

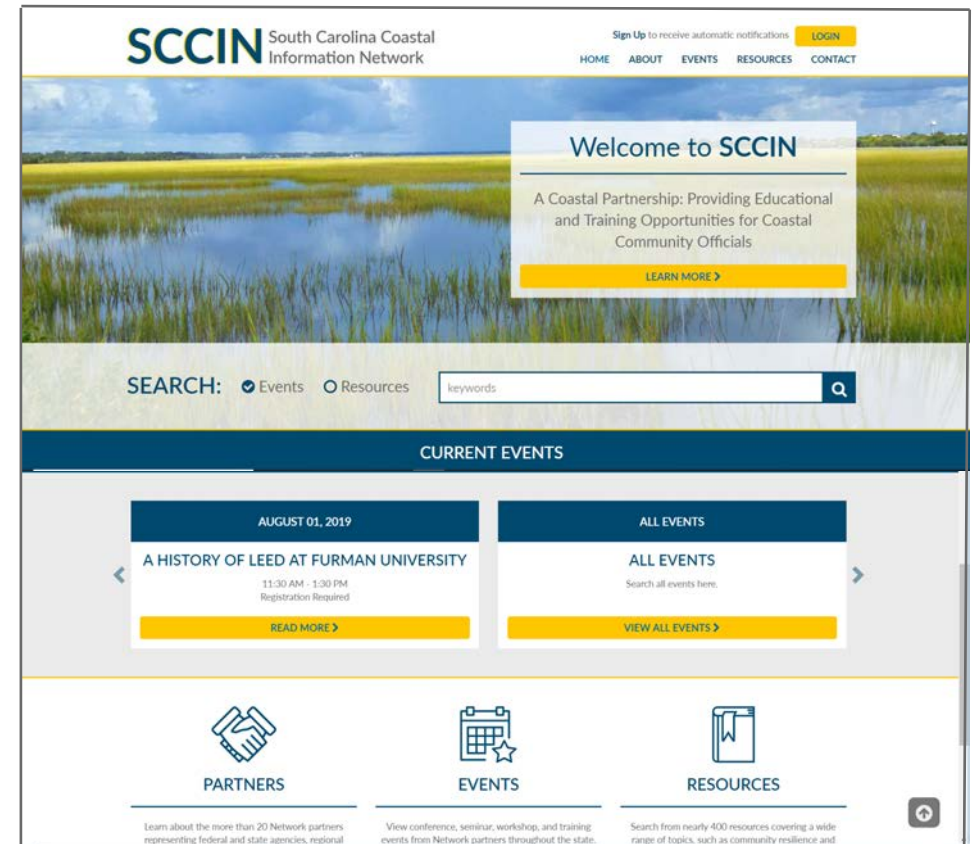


## South Carolina Coastal Information Network

<https://www.sccoastalinfo.org/>

### Instructors:

South Carolina Sea Grant Consortium, Clemson University, ACE Basin National Estuarine Research Reserve, South Carolina Department of Natural Resources, North Inlet-Winyah Bay National Estuarine Research Reserve, University of South Carolina, Coastal Waccamaw Stormwater Education Consortium, South Carolina Department of Health and Environmental Control



A stylized map of the Southeastern United States coastline, showing major waterways and the Gulf of Mexico. The map is rendered in light blue and yellow tones.

# Calling the Coast Home

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## **Course Series:**

Living with Water

The Land Water Connection

Tidelands, Water & Beach:  
Regulations & Rebuilding.

Coastal Lifestyle for Clean  
Water



Calling the Coast Home

[www.sccoastalinfo.org](http://www.sccoastalinfo.org)



# The Land-Water Connection



Amy Scaroni, Ph.D., Clemson University

April Turner, SC Sea Grant Consortium

Marzieh Motallebi, Ph.D., Clemson University

# Agenda

<b>Time</b>	<b>Topic</b>
1:00pm	Welcome
1:15-1:30pm	Introduction
1:30-2:00pm	What you can do on your property
2:00-2:10pm	Break
2:10-2:30pm	Low Impact Development Case Studies
2:30-2:45pm	The Economic Perspective
2:45-3:00pm	Questions and Wrap-up

# Introduction





A scenic view of a coastal waterway in South Carolina. The water is calm and reflects the clear blue sky. The banks are lined with lush green grasses and trees, including a large tree on the right side. The background shows a wide expanse of marshland under a bright, clear sky.

South Carolina's coastal  
waterways are one of the  
state's most valuable  
assets

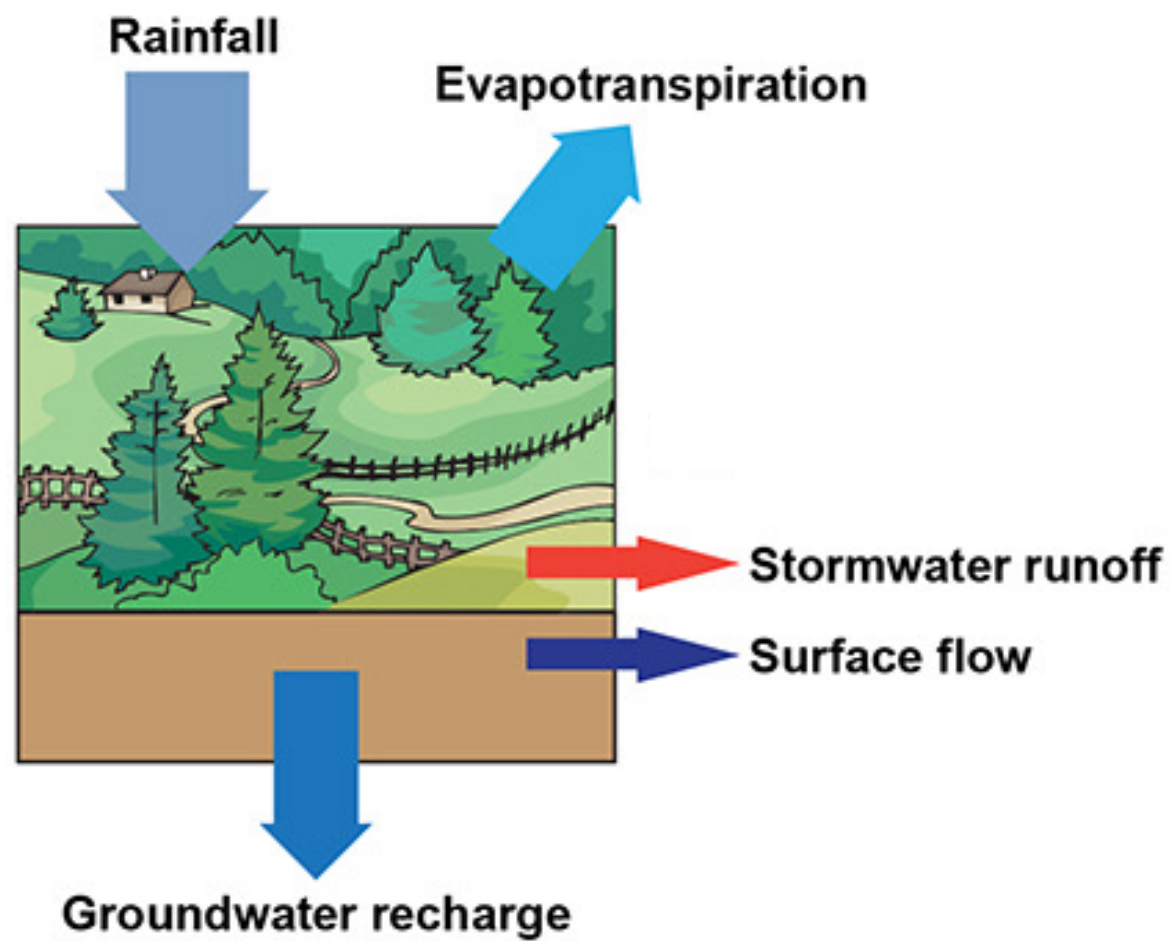




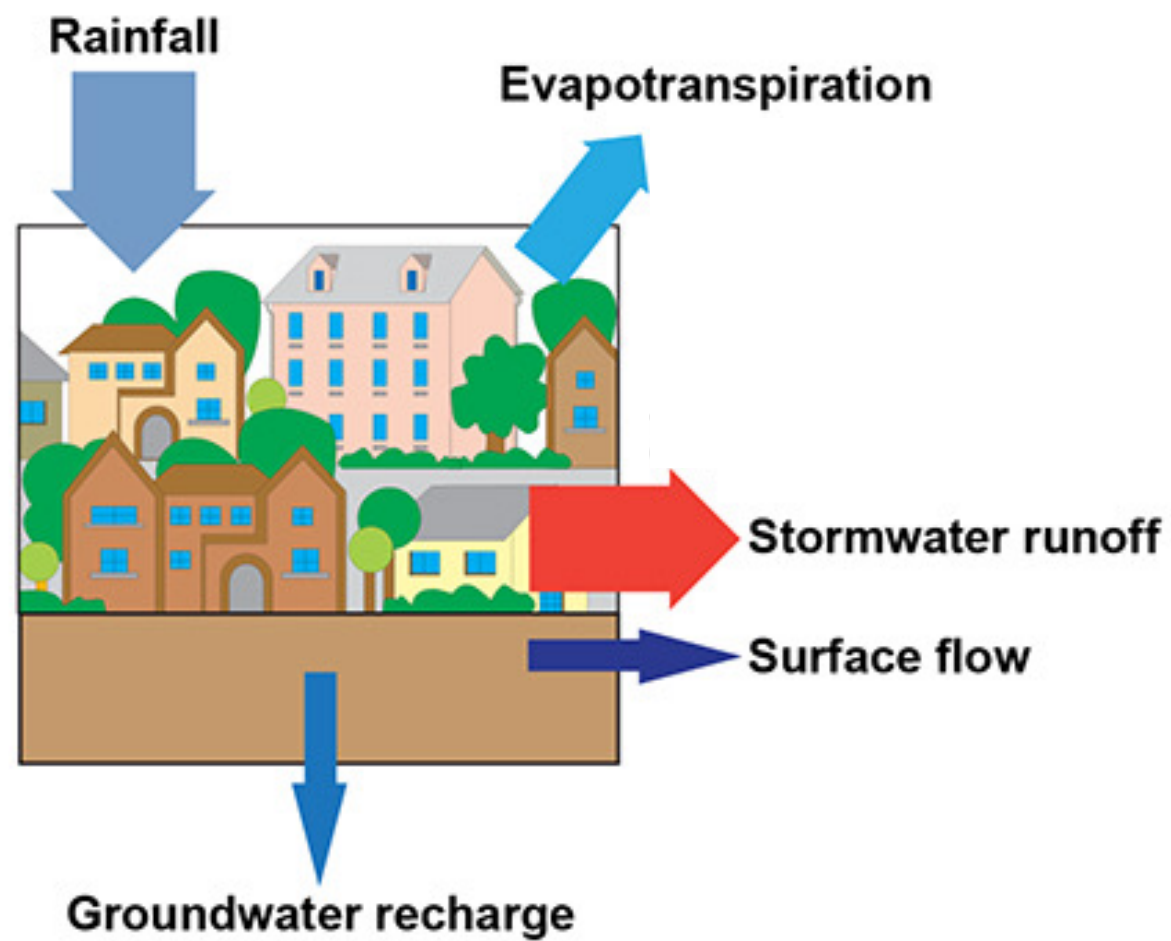








**Forested Watershed**



**Developed Watershed**





# Stormwater Challenges





Stormwater runoff is untreated.

trash

**bacteria**

nutrients

sediment

heavy metals

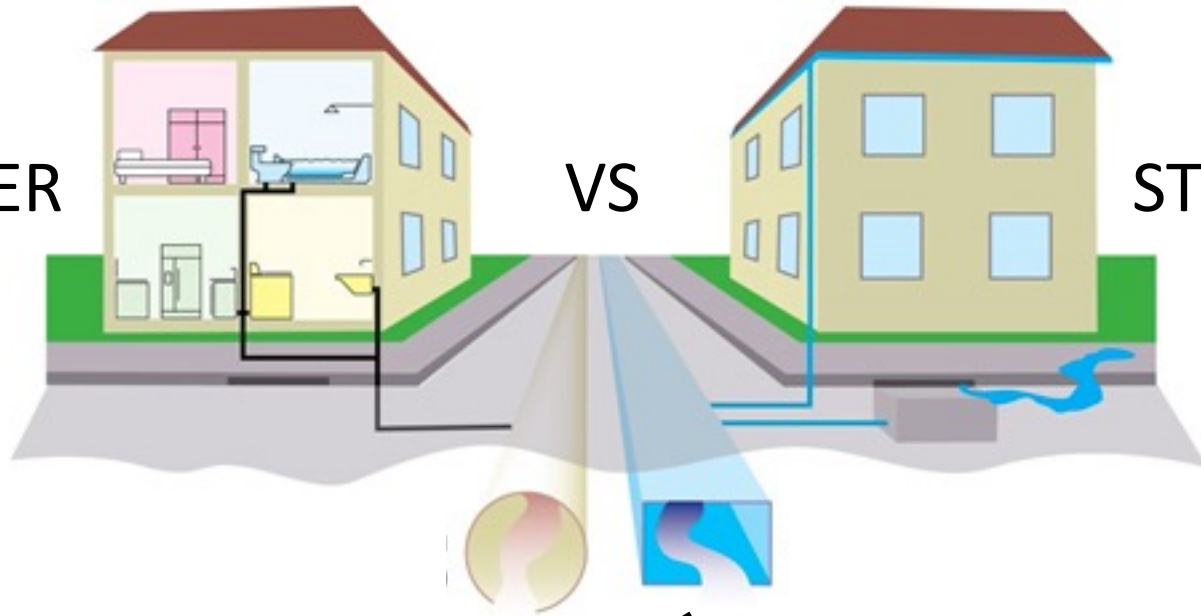
fats, oil and grease



WASTEWATER

VS

STORMWATER

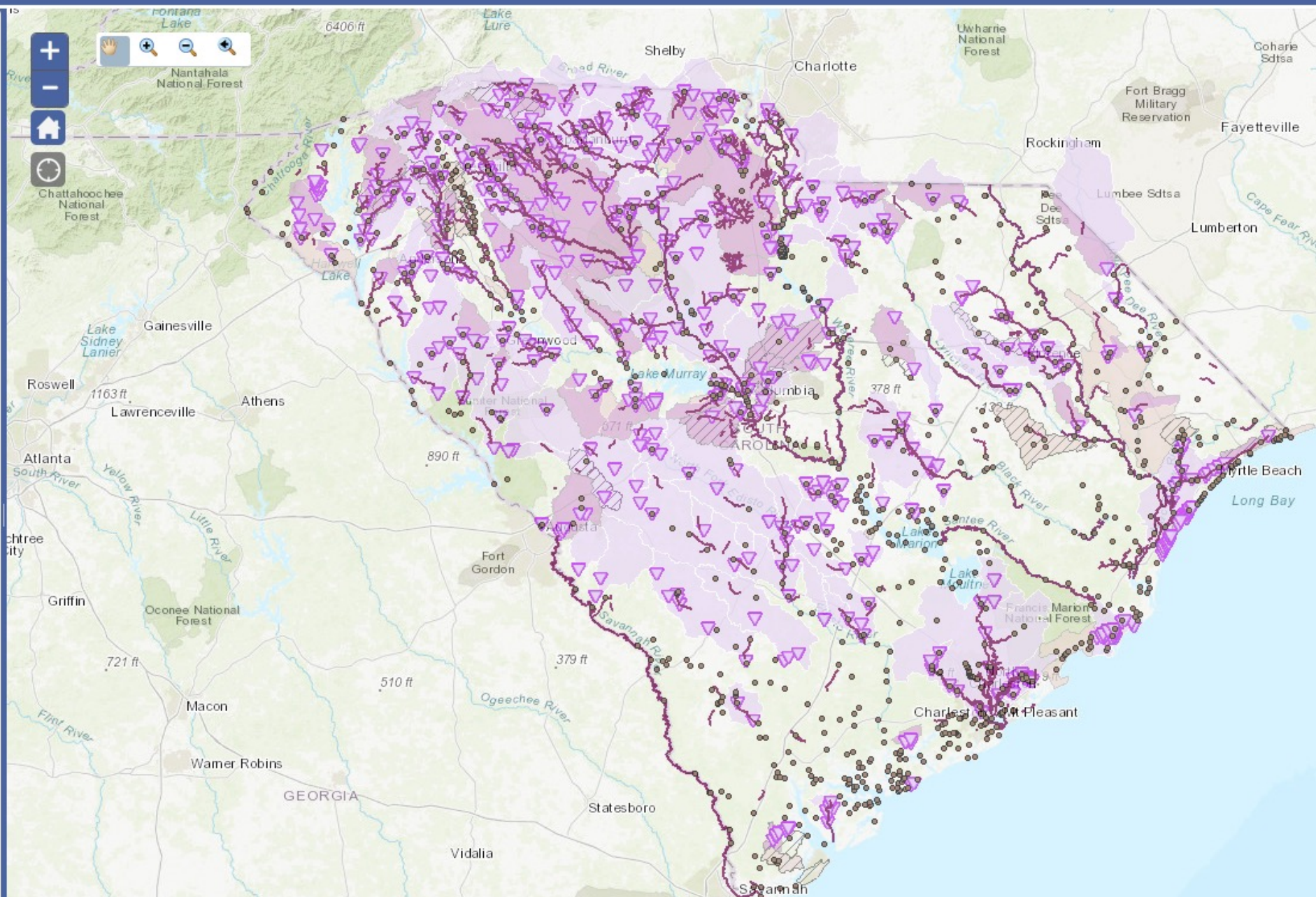






Map

- Watershed Layers
- Permits
- Public Water Supply
- Water Monitoring Stations
- Water Quality Assessments
  - 2016 Use Support and Trends
    - Stations
- Impaired Waters - 303(d)
  - 303(d) 2016
  - 303(d) 2014
  - 303(d) 2012
  - 303(d) 2010
  - 303(d) 2008
- Modeled Stream Reaches
- Approved TMDL Sites
- Approved TMDL Watersheds
- Shellfish Harvest Classifications
- Watershed Based Plans
- DHEC 319 Grant Projects
- Water Advisories
  - MS4-Municipal Separate Storm Sewer System
  - Ecoregions
- Watershed Boundaries
  - Major River Basin (Outline)
  - Major River Basins
  - 8-Digit Watersheds
  - 10-Digit Watersheds
  - 12-Digit Watersheds
- County Boundary
- Water Classification - PROVISIONAL
- National Wetland Inventory
- Floodplains
- Parcels (Zoom in to view) -Visit County Website for more info
- Nat'l Land Cover 2011



Enable 360° Imagery and Streetview on map click





# Stormwater Solutions





LOW IMPACT  
DEVELOPMENT  
strives to manage  
stormwater at the  
source.





STORMWATER BEST  
MANAGEMENT  
PRACTICES (BMPs)  
help to handle  
stormwater at the lot  
scale



What you can do  
on your property

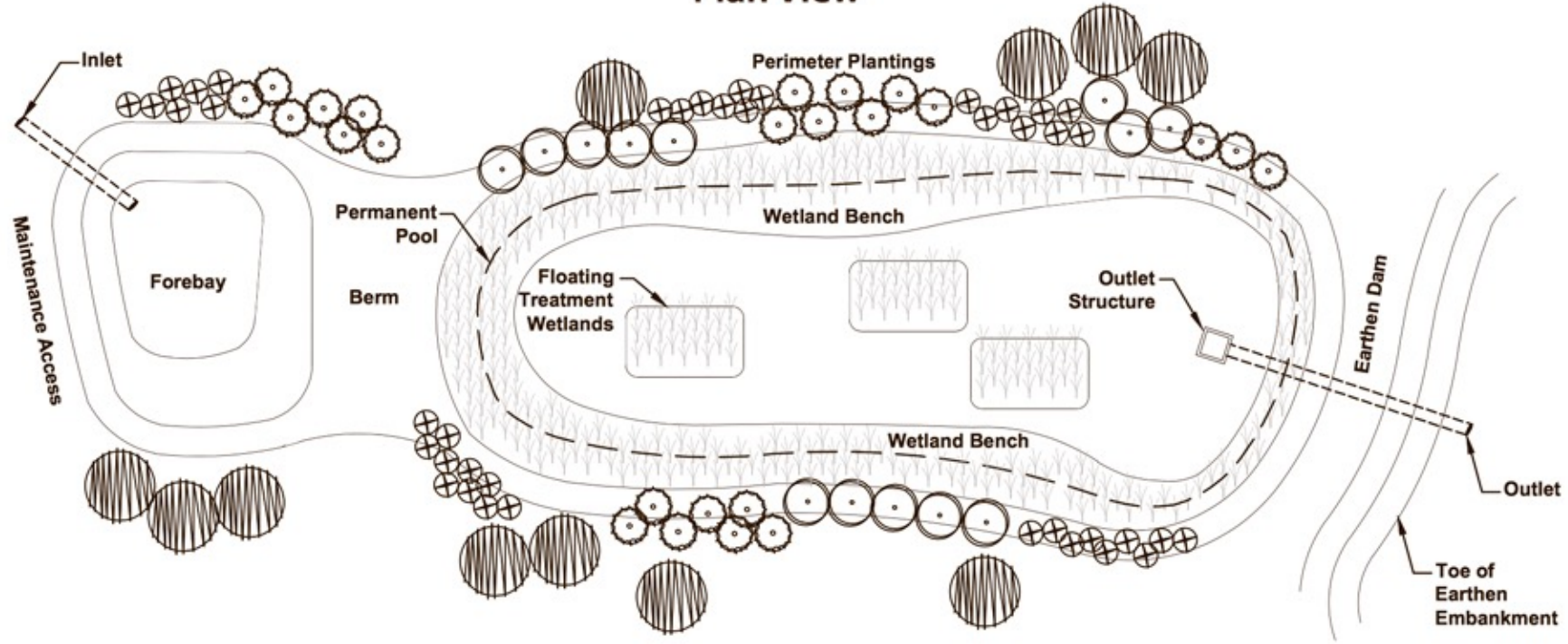


# Stormwater Ponds

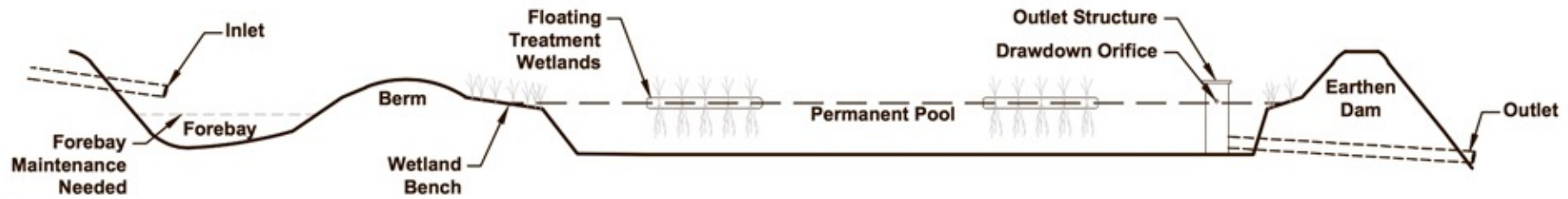




# Plan View



# Cross-Section View







# Stormwater Pond Resources

Clemson Extension Stormwater Pond Management Website:

<https://www.clemson.edu/extension/water/stormwater-ponds/index.html>

Sea Grant State of the Knowledge Report: <https://www.scseagrant.org/wp-content/uploads/Stormwater-Ponds-Executive-Summary.pdf>

Clemson's Master Pond Manager course:

<https://www.clemson.edu/extension/water/hybrid-training/mpm/>



# LANDSCAPING FOR WATER QUALITY





A photograph of a pond with a grassy bank on the left. Several large, green, leafy plants are planted along the edge of the water. The water is dark and reflects the surrounding greenery. The text "Shoreline plantings" is overlaid in white in the center of the image.

# Shoreline plantings

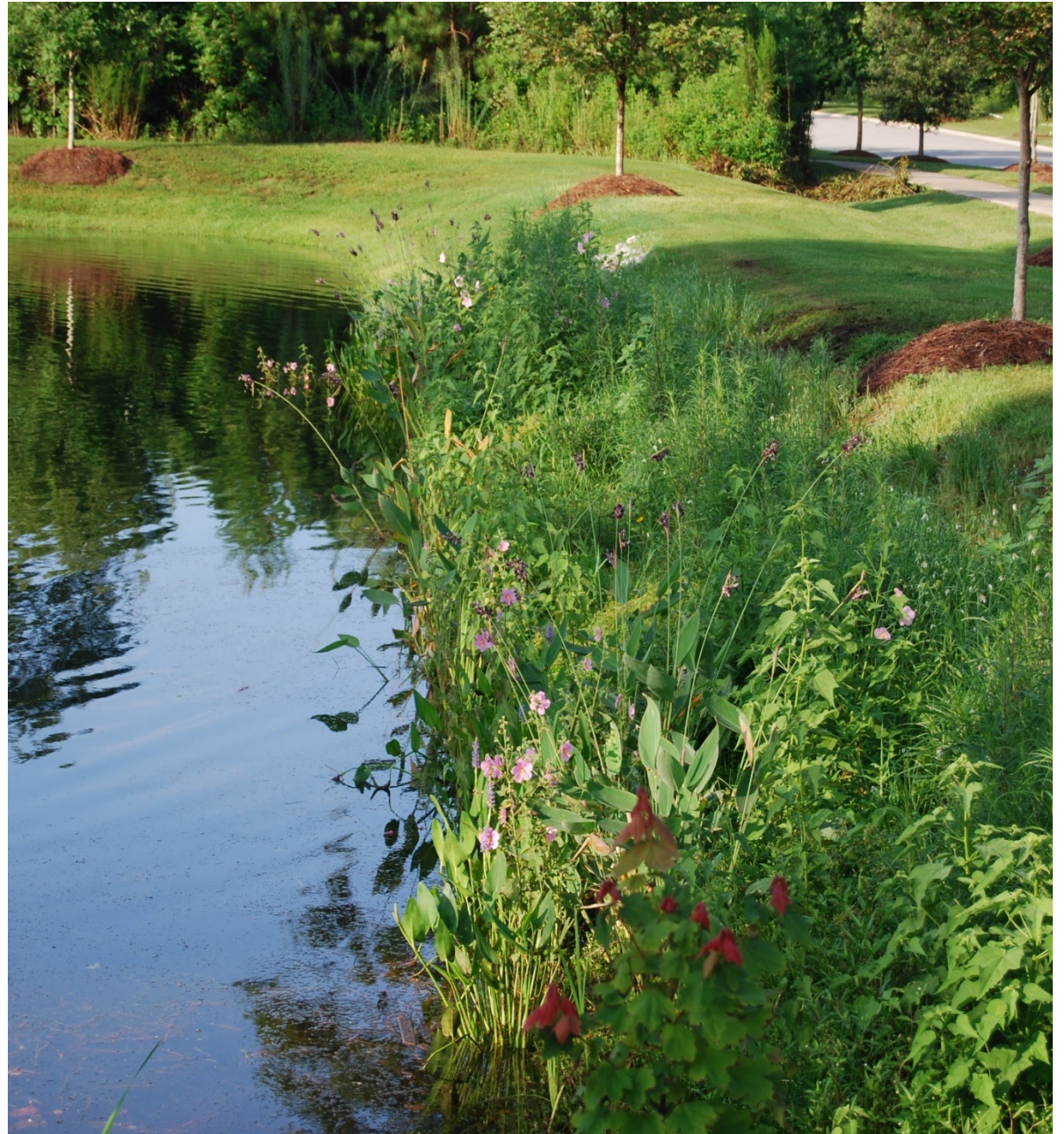


















# Shoreline planting Resources

HGIC Factsheet Shorescaping Freshwater Shorelines:

<https://hgic.clemson.edu/factsheet/shorescaping-freshwater-shorelines/>

HGIC Factsheet Plantings for Pond Shorelines:

<https://hgic.clemson.edu/plantings-for-pond-shorelines/>

Life at the Water's Edge (book)





# Floating Wetlands



(SAURURUS CERNUIS)

SWAMP HIBISCUS  
(HIBISCUS COCCINEUS)

PICKEREL WEED  
(PONTEDERIA CORDATA)

LEMON BACOPA  
(BACOPA CAROLINIANA)

DUCK POTATO  
(SAGITTARIA LATIFOLIA)

FLOATING WETLAND  
MATRIX

PLANTING MEDIA













# Floating Wetlands Resources

HGIC Floating Wetlands Fact Sheet:

<https://hgic.clemson.edu/factsheet/floating-wetlands-container-gardens-for-your-pond/>



# Rain gardens





















# Rain garden Resources

The Carolina Rain Garden Initiative:

<https://www.clemson.edu/extension/raingarden/>

A Guide to Rain Gardens in SC:

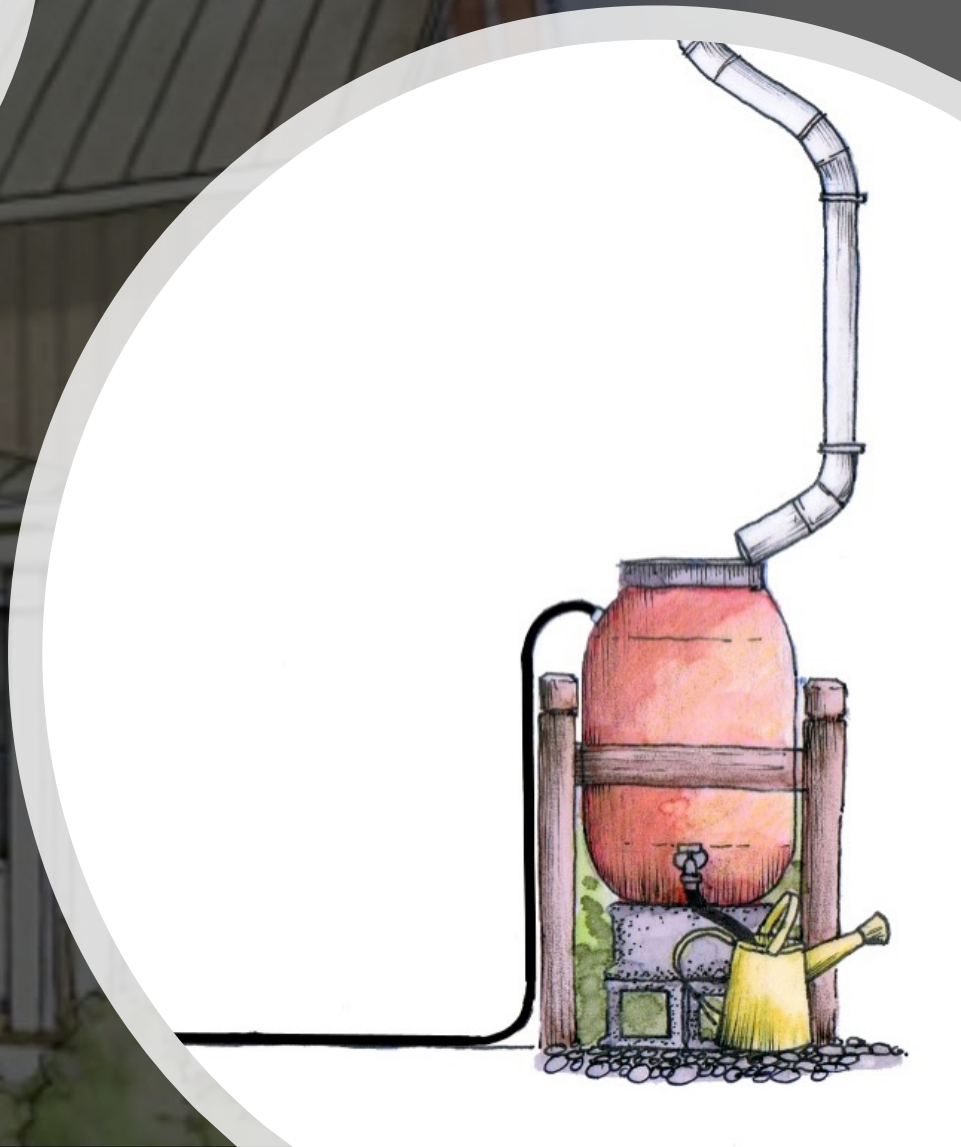
[https://www.clemson.edu/extension/raingarden/clemson\\_rain\\_garden\\_manual\\_2016.pdf](https://www.clemson.edu/extension/raingarden/clemson_rain_garden_manual_2016.pdf)

Clemson Extension Master Rain Gardener Certification Course:

<https://www.clemson.edu/extension/raingarden/mrg/>



# Rainwater harvesting



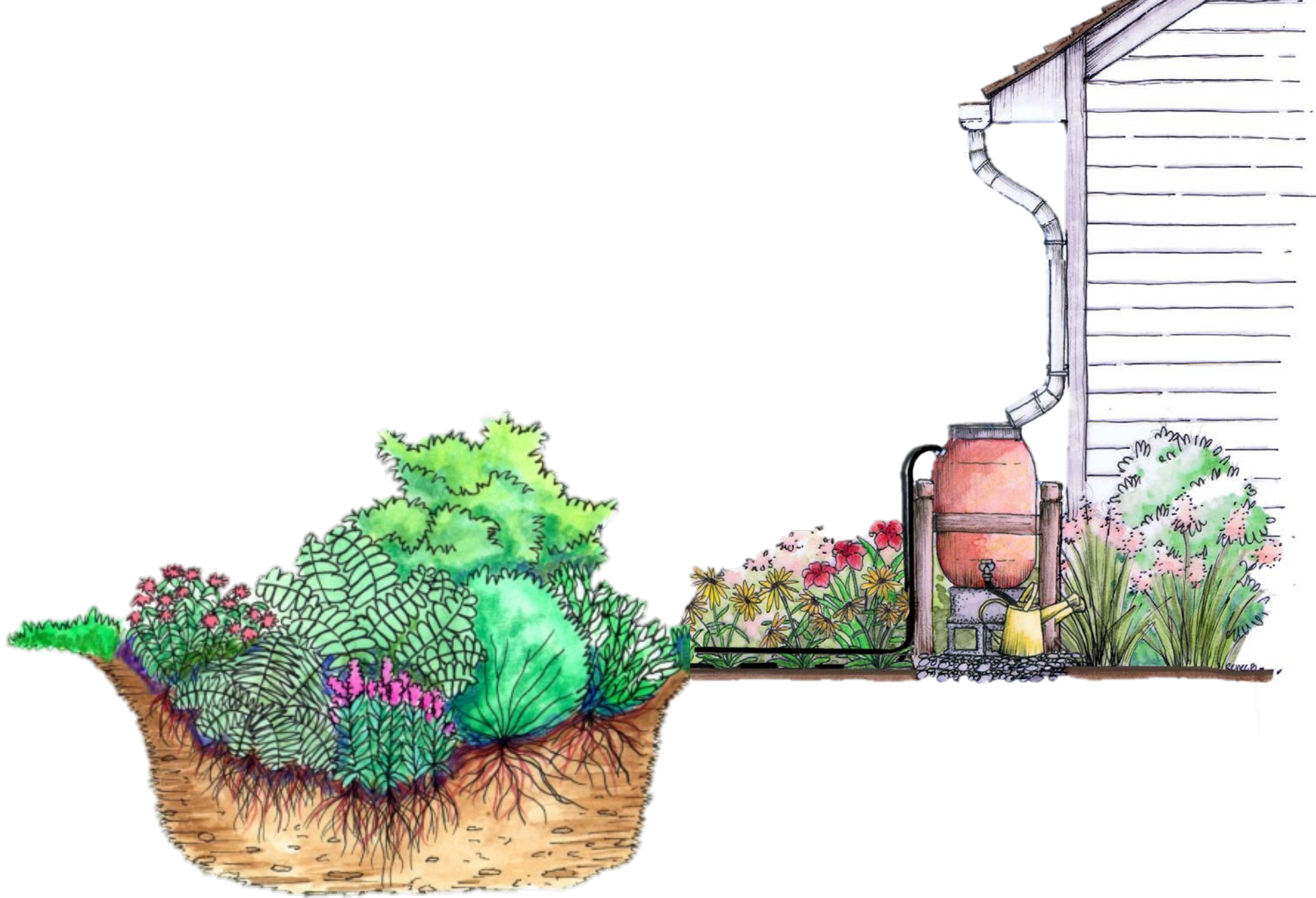














# Rainwater harvesting Resources

Clemson Extension Rainwater Harvesting for Homeowners manual:

<https://www.clemson.edu/extension/carolinaclear/files/RWHmanual.pdf>

Yearly rain barrel sales and build-a-barrel workshops around the coast





Downspout  
disconnection

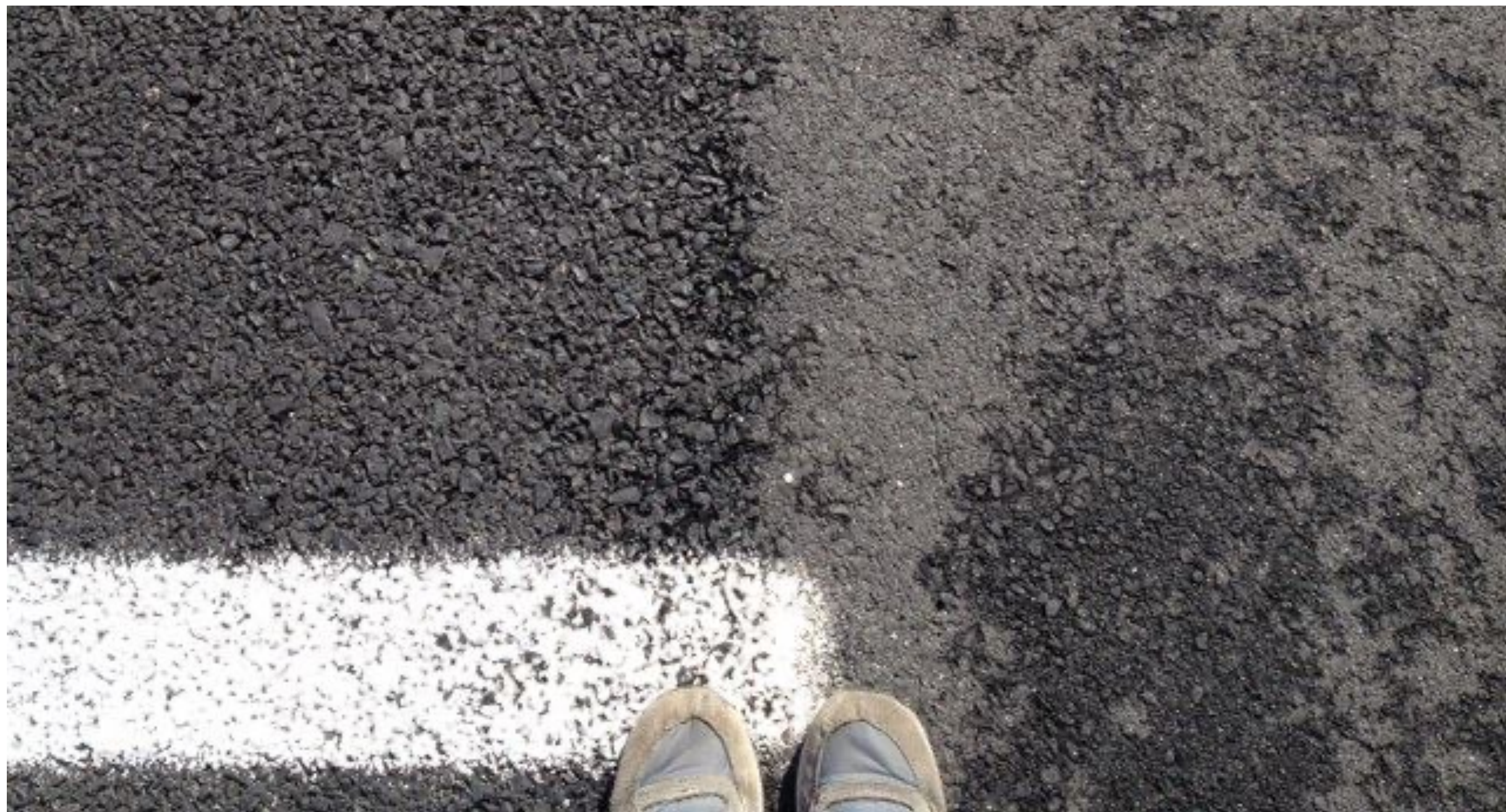






Reducing impervious area







# Turf Conversion





# Reducing Impervious Area Resources:

HGIC Factsheet: An Introduction to Porous Pavement

<https://hgic.clemson.edu/factsheet/an-introduction-to-porous-pavement/>



Use native plants









# Carolina Yards Plant Database

The screenshot shows a web browser window displaying the Carolina Yards Plant Database. The browser's address bar shows the URL `clemson.edu/extension/carolinayards/plant-database/index.html`. The website features a navigation menu with categories: ACADEMICS, RESEARCH, EXTENSION (highlighted), ABOUT, and GIVING. Below this, there are links for PROGRAMS, COUNTY OFFICES, PUBLICATIONS, RESOURCES, and CONTACT. The main content area is titled "Carolina Yards Plant Database" and includes a welcome message, search instructions, and a search interface with buttons for "Home", "Name Search", "Browse by Region", "Browse by Type", "Browse by Photo", and "Advanced". The search interface includes dropdown menus for "REGION" and "SC NATIVE".

Chrome File Edit View History Bookmarks People Tab Window Help

Carolina Yards Plant Database x Carolina Yards Plant Database x Carolina Yards Plant Database x +

`clemson.edu/extension/carolinayards/plant-database/index.html`

Apps Cascade CC Current Employees 80 Kronos Phase II Bay WIP TMDL Implementa... Fastrack User Dashboard

Clemson.edu PSA CAFLS A-Z Index Calendar Campus Maps Phonebook Apply Now Make a Gift Search clemson.edu

## CLEMSON

COOPERATIVE EXTENSION

ACADEMICS RESEARCH **EXTENSION** ABOUT GIVING

PROGRAMS COUNTY OFFICES PUBLICATIONS RESOURCES CONTACT

### Carolina Yards Plant Database

Carolina Yards  
Yard Actions  
Plant Database  
Carolina Yards Plant Database Map

Online Course  
Demonstration Carolina Yards  
Certify Your Yard  
Carolina Yards Partners  
Carolina Clear  
Events

Welcome to the Carolina Yards Plant Database which contains nearly 300 plants that are suited to growing in South Carolina. Plants were selected with the principles of environmental landscape design in mind. Remember, good landscape design hinges on choosing the right plant for the right place.

Use the search options below to make an informed decision when selecting plants. All search fields are optional; you may choose one or more search criteria. If you receive insufficient results, try searching on fewer fields. [Click here to determine which planting region your county is in, and watch for more search tips coming soon!](#)

Home Name Search Browse by Region Browse by Type Browse by Photo Advanced

Search the Plant Database

REGION  Which part of South Carolina are you in?

SC NATIVE  Are you looking for a plant native to South Carolina?



# Native Plant Resources

HGIC Factsheet An Introduction to Native Plants for SC Landscapes

<https://hgic.clemson.edu/factsheet/an-introduction-to-native-plants-for-sc-landscapes/>

Carolina Yards Plant Database:

<https://www.clemson.edu/extension/carolinayards/plant-database/index.html>

Native Plant Society website and biannual native plant sales

<https://scnps.org/>







# Break

10 Minutes





A photograph of a residential street scene. In the foreground, a paved road curves around a central landscaped area containing several large, mature trees with dense green foliage. The trees are the central focus, with their thick trunks and sprawling canopies. In the background, several houses are visible, including a prominent red house with white trim and a porch on the right, and a white house in the center. The sky is bright and slightly overcast. The overall atmosphere is peaceful and suburban.

# Case Studies





# Oak Terrace Preserve

- Community connectivity
- Tree preservation
- Green home building
- Innovative stormwater management practices





# Green Features







# Green Features

- Minimize Impervious Surfaces
- Pervious alleys and walkways



# Pervious Alleys and Walkways



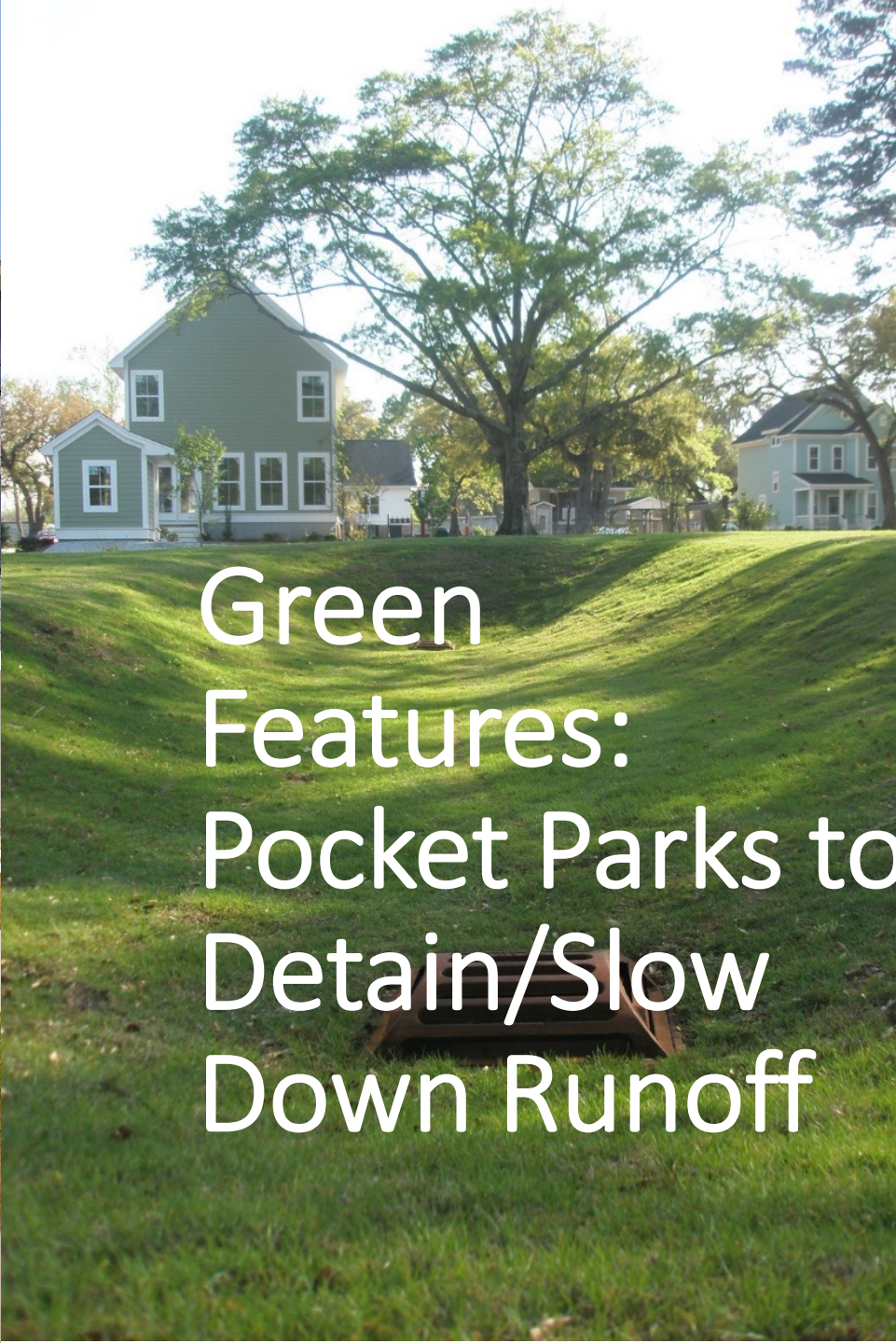




# Green Features

- Collect and Retain Runoff to Remove and Treat Pollutants
- Bioswales, rain gardens





Green  
Features:  
Pocket Parks to  
Detain/Slow  
Down Runoff



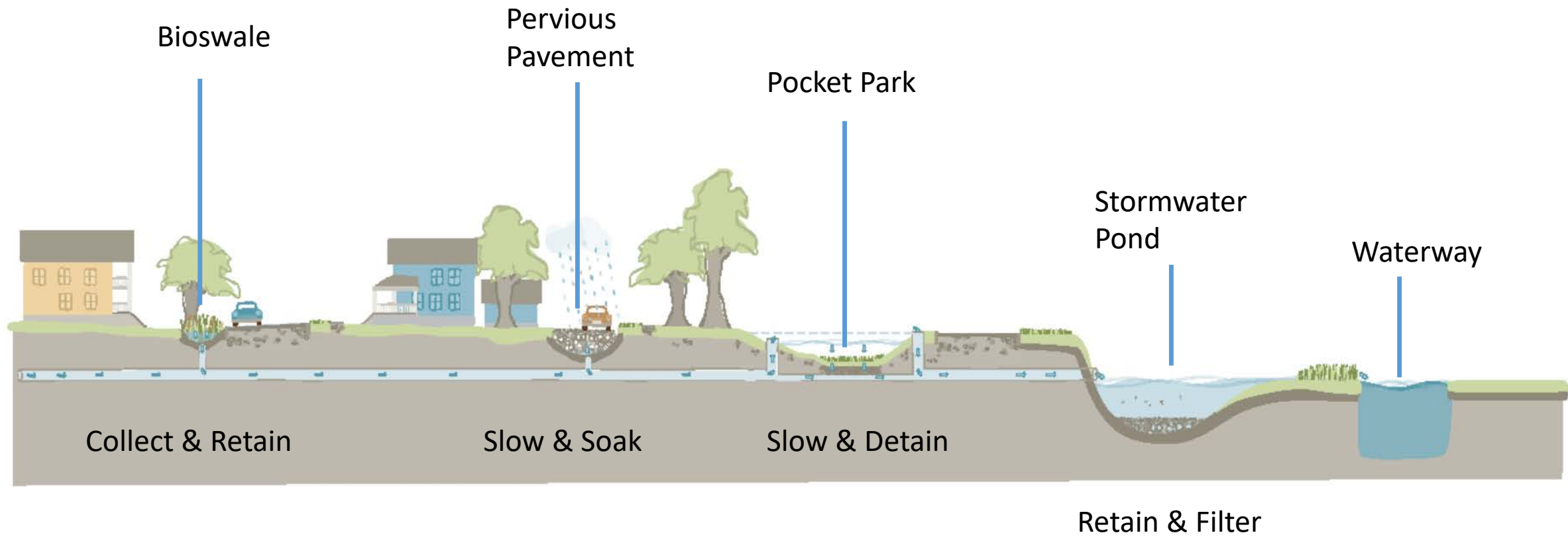


# Green Features

- Detain/Slow Down  
Runoff
- Forebay











# Oak Terrace Preserve Marketability

- Nationally recognized community featured in *Green Builder Magazine* and *Cottage Living*
- Municipal Excellence Award
- Voted Best New Neighborhood by Charleston City Paper in 2009
- Average list price \$524K





# Fox Hollow

- 2.65-acre residential development on James Island, SC
- Minimal alterations to topography, protecting trees and wetlands
- Use of LID techniques as part of the drainage system design for stormwater management





Priestly St

Canal St

Galloway Ln

Pentland Dr

Sunstone Ct

Hollyberry Rd

Saltgrass Pointe Dr

Eden Tree Pl

Beaten Path

Woodland Shores Rd

chool  
sage

Riser Dr

Rainsong Dr

Woodland Shores Rd

Con

Thras



# Protected Wetlands for Stormwater Management

Google







# LID Bioswale for Stormwater Management



A photograph of a two-story blue house with a grey roof and a two-car garage. A dark grey car is parked in the driveway. The house has a front porch with a brick base and white railing. Large trees are visible in the background and foreground. The text '\$625,000' and '2021 Sale Price' is overlaid in white on the image.

\$625,000  
2021 Sale Price



\$550,000-\$625,000  
Sale Price Range



Fox Hollow homes did not  
flood during major  
storm systems.





# The Economic Perspective on LID Features





## Monetary Benefits

In some parts of the country, green infrastructure costs about 25% less than the traditional approach of retrofitting and reactive solutions.

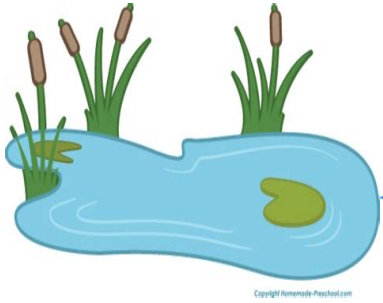




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LID practices save money for developers, property owners, and communities while also protecting and restoring water quality.





100-ft



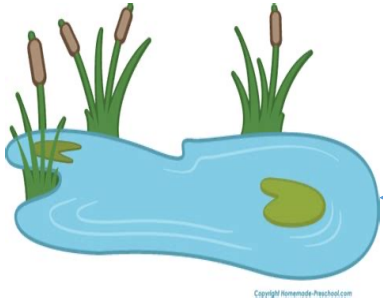
**\$214,000**



**\$200,000**

Results show proximity to a pond increases property values in Charleston County





100-ft



**\$202,000**



**\$200,000**

Results show proximity to a pond increases property values in Beaufort County



# Results also show size of pond increases property values in **Horry, Berkeley, and Georgetown Counties**

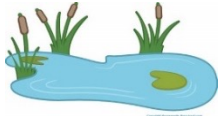


**\$199,969**



**\$204,254**

100-ft

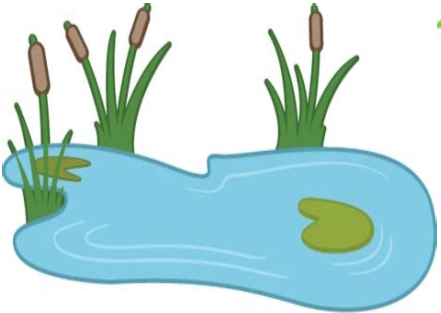


**\$242,547**



**\$193,922**

100-ft











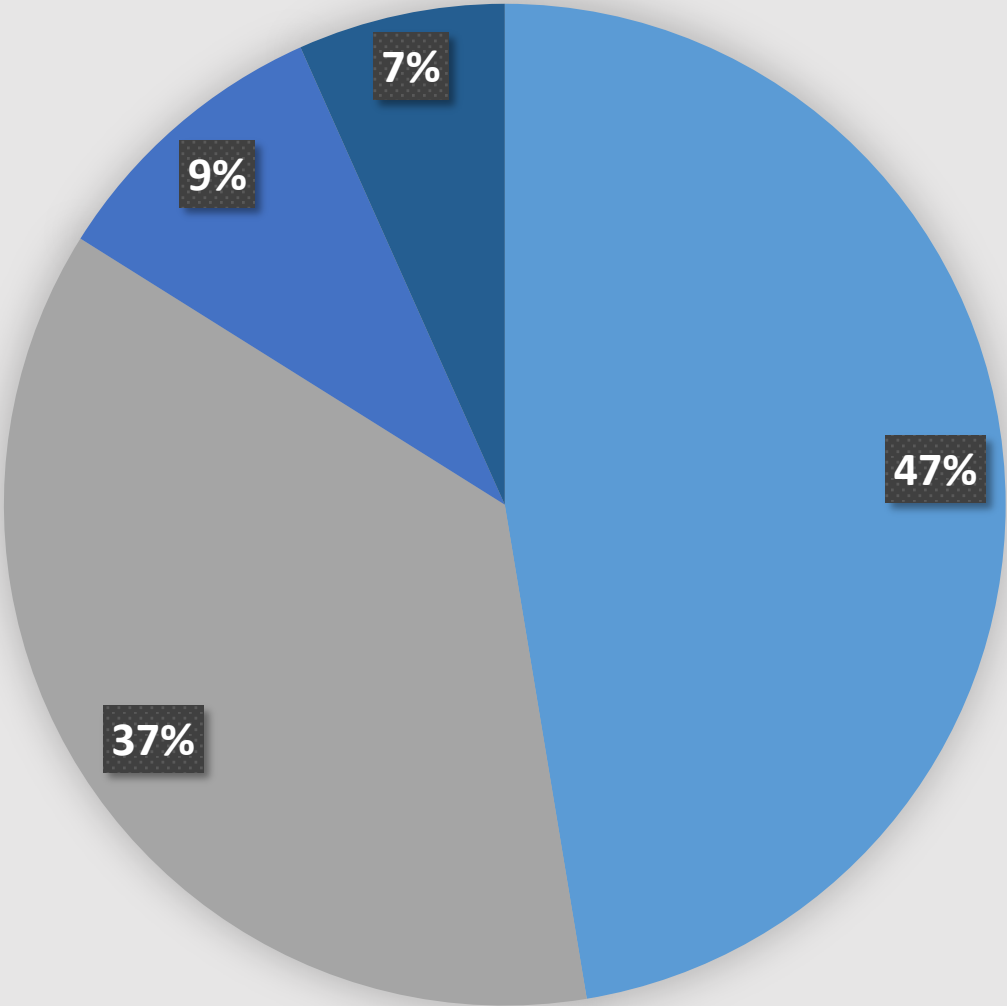


Online survey of 1,031 coastal residents  
gauged awareness and perception of  
Stormwater BMPs





# Nearly half of respondents experienced flooding in their yard



- Flooding of lawns, gardens or yards
- Flooding of driveway or road to your house
- Basement flooding
- Flooding inside the house

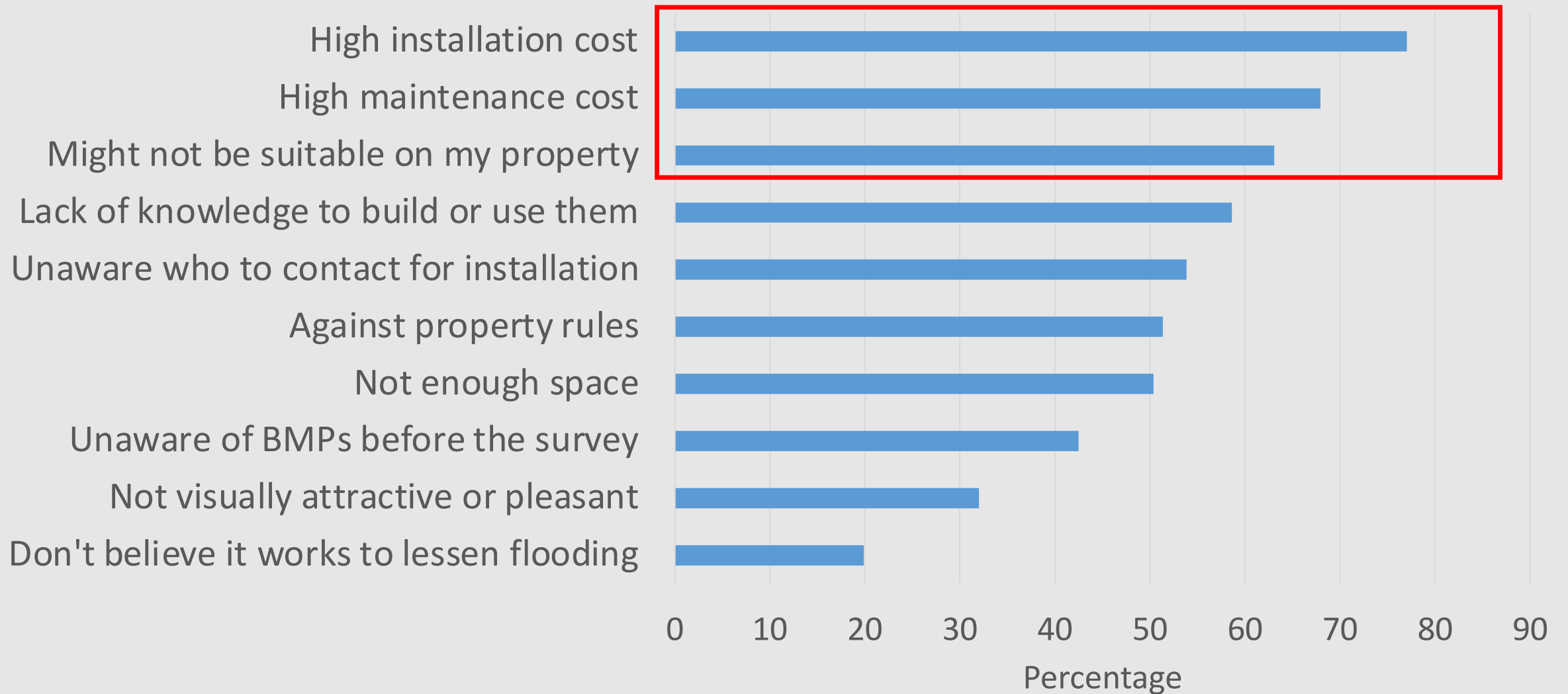




Results show that improvement of water quality and flood reduction are most important for residents

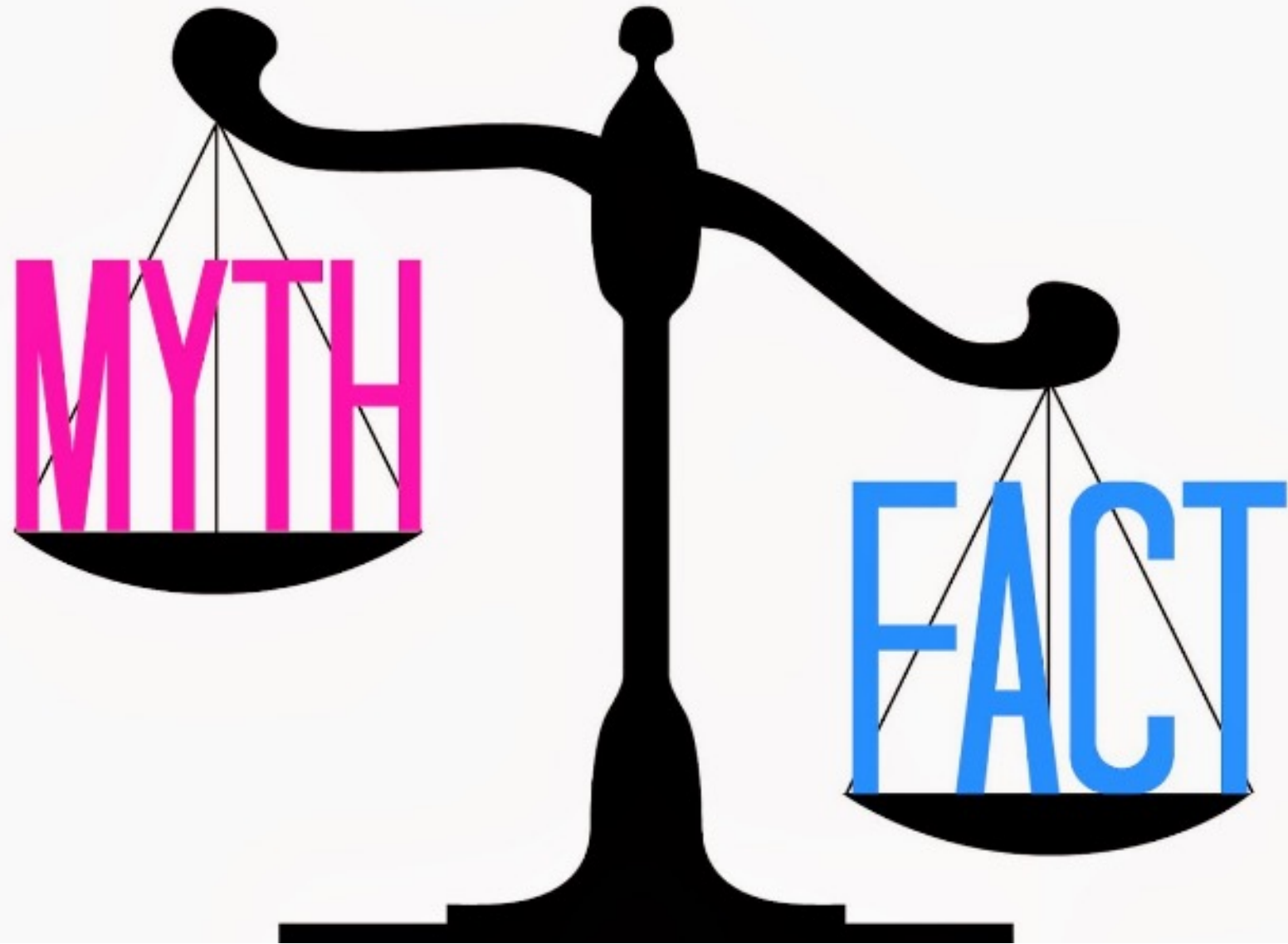


# Perceived Barriers to BMP Adoption\*



\*Multiple responses







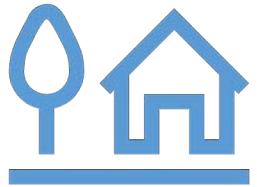


THE

# TAKE-HOME MESSAGE

Communicating the benefits of stormwater BMPs can help to shift perception and add value to properties that manage stormwater on site.





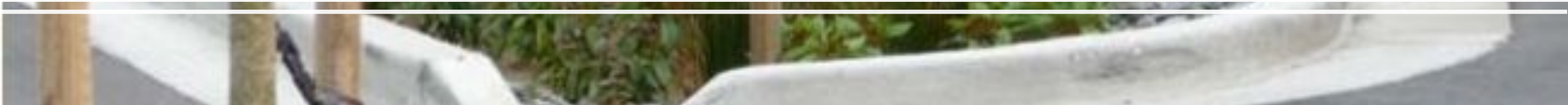
# Benefits of Stormwater BMPs







Flood storage and reduced runoff





# Groundwater Recharge





Protect water quality







Healthier aquatic habitat





Aesthetic value







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Please tell us what you think!!





*Please let us know how we can improve this course and the series.*

# Calling the Coast Home

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Living with Water

The Land Water Connection

Tidelands, Water & Beach:  
Regulations & Rebuilding.

Coastal Lifestyle for Clean  
Water



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