AUGUSTA, GA

STORMWATER SERVICES PROGRAM

AUGUSTA ENGINEERING DEPARTMENT

AUGUSTA COMMISSION WORKSHOP – JUNE 5, 2018

AUGUSTA ENGINEERING DEPARTMENT

❖ **AGENDA**

Overview of Augusta Engineering Department (AED)

Overview of Augusta Infrastructure System

Overview of Augusta Stormwater Services Program

Stormwater Utility Need, Implementation, and Progress Update

Questions and Answers

AUGUSTA ENGINEERING DEPARTMENT

- **ENGINEERING OPERATION DIVISION:**

  - Design Section
  - Land Acquisition Section
  - Stormwater Section
  - Construction Section

- **TRAFFIC ENGINEERING OPERATION DIVISION:**

  - Traffic Control and Operations Section
  - Signs, Markings, and Lighting Section
  - Design, Studies, and Plan Review Section
  - Intelligent Transportation System (ITS) Section

- **ENGINEERING MAINTENANCE OPERATION DIVISION:**

  - Concrete Maintenance (i.e., stormwater structures, sidewalks, etc.)
  - Stormwater Maintenance (i.e., ditches, swales, VAC-CON, vegetation control, etc.)
  - Potholes/Paving Maintenance

- **ADMINISTRATION/FINANCE DIVISION:**

  - Finance and Accounting Section
  - Human Resources and Employee Relations Section

STORMWATER SERVICES PROGAM

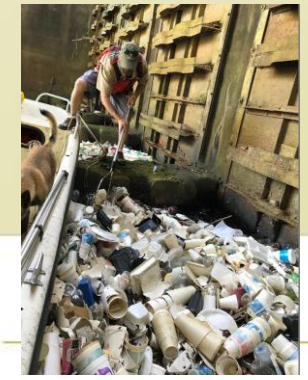
Why do we have a stormwater program?












Why do we have a stormwater program?

- The City is required by law to protect water quality
- The Clean Water Act (1972), states, “that all surface waters must be free from:
  - Toxic substances that are a threat to human, plant, animal, and aquatic life
  - Discoloration that causes adverse affects
  - Floating material in amounts that cause nuisance or affects designated use
- Citizen Health & Safety
- Protection of Local Natural Resources

USEPA

Clean Water Act- 1972

National Pollution Discharge Elimination System (NPDES)

"to restore and maintain chemical, physical, and biological integrity" of the nations waters

Point source discharges (industry, WWTPs)

Nonpoint source discharges (stormwater, agriculture, silviculture)

Municipal Separate Storm Sewer System (MS4)

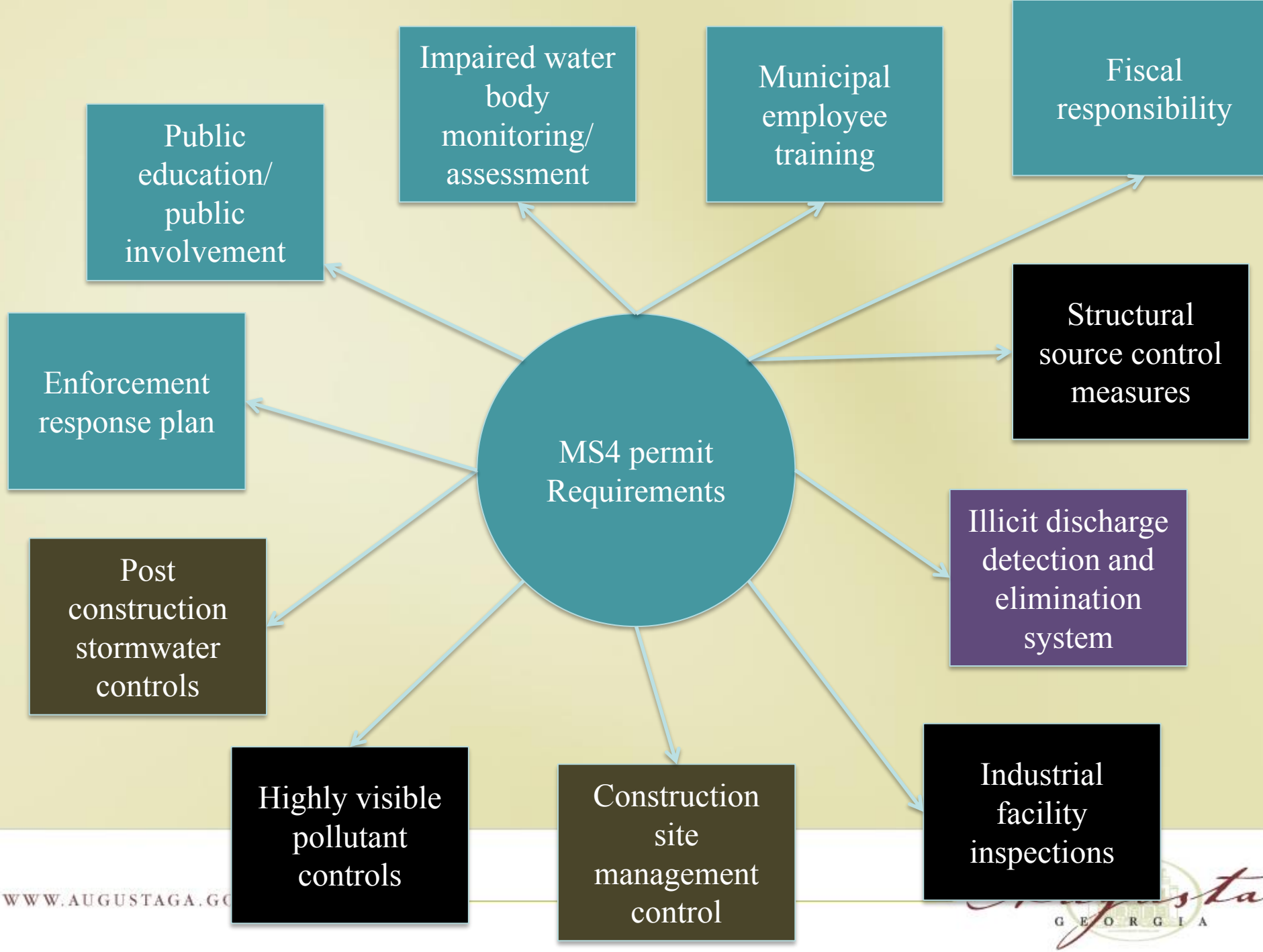
Phase 1 MS4

Phase 2 MS4

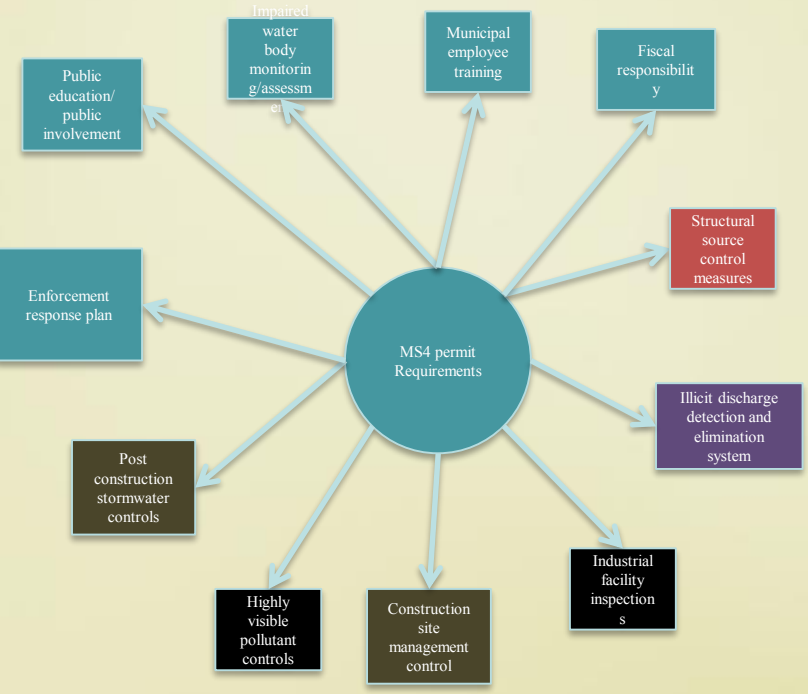
Large

Medium

Permit requirements


MS4 permit Requirements
Public education/ public involvement
Impaired water body monitoring/ assessment
Municipal employee training
Fiscal responsibility
Structural source control measures
Illicit discharge detection and elimination system
Industrial facility inspections
Construction site management control
Highly visible pollutant controls
Post construction stormwater controls
Enforcement response plan

Structural and Source Control Measures



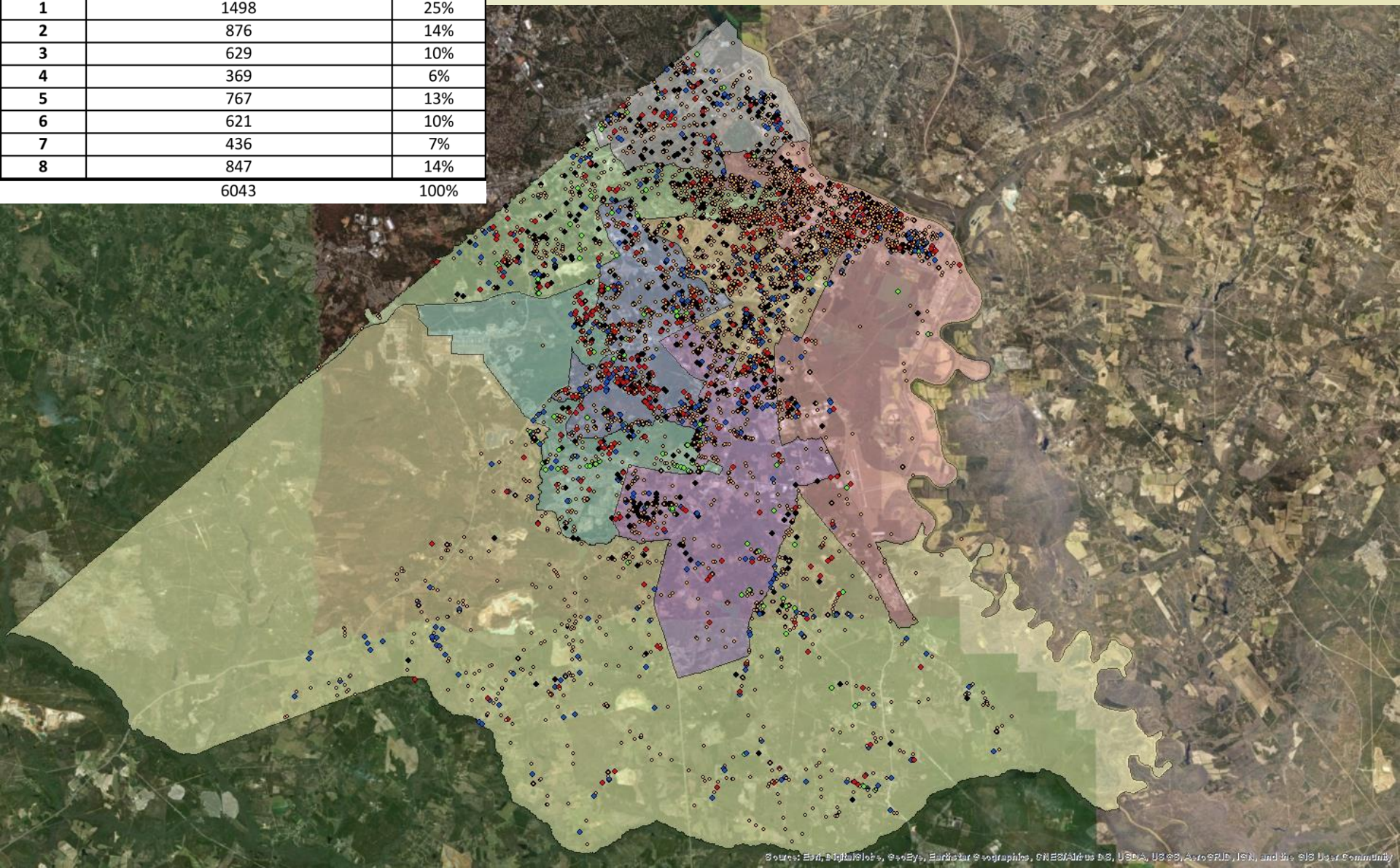
- Stormwater structure inventory
  - 41,000 Drainage Structures / catch basins
  - 582 miles storm pipe
  - 735 miles ditches
  - 696 detention ponds
  - 305 outfalls
- Structural control maintenance and inspection
  - on demand maintenance
  - all inventory needs to be inspected at least once within the 5 year permit cycle
- Planning and development controls
- Street maintenance
- Flood management projects
- Municipal facility inspections and housekeeping
- Pesticide, fertilizer, and herbicide inventory and housekeeping

2016/2017
STORMWATER SUMMARY REPORT
Maintenance

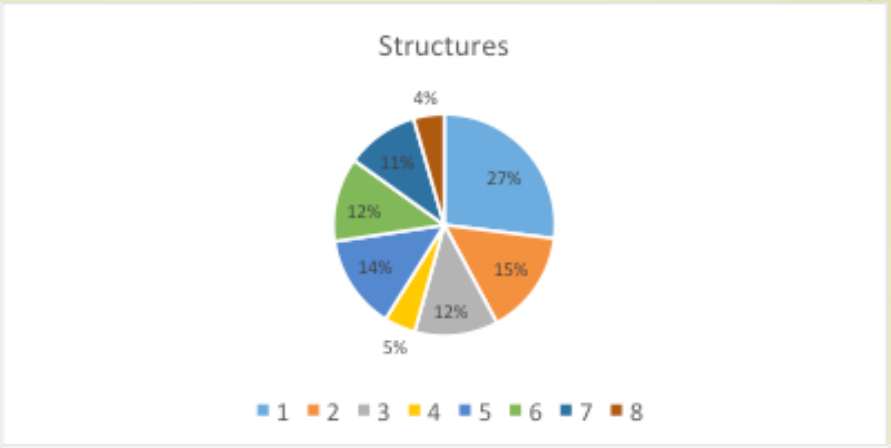
NO.	MAINTENANCE DESCRIPTION	UNIT	2016 ANNUAL TOTAL	2017 ANNUAL TOTAL	TOTAL	
1	Detention Pond Cleaning	Each	112	125	**237**	
2	Ditches Cleaned and Cut	Linear Feet	87,484	80,367	**167,851**	32 mi
3	Litter Pickup	Tons	234	164	**398**	
4	Roadside Mowing	Lane Miles	1,193	869	**2,062**	
5	Spot Mowing with Side Arm Mower	Each	144	3	**147**	
6	Storm Structure Cleaning (Vac Truck)	Each	453	676	**1,129**	
7	Stormpipe Cleaning (Vac Truck)	Linear Feet	6,819	21,708	**28,527**	
8	Storm Water Structures Repaired	Each	85	245	**330**	
9	Sinkholes Repaired	Each	121	204	**325**	
10	Drainage Ditch Regrading	Linear Feet	50,492	21,968	**72,460**	14 mi
11	Drainage Easements Cut	Linear Feet	48,540	41,676	**90,216**	
12	Shoulder Clipping	Linear Miles	16	1	**17**	
13	Dirt Roads Graded	Miles	233	213	**446**	446 mi
14	Trees/Limbs Removed	Each	231	402	**633**	
15	Driveway Repairs	Each	26	55	**81**	
16	Potholes Repaired	Each	250	1,664	**1,914**	
17	Ponds Inspected	Each	58	51	**109**	
18	Drainage Ditches Inspected	Miles	59	234	**293**	
19	Work Orders Received	Each	1,661	4,172	**5,833**	
20	Work Orders Closed	Each	1,408	3,540	**4,948**	85%
21	Initiated Work Orders	Each	772	1,829	**2,601**	

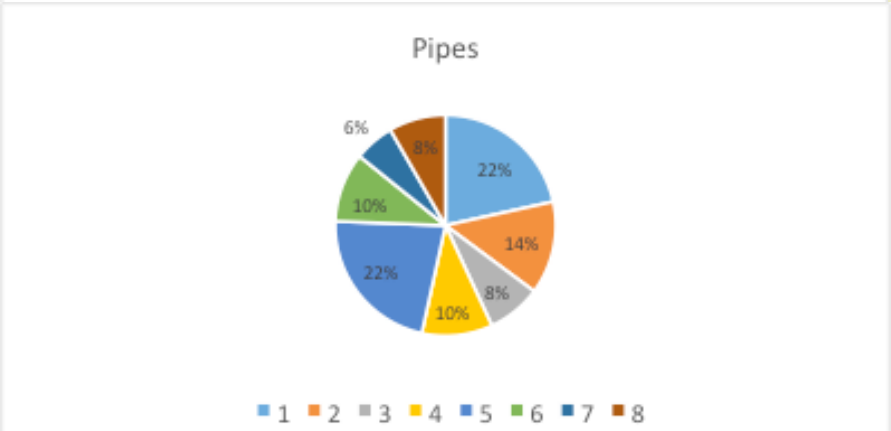
All districts-work orders closed

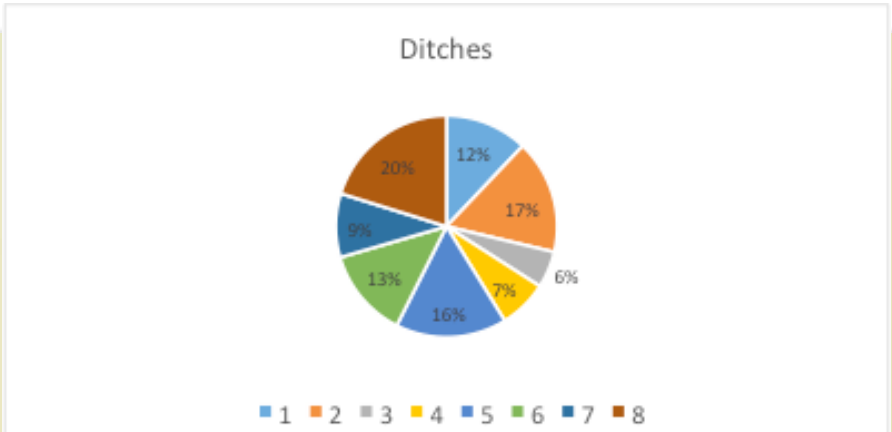
	Work orders closed (2016-current)	Percentage
1	1498	25%
2	876	14%
3	629	10%
4	369	6%
5	767	13%
6	621	10%
7	436	7%
8	847	14%
	6043	100%

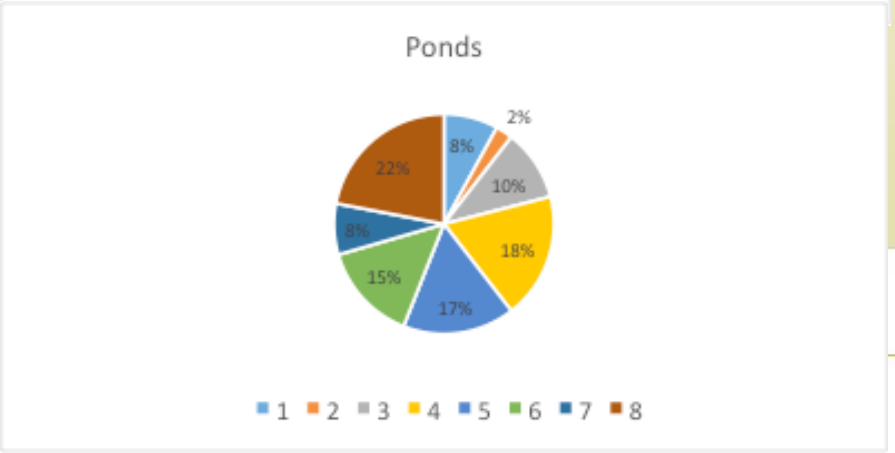


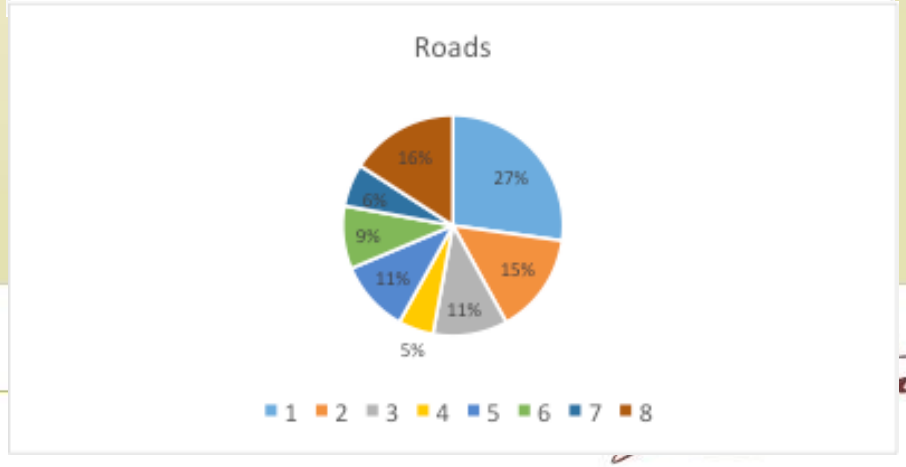
Maintenance activity

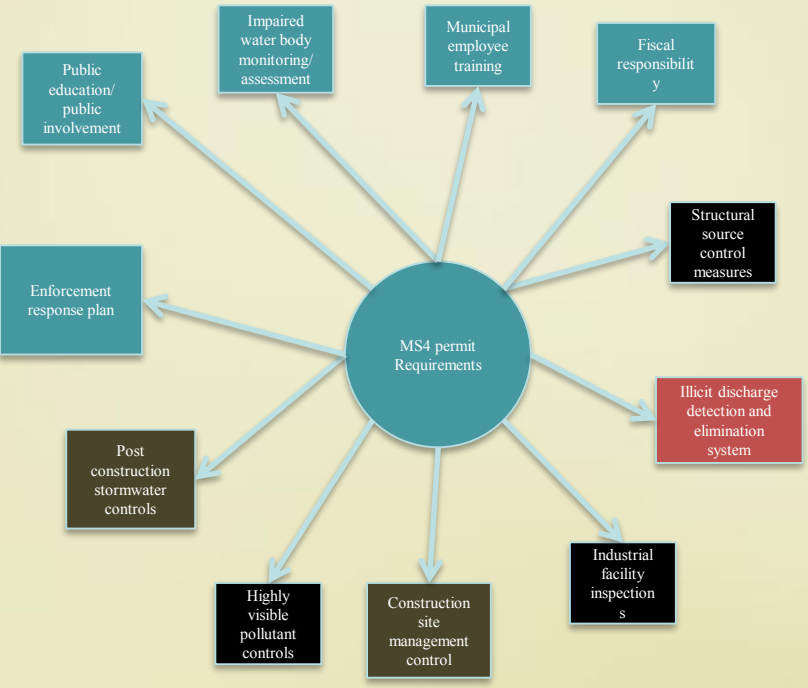






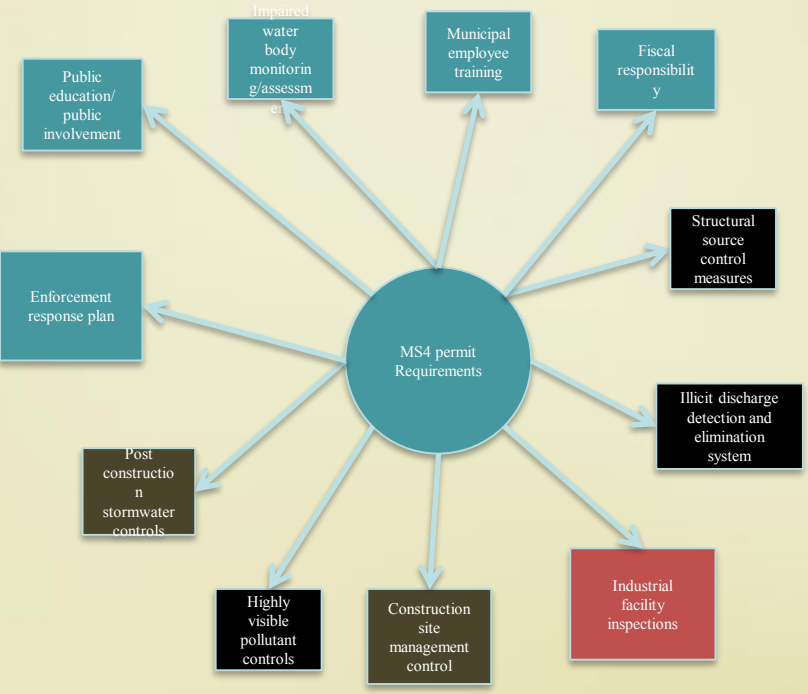






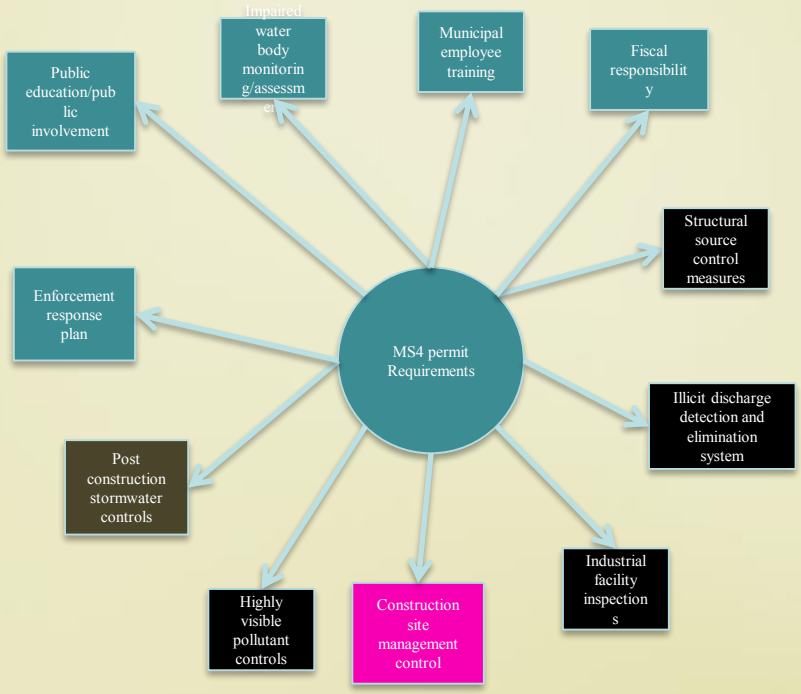
Illicit discharge detection and elimination program

- Outfall inventory
  - 305 outfalls
    - 168 pond outfalls
    - 137 piped outfalls
- Outfall inspections
- Accidental discharges and spills
- Management and disposal plan for used oil and toxic materials



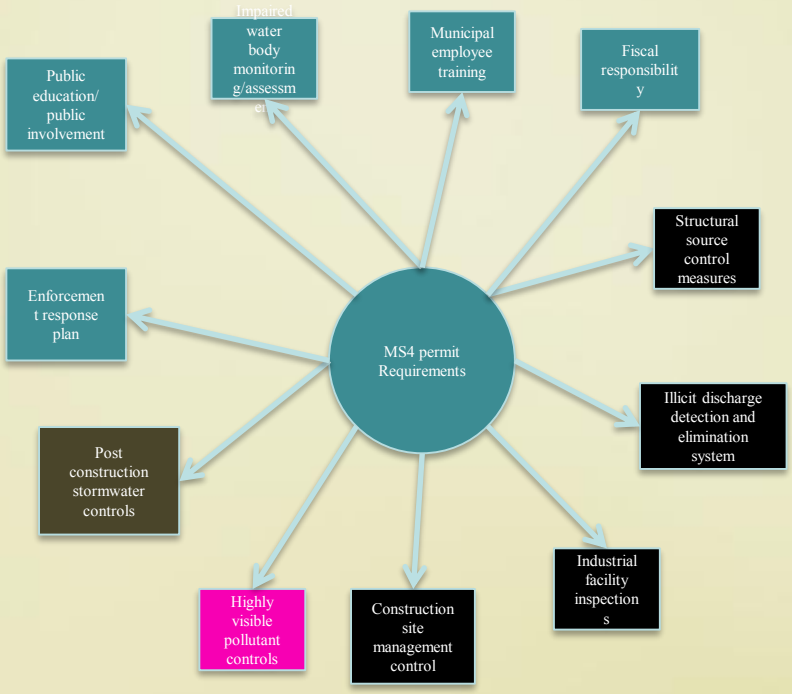
Industrial facility stormwater runoff control

- Industrial facility inventory
  - 64 industrial facilities
- Industrial facility inspections
- Industrial monitoring



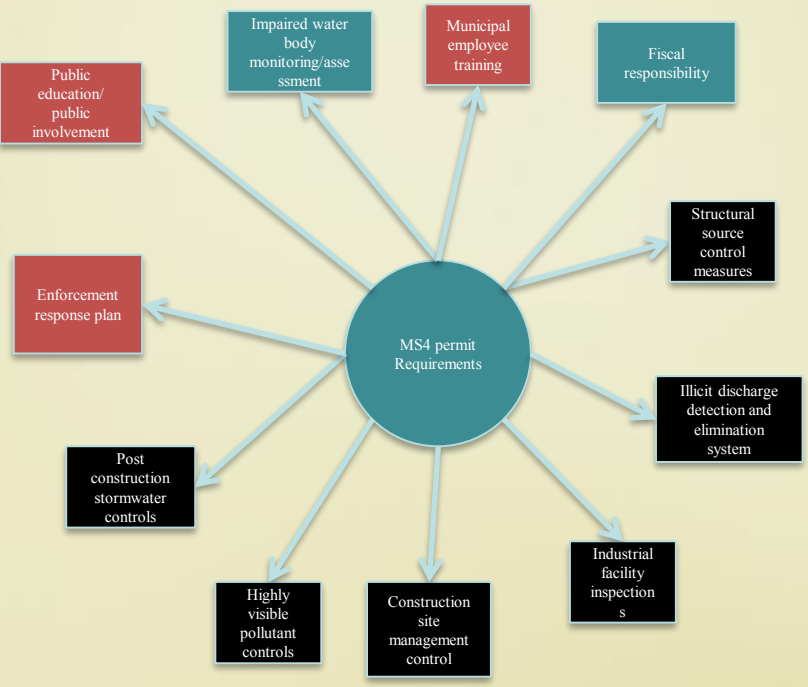
Construction site management and control

- Site plan review
- Erosion, Sedimentation and Pollution Control inspections
- Enforcement

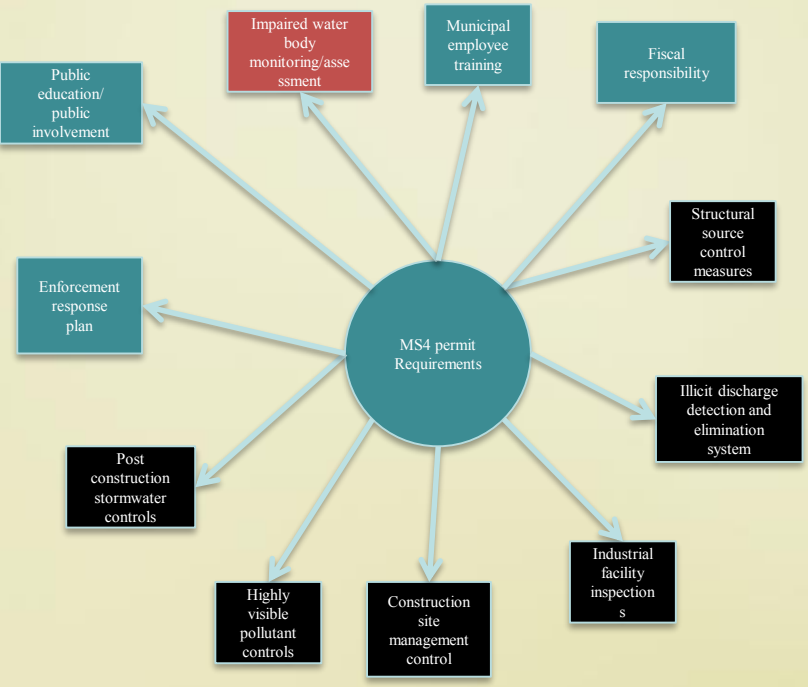


Highly Visible Pollutant sources

- Inventory of facilities with pollution potential
  - e.g. commercial car washes, auto part stores, nurseries, home improvement stores, kennels, veterinary offices, etc.)
  - 288 locations
- Inspection program



- Enforcement response plan
- Public education/public involvement
- Municipal employee training



- Impaired water body plan and monitoring
  - necessary for bringing impaired water bodies back into compliance
  - State issues Total Maximum Daily Load (TMDL)
  - Approved plan and progress reports are required

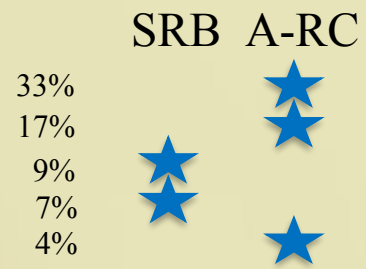
2014 EPA Water Quality Assessment Report-Georgia

Site-specific Targeted Monitoring Results

Causes of Impairment
Georgia Rivers and Streams 2014

Description of this table

Cause of Impairment	Cause of Impairment Group	Miles Threatened or Impaired
Fecal Coliform	Pathogens	4,660.0
Fish Bioassessments	Cause Unknown - Impaired Biota	2,359.0
Dissolved Oxygen	Organic Enrichment/Oxygen Depletion	1,267.0
Mercury in Fish Tissue	Mercury	991.0
Benthic Macroinvertebrates Bioassessments	Cause Unknown - Impaired Biota	626.0
PCB(s) in Fish Tissue	Polychlorinated Biphenyls (PCBs)	401.0
Other Cause	Other Cause	255.0
pH	pH/Acidity/Caustic Conditions	194.0
Lead	Metals (other than Mercury)	69.0
Zinc	Metals (other than Mercury)	58.0
Copper	Metals (other than Mercury)	35.0
Nutrient/Eutrophication Biological Indicators	Nutrients	30.0
Cadmium	Metals (other than Mercury)	23.0
Temperature, Water	Temperature	17.0
Selenium	Metals (other than Mercury)	11.0
Whole Effluent Toxicity (WET)	Total Toxics	10.0
Tetrachloroethylene	Toxic Organics	7.0
Mercury	Mercury	6.0
Toxaphene	Pesticides	5.0
Polychlorinated Biphenyls (PCBs)	Polychlorinated Biphenyls (PCBs)	4.0
Arsenic	Metals (other than Mercury)	3.0
Dieldrin	Pesticides	3.0
Alpha-BHC	Pesticides	1.0
Beta-BHC	Pesticides	1.0
1,1,2-Trichloroethane	Toxic Organics	1.0



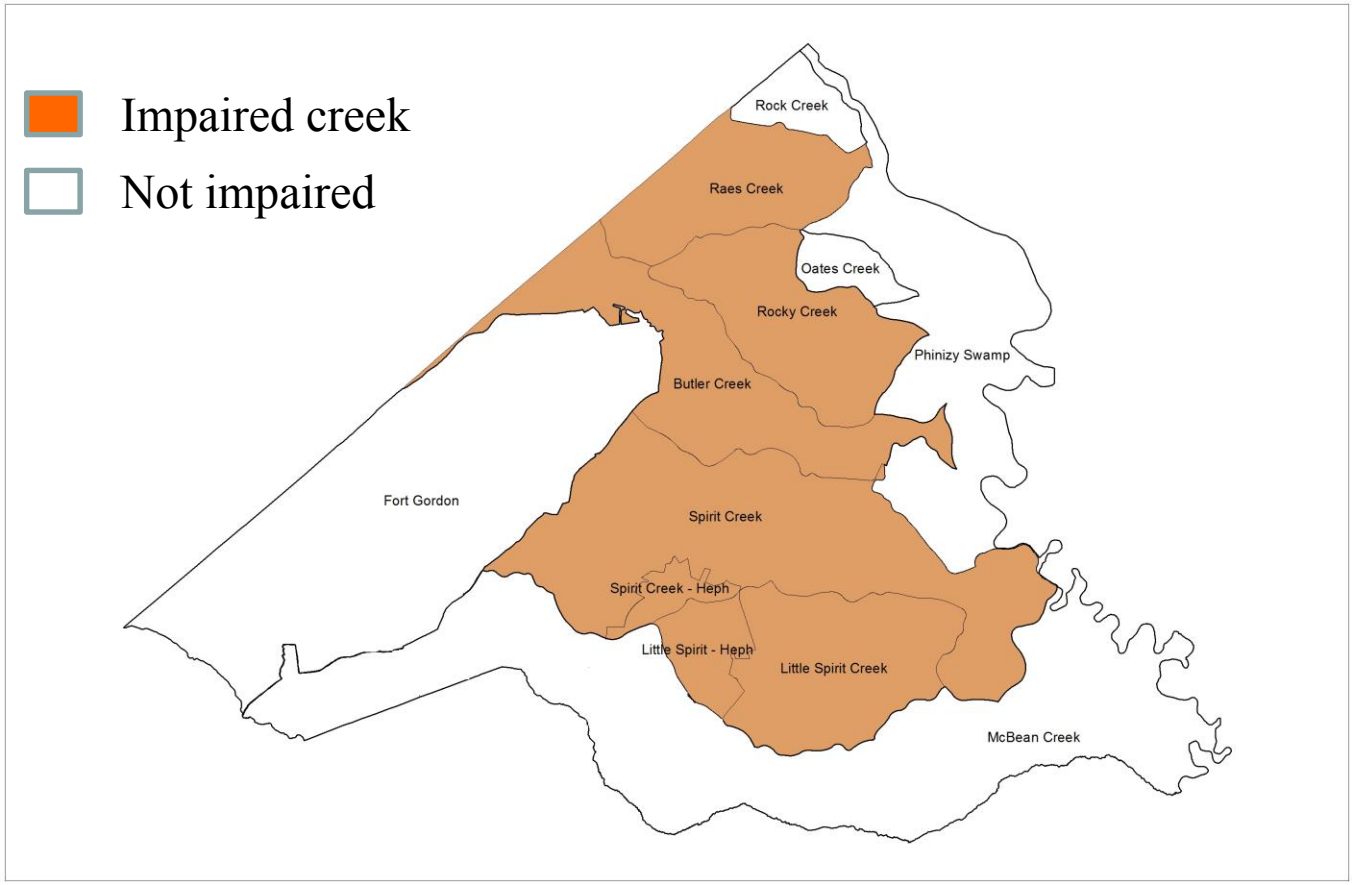
Augusta GEORGIA

Draft 2014 Integrated 305(b)/303(d) List

Streams - Not Supporting Designated Uses

Reach Name/ ID #/ Data Source	Reach Location/ County	River Basin/ Use	Criterion Violated	Potential Causes	Extent		Category	Priority	Notes
Spirit Creek R030601060307 1,4	Marcum Branch to McDade Pond Richmond County	Savannah Fishing	Bio F	UR	14	miles	5	2014	
Stekoa Creek R030601020215 9	Cox Lake to Scott Creek Rabun County	Savannah Fishing	Bio M	NP	3	miles	4a		TMDLs completed Bio M (2001) & FC (2000).
Stekoa Creek R030601020204 9,10,59	Clayton to Chattooga River Rabun County	Savannah Fishing	FC, Bio M	UR	14	miles	4a		TMDLs completed FC (2000) & Bio M (2001).
Stephens Creek R030601040115 1	Headwaters to Middle Fork Broad River Franklin County	Savannah Fishing	FC	NP, M	10	miles	5	2014	
Tallulah River R030601020106 10,59	Upstream Lake Burton Rabun County	Savannah Recreation	FC	NP	11	miles	4a		TMDL completed FC 2005.
Toccoa Creek R030601020401 10	Little Toccoa Creek to Lake Hartwell Stephens County	Savannah Fishing	FC	M, UR	3	miles	4a		TMDL completed FC (2005).
Tributary to Whites Creek R030601080104 56	Headwaters to Whites Creek near Thomson McDuffie County	Savannah Fishing	Cu	I2	2	miles	4b		Data from EPD's Harzardous Waste Branch. Facility under a corrective action plan.

Creeks not meeting water quality standards (2016)

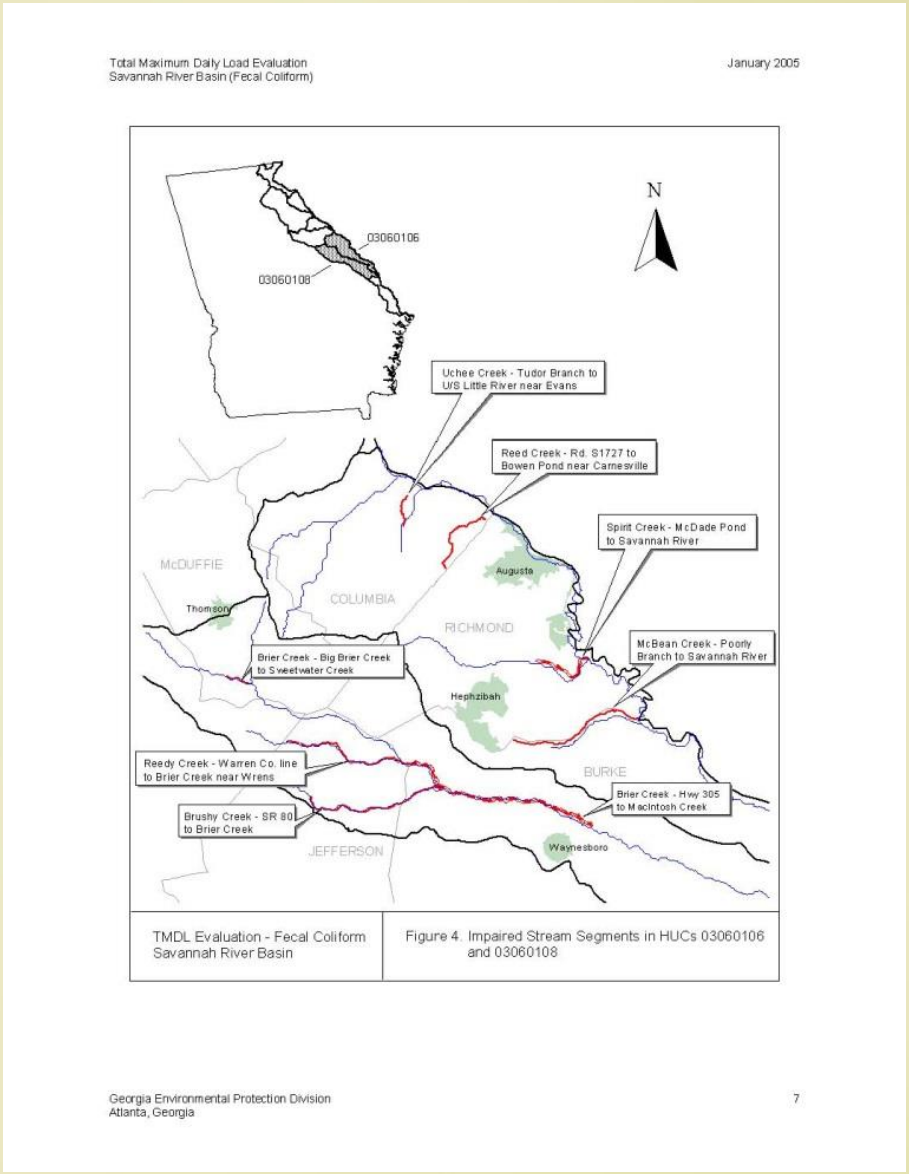


- Raes Creek
  - Fish
  - Aquatic insects
- Rocky Creek
  - Fish
  - Aquatic insects
  - pathogens
- Butler Creek
  - pathogens
- Spirit Creek
  - Fish
  - Aquatic insects

2010 Integrated 305(b)/303(d) List

Streams - Not Supporting Designated Uses

Reach Name/ ID # / Data Source	Reach Location/ County	River Basin/ Use	Criterion Violated	Potential Causes	Extent		Category	Priority	Notes
Shoal Creek R030601021308 9	Headwaters to Pooles Creek Hart County	Savannah Fishing	Bio M	NP	7	miles	4a		TMDL completed Bio(M) 2005.
Shoal Creek R030601021302 9,10,59	Pooles Creek to Lake Hartwell, Parkertown Hart County	Savannah Fishing	FC, Bio M	NP	1	miles	4a		TMDL completed FC (2005), Bio M (2005).
South Creek/Bigger Creek R030601040404 9	Headwaters to Brush Creek Madison County	Savannah Fishing	Bio M	NP	9	miles	4a		TMDL completed Bio(M) 2005.
South Fork Broad River R030601040401 10	Brush Creek to Beaverdam Creek near Comer Madison County	Savannah Fishing	FC	NP	3	miles	4a		TMDL completed FC (2005).
South Fork Broad River R030601040402 10	Clouds Creek to Fork Creek near Carlton Madison/ Oglethorpe County	Savannah Fishing	FC	NP	7	miles	4a		TMDL completed FC (2005).
Spirit Creek R030601060803 10,53	McDade Pond to Savannah River Richmond County	Savannah Fishing	FC	UR	7	miles	4a		TMDL completed FC 2005.



Creeks not meeting water quality standards (2010)

- Spirit Creek
  - pathogens
- McBean Creek
  - pathogens

TMDL Implementation Cost

Total estimated costs to meet the Butler Creek fecal bacteria TMDL. BMPs	Technical Assistance	Total Cost
($)	($)	($)
$2,265,550	$142,500	$2,408,050

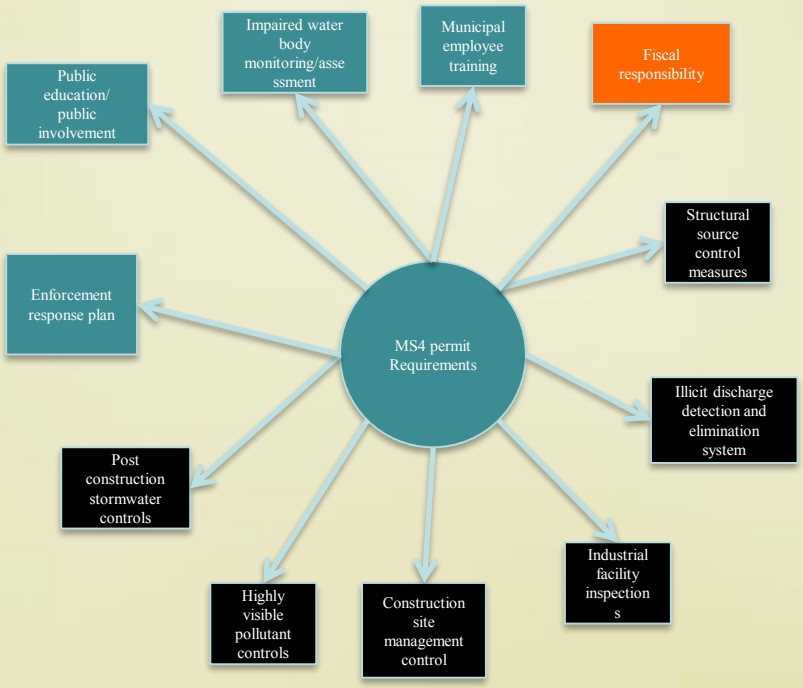
Stream Restoration

Stream Restoration / Feet = $300

Stream Stabilization / Feet = $75

Source: Virginia Dept. of Environmental Quality Bacteria and Sediment TMDL Implementation Plan

Total estimated costs to meet the Rocky Creek fecal bacteria TMDL. BMPs	Technical Assistance	Total Cost
($)	($)	($)
$2,402,400	$142,500	$2,554,900



- Fiscal responsibility
  - state requires proof that MS4 activities can be paid for through sustainable funding mechanism

FY 2016

Augusta Stormwater Permit Compliance	Needed Funds/ year
• Inspection, maintenance & repair ponds	$350,000
• Maintenance and repair of stormwater outfall	$100,000
• Maintenance of storm lines	$500,000
• Repair & replacement of storm lines	$5,000,000
• Maintenance of ditches	$500,000
• Maintenance and repair storm inlets & traps	$750,000
• Street sweeping county road system	$750,000
• Litter management and right-of-way maintenance	$2,500,000
• Retrofit existing detention pond	$200,000
• Illumination of illicit discharges to storm sewer system	$100,000
• Creek water quality monitoring and corrective measures	$350,000
• EPA Total Maximum Daily Load (TMDL) Implementation /watershed (three watersheds)	$1,500,000

FY 2016

Augusta Stormwater Permit Compliance	**Needed Funds/ year**
• Training County Staff, Local Industry,	$40,000
Local Businesses in stormwater Pollution Prevention Integrated Management Practice	
• Educate General Public in stormwater Pollution Prevention Best Management Practices	$25,000
• EPA New Requirement- Green Infrastructure Implementation & Maintenance Program	$250,000
• EPA New Requirement- Low Impact Development Implementation & Maintenance Program	$250,000
• EPA New Requirement- Post Construction Stormwater Control Program	$350,000
• Staff and accessories to carry out tasks 1 through 17	$1,500,000
Total Annual Funds need	**$15,015,000**

Funding

- Stormwater management is a state and federally-mandated program that requires Augusta to regulate and monitor stormwater in an effort to reduce pollution. However, federal or state governments do not provide funding.

- Revenues needed to support this mandated program are provided through General Funds (property tax), or combination of various funding sources such as Stormwater Utility.

AUGUSTA CURRENT STORMWATER MANAGEMENT LEVEL OF SERVICE (LOS)

LEVEL OF SERVICE (LOS)		PROGRAM MANAGEMENT ACTIVITIES	NPDES COMPLIANCE ACTIVITIES		CAPITAL IMPROVEMENT PROJECTS
			NON OPERATION & MAINTENANCE COMPLIANCE ACTIVITIES	OPERATION & MAINTENANCE PROGRAM ACTIVITIES	
A	5	Comprehensive Planning + Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/100% Routine	10-year Plan
B	4	Proactive Planning + Systematic CIP Implemenation Capabilities	Proactive Permit Compliance	Mixture of Routine and Inspection Based	20-year Plan
C	3	Priority Planning + Minimal CIP Implementation Capabilities	Minimal Permit Compliance	Inspection Based	40-year Plan
D	2	Reactionary Planning + Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only (Complaint-based)	50-year Plan
F	1	No Planning + No CIP Implementation Capabilities	Non-Compliance	Less than Full Response to all Complaints	75-year Plan (No Plan)
AUGUSTA CURRENT SCORE:		**1.75**	**D-**		
PRE-STORMWATER FEE:					

SOURCE: Level of Service (LOS) Chart – Southeastern Stormwater Association (SESWA) and CDM Smith

Drainage Problems

Lenox Rd _ Butler Creek

Apple Valley Subdiv.- Drainage Ditch

Belair Estate – Beaver Problem

Bath Edie Rd

SandRidge Subdiv. – Failing control structure and outfall

Orchard Subdivision – Brown Rd

Walton Farm subdivision – Drainage & Failing Road

Wood Lake Subdiv.– failing control structure

MAJOR REASONS FOR AUGUSTA, GA TO IMPLEMENT A STORMWATER UTILITY

1. Compliance with Augusta's Stormwater Permit.
2. Improved Response to Augusta Customer Requests.
3. Rehabilitation of Failing Infrastructure.
4. Maintenance of the Municipal Stormwater Conveyance System.
5. Implementing Watershed Master Plan.

AUGUSTA PLANNED STORMWATER MANAGEMENT LEVEL OF SERVICE (LOS)

LEVEL OF SERVICE (LOS)		PROGRAM MANAGEMENT ACTIVITIES	NPDES COMPLIANCE ACTIVITIES		CAPITAL IMPROVEMENT PROJECTS
			NON OPERATION & MAINTENANCE COMPLIANCE ACTIVITIES	OPERATION & MAINTENANCE PROGRAM ACTIVITIES	
A	5	Comprehensive Planning + Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/100% Routine	10-year Plan
B	4	Proactive Planning + Systematic CIP Implemenation Capabilities	Proactive Permit Compliance	Mixture of Routine and Inspection Based	20-year Plan
C	3	Priority Planning + Minimal CIP Implementation Capabilities	Minimal Permit Compliance	Inspection Based	40-year Plan
D	2	Reactionary Planning + Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only (Complaint-based)	50-year Plan
F	1	No Planning + No CIP Implementation Capabilities	Non-Compliance	Less than Full Response to all Complaints	75-year Plan (No Plan)
AUGUSTA PROPOSED SCORE:		**4.50**	**B+**		
POST-STORMWATER FEE:					

SOURCE: Level of Service (LOS) Chart – Southeastern Stormwater Association (SESWA) and CDM Smith

2017 ANNUAL
STORMWATER SUMMARY REPORT
Billed vs. Revenue

	Month	Amount billed	Revenue generated	% collected
Quarter 1	**January-17**	$ 1,101,482	$ 1,254,232	109%
	February-17	$ 1,152,397	$ 1,005,857	91%
	March-17	$ 1,186,133	$ 1,192,440	103%
Quarter 2	**April-17**	$ 1,190,422	$ 1,091,180	92%
	May-17	$ 1,194,009	$ 1,078,591	91%
	June-17	$ 1,207,626	$ 1,051,912	88%
Quarter 3	**July-17**	$ 1,063,716	$ 1,204,108	100%
	August-17	$ 1,214,000	$ 1,068,192	100%
	September-17	$ 1,209,089	$ 1,061,303	87%
Quarter 4	**October-17**	$ 1,205,376	$ 1,135,736	94%
	November-17	$ 1,184,528	$ 1,029,237	85%
	December-17	$ 1,167,094	$ 1,068,018	90%
	2017 TOTALS	**$ 14,075,873**	**$ 13,240,806**	**94%**
	2016 TOTALS	**$ 13,830,767**	**$ 10,917,101**	**87%**

- Fenwick Street-2nd Level Canal Bridge

- Birdwell Road

Bull Street Detention Pond

Lake Dredging

2016
STORMWATER IMPROVEMENTS
Small/Medium Capital Projects

During Construction

During Construction

FEATURED PROJECT: Longleaf Court

2016 L
STORMWATER IMPROVEMENTS
Small/Medium Capital Projects

FEATURED PROJECT: Longleaf Court

Drainage ditches regraded

- 2332 Travis Pines Dr.

Before

During

After

2017
STORMWATER SUMMARY REPORT
Maintenance

Storm Structure Cleaning

203 Metcalf St.

Before

After

Sinkhole Repair

- 516 Forsythe St.

Before

During

After

2017
STORMWATER SUMMARY REPORT
Maintenance

Ditches cleaned/cut

1140 Walton Trail

Before

After

2016 ANNUAL
STORMWATER SUMMARY REPORT
Small/Medium Capital Projects and Expenditures

NO.	PROJECT	DESCRIPTION	COST	2016 ANNUAL REPORT
1	1429 Ridgewood Dr.	Flooding	$12,150	Construction Completed
2	1911 Colony Park Place	Replace failing 18" storm sewer pipe	$35,880	Construction Phase
3	1st and Greene	Storm line replacement	$25,000	Construction Completed
4	210 Kings Chapel Rd.	Install new storm line to correct flooding	$150,000	Construction Phase
5	2305 Peach Blossom Pass	Regrade storm drain ditch	In-house	Construction Completed
6	2327 Ridge Road	Flooding	$20,555	Construction Phase
7	2510 Lindsey Rd.	Storm pipe & road failing	$93,911	Construction Phase
8	2720 Fawn Dr.	Replace corrugated metal pipe	$24,995	Construction Completed
9	2724 Smith Dr.	Storm drain line replacement/Drainage regrading	$24,821	Construction Completed
10	3024 Meadowlark Drive	Corrugated pipe replacement	$50,000	Construction Phase
11	3030 Longleaf Ct.	Installation of pipe and ditching to alleviate flooding issues.	$147,440	Construction Completed
12	3103 Belmont Ave.	Replace failing cross drain and side drain.	$34,228	Construction Completed
13	3125 Oxford Rd.	Storm drain repair & replacement,	$16,570	Construction Phase
14	3250 Wedgewood Drive	Storm pipe and road failure	$100,000	Construction Phase
15	3318 Wheeler Rd.	Collapse storm box & flooding in backyard	$11,780	Construction Completed

2016 ANNUAL
STORMWATER SUMMARY REPORT
Small/Medium Capital Projects and Expenditures

NO.	PROJECT	DESCRIPTION	COST	2016 ANNUAL REPORT
16	3326 Libby Dr.	Corrugated pipe replacement	$92,898	Construction Phase
17	3337 Ravenwood Dr.	Replace corrugated metal pipe	$75,500	Construction Phase
18	Bedford Drive	Extend 30" RCP/level roadway	$43,000	Construction Completed
19	Ellis Street	Replace failing 48" brick storm line	$123,268	Construction Completed
20	Happy Circle	Sink hole repair, on-call	$50,000	Construction Phase
21	Henry Brigham Center	Bank Stabilization	$24,450	Construction Completed
22	Meadow Wood Dr.	Replace failing 24" storm water pipe.	$52,939	Construction Phase
23	Oleander Drive	Replace drainage pipe	$15,000	Construction Phase
24	Oxford Rd.	Supplemental work to correct flooding issues.	$97,859	Construction Phase
25	Patterson Bridge Rd.	Culvert Replacement	$500,000	Construction Completed
26	Pleasant Home Rd.	Replace failing 36" CMP pipe	$80,305	Construction Phase
27	Skinner Rd. Detention Pond	Install outlet structure and outfall pipe	$109,501	Construction Phase
28	Lennox Road	Flooding and drainage issues	$35,000	Construction Phase
29	Wakefield Court	Drainage improvements	$198,161	Construction Phase
		TOTAL:	**$2,245,210**	

2017 ANNUAL
STORMWATER SUMMARY REPORT
Small/Medium Capital Projects and Expenditures

NO.	PROJECT ADDRESS	DESCRIPTION	COST	STATUS
1	Third Street	Sidewalk Section Replacement	$ 42,000.00	Complete
2	1262 Paramount Ct.	Fence Replacement at Pond	$ 1,545.00	Complete
3	2510 Lindsey Road	Storm Pipe Replacement	$ 61,200.00	Complete
4	3337 Ravenwood Dr.	Storm Pipe Replacement	$180,427.53	Awaiting P.O. Work Should Start Early 2018
5	3326 Libby Dr.	Storm Pipe Replacement	$ 92,898.00	
6	210 Kings Chapel Rd.	Install new storm line to correct flooding	$150,000.00	Design complete; Start early 2018
7	Happy Circle	Sink hole repair, on call	$ 50,000.00	Being Evaluated
8	1478 Goshen Rd.	Storm Line Replacement	$ 10,511.50	Complete
9	1911 Colony Park Place	Replace failing storm line	$ 35,750.00	Complete
10	3125 Oxford Rd.	Supplemental work to correct flooding issue	$ 97,859.02	Complete
11	4338 White Pines Ct.	Fence Replacement	$ 5,950.00	Complete
12	Skinner Rd. Pond	Clean Pond. Install new outlet structure and outfall pipe. Repair Driveway	$238,550.25	Complete
13	322 Pleasant Home Rd.	Replace failing 36" cmp pipe	$119,521.50	Complete
14	Third Street and Telfair	Sidewalk Repair/Replacement and ADA ramp improvements	$242,195.59	Complete
15	1735 Lawrence Rd.	Fence Replacement at Pond	$ 16,100.00	Complete
16	Russell St. Improvements	Install new curb and gutter and driveway aprons, extend existing sidewalks, Resurface	$396,971.86	Complete
17	Cresant Dr.	Repave section of Cresant Dr. adjacent to Wrightsboro Rd.	$ 19,404.00	Complete
18	Meadowwood Dr.	Replace failing storm line	$ 52,939.28	Complete
19	2002 Virginia Avenue	Culvert Repair – Replace two wing walls on outlet end, add outlet apron.	$ 71,671.25	Work to start early 2018
20	970 Baker Ave.	Sidewalk section replacement	$ 49,355.76	Complete
21	4014 Burning Tree Lane	Line Failing Storm Line	$ 39,640.00	Complete
22	3604 Meadowlark Dr.	Replace Failed Storm Line	$ 65,989.36	Complete

2017 ANNUAL
STORMWATER SUMMARY REPORT
Small/Medium Capital Projects and Expenditures

NO.	PROJECT ADDRESS	DESCRIPTION	COST	STATUS
23	Smith Creek Rd.	Mill and resurface roadway	$ 69,871.24	Complete
24	1850 Gordon Highway	Replace Failed Storm Line	$158,184.47	Complete
25	2414 Lennox Rd.	Install berm to prevent flooding	$ 61,490.50	Complete
26	Old Waynesboro Rd. at 4-H Club Rd.	Widen Intersection, Clean Ditches	$ 37,696.00	Complete
27	3338 Sugar Mill Rd.	Replace failed storm line and repair adjacent damaged yards	$ 71,868.35	Complete
28	Ranch Dr., Augusta Tech. Dr., Pineview Rd.	Remove roots from roadway, Patch and re-pave road	$ 46,445.77	Complete
29	3518 Edgeworth Dr.	Repair storm line and replace junction box	$ 81,394.03	Complete
30	3655 Bermuda Circle	Replace failed storm line	$ 30,739.50	Complete
31	2821 Hillcrest St. near Belmomt Ave.	Remove roots, replace damaged concrete roadway and curb/gutter	$ 46,285.40	Complete
32	2920-2948 Wakefield Ct.		$ 99,650.40	Complete
33	1114 Walton Trail	Mill and Resurface damaged roadway section	$ 31,985.80	Complete
34	Cardigan St. at Corning St.	Remove damaged concrete swale, raise curb/gutter, repave intersection	$ 40,984.06	Complete
35	1850 Kissingbower Rd.	Remove lodged debris from cross drain	$ 18,121.00	Complete
36	339 Alex Lane	Replace Concrete Headwalls, install outlet rip rap and repair flume	$ 45,915.00	Complete
37	2940-2946 Wakefield Ct.	Replace failed storm system	$256,080.87	Complete
38	3007 Libby Rd.	Replace and Repair Structures/Pipe	$ 25,965.50	Complete
39	3833 Farrington Dr.	Replace Storm Line	$ 61,036.00	Complete
40	3118 Arcadia Dr.	Line Storm Pipe	$ 38,090.00	Complete
41	Fourth and Telfair St.	Sidewalk section replacement	$ 33,325.00	Complete
42	557 Greene Street	Sidewalk section replacement	$ 56,053.00	Complete
43	3165 Damascus Rd.	Storm Pipe Replacement	$ 6,800.00	Complete
44	Lake Forrest Rd./Milledgeville Rd.	Replace Side Walk Sections	$ 29,019.60	Complete

2017
STORMWATER SUMMARY REPORT
Small/Medium Capital Projects and Expenditures

NO.	PROJECT ADDRESS	DESCRIPTION	COST	STATUS
45	2374 Wheeless Rd.	Repair 84" Storm Line	$ 15,500.00	Complete
46	1209 Alden Rd.	Repair Storm Line and Inlet Box	$ 8,600.00	Complete
47	Intersection Norton Drive & Wells Drive	Level and Resurface Intersection	$ 26,434.87	Complete
48	Norton Road	Drainage and Roadway Impovements	$120,382.50	Complete
49	1894 McDade Rd.	Storm Line Replacemnet	$ 18,786.40	Complete
50	3106 Goolsby Rd.	Ditch Evcavation/Repair	$ 21,100.00	Complete
51	Summerchase Circle	Line Defective Storm Line	$ 99,700.00	Complete
52	954 Fifth Street	Sidewalk section repl.	$ 34,854.00	Complete
53	2727 Wicklow Rd./2612 Willowwood	Storm Line Replacement	$ 85,078.58	To start early 2018
54	Buena Vista/Lake Forest	Storm Line Replacement and Road Repair	$277,647.15	Complete
55	Various Locations West Augusta	Inlet Top Replacement	$ 16,623.97	In-Progress, Completion First Quarter, 2018
56	Various Locations South Augusta	Inlet Top Repalcement	$ 16,783.51	In-Progress, Completion First Quarter, 2018
57	Various locations in Forest Hills Area	Brick Paver Replacement	$114,896.46	In-Progress, Completion First Quarter, 2018
58	255 Camila Dr.	Pipe Replacement in Pond	$278,340.14	Complete
59	2480 Cross Creek Rd	Storm Line Replacement	$ 10,617.50	Complete
60	2929 Meadowbrook	Line Defect. Storm Pipe	$ 88,100.00	Complete
61	302 Third Street	Sidewalk/Paver replac.	$ 37,842.48	Awaiting P.O. Work should start early 2018
62	Fayetteville Dr	Sidewalk/Shoulder Rep.	$ 20,064.63	Awaiting P.O. Work should start early 2018
63	440 Walton Way	Resurfacing	$ 44,470.00	Awaiting P.O. Work should start early 2018
64	Willis Foreman Rd.	Sidewalk Repair	$ 76,235.75	Awaiting P.O. Work should start early 2018
65	1055 Heph-McBean Rd./1529 Brown Rd/5045 Old Waynesboro Rd.	Pipe Installation and ditch regrade	$ 13,661.75	Complete
66	3773 Farrington Drive	Replace Storm Line	$ 36,983.00	Work to start early 2018
67	12th and Ellis	Replace Storm Line and Structure	$ 47,472.20	Complete

2017
STORMWATER SUMMARY REPORT
Small/Medium Capital Projects and Expenditures

NO.	PROJECT ADDRESS	DESCRIPTION	COST	STATUS
68	3250 Wedgewood	Replace Storm Line and Repair Roadway	$ 86,196.75	To Start Early 2018
69	Rosier Rd./J.Dewey Gray Circle, and others	Remove Roots and Repave	$ 19,476.30	Complete
70	Bermuda Circle	Remove Roots and Repave	$ 12,100.20	Complete
71	Beaufort Dr.	Repair drive and sidewalk	$ 17,049.00	Complete
72	3102 Bellameade	Curb/Gutter and Drive Repair	$ 5,219.42	Complete
73	2206 Lindsey Rd. & Rhodes Dr.	Line storm drain line and resurface roadway	$ 57,619.54	Complete
74	1923 Kristy way	Driveway and Fence Repair	$ 15,759.80	Complete
75	3224 Hampton Circle	Driveway Repair	$ 4,102.80	Complete
76	1437 Waters Edge	Structure and Ditch Repair	$ 44,605.00	Complete
77	Thread Needle @ Chatham	Inlet Box Top Repair	$ 2,808.50	Complete
78	Travis Rd./Donald Rd. & Others	Root Removal/Driveway Repair and Resurface	$ 24,180.00	Complete
79	603 Third Street and Bay Street	Sidewalk Repair	$ 30,623.00	Complete
80	McCoy Road	Storm Cross Drain Replacement	$ 28,096.20	Complete
81	1225 Carrier Place/2802 Glenn Hills Circle	Storm Line Replacement	$ 23,632.50	Completion expected Early 2018
82	Kentwood Dr./Goldfinch Dr. and other Locations	Inlet Box Top Repair	$ 24,757.15	Complete
83	1933 Roys Ln/2508 Hanover Rd.	Storm Line Replacement	$ 54,027.93	Completion expected Early 2018
84	Pinnacle Way and Crest	Drainage Ditch Repair and Rip-Rap	$ 37,490.00	Completion expected Early 2018
85	Forth and Telfair	Sidewalk Repair	$ 33,325.00	Complete
86	Riverwalk	Slope Repair and Rip Rap	$ 19,750.00	Complete
87	1812 Phinizy Rd.	Sidewalk installation and asphalt placemnet	$ 8,925.60	Complete
88	1478 Goshen Rd.	Storm Line Repalcement	$ 10,511.50	Complete
89	2439 Dublin Drive	Storm Box and storm line repair	$ 14,126.03	Complete

2017
Small/Medium Projects

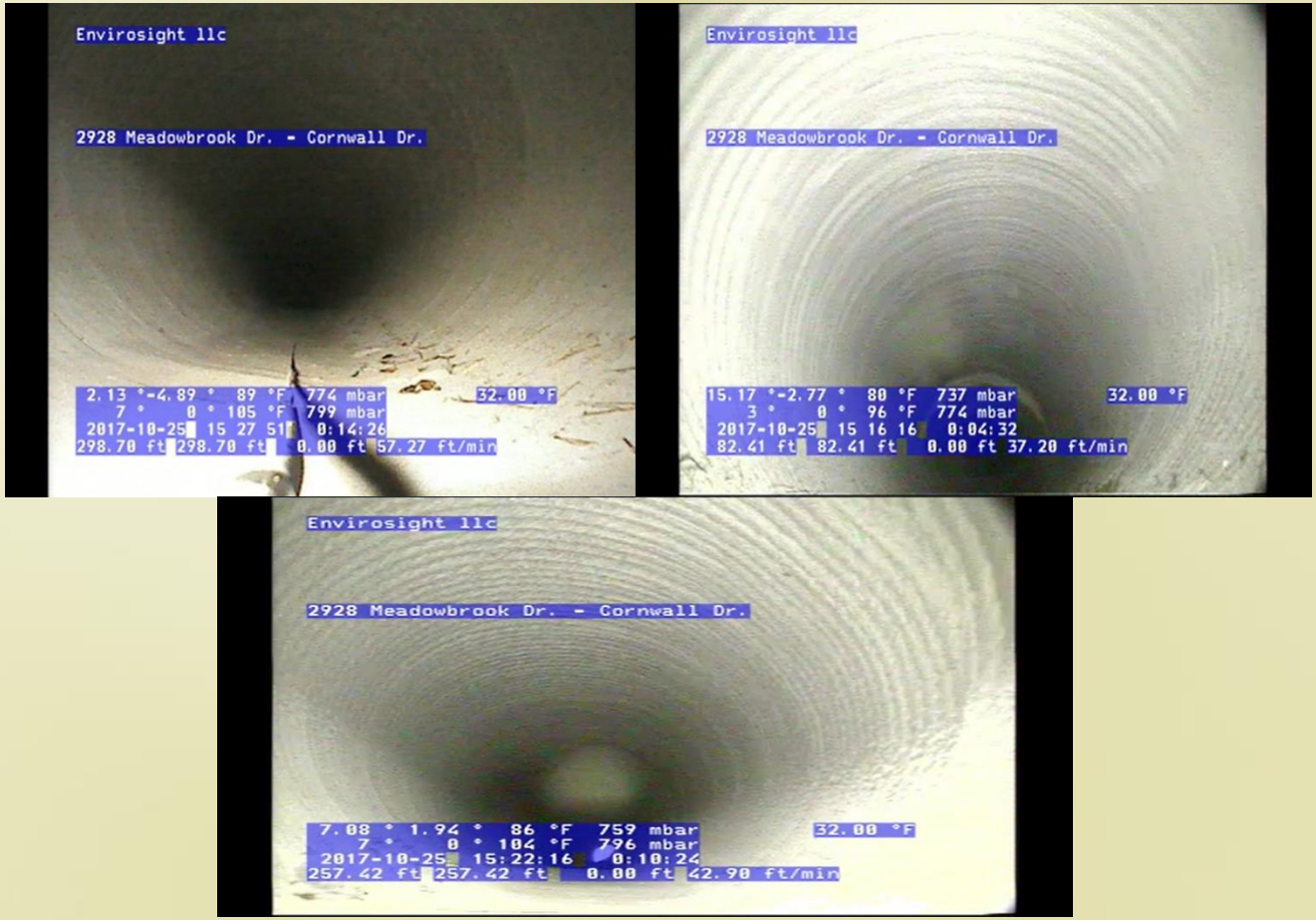
- 3604 Meadowlark Road
- Pipe Replacement
- Cost – $65,989.36
- Previous Status – N/A
- Current Status – Complete

2017
Small/Medium Projects

- Buena Vista @ Lake Forest & 3006 Lake Forest
- Concrete Road & Pipe Replacement
- Cost - $277,647.15
- Previous Status – N/A
- Current Status - Complete

2017
Small/Medium Projects

- 2929 Meadowbrook Drive
- Pipe Lining
- Cost – $88,100.00
- Previous Status – N/A
- Current Status – Complete

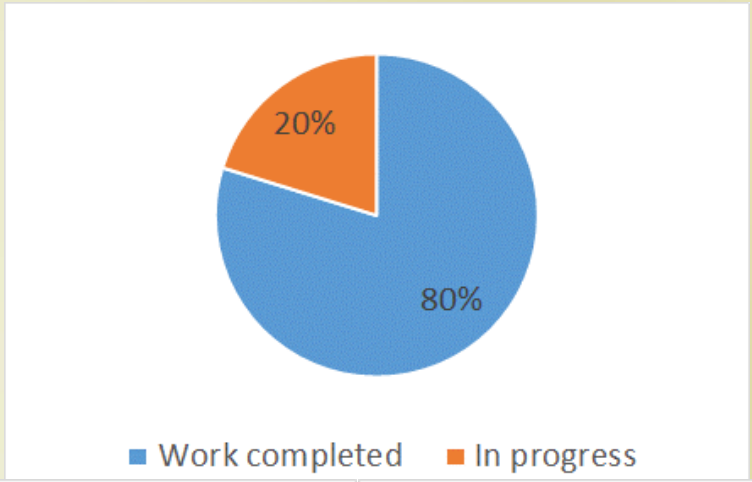


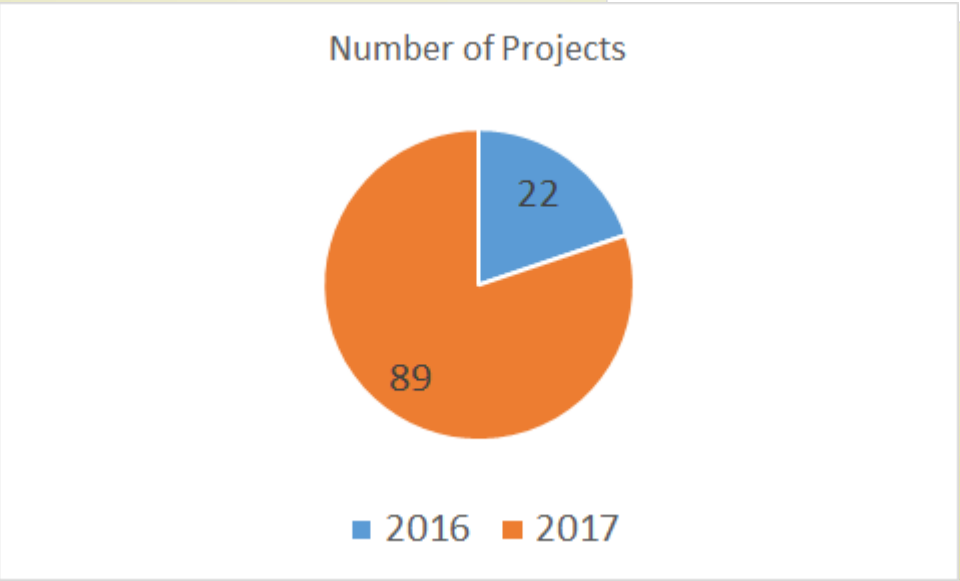
2017
Small/Medium Projects

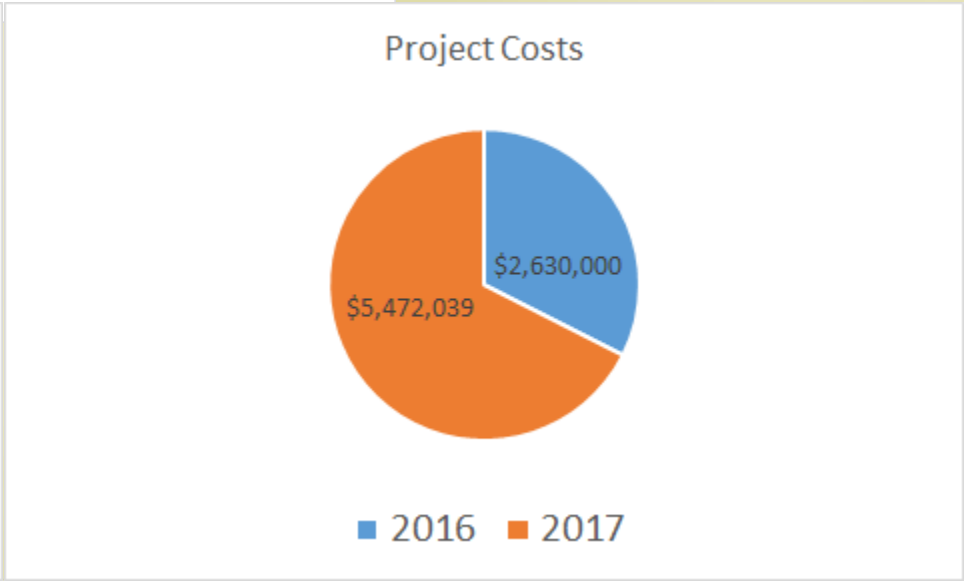
- 255 Camila Drive
- Outfall Structure & Pipe Replacement
- Cost - $278,340.14
- Previous Status: N/A
- Current Status: Complete

6/5/2018

2016/2017
STORMWATER SUMMARY REPORT
Small/Medium Capital Projects and Expenditures







2016/2017 ANNUAL
STORMWATER SUMMARY REPORT

- Since 2016, citizens have retained over $800,000 through detention, water quality, education, and other credit options
- Over 2,100 Impervious Area requests have been completed over the two year period
- For stormwater Customer Service Representatives, over 1,200 customers assisted in person and over 5,000 calls received on 2017
- Current focus on refining the program through optimizing workflows, analyzing/processing delinquent accounts and returned mail, and updating impervious area database

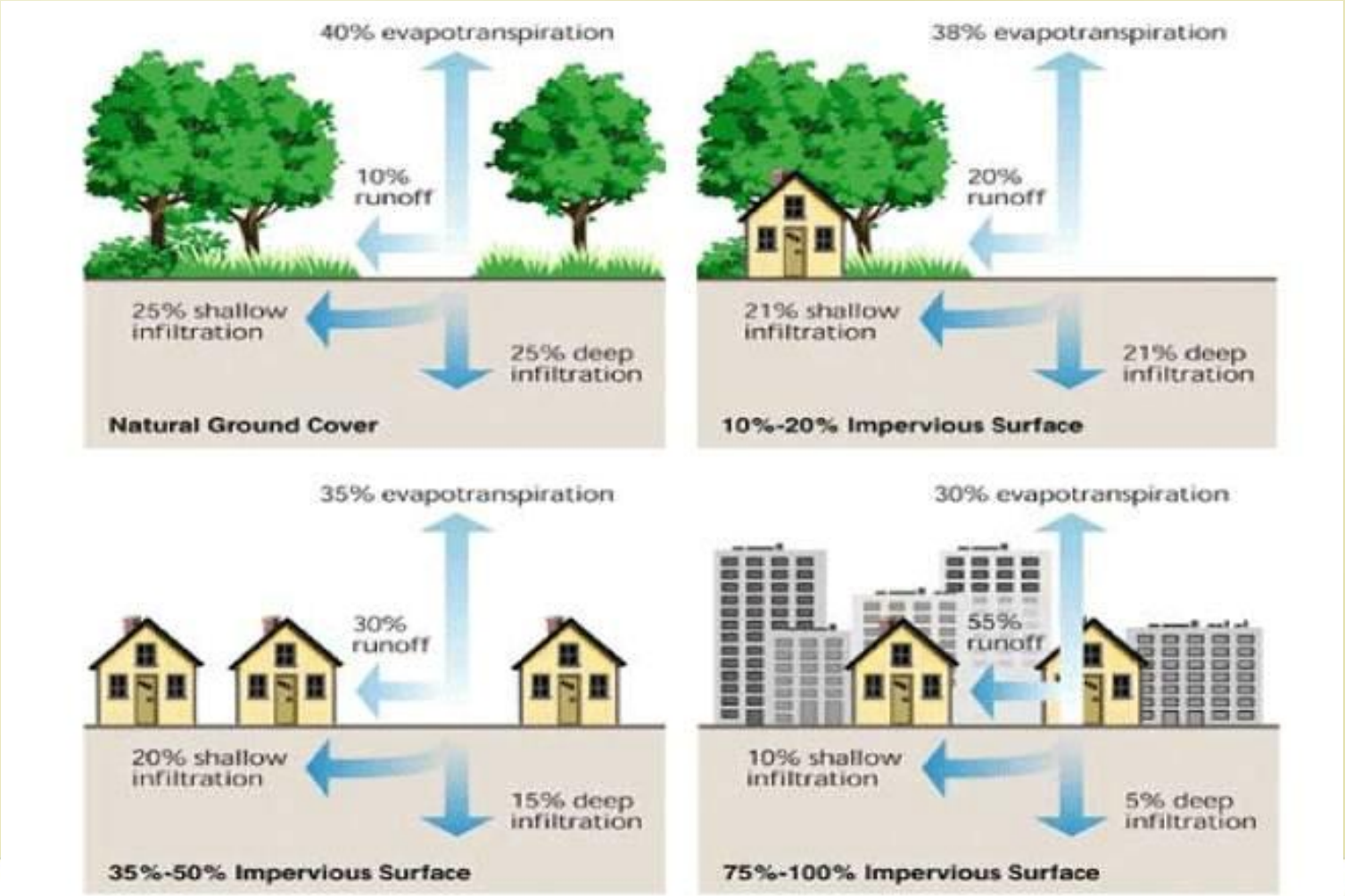
Common concerns and questions

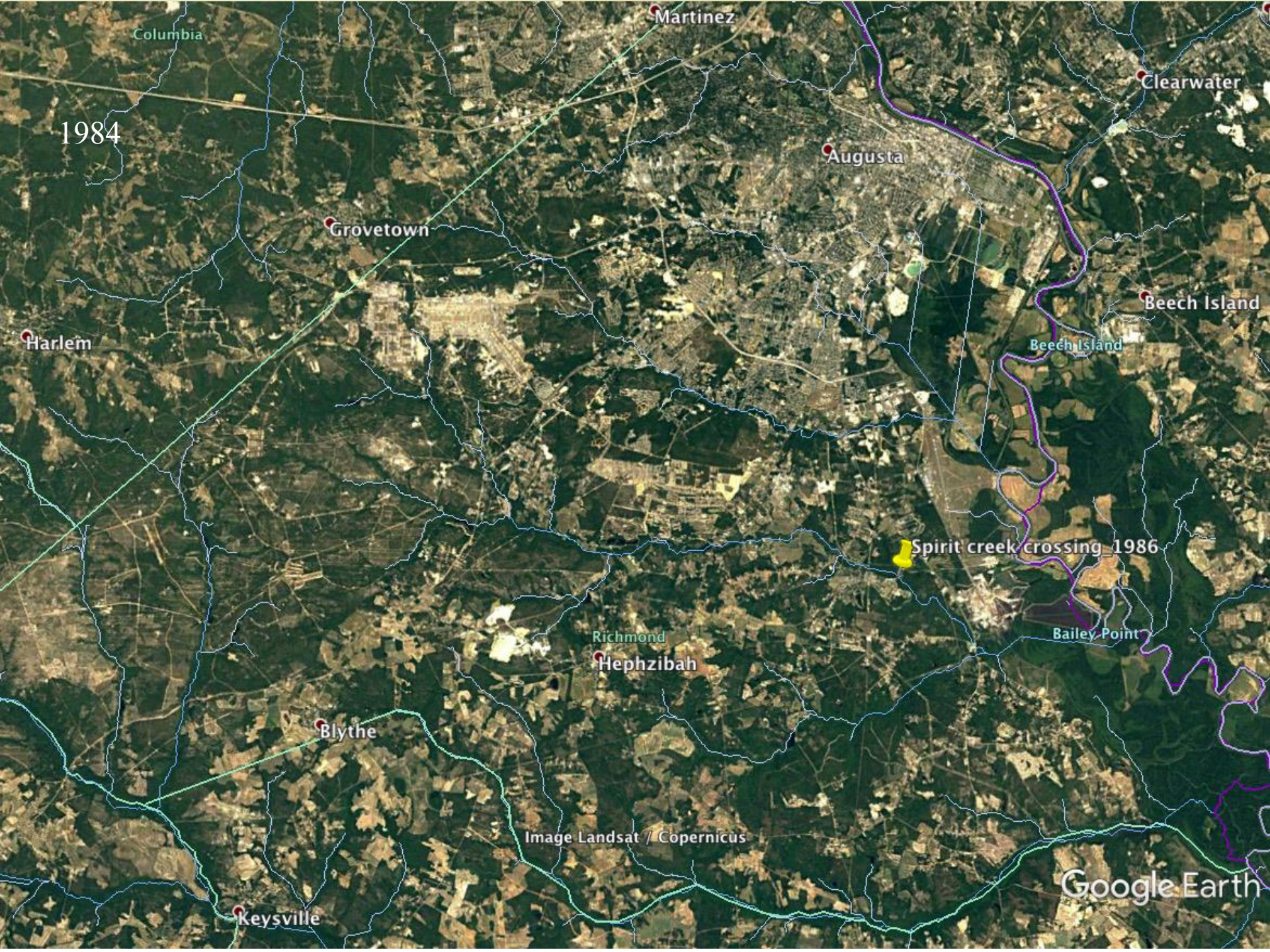
- No stormwater runs off my property, why should I pay the fee
  - this may be true for some properties
  - all county owned roads, bridges, ditches, structures, and pipes are all maintained by the same fee
- My stream bank is eroding
  - the function of all streams and rivers is to move material, including stream bank sediment
  - as impervious area increases, creeks carry more water and stream bank erosion increases
  - repairing banks is no longer a simple process and can not legally be conducted without a permit from the Corps and from GAEPD
  - Stream banks will repair over time
- Why are funds being used to mow the grass; why are contractors blowing clippings into the storm drains
  - roads without curb and gutter are designed to run off the road surface, over the road shoulder, and into a ditch or storm structure, vegetation gets in the way; mowing is part of the regular maintenance program to decrease flooding
  - Purposefully disposing of waste into a storm drain is illegal, including yard clippings
- Storm drains are not free of leaves and debris
  - unless the storm drains are clogged and causing flooding, stormwater will transport fallen leaves to the local creeks where they will become part of the food web
  - Report to 311 if they are causing flooding
- My yard is flooding
  - there may be several reasons for flooding
    - high rain events will cause temporary flooding
    - your property is in the floodplain and is highly prone to flooding
    - there is a privately-owned blockage to the free flow of stormwater
    - debris/tree fall causing flooding
    - storm system maintenance required

Common concerns and questions

- I created a 311 request and my issue has not been addressed
  - Work order queue
  - level of service expectation
- I was told this storm structure (catch basin, pond, ditch, pipe, road) was my responsibility and not the city's responsibility to maintain
  - Not all storm structures are Augusta-Richmond County owned and maintained
  - Generally, storm structures within the right of way along county-owned roads and within stormwater easements are owned and maintained by ARC
- My fee is not correct
  - contact a stormwater customer service representative to discuss the impervious area of your property and your bill
  - Impervious area review
  - Credits available for ponds and water quality features for non-single family residential properties
- The money generated is going to the general fund/not being spent on stormwater
  - Storm fee money goes for:
    - stormwater program management (33% $4.6M)
    - stormwater system maintenance activities (33% ($4.6M)
    - franchise fees, fee in lieu of taxes, overhead (19%; $2.7M)
    - supplement to SPLOST funds for small and medium stormwater projects (14% ($2M))
    - public education/public outreach activities (0.2%; $30,000)
    - staff training (0.2%; $30,000)

Growth is desirable but smart growth is necessary




1984
Columbia
Martinez
Clearwater
Augusta
Grovetown
Beech Island
Harlem
Beech Island
Spirit creek crossing 1986
Richmond
Hephzibah
Bailey Point
Blythe
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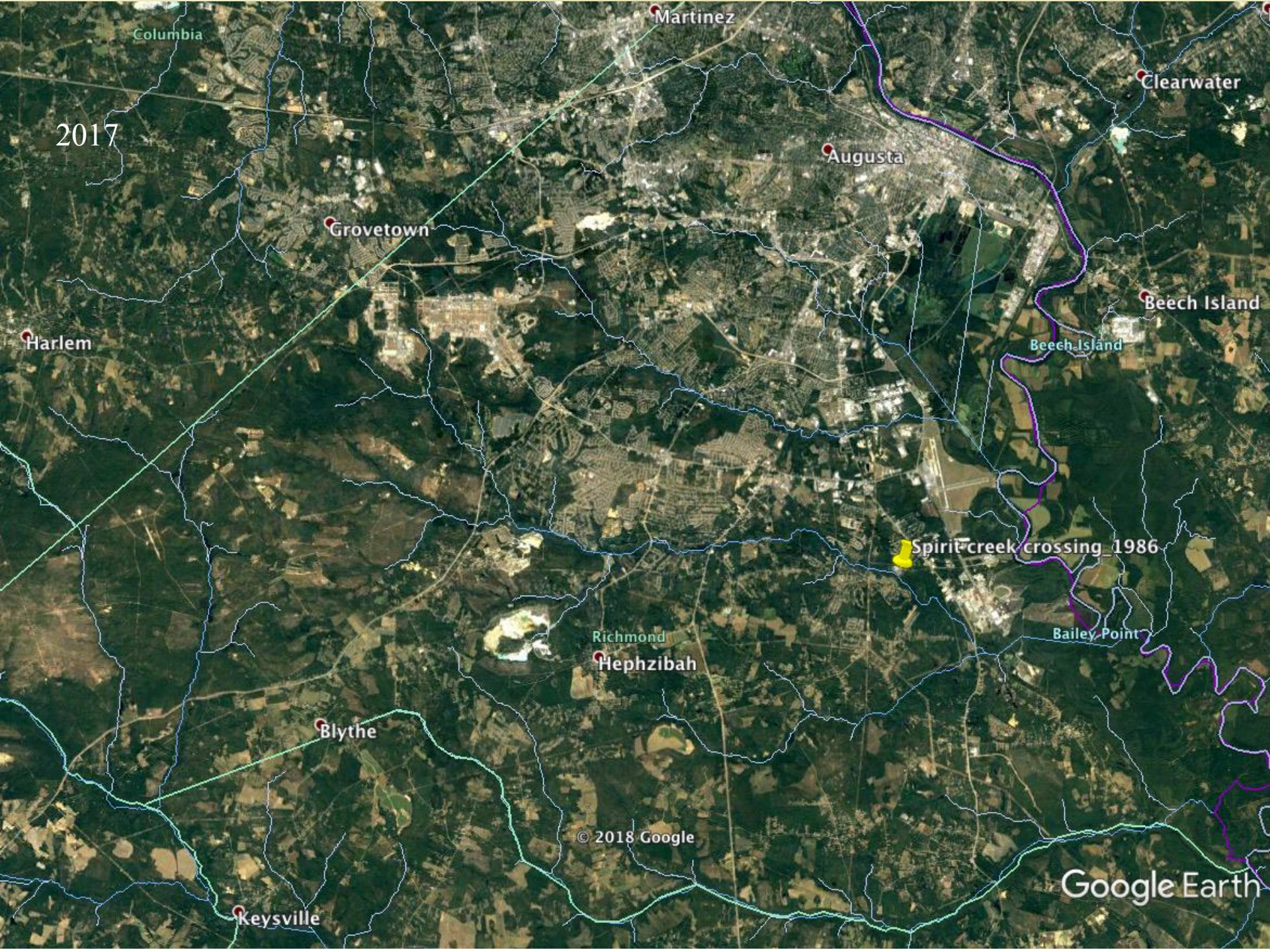
Keysville


2017
Columbia
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Beech Island
Harlem
Beech Island
Spirit creek crossing 1986
Richmond
Hephzibah
Bailey Point
Blythe
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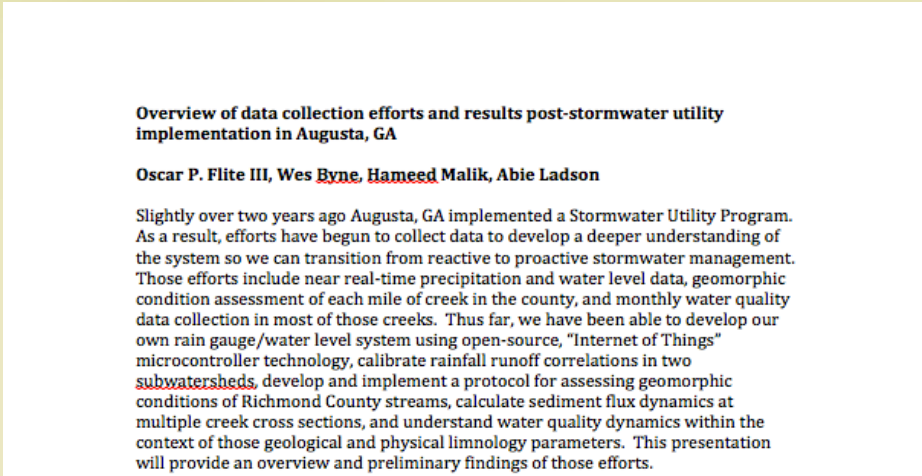
Something to be proud of

- Presentation at Georgia Association of Water Professionals-2018 Stormwater and Watershed Specialty Conference in Buford GA
- Email from conference representative stating:
  - *"When you have some time, I want to hear more about the work you were [discussing] at the specialty conference. They were all good presentations, but what you [all] were [discussing] could be a real innovation…"*



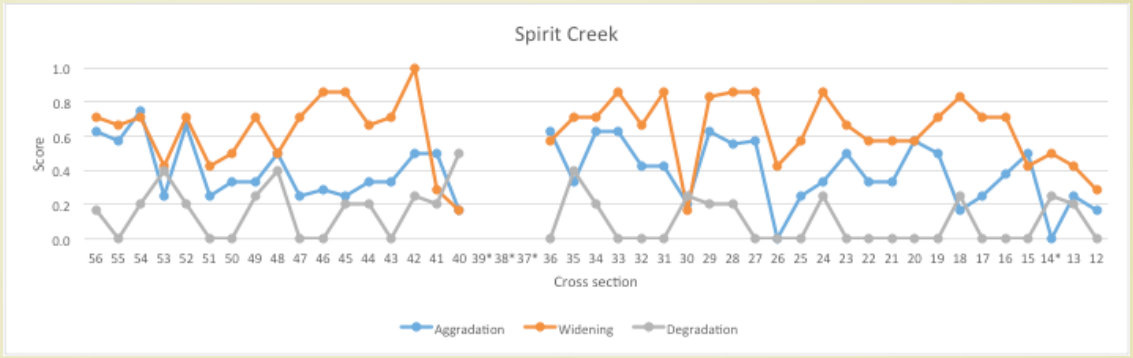
Overview of data collection efforts and results post-stormwater utility implementation in Augusta, GA

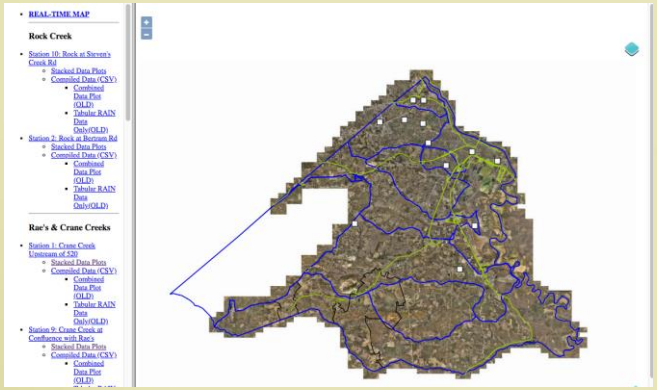
Oscar P. Flite III, Wes Byne, Hameed Malik, Abie Ladson

Slightly over two years ago Augusta, GA implemented a Stormwater Utility Program. As a result, efforts have begun to collect data to develop a deeper understanding of the system so we can transition from reactive to proactive stormwater management. Those efforts include near real-time precipitation and water level data, geomorphic condition assessment of each mile of creek in the county, and monthly water quality data collection in most of those creeks. Thus far, we have been able to develop our own rain gauge/water level system using open-source, "Internet of Things" microcontroller technology, calibrate rainfall runoff correlations in two subwatersheds, develop and implement a protocol for assessing geomorphic conditions of Richmond County streams, calculate sediment flux dynamics at multiple creek cross sections, and understand water quality dynamics within the context of those geological and physical limnology parameters. This presentation will provide an overview and preliminary findings of those efforts.

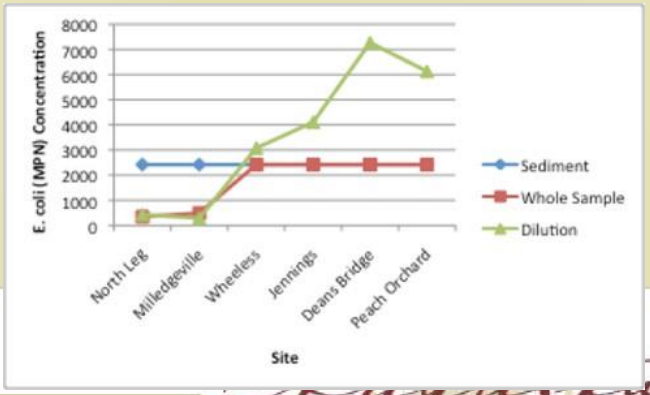
Innovation in Augusta's Stormwater Program

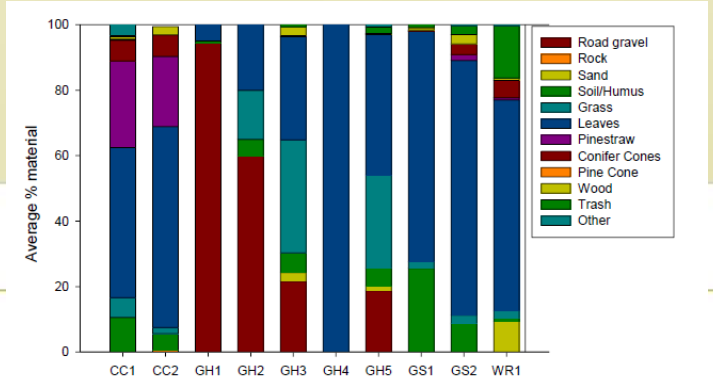
- Real-time rain gauge and water level logger development to monitoring creek water levels
  - Website: http://rainfalldata.com
- Stream stability assessment project- walking each mile of creek





- Pathogen studies- sampling according to travel time
- Decision support system for storm drain maintenance





USEPA/GAEPD grants awarded to Augusta for innovative stormwater projects

- 2014:
  - *Fecal pathogen implementation project in Rocky Creek (*($144134/$86350)
- 2015
  - *Biota improvement in an urban stream through aquatic habitat restoration* ($334,400/$193,750)
  - *Stormwater and its best management practices (BMPs): BMP installation and education curriculum implementation at a school in Augusta-Richmond County* ($627,201/$238,285)
- 2017
  - *Watershed management plan development for Rocky and Spirit Creeks* ($52,000/$40,000)

STORMWATER UTILITY

(Program Challenges and 5-Year Plan)

Challenges

1. Fill Positions (Departmental Issue).
2. Employee Retention.

5-Year Plan

1. Significantly Increase Customer Satisfaction.
2. Convert Maintenance Program from a Reactive to a Proactive System.
3. Improve Overall Stormwater System.
4. Hire Necessary Staff.

FUTURE

1. More proactive program
   - Asset management (replacing infrastructure before it fails)
   - Maintenance (implement Decision Support Systems)
2. Install “relief valves” in watersheds
3. Restore creek habitat to comply with water quality standards

Thank you