CNY STORMWATER COALITION

Gardens and Gutters

A Central New Yorker's Guide to Managing Stormwater Runoff

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Gardening in a Watershed

This issue of *Garden and Gutters* presents information about watersheds and the importance of knowing that gardening and other land use practices can contribute to water quality issues in downstream locations, even if they're miles away. Watersheds can be as small as a pond or very large, covering thousands of square miles. For example, the Chesapeake Bay watershed covers 64,000 square miles in six states and the District of Columbia.

Surface water and stormwater runoff within a watershed eventually drain to downstream bodies of water. For this reason, it's important to consider downstream impacts when evaluating land use plans within your community, when anticipating the impacts of strong storm events, and even when developing fertilizer and pest control plans for your lawn and garden. New development, agriculture, and other watershed activities eventually impact downstream areas.

This newsletter also contains interesting information about weather impacts on gardening and water resources, the benefits of green infrastructure, a summer yard and garden check-list, phosphorus fertilizer laws, and water quality concerns from geese and dogs.

Gardening Practices and Water Movement in a Watershed

A watershed is the area of land that drains rainwater and snowmelt to a body of water such as a river, lake, wetland or ocean. A watershed, often used interchangeably with drainage basin or catchment, includes both surface and groundwater. Adjacent watersheds are separated by high geographic features such as mountains, hills and ridges that are called drainage divides.

All water resources in New York State fall within one of 17 major watersheds. Most of Central New York is located in the Oswego River/Finger Lakes Watershed. The 5,070 square miles of land area and 8,896 miles of rivers and streams in this watershed include the Oswego, Oneida, Seneca and Clyde Rivers and most of the New York Finger Lakes. Stormwater management and the protection of drinking water and water-based recreational activities in this region remain high priorities. Water quality issues of concern in the watershed include industrial discharges to Onondaga Lake (currently being remediated); municipal wastewater and combined sewer overflows in Syracuse and other urban areas; and nonpoint sources of nutrients and additional pollutants.

The factors that determine how much water flows through a watershed are influenced by the amount of precipitation and soil infiltration. When precipitation falls on the ground, some of the water soaks into the soil. The water gradually moves downhill through the soil and eventually enters a stream through seepage. Some of the water also infiltrates to deeper levels of the soil, recharging groundwater aquifers. Water can travel long distances or remain in storage for long periods before returning to the surface. The amount of water that will soak into the ground depends on several factors such as soil characteristics, weather conditions, topography (slope of the land), evaporation, and water use.

Gardening and other land use practices have a direct impact on the type of pollutants flowing through a watershed. A primary goal of storm-water management is to limit the amount of water and pollutants that flow into nearby waterbodies. The pollutants of greatest concern from a gardening perspective are nutrients (primarily phosphorus) and sediment. Strong rain events can accelerate the rate of soil erosion whereby soil particles, nutrients and other pollutants are transported by water to local streams, rivers and lakes. The pollutants degrade the waterbodies by threatening the health of people, fish and wildlife and damaging aquatic habitat. The Central New York gardening community can reduce the amount of erosion and stormwater pollution by following the guidelines presented on the next page.

Lilac bushes provide vibrant color and fragrance to Central New York yards and gardens.

Summer Gardening Tips

Some gardening activities, especially if they are done prior to a heavy rainfall, have the potential to impact downstream areas in the watershed. For example, when gardeners apply pesticides, herbicides and fertilizers, the products can flow into local waterbodies which can affect the health of people and aquatic life. When rainwater flows over land surfaces, it picks up and transports pollution from pet waste, lawn chemicals, soil particles, paper, plastic bottles, leaves and other litter. The stormwater runoff that eventually flows into nearby lakes and streams often contains pathogens, nutrients, and toxic pollutants that can harm people, pets and wildlife. Unlike sanitary sewer systems which flow to a wastewater treatment plant, storm sewers flow directly to waterways without any treatment. By taking personal responsibility for stormwater management, you can help to meet New York State's goal of being a leader in the nation for protecting water resources. A few simple guidelines are provided below.

If your property is located in an area with steep slopes, install plants with deep roots such as native ground covers and shrubs. This will stabilize the soil and reduce erosion.

Cover bare piles of soil with a tarp. When piles are left uncovered, rain will cause soil particles to flow into nearby waterbodies. This reduces water clarity, lowers fish resistance to disease, and damages their habitat.

Improve soil health by adding organic matter and mulch. Mulch will help to minimize stormwater runoff, retain water, and absorb nutrients for healthier plants. Mulch will also help to reduce evaporation, inhibit weed growth, moderate soil temperature, and reduce erosion. Common types of mulches include bark chips, leaves, grass clippings, and straw. Leave a few inches of space between trunks of woody plants and organic mulches to prevent rot.

Purchase native plants for your yard and garden. They are well-adapted to local soils and climatic conditions, require fewer applications of fertilizer, and are more resistant to pests and diseases.

Compost your kitchen and yard waste. When applied to the base of vegetables and flowers, the compost will add nutrients to the soil and produce healthier plants.

Leave grass clippings in place when you mow the lawn. They will add nutrients and organic matter to the soil.

Sweep the clippings off sidewalks and driveways rather than wasting water by hosing them off with a garden hose.

Discard leftover garden products (such as pesticides and fertilizer) and hazardous material (paints, solvents, and varnishes) by taking them to a local hazardous waste collection event or check with the store where you purchased them to see if it has a recycling program.

Be sure to keep gas-powered lawn and garden equipment well-maintained and in good repair. Without regular upkeep, they can cause oil, gasoline, and coolant to drip onto soil, roads, parking lots, and driveways. Recycle motor oil and other fluids and never pour these products in a storm drain or on the ground because they will pollute surface and groundwater resources.

Collect and discard trash and other litter. This material can be picked up by water or wind and transported to local water resources where it damages aquatic life and diminishes the beauty of our waterways.

Wash your car on the lawn where the water can seep into the ground or use a commercial car wash. Most commercial car washes recycle or pre-treat their waste water which reduced negative environmental effects.

Green Infrastructure and the Gardening Community

Stormwater runoff from individual yards and gardens often results in water quality problems in nearby water resources. Without proper protection during rain storm events, precipitation can displace soil particles and fertilizer and transport them to local streams and lakes where they degrade water quality.

Stormwater runoff is a major cause of water pollution. Instead of seeping into the ground, water from precipitation and snowmelt drains through gutters and other collection systems and is discharged into nearby waterbodies without treatment. In addition to soil and nutrients, stormwater transports trash, bacteria, heavy metals, and other pollutants from the urban landscape to lakes, rivers and streams. Higher flow rates during heavy rain storms can also cause erosion and flooding, damaging habitat, property, and infrastructure.

Conventional piped drainage is designed to move stormwater away from roads, but does not treat or remove the pollutants it carries. Green infrastructure is a cost-effective, resilient alternative to managing impacts from rain events and other strong weather conditions. Green infrastructure practices slow stormwater runoff, filter and treat stormwater through pollutant uptake. Central New York communities are increasingly relying on the environmental, social, public health, and economic benefits that green infrastructure can provide.

The best way to control stormwater runoff is at the source. Rain gardens, tree plantings, downspout disconnections, planter boxes, vegetative swales, rain barrels, and permeable pavements are all examples of green infrastructure. These techniques use vegetation, soil, and other methods to restore natural processes, to slow the rate of stormwater runoff, and to provide time for the runoff to filtrate through the soil.

During these times of tight budgets, many communities are finding that green infrastructure can be an effective way to provide flood protection and cleaner water by using natural material and processes. Green infrastructure practices (either at the individual property or municipal levels) reduce the rate and composition of stormwater and decrease the potential for flooding. They help by capturing and absorbing stormwater runoff. This reduces the storm-related burden on individual septic systems and community sewer systems. Several types of green infrastructure practices improve water quality by filtering or removing stormwater pollutants such as heavy metals, nutrients, sediment, and pathogens. By slowing the rate of surface runoff, green infrastructure also helps to replenish groundwater supplies. Compared to conventional methods for managing stormwater runoff, green infrastructure techniques benefit individuals as well as municipalities. They are a cost-efficient alternative to conventional practices that have been shown to increase nearby property values.

A rain garden in front of the Syracuse Water Department on Genesee Street in Skaneateles. It was planted by Cornell Cooperative Extension of Onondaga County with help from volunteers.

Weather Impacts on Gardening and Water Resources

Did you notice that crocuses have bloomed and trees have budded earlier in recent years? Have you also wondered about the increasing frequency and intensity of recent storm events? Throughout Central New York, meteorologists have reported that average temperatures are gradually increasing and heavy rain storms are becoming stronger and more frequent. Summer heat waves are creating challenging conditions for gardening and agricultural communities. Strong rain events increase the amount of soil erosion in a watershed and influence the rate and composition of stormwater runoff. Storm events can also cause flooding and damage to infrastructure such as roads and bridges. In Central New York, variable weather patterns are impacting all aspects of our society, including the local economy and natural ecosystems such as lakes and forests.

Because of the unusual nature of recent weather patterns, historical climate trends that meteorologists have relied on in the past are no longer a reliable indicator of how to predict future weather patterns. New York State researchers are carefully documenting how the changing climate is affecting water resources and various other aspects of the natural environment.

For Central New Yorkers, the increasing frequency and intensity of storm events is a clear indication that a continued emphasis on stormwater management is a necessity. The control of stormwater runoff will help to minimize related environmental impacts such as flooding, soil erosion, and pollutant loading in nearby water resources. Municipal officials and agencies throughout the region are helping local communities adapt to the changing climate conditions by placing a greater focus on green infrastructure and other nature-based solutions. Gardeners can take an active role in adapting to the increased frequency and intensity of storm events by reducing their use of water, limiting the use of phosphorus fertilizer, and selecting native plants that are better adapted to local weather conditions. Additional recommendations for gardeners are found in the articles on pages 3 and 6 of this newsletter.

According to researchers at Cornell University, New York State has seen a 67% increase in the number of 2-inch rainfall events occurring over a 48-hour period since the 1950s. In addition, the scientific community predicts that New Yorkers will observe the following changes:

- An increase in average annual precipitation of up to 5% by 2020; 10% by the 2050s; and 15% by the 2080s.

- Changing precipitation patterns, with increased precipitation in the winter, and decreased precipitation in late summer or fall. Lower rainfall amounts in the summer may increase the frequency of drought and may negatively affect the ability of small drinking water supply systems to meet demand.

- Decreased snow cover, by as much as 25 to 50% by the end of the next century, may jeopardize opportunities for skiing, snowmobiling, and other forms of winter recreation. Natural ecosystems will also be affected by the changing snow cover.

- The number and intensity of extreme precipitation events are increasing in New York State and this trend is expected to continue. More rain falling in sustained heavy downpours heightens the danger of localized flash flooding, streambank erosion, and damage to infrastructure from stormwater runoff.

Central New York gardeners can adapt to these conditions by simple actions such as applying mulch to control soil erosion, minimizing water use, and using native plants that require fewer applications of fertilizer and pesticides.

Water Saving Tips

Watering your lawn and garden can be a major source of water consumption that often requires a lot of time and money. There are several things you can do to help reduce your water use such as using drip irrigation for flower beds, plants and trees instead of a directional sprinkler.

Timing is important when it comes to water conservation. The best time to water your plants is in the early morning. Watering in the middle of the day will cause a water loss of approximately 30%-40% from evaporation.

Another way to reduce water use is to group the flowers and vegetables with similar watering needs. By dividing the lawn and garden into zones, you can incorporate sprinklers, soakers or drip systems for a more efficient watering strategy. This will protect your plants from both under-watering and overwatering by addressing each zone as needed.

Remember to adjust your sprinkler so that the water only reaches the garden, landscaped areas and lawn. Don't waste water and money by having it flow onto the driveway or sidewalk. Increase your watering efficiency by using a timer that will automatically turn off the sprinkler or hose.

Minimize water loss by routinely checking your garden hose or irrigation system for clogged or broken sprinkler heads and check for problems in areas where the sprinkler heads connect to pipes or hoses. Clogged heads or a split hose can waste a lot of water.

And don't forget about the benefits of mulch. 2-3 inches of mulch placed around the base of the plants will reduce the need for frequent watering. Mulch will also improve the soil structure, and will help to keep the weeds from growing.

This information is adapted from "Today's Homeowner with Danny Lipford"

How Much to Water and When

During periods of drought, gardeners often know when their lawns need water but it can be difficult to determine how much, how often, and when to water. Turf expert Dr. Trey Rogers suggests that early morning is the best time to water (before 9 AM.) If watering takes place in the middle of the day, the sun causes a greater amount of evaporation which means less water efficiency. Evening irrigation isn't recommended because keeping the lawn wet overnight increases the risk of disease.

In terms of water volume, Dr. Rogers recommends that lawns receive one inch of water per week whether from rainfall or irrigation. An ordinary rain gauge is an efficient way to measure rainfall but if you are watering the lawn from a sprinkler system, you can easily create your own gauges. Set out several small containers on the lawn (tuna can size is ideal) and let the sprinkler run for thirty minutes. Measure the depth of water in the container and multiply by two. This will tell you how much water your irrigation system delivers in an hour. For additional watering advice, check "Today's Homeowner with Danny Lipford."

Why Phosphorus Control Is So Important

Be sure to do a soil test before applying fertilizer to your lawn or garden. In general, only newly established lawns or those with poor soil need phosphorus fertilizer. Phosphorus applied to an area that don't need it can be washed down stream and may cause harmful algae blooms and water pollution.

Harmful algae blooms have been in the headlines recently, especially last summer when they caused the temporary closure of recreation areas or threatened drinking water sources. Most algae are harmless and fill an important role in the food web. Certain types, however, can grow quickly to form blooms which can cover large portions of a lake. Some species of algae can also produce toxins that can be harmful to people and animals that come into contact with or drink the affected water. Blooms of algae species that produce – or have the potential to produce – toxins are referred to as harmful algal blooms (HABs). HABs most often occur in nutrient-rich waters, during extended periods of hot, calm weather.

In addition to health issues, HABs cause unpleasant sights and smells which can result in economic hardship for shoreline businesses when recreational opportunities are restricted. HABs also cause problems for fish and other aquatic organisms by reducing oxygen levels in the water. The only way to tell the difference between HABs and non-harmful algae blooms is through a laboratory analysis but that's not often practical. To be safe, the NYSDEC recommends that people, pets and livestock avoid coming in contact with or drinking water from a lake or stream with an algae bloom. Refer to the NYSDEC website for additional information.

You can help to reduce the threat of HABs by reducing or eliminating the use of phosphorus in your lawn and garden and be sure to review New York State laws regarding phosphorus fertilizer use before any applications are made.

NYS Law Restricts the Use of Lawn Fertilizers Containing Phosphorus

In NYS, it is illegal to use phosphorus fertilizer on lawns that don't need it. The fertilizer provisions of the NYS Dishwasher Detergent and Nutrient Runoff Law are designed to reduce the amount of phosphorus entering the state's waters and improve water quality in ponds, rivers, lakes and streams. The law sets restrictions on the use of phosphorus fertilizer on lawns or non-agricultural turf. Only lawn fertilizer with less than 0.67 percent by weight phosphate content is permitted. Be sure to follow these guidelines:

- Application of any fertilizer containing nitrogen, phosphorus or potassium on lawns or non-agricultural turf is prohibited between December 1 and April 1.
- Application of any fertilizer on lawns or non-agricultural turf within 20 feet of a water body or on paved surfaces is restricted.
- Retailers must display phosphorus fertilizer separately from phosphorus-free fertilizer and must post signs notifying customers of the terms of the law.

The law applies to homeowners applying fertilizer themselves, landscapers and lawn care professionals, pesticide applicators, retailers, distributors and manufacturers of lawn fertilizers. It also applies to fertilizer/pesticide combination products when these products contain over 0.67% phosphorus, and organic phosphorus fertilizer such as bone meal. The law does not apply to products with 0.67 or lower concentrations of phosphorus, agricultural fertilizer, fertilizer for trees, shrubs, gardens, or compost.

CNY STORMWATER COALITION

The CNY Stormwater Coalition was formalized in 2011 in order to establish a regional approach for stormwater management and water resource protection. The Coalition is made up of 29 local governments and the NYS Fairgrounds. Each member operates a Municipal Separate Storm Sewer System (MS4). Through the Coalition, members are working together to meet regulatory requirements while improving water quality.

CNY STORMWATER COALITION MEMBERS

Baldwinsville Village	Manlius Village
Camillus Town	Marcellus Town
Camillus Village	Marcellus Village
Central Square Village	Minoa Village
Cicero Town	North Syracuse Village
Clay Town	Onondaga County
DeWitt Town	Onondaga Town
East Syracuse Village	Phoenix Village
Fayetteville Village	Pompey Town
Geddes Town	Salina Town
Hastings Town	Solvay Village
LaFayette Town	Sullivan Town
Liverpool Village	Syracuse City
Lysander Town	Van Buren Town
Manlius Town	NYS Fairgrounds

The CNY Stormwater Coalition meets quarterly throughout the year and all meetings are open to the public. Check the Coalition's website for the times, dates, and additional meeting details. The CNY Stormwater Coalition is staffed and coordinated by the Central New York Regional Planning and Development Board. For additional information, visit the CNY Stormwater website www.cnyrpdb.org/stormwater

DOGS, GEESE, and WATER QUALITY

Be sure to clean up after your dog and never place the dog waste (bagged or un-bagged) in storm drains. The untreated stormwater in the drains lead directly to local streams, rivers, lakes and wetlands. Bacteria and parasites from dog waste make water resources unsafe for recreation and fisheries.

People and pets aren't the only groups that contribute to poor water quality. Large flocks of Canada geese can add a significant amount of nutrients to water resources which accelerates the growth of algae and rooted aquatic plants. Goose droppings can also cause health problems for people by transmitting disease and can create messy conditions on athletic fields, golf courses, and residential neighborhoods. High levels of fecal material and bacteria from dogs and geese can lead to beach closures and economic hardship for local businesses. Geese can also be very aggressive, making them unwelcome guests in back yards and neighborhood parks.

DECinfo Locator is a map-based way to easily access many documents and public data pertaining to the environmental quality of specific sites in New York State, as well as the many outdoor recreational opportunities.

By searching for a specific area or zooming in on your county, you can view and download documents and relevant information.

Environmental Quality Map View provides information on water quality, clean-up areas, air permits, and permitted mines. Outdoor Recreational Opportunities Map View shows state lands, boat launches, and aquatic biological monitoring information.

Additional information is located at the NYSDEC website.

Central New York Regional Planning & Development Board

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