U.S. Environmental Protection Agency, Region 4
Centers of Excellence for Watershed Management

2015 ANNUAL REPORT

CLEMSON UNIVERSITY
CENTER FOR WATERSHED EXCELLENCE

Prepared by Katie Buckley and Calvin Sawyer, Ph.D.
Assistance Provided by Kim Counts Morganello, Cathy Reas Foster, Karen Jackson,
and Charly McConnell
Clemson Extension

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This document has been produced to report on the calendar year 2015 efforts of the Clemson University Center for Watershed Excellence [the Center], designated as such by the US Environmental Protection Agency (EPA). The Center, in partnership with the South Carolina Department of Health and Environmental Control, Clemson University, and EPA Region 4, seeks to utilize the diverse talent and expertise of colleges and universities in various geographic areas to provide hands-on, practical products and services to help communities identify watershed-based problems and develop and implement locally-sustainable solutions. This original Memorandum of Understanding (MOU) between named agencies was signed in June 2008. The Center was re-designated in June 2013 under a new five-year MOU with this same primary purpose.

This report and all products of the Center’s activities will be archived at www.clemson.edu/watershed to encourage greater awareness, involvement and partnerships developed through the Center and its agency partners.

It is therefore a great honor to serve as an EPA-designated Center for Watershed Excellence with such a critical mission to serve in the long-term protection of this most vital resource.

Katie Buckley, Director

Calvin Sawyer, Ph.D., Associate Director
Measures of Success (IV. Section I. MOU)

I. Number & Names of Clients Supported

CAROLINA CLEAR PROGRAM

Carolina Clear (http://www.clemson.edu/carolinaclear) is a nationally award-winning program of the Clemson Extension Service and the Clemson University Center for Watershed Excellence. This comprehensive program works alongside more than 30 South Carolina communities (Fig. 1) and dozens of non-profit groups, colleges, universities, and agencies to inform and educate target audiences about water quality, water quantity, and the cumulative effects of stormwater. Utilizing lessons learned from marketing and social science research, Carolina Clear programming seeks to reduce barriers by addressing the special significance of South Carolina's water resources and the role they play in the state's economy, environmental health and overall quality of life. Carolina Clear supports municipalities statewide through seven consortiums. Nearly three-dozen cities, towns and counties are working amongst regional programs (named below) to increase awareness and involvement in stormwater management and successfully comply with NPDES General Stormwater Permit requirements. In 2015, there were approximately 2.5 million impacts documented statewide from programs including workshops and presentations to billboards and commercials.

Partnering communities that provide funding for personnel and resources to coordinate and lead activities of each consortium include the following, identified by regional effort:

- **Ashley Cooper Stormwater Education Consortium** – participating communities include the counties of Berkeley, Charleston and Dorchester and the municipalities of Charleston, Folly Beach, Goose Creek, Isle of Palms, James Island, Lincolnville, North Charleston, Sullivan’s Island, Summerville, and the Town of Mount Pleasant.
- **Coastal Waccamaw Stormwater Education Consortium** (co-lead) – participating communities include the counties of Horry and Georgetown and the municipalities of Atlantic Beach, Surfside Beach, Conway, Myrtle Beach, Briarcliffe Acres, and North Myrtle Beach.
- **Florence Darlington Stormwater Consortium** - participating communities include the City of Florence, City of Darlington, Town of Timmonsville, Town of Quinby, Darlington County, and Florence County.
- **Anderson and Pickens Counties Stormwater Partners** – participating communities include Pickens County, City of Central, City of Clemson, Clemson University, City of Easley, Town of Norris, City of Pickens, City of Liberty, Anderson County, City of Anderson, and the Town of Belton.
- **Richland Countywide Stormwater Consortium** – participating communities include Richland County along with the municipalities Arcadia Lakes and Forest Acres.
- **Sumter Stormwater Solutions** – participating communities include Sumter County and the City of Sumter.

Specific target audiences, behaviors, and corresponding pollutants of concern of 2015 Carolina Clear outreach

www.clemson.edu/watershed
programming included the following:

- Homeowners and residential lawn care practices – phosphorus, nitrogen, sediment loss (indirectly, dissolved oxygen), pesticides, increasing infiltration/decreasing runoff, rainwater harvesting;
- Homeowner associations (HOAs) and neighborhoods – phosphorus, nitrogen, sediment loss (indirectly, dissolved oxygen), pesticides, infrastructure clogging from yard debris and placement of debris, progressive stormwater pond management, Resident Canada Goose population deterrents, shoreline vegetation and stabilization, increasing infiltration;
- Restaurant managers and staff – fats, oils, and grease;
- Contractors – combined practices for better erosion control and management of sediment loss;
- Dog Waste;
- Stormwater pond owners and HOAs – best practices for long-term stormwater pond function, increased awareness of ownership, shared benefits of the pond, and shared responsibilities for maintenance.

In 2015, approximately 2.5 million impacts were recorded by the Carolina Clear program and regional efforts through the following outreach vehicles:

- In-person workshops and presentations;
- Phone calls and office visits;
- Demonstration sites with educational signage showcasing rain gardens, bioretention basins, rain barrels, cisterns, constructed wetlands, floating wetlands, and vegetated shorelines;
- Community street, river and beach clean ups;
- Storm drain marking;
- Rain barrel art with schools and adult audiences;
- Rain barrel DIY workshops, as well as rain barrel sales;
- Shoreline restoration projects that include train-the-trainer model of working with teachers and instruction provided to students involved in re-vegetation projects;
- Water-focused fact sheet series for suburban and urban audiences, SC WaterWays (http://www.clemson.edu/extension/hgic/water/resources_stormwater/) included new additions to address common construction site issues, green infrastructure, and plant series supporting rain garden outreach;
- “Educational postcards” (replacing brochures for inexpensive and attractive handouts), able to be viewed at our NPS Toolbox at www.clemson.edu/carolinaclear;
• Mass media including newspapers and newsletters, websites, social media (multiple Facebook pages, Pinterest, and YouTube), regional e-news, commercials, radio interviews and segments, and billboards.
  o The Carolina Yards teaches low impact residential landscape practices that are low maintenance, can be low cost and are more environmentally friendly through 12 specific actions. This program’s updated resources were featured in the mass media campaign of 2013-2014, and billboards continue to direct public to the website for more information.

*One of four billboard designs supporting the Carolina Yards program and its many resources to encourage environmentally responsible yard care.*

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• The 2015-2016 educational campaign is focusing on stormwater ponds and best management practices for ponds, in general. Five tips are provided in the commercial, filmed along the shoreline of a pond in Easley, SC. These five tips are raise your mower blade and mow less frequently; create a fertilizer and herbicide free zone along the perimeter of your pond; plant pond friendly, native plants to stabilize your shoreline; allow Canada Goose populations to naturally migrate by not feeding them or other wildlife; use the results of a soil test to direct fertilizer use and minimize nutrients in runoff. This commercial is being aired on local television stations, with emphasis during and around the morning and evening news, as well as on cable programming in the lowcountry. Some areas include community segments featuring the weather forecaster at a stormwater pond introducing best practices with a Clemson Extension agent.

*Screenshot of commercial, which can be viewed at www.youtube.com/carolinaclear.*
As the first university or college within the state of South Carolina to become an SMS4, Clemson University has engaged the Center for Watershed Excellence and Clemson Extension Carolina Clear to assist in creating a whole community conversation and involvement in stormwater management and pollution prevention. Through stormwater presentations, rain barrel paintings, student fairs and litter pick-ups with different student groups and clubs, the students at Clemson have already been busy in raising stormwater awareness for their campus. Some other exciting projects for the spring semester includes the installation of a tiger paw shaped floating wetland near the athletic fields, as well as a storm drain mural contest.

Three students per year will be involved in stormwater awareness and pollution prevention projects on campus. The communication between different departments, as well as operations-focused divisions on campus is a first important step in understanding how each group’s practices contribute to the prevention of stormwater pollution to our receiving waterways. With the efforts of many, it is hoped that Clemson University will be a training grounds for the state, exercising its land grant mission of using science and research to affect applied practices in natural resources management.

Center-associated staff and faculty have over time and continue to be present and involved in the University’s Stormwater Advisory Group, evaluating policies, enforcement possibilities, major projects, communication and more that relates to stormwater control and pollution prevention at Clemson University.
AGENCY COLLABORATION AND STAKEHOLDER ENGAGEMENT OF THE STATE’S SURFACE WATER AVAILABILITY ASSESSMENT

The Center maintains meaningful communication with the state’s environmental agencies, resulting in greater shared problem-solving, resource saving, outreach development, certification programs, and projects:
1. In February 2016, a meeting was held with Bureau of Water Permit Compliance staff to discuss MS4 reporting and regional operations and objectives.
2. The Center for Watershed Excellence in partnership with the South Carolina Water Resources Center is working with SC Department of Natural Resources and SC DHEC to facilitate the stakeholder engagement process of the state’s surface water availability assessment. This is the state’s first step in the development of the next State Water Plan. The facilitation process includes holding two public meetings per major river basin to introduce the model being used to assess the amount of surface water available throughout each basin, and to engage stakeholders in data development and calibration of the models before final release. More information on this project can be viewed at www.scwatermodels.com.

II. Report on any Client Feedback Collected

Feedback is received every four years from our program’s survey instrument, and regularly through client communication, advisory board feedback, and program evaluations. The below includes major points of feedback from 2015:
• The launch of previously-reported hybrid courses has been very well-received. Entities such as the SC Chapter of the American Society of Landscape Architects, SC Home Builder’s Association, and SC Chapter of the American Public Works Association are looking for more in-state professional development opportunities and training to offer to members. Specific requests have included low impact
development summits, green infrastructure case studies, and regulatory updates. Basic training has also been requested such as good housekeeping measures, the MS4 permit, and the Construction General Permit.  

- Advisory Board feedback from 2015 included positive comments about the hybrid course work as well. Two additional courses were discussed and actions taken in 2015:
  - Beyond the Silt Fence is an in-person one-day erosion control training on how a combination of techniques and materials can minimize return (and costly) maintenance visits on construction sites, as well as penalties for failures. A subcommittee was developed, and the program to be piloted in late winter 2016; contractors and municipal and county staff are target audiences.
  - Water Quality Sampling Methods was also requested by communities that want to conduct their own sampling and properly train in-house staff to do so. Preparations for such a course began in 2015.
- The SC Water Resources Conference is the biennial water resources research conference in South Carolina. Center leadership is involved in the planning of this conference as subcommittee members and contributed feedback in 2015 towards the planning of this fifth offering scheduled for October 12-13, 2016. For more information, see www.scwaterconference.org.

III. Watershed Plans Developed (Partnership)

Several watershed plans and watershed restoration efforts have been a focus of the Center for Watershed Excellence and affiliated programs.

Georges Creek
The Georges Creek Watershed Based Plan was completed and submitted to SC DHEC in April 2015. This subwatershed located within the Upper Saluda River Basin has multiple sites included on both the 303(d) and Total Maximum Daily Load (TMDL) lists for bacterial impairment. Georges Creek contains portions of two Small Municipal Separate Storm Sewer System (SMS4) permittees (City of Easley and Pickens County) and covers a total of 2,109 acres.

The Georges Creek plan prioritizes areas and best management practices (BMPs) to help reduce pollutant loads and outlines strategies to address pollution sources, expected load reductions for solutions, nonpoint source management measures, technical and financial assistance, education and outreach, implementation schedule, milestones, load reduction evaluation criteria, and monitoring. Potential project partners were also identified and include Pickens County, Pickens County Clemson Extension Service, Upstate Forever, Save our Saluda, Pickens County Soil & Water District, Pickens County Beautification and Advisory Committee and USDA – NRCS.

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<th>Recommended Agricultural Reductions (Counts/Year)</th>
<th>Recommended Pet Waste Reductions (Counts/Year)</th>
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<td>3.18E+13</td>
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Recommended Annual Bacterial Load Reductions – Georges Creek Watershed Based Plan

Though implementation has yet to begin, the Georges Creek plan has a robust timeline developed including milestones for each of the component requirements. Numerous partnership opportunities exist for plan implementation, and it is expected that the Center will explore opportunities to collaborate.
Twelve Mile Creek, Golden Creek, and Eighteen Mile Creek
The Twelve Mile Creek, Golden Creek, and Eighteen Mile Creek Watershed Plan is currently in its final months of development.

- Twelve Mile Creek is a popular recreational destination for paddlers since the removal of two dams has opened up about a two-mile stretch of whitewater within the 139 miles of streams in this watershed. This creek is well known to boaters, fishermen, and local residents because of the PCB contamination.
- The Twelve Mile Creek and Golden Creek watersheds are important to the water quality of Lake Hartwell because they come together before entering the lake near the Twelve Mile Beach public swimming area.
- Eighteen Mile Creek is a long and narrow watershed with about 130 stream miles and 360 acres of open water located within an arm of Lake Hartwell.

These watersheds include an interesting diversity of land use and cover: urban, suburban, industrial, commercial, rural, forests. Six municipalities (Easley, Liberty, Norris, Central, Clemson, Pendleton and two universities (Clemson and Southern Wesleyan) are partly located in these watersheds. Industries, landfills, wastewater treatment facilities, dog parks, horse riding trails, a facility for dog, horse and cattle events, waterfowl ponds, a managed forest, and a commercial nursery are also located in these watersheds.

When completed, the watershed plan will seek a reduction in bacteria loading to the Twelve Mile, Golden Creek and Eighteen Mile watersheds in accordance with respective approved TMDLs for fecal coliform bacteria; issued in 2003 for Twelve Mile and Golden Creek and in 2005 as part of the Savannah River TMDL for Eighteen Mile. Loads reductions are: 56% for SV-136; 64% for SV-137, SV-015, SV-239 located within Twelve Mile and Golden Creek and 76% at SV-017, 89% at SV-245, 77% at SV-135 and SV-268, 57% at SV-233, and 89% at SV-241 located within Eighteen Mile Creek.
The watershed-based plan will outline a work plan with goals, timelines and strategies to assess information and data, characterization of the watersheds, partnership-building and community outreach, identifying and prioritizing concerns, determining best management practices and load reductions, and providing resources for implementation of practices and water quality protection. Stakeholder involvement and insights will be an important part and process of developing the plan. Goals will be determined using SMART (Specific, Measurable, Achievable, Realistic, Timely) objectives. Milestones and assessments will be used for scheduling and to track progress.

Development of the monitoring program is significant to help track implementation efforts. BMPs will be identified and load reduction calculations made. All information will be compiled into the watershed-based plan, which will be used as a stepping stone for implementation.

IV. Watershed Plans Implemented (Partnership)

The Center for Watershed Excellence through its Carolina Clear outreach programming and the Clemson Cooperative Extension Service have conducted the following efforts that relate to Watershed Restoration Plans or watershed management activities:

1. **Gills Creek Watershed**, Richland County, SC – in support of
   - Conversations with a local church about rain gardens and an installation at their public location.
   - Rain barrel and compost bin sale held in September 2015.
   - Distributed dog waste materials to veterinary offices in the watershed.
   - Signs installed at Sesquicentennial Park (Centennial Pond) to discourage geese feeding.

2. **Crane Creek Watershed**, Richland County, SC – in support of education and implementation towards bacteria, macroinvertebrate, and dissolved oxygen impairments,
   - Installed a floating treatment wetland at public pond at the Public Works Department.
   - Installed a rain garden at Longleaf Middle School as part of ZooBot Program in partnership with school district.
   - Rain barrel and compost bin sale held in September 2015.
   - Distributed dog waste materials to veterinary offices in the watershed.
   - Maintenance of shoreline buffer at Public Works pond in Upper Crane Creek Watershed.

V. Documented Water Quality Improvements

Though there were more than a dozen best management practices installed in 2015 across the state (cisterns, rain gardens, floating treatment wetlands, erosion control demonstrations, educational signage, pet waste stations,
and more), monitoring was not included in these activities; therefore, there are no water quality improvements to report at this time.

VI. Important Work Not Specified Above

1. CONTINUED EFFORTS IN HYBRID LEARNING

In celebration of Extension’s Centennial Anniversary, the Center for Watershed Excellence received an internal funding award to initiate new hybrid learning products and programs supporting water resources protection. This collaborative effort included identification of the learning infrastructure, partnership building and professional affiliations, marketing, and the successful launch of several hybrid courses.

This large undertaking includes the involvement of many faculty, Extension agents, private partners, community partners, and staff. More information on each course team and details about each program can be found at www.clemson.edu/watershed.

Master Pond Manager Certification Course
Master Pond Manager (MPM) is designed to teach participants a wide range of pond management knowledge and skills. As a “hybrid” offering, this course incorporates self-paced lectures, discussions, quizzes, and more interaction, with a mandatory field day for in-person and hands-on learning with recognized experts. Course is structured in two tracks – stormwater and recreational ponds – and those who complete both tracks and pass the exam are certified as Master Pond Managers. Fifty-two professionals participated in 2015; this course is in its third offering this spring 2016.

Post-Construction BMP Inspector Certification Course
This offering is purposed to train professionals in methods and strategies for conducting routine and thorough inspections of stormwater management practices. This is a five-week, self-paced online offering, with one mandatory field day for hands-on learning and inspections alongside recognized experts. Best management practices include wet and dry ponds, stormwater wetlands, bioretention and infiltration practices, manufactured devices, underground detention, swales and buffers, cisterns, and permeable materials. This course is in its third offering.

Environmental Landscape Professional
Curriculum in this professional online course seeks to increase awareness and knowledge of best practices in the landscape industry for pollution minimization, addressing irrigation solutions, turf diseases and needs, native plants, shoreline practices, rain gardens, and more. Launch of this program is expected in 2016.

2. STORMWATER POND STATE OF THE KNOWLEDGE REPORT: COMPREHENSIVE EDUCATION PLAN DEVELOPMENT

Stormwater ponds are widely used across South Carolina, particularly along the coast, to manage and treat stormwater. Improper maintenance can lead to degraded water quality, reduced localized flood protection, expensive repairs, and create an eyesore for the community. The Center for Watershed
Excellence, sponsored by SC Sea Grant Consortium, lead a team to identify the current understandings and misgivings about stormwater ponds and their function, analyze the audiences involved and opportunities that exist to educate associated audiences, and outline a message library and communication strategy for consistent and effective outreach on purpose and maintenance of stormwater ponds in South Carolina.

Some findings are included below:

- Self-efficacy is a major factor in addressing stormwater pond awareness, understanding, and function. Homeowners Associations (HOAs) want a comprehensive set of instructions for stormwater pond maintenance to share with residents.
- City and county staff in engineering, stormwater, and overall, public works departments, share common concerns which are mostly related to maintenance practices, especially keeping all stormwater infrastructure and conveyances clear of debris, managing erosion around infrastructure and pond, flow obstruction from vegetation and sediment, and exposed pipes.
- Barriers to widespread adoption of vegetated shoreline buffers are primarily due to misconceptions about cost, function, maintenance, and HOA covenants restricting shoreline plantings.
- The health of people, wildlife, and the overall ecosystem connected to a stormwater pond was the greatest concern voiced by residents, followed by the risk of loss of recreational opportunities in and downstream of ponds that are failing to perform as designed.
- Outreach messages addressing stormwater pond health and maintenance should be specific, instructive, and connect all community residents' actions and influence to the health of the pond.
- Positive images of a healthy pond are more likely to capture the attention of coastal South Carolina homeowners, than images showing algae, stagnation, or overall unsightly conditions.

These lessons and hopeful next steps will be integrated into current stormwater pond programming and will hopefully lead to the development of new resources for stormwater pond owners, HOAs, and property management companies.

3. ADOPT-A-STREAM EFFORTS IN SOUTH CAROLINA

The Adopt-A-Stream is a volunteer based monitoring program that started in Georgia but has now spread across the Upstate of South Carolina. The five programs goals that stand for ADOPT are to increase public Awareness, collect quality baseline water quality Data, gather Observations, encourage Partnerships between citizens and their local government, and provide citizens with the Tools and Training to evaluate and protect their local waterways. Volunteers are trained by certified trainers in order to follow EPA-approved protocols to monitor their local streams. Trainings are provided for chemical (pH, temperature, conductivity, dissolved oxygen), bacteria (E. coli), and macroinvertebrates. Amphibian monitoring guidelines are also provided. By testing key factors like dissolved oxygen, macroinvertebrates and bacteria levels, volunteers hope to gain a better understanding of the health of their local waterways.
4. **HUNNICUTT CREEK CREATIVE INQUIRY**

Center Associate Director co-teaches a Creative Inquiry course (FNR 4730) entitled *Vegetative Succession in Restored and Wetland and Stream Ecosystems: A Hunnicutt Creek Case Study*. In June of 2013, a multi-disciplinary project was undertaken on the lower section of Hunnicutt Creek to restore and enhance selected areas as part of an approved compensatory mitigation plan. Three hundred and ninety (390) linear feet of perennial stream were restored and activities undertaken to enhance approximately two (2) acres of jurisdictional wetland through conversion from emergent vascular to bottomland hardwood ecosystems. The Creative Inquiry project established a collaborative research effort designed to document the composition and status of vegetation for purposes of inventory, non-compliance based monitoring, and assessment of environmental conditions. Fourteen (14) students were enrolled in 2015, which covers overlapping academic years. The course allows students to: 1) learn the theory and practice of ecological restoration; 2) participate in an active restoration project on the Clemson campus; 3) establish long-term vegetation monitoring plots; and, 4) collect and analyze data to assess the effectiveness of restoration activities in the Hunnicutt Creek watershed.

This undergraduate research effort builds on the larger Hunnicutt Creek Initiative taking place on campus. For additional project details including stream restoration overview, wetland enhancement efforts, invasive species research, student work and ecosystem monitoring, visit the project web site: [http://www.clemson.edu/public/hunnicutt](http://www.clemson.edu/public/hunnicutt).
5. PARTICIPATION IN THE SC CHAPTER OF THE INTERNATIONAL EROSION CONTROL ASSOCIATION

Center Associate Director serves on the International Erosion Control Association Southeast Chapter Technical Advisory Committee. In that role he assists in organizing the technical program of the SC IECA Field Day each year at the TRI Denver Downs Research Facility. In 2015, over 100 participants attended the field day entitled *Installation of BMPs: How Are We Doing?* Technical presentations included BMP design and installation, index testing protocols, and applied research updates from participating Clemson faculty involved with erosion control research.

6. SC SEA GRANT COMMITTEE INVOLVEMENT

Center Associate Director serves on the SC Sea Grant Consortium’s Stormwater Pond Advisory Council. In 2015, SC Sea Grant organized the South Carolina Stormwater Ponds Research and Management Collaborative (Collaborative) partnership to initiate integrated programs to address the pressures from increasing use and maintenance of stormwater ponds. To guide the activities of the Collaborative, the Consortium created the Stormwater Pond Advisory Council (SPAC) whose membership represents stormwater managers and consultants, government officials, scientists, and outreach specialists. The SPAC oversees Collaborative activities to ensure they are targeted towards improving knowledge and management of coastal stormwater ponds.

Also in 2015, the Center Associate Director served on the search and screening committee that hired a Coastal Environmental Quality Program Coordinator to provide program management for the Collaborative and SC Sea Grant’s other water quality research and outreach programs. Dr. Melody Hunt accepted the position and began work in June.

Center Director served as a topical constituent panelist in SC Sea Grant’s 2015 National Sea Grant Site Review.

7. INVASIVE PLANT MANAGEMENT STUDIES

Center-affiliated faculty directed a Creative Inquiry project (FNR 4730) that worked with 14 students and evaluated the effectiveness of prescribed grazing by goats on a 4.7-ac tract located on the main campus of Clemson University. Prescribed grazing is the controlled harvest of vegetation with grazing animals that are managed with the intent to achieve a specific objective.

A statistically derived series of nested plots was established throughout the area of interest before goats were deployed. CVS or Carolina Vegetative Surveying method was utilized to observe change in growth, biomass density, and species diversity. In addition, corresponding water quality sampling was conducted to evaluate bacterial and sediment loading under storm flow conditions.

A herd of 40 goats were released into an area contained by an electrified fence. Grazing was performed within two sub-unit areas over several weeks. Total grazing period was 56 days.
Preliminary statistical analysis suggests the initial deployment of goats for prescribed grazing to control invasive vegetation on the Clemson University campus achieved favorable results. CVS plot data collected prior to goat arrival indicated the mid-story and understory were dominated (>90% cover) by non-native invasive species. Data analyses following goat removal indicated six of eight invasive species had reduced cover due to grazing, including three species that were eliminated altogether from the study areas. Those species showing reduction or eradication include Kudzu, Silverthorn, English ivy, Mondo grass and Japanese stiltgrass. Results also reveal one species was essentially unchanged (Chinese privet) and another (Japanese honeysuckle) increased its understory coverage. We suspect the growth was due to resprouting from increased exposure to sunlight.

Surface water samples were collected from Hunnicutt Creek before, during and after goat deployment. Laboratory analysis indicated there was no statistical difference between the samples collected during the grazing period with those collected before and after. These results suggest that while there may be temporary fluctuations in bacterial density associated with fecal deposition by goats within the study area, longer-term impairments were not identified. One additional result to consider: of the nine dates for which *E. coli* was analyzed, seven exceeded the EPA-recommended single sample threshold for contact recreation of 235 CFU/100ml, indicating a larger issue of bacterial impairment within Hunnicutt Creek.

8. THE CAROLINA RAIN GARDEN INITIATIVE

The *Carolina Rain Garden Initiative* was launched in 2015 by Water Resources Extension Agent Kim Counts Morganello. The objective of this program is to increase the number of residential-scale “pocket” rain gardens present in SC. The program brings together new and existing resources that provide awareness and practical information on the practice, installation and maintenance of rain gardens.

As part of this initiative, one of the newly developed resources is the *Professional Rain Garden Design and Installer Certification Program* piloted in Berkeley, Charleston, and Dorchester Counties in 2015. This full-day training was hosted at a Berkeley County Library and a Town of Mount Pleasant Fire Station and had a total of 36 participants attend. Don’t miss the photo of one of the rain gardens installed by participants as part of this training! Individuals who attended this training now have the option to become a Certified Rain Garden Design and Installer by submitting their rain garden portfolio to a review committee. To date, four professionals have become certified with more expected in 2016; a list of those recognized is provided on the Carolina Rain Garden Initiative website [http://www.clemson.edu/extension/raingarden/professional.html](http://www.clemson.edu/extension/raingarden/professional.html)

Also as part of the Carolina Rain Garden Initiative, the *Virtual Rain Garden* was created to provide a step-by-step approach for rain garden design, installation and maintenance. This series of 17 short videos guides the viewer through all aspects rain gardening including site assessment, soil analysis, rain garden sizing, design, plant selection, maintenance and more. We hope you can share this tool when you receive client calls about flooding and erosion issues in the home landscape or interest in “green” thumb gardening.

View more of the Carolina Rain Garden Initiative’s features and resources at [www.clemson.edu/extension/raingarden](http://www.clemson.edu/extension/raingarden).