# NONPOINT SOURCE SUCCESS STORY

Georgia

# Neighborhood-Scale Green Infrastructure Improves Water Quality in Marsh Creek in the City of Sandy Springs

## Waterbody Improved

A four-mile segment of Marsh Creek is not supporting the designated use of fishing due to excess fecal coliform (FC) bacteria. In response, the City of Sandy Springs installed a wetland detention/bioretention green infrastructure (GI) area and a stormwater pond in a headwater tributary 3 miles upstream of the impaired segment to treat stormwater runoff from the highly urbanized subwatershed. Pre- and post-installation monitoring of the systems showed that the project goal of 20 percent bacteria reduction was surpassed. Geometric means from continuous in-stream sampling of the impaired segment show FC reductions of greater than the 60 percent requirement in the 2008 revised total maximum daily load (TMDL).

## Problem

The Marsh Creek watershed (HUC-10 #0313000111) is in Sandy Springs, about 15 miles north of Atlanta in the Chattahoochee River Basin (Figure 1). The impaired segment (Headwaters to Chattahoochee River) was reported in Georgia's 2002 Clean Water Act (CWA) Section 305(b)/303(d) Integrated Report based on bacteria data collected in 1992–1996. A geometric mean of 5,623.41/100 milliliters (mL) from 38 in-stream samplings collected by Georgia Environmental Protection Division (EPD) and Fulton County at the Georgia EPD listing site (Brandon Mill Road) qualified the segment as impaired for FC.

A 2008 revised TMDL for fecal coliform required a 60 percent reduction in bacteria loadings to restore compliance with state water quality standards: 1,000 per 100 mL (geometric mean November–April) and 200 per 100 mL (geometric mean May–October). The 2008 revised TMDL, which had replaced a 2002 study, indicated multiple sources of FC from urban runoff, domestic animals, leaks and overflows from sanitary sewer systems, illicit discharges of sanitary waste, leaking septic systems, runoff from improper disposal of waste materials, and leachate from operating and closed landfills.

A 2004 TMDL implementation plan further assessed the causes of impairment with a land cover chart, visual field survey, maps and photographs. In 2010 the *City of Sandy Springs Fecal Coliform Watershed Improvement Plan* ranked the Marsh Creek Headwaters Project as the highest scoring new solution to stormwater control among prioritized watershed improvement recommendations.

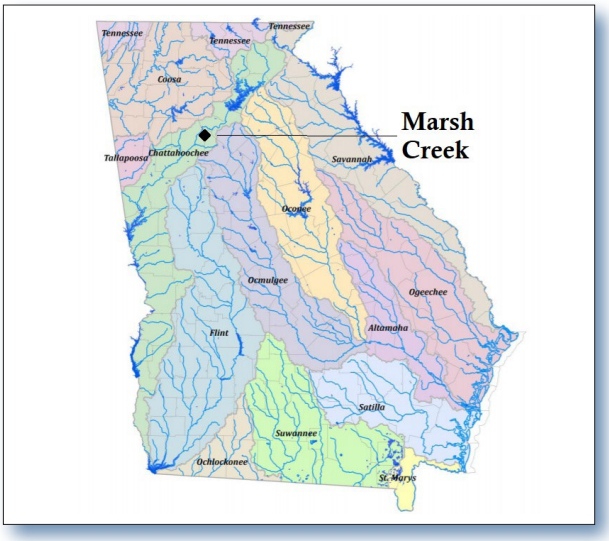


Figure 1. Marsh Creek is in northern Georgia's Chattahoochee River watershed.

## Story Highlights

The City of Sandy Springs was awarded a Fiscal Year (FY) 2013 Clean Water Act section 319(h) grant to install the Marsh Creek Headwaters Project. Now called the Marsh Creek Rain Garden Park, the regional stormwater systems are at 100 Johnson Ferry Road and help protect the downstream channel and manage

Figure 2. The bioretention area filters and treats the first flush of urban stormwater runoff.

Figure 3. The main pool provides storage volume for water quality/channel protection and outlet control.

stormwater runoff from the upstream 14-acre City Springs mixed-use center. A GI wetland/detention pond and a permanent pool provide storage volume and outlet control for extreme flood event protection, while also diverting and infiltrating runoff from a drainage basin measuring approximately 32 acres with 69% impervious surface (Figures 2 and 3). In addition to reducing bacteria loadings (as required by the TMDL), the systems meet 88% of the channel protection volume required for 100% redevelopment and provide the required water quality treatment volume of 94,475 cubic feet (as required by Sandy Spring's National Pollutant Discharge Elimination System permit).

Additionally, landscaping on the site features a preserve with educational signage where the City of Sandy Springs continues to host tours to showcase GI projects in the southeast. The City has built on the success of these stormwater infiltration technologies with further "greening" activities upstream. The new City Springs complex (2018) incorporates parks, trees, green space and a rainwater harvesting system to further reduce the impact of impervious surfaces.

## Results

As monitoring continues to show water quality improvement in the impaired segment, the City of Sandy Springs is evaluating remaining sources of bacteria with the goal to remove Marsh Creek from Georgia's impaired waters list for FC. In 2017 Georgia EPD approved the City of Sandy Spring's *Sampling and Quality Assurance Plan* to qualify monitoring data for 305(b)/303(d) listing assessments. Post-installation sampling of the project's stormwater systems showed an average FC reduction of 84.5%. In-stream FC monitoring conducted at the Georgia EPD listing site shows water quality improvement in the impaired segment. All FC sampling data is computed as geometric means, and they have surpassed the 60% load reduction targeted in the 2008 TMDL since the project was completed. Data collected during the first two quarters in 2020 at the sampling site immediately downstream of the stormwater BMP show FC geometric means (counts/100 mL) of 125 and 48, respectively. In 2019 the City of Sandy Springs hosted site tours for various groups as part of a GI certification course and for U.S. Environmental Protection Agency Region 4 Earth Day Week.

## Partners and Funding

WK Dickson & Co, Inc.; Wrecking Corp of America, LLC (a minority-owned business); and Tri Scapes, Inc. (a woman-owned company) partnered as contractors with the City of Sandy Springs to provide engineering logistics and water quality monitoring, demolition and construction. The original grant budget was based on preliminary estimates of $387,747 in federal award and $437,247 in local match, totaling $824,994. The final total cost of $2,129,843 reflected change orders for nonfederal matching funds in the additional amount of $1,304,849 to cover modifications such as a concrete wall to support an earthen embankment and removal of additional rock revealed by soil borings.

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**For additional information contact:**

**Mary E Gazaway**
Georgia EPD Watershed Protection Branch
404-651-8522 • mary.gazaway@dnr.ga.gov