

# Education & Involvement Programming with the Help of the Extension Service

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**CLEMSON**  
COOPERATIVE EXTENSION



**ANDERSON & PICKENS COUNTIES**  
**stormwater**  
**PARTNERS**  
A PUBLIC SERVICE OF CLEMSON UNIVERSITY

**FD FLORENCE / DARLINGTON**  
STORMWATER CONSORTIUM



  
Coastal Waccamaw Stormwater Education Consortium

**ASHLEY COOPER**  
STORMWATER EDUCATION CONSORTIUM



**LOWCOUNTRY**  
**STORMWATER**  
**PARTNERS**  
A Service of Clemson Extension





FROM THIS...



...TO THIS





**KEYS TO REMOVING BARRIERS**

- Know-How
- Embracing a Different Aesthetic
- Financial Resources
- Access to Trained Professional



before

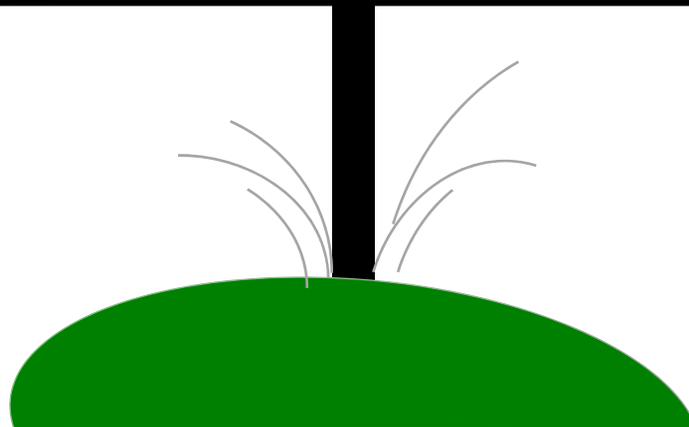
# HEALTHY LANDSCAPES. HEALTHY PONDS.

[www.clemson.edu/extension](http://www.clemson.edu/extension)

STORMWATER PONDS

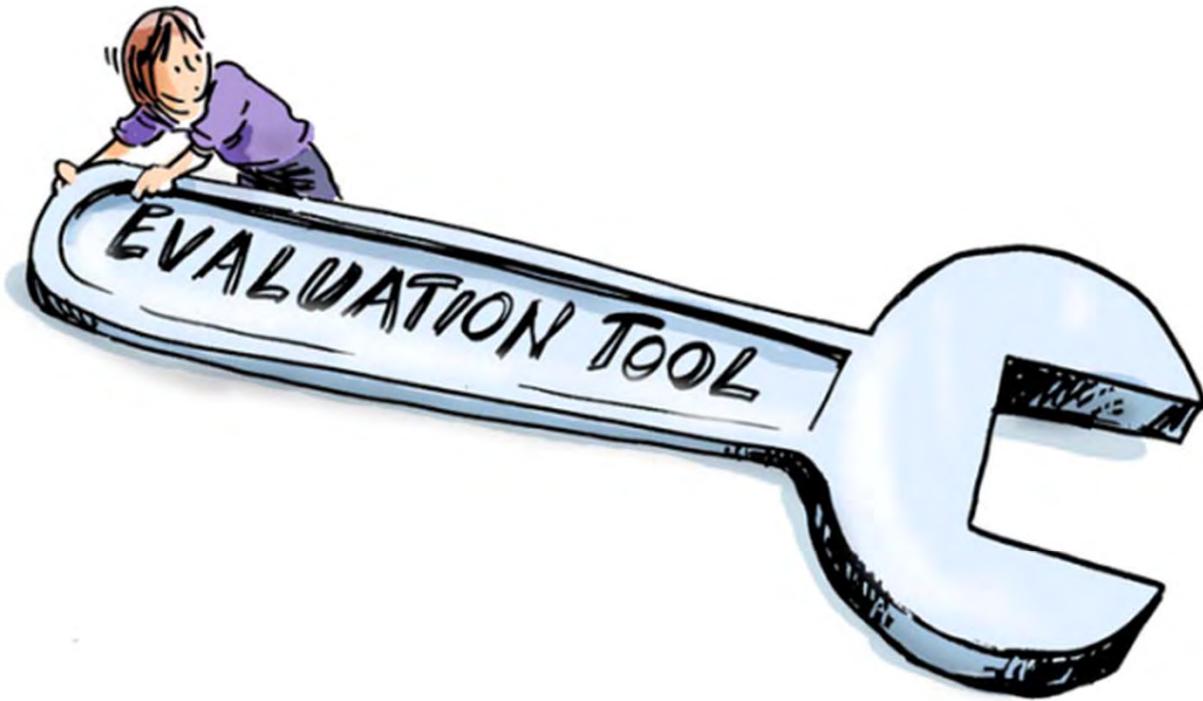


after



• Plant native and pond friendly plants

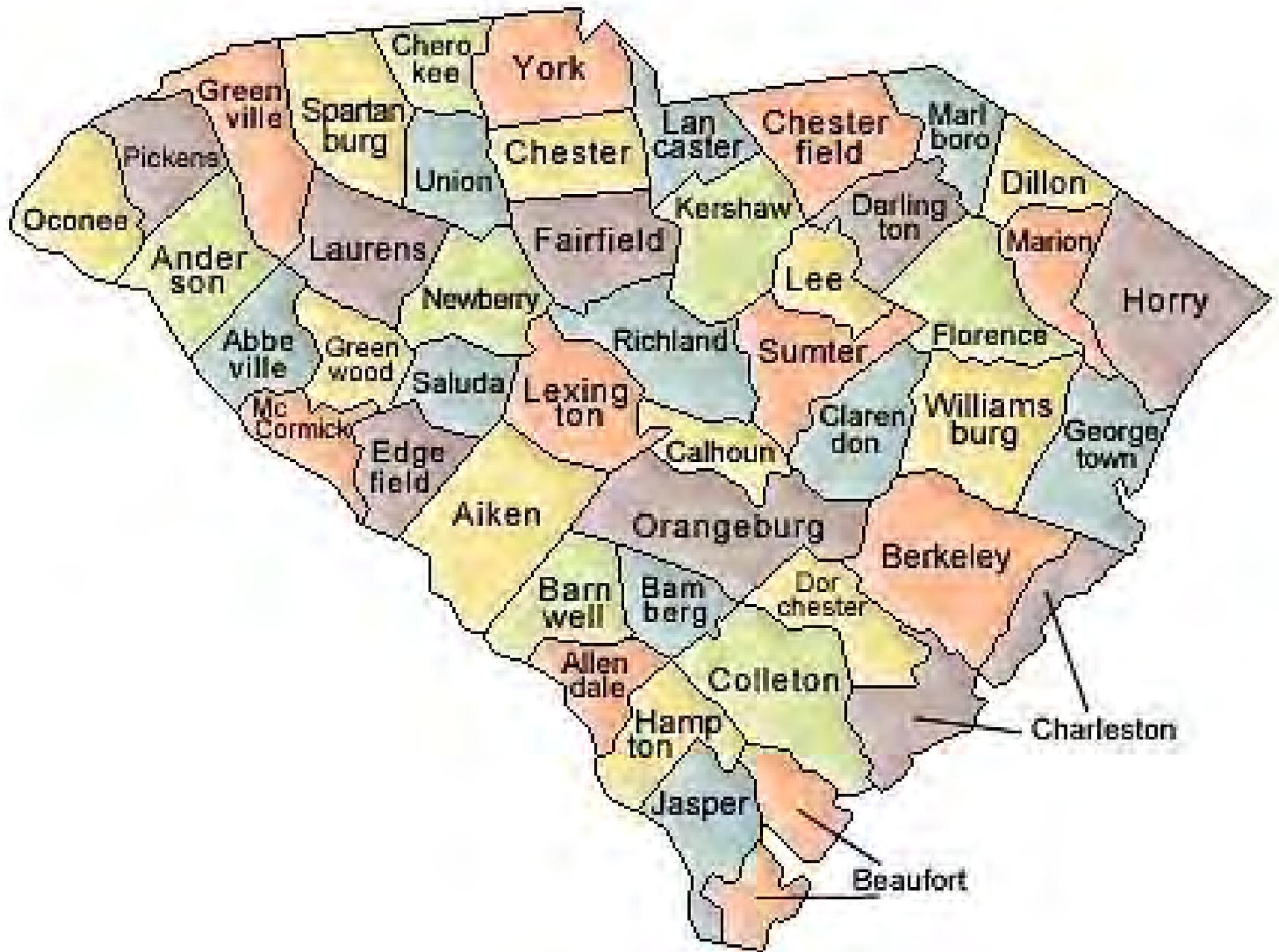




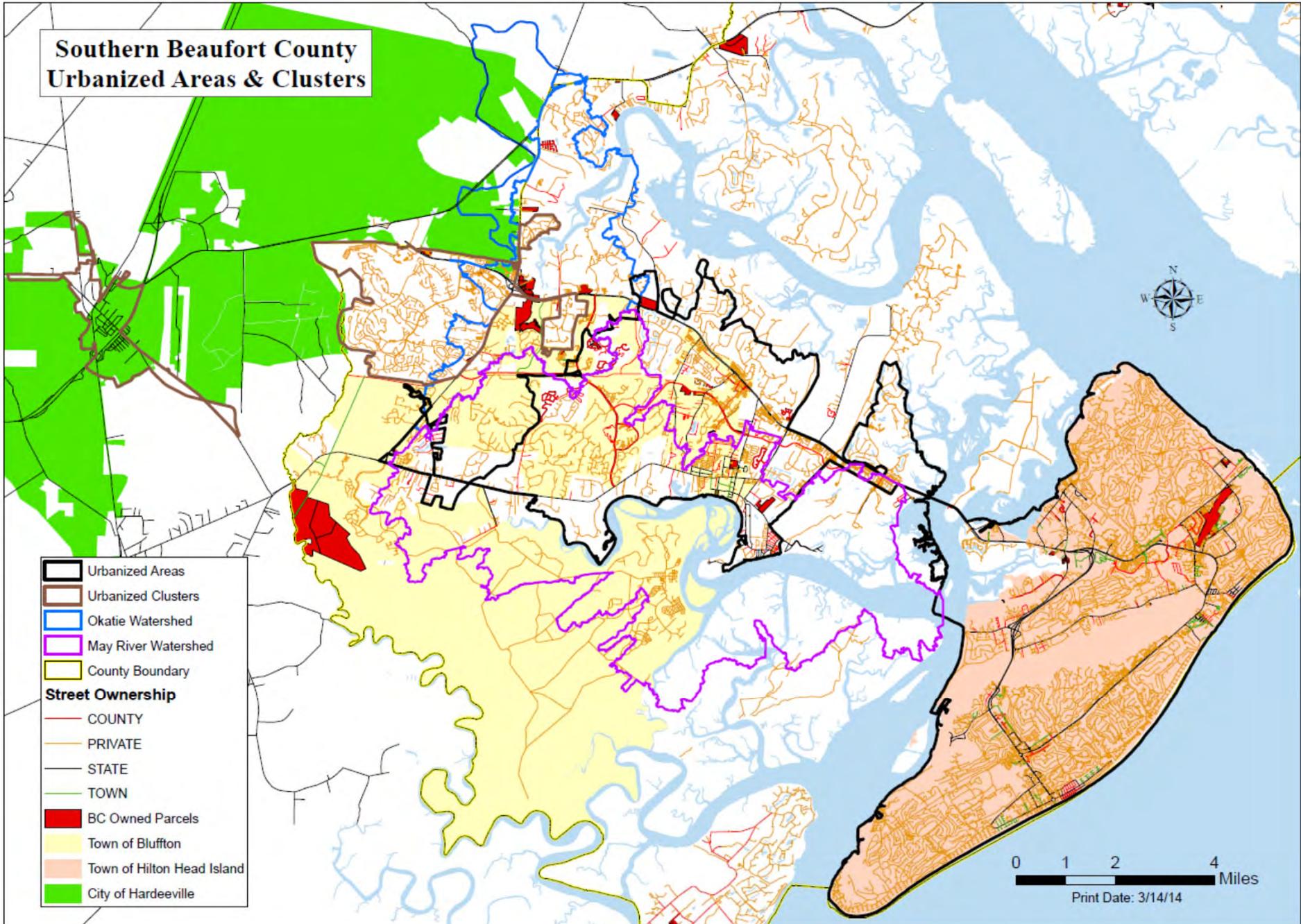
THERE'S A  
PROBLEM  
WITH THE  
NUT...



Simon  
Kessell



# Southern Beaufort County Urbanized Areas & Clusters

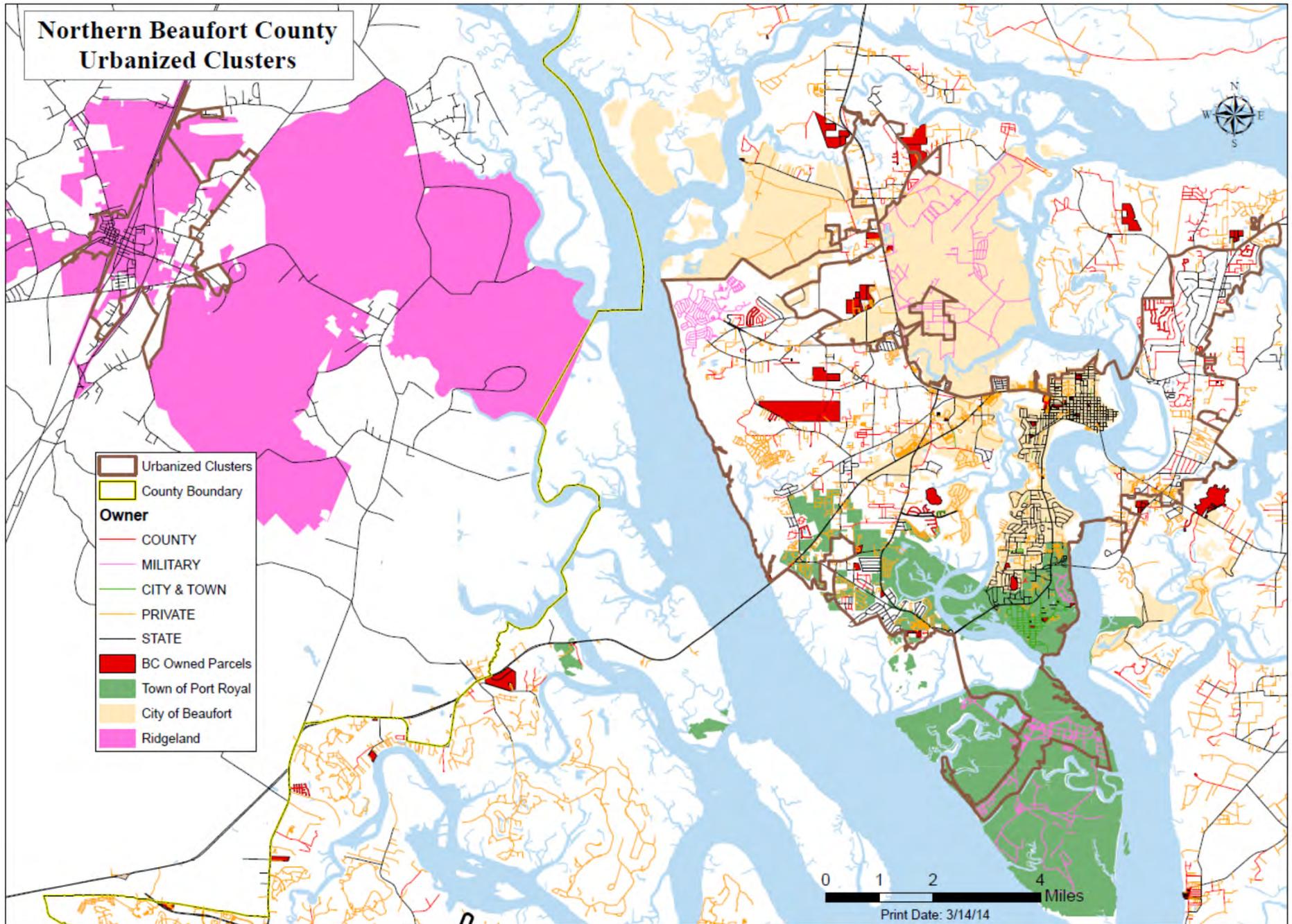


- Urbanized Areas
- Urbanized Clusters
- Okatie Watershed
- May River Watershed
- County Boundary
- Street Ownership**
- COUNTY
- PRIVATE
- STATE
- TOWN
- BC Owned Parcels
- Town of Bluffton
- Town of Hilton Head Island
- City of Hardeeville

0 1 2 4 Miles

Print Date: 3/14/14

# Northern Beaufort County Urbanized Clusters



# LOWCOUNTRY STORMWATER PARTNERS



# LOWCOUNTRY STORMWATER PARTNERS



# CLEMSON<sup>®</sup>

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## COOPERATIVE EXTENSION

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# LOWCOUNTRY STORMWATER PARTNERS



**COASTAL  
DISCOVERY  
MUSEUM**

Experience The  
Lowcountry Up Close



COASTAL  
CONSERVATION  
LEAGUE



SAVANNAH  
RIVERKEEPER®

It's Your River, Protect It!



# STRATEGIC PLANNING PROCESS



## Goals

Identify POCs

Identify target audiences

Brainstorm potential solutions



# STRATEGIC PLANNING PROCESS



## Process

MS4 input

Local perspectives survey

POC brainstorming and  
prioritization

ID programs and resources



# STRATEGIC PLANNING PROCESS



## Local Perspectives Survey

50% of respondents live in gated communities

73% recognize that stormwater isn't treated



## Local Perspectives Survey

Target Audiences:

- Construction professionals

- Landscape professionals

- Homeowners

47% witness an illegal discharge  
at least 3x a year



# STRATEGIC PLANNING PROCESS



## POC Identification

24 different pollutants

6 primary POCs

Primary POCs
Post-con. maintenance
Freshwater
Litter
Bacteria
Nutrients
Sediment

# STRATEGIC PLANNING PROCESS



Target Pollutant								Program/Activity
Post-Construction Maintenance	Freshwater (Runoff Volume)	Litter	Bacteria	Nutrients	Sediment	General Stormwater Awareness	Other	
x						x		Participation in the Carolina Clear Mass Media Campaign 2014-2017 Stormwater Ponds
x						x		Stormwater Pond Billboards
x			x	x	x	x		Stormwater Pond Conference
x	x	x	x	x	x	x		Watershed Friendly Business Program
x	x		x	x	x	x		Neighbors for Clean Water

## Educational Programs

Master Pond Manager

“Cultivating a Carolina Yard”

Stormwater Pond Conference



## Community Outreach

May River Cleanup

Making It Grow

Kids in Kayaks program



# REGIONAL CONSORTIUMS



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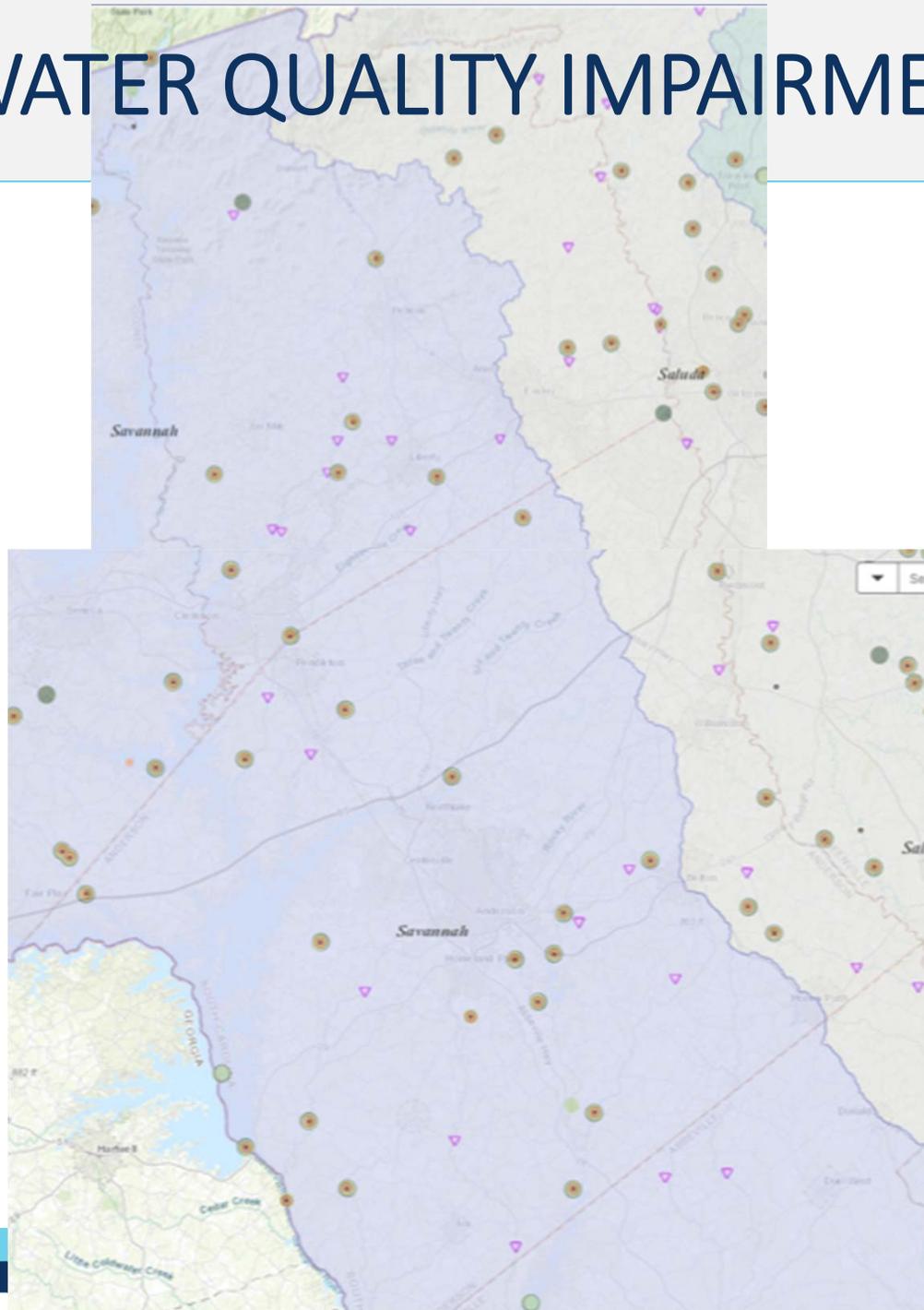
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# WATER QUALITY IMPAIRMENTS



**SC Watershed Atlas**

[gis.dhec.sc.gov/watersheds](http://gis.dhec.sc.gov/watersheds)

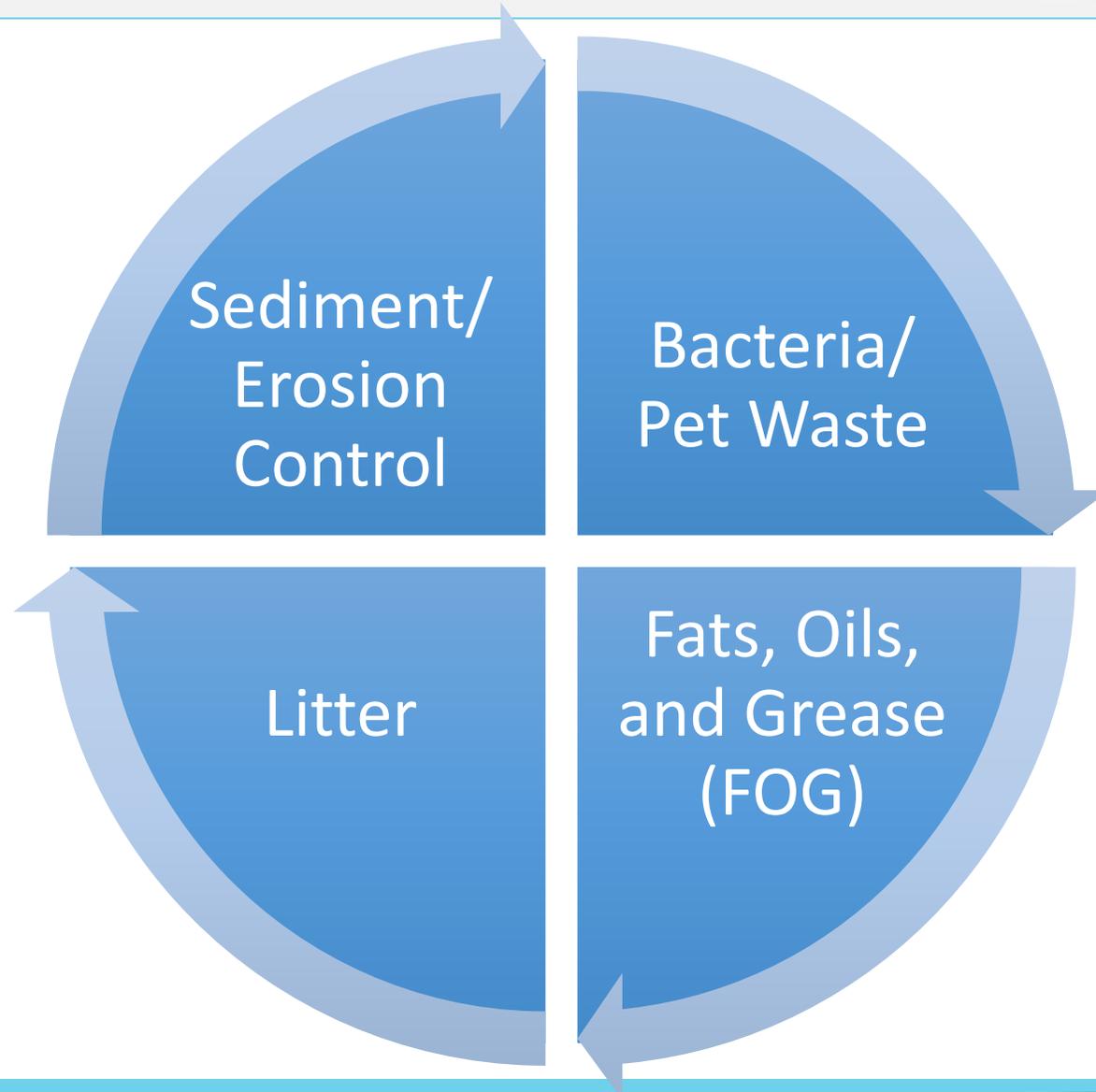


303(d) list

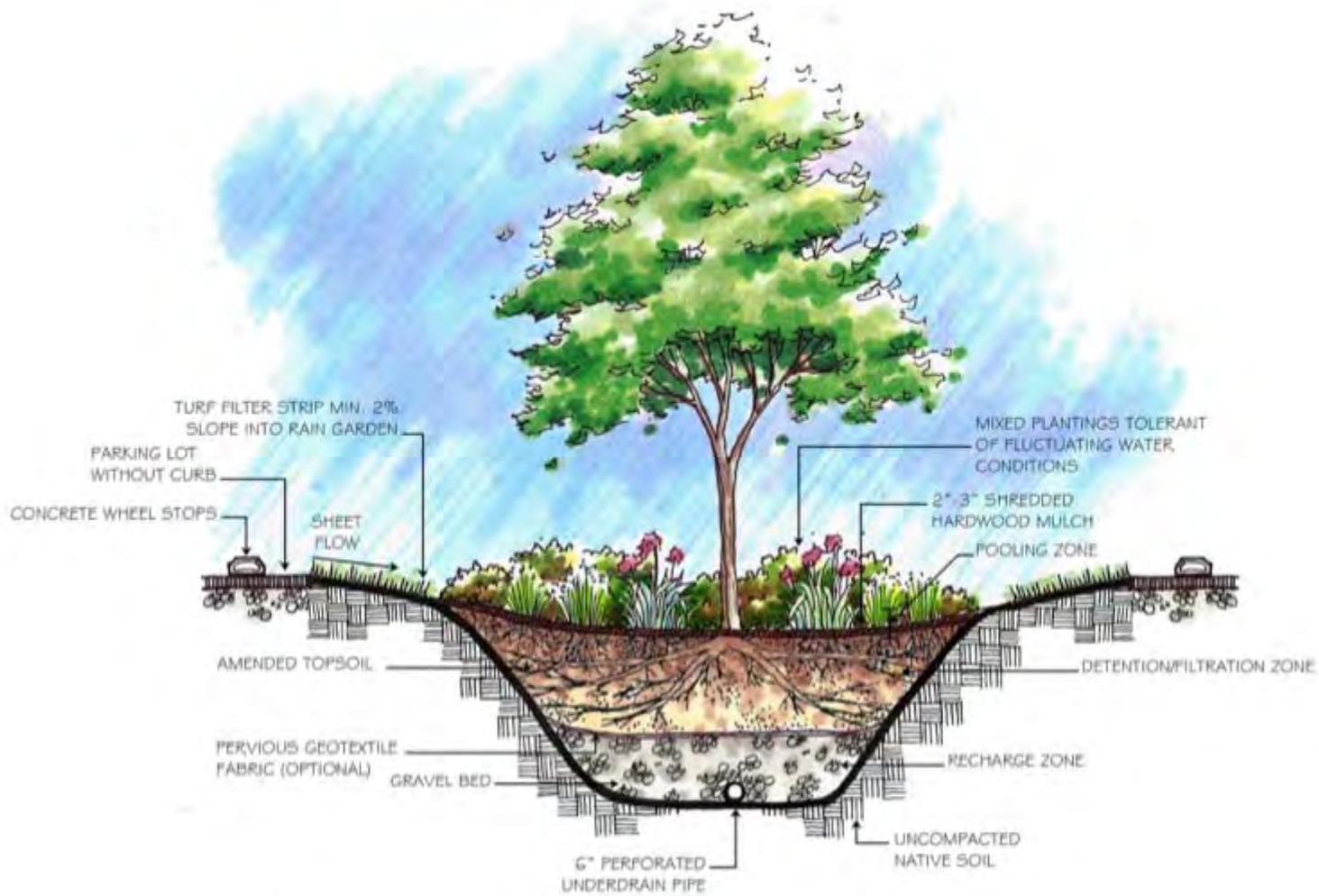


Approved TMDL sites

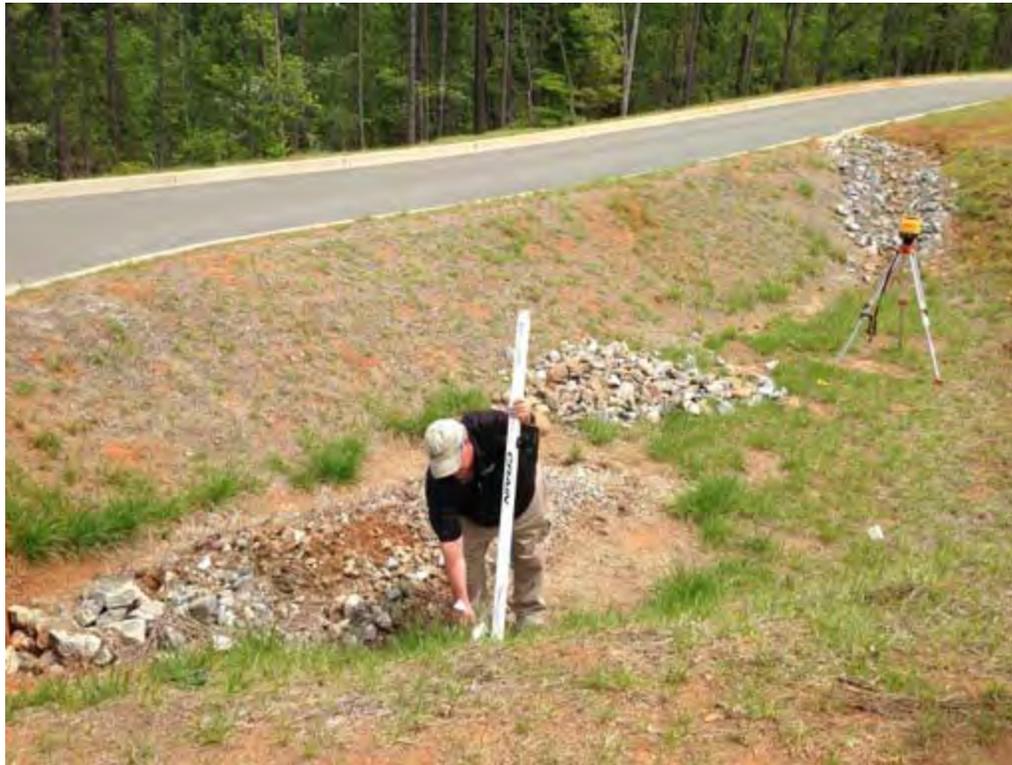
# POLLUTANTS OF CONCERN



# BIORETENTION



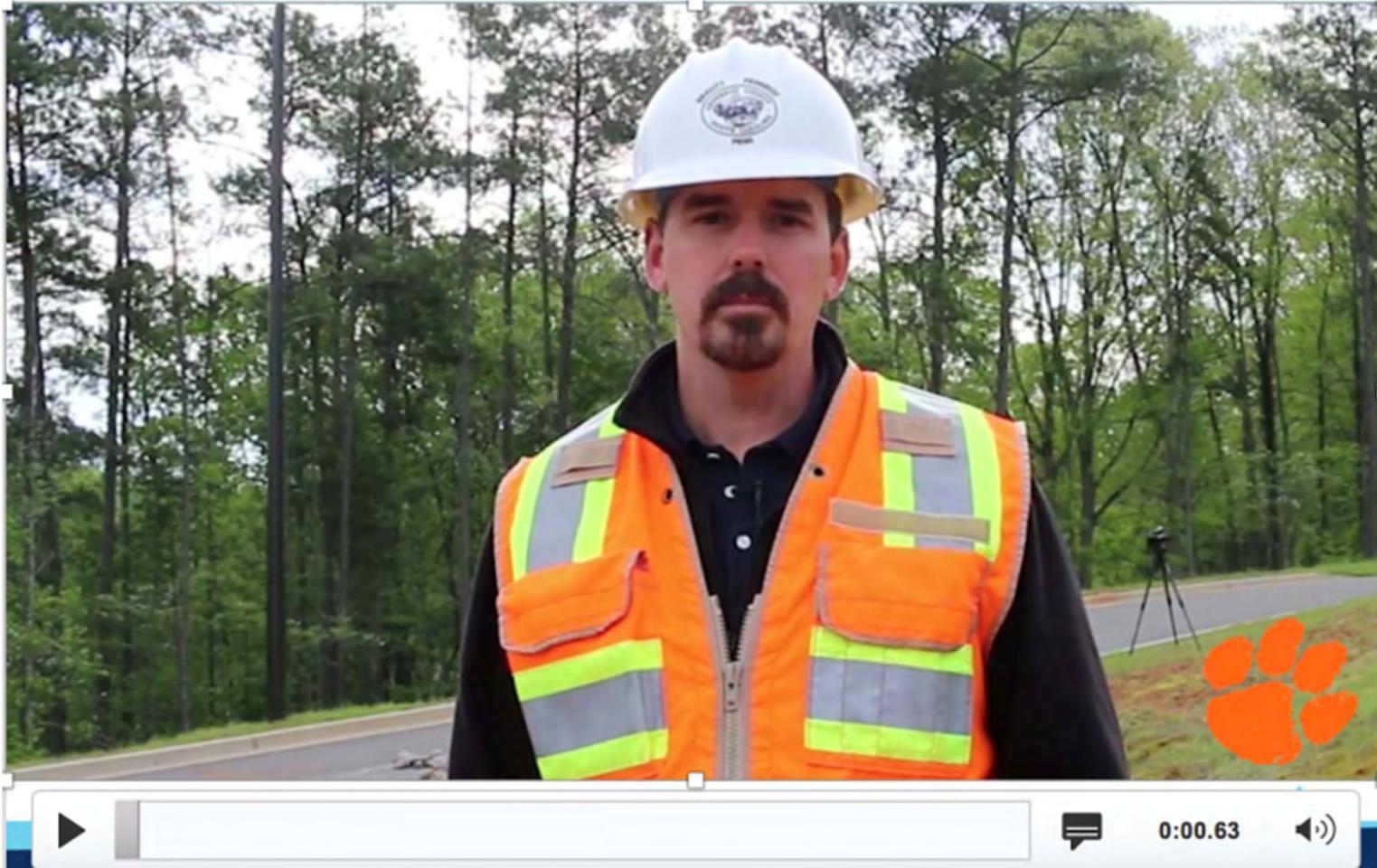
# GREEN POND LANDING - BEFORE



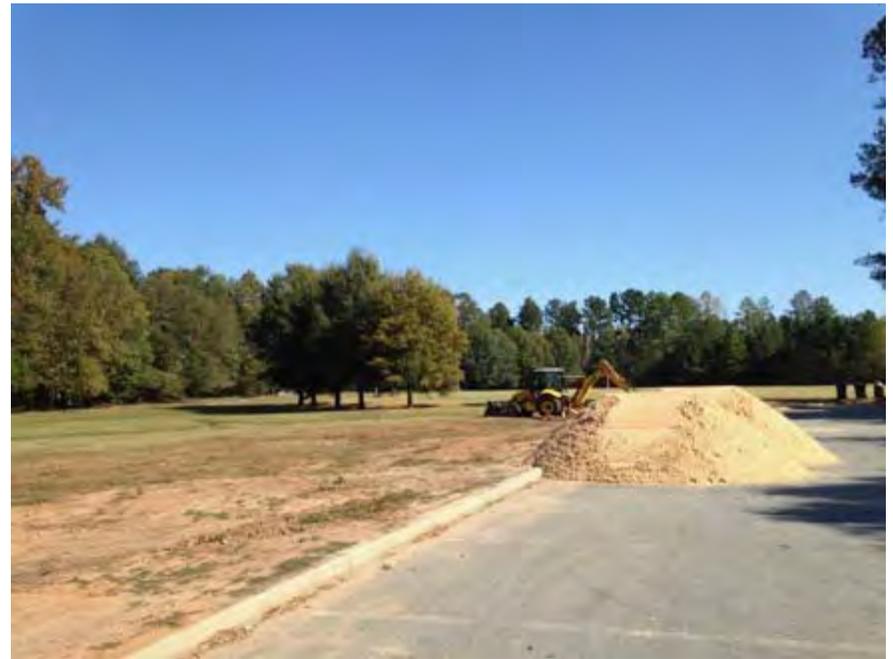
# GREEN POND LANDING – AFTER



# GREEN POND LANDING



# NETTLES PARK - BEFORE



# NETTLES PARK - DURING



# NETTLES PARK - AFTER



# NETTLES PARK



# Bioretention

## Naturally Treating Polluted Runoff

**STORMWATER** is water that originates from **rain events**. Stormwater that does not soak into the ground becomes surface runoff and flows to nearby ditches, storm drains and waterways. Stormwater picks up pollution from the landscape, but does not go to a treatment plant.

**BIORETENTION BASINS** are engineered, landscaped depressions that receive stormwater runoff and improve water quality before runoff reaches ditches, storm drains and waterways, or groundwater. These pond alternatives have several benefits:

- **STORE AND ABSORB WATER** that might otherwise contribute to flooding
- Provide **HABITAT**
- **BEAUTIFY** the landscape
- Naturally **REMOVE POLLUTANTS**:
  - Plants and soil trap **metals** and **sediment**
  - Plants use **nutrients**
  - Engineered drainage removes **nitrogen**
  - Soil microbes break down **pathogens**, like bacteria

### How does bioretention work?



Carolina Clear is a program of Clemson University's Public Service Activities. Information is provided by faculty and Cooperative Extension Agents, Clemson University Cooperative Extension Service offers its programs to people of all ages, regardless of race, color, sex, religion, national origin, disability, political beliefs, sexual orientation, marital or family status and is an equal opportunity employer.

# BIORETENTION WORKSHOP



## Low Impact Development: Designing Bioretention

For stormwater design engineers, MS4 stormwater staff

This one day workshop for stormwater professionals will focus on design, implementation, and maintenance of bioswales and bioretention in stormwater management. Content will be taught by Clemson Extension Specialists and Agents.

### Proposed Agenda

- 9:00 Registration
- 9:15 Overview of LID practices
- 10:00 Hear from local MS4s on permit approval process
- 10:30 Bioretention design with case studies
- 11:30 Plant selection and maintenance
- 12:00 Lunch (provided)
- 1:00 Field tours
- 2:45 Conclusion

Registration deadline: June 5, 2017

Register and pay online at Clemson University Marketplace – Carolina Clear Store  
Link: <http://bit.ly/2oD08aV>

Participants will receive PDHs or CEUs upon completion

Questions?  
Contact Rachel Davis  
864-878-1394 x111  
[herold@clemson.edu](mailto:herold@clemson.edu)



Please find additional resources at [www.clemson.edu/carolinaclear](http://www.clemson.edu/carolinaclear)

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# RESOURCES



- DHEC BMP Handbook  
[www.scdhec.gov/Environment/WaterQuality/Stormwater/BMPHandbook](http://www.scdhec.gov/Environment/WaterQuality/Stormwater/BMPHandbook)
- Low Impact Development in Coastal South Carolina: A planning and design guide  
[www.northinlet.sc.edu/LID](http://www.northinlet.sc.edu/LID)
- Plant Selections for Bioretention Cells <http://bit.ly/2sEtneO>
- Bioretention and Bioswale Video  
[www.youtube.com/carolinaclear](http://www.youtube.com/carolinaclear)
- Bioretention Cell Time-Lapse Video [www.youtube.com/clemsonpsa](http://www.youtube.com/clemsonpsa)
- Post Construction BMP Inspector Course  
[www.clemson.edu/public/water/watershed/training/bmp](http://www.clemson.edu/public/water/watershed/training/bmp)

# QUESTIONS?



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