



YOUR LAND  
YOUR WATER  
YOUR SOLUTION



# Eastern Rhode Island Conservation District's Residential Guide to Stormwater Management

Do-It-Yourself Stormwater  
Solutions for Your Home

# Eastern Rhode Island Conservation District's Residential Guide to Stormwater Management Do-It-Yourself Stormwater Solutions for Your Home

Written and Illustrated by Ryanne Simpson  
Edited by Sara Churgin  
Photography by Ryanne Simpson unless noted otherwise

# Eastern Rhode Island Conservation District's Residential Guide to Stormwater Management

Do-It-Yourself Stormwater  
Solutions for Your Home





YOUR LAND  
YOUR WATER  
YOUR SOLUTION

**This manual is adapted from a program of the New Hampshire Department of Environmental services. This manual is a product of ERICD Soak up the Rain. The guide is directed towards serving the Bristol and Newport Counties.**



**Eastern Rhode Island Conservation District**

— Serving Bristol & Newport Counties —

Barrington : Bristol : Jamestown : Little Compton : Middletown : Newport : Portsmouth : Tiverton : Warren

# Contents

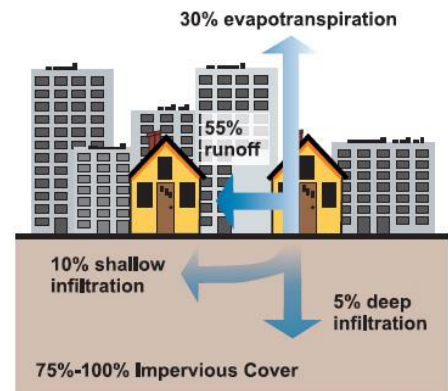
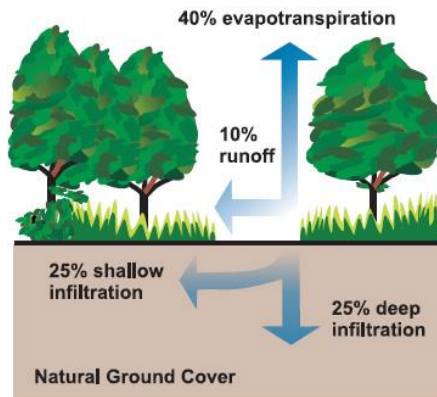
Introduction	
What is Stormwater Runoff	6
Purpose of the Guide	7
Stormwater Pollution	8
Stormwater on Shoreland Properties	9
Stormwater Management Strategies	10
Do-It-Yourself Stormwater Management	11
Getting Started	11
Do-It-Yourself List of Solutions	12

# Introduction

## What is Stormwater Runoff?



The rainfall or melting snow and ice that flows over ground surface is stormwater runoff. Stormwater runoff occurs because water falls onto impervious surfaces that do not allow water to get naturally soaked into the ground like it should. The ground has the ability to, in a sense, disinfect pollutants before water enters streams, ponds, lakes, etc. Such impervious surfaces in your own yard may include sidewalks, driveways, rooftops, and any other completely paved surfaces. Because the water cannot gradually soak into the ground, large amounts of it are carried to streams, lakes, wetlands, and rivers. This causes flooding and soil erosion. Both are harmful to the creatures living in a water environment.



<https://mysticriver.org/stormwater/>

## Watershed



Since large amounts of water are carried to streams, lakes, and more from paved surfaces, many pollutants go with it. This may include trash, pesticides, fertilizer, car leakage, and even pet waste that contain nitrogen, which is harmful in large amounts to our waters. When pollutants get carried to our water bodies, this has an effect on the entire watershed. The watershed is the place to where all of our waters drain. Watersheds are interconnected, meaning that affecting our own watershed has an effect on not only our own community, but the communities around us as well.

# Purpose of the Guide

## The Bridge to Stormwater Management

Luckily, there is so much that homeowners can do to help protect the watershed. Some actions can be as small as directing your gutter downspout towards vegetation rather than your driveway or using less fertilizer on your lawn.

The purpose of this manual is to guide property owners on how to manage the storm water on their property. We will discuss common pollutants that harm water and what you will be able to do on your own property to manage it.

This guide:

1. Explains where stormwater pollutants come from, how stormwater pollutants impact the watershed, and how stormwater management solutions will help.
2. Provides a step-by-step guide to what you can do, the installation process, and what it'll cost to improve your property for stormwater management.
3. Provides a list of materials, diagrams, and instructions for construction.



# Stormwater Pollution

## Common Problems and Impacts



### Impervious Surfaces

Paved surfaces do not allow the ground to naturally soak up water. This increases the amount of polluted water that goes into streams, rivers, lakes, and ponds. The excess water causes flooding and soil erosion.

### Flooding and Soil Erosion

Soil erosion creates foggy water and may clog the gills of the fish living in the habitat. Flooding is when more water than nature intended must flow through an area. Too much water could actually cause fluctuation in temperature.



### A Rise in Water Temperature

Water temperature increasing rapidly is dangerous for the fish living there. Because the heat capacity of water is so much greater than the heat capacity of air, it takes much longer for water to warm up than air does. Although humans experience great variations of temperatures per day and even per hour, fish only experience a variation of a few degrees in their entire life. Runoff from hot driveways can cause a rapid rise in temperature in small bodies of water, killing the inhabitants.



### Chemicals and Toxins

Fertilizers, vehicle leaks, road salt, stress aquatic animals. Any chemical is harmful to any living creature, including us. Excess salt added to water where the creatures depend on fresh water for their life will harm them.

### Waste

Waste of pets contributors to an increase in nitrogen in water. More nitrogen means that less oxygen will be present. Less oxygen causes fewer plants and so less food for fish. Septic systems have the same contribution.





# Stormwater on Shoreland Properties

In Eastern Rhode Island, living so close to the shoreland, property owners have a special responsibility in protecting the waterfront. Erosion and the deposition of sediment are natural processes. Shore erosion can be caused by wind-driven waves and even larger boats passing by. Shore erosion is also caused by a lack of human-controlled runoff management.

Waterfront properties are very valuable. Time should be taken to help protect the waterfront, which in return helps our oceans, thus helping us in the long run. Preventing erosion helps wildlife thrive and allows us to continue our recreation of the waters, such as fishing and swimming in clean water. Protecting this important feature that makes up Rhode Island can be very simple; all homeowners need is a buffer between runoff and the water.

Buffers reduce pollutants and sediment from entering the ocean. Buffers, like trees and other plants, provide a natural interception between runoff and the ocean. This manual will guide homeowners on how they can protect our Eastern Rhode Island shoreland so we can all continue to enjoy our historic shoreland homes.

The do-it-yourself activities in this manual are on a small-scale, using hand held tools. Actions should not require special permits; however, it is always best to check with your state and town codes to make sure special permits are not required for shoreland and waterfront homes.



Eastern Rhode Island Conservation District

— Serving Bristol & Newport Counties —

Barrington : Bristol : Jamestown : Little Compton : Middletown : Newport : Portsmouth : Tiverton : Warren



## Stormwater Management Strategies

If an area is not naturally equipped to deal with excess water, any changes to the landscape can be hazardous. With human settlement, we have altered land a lot through slick roofs, impervious driveways, and the destruction of the trees that used to be there. The natural landscape protected stormwater runoff hazards. Because of this fact, it only makes sense to use nature as a strategy. We want to mimic the natural landscape. Green infrastructure and low-impact development of the property will manage stormwater. There are many benefits to switching to pervious surfaces and adding rain gardens to your property.

Besides being much more aesthetically pleasing by immersing your property with nature, reducing the volume of stormwater runoff will reduce flooding and flood-related damages and costs. Removing excess pollutants from storm water will reduce the impact of development on the environment and keep bodies of water healthy and clean for recreation. With the use of rain barrels, water will be conserved and can be reused for non-drinking water needs, such as water plants during dry spells. Creating a place to soak in water will reduce droughts and keep streams flowing with water. Lastly, treating water right at the source of its downfall will increase the lifespan of drainage systems that will no longer have to take on large volumes of stormwater.

By following this guide, you, as a property owner, will have the satisfaction knowing that you have successfully done your part in protecting the environment.



# Do-It-Yourself Stormwater Management Getting Started

Before you begin managing the stormwater on your property, it is best to start with the following:

1. **Observe.** Take notice of where the stormwater is coming from most and where it ends up. You may also want to take note of problem-areas on your property where soil has begun to erode.
2. **Location.** Select a location where you want to manage the stormwater. Take into consideration features that may limit the management system of your choosing such as septic tanks, tree roots, setbacks, or buildings with foundations.
3. **Test the Soil.** This step is much simpler than it may sound! Testing the soil is important when deciding which system to choose because you need to be sure the soil will absorb the rainwater or you may have to install a rain barrel instead. In order to complete a simple percolation test, do the following:
  - a. Dig a 12" hole
  - b. Fill the hole with water and allow it to drain completely. If the hole fills with water on its own, select a new location.
  - c. Fill the hole with water a second time and place a ruler in the hole. After 15 minutes, measure the water level again.
  - d. Multiply the change in water by 4 to get the number of inches of infiltration in an hour. A rate of at least  $\frac{1}{2}$  an inch per hour indicates that the soil is appropriate for infiltration practice.
4. **Test the Soil.** For a rain garden, you must complete a Soil Ribbon Test. It is also a simple test by using the following:
  - a. Grab a handful of moist soil and roll it into a ball in your hand.
  - b. Place the ball of soil between your thumb and side of your forefinger and gently push the soil forward with your thumb, squeezing it upward to form a ribbon about a quarter of an inch thick.
  - c. Try to keep the ribbon uniform in thickness and width. Repeat the motion to lengthen the ribbon until it breaks under its own weight.
  - d. Try to measure while you create the ribbon. If you cannot create a ribbon, the soil is sand. If it is less than 1.5 inches, it is silt. If it can be more than 1.5 inches, it is clay.
5. **Select a Stormwater Practice.** Use the found information to pick the perfect practice for your yard.

# Do-It-Yourself Solutions List

The following several pages will further describe the practices on this solution list, describing how to do them yourself.

**Dripline Infiltration Trench.** Collects and infiltrates stormwater from your roof until it soaks into the ground. It helps control stormwater from running off of your property.

**Driveway Infiltration Trench.** Collects and infiltrates stormwater from your driveway, allowing it to soak into the ground. It helps reduce stormwater runoff.

**Dry Well.** Collects runoff from gutter downspouts, roof valleys, and other areas where water concentrates and flows. They help infiltrate runoff and reduce erosion.

**Infiltration Steps.** Slows down and infiltrates runoff on moderate slopes to reduce erosion and define walking paths.

**Pervious Walkways and Patios.** Looks like traditional pavers, but are able to absorb and store rain and snowmelt to reduce runoff from your property.

**Rain Barrel.** Captures rainwater from your roof to reduce runoff from your property and provide you with water for lawns, gardens, and indoor plants to use in dry weather.

**Rain Garden.** A sunken, flat-bottomed garden that uses soil and plants to capture, absorb, and treat stormwater. This helps to reduce stormwater runoff and recharge groundwater.

**Vegetated Buffer.** A planted area along a waterbody that provides shade, stabilizes slopes, and can help slow down and clean stormwater runoff. Buffers also provide essential habitat for wildlife.

**Vegetated Swale.** A shallow channel that slows runoff and directs it to an area where it can infiltrate. Swales use plants to stabilize the soil, reduce erosion, slow the flow and absorb runoff.

**Water Bar.** Intercepts runoff traveling down moderately steep walkways, paths, gravel driveways, and other areas and diverts it into stable vegetated areas to reduce erosion.

