



NONPOINT SOURCE SUCCESS STORY

South Carolina

Improving Shellfish Waters Through Multiphase Implementation in May River

Waterbody Improved

Due to the rapid development within the May River Watershed over the past 20 years, rising fecal coliform bacteria levels in the river's headwaters have resulted in four stations being listed on the 2010 Clean Water Act (CWA) section 303(d) list of impaired waters and shellfish harvesting being restricted in the upper reaches of this river. Multiple phases of CWA section 319 implementation projects have identified and addressed fecal contamination. Projects including septic system repair, sanitary sewer connection, urban pond retrofit, and pervious pavement installation have resulted in water quality improvements, and in 2022 a segment will be removed from the CWA section 303(d) list. This work is also resulting in the reopening of a shellfish harvesting area for the upcoming season beginning October 1, 2021.

Problem

The May River is in the Savannah River Basin and includes the town of Bluffton and portions of Beaufort County (Figure 1). This estuarine river is designated an Outstanding Resource Water and is valued for its oyster production, aesthetic qualities and recreational opportunities. Land use is mostly evergreen forest (26%), woody wetlands (30%), and developed lands (31%). The population increased by 96% between 2000 and 2010, and developed area increased 20% between 2002 and 2018.

The South Carolina Department of Health and Environmental Control (SCDHEC) Shellfish Program conducts monthly water quality monitoring at 11 stations within the May River. The target water quality standard for shellfish harvesting is a daily maximum concentration of 43 colonies/100 milliliters (mL) or a monthly average of 14 colonies/100 mL.

Sources of fecal coliform in the headwater subwatersheds of Stoney Creek, Rose Dhu Creek, Duck Pond, and Palmetto Bluff stem primarily from urban runoff including malfunctioning septic systems, pet waste, wildlife and sanitary sewer leakages. Stations 19-19 through 19-19C have been closed for shellfish harvesting since 2010 and are included on the CWA section 303(d) list. Bluffton developed the May River Watershed Action Plan (WAP) in 2011.

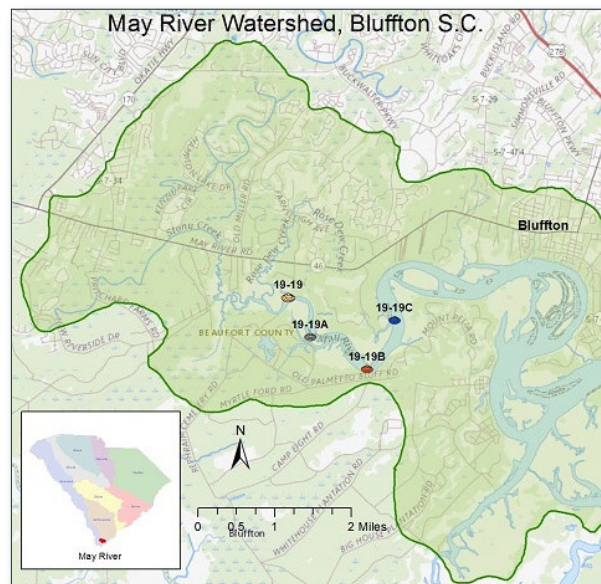


Figure 1. Map of May River headwaters and shellfish monitoring stations.

Story Highlights

The town contracted development of water quality models for the four May River subwatersheds where the shellfish impairments are located and produced the May River WAP Update and Modeling Report in 2020. The purpose of the modeling effort was to better understand fecal coliform fate and transport and to develop strategies intended to open all shellfish stations to harvesting. To capture the variety of storm

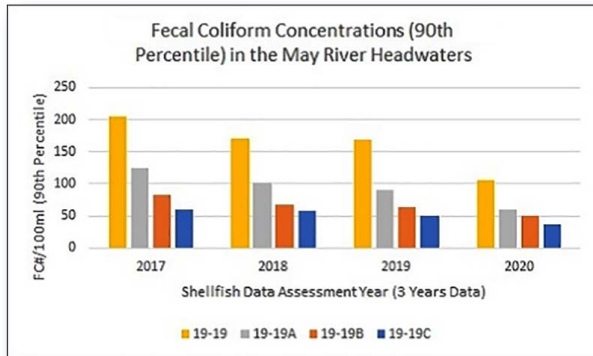


Figure 2. Fecal coliform concentrations at four shellfish monitoring sites in the May River.

events and environmental conditions, the modelers developed a continuous simulation of both water quantity and quality. The model results confirm that growth-related increases in stormwater runoff and pollutant loads reduces salinity in receiving waters and promotes the survival of bacteria.

Bluffton began working on multiple implementation phases of their WAP in 2012 to address the water quality issues in the headwaters of the May River. Phase one included a lagoon retrofit to maximize stormwater retention and reduce stormwater volume. This included installing a stormwater reuse irrigation system that provides subsurface irrigation to vegetation and reduces stormwater volume by approximately 60% annually. Additionally, an outfall ditch enhancement project was completed to reduce coliform bacteria loads in stormwater runoff through the installation of Filtrexx filter socks.

In the next phase, approximately 8,000 square feet of pervious parking was installed and a bioretention cell was constructed adjacent to a parking lot. Both construction projects were implemented with the goal of increasing filtration to reduce bacterial loading into the May River, specifically near shellfish stations 19-19B and 19-19C. Education and outreach efforts included permanent signage and public education events that highlighted the connection between impervious surfaces and degradation of water quality.

A third ongoing phase includes the construction of sanitary sewer main lines to replace faulty septic systems. A goal of this multi-phase implementation is to eliminate all septic systems in the town of Bluffton

to mitigate sources of fecal coliform in the May River watershed. The Bluffton Capital Improvement Program funded the construction of new sanitary sewer main lines, and over 80 homes have since been connected to sewer, including 31 connections within a 500-foot waterfront priority buffer area. A future phase of implementation will include low impact development, pervious pavement and stormwater inlets.

Results

The best management practices (BMPs) implemented through this multiphase effort resulted in stormwater reduction and reduced fecal loads to the headwaters of the May River. Assessments of the regularly sampled shellfish station data have shown steady improvement in the impaired segment of the May River since 2017 (Figure 2). Estimated fecal coliform load reductions total $1.972e+12$ to date. The most recent assessment of the prior 3 years' data indicates that station 19-19C is meeting the standard of 43 colonies/100 mL (90th percentile). This has allowed this section of the estuary to be re-opened for shellfish harvesting for the season beginning on October 1, 2021, and the segment will be removed from the 2022 CWA section 303(d) list of impaired waters. Bluffton is currently adopting a new regional stormwater design manual and ordinance in partnership with Beaufort County, Jasper County, the cities of Beaufort and Hardeeville, and the towns of Port Royal and Yemassee.

Partners and Funding

Three phases of the May River WAP were awarded over \$885,000 in CWA section 319 funds for implementation projects in 2012–2019. Bluffton has also committed \$612,362. Numerous partners helped to implement BMPs and conduct marketing campaigns to restore and protect the May River. Partners include the National Oceanic and Atmospheric Administration, SCDHEC, South Carolina Department of Natural Resources, Bluffton, Beaufort County, University of South Carolina (USC), Clemson University, South Carolina Sea Grant Extension Program, Palmetto Bluff Conservancy, Friends of the Rivers, Trust for Public Land, and Pine Ridge Property Owners Association. USC conducts local monitoring. Local partners played a vital role and were involved in various efforts such as garden and buffer plans and planting, land access, marketing and land donation.



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