Approaches to Stormwater Management:

Stormwater Utilities and Green Infrastructure

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The Environmental Finance Center at the University of North Carolina, Chapel Hill is dedicated to enhancing the ability of governments to provide environmental programs and services in fair, effective, and financially sustainable ways.

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Introduction

The term "stormwater" refers to the runoff that occurs when rain or snowmelt flows across the ground. Impervious areas such as roofs, driveways and paved parking lots prevent stormwater from permeating into the ground. As the stormwater flows across these impervious surfaces, it picks up pollutants such as oil, dirt and debris. The stormwater transports these pollutants either directly into a waterbody, or indirectly to the waterbody through a storm sewer system. Since these waterbodies are important for wildlife as well as human uses such as swimming, fishing and providing drinking water, increasing attention is being paid to protecting the quality of stormwater.

To generate funds to treat stormwater, some communities have created stormwater utilities that charge a fee to residential, industrial and commercial water customers. The revenue from the stormwater fees are then used by the utility to create "best management practices" such as wet detention ponds and rain gardens that slow the flow of stormwater, allowing it to soak into the ground and filter before entering a waterbody.

Why Some Communities have Created Stormwater Utilities

Stormwater utilities are separate enterprise funds within a local government that are created to generate revenue for watershed and stormwater improvement projects/activities. The following are some of the more common reasons for creating such utilities:

1. The main impetus to create stormwater utilities has come from the **National Pollutant Discharge Elimination System** (NPDES) permit program. In essence, this program requires all facilities which discharge pollutants from any point source into waters of the United States to obtain a permit. Discharges from municipal separate storm sewer systems (MS4s) are also relevant. EPA has implemented this permit requirement in two phases. Phase I communities are MS4s that generally serve populations over 100,000, larger acres of construction activities that disturb land, or certain types of industrial activities. These entities have been required to have stormwater permits since 1990. Later, this program to manage stormwater was extended to an additional group of utilities known as Phase II communities. To fund the requirements under these permits, many Phase I and Phase II communities have created stormwater utilities. Of the 44 stormwater utilities in Georgia, about half are Phase I communities, the other half are Phase II communities, and there are two communities that are neither Phase I nor II.

2. Some communities have opted for stormwater utilities in order to address local **flooding problems**. Projects to manage stormwater flow inherently address flooding problems.

3. Stormwater management is one of the areas a community must address in order to receive WaterFirst designation. Having a utility to generate the funds to create some of the best management practices involved has assisted some utilities in attaining WaterFirst status. (WaterFirst designation offers the community not only prestige, but also lower interest rates for certain loans.)

4. Stormwater management and green infrastructure are at the core of EPA's Healthy Watershed Initiative and Watershed Management Approach. Hence more and more communities are trying to align with these methods of managing water. This puts the community in good standing to receive federal funds, as well as gives a "head-start" should new requirements be handed down from EPA

5. Specific to coastal communities, stormwater management is directly linked to Georgia's Coastal Non-Point Source and Statewide Non-Point Programs. Federal funding is connected to these programs' approval and implementation through 319 Grants and Coastal Incentive Grants

Since there has been a lot of interest in the stormwater utility concept among Georgia Communities, a survey of such utilities was recently conducted. The information below comes primarily from the 2012 survey of the existing stormwater utilities in the state of Georgia.

The Wide Diversity in Stormwater Utilities across Georgia

In 2012, the Environmental Finance Center at UNC Chapel Hill (EFC), under contract with the Georgia Environmental Finance Authority (GEFA), performed a survey of the existing stormwater utilities in the state. We found forty-four (44) stormwater utilities in the state at that time. Attachment A is a table that lists all of these utilities. The range of stormwater utilities in Georgia is quite wide. For example, the oldest stormwater utility in Georgia, the City of Griffin, first collected fees in 1998. Since the survey was conducted two years ago, there have been steps to create new stormwater utilities in 2013. Based on census data, we found that the smallest stormwater utility in the state (Avondale Estates) serves about 2,900 in population, while the largest population served is in Gwinnett County, with over 800,000 customers.

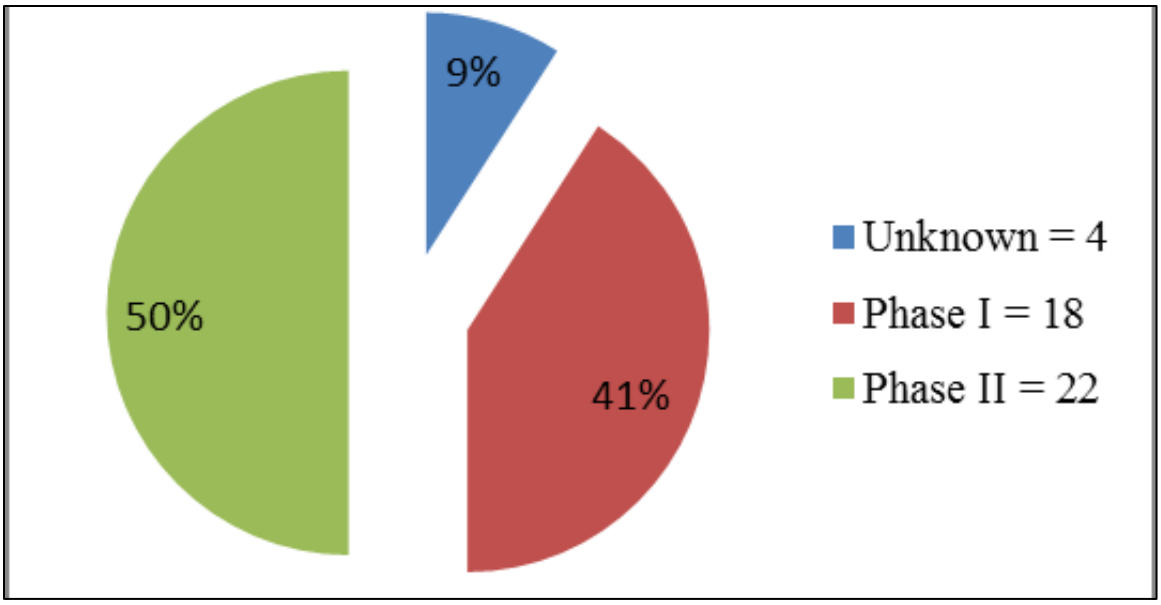

FIGURE 1 NPDES CATEGORIES OF GEORGIA STORMWATER UTILITIES (N = 44)

The EFC found that Georgia stormwater utilities are roughly equally split between Phase I and Phase II of the National Pollutant Discharge Elimination System (NPDES). Based on EPA polices, Phase I communities are larger municipal separate stormwater systems that generally serve populations over 100,000, larger acres of construction activities that disturb land, or certain types of industrial activities. These entities have been required to have stormwater permits since 1990. Later, this program to manage stormwater was extended to an additional group of utilities known as Phase II communities. It is interesting that the same number of the smaller Phase II communities in Georgia have opted for stormwater utilities as the larger Phase I communities. Perhaps even more noteworthy is that at least two of the communities that fall into the category of "unknown" in the chart above are neither designated as Phase I nor Phase II by EPA. These communities have elected to create a stormwater utility to manage their stormwater challenges in the absence of the regulatory pressures associated with the NPDES program.

What Georgia Communities Charge for Stormwater Utility Fees

The monthly fee also varies widely, ranging from less than 10 cents for some residential customers to more than $6 for other households. Statewide, the median rate at 3,000 sq. ft. for residential stormwater utility customers was $4.00. For nonresidential customers, the median rate at 12,000 sq. ft. was $15.50.

Method of Collecting Stormwater Fees in Georgia

Stormwater utilities have a variety of options for actually sending out the stormwater fee. How these fees are billed has many policy and financial implications. For example, tagging the fee to the property tax bill is probably cheaper than having a separate mailing, and anecdotal information in Georgia implies that the property tax method results in a higher collection rate. However, adding the stormwater fee to a water and/or sewer bill adds to public education efforts to communicate that stormwater management is a fee for service, just like fees for water and wastewater services. In Georgia, the water bill and the property tax bill are roughly equal in how common they are used for stormwater billing. Only 11% of stormwater utilities reported having a standalone bill.

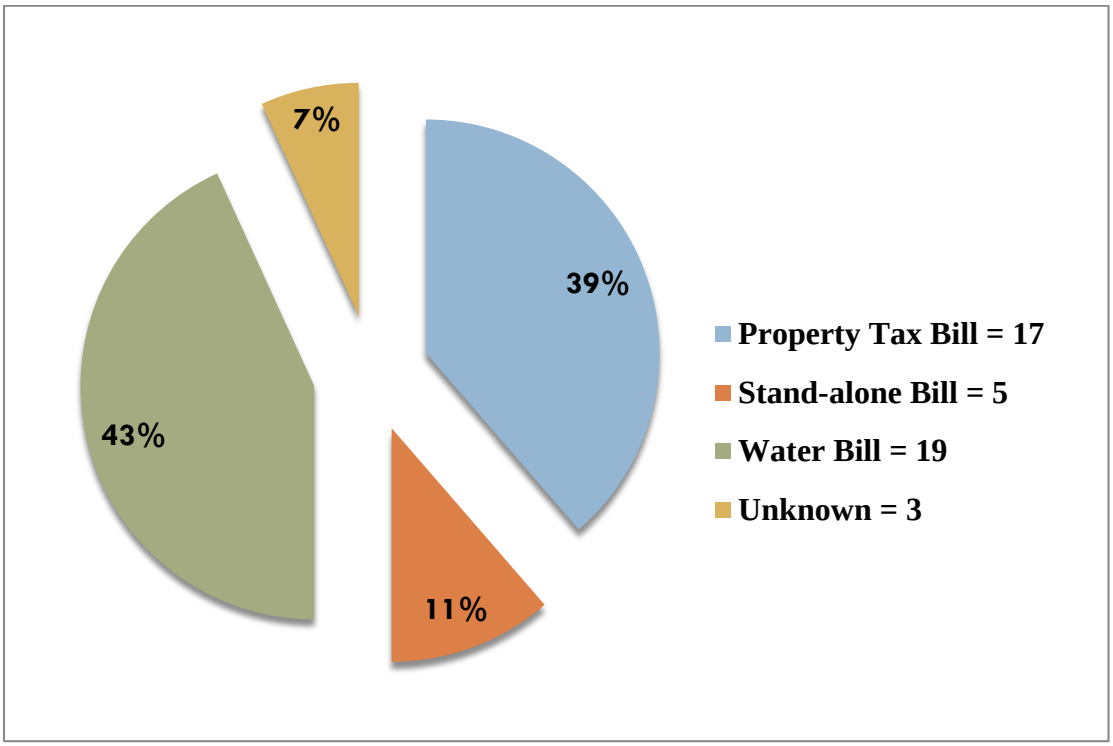

FIGURE 2: METHOD OF COLLECTING STORMWATER FEES IN GEORGIA (N=44)

A community considering setting up a stormwater utility in Georgia might also be interested in the fact that thirty (34) of the utilities reported that they offer some sort of credit program to customers who are willing to implement certain stormwater mitigation steps on their own property.

Examples of Stormwater Fee Structures

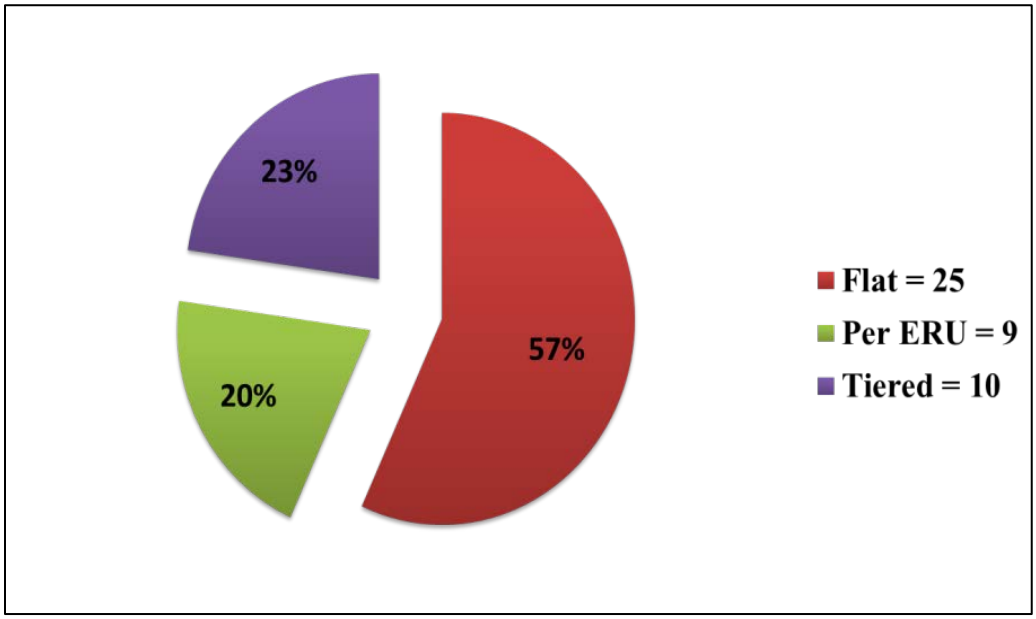

FIGURE 3: TYPES OF STORMWATER RESIDENTIAL RATE STRUCTURES IN GEORGIA (N = 44)

In terms of the structure of stormwater fees in Georgia, Figure 3 shows that over half (57%) of the utilities use a flat fee per residential customer. Roughly 20% of utilities charge their residential customers per equivalent residential unit (ERU), while 23% of stormwater utilities have a tiered rate structure.

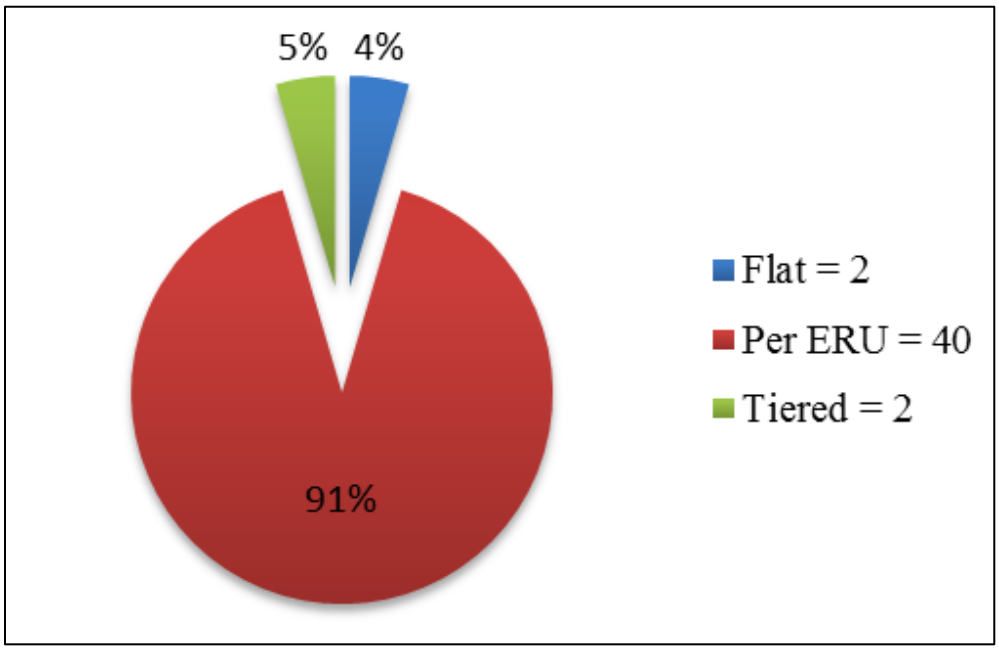

FIGURE 4: TYPE OF NONRESIDENTIAL RATE STRUCTURE (N = 44)

As can be expected, per ERU is a common way for stormwater utilities to charge their non-residential customers. In the Georgia survey, only 2 utilities reported using a "tiered" structure and another 2 utilities have a nonresidential fee that is flat.

Tiered rates seem to be an increasing trend in stormwater utility fee design. The following example of a tiered rate structure comes from the City of Valdosta, GA.

TABLE 1: TIERED RATE STRUCTURE FOR VALDOSTA STORMWATER UTILITY

Single Family	Monthly Rate
1,849 sq ft or less	$1.25
1,850 sq ft – 6,099 sq ft	$2.50
6,100 sq ft or more	$4.25

Examples of the Revenue Generated by Stormwater Utilities in Georgia

Table 2 shows some of the characteristics of the nine (9) stormwater utilities in Georgia that have a population of approximately the same size or smaller than Rincon, GA. In particular, the table includes a column with the "Stormwater Utility Annual Revenue." It should be noted that while comparisons by population size may be useful, other factors such as poverty rate, Median Household Income (MHI), geographical characteristics etc. must be taken into account when setting rates and fees for a specific community.

To see similar information for other stormwater utilities in an interactive dashboard format, visit http://www.metroatlantachamber.com/members/login . The following diagrams show screenshots of the tool:

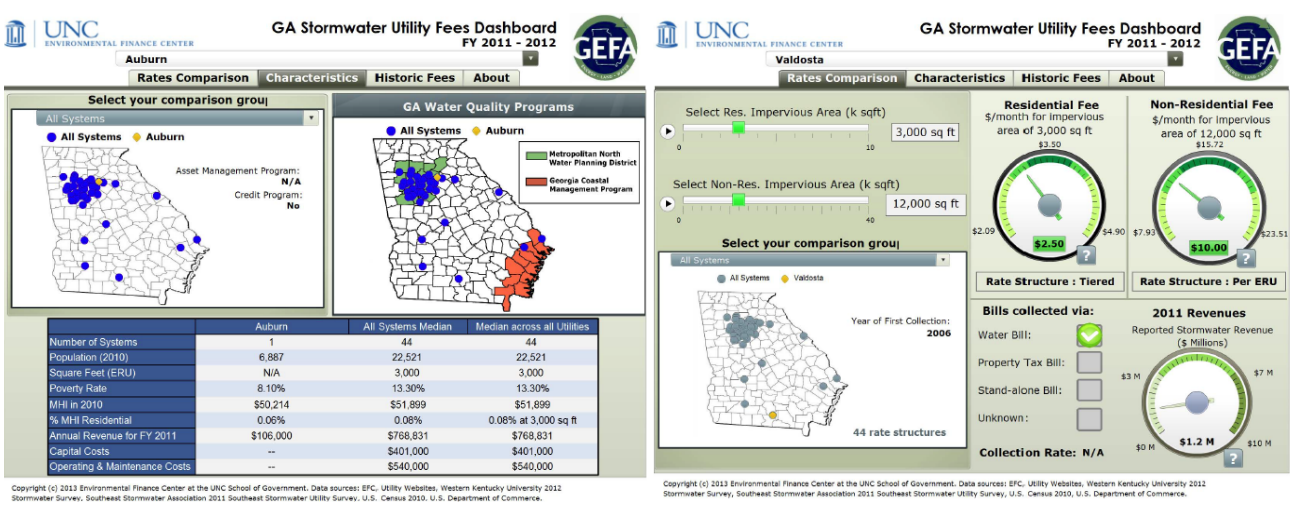

FIGURE 5: SNAPSHOTS OF GEORGIA STORMWATER UTILITY FEES DASHBOARD

Table 2: Stormwater Utility Characteristics for Select Communities in Georgia

	RESIDENTIAL		NON RESIDENTIAL							
Local Government	**Fee Per Month**	**Impervious Area (sq. ft.) (Residential)**	**Fee Per Month**	**Impervious Area (sq. ft.)**	**Collection Method**	**Stormwater Utility Annual Revenue**	**Year Fees First Collected**	**Service Population (From Census Data)**	**Poverty Rate (From Census Data)**	**MHI in 2010 (From Census Data)**
Avondale Estates	$5.00	2,900	$5.00 Per ERU	2,900	Not Listed	$116,352	2004	2,960	3.5%	$86,658
Camilla	$4.00	3,360	$4.00 Per ERU	3,360	Utility Bill		2010	5,360	21.2%	$28,630
Austell	$3.00 ($36.00 Annual Fee)	3,100	$3.00 Per ERU	Over 3,100	Property Tax Bill	$333,868	2011	6,581	15.1%	$44,583
Auburn	$2.50	2,600	N/A	N/A	Property Tax Bill	$106,000	2011	6,887	8.1%	$50,214
Doraville	$4.00	3,000	$4.00 Per ERU	3,000	Property Tax Bill	$485,000	2005	8,330	32.6%	$39,828
Garden City	$4.75	3,000	$4.75 Per ERU	3,000	Utility Bill	$860,000	2009	8,778	22.4%	$37,264
Norcross	$1.25 Per ERU ($0.10 Per Month Per ERU)	100	$1.25 Annually Per ERU ($0.10 Per ERU Per Month)	100	Property Tax Bill		2008	9,116	12.2%	$55,109
Holly Springs	$4.00 Per ERU	2,700	$4.00 Per ERU	2,700	Property Tax Bill	$311,000	2009	9,189	4.5%	$63,488
Loganville	$5.00	3,000	$5.00 Per ERU	3,000	Property Tax Bill	$400,000	2006	10,458	13.8%	$55,735

Green Infrastructure and Credit Programs Associated with Stormwater Management

One of the basic tenets of a stormwater management program is to treat stormwater as close to where the precipitation falls as possible. As such, more programs are shifting from large-scale detention/retention ponds to more localized approaches. These include features such as rain gardens or bioswales within a specific parking lot of a commercial entity (for example a mall). Such localized approaches to stormwater management are known as green infrastructure. Many studies have shown that these types of features are not only effective at treating stormwater, but also provide important secondary benefits such as aesthetic and recreational value.

In fact, to be more legally robust, a good stormwater utility fee structure should include an option for a customer to receive some sort of "credit" on the customer's stormwater fee if that customer has installed certain features to treat the stormwater onsite. For example, in Garden City, GA, a customer may be allowed to secure a maximum credit of 50% off that customer's user fee charge amount by implementing green infrastructure techniques on his/her property. The following table comes from Garden City, GA and provides a summary of the credits for that city's stormwater program.

Table 1: Stormwater User Fee Credit Summary

Credit Description	Credit Term	Potential Stormwater User Fee Credit Recipient and Amount		
		Single Family Residential (SFR)	Non Single Family Residential (NSFR)	Stormwater User Fee Credit
User Fee Credit Elements				
Residential Environmental Technologies	5 years	x		10%
Rain Barrel	5 years	x		(up to) 20%
Low-Impact Parcel	5 years	x	x	25%
Reduced SFR Footprint	5 years	x		50%
No Direct Discharge	5 years	x	x	(Up to) 50%
Watershed Stewardship	1 year	x	x	5%
Septic Tank Maintenance	5 years	x	x	10%
Stormwater Runoff Infiltration	5 years	x	x	(Up to) 50%
Natural Area Preservation	Unlimited	x	x	(Up to) 20%
Water Resources Education Program[1]	1 year		x	50%
NPDES Industrial Stormwater General Permit	1 year		x	15%
Hot Spot BMP Implementation	5 years		x	15%
GSMM Unified Stormwater Sizing Criteria[2]				
Water Quality	5 years		x	10%
Channel Protection	5 years		x	10%
Overbank Flood Protection	5 years		x	10%
Extreme Flood Protection	5 years		x	10%

[1] A customer is may be allowed to secure a maximum credit of 65% if the customer is approved for a Water Resources Education Program credit by the SW Utility Manager, in addition to other credits.
[2] Residential customers that are part of a larger common development (or subdivision) can collectively apply for credits related to the GSMM Unified Stormwater Sizing Criteria.

FIGURE 6: GARDEN CITY STORMWATER USER FEE CREDIT SUMMARY. FROM GARDEN CITY STORMWATER MANAGEMENT PROGRAM

Financing for Green Infrastructure Alternatives for Stormwater Management

TABLE 3: LOANS AND GRANT OPTIONS FOR FUNDING GREEN INFRASTRUCTURE AND STORMWATER MANAGEMENT PROJECTS

Organization	Program (keywords)	Purpose or Use of Funds	Application Dates	Website	Contact
Georgia Department of Natural Resources, Environmental Protection Division	Clean Water Act Section 319(h) Grants; (Nonpoint Source Implementation Grant) (nonpoint, water quality improvement)	The grants will fund a variety of nonpoint source projects such as restoration, best management practices demonstrations, outreach and education, regulatory enforcement, and watershed planning. Priority is given to projects that implement Total Maximum Daily Loads (TMDLs), Watershed Plans, will restore an impaired stream, and will have direct measurable benefits to water quality. Federal permit requirements are ineligible to be funded.	Application deadline is October 31st.	http://www.gaepd.org/Documents/epdforms_wpb.html - nps	Jeff Linzer Jeffrey.Linzer@dnr.state.ga.us 404-656-4713 2 MLK, Jr. Dr. S.W., Suite 1462, Atlanta, GA 30334
Georgia Department of Natural Resources, Coastal Resources Division	Coastal Incentive Grant Program (Coastal Resources Division) (coastal, natural)	To fund projects that protect, enhance or maintain coastal natural, historic or recreational resources in Georgia's coastal zone through planning, research, and public education. This program will also fund small capital projects to enhance access to coastal natural resources.	A Request for Proposals is issued annually every fall with applications due in January or February each year.	http://www.coastalgadnr.org/	Susan Reeves susan.reeves@dnr.state.ga.us 912-264-7224 One Conservation Way, Suite 300 Brunswick, GA 31520
Georgia Environmental Finance Authority (GEFA)	Clean Water State Revolving Fund Loan Program (CWSRF) (sewer)	The CWSRF program is available to fund a wide variety of water quality and wastewater treatment projects as well as storm water projects. (Certain types of "green" projects are also eligible.)	Pre-applications solicited annually to develop yearly plan. Applications received year round.	http://gefa.georgia.gov/clean-water-state-revolving-fund	Jason Bodwell jason@gefa.ga.gov 404-584-1129 233 Peachtree Street, NE - Harris Tower Suite 900 Atlanta, GA 30303-1911
Georgia Environmental Finance Authority (GEFA)	Land Conservation (natural waterbodies)	This program provides loans for local land conservation projects.	Applications received year round.	http://glcp.georgia.gov/	Andrew Szwak andrew@gefa.ga.gov 404-584-1035 233 Peachtree Street, NE Harris Tower Suite 900 Atlanta, GA 30303-1911

Public Private Partnerships (P3s) are another emerging source of financing for these types of projects. In this case, the local government works with a private entity which provides

a large share of the financing for a stormwater improvement project. In this arrangement, the private sector assumes most of the risk in terms of financing, constructing, and maintaining the infrastructure. Government repays the private sector over the long term if the infrastructure is built and maintained according to specifications. Examples of this arrangement are emerging from several states, including Maryland, New York and Pennsylvania.

Existing Stormwater Education Outreach Template Materials

Many nonprofit watershed-related organizations and individual local governments have created templates for outreach and education to residents about stormwater pollution and management. The templates below are designed so that a community can insert its own name and simply reuse the materials for outreach.

FIGURE 7: EXAMPLES OF OUTREACH MATERIAL, SOURCE: HTTP://CFPUB.EPA.GOV/NPSTBX/LOGOS.CFM

EPA Internet Resources:

- Stormwater case studies on public education includes case studies of how a Phase I or Phase II community has implemented the public education requirements.
- Stormwater Outreach Materials and Reference Documents provides outreach materials that municipalities, watershed groups, state, and local governments can customize and use for their own stormwater outreach campaigns.
- After the Storm is a half-hour television special produced by EPA and The Weather Channel on how polluted runoff threatens watersheds. The video is intended for educational and communication purposes in classrooms, conferences, public meetings, public access cable stations etc.
- Marine Debris, often called litter, is any man-made, solid material that enters our waterways. EPA's marine debris website and factsheet are useful resources for educating the public about impacts and ways to prevent marine debris.
- Nonpoint Source Outreach Digital Toolbox includes a catalog of over 700+ materials (TV/print/radio/give-aways/mascots/ public attitude surveys, evaluations of public response to media campaigns) that can be used in a stormwater public education campaign. (Release date: Fall 2006)
- Public Education and Outreach on Stormwater Impacts includes a list of resources complied for the NPDES community

Other Internet Resources:

- Stormwater Education Toolkit from the University of Central Florida (Stormwater Management Academy) includes thousands of educational products organized by target audience, and type of activity that can impact stormwater pollution.
- City of Grand Rapids Environmental Protection Services Department - Water Spots includes over twenty different radio spots created to educate the public on different aspects of stormwater pollution prevention.
- Santa Clara Valley Urban Runoff Pollution Prevention Program Watershed Watch Education Site includes numerous downloadable materials and kits.
- City of San Diego's Think Blue program is an award-winning multi media campaign on preventing polluted runoff.
- Cooperative Extension's National Extension Water Outreach Education includes information on improving outreach efforts using "Best Education Practices".