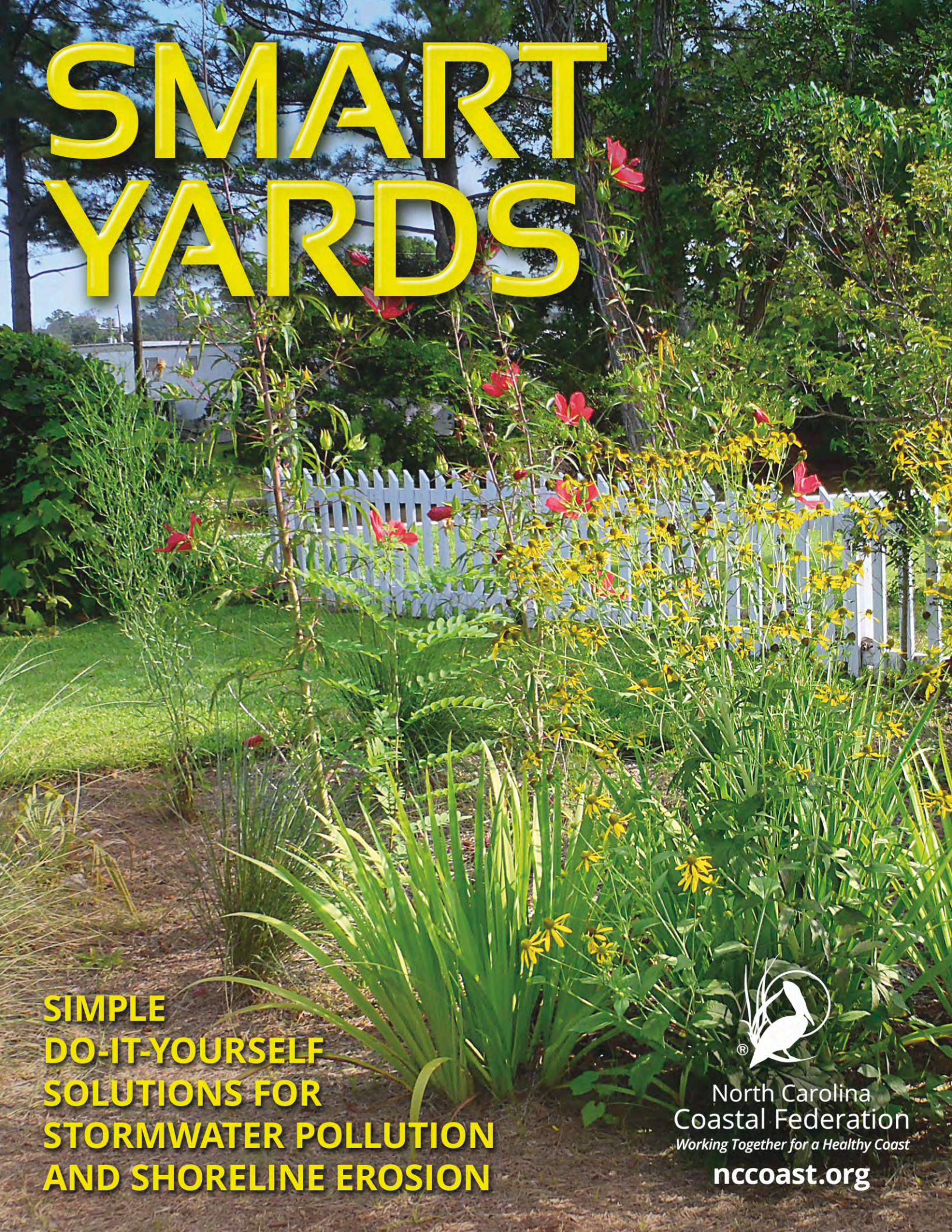
SMART YARDS



SIMPLE DO-IT-YOURSELF SOLUTIONS FOR STORMWATER POLLUTION AND SHORELINE EROSION

North Carolina Coastal Federation®
Working Together for a Healthy Coast
nccoast.org

Why Have A Smart Yard Guide?

Because you care about keeping our creeks, rivers and sounds healthy for fishing and swimming. This guide includes simple Do-It-Yourself (DIY) Smart Yard projects to reduce stormwater and improve the health of our coastal waters.

What's the Problem?

Stormwater – it isn't soaking into the ground the way it used to. Rooftops, driveways, parking lots and other hard surfaces now drain stormwater runoff into streets, pipes and ditches that flow into our coastal waters. The polluted stormwater is full of bacteria and other pollutants. That is why we often see signs alerting us not to swim or catch shellfish. Valuable shorelines are also disappearing as more and more bulkheads and hardened structures are built along our coast.

What's the Solution?

Our Smart Yards guide offers simple techniques that can reduce the amount of stormwater running off your property. If you live on the water, you can also make your shoreline a "living shoreline" to reduce erosion and runoff and protect fragile coastal habitat. Collectively, simple things can really make a big difference.

What are Smart Yards and Shorelines?

Smart Yards use the soil, plants and containers (rain barrels) to capture the rain *before* it has a chance to become polluted runoff. Some techniques such as rain gardens absorb the runoff. Others, like rain barrels, catch the runoff for later use. Living shorelines are a more natural way to tackle shoreline erosion.

Together We Can Do It

If you need help with a project, just contact us at the North Carolina Coastal Federation at *www.nccoast.org* or email Lauren Kolodij at *laurenk@nccoast.org* and we will gladly answer your questions and connect you with additional resources.

Even Simple Things Can Make A BIG DIFFERENCE

A downspout disconnection program in Portland, Oregon reduced 1.2 billion gallons of runoff each year by redirecting 56,000 downspouts in the city.

Simple DIY Solutions:

Rain Gardens

Rain Garden planting at Winding River, Brunswick County

Rain Garden during 1.5" rain

Same Rain Garden 24 hours later

What is a Rain Garden?

Rain gardens are small, shallow, vegetated areas that capture rain during storms. They are lower than the surrounding lawn and function like a bowl to collect stormwater from your roof or driveway. The plants and soil in rain gardens soak up the rain before it has a chance to become polluted runoff.

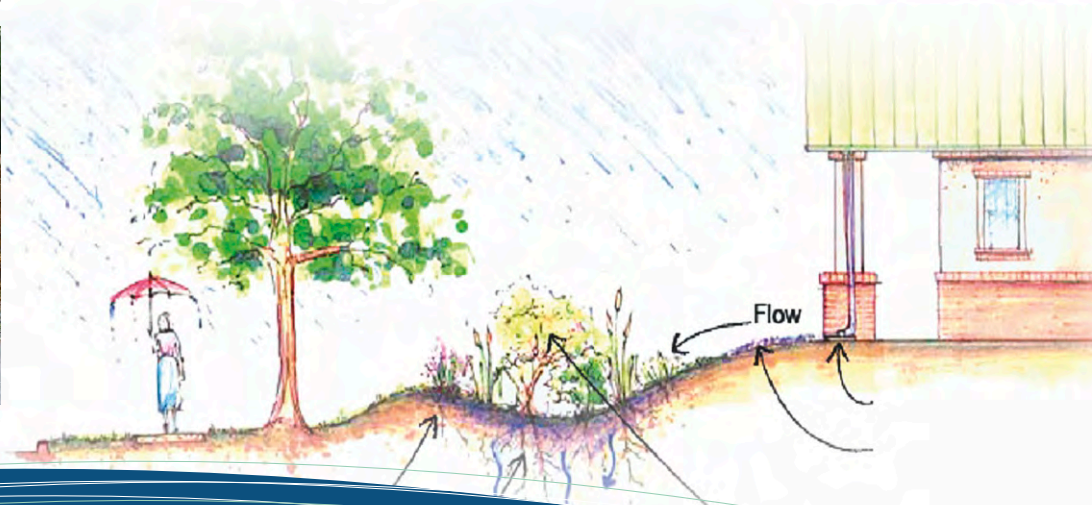
Did You Know?

- Rain gardens can reduce stormwater runoff by 90 percent or more.
- Using native plants in rain gardens can lower maintenance needs and costs.

Benefits

- Reduced stormwater runoff
- Reduced pollutants
- Reduced flooding
- Natural stormwater treatment
- Attractive landscaping feature

See next page for tips on building your own rain garden



Where to Start

Locate

- Select an area that will capture and absorb runoff based on how rain flows across your yard.
- Site the garden at least 10 feet from your house and 25 feet from your well and septic field.
- Check the soil for drainage by digging a hole, pouring water in it and observing how quickly it soaks in.

Design

- Rain gardens are typically about 6-10 inches lower than the surrounding lawn.
- Rain gardens can be any shape but are generally round or oval shaped.
- Rain gardens should be sized to capture 10 percent of your roof and impervious surface drainage area.

Build & Plant

- Check for utilities by calling 811 before you dig.
- Dig out a shallow depression for the outline and base of the rain garden.
- Plant flowers, shrubs, grasses or even turf (choose native plants when possible).
- Use triple shredded hardwood mulch that won't float away after rain events.

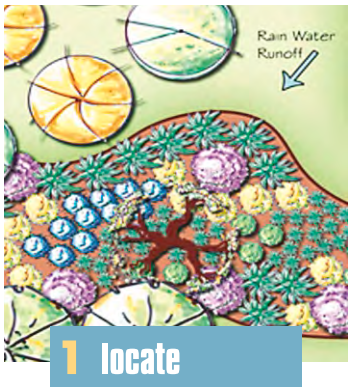
Care

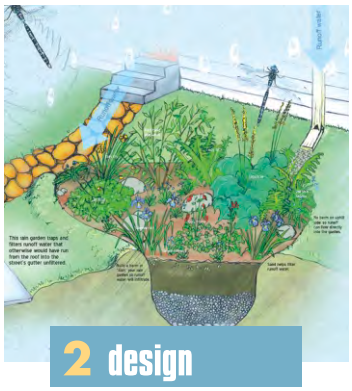
- Periodically water your garden until established.
- Mulch and weed annually.

References and Resources

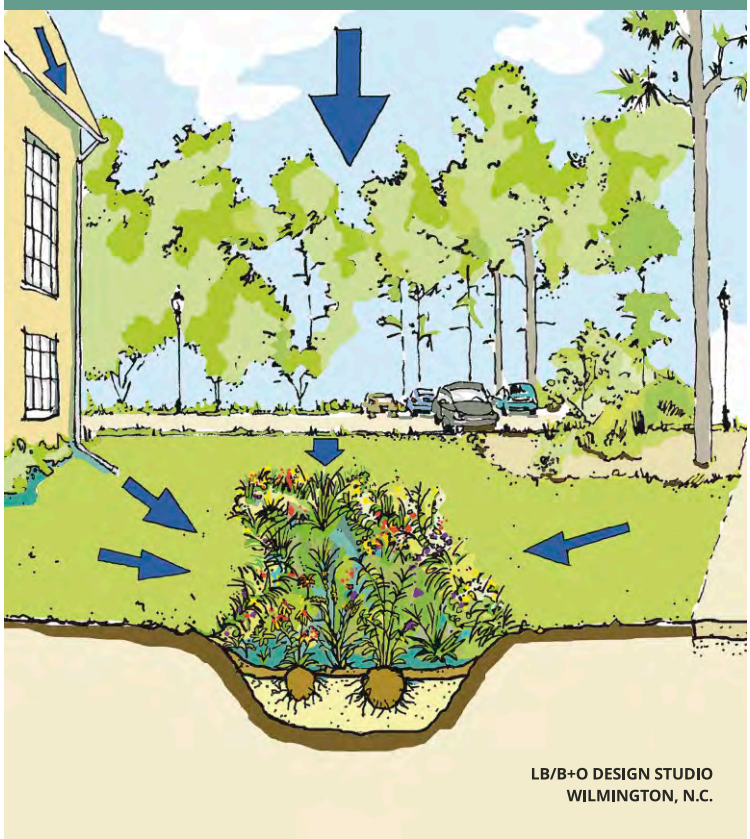
- **N.C. State University Rain Garden Guide**
  www.bae.ncsu.edu/extension/ext-publications/water/protecting/RainGardenManual2014.pdf

HOW TO BUILD A RAIN GARDEN





HOW A RAIN GARDEN WORKS



Simple DIY Solutions: Reroute Downspouts

Typical placement of a downspout

Residents show how to reroute downspouts

Why Reroute Downspouts?

Roof gutter downspouts directed to driveways, sidewalks or parking lots discharge polluted runoff into streets, drains and ditches and then to coastal waters. Fifty percent or more of this runoff can be reduced by simply redirecting the end of the gutter to your lawn, rain garden or rain barrel.

Did You Know?

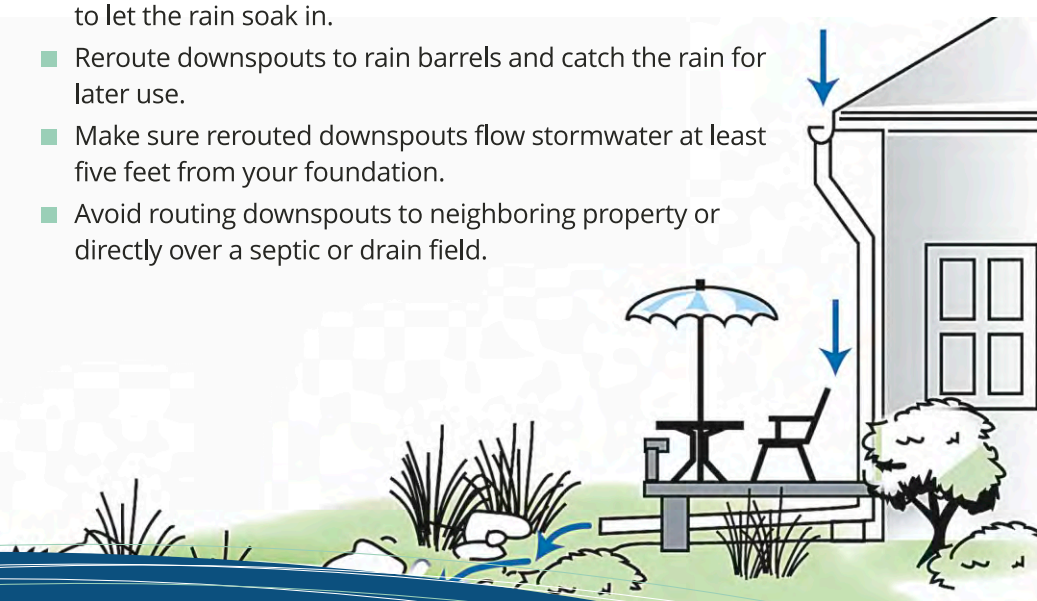
- Approximately 12 gallons of rainwater per minute flow from a single house downspout during a 1-inch rainfall.
- Downspout diverters are a cost-effective solution to stormwater pollution costing about $9 dollars per downspout.

Benefits

- Reduced runoff by up to 90 percent
- Reduced pollutants
- Reduced flooding

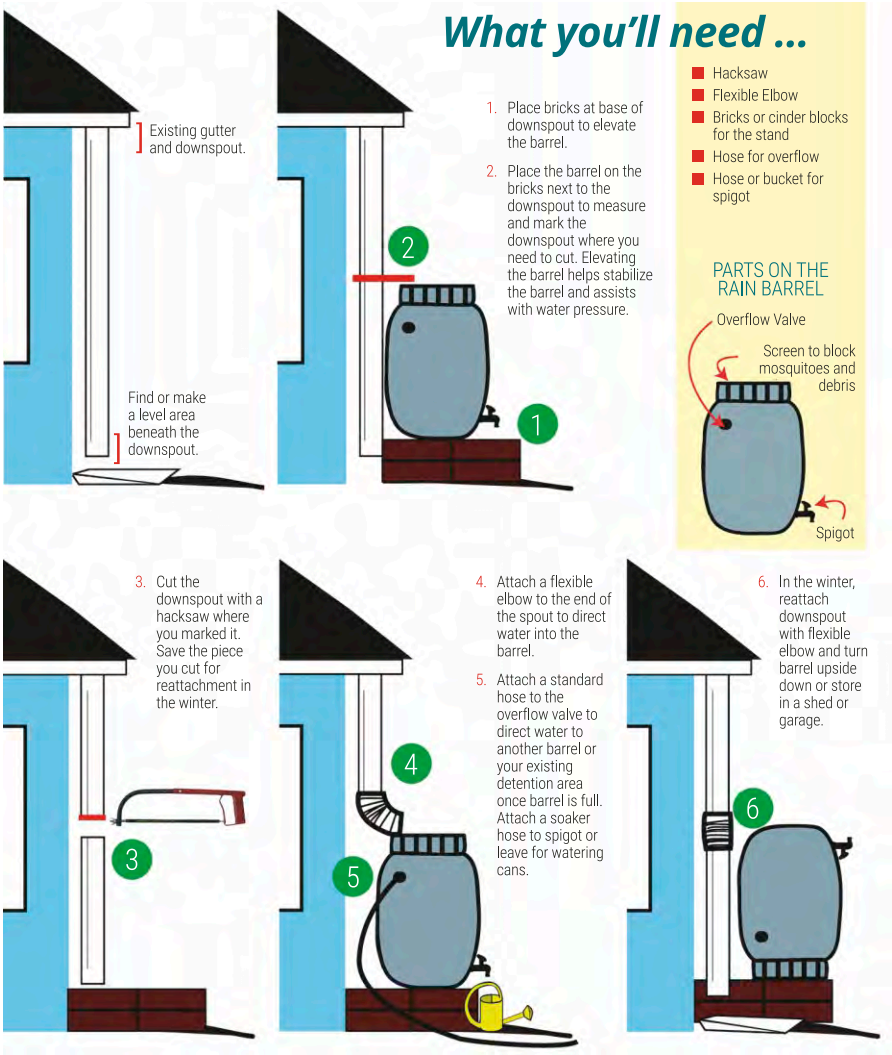
Reroute Your Downspout With These Few Simple Steps:

- Add a diverter and turn downspouts away from sidewalks and driveways and toward lawns, natural areas or rain gardens to let the rain soak in.
- Reroute downspouts to rain barrels and catch the rain for later use.
- Make sure rerouted downspouts flow stormwater at least five feet from your foundation.
- Avoid routing downspouts to neighboring property or directly over a septic or drain field.



Simple DIY Solutions: Rain Barrels

How To Install Your Rain Barrel



Source: DuPage County Stormwater Management 1/2010

What is a Rain Barrel?

A rain barrel is a container that collects and stores rainwater from your roof. Rain barrels come in all shapes and sizes. They are placed under roof gutter downspouts and typically hold 50-55 gallons of water.

Did You Know?

- One quarter inch of rain produces enough runoff to fill a rain barrel.
- During the summer months nearly 40 percent of household water use is for irrigating lawns and gardens. Why not collect it from your roof instead?

Benefits

- Free source of water for plants and gardens
- Reduced runoff
- Reduced pollutants
- Reduced flooding

Resources

- For information on how to purchase a rain barrel contact the **North Carolina Coastal Federation** at 252.393.8185 or call your local **N.C. Cooperative Extension Agency** or **Soil and Water Conservation District**

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Simple DIY Solutions:

Native Landscaping and Tree Planting

Coreopsis

Border Penstemons

Joe Pye Weed and Black Eyed Susans

Native Landscaping

Native landscaping includes the use of native plants and trees that are hardy and well-suited for the soils and climate of the southeast coastal region. Purple cone flower, black-eyed Susan and muhly grass are just a few examples of beautiful native plants.

Tree Planting

Tree canopies catch rain and allow it to evaporate. Their roots also soak in rain which reduces runoff and helps recharge groundwater. It is estimated that 100 mature trees catch up to 1.2 million gallons of rainfall per year. Trees also provide shade, which lowers surface temperatures.

Did You Know?

- Native trees and plants require little care once established as compared to non-natives.
- Plants absorb and slow the flow of stormwater runoff and prevent erosion.

Benefits

- Reduced need for costly and polluting fertilizers and pesticides
- Reduced need for costly irrigation
- Reduce stormwater runoff
- Higher property values

Resources

- **Native Plant Resources**
  www.ces.ncsu.edu/natives/
- **NC Native Plant Society (Southeastern Coastal Area Chapter)**
  www.ncwildflower.org/about/chapters/secoast

Long Leaf Pine

Live Oak

Sweet Bay Magnolia

Simple DIY Solutions: Permeable Paving

Permeable paving demonstration

Porous parking lot

Notice how rainfall soaks into permeable pavement

Permeable Paving

Traditional paved surfaces collect and convey stormwater runoff to conventional stormwater pipes and ponds and then to coastal waters. Permeable paving materials include specially mixed concrete, paver blocks and concrete or plastic cells that allow stormwater to soak directly into the ground instead of flowing off as polluted runoff. Permeable paving can be used for walkways, patios, driveways, parking stalls and overflow parking areas.

Did You Know?

- Permeable paving can infiltrate as much as 70 percent to 80 percent of a normal rain event.
- Porous pavers are a great alternative to traditional paving that reduce polluted runoff in the coastal environment.

Benefits

- Reduced runoff
- Increased groundwater recharge
- Reduced flooding

Resources

- **Permeable Pavement**
  www.ncagr.gov/SWC/costshareprograms/CCAP/documents/Chapter10-PermeablePavement.pdf

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Simple DIY Solutions: Backyard Wetlands

Example of a backyard wetland garden

Eagle Point Golf Club stormwater wetland

Bradley Creek Elementary School stormwater wetland

What Is A Backyard Wetland?

Backyard wetlands are naturally occurring wet areas in your yard that are enhanced by planting native wetland plants. These sites are typically wet for several days following a rain event. Backyard wetlands capture and treat stormwater runoff like rain gardens but in locations with high water tables and soggy soils.

Did You Know?

- Landscaped backyard wetlands can provide many of the same benefits as natural wetlands when they include several kinds of water-dependent plants to create a thriving habitat.

Benefits

- Reduced runoff
- Enhanced landscaping
- Bird and butterfly habitat

Resources

- **Native Plants for Coastal NC Wetlands**
  brunswick.ces.ncsu.edu/wp-content/uploads/2013/04/Plants-for-Backyard-Wetlands.pdf?fwd=no
- **Urban Waterways: Designing Stormwater Wetlands for Small Watersheds**
  www.bae.ncsu.edu/extension/ext-publications/water/protecting/ag-588-02-designing-stormwater-wetlands-small-watersheds.pdf

Simple DIY Solutions: Living Shorelines

SMART YARDS: SIMPLE DO-IT-YOURSELF SOLUTIONS FOR SHORELINE EROSION

Pine Knoll Shores residential shoreline before restoration

Pine Knoll Shores residential shoreline after restoration

Living Shoreline at Hammocks Beach State Park

What is a Living Shoreline?

Shoreline change and erosion are continuous processes, driven by currents, waves, winds, storms, sea levels and human influences. Bulkheads and riprap are "hardened" structures commonly installed along sound-side shorelines to try to reduce erosion. Unfortunately, they destroy natural marsh and cause increased erosion of nearby properties. If you live on the water, we have solutions to shoreline erosion that maintain the natural marsh. Called "living shorelines," these systems use marsh plants and sometimes oyster or rock sills to create a more natural and productive shore.

Did You Know?

- North Carolina has over 12,000 miles of shoreline bordering the bays, creeks and sounds that make up our estuaries.
- Estuaries are where fresh water and salty ocean water meet. They are home to many important fish and shellfish that need protection.
- Each year an estimated 26 miles of estuarine shoreline are "hardened."
- Bulkheads are a temporary fix and often need costly repair.
- Living shorelines are longer-term, less-expensive and reduce erosion while maintaining or restoring the shoreline's natural system.

Benefits

- Reduced erosion
- Maintained natural marsh
- Protected coastal habitat
- Filtered and improved water quality
- Buffered shore for changing water levels

Resources

- Visit www.nccoast.org/livingshorelines and www.livingshorelinesacademy.org for everything you need to know about living shorelines and your options for shoreline erosion control.

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Join the many coastal residents, businesses and institutions that are doing their part to help protect and restore the North Carolina coast by installing Smart Yards and living shorelines.

Acknowledgements

The North Carolina Coastal Federation would like to thank the following partners for their contributions to the development of this guide:

WithersRavenel • N.C. State University • N.C. Cooperative Extension Service U.S. Environmental Protection Agency • N.C. Division of Mineral, Energy and Land Resources • N.C. Attorney General's Environmental Enhancement Program • N.C. Clean Water Management Trust Fund • National Estuarine Research Reserve • N.C. Division of Soil &Water Conservation Community Conservation Assistance Program • North Carolina Native Plant Society and additional resources listed in this publication

LAYOUT & DESIGN OF SMART YARDS BY ANITA LANCASTER
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- Exciting volunteer opportunities

Questions? Call us at 252.393.8185 or email us at nccf@nccoast.org

About the North Carolina Coastal Federation

The North Carolina Coastal Federation is a member-supported nonprofit organization working to protect and restore the North Carolina coast. We engage people from all walks of life who are committed to preserving the coast for current and future generations.

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