

# WATER CONSERVATION IN COASTAL GEORGIA: A SUCCESS STORY

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**Abstract.** The threat of saltwater intrusion in the Upper Floridan Aquifer in Southeast Georgia has made it necessary for Chatham County to develop a comprehensive water supply management plan that includes a water conservation program. The conservation program utilizes tools including: public outreach, education, plumbing retrofits, inverted block rate structures, and leak detection programs. Four years after the launch of the program, total domestic/commercial water use had been successfully reduced by 4.47 million gallons per day (MPC, 2000).

## INTRODUCTION

The majority of coastal Georgia's domestic, industrial and agricultural water supply is groundwater derived from the Upper Floridan aquifer. This potable water source is currently in danger from saltwater intrusion in the Brunswick, GA and Hilton Head, SC areas due to decades of heavy groundwater usage. The United States Geological Service estimated that 1995 groundwater use in the 24 coastal counties of Southeast Georgia was approximately 359 million gallons per day (EPD, 1997). Total Floridan Aquifer usage in Chatham County in 1993 was estimated to be 76.24 million gallons per day (MPC, 2000).

In response to this threat, the Georgia Environmental Protection Division (EPD) issued the *Interim Strategy for Managing Water Intrusion in the Upper Floridan Aquifer of Southeast Georgia* (Interim Strategy) in 1997. This policy was intended to manage the Upper Floridan aquifer resource until a final plan was finished in 2005. Among other programs, the Interim Strategy established the need for regional and countywide water supply planning in Southeast Georgia and also capped future groundwater withdrawals from the Upper Floridan aquifer in the Chatham County area (EPD, 1997).

In anticipation of the Interim Strategy, the Chatham County Comprehensive Water Supply Plan was prepared by the Chatham County – Savannah Metropolitan Planning Commission (MPC) in 1995. Funding and assistance for this planning effort was

provided by the City of Savannah, Chatham County, and the Water Resources Management Branch of the Georgia EPD. The main goal of this plan was to reduce groundwater consumption in Chatham County by 27 million gallons per day by the year 2025 through water conservation and exchanging groundwater for surface water. A water conservation program was envisioned that would reduce domestic/commercial water use by 29% and would require the participation of all public and private water suppliers (MPC, 1995). The Water Conservation Program is currently funded by the City of Savannah and Chatham County through water billing revenue. For example, the City of Savannah's contribution to the program is approximately \$1.58 per customer per year (Denion, 2003)

## PROGRAM ELEMENTS

The *Handbook of Water Use and Conservation*, recommends, "Education programs to raise public awareness about the need for conservation are critical to the success of a comprehensive conservation program" (Vickers, 2001). People must first understand why and how to conserve water before any reductions in per capita groundwater use are realized. A water conservation attitude survey, conducted by the Survey Research Center at Savannah State University on behalf of the MPC, indicated that while 94% of respondents thought water conservation was "important" or "very important", very few residents were aware of how much water they consumed per day. Most respondents did not know the capacity of their toilet tanks or washing machines, and a surprising number of people were engaging in very wasteful behaviors (Bart & Nabhan, 1996).

Public education is not the only essential component of a successful water conservation program. While it is necessary to provide water users with the knowledge to conserve water, they must also be provided with the incentive and means to do so. What follows is a description of the water conservation program, developed by the MPC, on behalf of municipal and private water suppliers in Chatham County, GA.

## **Community Involvement and Education**

Any local government and/or water provider developing a water conservation program should take advantage of the resources available to them. The Groundwater Foundation (Foundation) is a non-profit organization dedicated to informing the public about groundwater protection (The Groundwater Foundation, 2003). The Foundation's Groundwater Guardian program is designed to encourage communities to develop their own groundwater protection teams. The Foundation provides resources and technical assistance for local awareness and protection activities and also recognizes the achievement of the groundwater guardian teams.

The Chatham County Groundwater Guardian Team was established in 1996 with the goal of educating the public about groundwater resources. The Team members represent local governments, agriculture, industry, academia, and private citizens. Each year the group establishes and implements result oriented activities (ROAs) that will further groundwater protection in Chatham County. Examples of past ROAs include xeriscape education, a Groundwater Guardian display, and a groundwater festival. This program is invaluable in that it allows government staff to collaborate with local residents, which in turn can generate improved public relations and greater participation in groundwater protection programs.

## **Public Presentations**

A successful water conservation program cannot be run entirely from an office; it is absolutely necessary to reach out to the public to get the message heard. MPC and City of Savannah Environmental Affairs Office staff are available to make presentations to schools, civic clubs, garden clubs, neighborhood associations, etc. about topics ranging from water-wise landscaping to elementary aquifer hydrology to water pollution.

## **Water Sourcebooks**

Water conservation education in schools is needed to change wasteful habits of future generations. It is much easier to change the behavior of children than that of adults. If children learn at an early age how and why they should conserve water resources, they are likely to do so later in life. The Water Sourcebook is a curriculum guide for grades K-12 that addresses many academic subjects and uses water resources as its subject matter. The books or CD provide hundreds of lesson plans and a teacher's guide. The Water Sourcebook was developed by the Tennessee Valley Authority in cooperation with the United States

Environmental Protection Agency (TVA, 1995). It is distributed in Georgia through the Water Wise Council and is purchased by the Water Conservation Program for all Chatham County public and private schools.

## **Public Awareness Events**

The MPC and the City of Savannah, in conjunction with local commercial sponsors, coordinate the annual Earth Day Festival for the Chatham County area. The Earth Day Festival is designed to provide an enjoyable setting where citizens can learn about local environmental issues, including water resources. At the event in 2002, over 70 environmentally concerned organizations and agencies presented their displays to a crowd of approximately 7500 people. Public awareness events such as this not only offer an opportunity to educate the public about water-related issues, but can also facilitate communication between local environmental and governmental groups participating in the event.

## **Media Publicity**

The City of Savannah and the MPC write and produce a bi-monthly cable television show entitled, "Water Wisdom" about water supply and water quality topics. The program airs two to four times monthly on the City of Savannah government access cable network. "Top of Your Mind" ads with water saving tips appear weekly in the local newspaper *The Savannah Morning News* (circulation 70,000). The MPC also produces its own quarterly newsletter, *The Water Spout*. The newsletter is distributed to all public and private schools, local government officials and staff, and citizens throughout coastal Georgia. It is available to the public through all area town and city halls. These tools have been most useful because they allow water conservation staff to address current water resource issues as well as advertise events and programs.

## **Mascots**

A creative and appropriate mascot will provide instant recognition for any program, and will help children and adults alike remember to conserve water. "Less Waters<sup>®</sup> - Running Toilet Person" has been the mascot for the Water Conservation Program since 1998. Less spreads the word about fixing leaks, especially leaky toilets because they are big water wasters. His main appearances are at the local single A baseball stadium in Savannah where he races a child or the Sand Gnat's mascot around the bases illustrating the message, "Stop the Running Toilet!" Less has become so popular that requests pour in from

all over Georgia for appearances at public events. This has allowed MPC staff to educate people who would not ordinarily be exposed to information about water resources.

### **Professional Best Management Practice Seminars**

Informing the general public is not enough to lower per capita groundwater consumption, it is also necessary to reach out to commercial businesses and industries that can influence domestic/commercial water use. Best management practice seminars can target specific industries and businesses for education about water efficient practices and also provide a forum for communication between local industries, government and water suppliers. The MPC recently hosted its second annual best management practice seminar, "Xeriscape – A Water-Wise Landscaping Conference." Landscape professionals, municipal staff, and local elected officials attended this conference to learn best management practices for water-wise landscaping and to discuss possible incentive programs that would encourage outdoor water conservation. Some of the programs discussed included amending the Land Disturbing Activities Ordinance to award extra points for water-smart plants, regulating irrigation system installers, and adopting a rain sensor ordinance for automated irrigation systems. The lecture series included talks on the financial benefits of xeriscape, water conservation, turf management during drought, efficient irrigation, water-smart plants, sustainable landscaping, and water quality protection.

### **Plumbing Retrofits**

Plumbing retrofits are considered "measurable results" projects because their effectiveness can be proven through water billing data. Comparing the average monthly water usage before and after a retrofit will show an immediate water savings. This is one of the most valuable water conservation tools because it can provide evidence of a monetary incentive to the public for participating in water conservation programs. The opportunity to save money on their monthly water bill is extremely motivating to water customers.

The Savannah Water Efficiency Project provides low-flow toilets to low income single family and multifamily residences free of charge. The recipients of the toilets are responsible for installation of the devices. In January of 2002, a low-flow toilet retrofit project replaced 385 old toilets in single and multi family residences. Participants also received low-flow showerheads and faucet aerators. Results indicate a 28.5% reduction in water use which would represent a

significant savings to participants. Results from the 1999 retrofit project show a similar reduction of 25.6%.

The Water Conservation Program makes indoor water conservation "kits" consisting of low-flow showerheads, faucet aerators, and toilet tank banks available year-round to the public upon request. If the recipients provide their address and/or water billing account number, water savings data can be generated from this type of retrofit project as well.

### **Conservation Rate Structures**

Conservation rate structures can allow a water utility to promote water efficiency without adversely affecting essential revenue (Vickers, 2001). The local municipal water suppliers of Chatham County, Savannah, Bloomingdale, and Port Wentworth all have inverted block rate structures where water customers are charged more per unit of water over an established base amount. For example, Savannah residents are charged \$0.46 per 100 cubic feet of water for the first 1500 cubic feet, and \$0.64 per 100 cubic feet over that. Water customers are encouraged to conserve water because once they have used more than 1500 cubic feet, their water bills begin to increase dramatically. Larger water users that are paying a higher rate per unit of water make up for any lost revenue.

Seasonal rates, i.e. rates that increase during summer months to discourage excessive outdoor water use, are another effective method of conservation rate structuring, but are not utilized in the Chatham County area at this time.

### **Unaccounted For Water (UAW)**

Unaccounted for water is the amount of water that a water supplier has pumped (or purchased from another water supplier) minus the metered amounts that are sold or distributed free of charge. A water supplier may have a high percentage of UAW due to inaccurate estimates of the amount of water pumped or purchased, faulty customer meters, bookkeeping errors, non-metered uses, or water leaks (KWO, 1997). The City of Savannah Water and Sewer Bureau has an extensive leak detection program and reports to have fixed 1005 leaks in 2001 (City of Savannah, 2003). The Bureau implements a water distribution line and service lateral replacement program, which reduces UAW lost from an old and deteriorating conveyance system. Finally, in an effort to eliminate non-metered uses, the Bureau has begun an initiative to meter 100% of all free municipal accounts (Denion, 2003).

## CONCLUSIONS

Five years after the Water Conservation Program was established, total domestic/commercial water use was reduced by 4.47 million gallons per day. Based on total population figures for all of Chatham County, per capita water use went from 169 gallons per day in 1995 to 141.6 gallons per day in 1999. This is a 2.7% decrease per person per year, and is more than half the reduction required to meet the final per capita water use goal of 120 gallons per day (MPC, 2000). Much of this reduction can be attributed to water conservation efforts. Georgia EPD is currently making it a priority to not only require conservation plans from permitted groundwater users, but to also enforce implementation of those plans. With this new political climate, many of the 24 coastal counties will have to develop comprehensive programs with very little funding and staff. Many of the programs described above can be implemented with modest revenue by relying on resources from non-profit organizations, grant money, and community volunteers. Water conservation is a great investment for any water supplier because it can require little initial capital, but the returns in water savings, reduced infrastructure demands, and public relations can be invaluable.

## SELECTED REFERENCES

- Bart, Barbara D. & Majeda Nabhan, 1996. Water Conservation Attitude Study Survey of Residential Customers, Survey Research Center, Savannah State University, Savannah, GA, 43 p.
- Denion, Deatre, 2003. Environmental Planner, City of Savannah, personal communication.
- Chatham County – Savannah Metropolitan Planning Commission (MPC), 2000. Chatham County Comprehensive Water Supply Management Plan: 2000 Update, Chatham County - Savannah Metropolitan Planning Commission, Savannah, GA, 91 p.
- Chatham County – Savannah Metropolitan Planning Commission (MPC), 1995. Chatham County Comprehensive Water Supply Management Plan, Chatham County - Savannah Metropolitan Planning Commission, Savannah, GA, 174 p.
- City of Savannah, 2003. Web Page: <http://www.ci.savannah.ga.us>, last updated: February 21, 2003.
- Georgia Environmental Protection Division (EPD), 1997. Interim Strategy for Managing Salt Water Intrusion in the Upper Floridan Aquifer of Southeast Georgia, Georgia Environmental Protection Division, Atlanta, GA, [digital data, *variously paged*].
- Kansas Water Office (KWO), 1997. Assessment of Unaccounted for Water, Kansas Water Office, Topeka, KS, [digital data, *variously paged*].
- Tennessee Valley Authority (TVA), 1995. *The Water Sourcebook*, Grades K-12, Georgia Water Wise Council, [digital data, *variously paged*].
- The Groundwater Foundation, 2003. Web Page: <http://www.groundwater.org>, last updated: January, 2003.
- Vickers, Amy, 2001. *Water Use and Conservation*, Water Plow Press, Amherst Massachusetts, 446 p.

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