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South Carolina Department of Health and Environmental Control

## SOUTH CAROLINA NONPOINT SOURCE MANAGEMENT PROGRAM ANNUAL REPORT FISCAL YEAR 2018

FY

2018

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

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#### NONPOINT SOURCE POLLUTION - NPS

Nonpoint source (NPS) pollution occurs when rainfall or irrigation runs over land or percolates through the ground, picking up pollutants and carrying them into rivers, lakes, and coastal and ground waters. Unlike point source pollution, which can be traced to a defined source, nonpoint source pollution is diffuse, making the source of the problem difficult to identify and control.

Nonpoint sources of pollution are important to control because they continue to be recognized as the nation's largest remaining cause of surface water quality impairments. NPS pollution may contain bacteria and nutrients from malfunctioning septic systems or animal waste, eroded soil from land disturbances, nutrients and pesticides from agricultural or urban areas, air pollutants from atmospheric deposition, and heavy metals and other toxins bound to soil particles. These pollutants, in turn, can impact human and aquatic health, aquatic and marine habitat, and make drinking water more difficult to treat. The pollutants also ruin the beauty of healthy, clean water ecosystems.

#### Some common sources of nonpoint source pollution nationwide.



The most common measured NPS pollutant in South Carolina is *E.coli* bacteria. Other common examples include nutrients such as phosphorus and nitrogen, pesticides, oil and grease, toxic chemicals, and heavy metals. These pollutants most often wash into waterbodies in sediments from agricultural land, small- and medium-sized animal feeding operations, construction sites, and other areas of disturbance. Other major sources of these pollutants are found in urban areas, including wash-off from parking lots, storm drains, and roads.

#### HISTORY OF SOUTH CAROLINA'S NONPOINT SOURCE MANAGEMENT PROGRAM

In the late 1980s Congress recognized the growing problem of NPS pollution, subsequently adding nonpoint source provisions to the Clean Water Act (CWA) under Section 319. Among other provisions, Section 319 requires each state to develop and maintain a Nonpoint Source Management Program to comprehensively address nonpoint sources of pollution. The South Carolina program, which is administered by the S.C. Department of Health and Environmental Control (SCDHEC), was originally approved by the United States Environmental Protection Agency (EPA) in 1990. That year, Congress also enacted the Coastal Zone Act Reauthorization Amendments (CZARA) to more specifically address the impacts of NPS pollution on coastal water quality. As a result, South Carolina developed a Coastal Nonpoint Pollution Control Program that received full approval in 2008 and was later merged with the statewide NPS Management Program. Since the original program was developed, the Nonpoint Source Management Plan has been updated twice, in 1999 and 2014.

In 2013, EPA issued updated guidance for states to use in reviewing, revising, and updating their NPS management programs. The guidance reflected a nation-wide focus on addressing water quality issues on a watershed basis and emphasizes a streamlined approach to implementing NPS reduction and prevention strategies. South Carolina's

Management Plan has been updated to reflect this guidance along with other state and federal priorities. In 2014, South Carolina's NPS Management Plan for 2015-2019 was approved by EPA.

#### THE 303(D) LIST

Section 303(d) of the Clean Water Act mandates that every two years each state must compile a list of waters that do not meet water quality standards. In South Carolina, portions of streams, rivers, lakes, and other waterbodies are placed on the 303(d) list when monitoring data indicates that the established state water quality standards are not met.

Waters can be impaired for a variety of causes including, but not limited to, bacteria, phosphorus, heavy metals, etc. Sources of these impairments vary with land uses, such as urban, rural, or agricultural. Once a waterbody is on the 303(d) list, it is targeted for water quality improvement. Local stakeholders are often eligible for grants for improvement projects through SCDHEC. The implementation projects listed in this report are funded in such a manner through Section 319 of the Clean Water Act. Impaired waters can be removed from the 303(d) list either through the development of a TMDL or SCDHEC monitoring that shows water quality has improved to the point it meets the standard for the designated use of a waterbody.

#### TMDL – A TOOL FOR WATER QUALITY IMPROVEMENT

The passage of the Federal Clean Water Act laid the groundwork for improving water quality in the nation's waterbodies. An important part of that groundwork is contained in Section 303(d) of the Act, which requires that states compile lists of waterbodies that are not meeting water quality standards. Once on the list, a Total Maximum Daily Load (TMDL) must be developed for each impaired waterbody.

A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. TMDLs for a waterbody are calculated based on point source wasteload allocations (industrial discharges, wastewater treatment discharges, municipal stormwater discharges, etc.), nonpoint sources (pollutants from runoff), natural background sources such as wildlife, and a margin of safety. TMDLs are developed for each pollutant causing impairment to a waterbody. Therefore, a waterbody may have multiple TMDLs if it is impaired by more than one pollutant.

In South Carolina, the overwhelming majority of impairments to surface waters, as included on the 303(d) list, are due to bacterial pathogens. These are almost invariably due to nonpoint sources since all point source dischargers are required to disinfect their effluent. The development of a TMDL involves an assessment to determine the characteristics of the impairment under conditions when exceedances of the water quality standard occur during common weather conditions such as after rain events, under low flow conditions, or during droughts or periods of extended hot weather. For pathogen-impaired waters, the sources are typically failing septic systems, cattle with access to streams, runoff from improperly applied manure, leaking or over-flowing sanitary sewers, and runoff from urbanized land. A computer model or another method, such as load-duration curves, is used to determine the existing load of pollutant and the Load Allocation (LA), or quantity of pollutant allowed from nonpoint sources for the TMDL.

Before it is submitted to EPA for approval, the public is given an opportunity to comment on the TMDL. The TMDL document is posted on SCDHEC's site (www.scdhec.gov) and the public is notified of its availability through e-mail and legal notice in a local newspaper. After the public notice period, the TMDL is submitted to EPA for review and

approval. South Carolina currently has 107 approved TMDL documents, covering 644 monitoring stations (mostly for pathogens). There is currently one alternative restoration plan in place to address one impaired location in the Savannah River. In addition, there are 4 TMDL documents or alternative restoration plans under development to address 78 impairments statewide.

An approved TMDL also establishes the available wasteload allocations for point sources. Permits for National Pollutant Discharge Elimination System (NPDES) facilities (point sources) and NPDES storm water permits must be consistent with any applicable TMDLs. Generally, SCDHEC does not have regulatory authority over the control of nonpoint sources. Rather, control of nonpoint sources is encouraged by using 319 grants, USDA cost share programs, CDBG block grants, or other state or federal programs to encourage landowners, farmers, and interested citizens to voluntarily work to improve the water quality.

Once the TMDL has been developed, the next step is implementation. At this point, the TMDL can be used to help formulate a strategy to reduce the pollutant loading through best management practices (BMPs) and stream restoration projects in the watershed. It is important to note that watershed stakeholders play a major role in realizing source reductions as implementation projects are underway.

#### SOUTH CAROLINA'S STRATEGY

South Carolina is taking full advantage of Clean Water Act Section 319 funding that is available from EPA to prevent and reduce NPS water pollution in the state. The annual grant funds and resultant workplan is the principal financial mechanism for implementing the goals of the NPS Management Program. All projects described in the workplan are linked to one or more of the goals described in the 2015 NPS Management Plan. To meet the goals of the 2015 NPS Management Plan, emphasis has shifted over the last several years toward implementing projects that address specific NPS-affected impairments in priority waterbodies/watersheds. Beginning in fiscal year 2003, in accordance with federal guidelines, South Carolina began focusing resources exclusively on implementation of watershed-based plans. While the majority of this funding has focused on watersheds with approved Total Maximum Daily Loads (TMDLs), impaired or threatened waterbodies have also been included. Beginning in 2013, federal guidelines placed an even greater emphasis on watershed-based plan implementation. In 2018, South Carolina awarded two watershed-based plan development projects through a Drinking Water State Revolving Fund set-aside. The development of additional watershed-based plans increases the pool of watersheds eligible for implementation funds.

While Section 319 grant funds provide significant financial resources for implementing the NPS Management Program, the Program is much broader in scope. There are a variety of other programs including enforceable mechanisms that are applied to NPS pollution prevention. Within SCDHEC, several regulatory programs are administered including agricultural animal facility permitting and compliance, erosion and sediment control permitting and compliance, municipal and industrial facility NPDES stormwater permitting, coastal zone permitting, state water quality standards and Pollution Control Act compliance, Section 401 certification for wetlands disturbance and hydrologic modification, and onsite wastewater system standards and permitting. Further, the SC Forestry Commission implements a very successful forestry Best Management Practice (BMP) compliance program. Since its inception in the early 1990's, the rate of compliance has increased significantly (see "SC Forestry Commission BMP Compliance Program Annual Update" to learn more).

Another significant source of funding for nonpoint source abatement projects is a state and federally supported low interest loan program known as the State Revolving Fund (SRF). Pursuing a 319 grant and SRF loan can be part of a larger strategy for municipalities seeking large-budget capital improvements affecting water quality. In addition to

Hardship and Green discounted interest rates for loans, SRF offers an additional reduced interest rate category titled Nonpoint Source, available for up to \$4 million of a project in which at least 50% of the costs are used for BMPs. SRF projects that complement 319 efforts are awarded additional points in the Priority Ranking System that is used to select projects for SRF loans.

A small portion of the Drinking Water SRF can also be used to fund technical assistance and water-quality improvement efforts. Of these funds, \$100,000 is set aside for the development of watershed-based plans. These watershed-based plans address nonpoint source pollution affecting surface drinking water sources. This Source Water Protection Set-Aside is an important source of funds to increase watershed-based plan coverage throughout the state. Once these plans are completed, they are eligible for implementation with 319 funds.



The 1999 update to the NPS Management Plan incorporated South Carolina's Coastal Nonpoint Pollution Control Program (CNPCP) under Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA). The purpose of the CNPCP is to address nonpoint source pollution issues within the coastal zone and ensure that all applicable management measures are implemented to protect and restore the State's coastal resources. SCDHEC's Office of Ocean and Coastal Resource Management (OCRM) prepared a 15-year strategy for the CNPCP, which describes general objectives for the comprehensive and effective management of polluted runoff within the coastal zone. South Carolina received final program approval by the National Oceanic and Atmospheric Administration (NOAA) and EPA in 2008.

Stakeholders play an integral part in the State's NPS strategy. Federal agencies such as the USDA Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), US Forest Service (USFS), US Army Corps of Engineers (USACOE), and United States Geological Survey (USGS) have major roles. State agencies with complementary programs include the Department of Natural Resources, Clemson Extension Service, and the Forestry Commission. Non-profit groups such as the SC Wildlife Federation, Save Our Saluda, SC Coastal Conservation League, and Upstate Forever, as well as industry trade organizations including the Farm Bureau, SC Association of Conservation Districts, Cattlemen's Association, and the Forestry Association are also active participants. Private utilities and industries can be excellent partners as well.

South Carolina's fiscal year 2018 Section 319 grant workplan for EPA contains projects funded under two different EPA defined categories: program and project. The program allocation is used to implement projects that address general NPS pollution activities that are statewide, while the project allocation is targeted for on-the-ground implementation of nonpoint source best management practices prescribed in approved watershed-based plans. SC's workplan specifically describes the programs and projects which receive funding from the EPA 319 grant to the State. However, in addition to these activities, other NPS activities are planned and on-going in accordance with SC's 2018 NPS Management Plan for this year. The 2015-2019 Management Plan outlines all of the State's NPS Program efforts, and the annual workplan for EPA will continue to only address activities funded by EPA.

The graph (right) shows SC 319 Grant Amounts from federal fiscal years 2000-2018. In 2013, the 319 grant amount was cut by over 5%, and the grant amounts have remained relatively low since. Decreases in the 319 budget can impact the program's ability to address nonpoint source concerns, both through DHEC staff availability and through awarding grants for implementation projects. However, SC's NPS Program is encouraged by both the increase in the FY16-18 budgets compared to FY13-



15 and the relative steadiness of the FY16-18 budgets. A steady or increasing budget can help the SC NPS Program continue its work in the long term.

Cooperating agencies and organizations throughout the state have become highly involved in the watershed-based plan implementation process. One or several can jointly implement a plan in a given watershed using the Section 319 funds. Projects to be implemented by outside agencies and organizations are selected using a competitive proposal process. A Request for Proposals (RFP) is promulgated at least once per year through various meetings, workshops, web site, mailings, and advertisements.

Applicants must follow specific guidelines, which are published on the SCDHEC web site (www.scdhec.gov) to develop a proposal. The proposed project can implement a watershed-based plan for an approved TMDL or an impaired or threatened waterbody, or for the protection and preservation of unimpaired waterbodies; the objective must be to reduce the pollutant load so streams in the watershed meet water quality standards. SCDHEC guidelines stipulate that the project must address the nine elements of a well-designed watershed implementation project as specified by EPA.

Proposals received as a result of an RFP are reviewed and selected by a review committee. A proposed project must meet all the criteria described above to be selected for funding, and the federal funds must be matched with at least 40 percent in non-federal funds. South Carolina encourages combining funds from other sources such as the United States Department of Agriculture's Environmental Quality Incentives Program (USDA EQIP) funds.

NPS program fund allocation projects are statewide or regional in scope and continue to institutionalize the state's nonpoint source program. Many of these projects address various nonpoint source categories including forestry, urban runoff, animal agriculture, wetlands, construction, and groundwater impacts. Annual program allocation projects are implemented by SCDHEC staff and the SC Forestry Commission. A significant portion of the annual allocation is used for NPS administration, education and outreach, NPS monitoring, and watershed management and compliance. It is also used to continue implementation of a statewide forestry BMP compliance program.

#### MEETING THE GOALS OF THE NPS PROGRAM

The SC NPS Management Program document describes multiple long-term goals, milestones, and measures that facilitate and promote the state's efforts to manage NPS water pollution. They are as follows, with corresponding FY 2018 goals met. *Objective, milestone, and measure numbering correspond to the current year (FY 2018), which is year 4 of the 2015-2019 South Carolina NPS Management Plan.* 

		Year 4 Measures 2018		
Objective	Milestone	Measure	Year	Goals Met
1. ACCURATELY IDENTIFY WATERBODIES AFFECTED BY NONPOINT SOURCE POLLUTION	1. Assess statewide water quality through consistent monitoring.	a) Collect and analyze monthly samples at 45 sites for probabilistic monitoring program.	Annual	Samples from approximately 90 sites across the state were collected and analyzed monthly in 2018.
		b) Collect and analyze bi-monthly samples at 120 base sites for routine monitoring.	Annual	Samples from approximately 244 base sites across the state were collected and analyzed monthly in 2018.
		c) Perform macroinvertebrate assessments statewide, typically 18 sites per year depending on hydrology.	Annual	Macroinvertebrate assessments were performed at 52 regular trend sites across the state in 2018.
		d) Measure chlorophyll-a levels at 17 sites monthly and 12 sites bi-monthly from May through October.	Annual	Chlorophyll-a levels were measured at 100 sites monthly from May to October across the state. Chlorophyll-a levels were measured once a week at 10 sites from May to August 2018. Chlorophyll-a levels were measured once a week at 5 sites from May to the end of June 2018.
	2. Develop, maintain, and distribute South Carolina's Integrated Report including Part 1: 303(d) List of Impaired Waters and Part 2:	a) Solicit external data for inclusion in 303(d) assessment.	4	External data was included in the current 303(d) assessment from entities with an approved QAPP such as the Congaree River Keeper, the Charleston Harbor Water Keeper, and the Midlands River Coalition.
	Section 305(b) Assessment and Reporting.	<ul> <li>b) Assess all SCDHEC data plus appropriate external data to determine impairment status for</li> </ul>	4	All SCDHEC data and external data were assessed to determine the impairment status for the 303(d) report and all statistical

		<ul> <li>303(d), typically 2000 sites per 2-year cycle and assess all statistical survey sites for the 305(b) report, typically</li> <li>450 sites per 2-year cycle.</li> <li>c) Prepare and public notice draft</li> <li>303(d) lists for 2018, address public comments, deliver 303(d) list to EPA for approval and the 305(b) report together comprising the Integrated Report.</li> </ul>	4	survey sites were assessed for the 305(b) report. The 303(d) lists and 305(b) report were completed and sent for public notice in November. Public comments are subsequently addressed, and the reports are delivered to EPA for approval.
	3. Identify candidate watersheds for nonpoint source TMDLs.	a) Identify 1 watershed suitable for nonpoint source TMDL development containing required elements outlined in new 319 guidance.	Annual	Since the approval of the 5-year NPS Management Plan, SCDHEC does not use 319 funding to assist in the development of TMDLs. Funding for the development of TMDLs is being provided from other sources. Therefore, this measure was not implemented.
	4. Implement and update sanitary surveys based on coastal water quality	a) Collect monthly water quality samples at 405 sites to be used to establish shellfish classifications.	Annual	Monthly water quality samples were collected at 465 sites. <sup>1</sup>
	monitoring data.	b) Perform sanitary surveys, identify needed corrective actions, and develop shellfish harvesting classifications in 25 shellfish growing areas.	Annual	Sanitary surveys were completed, needed corrective actions were identified, and shellfish harvesting classifications were developed in 25 shellfish growing areas. <sup>2</sup>
		c) Generate a trend report for annual shellfish harvesting classifications.	4	A trend report for annual shellfish harvesting classifications was generated at posted to the SCDHEC website for public viewing <sup>3</sup>
2. BETTER TARGET NPS PROGRAM RESOURCES TO ADDRESS WATERSHEDS	6. Work with watershed partners to develop	a) Annually develop watershed-based plans in at least 1 newly identified priority watershed.	Annual, Beginning Year 3	In 2018, 2 projects began to develop watershed-based plans to address nutrients, turbidity, and bacteria in the Savannah River

 $<sup>4</sup>a^{l} \underline{http://www.scdhec.gov/FoodSafety/ShellfishMonitoring/MonitoringProgramOverview/}$ 

<sup>4</sup>b<sup>2</sup>http://www.scdhec.gov/FoodSafety/ShellfishMonitoring/MonitoringStationReports/ 4c<sup>3</sup>https://scdhec.gov/food-safety/shellfish-monitoring-program-overview/monitoring-station-reports

IMPAIRED BY NPS	watershed-based plans for			Basin—one for Three and Twenty Creek in
POLLUTION	7. Solicit and award 319	a) Annually award projects in at least	Annual,	the Upper Savannah River Basin and the other for the Hog Branch-Savannah River, Black Swamp, Cypress Branch, Coleman Run, and Sand Branch of the Lower Savannah River Basin. Both River Basins are priority watersheds identified in the NPS Management Plan. In 2018, 1 project was awarded to
	grants for implementation of watershed-based plans in new priority watersheds.	1 newly identified priority watershed.	Beginning Year 4	implement a watershed-based plan in the Okatie River, a priority watershed identified in the NPS Management Plan.
3. WORK TOWARD PROTECTION OF UNIMPAIRED WATERS IN SOUTH CAROLINA	10. Work with watershed partners to include strategies for protecting priority unimpaired watersheds in watershed- based plans.	a) Incorporate protection strategies into at least 1 watershed-based plan for an unimpaired watershed.	4	Protection strategies were incorporated into at least 1 watershed-based plan for an unimpaired watershed.
4. DEVELOP CORRECTIVE ACTION STRATEGIES FOR WATERBODIES IMPACTED BY NPS POLLUTION	11. Use best available information to develop nonpoint source TMDLs for priority impaired watersheds.	b) Develop 1 nonpoint source TMDL containing required elements outlined in new 319 guidance for impairment other than bacteria.	Annual, Beginning Year 3	Since the approval of the 5-year NPS Management Plan, SCDHEC does not use 319 funding to assist in the development of TMDLs. Funding for the development of TMDLs is being provided from other sources. Therefore, this measure was not implemented.
	12. Use best available information to develop and implement TMDL implementation plans.	a) Develop 1 nonpoint source TMDL implementation plan containing additional required planning elements for an "implementation- ready" project.	Annual, Beginning Year 4	Since the approval of the 5-year NPS Management Plan, SCDHEC does not use 319 funding to assist in the development of TMDLs. Funding for the development of TMDLs is being provided from other sources. Therefore, this measure was not implemented.

	13. Aid stakeholders in the development of watershed- based plans and/or other improvement strategies and BMP selection.	c) Serve as facilitator for watershed- based plan development, as needed.	3-5	NPS staff work closely with stakeholders and assist with watershed-based plan development as needed. In 2018, 2 watershed-based plan development projects were selected for funding. NPS staff remain closely involved in the watershed- based plan development process.
		d) Provide GIS support for plan development by creating maps and maintaining applicable shape files.	Annual	GIS support was provided to stakeholders for plan development by map creation and the maintenance of applicable shape files. GIS support, in conjunction with the Watershed program, also developed the Watershed Atlas, a user-friendly GIS-based searchable South Carolina watershed web application showing watershed descriptions, NPS projects, base maps, water quality assessments and trends, use support, monitoring sites, TMDLs, and more. It was made public in January 2016 and has been updated at least annually since.
5. ALLOCATE RESOURCES TO REDUCE NPS IMPACTS THROUGH WATERSHED IMPLEMENTATION PROJECTS	14. Issue a statewide solicitation for watershed implementation proposals, including coastal areas.	a) Prepare and release at least one request for proposals each year to solicit watershed implementation projects. *By years 4 and 5, this solicitation should be directed to projects in priority areas.	Annual*	A request for proposals was released in February 2018 to solicit watershed implementation projects, specifically directed to projects in priority areas. 10 implementation proposals were received, of which 7 were selected for 319 funding.
	15. Convene an intra-agency review committee to select projects based on NPS Program priorities.	a) Convene committee after each grant solicitation period (at least once annually).	Annual	The grant committee was convened in June 2018 after the February 2018 grant solicitation period.
	16. Award funding to committee-selected projects.	a) Annually award at least 3 projects covering 6 or more watersheds. *By years 4 and 5, award projects in priority areas.	Annual*	In June 2018, the committee selected seven new projects for funding covering 17 HUC12 watersheds. These projects were: Earlewood Park in Richland County, Hyatt Park in Richland County, Shaw's Creek in Edgefield and Aiken Counties, Morse Park in Georgetown County, Tyger River in Greenville and Spartanburg Counties, Hog

				Inlet in Horry County, and Evergreen Tract in Beaufort County which is in the priority area of the Okatie River.
6. EVALUATE THE EFFECTIVENESS OF 319 IMPLEMENTATION PROJECTS	17. Develop and implement monitoring studies in watersheds where 319 projects have been or will be implemented.	a) Update NPS monitoring QAPP to include new projects and other revisions and deliver plan to Department Quality Assurance Project Officer for final approval.	Annual	The NPS monitoring QAPP was updated in 2018 to include new projects and revisions, and it was then delivered to the Department Quality Assurance Project Officer.
		<ul> <li>b) Conduct monthly sampling at all</li> <li>319 projects including all impaired</li> <li>locations within the project</li> <li>watershed commencing with award</li> <li>and continuing 1-2 years after project</li> <li>is completed.</li> </ul>	Annual	Monthly sampling was conducted for all 319 projects including all impaired locations within the watershed. Monitoring commenced with award and continued 2 years after project completion.
	18. Analyze samples collected by monitoring staff at 319 implementation sites.	a) Analyze all samples according to appropriate analytical protocol.	Annual	All collected samples were analyzed according to analytical protocol.
	19. Assess projects and document any water quality improvements.	a) Assess all 319 project sites within 1 year after completion of post-project monitoring and document any water quality improvements for inclusion in Annual Report and success stories.	Annual	All 319 project sites were assessed within 1 year of post-project monitoring and water quality improvements were documented.
7. PROVIDE COMPLIANCE ASSISTANCE, TRACK AND ENFORCE PERMITS	23. Permit, inspect and provide technical assistance for agricultural facilities.	a) Prepare or review agricultural waste permits statewide (typically 50- 100 permits per year).	Annual	48 agricultural waste permits were prepared or reviewed statewide in FY 2018.
		b) Perform 150 inspections including follow-up, complaints, site assessment, etc. Highest priority will be given to sites in proximity to watershed-based plan implementation projects.	Annual	During FY 2018, 318 routine inspections, follow-up visits, and complaint inspections, were completed statewide.

24. Follow up on referrals for non-compliance with agricultural, land application permits, MS4s, stormwater permits, onsite wastewater and violations of the SC Pollution Control act related to nonpoint source activities.	a) Follow enforcement procedures as needed for all violations. Follow-up on NPS, stormwater, and onsite wastewater referrals statewide.	Annual	Enforcement procedures for NPS stormwater and onsite wastewater referrals were assigned to and followed up by SCDHEC's Water Pollution Control Division.
25. Ensure proper installation of onsite wastewater systems and	a) Issue 6000 permits for new septic systems; issues licenses for septic installers and servicers.	Annual	10,435 permits for new septic systems were issued, as well as 86 licenses for septic installers and servicers.
provide technical assistance as needed.	b) Provide compliance assistance by investigating referrals and failing systems (including in 319 implementation watersheds). Staff may also provide workshops or other training.	Annual	1,078 complaints/investigations for referrals and failing onsite wastewater systems were completed in FY 2018.
26. Through 401 water quality certifications, evaluate appropriate BMPs for wetland and water quality protection.	a) Issue 50 water quality certifications with requirements for BMPs.	Annual	100 water quality certifications with requirements for BMPs were issued.
27. Renew Forestry Commission contract to implement a Statewide Forestry BMP Compliance Program. Follow-up on any referrals for water quality impacts.	a) Request annual workplan, obtain EPA approval then issue or amend enabling legislation grant agreement with SC Forestry Commission.	Annual	The annual workplan for SC Forestry Commission was submitted, approved by EPA, and a new amendment extending the project for one year was issued in August 2018.
28. Maintain a database to track permits, inspections, and compliance and enforcement actions.	a) Enter all facility and permit related information into the Environmental Facility Information System (EFIS) or its replacement.	Annual	All facility- and permit-related information was entered into the Environmental Facility Information System (EFIS) for FY 2018. SCDHEC is in the process of shifting to a new database.

8. ADDRESS AND TRACK RESPONSES TO NPS INCIDENTS AND COMPLAINTS	<ul> <li>29. Address nonpoint source related complaints reported by the general public, MS4s, and other entities.</li> <li>30. Coordinate compliance and enforcement action when voluntary remediation to remediate NPS incidents is unsuccossful</li> </ul>	<ul> <li>a) Investigate acute nonpoint source complaints from the public and MS4s.</li> <li>Initiate investigations, including site assessment, letter/report writing, and follow-up.</li> <li>a) Refer incidents to enforcement staff for follow-up.</li> </ul>	Annual	142 NPS complaints were investigated statewide, including site assessment, letter/report writing, and follow-up. Onsite wastewater incidents that required further action were referred to enforcement staff for follow-up.
	31. Track NPS investigations using established electronic systems.	a) Enter all information into the Environmental Facility Information System (EFIS) or its replacement.	Annual	All facility- and permit-related information was entered into the Environmental Facility Information System (EFIS) for FY 2018. SCDHEC is in the process of shifting to a new database.
9. PROMOTE AWARENESS OF NPS PROBLEMS AND BUILD CAPACITY FOR EFFECTIVE NPS OUTREACH IMPLEMENTATION IN SOUTH CAROLINA COMMUNITIES	32. Increase awareness of health risks associated from swimming in impaired waters and educate citizens about how to reduce those risks and their NPS contributions to local waters.	a) Annually review and provide NPS educational information as needed on Agency swimming advisory website.	Annual	The Swimming Advisory website was reviewed, and adjustments were made as needed. The Swimming Advisory information line was monitored daily throughout the warm weather months. In the summer of 2018, only one swimming advisory inquiry call was received and managed.
	33. Increase awareness of atmospheric deposition of mercury and the associated health risks through annual Fish Consumption Advisory information.	a) Collect fish tissue samples statewide and obtain other samples through partnering agencies and events. Analyze tissue samples for mercury, PCBs, and other metals, as needed.	Annual	887 fish tissue samples were collected statewide from the Department and partnering agencies and analyzed for mercury, PCBs, and other metals as needed.
		b) Annually produce and distribute the SC Fish Consumption Advisory booklet (30,000 copies) and revise website.	Annual	The SC Fish Consumption Advisory booklet was revised and is available on the SCDHEC website. <sup>3</sup>

<sup>33</sup>b<sup>3</sup>https://www.scdhec.gov/food-safety/food-monitoring-advisories/fish-consumption-advisories

	<ul> <li>34. Promote NPS awareness through the Champions of the Environment grant awards program.</li> <li>36. Provide technical assistance and water quality information to stakeholders to support the effective management of NPS</li> </ul>	<ul> <li>a) Award 8 grants to environmental education projects. Develop and air TV commercials broadcasting each project.</li> <li>a) Participate in stakeholder meetings and respond to requests for information including assistance with obtaining and analyzing water quality data</li> </ul>	Annual	8 grants of \$2,000 each were awarded. 2 merit awards of \$750 each and 2 seedling awards of \$550 each were awarded. 248 TV commercial spots were aired in 2017 (2018 TV commercials won't air until April 2018). Staff attended and/or presented at multiple stakeholder meetings statewide. Staff also aided in obtaining and analyzing water quality data.
	pollution.	b) Update the water quality assessments on the SC Watershed Atlas online web application, which replaces the Watershed Water Quality Assessments (WWQA) for all of SC's eight major watersheds every two years in conjunction with the Integrated Report. Water quality information will be updated on a regular basis as it becomes available through other programs. Post updated information and maps online.	Annual	Watershed Water Quality Assessments for SC's eight major basins have been replaced by the Watershed Atlas online. This interactive, GIS-based web application <sup>4</sup> includes the most recent watershed data previously found in the WWQAs and is updated at least once a year.
10. COORDINATE NPS REDUCTION EFFORTS WITH USDA AGENCIES	38. Assess water quality impacts of agricultural conservation practices on pollutant loading in NWQI watersheds.	a) Collect and analyze monthly water quality samples at established DHEC monitoring sites in all current NWQI watersheds.	Annual	SCDHEC water quality monitoring stations in current NWQI watersheds were monitored monthly.
	39. Participate in the NRCS State Technical Committee.	a) Attend committee meetings as they are called, typically 1-2 times per year. Additional staff such as agricultural permitting and watershed managers may attend, as needed.	Annual	NRCS State Technical Committee meeting was attended in FY 2018.

<sup>36</sup>b4<u>https://gis.dhec.sc.gov/watersheds/</u>

	40. Leverage USDA resources to complement existing 319 efforts.	a) Encourage grantees to utilize EQIP and other USDA funding options in watersheds with ongoing implementation projects. Coordinate with State NBCS staff as needed	Annual	Project managers for several ongoing implementation projects were assisted and encouraged to obtain EQIP funding.
		b) Select NWQI watersheds with State NRCS staff, striving to choose watersheds which are current or recently closed 319 implementation areas or where watershed-based plans exist.	Annual	There are three current NWQI watersheds: Upper Little Saluda River (an NRCS Approved Watershed for FY 2018) and Big Creek – Little Saluda River and Smith Swamp (FY 2018 NRCS Readiness Phase Watersheds). A joint meeting with state NRCS staff was conducted in 2018 to discuss current NWQI watersheds.
		c) Review EQIP ranking criteria through the State Technical Committee to ensure that points are awarded for impairments and proximity to 319 projects. Provide GIS layers, etc. as needed.	Annual	EQIP ranking criteria were reviewed through the State Technical Committee to ensure points are awarded for impairments and proximity to 319 projects.
11. INCREASE COLLABORATION WITH OTHER STATE, FEDERAL AND UNIVERSITY PARTNERS TO IMPROVE COASTAL MANAGEMENT OF NONPOINT SOURCE POLLUTION	41. Collaborate with other state, federal and university partners to develop recommendations on knowledge transfer and BMP implementation.	b) 319 staff will meet as needed or at least annually with other state, federal, and/or university partners to ensure coordinated engagement on knowledge transfer and BMP initiatives, and awareness of relevant coastal management trends and developments.	Annual	NPS staff collaborated as needed with state, federal, and university partners.
		<ul> <li>c) Collaborate on preparation and distribution of communications materials that build awareness of BMPs among coastal stakeholders.</li> </ul>	Annual	NPS staff communicate with stakeholders across the state, including coastal areas. In addition, NPS staff support 319 projects and watershed planning efforts in coastal areas.
	43. Coordinate management activities between the CZARA and NPS programs.	a) Coastal NPS and 319 staff will meet at least annually to coordinate efforts.	Annual	Communication throughout the year assisted in coordinating management efforts between the Coastal NPS and 319 Programs.

		<ul><li>b) Coastal NPS staff will serve on the 319 Review Committee for each funding round.</li></ul>	Annual	Coastal NPS staff served on the 319 Review Committee for the FY 2018 funding round.
12. ESTABLISH AND STRENGTHEN PARTNERSHIPS TO ADDRESS NPS POLLUTION	47. Encourage new entities to become involved in NPS projects.	a) Inform 5 stakeholder organizations about the specifics of the Program and grant opportunities.	4	Stakeholder organizations were informed about the specifics of the Program and grant opportunities.
13. LEVERAGE STATE REVOLVING FUND MONEY TO ADDRESS WATERBODIES AFFECTED	48. Coordinate with SRF staff to encourage implementation of NPS Plan goals.	a) Assist SRF staff with goal setting in the CWSRF Intended Use Plan.	Annual	NPS staff assisted SRF staff with goal setting in the CWSRF Intended Use Plan as needed.
BY NPS POLLUTION	49. Prioritize SRF projects according to their potential to improve water quality and complement existing NPS reduction efforts.	a) Using the SRF Priority Ranking System, review and score each project requesting SRF funding. Review includes assessment of priority watersheds, impairments, TMDLs and 319 projects in the project area.	Annual	Project Questionnaires were reviewed and scored using the SRF Priority Ranking System in FY 2018.
	50. Use SRF funds to implement NPS reduction	b) Fund at least one NPS project per year with SRF.	3-5	SRF closed a loan for one NPS project in FY 2018.
	projects.	c) Seek to fund one project which complements a current or recently- funded watershed-based plan implementation project or TMDL.	Annual	Two projects—Tyger River and Shaw's Creek—were selected for 319 funding that implement recently completed watershed- based plans. These watershed-based plans were funded by the SRF set-aside.
14. STRENGTHEN NPS PROGRAM ACCOUNTABILITY	51. Develop success stories for fully or partially restored waterbodies primarily	a) Identify and develop success stories for watersheds showing full restoration (EPA measure WQ-10) for	Annual	NPS staff reviewed the 2018 303(d) assessment. A success story for the Brunson Swamp implementation project was
THROUGH REGULAR REPORTING ON THE	impaired by NPS pollution.	at least two watersheds per year. Also develop stories for watersheds showing improvement.		identified and developed.

STATE'S NPS ACTIVITIES AND ACCOMPLISHMENTS	52. Use the Grants Reporting and Tracking System (GRTS) to report on progress of active 319 projects.	a) All project information will be regularly updated and comprehensively reviewed to ensure completeness by EPA's February 15 annual deadline in accordance with FY 2014 revisions and mandated data elements.	Annual	Project information was regularly updated and reviewed for completeness in the Grants Reporting and Tracking System (GRTS).
	53. Estimate load reductions for active and recently completed 319 projects.	<ul> <li>a) Increase cumulative annual load reductions resulting from 319-funded BMPs by the following:</li> <li>7500 pounds of nitrogen (WQ-9a)</li> <li>2000 pounds of phosphorus (WQ- 9b)</li> <li>1000 tons of sediment (WQ-9c)</li> <li>5E+13 CFU of fecal coliform bacteria and/or equivalent E. coli reduction</li> </ul>	Annual	<ul> <li>Annual load reductions resulting from active and recently completed 319-funded projects increased, and were as follows:</li> <li>30,707.90 pounds of nitrogen (WQ-9a)</li> <li>8,693.80 pounds of phosphorus (WQ-9b)</li> <li>2,995.40 tons of sediment (WQ-9c)</li> <li>2.5E+15 CFU of fecal coliform bacteria and/or equivalent E. coli reduction</li> </ul>
		b) Upload BMP and load reduction information for all applicable projects to GRTS by February 15 in accordance with FY2014 revisions and mandated data elements.	Annual	BMP load reduction information for applicable projects was uploaded to GRTS by the February 15 deadline.
	54. Document 319 implementation practices using GIS.	b) Update map as BMPs are installed.	4-5	The Watershed Atlas has a HUC-based layer to show locations of 319 implementation projects and watershed-based plan areas. NPS staff updated this layer to reflect new projects or changes to existing projects.
	55. Prepare Annual Report to Congress on progress in meeting NPS Program goals.	a) Submit Annual Report to EPA by December 1st each year. Include information on all open watershed- based plan implementation projects as well as report on annual plan milestones.	Annual	The Annual Report was submitted to EPA in December 2017 with information on the implementation projects as well as reporting on annual plan milestones.
15. PROVIDE EFFICIENT PROGRAM MANAGEMENT	56. Submit annual 319 grant application.	a) Prepare annual workplan, budget, and grant application and submit to EPA by September 30th each year.	Annual	The annual workplan, budget, and grant application were prepared and submitted to EPA in September 2018 for FY 2019.

57. Complete grant close-	a) Assemble and submit grant	4 – FY13	The closeout package for FY13 was
out packages.	closeout packages within 90 days of a	5 – FY14	assembled and submitted in June 2018.
	grant close. Grants from fiscal years		
	2008 through 2014 will be closed out		
	in this planning period.		
58. Ensure consistency with	a) Participate in at least 1 national or	Annual	When conferences and training
national and regional goals	regional conference and 1 national or		opportunities were available, NPS staff
and requirements through	regional training such as National NPS		attended events such as the National NPS
participation in trainings,	Conference, GRTS Training or Region		Conference, the SC Water Resources
conferences and meetings.	IV NPS Coordinators meeting.		Conference, GRTS Training, and Region IV
			NPS Coordinators meeting.
59. Administer 319 grants	a) Award grant agreements following	Annual	Grant agreements were awarded in Fall
including issuing and	annual project selection.		2018 following the annual project selection.
ensuring compliance with	b) Review quarterly requests for	Annual	Monthly and quarterly requests for
grant agreements,	reimbursement and progress reports		reimbursement and progress reports from
processing payments and	from grantees to ensure compliance		grantees were reviewed as they were
monitoring non-federal	and track expenditures.		received to ensure compliance and to track
match.			expenditures.
	c) Conduct a site visit with each active	Annual	Site visits with each active project have
	project at least once annually to		been conducted annually.
	ensure adherence to project goals		
	and timeline.		
60. Regularly review NPS	a) Perform cursory plan review and	Annual	Cursory plan review and update of
Management Plan for	update objectives and milestones as		objectives and milestones were performed
effectiveness and	needed as part of annual application		in September 2018 as part of annual
applicability to	process and Annual Report		application process and Annual Report
programmatic needs.	preparation.		preparation.
	<ul> <li>57. Complete grant close- out packages.</li> <li>58. Ensure consistency with national and regional goals and requirements through participation in trainings, conferences and meetings.</li> <li>59. Administer 319 grants including issuing and ensuring compliance with grant agreements, processing payments and monitoring non-federal match.</li> <li>60. Regularly review NPS Management Plan for effectiveness and applicability to programmatic needs.</li> </ul>	57. Complete grant close- out packages.a) Assemble and submit grant closeout packages within 90 days of a grant close. Grants from fiscal years 2008 through 2014 will be closed out in this planning period.58. Ensure consistency with national and regional goals and requirements through participation in trainings, conferences and meetings.a) Participate in at least 1 national or regional conference and 1 national or regional training such as National NPS Conference, GRTS Training or Region IV NPS Coordinators meeting.59. Administer 319 grants including issuing and ensuring compliance with grant agreements, processing payments and monitoring non-federal match.a) Award grant agreements following annual project selection.60. Regularly review NPS Management Plan for effectiveness and applicability to programmatic needs.a) Perform cursory plan review and update objectives and milestones as needed as part of annual application process and Annual Report preparation.	57. Complete grant close- out packages.a) Assemble and submit grant closeout packages within 90 days of a grant close. Grants from fiscal years 2008 through 2014 will be closed out in this planning period.4 – FY13 5 – FY1458. Ensure consistency with national and regional goals and requirements through participation in trainings, conferences and meetings.a) Participate in at least 1 national or regional conference and 1 national or regional training such as National NPS Conference, GRTS Training or Region IV NPS Coordinators meeting.Annual59. Administer 319 grants including issuing and ensuring compliance with grant agreements, processing payments and monitoring non-federal match.a) Award grant agreements following annual project selection.Annual60. Regularly review NPS Management Plan for effectiveness and applicability to programmatic needs.a) Perform cursory plan review and update objectives and milestones as needed as part of annual application process and Annual Report proparation.Annual

EPA's Strategic Plan includes results-based performance goals to protect the environment. South Carolina has incorporated applicable goals and objectives into the state's NPS Management Program. One of the goals has several objectives related to NPS. In that regard, EPA has asked states to report on four of these NPS objectives:

1. The number of watershed-based plans (and acres covered) supported under state nonpoint program grants developed since 2002: 61 watershed-based plans have been supported under South Carolina nonpoint program grants since 2002, covering 3,838,071 acres within the state.

2. The number of watershed-based plans (and acres covered) supported under state nonpoint program grants developed since 2002 that are being substantially implemented: 55 NPS implementation projects have been substantially implemented under South Carolina nonpoint program grants since 2002, covering 3,882,518 acres within the state.

Table 1: Waterbodies Removed from SC's 303(d) List of Impaired Waters				
303(d) Impaired Waters List Year	Number of Restored Waterbodies			
2002	126			
2004	88			
2006	87			
2008	170			
2010	235			
2012	140			
2014	81			
2016	52			
2018	49			
Total:	1,028			

3. The number of waterbodies identified in the year 2000 as impaired by nonpoint sources that are fully restored:

Every two years, SCDHEC reviews water quality data and determines if waterbodies should be included on the SC 303(d) list as impaired. During this assessment, SCDHEC also identifies waterbodies that were previously included on the impaired waters list that can be delisted due to attainment of standards. Table 1 shows each 303(d) assessment year with the number of water bodies that were removed since the previous year's assessment was completed. **Since 2000, a total of 1,028 impaired waterbodies were removed from the 303(d) list because water quality standards were attained.** 

4. The annual reduction in pounds/tons of nitrogen, phosphorus, and sediment from nonpoint sources to waterbodies:

In cooperation with its 319 partners, SCDHEC has developed methodologies for estimating pollutant load reductions from past and ongoing projects. In accordance with EPA instructions, these initial estimations have focused on sediment and nutrient pollution. The projects with current annual load reduction estimates are found in the chart on the following page, including both closed and ongoing projects (GRTS as of November 27, 2018).

The bottom line for effectiveness, particularly in 319-funded projects, is measurable improvement in water quality. When totaled, these figures translate to an annual reduction of 87,451.49 tons of sediment, 620,695.09 pounds of nitrogen, 142,118.16 pounds of phosphorus, and 5.1343x10<sup>15</sup> CFU of bacterial pathogens. This represents estimates from 51 projects with installed BMPs across SC. All grantees are required to supply detailed information in their quarterly and final reports, so the variables required to make these estimations are more accurate and readily available. Load reduction information is reported to EPA using the Grants Reporting System (GRTS). SCDHEC will continue to assess water quality through its extensive ambient water quality monitoring strategy.

#### **Annual Load Reductions Estimates for all 319 Implementation Projects** Data taken from EPA Grants Reporting and Tracking System (GRTS) 11/27/2018

IMPLEMENTATION PROJECTS		Nitrogen (Pounds)	Phosphorus (Pounds)	Sediment (Tons)	Fecal Coliform (CFU)
	Boggy Creek - Enoree River Bacteria Reduction	1550.00	1664.00	919.00	8.6748E+13
	Burton Hill M2 Regional Water Quality Retrofit	1837.00	284.00	63.00	8.7000E+09
	Bush River TMDL Implementation	24202.06	4742.86	6213.40	9.2000E+13
	Coneross Creek and Beaverdam Creek TMDL Implementation	28622.00	5620.00	15638.00	8.6002E+11
	Crabtree Water Quality Improvement Project	2954.00	1159.00	0.00	2.2960E+12
	Crane Creek Watershed Improvements	14.90	1.00	0.40	4.9000E+09
Ţ	Enoree River Total Maximum Daily Load Implementation Project	13088.69	2490.72	1485.20	3.8400E+11
	FC Bacteria TMDL Development and Implementation for Big Swamp and Dissolved Oxygen Characterization for Big Swamp and Singleton Swamp Watersheds	2786.20	1037.00	161.20	1.8850E+12
	FC Bacteria TMDL Development and Implementation for the Scape Ore Swamp Watershed	249691.80	44412.01	65.10	1.1700E+14
	FC Bacteria TMDL Implementation for Cane Creek and Little Cane Creek	617.63	224.93	11.46	6.2155E+11
	FC Bacteria TMDL Implementation for the Litchfield-Pawley's Island Estuary	2031.69	3691.94	7.60	7.0615E+14
	Fecal Coliform Bacteria TMDL Implementation for Spears and Kelly Creeks	15358.99	1718.39	568.60	9.2100E+12
ROJECTS	Fecal Coliform Bacteria TMDL Implementation for the Thompson Creek Watershed Located in Chesterfield County	10919.70	2883.30	778.50	2.3640E+12
	Fecal Coliform Bacteria TMDL Study and Implementation for the Fork Creek Watershed in Chesterfield County	4910.32	1114.36	659.20	5.1800E+12
TED PI	Fecal Load Reduction BMPs in Support of the May River Watershed Action Plan Phase 2	698.00	127.00	16.00	6.1000E+09
PLE	Fecal Load Reduction in the May River Watershed Phase 1	731.00	286.00	1.00	1.8740E+12
сом	Hard Labor Creek Watershed Water Quality Improvement Project	2977.70	1152.40	251.00	5.0706E+13
	Hills Creek WS WQ Improvement Project	3285.56	438.08	113.31	3.4130E+11
	Hollow Creek Watershed Water Quality Improvement Project	4508.00	1232.00	1368.00	6.2540E+13
	Horry Aynor and Dogbluff (HAD) Water Quality Project	8704.00	2170.00	114.00	6.9835E+13
	Huff Creek Pollution Reduction for E. coli	155.00	61.00	0.00	1.2090E+11
	Implementation of a Sewee to Santee Watershed Based Plan	2253.00	829.00	0.00	1.6400E+12
li A S	Implementation of a Toogoodoo Creek Watershed-Based Plan to Address Fecal Coliform Bacteria Through Targeted Nonpoint Source Management	1462.20	573.40	0.00	1.1370E+12
	Implementation of an Okatie River Watershed Plan	2363.00	654.00	19.00	7.1497E+14
	Interstate Fecal Coliform Bacteria TMDL Development and Implementation for the Upper Little Pee Dee River	24525.70	11682.10	12655.70	3.5000E+12
	Little Eastatoe Creek Restoration	103.00	43.00	33.00	5.7800E+12
	Little Pee Dee River Watershed Water Quality Improvement Project	24285.00	6443.00	2978.00	1.4972E+14
	Little Saluda and Clouds Creek TMDL Implementation Project	7326.00	1417.00	441.00	1.3062E+12
	Long Cane Creek Total Maximum Daily Load (TMDL)	12967.60	2593.80	2101.50	2.8662E+12
	Lucas and Timrod Parks Restoration Project	151.40	66.00	14.40	1.7943E+15
	Middle Saluda Fecal Coliform Pollution Reduction	310.00	121.00	0.00	2.4190E+11

	Middle Savannah Watershed Total Maximum Daily Load (TMDL) Implementation Project	2204.50	805.20	0.00	1.9850E+12	
	Murrells Inlet Watershed Plan BMP Demonstration Projects	209.00	76.00	3.00	1.5000E+11	
	Okatie West Water Quality Retrofit*	0.00	0.00	0.00	0.0000E+00	
	Owens Field Park BMP Construction and Education	117.00	4473.00	1.00	6.4047E+12	
	Pacolet River Fecal Coliform Reduction Pollution	31837.00	5516.00	2483.00	2.0882E+14	
	Rabon Creek Total Maximum Daily Load (TMDL) Implementation Project	4611.00	1343.00	645.00	3.8700E+13	
	Reducing Bacteria Levels in the Saluda River	211.00	90.00	12.00	3.7467E+12	
	TMDL Implementation for FC Bacteria and Turbidity in the Big Wateree Creek Watershed	21455.03	3443.24	1705.00	5.3583E+12	
	TMDL Implementation for FC Bacteria in Turkey Creek and Bullock Creek Watersheds	10004.52	2943.33	3256.80	4.6930E+13	
	TMDL Implementation for FC in Allison Creek, Calabash Branch, Beaverdam Creek, and Brown Creek	9329.90	1779.00	3805.82	7.9730E+12	
	TMDL Implementation for FC in the Fishing Creek Watershed	30394.90	5467.90	5884.60	1.0403E+13	
	Twelve Mile Creek Watershed Fecal Coliform TMDL Reductions	7387.10	1953.40	12367.70	1.3380E+14	
	Twelve Mile Creek Watershed Water Quality Improvement Project	686.00	195.00	30.00	1.5724E+13	
	Twenty-Five Mile Creek Watershed Water Quality Improvement Project—Richland County	2930.50	805.00	535.00	1.2100E+11	
	Tyger River TMDL Implementation	11231.00	3009.00	6751.00	3.1400E+12	
	Walnut Creek Nutrient Reduction Project	1650.00	608.00	301.00	4.2569E+13	
	· · · · · · · · · · · · · · · · · · ·	2000.00	000.00	001.00		
	Total for Fully Completed Projects with Final Reports	589,649.59	133,439.36	84,457.49	4.4114E+15	
	Total for Fully Completed Projects with Final Reports           Congaree Creek Watershed Water Quality Improvement Project	<b>589,649.59</b> 1026.00	<b>133,439.36</b> 403.00	<b>84,457.49</b> 0.00	<b>4.4114E+15</b> 7.9800E+11	
	Total for Fully Completed Projects with Final ReportsCongaree Creek Watershed Water Quality Improvement ProjectEarlewood Park Stream Restoration, Buffer Replanting, andBioretention*	589,649.59 1026.00 0.00	<b>133,439.36</b> 403.00 0.00	<b>84,457.49</b> 0.00 0.00	<b>4.4114E+15</b> 7.9800E+11 0.0000E+00	
	Total for Fully Completed Projects with Final ReportsCongaree Creek Watershed Water Quality Improvement ProjectEarlewood Park Stream Restoration, Buffer Replanting, andBioretention*Evergreen Tract Stormwater BMP*	<b>589,649.59</b> 1026.00 0.00 0.00	<b>133,439.36</b> 403.00 0.00 0.00	84,457.49 0.00 0.00	<b>4.4114E+15</b> 7.9800E+11 0.0000E+00 0.0000E+00	
	Total for Fully Completed Projects with Final ReportsCongaree Creek Watershed Water Quality Improvement ProjectEarlewood Park Stream Restoration, Buffer Replanting, and Bioretention*Evergreen Tract Stormwater BMP*Fecal Load Reduction BMPs in Support of the May River Watershed Action Plan Phase 3*	589,649.59 1026.00 0.00 0.00 0.00	133,439.36           403.00           0.00           0.00           0.00	84,457.49 0.00 0.00 0.00 0.00	4.4114E+15           7.9800E+11           0.0000E+00           0.0000E+00           0.0000E+00	
	Total for Fully Completed Projects with Final ReportsCongaree Creek Watershed Water Quality Improvement ProjectEarlewood Park Stream Restoration, Buffer Replanting, andBioretention*Evergreen Tract Stormwater BMP*Fecal Load Reduction BMPs in Support of the May RiverWatershed Action Plan Phase 3*Gills Creek Stream and Riparian Buffer Restoration*	<b>589,649.59</b> 1026.00 0.00 0.00 0.00 0.00	<b>133,439.36</b> 403.00 0.00 0.00 0.00 0.00	84,457.49 0.00 0.00 0.00 0.00 0.00	4.4114E+15         7.9800E+11         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00	
CTS	Total for Fully Completed Projects with Final ReportsCongaree Creek Watershed Water Quality Improvement ProjectEarlewood Park Stream Restoration, Buffer Replanting, andBioretention*Evergreen Tract Stormwater BMP*Fecal Load Reduction BMPs in Support of the May RiverWatershed Action Plan Phase 3*Gills Creek Stream and Riparian Buffer Restoration*Hyatt Park Revitalization*	<b>589,649.59</b> 1026.00 0.00 0.00 0.00 0.00 0.00 0.00	<b>133,439.36</b> 403.00 0.00 0.00 0.00 0.00 0.00	84,457.49 0.00 0.00 0.00 0.00 0.00 0.00	4.4114E+15         7.9800E+11         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00	
DECTS	Congaree Creek Watershed Water Quality Improvement ProjectEarlewood Park Stream Restoration, Buffer Replanting, andBioretention*Evergreen Tract Stormwater BMP*Fecal Load Reduction BMPs in Support of the May RiverWatershed Action Plan Phase 3*Gills Creek Stream and Riparian Buffer Restoration*Hyatt Park Revitalization*Hog Inlet Watershed Plan Implementation Project*	<b>589,649.59</b> 1026.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	133,439.36 403.00 0.00 0.00 0.00 0.00 0.00 0.00	84,457.49 0.00 0.00 0.00 0.00 0.00 0.00 0.00	4.4114E+15         7.9800E+11         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00	
PROJECTS	Total for Fully Completed Projects with Final ReportsCongaree Creek Watershed Water Quality Improvement ProjectEarlewood Park Stream Restoration, Buffer Replanting, andBioretention*Evergreen Tract Stormwater BMP*Fecal Load Reduction BMPs in Support of the May RiverWatershed Action Plan Phase 3*Gills Creek Stream and Riparian Buffer Restoration*Hyatt Park Revitalization*Hog Inlet Watershed Plan Implementation Project*Little Pee Dee with Chinners Swamp	589,649.59 1026.00 0.00 0.00 0.00 0.00 0.00 0.00 24,285.00	<b>133,439.36</b> 403.00 0.00 0.00 0.00 0.00 0.00 6,443.00	84,457.49 0.00 0.00 0.00 0.00 0.00 0.00 2,978.00	4.4114E+15         7.9800E+11         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         1.4972E+14	
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OPEN PROJECTS	<td co<="" td=""><td>589,649.59           1026.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           24,285.00           4601.00           0.00</td><td>133,439.36           403.00           0.00</td><td>84,457.49           0.00</td><td>4.4114E+15         7.9800E+11         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         1.4972E+14         5.7200E+14         0.0000E+00</td></td>	<td>589,649.59           1026.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           24,285.00           4601.00           0.00</td> <td>133,439.36           403.00           0.00</td> <td>84,457.49           0.00</td> <td>4.4114E+15         7.9800E+11         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         1.4972E+14         5.7200E+14         0.0000E+00</td>	589,649.59           1026.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           0.00           24,285.00           4601.00           0.00	133,439.36           403.00           0.00	84,457.49           0.00	4.4114E+15         7.9800E+11         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         0.0000E+00         1.4972E+14         5.7200E+14         0.0000E+00
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\*Note: projects with zero load reductions have not yet been fully implemented, or load reductions have not yet been reported or calculated.

#### **EPA NPS SUCCESS STORY**

# TED STATE outh Carolina

## DINT SOURCE SUCCESS STORY

## Making Progress Through Implementation and Partnership in Brunson Swamp

#### Waterbody Improved

Nonpoint source pollution from agriculture and failing septic systems contribute to elevated bacteria levels in Brunson Swamp.

The waterbody failed to attain its primary recreation designated use, prompting South Carolina to add Brunson Swamp to the 2014 Clean Water Act (CWA) section 303(d) list for Escherichia coli bacteria impairment. In response, stakeholders implemented agricultural best management practices (BMPs), repaired failing septic tanks, and conducted outreach throughout the watershed. Water quality in Brunson Swamp has significantly improved; however, it will remain listed as impaired until bacteria levels consistently meet water guality standards.

#### Problem

Brunson Swamp is a blackwater system in the Lower Coastal Plain that drains to the Little Pee Dee River in the greater Pee Dee basin. The mostly rural Brunson Swamp watershed is in Horry County, south of the town of Aynor (Figure 1). The watershed is 16,000 acres, with most of the land being forested (48 percent) or devoted to agriculture (44 percent).

Brunson Swamp was included in a larger CWA section 319 implementation effort with Chinners Swamp and Palmetto Swamp, which all discharge to the Little Pee Dee River. Before this implementation project, water quality monitoring had not been conducted in the Brunson Swamp watershed. Beginning in 2011, as part of the implementation project, South Carolina Department of Health and Environmental Control (SCDHEC) began monitoring at station PD-370 to assess whether bacteria levels supported recreational use.

Until 2013, state criteria for fecal coliform bacteria in freshwaters required that at least four samples collected over a 30-day period could not exceed a geometric mean of 200 colony forming units (CFU) per 100 milliliters (mL), with a single sample maximum (SSM) of 400 CFU/100mL. After 2013, state criteria for E. coli require that at least four samples collected over a 30-day period cannot exceed a geometric mean of 126 most probable number (MPN) per 100 mL, with a SSM of 349 MPN/100 mL In most cases, insufficient data are collected to evaluate against the geometric mean criterion of the water quality standard: therefore, evaluation against SSM criterion is necessary. The



Figure 1. The Brunson Swamp watershed (in orange) has shown water quality progress at SCDHEC monitoring station PD-370.

CWA section 303(d) impaired waters list assessment methodology allows for no greater than 10 percent exceedances of the SSM criteria during a five-year assessment window. Upon review of data collected in 2011 and 2012, SCDHEC placed Brunson Swamp on the CWA section 303(d) list of impaired waters in 2014 due to exceedances of the recreational use SSM criterion.

## Project Highlights

In 2011 the Horry Soil and Water Conservation District (Horry SWCD) began an effort to repair septic tanks and implement agricultural BMPs as part of the Horry, Aynor, and Dogbluff (HAD) Water Quality Project. As



Figure 2. Farmers installed alternative watering tanks in the Brunson Swamp watershed.

part of the project, Horry SWCD planned to repair 80 failing septic tanks. By the end of the project in 2015, Horry SWCD worked with landowners to exceed this goal, successfully repairing 120 failing systems.

A key component of this steady success was the faceto-face work between conservation staff and landowners. The main objectives of the agricultural component included minimizing concentrated manure deposition from livestock operations and educating landowners about manure and pasture management. A comprehensive nutrient management plan was developed for a participating swine producer, which included calibrating a spreader and installing a pumping plant to agitate manure. In 2013 the swine farmer hosted an Animal Waste Field Day where Clemson Extension staff spoke to 25 livestock producers.

Horry SWCD continued advertising using flyers posted in local businesses, such as feed and tack stores, and hand-delivered to local churches. The SWCD hosted two workshops focused on soil conservation, forage enhancement, and herd health throughout the project area. The SWCD also worked with participating landowners to start rotational grazing with their livestock (affecting 593 pasture acres) and worked with livestock producers to exclude herds from waterways and provide alternative water sources. In total, nine wells, 28 water storage tanks, and 9,450 feet of pipeline were installed for livestock alternative water sources (Figure 2), and 1,600 feet of fencing was also installed to physically exclude 359 livestock from waterways.

Horry SWCD also had an extensive outreach program that focused on the public and their impact on water quality. Representatives had a water quality



U.S. Environmental Protection Agency Office of Water Washington, DC

EPA 841-F-18-001LL November 2018



Figure 3. Percent exceedance of the E. coli single sample maximum standard at Station PD-370.

information booth at Swampfest and Baby Animal Day held at the Playcard Environmental Education Center. These events were open to all Horry County residents and were attended by approximately 2,000 people.

#### Results

Monitoring in the watershed began in 2011 with the start of the project and continued during and after implementation. In total, implementation efforts reduced pollutant loadings of nitrogen by 8,704 pounds, phosphorous by 2,170 pounds, and sediment by 114 tons. Monitoring from 2011 to 2018 shows that monitoring site PD-370 steadily improved, as the percent of samples with *E. coli* bacteria exceedances decreased from 35 percent to 18 percent (Figure 3). Although water quality standards have not yet been met, continued implementation efforts and monitoring in the watershed may continue to show incremental improvements.

## Partners and Funding

The HAD Water Quality Project was made possible by the efforts of several organizations led by the Horry SWCD. Horry SWCD encouraged participation using partnerships with U.S. Department of Agriculture's Natural Resources Conservation Service, Horry County, Grand Strand Water and Sewer Authority, the town of Aynor, and local landowners. These partners and landowners supported the project by providing \$517,780 in cash and in-kind services for BMP cost-share. In addition, funding sources included \$525,115 in CWA section 319 funding from SCDHEC.

#### For additional information contact:

Carmony Corley South Carolina Department of Health and Environmental Control, Bureau of Water 803-898-4401 • corleyc1@dhec.sc.gov

#### GILLS CREEK

Gills Creek Watershed Association (GCWA), through the section 319 grant, is working to restore and implement buffer enhancement for 890 linear feet of Gills Creek in order to reduce the amount of *E. coli* in the waterbody. The stream and riparian buffer restoration project will mimic a natural stream corridor, requiring little ongoing maintenance. However, some maintenance and oversight will be required to ensure the project is functioning as intended. This will be done by nearby property owners, who have agreed to maintain landscaping and plants that will be established in this area on both sides of the creek.



On October 29, 2018 the project steering committee met with Wildlands for a project kickoff meeting and site visit. The meeting topics covered physical constraints of the site and project goals. Wildlands is in the process of

In early 2018, a competitive Request for Qualifications (RFQ) for a design consultant were developed and advertised. Eight proposals were received and reviewed from the project steering committee using a criteria-based evaluation process. GCWA selected the design consultant, Wildlands Engineering in June 2018.



collecting data for the site and plans to have concept designs ready for January/February 2019.

Gills Creek Watershed Association has been updating members and the public about the project in all social media avenues, as well as the GCWA big splash e-newsletter. Gills Creek Watershed Association is in the process of creating a webpage dedicated to the Gills Creek stream enhancement project on the Gills Creek Watershed Association website.

#### SHAWS CREEK - AGRICULTURE

The City of Aiken was awarded a Non-Point Source grant to implement agricultural Best Management Practices to address sources of nutrients, sediment and bacteria pollution in the Shaws Creek Watershed. The City of Aiken has hired a part-time Conservation Technician who has begun working with the Aiken and Edgefield Natural Resources Conservation Service and Soil and Water Conservation Districts to recruit farmers and begin preparing conservation plans. Post cards were sent to all farms near waterbodies in the watershed.



Three potentially interested farmers in



Aiken County and one in Edgefield County have been identified. Those along Shaws Creek have been prioritized, such as a 500-acre horse farm with poorly stabilized soil, as shown. A Conservation Plan has been developed for one farm to date.

Stakeholders are discussing holding a workshop this winter to help recruit interested farmers. Ideas for the workshop include a rain simulator

demonstration, a speaker on soil health and a speaker on estate planning.

#### TWENTY-FIVE MILE CREEK (KERSHAW COUNTY)

The issue of failing septic systems was determined to be one of the sources of bacteria and nutrients in Twenty-five Mile Creek. Kershaw County is jointly working with Richland and Fairfield Counties to provide a cost share opportunity to repair or replace failing septic systems at homes and businesses in the watershed. In addition to social media and other news outlets across the watershed, Kershaw County also sent post cards to all known septic homes/businesses in the watershed.





Since fall 2017, participants have repaired or replaced 18 failing septic systems in Twenty-five Mile Creek Watershed, located in both Kershaw and Richland Counties. Kershaw County is working with Richland and Fairfield County to advertise the grant to encourage more participation.

#### MAY RIVER – PHASE III

In response to rising fecal coliform concentrations, the May River was designated a priority and threatened

watershed in 2008 by EPA and SCDHEC. The Town and its partners were awarded an EPA 319-grant by SCDHEC in 2009 (Phase 1), 2012 (Phase 2) and again in 2016 (Phase 3) to implement the May River Watershed Action Plan to restore water quality throughout the May River. The Phase 3, 319 grant will support a Town Hall retrofit project to install pervious pavement systems to replace existing asphalt, gravel and dirt parking lots as well as install a bio-retention best management practice (BMP) to infiltrate runoff generated from a portion of the existing Town Hall roof. The project is expected to reduce fecal coliform loading by reducing the volume of runoff discharging from the site, which pre-dates any stormwater treatment requirements, and



ultimately affecting the May River. The pervious parking areas and bio-retention cell will reduce fecal coliform loading by holding runoff from small, frequent storms within their respective storage layer where it will be infiltrated over a 48- to 72-hour period. The project was bid through the Town of Bluffton's solicitation process

with an intent to award to JS Construction and Notice to Proceed anticipated in late-November 2018. Construction is anticipated to be completed within 90 days of a Notice to Proceed to the contractor.

The project site is an ideal location for the installation of infiltration-based stormwater best management practices due to the high permeability soils, a low groundwater table, and the high levels of public visibility/educational opportunity of the Town Hall site. Additionally, the biggest threat to the performance and service life of pervious pavement systems, which is sediment clogging the pervious surface, is minimized because the site surrounding the proposed retrofit area is already stabilized. This lowers the risk of sediment being washed or tracked onto the pervious surface, thereby limiting the chances of clogging the media and inhibiting infiltration.

The Town also has a street-sweeping program and owns a street sweeper vacuum truck that will be



New Town Hall Parking Lot Improvements used to maintain the pervious pavement post-construction to ensure long-term performance.

#### RICHLAND CREEK

All stream channel work has been completed at McPherson Park, including installation of shallow drainage conveyance, minor bank and terrace grading, removal of invasive vegetation and concrete/asphalt debris, and steppool installation. The permeable pavement parking lot is nearly completed and bioswales around the tennis court are also almost completed. Infiltration testing will be done after these are completed.



The reach of Richland Creek from East Washington Street approximately 1,100 linear feet upstream to Laurens Roadis characterized by active bank erosion that contributes excess fine sediment to Richland Creek and the Reedy River, the confluence of which is about half a mile downstream of the project reach. The Army Corp Permit has been received and project design has been modified based on field conditions prior to construction.

An unnamed tributary to Richland Creek flows along the south side of the TD Convention Center parking lot and exhibits active bank erosion. Stabilization will be accomplished through bioengineering techniques, and a regenerative stormwater conveyance feature, an innovative BMP, will capture and treat runoff from adjacent impervious surfaces. Bank stabilization and construction of the conveyance will reduce fine sediment loading to downstream reaches while removing pollutants from runoff. The contractor has been mobilized and completion is expected by December 2018.



Much outreach work has been done by the City of Greenville in support of the Richland Creek Water Quality Master Plan projects. As the project kicked off, a Clemson student engaged with the City to create a website that would provide information on the Master Plan and projects. The City issued several updates about the McPherson Park project and used the opportunity to promote the practices and the EPA/SCDHEC partnership. The updates went out as News Releases and more detailed information is provided on the Engineering Division's webpage. *The Greenville Journal*, a local print and online news outlet, provided a great article about the City's work to improve water quality, particularly citing McPherson Park. The City presented the McPherson Park project as a case study at the annual IECA conference held in Greenville, SC on October 11, 2018. The event was a cross-section of 180 government sector employees, consulting engineers, contractors, and vendors from across South Carolina and parts of North Carolina. The City also conducted a tour of the McPherson Park project for the Reedy River Water Quality Group, which is a local collaboration of diverse stakeholders engaged in a 5R water quality restoration plan, on October 12, 2018.

#### MITCHELL SWAMP OUT OF LORIS

The Mitchell Swamp out of Loris 319 Water Quality Project began in October of 2017. A kick-off meeting was held at the Town of Loris Municipal Building with numerous contractors, interested homeowners, and State Department of Health and Environmental Control staff members in attendance. Applications were taken at the kick-off meeting and septic repairs began soon thereafter.



Over the first two quarters of the program, 112 applications were submitted, and 54 septic systems were installed which two were sewer tie on. By the end of the third quarter, all grant funds had been obligated. A wet summer and Hurricane Florence have slowed septic repair work. As the land dries from the abundant rainfall and flooding, septic repairs will resume, and water quality will be improved.



#### CONGAREE CREEK

On April 30, 2018 final signatures were obtained for an amendment to the 319 Grant titled "Congaree Creek Watershed Water Quality Implementation Project" for Lexington County. This amendment reduced federal funding and extended the grant timeline by four months. The split was also changed to 90/10, allowing for greater participation from residents in the watershed.



Lexington County has focused entirely on the septic program, as no interest had been shown for agricultural. In March 2018 after working with the County's GIS



department, Lexington County was able to identify 5,000 parcels on septic systems in the Congaree Watershed. Lexington County mailed an informational brochure discussing the grant and the opportunity for assistance with fixing failing septic systems to all 5,000 parcels. The response has been a great success. Since April, Lexington County repaired/replaced 50 failing septic

systems, and it has 10 projects somewhere between initial site visit and installation of new system. In the past year, this project has seen much success, and funds have been almost entirely used.

#### LITTLE PEE DEE/CHINNERS SWAMP

In less than nine months, all funds have been obligated, 141 septic systems were repaired, two spreader trucks were purchased, and a livestock watering system was implemented for water quality improvement. With the flooding and hurricanes over the past three years, many homeowners have experienced septic system failures and swine and chicken producers have found it necessary to improve their waste distribution capabilities. The cost-share funds available through the Little Pee Dee with Chinners Swamp 319 Water Quality Project have made it possible for septic system and animal waste handling system improvements. This program has enabled the homeowners and confined animal farmers in this project area to help themselves with their waste problems.





#### WATERSHED-BASED PLAN IMPLEMENTATION - PROJECTS COMPLETED IN FY 2018

#### SALUDA RIVER (UPSTATE FOREVER)

This project ended on October 19, 2017. This project included the implementation of agricultural and septic Best Management Practices (BMPs) in the Big Creek and Craven Creek subwatersheds in conjunction with work on urban BMPs—the

installation of pet waste stations—across all four subbasins.

With 2017 being the final year of the project, UF continued to engage in public outreach activities to promote these cost share opportunities to local landowners and increase BMP installations. UF sent out targeted mailings to homeowners, marketed the project on social media, and



attended the Saluda River Rally, a local paddling event on the Saluda River. In the end the hard work paid off and UF was able to complete three septic repairs and the installation of three pet waste stations in the focus area. Most stations were installed in public parks with high visibility and existing maintenance staff. The following is a summary of the total BMPs installed from 2014-2017:

- 9 septic repairs/replacements (3 Big Creek, 6 Craven Creek)
- 4 agricultural BMPs (4 Big Creek)
- 8 pet waste stations installed (4 Big Creek, 2 Craven Creek, 2 Grove Creek)

#### OKATIE WEST

This project ended on July 31, 2018. The primary BMP for treatment of the targeted pollutant (bacteria) is the installed wet detention pond. A rip rap weir installed in the main wetland tributary will direct flow into the pond for detention and treatment. An outlet control structure in the pond will detain the stormwater and release it slowly over a 24-48 hour period. The rip rap diversion weir in the tributary will also serve as the emergency overflow weir that will bypass rainfall from larger, less frequent rainfall events.



A post-construction open-house was conducted so the public could see the completed and functioning pond. The event was

advertised and conducted as a 3-hour long drop-in format.



Based on pre-construction modeling from the Beaufort County Stormwater Master Plan and from the Okatie River Watershed Based Plan, the bacteria contaminant load reduction at SCDHEC monitoring station 18-08 is expected to be around 7%. The load reduction is expected to be much higher immediately downstream of the BMP, with reductions as high as 16%. Beaufort County conducted pre-development monitoring immediately upstream and downstream of the BMP site and will conduct similar

monitoring post-construction. They plan to collect the same number of samples over the same time period around the same time of year, for the most comparable data sets. These results will be available around March 2019.

#### TWENTY-FIVE MILE CREEK (RICHLAND COUNTY)

This project ended on January 31, 2018. Through this 319 Project, grantees sought to implement agricultural BMPs on pastures and cropland to reduce erosion and runoff and to improve soil health and nutrient management in the Twenty-five Mile Creek Watershed. During the final year of the project, project coordinators were able to expand the scope of the program to include (a) the purchase of a no-till drill and crop roller to encourage better pasture management practices in the watershed and (b) the provision of financial assistance for residential septic repairs. Five septic repairs were completed following this project expansion.



Thanks to the strong partnership and cooperation between Kershaw and Richland Counties, the Kershaw and Richland Soil and Water Conservation Districts, the USDA-Natural Resources Conservation Service, and other entities, nine conservation plans were developed for seven livestock operations in the watershed and a number of important BMPs were installed. Three technical workshops were held to educate livestock owners about pasture management and how it impacts water resources; two public meetings (one for all watershed stakeholders and another for septic contractors) were offered; and information about the watershed and water quality was provided in a number of written and electronic sources.

#### MURRELLS INLET

This project ended on January 31, 2018. The Murrells Inlet Watershed BMP Demonstration Project provided Georgetown County, Horry County, and Murrells Inlet 2020 the opportunity to initiate management strategies outlined in the 2014 Murrells Inlet Watershed Plan.

Project concepts that were completed through this Section 319 grant include the following: Installing bacteria filter strips in targeted drainage ditches and tidal creeks, including roadside drainage ditches throughout Garden City and at tidal creek sites in Georgetown County; constructing an infiltration bioswale in Garden City; creating two floating wetlands—one at an existing stormwater pond in Garden City and the other in a stormwater pond adjacent to the Marina Colony condominium community; and

County.







These projects provided an invaluable opportunity to implement concept stormwater best management practices here in a local setting to determine long-term pollutant removal effectiveness. Each project was also carefully evaluated to assess factors that need to be considered if the BMP strategy is pursued in other areas of the watershed.

#### LUCAS AND TIMROD PARKS

This project ended on January 31, 2018. The BMPs installed in Timrod park included two infiltration trenches to treat sheet flow runoff from neighboring streets and the existing tennis facility. By replacing the paths with these trenches, and installing geogrids under the stone walking course, the functional paths were replaced with infiltration features that trapped pollutants prior to discharging to Gully Branch. Additionally, three existing catch basins were replaced with infiltration treatment boxes that filter pollutants from street and surface runoff prior to direct discharge to the creek. The final BMP implementation within Timrod Park consisted of approximately 200 linear feet of stream restoration to restore an existing stream bank that had been severely eroded and was causing sediment, and subsequently bacterial, issues downstream within the park.



A three-tiered bioretention BMP was installed in Lucas Park. The bioretention area treats significant runoff from the neighborhood and was designed with future path and mixed-use park functionality in mind. Downslope from the bioretention area, the park has historically had severe drainage problems. Enhanced infiltration trenches with underdrains were installed with a seeded surface area for a well-drained grassed landscape. At the lower end of the underdrains, an additional bioretention cell was designed around an existing drop inlet to treat and filter stormwater runoff prior to discharge to the drainage system in the park.



Long term maintenance for the Lucas and Timrod Park BMPs will continue indefinitely. Since City staff was involved with the development and construction of the facility, they have taken great pride and ownership with the sites and have long-term maintenance plans for each BMP.

#### WATERSHED-BASED PLAN IMPLEMENTATION - PROJECTS BEGINNINGIN FY 2018

#### **EVERGREEN TRACT**

The objective of the project is to construct a water quality retrofit pond that will treat runoff from the 21-acre upstream sub-watershed that consists primarily of impervious surfaces related to Okatie Highway.

#### HYATT PARK

Specific BMP objectives will include daylighting approximately 500 linear feet of a piped Smith Branch tributary that runs through the center of Hyatt Park, restoring an existing blue line stream that converges with the daylighted stream, buffering the streams with vegetated buffers and creating a bio-retention area to reduce nonpoint source inputs of pollutants affecting water quality in Smith Branch.

#### EARLEWOOD PARK

The objective of the project is to reduce *E. Coli* and fecal bacteria in Smith Branch through stream stabilization, stream restoration, and buffer replanting of 464 linear feet of a tributary to the stream and through construction of a bioretention area treating runoff from a dog park and from an urban drainage area north of the park.

#### TYGER SUBWATERSHEDS

Twelve sets of agricultural BMP projects will be implemented to restrict livestock access to streams, provide an alternative water source for the animals, stabilize streambanks, and improve riparian buffers. The repair and/or replacement of 22 failing septic systems are intended to prevent the leakage of untreated or partially treated wastewater into local waterways. The protection of six priority parcels from development through a variety of land protection strategies will also occur.

#### MORSE PARK

Low Impact Development measures, such as a biorention system, pervious surfaces, vegetated drainage ditch maintenance/retrofit, strategic tree/bush/emergent plantings, and catch basin inserts, will be incorporated into the existing boat ramp and park. Modifications will be made after survey data collection is completed to ensure that the project takes advantage of all BMP's suitable for the site.

#### HOG INLET

To reduce fecal coliform levels in the watershed, approximately thirty residences will be connected to the sanitary sewer system, reef restoration efforts will occur, and Low Impact Development practices will be implemented to reduce stormwater runoff.

#### SHAWS CREEK - LAND

The City of Aiken intends to reduce contamination of their drinking water supply by stabilizing land use through a voluntary conservation easement program funded through Clean Water Act Section 319.

#### SOUTH CAROLINA COASTAL NONPOINT SOURCE PROGRAM

The Coastal Nonpoint Program (CNP) is an extension of the statewide Nonpoint Source Management Program (319 Program) and is intended to focus on nonpoint source issues affecting the eight coastal zone counties. The CNP



program is directed toward the implementation of management measures, including best management practices, in seven specific areas: public education and outreach, watershed protection, urban activities, monitoring and tracking, marinas, hydromodification, and wetlands. By fostering coordinated research, outreach, and management activities, the CNP enhances state and local efforts to manage nonpoint pollution in coastal South Carolina. The South Carolina CNP received final approval status from NOAA and EPA in February 2008. The South Carolina CNP currently leverages ongoing efforts

funded through Coastal Zone Management Awards, as well as existing state and local programs, to ensure continued implementation of management measures.

Since its inception in 1992, the Adopt-A-Beach program, administered by the SCDHEC Office of Ocean and Coastal Resource Management (DHEC OCRM), has encouraged volunteers to take an active role in preserving South Carolina's beaches. In 2014, DHEC OCRM launched *MyCoast South Carolina*, a web and mobile application designed to engage the public, visualize the impact of coastal hazards, collect data, and enhance awareness of coastal vulnerability among decision-makers, stakeholders, and the public. In 2016, the Adopt-A-Beach program was

incorporated into *My Coast* with the addition of the Beach Cleanup tool (https://mycoast.org/sc/beachcleanup). During FY 2018, Adopt-a-Beach groups held 460 beach cleanup events, logging over 1,600 volunteer hours removing garbage and debris. In FY 2018, over 2,500 pounds of debris were removed from publicly accessible beaches.





DHECOCRM continues to participate as a member of the SC Clean Marina Program. The program is coordinated by the National Marine Manufacturer's Association South Carolina and consists of staff members from DHECOCRM, SC Department of Natural Resources, and SC Sea Grant. The team is responsible for reviewing Clean Marina applications, conducting site inspections, meeting marina/boatyard representatives, and providing awards and recognition to owners of facilities that meet the Clean Marina criteria.

By meeting the environmental performance criteria, a certified marina can qualify to fly the Clean Marina Flag to attract boaters to their facilities. Through 2018 there are 17 marinas that have met the stringent qualifications of the program, 15 coastal and 2 inland.

#### SOUTH CAROLINA FORESTRY COMMISSION BMP COMPLIANCE PROGRAM

The SC Forestry Commission implemented a statewide, coordinated Best Management Program (BMP) for forestryrelated activities. The BMP program focused on a proactive approach to preventing NPS pollution by offering



voluntary courtesy BMP exams to forest landowners, foresters, and forestry operators. Forestry operations were located through aerial detection, voluntary notification, and complaint calls. Sedimentation of streams is one of the primary forms of NPS pollution nationwide. The forestry BMPs require trees and vegetation to be left along a stream, wetland, or lake adjacent to a forestry harvesting or planting site where activities may result in soil disturbance.

Courtesy BMP exams include site-specific recommendations regarding BMP implementation. After the forestry operation is completed, final on-site inspections are conducted to determine if the appropriate BMPs were implemented on the site. On sites where damage has already occurred, recommendations for mitigating the damage are made. Close cooperation with SCDHEC is essential on sites referred for enforcement action and in correcting problems to ensure compliance with water quality requirements.

From September 2017 to August 2018, the SC Forestry Commission closed out 291 sites. Two harvesting operations were out of compliance with applicable Best Management Practices. The result is a 99.31% compliance rate on sites visited by a BMP Forester.

Of the 291 sites reported, BMPs were properly applied by those responsible on 214 sites, BMP Foresters provided recommendations during the operation to assist with compliance on 62 sites, BMP Foresters noted deficiencies and requested additional action on site to achieve compliance on eight sites, and two sites required remedial action or a return visit by the operator to bring the site into compliance.

The 291 sites visited combined for 19,185 acres of timber harvested, including clearcuts and thinnings. Approximately 89.4 miles of perennial, intermittent,



and ephemeral streams were protected by SC BMPs during this grant period, with 48.9 miles of forested streamside management zones remaining intact along perennial streams.

In the month of August 2018, thirty-one sites were closed out. No sites were found to be out of compliance with applicable BMPs. Of the thirty-one sites reported, BMPs were properly applied by those responsible on twenty sites, BMP Foresters provided recommendations during the operation to assist with compliance on ten sites, and the BMP Forester noted deficiencies and requested additional action to achieve compliance on one site.

#### CHAMPIONS OF THE ENVIRONMENTAL PROGRAM TARGETS NPS EDUCATION



In the 2017-2018 school year, the Academy for Technology and Academics won a Champions of the Environment Grant Award for a nonpoint source pollution reduction project that focused on sustainable gardening.

Students at the Academy for Technology and Academics had no gardening experience or knowledge of urban agricultural impacts on the environment. For this project, students constructed

three different growing systems including a traditional raised bed, a self-irrigated raised bed, and a deep-water culture floating hydroponic system. They compared and recorded the required resources, labor input, and water use efficiency for each type of growing system against fruit production and quality.





They also studied the systems' impact of bioremediation on contaminates entering through runoff from a nearby road. Students learned how to grow healthy food with less impact on the environment.

For 26 years, Champions of the Environment has rewarded environmental awareness and action in South Carolina's Kindergarten through 12th grade students. Champions' is sponsored by DHEC, International Paper, and SCE&G, with assistance from the Environmental Education Association of South Carolina. For more information, visit the Champions Web site at: www.scdhec.gov/champions.

## SOUTH CAROLINA NONPOINT SOURCE PROGRAM

## CONTACTS

#### **Carmony Corley**

State NPS Coordinator SCDHEC Bureau of Water 2600 Bull Street Columbia, SC 29201 (803) 898-4401 <u>corleyc1@dhec.sc.gov</u>

#### Jana Baxley

Grant Coordinator SCDHEC Bureau of Water 2600 Bull Street Columbia, SC 29201 (803) 898-4213 baxleyjs@dhec.sc.gov

#### **Karin Skipper**

Watersheds and 319 NPS Section Manager SCDHEC Bureau of Water 2600 Bull Street Columbia, SC 29201 (803) 898-4187 <u>skippekb@dhec.sc.gov</u>

For more information, visit our website: https://scdhec.gov/environment/your-water-coast/watersheds