater and bring value to communities.



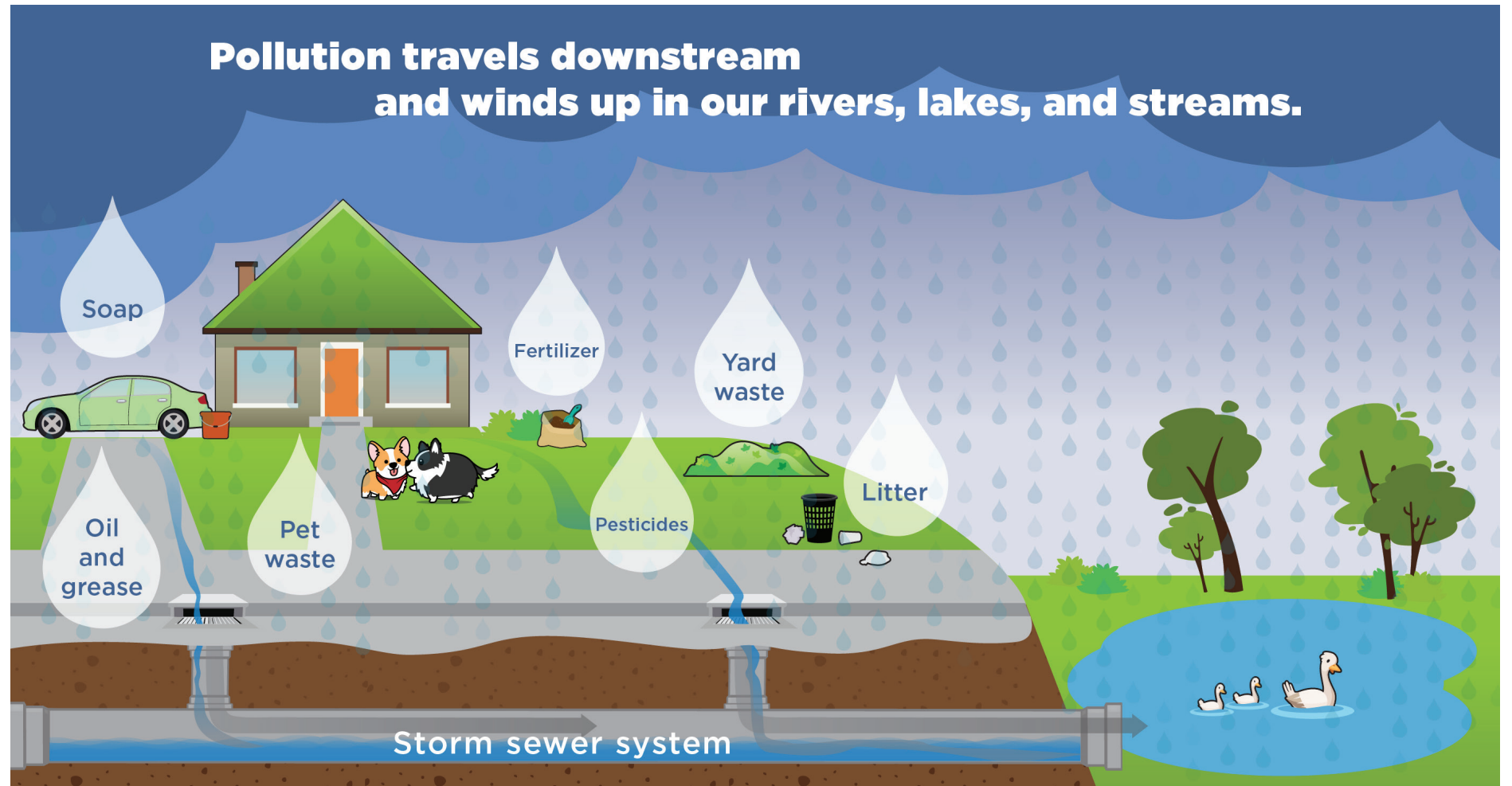
BE STORMWATER SMART
Know What Happens When It Rains

Have you ever watched water run down a gutter or pool on the side of the road during a storm? What happens to all the water? Most stormwater—the water from rain and snow—runs over the land and down a storm drain. The water flows through a network of underground pipes and open channels directly to our streams, rivers, and lakes. That’s why keeping stormwater clean is vital to the health of our waterways, community, and even our economy.

KNOW WHAT’S IN THE FLOW

When water flows off our property after a storm, what's on our lawns, roads, buildings, and parking lots flows with it. The water that doesn't soak into the ground picks up oil, litter, fertilizer, and other unhealthy items along its way that wind up in our rivers, lakes, and streams.

Water pollution can start on your property in ways you cannot see, but that affect your health and the whole community downstream. Watching what we put in our storm drains and



on our property makes our rivers, lakes, and streams cleaner, healthier, and more enjoyable. And by investing in solutions to manage stormwater, we help make our community a safer, greener, healthier, and more enjoyable place to live.

Stormwater is the water that flows over the ground after it rains, snows, or sleet. It can become polluted as it runs over hard surfaces and flows downstream.

Protecting Water Quality from **URBAN RUNOFF**

Clean Water Is Everybody's Business

In urban and suburban areas, much of the land surface is covered by buildings and pavement, which do not allow rain and snowmelt to soak into the ground. Instead, most developed areas rely on storm drains to carry large amounts of runoff from roofs and paved areas to nearby waterways. The stormwater runoff carries pollutants such as oil, dirt, chemicals, and lawn fertilizers directly to streams and rivers, where they seriously harm water quality. To protect surface water quality and groundwater resources, development should be designed and built to minimize increases in runoff.

How Urbanized Areas Affect Water Quality Increased Runoff

The porous and varied terrain of natural landscapes like forests, wetlands, and grasslands traps rainwater and snowmelt and allows them to filter slowly into the ground. In contrast, impervious (nonporous) surfaces like roads, parking lots, and rooftops prevent rain and snowmelt from infiltrating, or soaking, into the ground. Most of the rainfall

The most recent National Water Quality Inventory reports that runoff from urbanized areas is the leading source of water quality impairments to surveyed estuaries and the third-largest source of impairments to surveyed lakes.

Did you know that because of impervious surfaces like pavement and rooftops, a typical city block generates more than 5 times more runoff than a woodland area of the same size?

and snowmelt remains above the surface, where it runs off rapidly in unnaturally large amounts.

Storm sewer systems concentrate runoff into smooth, straight conduits. This runoff gathers speed and erosional power as it travels underground. When this runoff leaves the storm drains and empties into a stream, its excessive volume and power blast out streambanks, damaging streamside vegetation and wiping out aquatic habitat. These increased storm flows carry sediment loads from construction sites and other denuded surfaces and eroded streambanks. They often carry higher water temperatures from streets, roof tops, and parking lots, which are harmful to the health and reproduction of aquatic life.

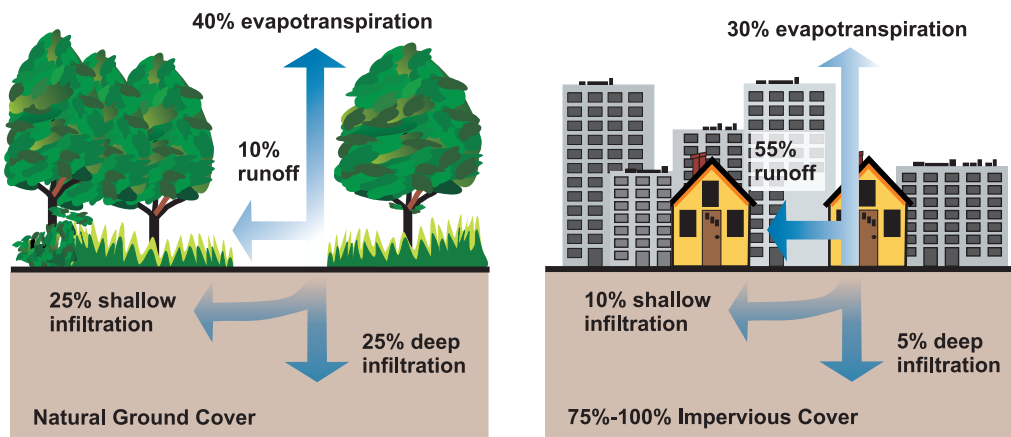
The loss of infiltration from urbanization may also cause profound groundwater changes. Although urbanization leads to great increases in flooding during and immediately after wet weather, in many instances it results in lower stream flows during dry weather. Many native fish and other aquatic life cannot survive when these conditions prevail.

Increased Pollutant Loads

Urbanization increases the variety and amount of pollutants carried into streams, rivers, and lakes. The pollutants include:

- Sediment
- Oil, grease, and toxic chemicals from motor vehicles
- Pesticides and nutrients from lawns and gardens
- Viruses, bacteria, and nutrients from pet waste and failing septic systems
- Road salts
- Heavy metals from roof shingles, motor vehicles, and other sources
- Thermal pollution from dark impervious surfaces such as streets and rooftops

These pollutants can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe and unpleasant.



Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface runoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.

Managing Urban Runoff

What Homeowners Can Do

To decrease polluted runoff from paved surfaces, households can develop alternatives to areas traditionally covered by impervious surfaces. Porous pavement materials are available for driveways and sidewalks, and native vegetation and mulch can replace high maintenance grass lawns. Homeowners can use fertilizers sparingly and sweep driveways, sidewalks, and roads instead of using a hose. Instead of disposing of yard waste, they can use the materials to start a compost pile. And homeowners can learn to use Integrated Pest Management (IPM) to reduce dependence on harmful pesticides.

In addition, households can prevent polluted runoff by picking up after pets and using, storing, and disposing of chemicals properly. Drivers should check their cars for leaks and recycle their motor oil and antifreeze when these fluids are changed. Drivers can also avoid impacts from car wash runoff (e.g., detergents, grime, etc.) by using car wash facilities that do not generate runoff. Households served by septic systems should have them professionally inspected

and pumped every 3 to 5 years. They should also practice water conservation measures to extend the life of their septic systems.

Controlling Impacts from New Development

Developers and city planners should attempt to control the volume of runoff from new development by using low impact development, structural controls, and pollution prevention strategies. Low impact development includes measures that conserve natural areas (particularly sensitive hydrologic areas like riparian buffers and infiltrable soils); reduce development impacts; and reduce site runoff rates by maximizing surface roughness, infiltration opportunities, and flow paths.

Controlling Impacts from Existing Development

Controlling runoff from existing urban areas is often more costly than controlling runoff from new developments. Economic efficiencies are often realized through approaches that target “hot spots” of runoff pollution or have multiple benefits, such as high-efficiency street sweeping (which addresses aesthetics, road safety,

and water quality). Urban planners and others responsible for managing urban and suburban areas can first identify and implement pollution prevention strategies and examine source control opportunities. They should seek out priority pollutant reduction opportunities, then protect natural areas that help control runoff, and finally begin ecological restoration and retrofit activities to clean up degraded water bodies. Local governments are encouraged to take lead roles in public education efforts through public signage, storm drain marking, pollution prevention outreach campaigns, and partnerships with citizen groups and businesses. Citizens can help prioritize the clean-up strategies, volunteer to become involved in restoration efforts, and mark storm drains with approved “don’t dump” messages.



Related Publications

Turn Your Home into a Stormwater Pollution Solution!

www.epa.gov/nps

This web site links to an EPA homeowner’s guide to healthy habits for clean water that provides tips for better vehicle and garage care, lawn and garden techniques, home improvement, pet care, and more.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas

www.epa.gov/owow/nps/urbanmm

This technical guidance and reference document is useful to local, state, and tribal managers in implementing management programs for polluted runoff. Contains information on the best available, economically achievable means of reducing pollution of surface waters and groundwater from urban areas.

Onsite Wastewater Treatment System Resources

www.epa.gov/owm/onsite

This web site contains the latest brochures and other resources from EPA for managing onsite wastewater treatment systems (OWTS) such as conventional septic systems and alternative decentralized systems. These resources provide basic information to help individual homeowners, as well as detailed, up-to-date technical guidance of interest to local and state health departments.

Low Impact Development Center

www.lowimpactdevelopment.org

This center provides information on protecting the environment and water resources through integrated site design techniques that are intended to replicate preexisting hydrologic site conditions.

Stormwater Manager’s Resource Center (SMRC)

www.stormwatercenter.net

Created and maintained by the Center for Watershed Protection, this resource center is designed specifically for stormwater practitioners, local government officials, and others that need technical assistance on stormwater management issues.

Strategies: Community Responses to Runoff Pollution

www.nrdc.org/water/pollution/storm/stoinx.asp

The Natural Resources Defense Council developed this interactive web document to explore some of the most effective strategies that communities are using around the nation to control urban runoff pollution. The document is also available in print form and as an interactive CD-ROM.

For More Information

U.S. Environmental Protection Agency
Nonpoint Source Control Branch (4503T)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

www.epa.gov/nps

You can support stormwater management projects in your community that both benefit the environment and bring value to the community. Local schools, parks, and private institutions can do a lot to reduce the impact from rainfall on rivers, lakes, and streams:

- Rain gardens and bioretention areas absorb rain before it runs into the street.

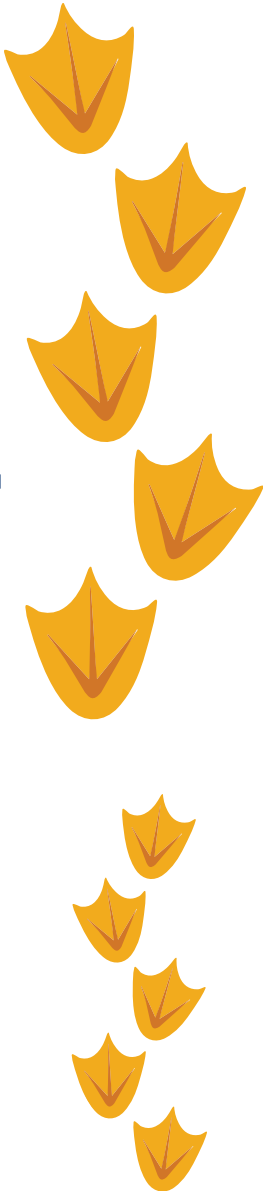
- Green roofs help keep water from running off buildings.
- Replacing walkways with pavement that is permeable allows water to soak into the ground.

While you're enjoying local parks and waterways, don't forget to do your part! Pick up after pets—and yourself—and never dump liquids down storm drains. We can all do our part to be stormwater smart!

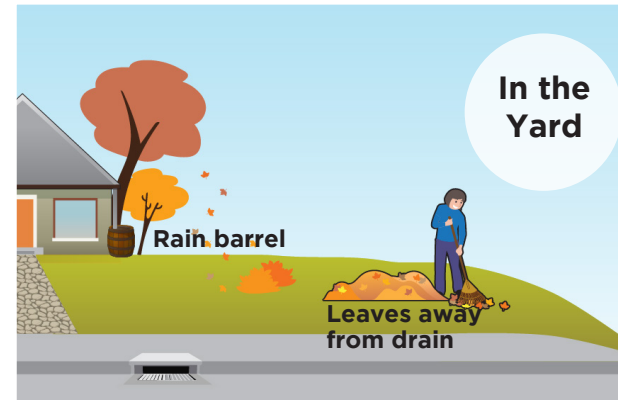
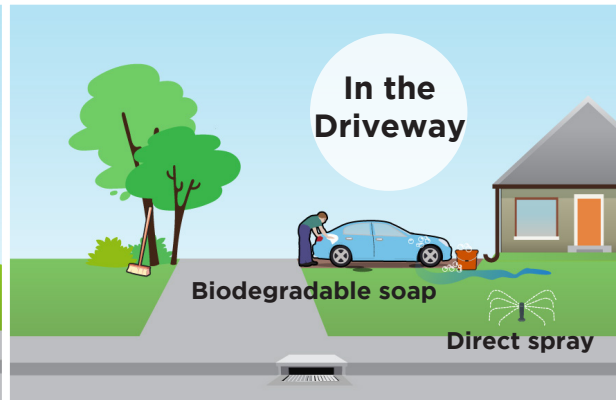
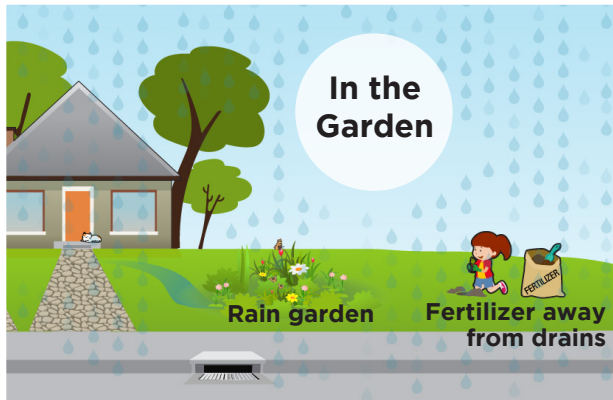


BE STORMWATER SMART

Take Steps to Protect Our Waterways



If you've been thinking about reducing your environmental footprint, you can take steps to decrease the amount of pollution that flows from your home into local waterways every time it rains. Known as stormwater, once rain or snow hits the ground, it can carry dirt, chemicals, and other pollutants downstream from your home and yard to the rivers and lakes in your community. Here are a just a few steps you can take to be stormwater smart at home:



Rain is great for your lawn, but excess rain can run off from your yard and walkways into the street, where it flows from the storm drain into local rivers, lakes, or streams, taking any chemical you've applied with it.

- Apply fertilizers and pesticides carefully on your lawn or garden and not on pavement.
- Avoid using fertilizers and pesticides completely if rain is in the forecast.
- Consider installing a rain garden, which is a depressed area planted with grasses or perennials that collects stormwater.

- Wash your car with biodegradable soap to avoid chemicals floating downstream, or visit a carwash.
- Direct water from downspouts and car washing to grassy areas, so it can soak into the ground rather than hit the pavement.
- Don't hose down your driveway and flush dirt down the storm drain.
- When watering your lawn, direct the spray toward your lawn and plants, not the pavement.
- Look for spots on the ground that indicate your car leaks oil or fluid. Don't let your leaks pollute!

- Use permeable pavers instead of hard stones or pavement in your yard to help water absorb into the ground.
- Don't rake leaves or yard clippings into the storm drain to avoid clogs and debris that could cause flooding.
- Install a rain barrel to help prevent rain from flowing into storm drains (and also save water for dry spells!).

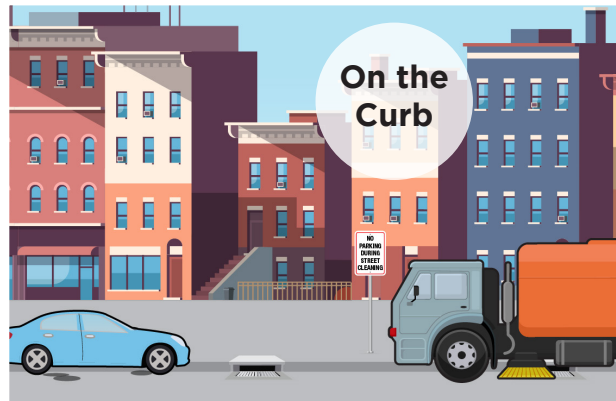
- Pick up pet waste and keep trash and dirty water away from pavement and storm drains, where it can contaminate stormwater that flows downstream.
- During colder weather, avoid oversalting your sidewalks and use an appropriate amount of deicer—a little goes a long way.
- Sweep sidewalks and put the debris in the trash.

DID YOU KNOW?

If you use a rain barrel to collect water for plants, you can keep your landscape green for free. Every time it rains, you'll collect water that can be used later! Check out www.epa.gov/watersense for more tips to save water!

If you've been thinking about reducing your environmental footprint, you can take steps to decrease the amount of pollution that flows into local waterways every time it rains. Known as stormwater, once rain or snow hits the ground, it can pick up dirt, chemicals, and other pollutants and carry them downstream from your sidewalks, streets, and alleys to bodies of water in your community.

Rain is great for growing things in the city, but excess rain can run off from roofs, pavement, and other hard surfaces into the street, where it flows from the storm drain into local rivers, lakes, or streams, taking pollution from those surfaces with it. Here are just a few steps you can take to be stormwater smart, starting in your own neighborhood:



- If you park your car on the street, check for spots underneath it, which could be a sign of leaky oil or other fluids that can contaminate stormwater as it washes by. Don't let your leak pollute.
- Street sweeping is an important part of stormwater management; during posted sweeping hours, don't park your car on the street.

- Keep garbage cans covered to keep trash from blowing and avoid rainwater getting contaminated by your trash. Never dump garbage in alleys or gutters.
- Read the label to dispose of household chemicals and paints properly, and never dump them in the alley, on the sidewalk, or in the street.


- Keep raked leaves or yard clippings out of the storm drain to avoid clogs and debris that can reach waterways.
- Don't hose down sidewalks; that will flush dirt down through the storm drain system!
- During colder weather, avoid oversalting the sidewalk or use "green" deicer—a little goes a long way!

- Always pick up after your dog by putting waste in a bag and disposing it in an appropriate waste container, rather than dropping it in the storm drain.
- Never drop cigarette butts on the ground; put out cigarettes and drop the butts in a proper receptacle or trash can.
- Always put trash in its place and keep it away from storm drains.

DID YOU KNOW?

Everything you put on the ground can possibly contaminate local water bodies and affect public health.

STORMWATER SMART LAWN CARE



When water from rain, snow, or sleet flows over the ground, it's called "stormwater." Stormwater can pick up debris, litter, fertilizer, and pesticides used for lawn care. And when that stormwater flows into street gutters, storm drains, and downstream, it can pollute rivers, lakes, and streams. Follow these simple pollution solutions to help keep local waterways clean and healthy!



DON'T MOW TOO LOW

Only remove 1/3 of the grass blade height and leave clippings on lawn to allow nutrients to return to the soil—they act as a natural fertilizer!



CAREFUL WITH CHEMICALS

Read the label when applying pesticides and fertilizers, use them sparingly, and avoid applying them to pavement. When there is rain in the forecast, any chemicals you apply can wash downstream.



ONLY RAIN IN THE DRAIN

Don't rake, sweep, or hose debris down the storm drains. Leaves, yard clippings, and trash can clog storm pipes, causing floods and polluted waterways.



CURB YOUR WATER WASTE

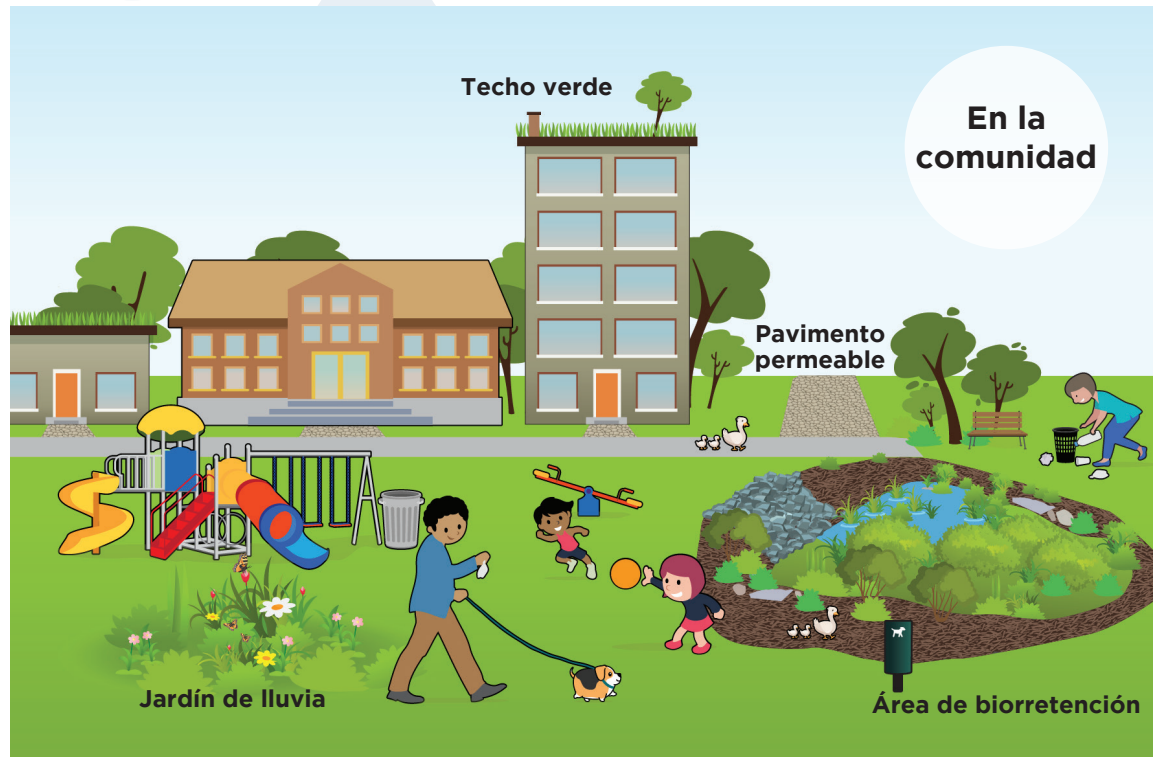
Direct sprinklers toward the lawn and away from pavement to save water and keep chemicals and debris out of storm drains. Check out www.epa.gov/watersense for more tips to save water!

Puede apoyar los proyectos de gestión de aguas pluviales en su comunidad que benefician al medioambiente y aportan valor a la comunidad. Las escuelas, los parques y las instituciones privadas locales pueden hacer mucho para reducir el impacto de las lluvias en los ríos, lagos y arroyos:

- Los jardines de lluvia y las áreas de biorretención absorben la lluvia antes de que esta llegue a la calle.
- Los techos verdes ayudan a evitar que el agua se escurra desde las edificaciones.

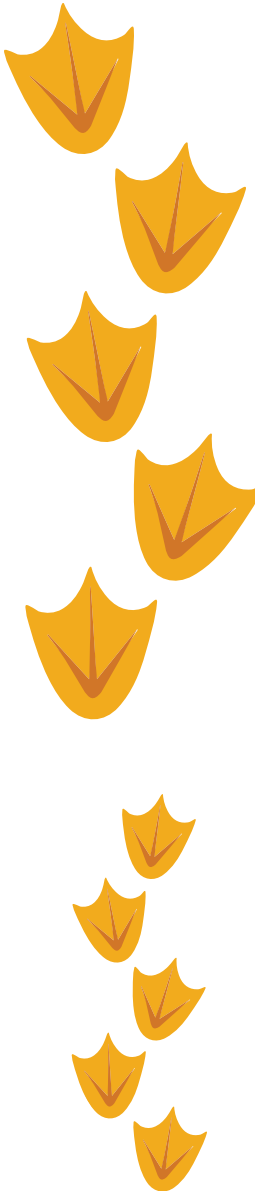
- Reemplazar las pasarelas con pavimento permeable permite que el agua penetre en el suelo.

Mientras disfruta de los parques y las vías fluviales locales, no se olvide de hacer su parte. Recoja los residuos de las mascotas (y los suyos) y nunca arroje líquidos por los desagües pluviales. ¡Todos podemos ser parte de las medidas inteligentes para las aguas pluviales!

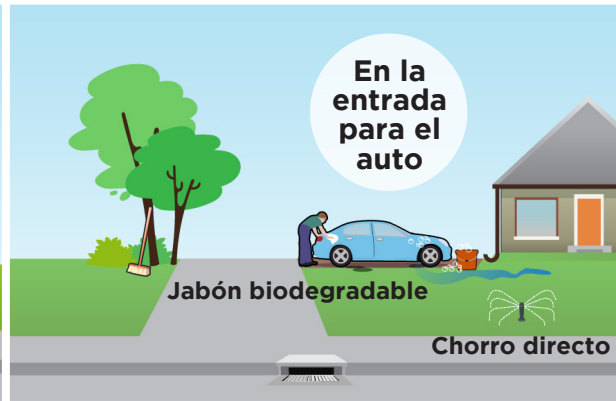


TOME MEDIDAS INTELIGENTES PARA LAS AGUAS PLUVIALES

Proteja nuestras vías fluviales



Si ha estado pensando en reducir su huella ambiental, puede tomar medidas para disminuir la cantidad de contaminación que fluye hasta las vías fluviales locales cada vez que llueve. Conocidas como aguas pluviales, cuando la lluvia o la nieve caen sobre el suelo, pueden recoger suciedad, sustancias químicas y otros contaminantes, y acarrearlos desde las aceras, las calles y los callejones hasta las masas de agua de la comunidad:



La lluvia es maravillosa para su césped, pero el exceso de lluvia puede escurrirse desde su patio y las pasarelas peatonales hacia la calle, donde fluye desde el desagüe pluvial hacia ríos, lagos o arroyos locales, acarreando con ella cualquier sustancia química que usted haya aplicado.

- Aplique fertilizantes y pesticidas con cuidado en su césped o jardín; no los aplique sobre el pavimento.
- Evite por completo usar fertilizantes y pesticidas si hay pronóstico de lluvia.
- Considere la posibilidad de instalar un jardín de lluvia, que es un área deprimida que incluye pastos o plantas perennes, que recoge el agua pluvial.

- Lave su automóvil con jabón biodegradable para evitar que las sustancias químicas lleguen a los desagües, o visite a un lavadero de carros.
- Dirija el agua de las bajantes pluviales y el lavado del automóvil a zonas con césped, para que se filtre en el suelo y no llegue al pavimento.
- No limpie la entrada para el auto con manguera y envíe la suciedad hasta el desagüe pluvial.
- Al regar el césped, dirija el chorro hacia el césped y las plantas, no hacia el pavimento.
- Busque manchas en el suelo para saber si el coche fuga aceite o líquido. ¡No deje que las fugas contaminen el agua!

- En su patio, use adoquines permeables en lugar de piedras duras o pavimento para ayudar a que el agua se absorba en el suelo.
- No rastrille las hojas o los recortes de la vegetación hacia el desagüe pluvial para evitar obstrucciones y escombros que podrían causar inundaciones.
- Instala un barril de lluvia para ayudar a prevenir que la lluvia fluya hacia los desagües pluviales (¡y también ahorrar agua para los períodos de sequía!).

- Recoja los desechos de su mascota y mantenga la basura y el agua sucia lejos del pavimento y los desagües pluviales, donde pueden contaminar las aguas pluviales en su recorrido.
- Durante el clima más frío, evite poner demasiada sal en las aceras y use la cantidad adecuada de descongelante —un poco es suficiente.
- Barra las aceras y pon los desechos en la basura.

¿SABÍA QUE...?

Si recoge el agua para las plantas con un barril de lluvia, puede tener un jardín ecológico de forma gratuita. Cada vez que llueva, recogerá agua para usar posteriormente. Consulte www.epa.gov/watersense para ver más consejos sobre la forma de ahorrar agua.

Soak Up the Rain with Green Infrastructure

www.epa.gov/soakuptherain



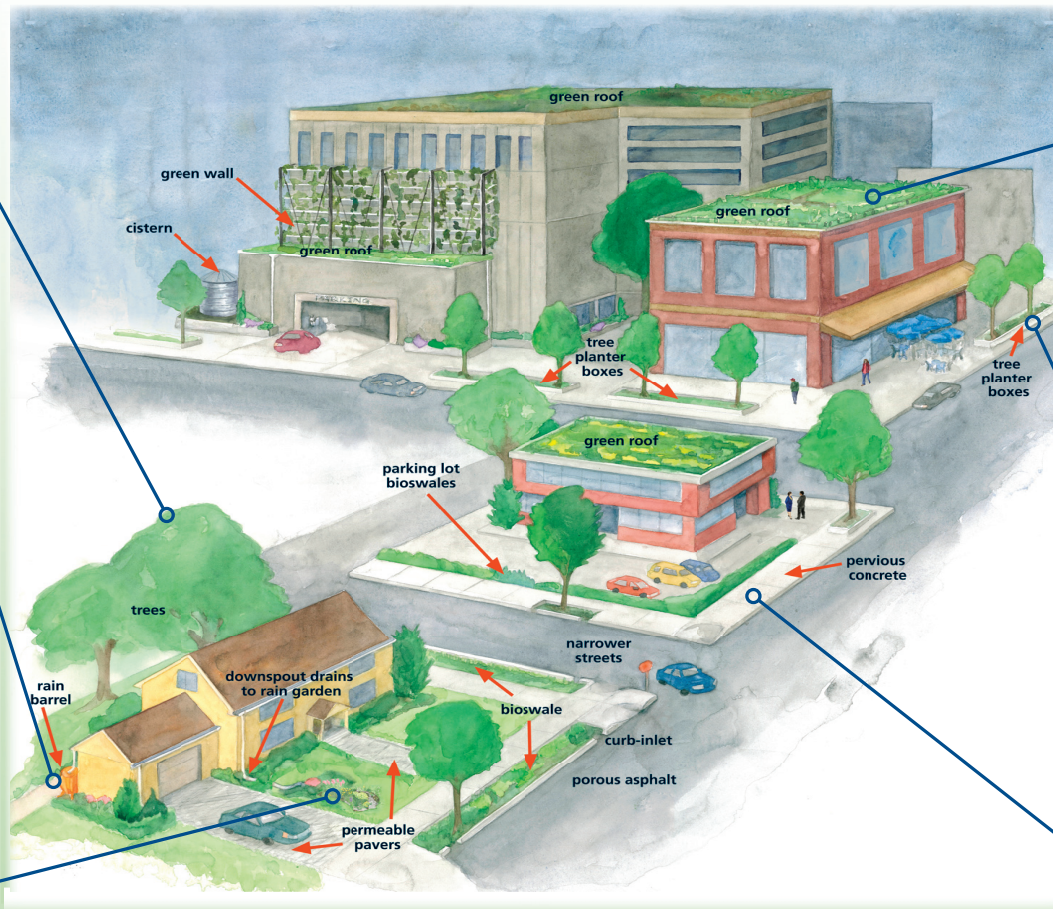
Tree Canopy



Rain Barrel



Rain Garden



Green Roof



Tree Planter Box



Pervious Concrete

Learn more. Take Action.



After the Storm

*A Citizen's Guide to
Understanding Stormwater*



The effects of pollution

What is stormwater runoff?



Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Why is stormwater runoff a problem?



Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- ◆ Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- ◆ Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- ◆ Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- ◆ Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- ◆ Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.



- ◆ Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.



Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- ◆ Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- ◆ Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- ◆ Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- ◆ Cover piles of dirt or mulch being used in landscaping projects.



Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- ◆ Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- ◆ Don't dispose of household hazardous waste in sinks or toilets.



Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- ◆ Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- ◆ Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.



Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- ◆ When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.



Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for



rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.



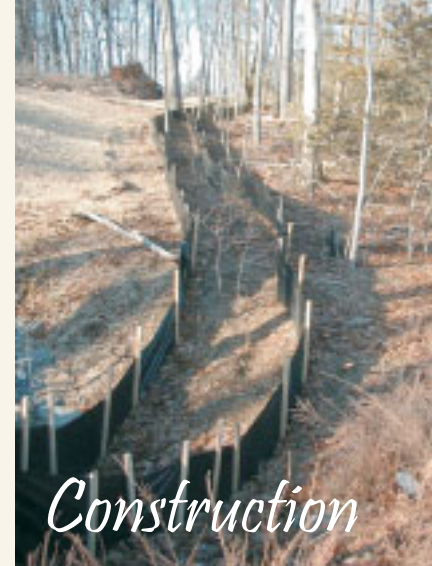
Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- ◆ Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- ◆ Cover grease storage and dumpsters and keep them clean to avoid leaks.
- ◆ Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- ◆ Divert stormwater away from disturbed or exposed areas of the construction site.
- ◆ Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- ◆ Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



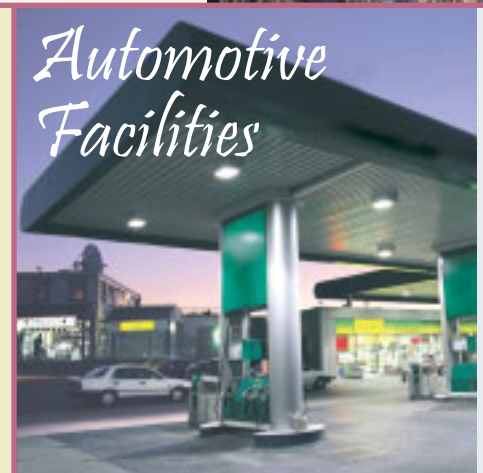
Construction



Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- ◆ Keep livestock away from streambanks and provide them a water source away from waterbodies.
- ◆ Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- ◆ Vegetate riparian areas along waterways.
- ◆ Rotate animal grazing to prevent soil erosion in fields.
- ◆ Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.



Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- ◆ Clean up spills immediately and properly dispose of cleanup materials.
- ◆ Provide cover over fueling stations and design or retrofit facilities for spill containment.
- ◆ Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- ◆ Install and maintain oil/water separators.



Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- ◆ Conduct preharvest planning to prevent erosion and lower costs.
- ◆ Use logging methods and equipment that minimize soil disturbance.
- ◆ Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- ◆ Construct stream crossings so that they minimize erosion and physical changes to streams.
- ◆ Expedite revegetation of cleared areas.



For more information contact:

or visit

www.epa.gov/npdes/stormwater

www.epa.gov/nps



EPA 833-B-03-002

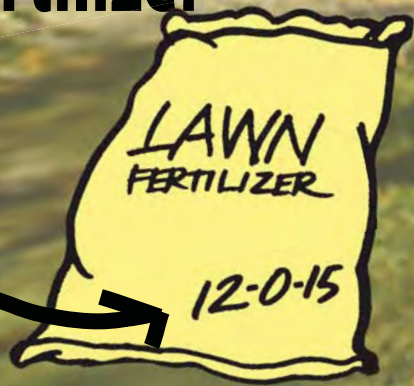
January 2003



Don't P on your Lawn

*Phosphorus pollutes our water.
Use lawn fertilizer with zero
percent Phosphorus.*

Phosphorus free
Fertilizer



Look for the Zero!

Check labels and look for the zero! The numbers on a fertilizer bag refer to the percentages of nitrogen, phosphorus and potassium found inside. Phosphorus is always the middle number.



Rain can wash fertilizer into the street and storm drain and directly into our streams, lakes and reservoirs stimulating algae growth and diminishing water quality.

Westchester County law requires that: no lawn fertilizers be applied between Dec. 1 and April 1; no fertilizers be applied to impervious surfaces such as parking lots, driveways, roads or sidewalks; no fertilizers be applied within 20 feet of any surface water; and, as of Jan. 1, 2011, the law will regulate the use of lawn fertilizers containing phosphorus.



Westchester
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Stormwater Education and Outreach Program

WESTCHESTER COUNTY DEPARTMENT OF PLANNING

Learn more at www.westchestergov.com/stormwater or phone: 914.995.4400



Keep Westchester Water H:OK

This poster was funded by a grant from the New York State Department of Environmental Conservation. (March 2010)

HALT before you

SALT

*use less de-icer
protect our water*



Did you know that salt and other de-icers can wash into storm drains and pollute our streams, rivers and drinking water? Salt can also deplete the soil of beneficial bacteria and nutrients and inhibit plant growth.

Here are a few tips on how to use salt wisely and protect our water:

Salt before it snows.

Salt goes a longer way if applied before the snowfall, saving you money. It prevents ice from bonding to the pavement, making it easier to shovel.

Never use sand or cat litter.

Sand and cat litter can clog our storm drains and waterways. This can be harmful to aquatic life and our drinking water.

Consider alternatives.

In addition to rock salt (Sodium Chloride), Calcium Chloride and products with Potassium Chloride can be used safely in moderation. Other alternatives include Calcium Magnesium Acetate and Potassium Acetate.

For more information on de-icing and protecting our water, go to:

westchestergov.com/stormwater



Only rain down the drain

*Wash your car on the grass
or at the car wash -
not pavement!
Soap and oil
runoff pollutes
our water.*



Minimize environmental impacts. Wash your car at a car wash where the water gets treated and recycled. If you wash your car at home, wash with a biodegradable soap parked on gravel or grass, where water is filtered naturally. Avoid washing cars where dirt and oil can wash into the street and storm drain.

**ONLY
RAIN**

**DOWN
the
STORM
DRAIN**

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Keep Westchester Water H₂O^K

Don't Pollute
Our Water

Scoop the Poop



Pet waste left on the ground increases the risk for harmful bacteria and nutrients to wash into storm drains and into streams, lakes and reservoirs. What to do? Pick up pet waste and dispose of it in a trash can. Never dump anything into a storm drain.



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Keep Westchester Water H₂O_K

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When you're
washing your
car in the
driveway,

When
your pets
go on the
ground,

When
you're
fertilizing
the lawn,

When
your car is
leaking oil on
the street,



...you're not just washing your car in the driveway.

...they're not just going on the ground.

...you're not just fertilizing the lawn.

...it isn't just leaking oil on the street.

Step By Step

Your Guide To Cleaner Water

If you wash your car on the street or driveway, the soap and oily grit picked up by your car will be washed into nearby storm drains and then into our streams, ponds, reservoirs or estuaries, without any treatment. This pollution is unhealthy for all of us.

So how can you avoid this mess? Wash your car on grass or gravel surfaces instead of on paved streets. Better yet, take it to a commercial car wash where the water is treated and recycled.

If pet waste is not properly disposed of, the waste may be washed into nearby storm drains by rain or melting snow. Pet waste is a source of bacteria. Many storm drains empty into our streams, ponds, reservoirs and estuaries, delivering bacteria and other pollutants to these waters.

So what can you do? Carry a pooper scooper or plastic bags. Flush only the waste or seal it in a plastic bag and dispose of it in the garbage.

If you apply too much fertilizer, especially before a heavy rain storm, a lot of it may be washed into nearby storm drains and then our waterways and water bodies without treatment. Once in the water, fertilizers promote a growth and decay process in algae. The decaying algae then use up oxygen, which fish need to survive.

So when you apply fertilizer to your lawn or garden use it sparingly, avoid applying it before a heavy rainstorm, and use slow-release fertilizer.

When oil leaks from our cars onto driveways, streets and parking lots, there's a good chance it will be washed into nearby storm drains, eventually making its way into our streams, ponds, reservoirs and estuaries. Picture the number of cars in your area and imagine the amount of oil that finds its way from leaky gaskets into our waterways and water bodies.

So, please fix leaks and never dump used motor oil or other engine fluids into storm drains or the ground.

Be Part Of The Pollution Solution!

Visit these web sites for information about polluted runoff:

County of Westchester:

www.westchestergov.com/waterquality

Center for Watershed Protection:

www.stormwatercenter.net

U.S. Environmental Protection Agency:

<http://www.epa.gov/owow/nps>

What is Polluted Stormwater Runoff?

When snow melts or it rains, water runs over roads, parking lots, sidewalks and lawns, removing oils and grease, sand and salt, tiny metal and soil particles, and fertilizers. This stormwater runoff and the pollutants it contains then flow directly into storm drainage systems. From there, it's carried without treatment into our streams, ponds, reservoirs, Long Island Sound and Hudson River.

If we want to continue making progress, more effort is needed to control polluted stormwater runoff, such as by fixing any oil and other fluid leaks on our cars, reducing the amount of fertilizers we use, and washing our cars at commercial car washes where the water is recycled and/or filtered. And remember, don't dump! Only rainwater should go down a storm drain, not used motor oil or pet waste.

Help Clean Up Our Water Resources.

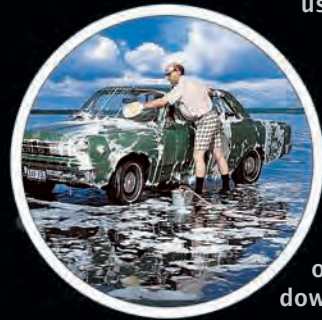
Clean streams, lakes, reservoirs and estuaries are important to all of us!

But you don't have to live near a stream or lake to affect their water quality. For example, spilled oil may eventually find its way there no matter where it's spilled. The environmental impacts from polluted runoff are gradual, but severe. The cumulative effects of polluted stormwater runoff can make the water very unhealthy for fish, animals and people.

It's up to all of us to keep our water resources clean. Polluted runoff can be reduced significantly if everyone incorporates small preventive measures into their regular everyday activities, such as properly disposing of pet waste or minimizing use of lawn fertilizers.

What Can You Do?

Wash your car on a grassy area so the ground can filter the water naturally.



Use soap sparingly and use non-phosphate detergents.

Use a high-pressure, low-volume hose with a trigger nozzle to save water.

Empty your bucket of used, soapy water down the sink.

Best of all, take your car to a commercial car wash where the used water is captured, recycled and/or filtered to remove pollutants.

If you plan to hold a fund-raising car wash, try to have the cars washed on a permeable surface where the soapy water can be absorbed into the ground.

What Can You Do?

Scoop up pet waste.



Flush it down a toilet, as long as it's not mixed with litter or other materials. This is the best method because your septic system or community sewage plant will treat the waste.

Or seal the waste in a plastic bag and put it in the garbage.

Never dump pet waste or plastic bags containing waste into a storm drain.

If your community does not regulate pet waste, encourage your local government to adopt a "pooper-scooper" ordinance.

If your local parks do not provide pet waste stations, encourage them to do so.

What Can You Do?

Use fertilizers sparingly. Lawns and many garden plants do not need as much fertilizer as you might think, especially if you use certain grasses and native plants.



Use slow-release fertilizers.

Don't fertilize just before a forecasted heavy rain storm.

Use commercially available compost or make your own using yard waste. Mixing compost with soil means your plants will need less chemical fertilizer and puts your waste to good use.

Compost may be available from your local public works facility or a garden store.

Don't bag grass clippings. Use a mulching lawn mower and naturally fertilize your lawn with the clippings.

Wash your spreader and equipment on a pervious area like a lawn, not on the driveway. This allows natural absorption of excess fertilizer.

Maintain a buffer strip of unmowed, natural vegetation alongside streams, ponds and wetlands to trap excess fertilizers and sediment.

What Can You Do?

Check your car often for oil and fluid drips and other leaks and fix them promptly.

Have your car regularly tuned-up to reduce oil use.

Use ground cloths or drip pans under your vehicle if you have leaks or are doing engine work.

Recycle used motor oil. Many auto supply stores, car-care centers and gas stations accept used oil. Some public works facilities also accept used oil.

Clean up spills immediately. You can use kitty litter or sand to soak up the liquid. Properly dispose of this material after the spill.



Collect all used oil in containers with tight-fitting lids. Do not mix waste oil with gasoline, solvents or other engine fluids. This contaminates the oil, which may otherwise be reused, and may form a more hazardous chemical.

Never dump motor oil, antifreeze, transmission fluid, or other engine fluids down storm drains, into road gutters, on the ground, or into a ditch.

The Department of Planning, in partnership with the Soil and Water Conservation District, has advanced a number of initiatives to control polluted stormwater, including watershed planning, stormwater management and natural resources restoration projects, and public outreach and education. For more information, call (914)995-4400 or visit www.westchestergov.com/planning/environmental.



The Westchester County Department of Planning and Soil and Water Conservation District wish to thank the Washington State Department of Ecology for these images, and Long Island Sound Study and New England Interstate Water Pollution Control Commission for sharing the brochure design.



Westchester County
Soil and Water Conservation District