NONPOINT SOURCE SUCCESS STORY

Georgia

Municipal Total Maximum Daily Load Implementation Program Helps Restore Upper Butler Creek

Waterbody Improved

Because of elevated fecal coliform levels, 9 miles of Upper Butler Creek were added to the Clean Water Act (CWA) section 303(d) list of impaired waters in 2010. In 2012–2014, the city of Augusta partnered with the Southeastern Natural Sciences Academy to conduct a total maximum daily load (TMDL) implementation program to address fecal coliform impairments in Lower Butler, Rocky and Reed creeks in the Butler Creek watershed. Activities included education, outreach, sediment sampling, water quality monitoring for bacteria, and macroinvertebrate sampling within the Butler Creek watershed. Implementing an expanded monitoring program in a 9-mile segment (Upper Butler Creek) yielded data showing that the segment meets water quality standards for fecal coliform. Therefore, the Georgia Environmental Protection Division (GAEPD) recommended that this section of Upper Butler Creek be removed from the state's list of impaired waters, as reported on Georgia's 2016 Integrated Report.

Problem

Butler Creek is on the south side of the city of Augusta in Augusta–Richmond County, Georgia (Figure 1). Watershed characteristics include low-density urban land use. Portions of a 12-mile riparian greenway provide connectivity for the movement of wildlife through a state-owned wildlife management area and the Phinizy Swamp Nature Park. The 9-mile segment (Boardmans Pond to Phinizy Ditch), known as Upper Butler Creek, was placed on Georgia's 2010 list of impaired waters for not meeting water quality standards for fecal coliform based on 2007 data. The TMDL evaluation determined nonpoint sources and urban runoff were causes of bacteria loadings and established a required 49 percent bacteria load reduction.

Story Highlights

The TMDL implementation program identified critical areas of fecal coliform/*Escherichia coli* concentrations in the Butler Creek watershed with attention to areas that were impervious to water infiltration and prone to generating polluted runoff. The city of Augusta also identified creek sections that contributed loading but did not have distinctly observable problematic issues (e.g., broken sewer pipes, failing septic systems) upon additional visual inspection.

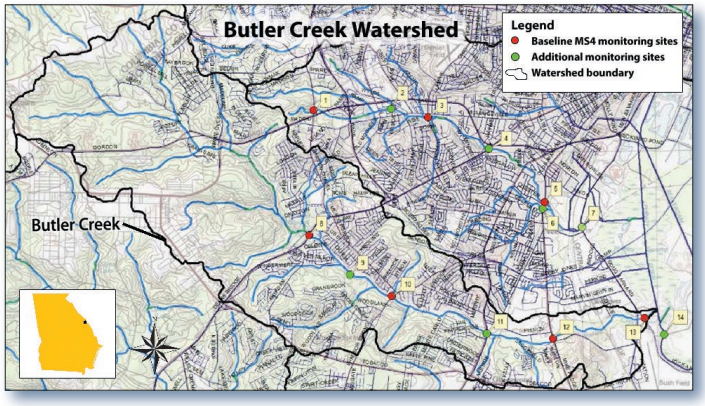

Figure 1. Butler Creek water quality monitoring locations.

Public education strategies targeted specific human awareness of issues such as septic system maintenance, pet waste management, and storm drainage system fundamentals and protection. Numerous messaging methods were used in the geographic areas identified as contributing the greatest bacteria loads, including flyers, posters, social media and news articles, speaking engagements, a YouTube video, a hands-on "Emriver Stream Table" model displayed at park and public events, a "Creekwalk Community Education Program" and an educational field trip. A "Water Fun Block Party" designed to target a specific

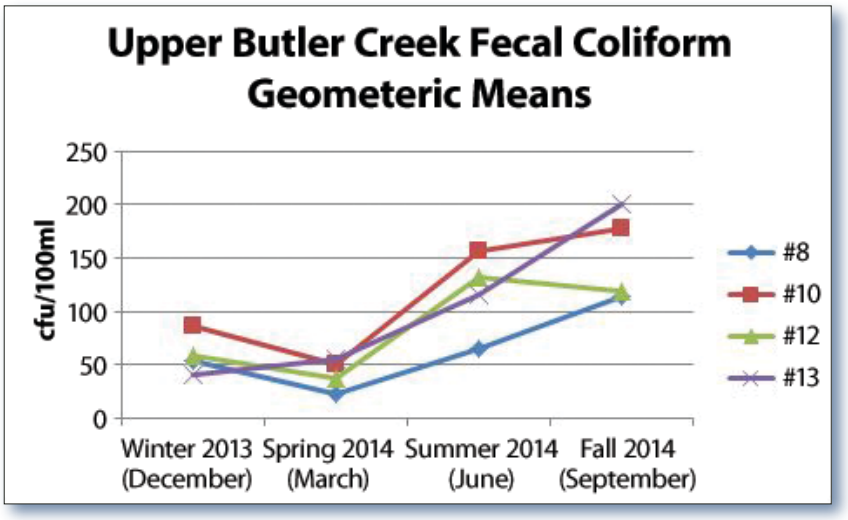

Figure 2. Upper Butler Creek data collected in 2013–2014 show that fecal coliform levels meet the water quality standard.

residential community about septic system maintenance cycled 30 neighbors through educational activities designed for families. Participants correctly selected more signs of a septic system malfunction in post-education surveys, indicating the potential for on-the-ground nonpoint source pollution control practices in septic system management.

Educational efforts appear to be paying off. The septic sludge delivery data collected by the Augusta wastewater treatment plant over a 3-year period showed a steady increase in volume delivered by septage truck to the wastewater treatment plant. This increase could be due to increased pumping frequency as a result of the campaign to educate the public on septic system management.

Results

Expanded fecal coliform/*E. coli* monitoring implemented in July 2012 doubled the number of sites previously monitored under the municipal separate storm sewer system (MS4) permit to provide additional data on areas of high bacteria loading (see Figure 1). As a result of increased sampling and encouragement to sample in strict adherence to a GAEPD-approved Sampling and Quality Assurance Plan, Augusta was able to demonstrate that Upper Butler Creek met state water quality standards for fecal coliform in 2013–2014 (Figure 2). The creek is meeting bacteria water quality standards for its fishing designated use, which requires that fecal coliform levels not exceed 200 colony-forming units per 100 milliliters of water (cfu/100 mL). As a result, GAEPD removed the fecal coliform impairment of the 9-mile stretch of Upper Butler Creek (from Boardmans Pond to Phinizy Ditch) from the state's list of impaired waters, as reflected in Georgia's 2016 Integrated Report.

Partners and Funding

The Clean Water Act section 319 program provided $86,346 and Augusta Engineering Department stormwater management general funds provided $57,652 in match. The Augusta Engineering Department collected monitoring data while the Southeastern Natural Sciences Academy, the Phinizy Center for Water Sciences Education Department and the Phinizy Swamp Nature Park designed and conducted public education and outreach activities. Other groups involved with project coordination included Georgia Master Naturalist, Georgia Adopt-A-Stream, Augusta Utilities Department, Georgia Regents University and Central Savannah River Area Fly Fishers.

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

EPA 841-F-19-001C
January 2019

For additional information contact:

Veronica Craw
Georgia Environmental Protection Division
404-651-8532 • veronica.craw@dnr.ga.gov