

ONE UTILITY'S SUCCESSFUL APPROACH TO SUSTAINABLE WATER MANAGEMENT: DRINKING WATER, WASTEWATER AND STORMWATER MANAGEMENT PROGRAMS OF THE DOUGLASVILLE-DOUGLAS COUNTY WATER AND SEWER AUTHORITY

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REFERENCE: *Proceedings of the 2007 Georgia Water Resources Conference*, held March 27–29, 2007, at the University of Georgia.

Abstract. In 2002, the Douglasville-Douglas County Water and Sewer Authority (WSA) acquired the responsibility of managing stormwater infrastructure within the City of Douglasville and Douglas County. WSA took this action realizing that it was essential to assure a sustainable water future for city and county residents. All of WSA's water supply and wastewater facilities are located in the rapidly-growing county, so their protection is critical for a sustainable water future.

Jordan, Jones & Goulding (JJG) has assisted WSA in developing a comprehensive stormwater management program necessary to meet its various water infrastructure management needs. JJG is currently working with WSA on the first series of county-wide watershed studies utilizing the floodplain mapping and stormwater improvement protocols established in the Slater Mill Creek pilot program. The flood maps developed will meet FEMA approval for its ongoing Map Modernization Program, as well as the Metropolitan North Georgia Water Planning District's future floodplain mapping requirements.

INTRODUCTION

In 2002, the WSA acquired the responsibility of managing stormwater infrastructure within the City of Douglasville and Douglas County. WSA took this action realizing that it was essential to assure a sustainable water future for city and county residents. All of WSA's water supply resources, as well as wastewater and stormwater facilities are located inside the rapidly-growing county, so an integrated approach to their management is critical for a sustainable water future.

JJG has assisted WSA in developing a comprehensive stormwater management program, coordinated with other water infrastructure management. There were many lessons learned along the way, and changes necessary for WSA and its operations.

- Organizational culture changes – Although WSA has long employed a cross-training program for

its employees across the water and wastewater to include staff with skills in the stormwater arena.

- A business-oriented model - WSA has historically functioned more like a business than a utility, and this proved especially helpful as stormwater responsibilities were added to its operations. The Authority determined that many functions, staff and equipment could be used in all three areas (water, wastewater and stormwater), resulting in cost-efficiencies and maximum use of resources.

- Reality vs. perception – Although information from both the City and County about existing stormwater infrastructure was provided prior to WSA assuming these assets, the magnitude of the challenges turned out to be far greater than expected. A primary consideration for any agency taking over an existing stormwater system should be to never underestimate the effort needed to inventory, categorize and fix stormwater problems.

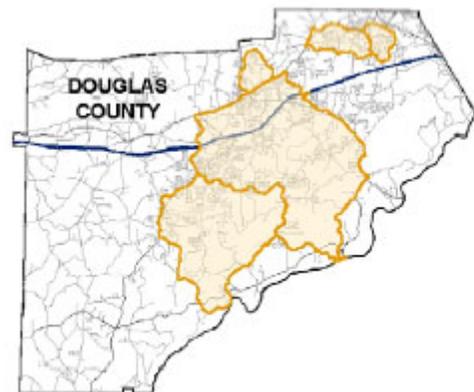


Figure 1: Modeled Watersheds in Douglas County

- Public reaction – Although WSA inherited the problems in the stormwater system, public reaction focused on anger with the lack of maintenance that put the community in this position. Residents were also unhappy with the street closings necessary to fix problems, and most did not understand why they should have to pay to maintain the stormwater system.
- Public education – WSA learned the public can be educated about the issues related to stormwater, and in fact “converted” into stormwater stewards. Many calls are received now from residents calling to report stormwater violations such as someone cleaning a paint brush in a local stream.
- Importance of technical data – To address the array of challenges with the stormwater management system, WSA realized it was imperative to prepare flood plain studies that looked at the big picture. This enabled them to take an organized approach to fixing the problems, rather than moving forward with piecemeal fixes that potentially created additional problems downstream.
- Prioritization – WSA found that the task was twofold: “putting out fires” with immediate problems, while developing a long-range approach so that mistakes would not be made again. Juggling priorities to address both of these issues proved complex but necessary.
- Integrated water management – WSA is steadily moving toward truly integrating water management so that various WSA Divisions do not operate in isolation, but are working to protect and make wise use of the County’s overall water resource needs.



Figure 2: Dog River

CHALLENGES IN TAKING OVER STORMWATER MANAGEMENT

In February 2003, JIG began working with WSA to develop and implement a stormwater program for only the jurisdictional areas of the City of Douglasville. This project included development of permit documentation for this newly regulated NPDES Phase II community, public outreach materials, a detailed stormwater management plan outlining improvement needs and priorities, a funding mechanism/stormwater utility, and valuation of infrastructure assets transferred from the City to DDCWSA. In 2004, the project expanded to include unincorporated areas of Douglas County and a complete inventory of all stormwater assets in the County.

Asset Valuation and Data Management

Part of the project required identification and valuation of catch basins, conveyance pipes, and detention ponds that were being transferred to DDCWSA ownership from the City of Douglasville in 2003 and Douglas County in 2004. JIG completed the first valuation of City assets needed for compliance with GASB-34 financial reporting requirements in an expedited timeframe using the best data available at the time. As the Authority was planning to assume control and ownership of the County’s stormwater program and assets in 2004, it became clear that a comprehensive City- and County-wide inventory of stormwater infrastructure was needed. JIG developed a comprehensive GIS-based data management model used to capture, store and process all data related to the overall stormwater program. Moreover, JIG ultimately assisted DDCWSA in the capture of updated orthophotography and LiDAR topography data, as well as parcel, impervious area, drainage complaint, and stormwater infrastructure data.

Stormwater Inventory

Once the stormwater utility and management plan activity was expanded to all of Douglas County, JIG worked with a local surveyor to develop an inventory of all public right-of-way stormwater infrastructure. The inventory was completed using mapping grade GPS technology and field data loggers. All shape files and data attributes were loaded into an ArcView geodatabase and set up for viewing by any WSA user employing an ArcReader browser. Over 9400 inlets, outlets and junctions and over 12,000 pipes and culverts were collected and processed during the course of the 11-month field effort. The data management system is now able to support the Authority’s maintenance and repair efforts, NPDES permitting requirements, capital improvement planning and prioritization, and ongoing asset valuation and management needs. JIG is currently

using the inventory data to support detailed flood studies being conducted to update FEMA Flood Insurance Rate Maps and future floodplain limits required by the Metro North Georgia Water Planning District.

PUBLIC OUTREACH – EDUCATING THE COMMUNITY

Many communities have adopted the approach of funding stormwater issues through a user fee - typically a stormwater utility - much like is done for water and sewer utilities. However, many *consumers* of the stormwater services do not readily understand the need for the stormwater user charge, and are often opposed to the concept of the stormwater utility. One reason is that stormwater services, unlike other utilities that can be *metered*, are difficult to quantify, a challenge inherent to all forms of non-point source pollution.

WSA enjoys a solid image within its community thanks to many years of communication and outreach to the local area. The stormwater utility fee was seen as another component of the education process for WSA customers, even for those who were not currently being charged drinking water and wastewater fees. An organized communication effort was developed, including bill inserts, presentations to community groups, website information, advertisements and articles in the local newspaper, displays in the WSA offices, and other techniques. The approach was proactive and far-reaching, and resulted in few complaints or calls from property owners objecting to the stormwater fee.

In the case where concerns were raised by area churches, a program was developed allowing them to earn a \$2/month credit for each person who attended a 3-hour Stormwater Stewardship Class presented by WSA (up to

20% of their total fee). This allowed church members to reduce the stormwater fee for their local congregations, and generated goodwill with the local community and elected officials. A major benefit of the Stormwater Stewardship Class was that by learning about stormwater issues, attendees realized that their church's impervious surfaces were part of the problem, and bought into the concept that they needed to be part of the solution. This had the effect of greatly reducing their opposition to the stormwater utility.

The Authority also implemented a stormwater fee credit program for the local school system. In exchange for the credit, children in grades 1-5 are given a general education in environmental issues associated with water. For middle school students, the school system agreed to incorporate a stormwater curriculum as a science elective in grades 6-8.

Stormwater Videos

Another successful component of WSA's outreach was a video series developed for the Authority by JYG. This straightforward but highly effective approach allowed facts to be presented as visual concepts. Designed to address both stormwater problems and the solutions at the individual level, the videos expose the public to the full array of stormwater challenges that *they* must help solve.

The videos focus on addressing stormwater management issues such as flood control, stream bank protection, water quality, habitat preservation, and development of capital improvement projects, i.e., *getting the message out and building advocacy within the community*. Videos and animations generate interest and build awareness by simplifying technical information into visual ideas people can see and understand. Once they have been engaged at a visual level they can be made more aware of the magnitude and extent of the problems caused by stormwater runoff. Once aware, the public can begin to recognize how individuals can have an impact upon the problem and can contribute to the solution, and what range of funding that is required to solve those problems. Higher public awareness also helped WSA to create a more favorable environment for the introduction of a stormwater utility and user fee.

TECHNICAL COMPONENTS – INFORMATION NEEDED AND HOW IT WAS GATHERED

The WSA began the process of implementing stormwater solutions with the Slater Mill Creek Capital Improvement Program and Watershed Action Plan project.

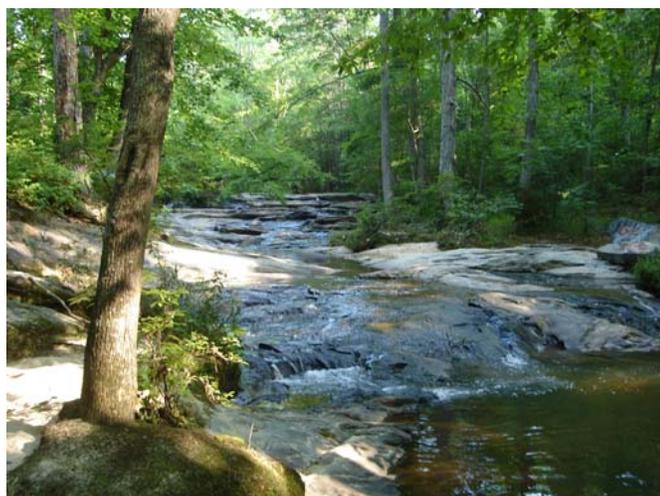


Figure 3: Slater Mill Creek

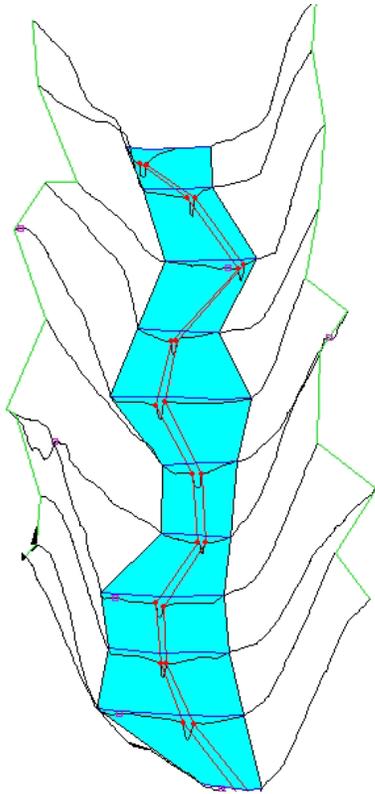


Figure 4: 3-Dimensional flood plain map

While the goal of the project was to identify solutions to flooding, stream bank erosion, and water quality problems, WSA also chose to define protocols for using county-wide data (survey, imagery, etc.), previous watershed assessment data, and floodplain modeling and mapping tools. This blueprint included a data management (GIS) and modeling needs assessment, considered implementation of tasks on a county-wide scale to achieve economy-of-scale benefits, and built off of the planning framework established by regulatory entities in the region. It thus ensured that the Authority complied with the mandates of the NPDES Phase II Program and the Metropolitan North Georgia Water Planning District.

The Slater Mill project was also used to develop standardized methods to study other Douglas County basins and to develop long-term stormwater management programs. Jordan, Jones & Goulding (JJG) is now working to complete similar studies for the Authority's entire service area, including the Bear Creek watershed (18 square miles), the Anneewakee Creek watershed (30 square miles) and tributaries to the Sweetwater Creek watershed (8 square miles).

These areas were addressed through the development of floodplain maps to identify areas sensitive to damages from current flooding or potential future improvements. The maps were prepared using a two-phase approach based on the methodology used to perform the Slater Mill

Tributary 1 study. Since the completion of both phases, the WSA has a map-based management tool that will illustrate property and drainage structures at risk from flooding damage. All floodplain analyses were performed such that maps can be generated that meet FEMA approval for its ongoing Map Modernization Program.

The mapping projects have been organized into two phases to allow for greater value to be achieved in performing preliminary analyses on larger watershed scales (Phase I), while limiting in-depth analyses and reporting to smaller areas of immediate interest to the Authority (Phase II):

Phase I - Base Model and Mapping. This will lay the groundwork for entire watersheds to be analyzed and enable WSA to select smaller basins for detailed analyses as part of Phase II. The major tasks for this phase are hydrologic and hydraulic modeling and floodplain mapping.

Phase II - Final Floodplain Mapping and Basin Implementation Studies. Phase II services (now underway) include the analyses required to refine the extent of the stormwater problems identified in Phase I and to develop updated FEMA floodplain maps. Phase II services will be implemented on a smaller (basin) scale. Each basin study performed in this phase will be based on template work products, offering consistent content and format. The tasks associated with this phase are:

- Database development;
- Field investigations and surveying;
- Refined hydrologic and hydraulic analyses;
- Water quality characterization;
- Capital improvement program and watershed action plan; and
- FEMA letter of map revision.

LITERATURE CITED

- Jordan, Jones & Goulding, Inc., March 2006. Task Order 14 FY-06 Floodplain Mapping and Stormwater Improvements: Bear Creek, Chapel Farms Creek, Beaver Creek, Park Creek and Huey Creek Basins.
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