City of Greenville, South Carolina

Capitalizing on a Watershed Plan: How We Earned Grant Funding

October 12, 2017

Goals of the Session

- To examine the data requirements for developing and monitoring a meaningful watershed plan.
- To identify necessary components of a Watershed Based Plan that meets EPA guidelines necessary for 319 Grant funding.
- To share critical components necessary to leverage a Watershed Plan to receive grant funding.

Agenda

- Greenville's Watershed
- Richland Creek Water Quality Master Plan
- Alignment to EPA's Nine Elements
- 319 Grant Success
- Lessons Learned

Greenville's Watershed Program

Northwest corner of SC

City Population:

61,000 & growing

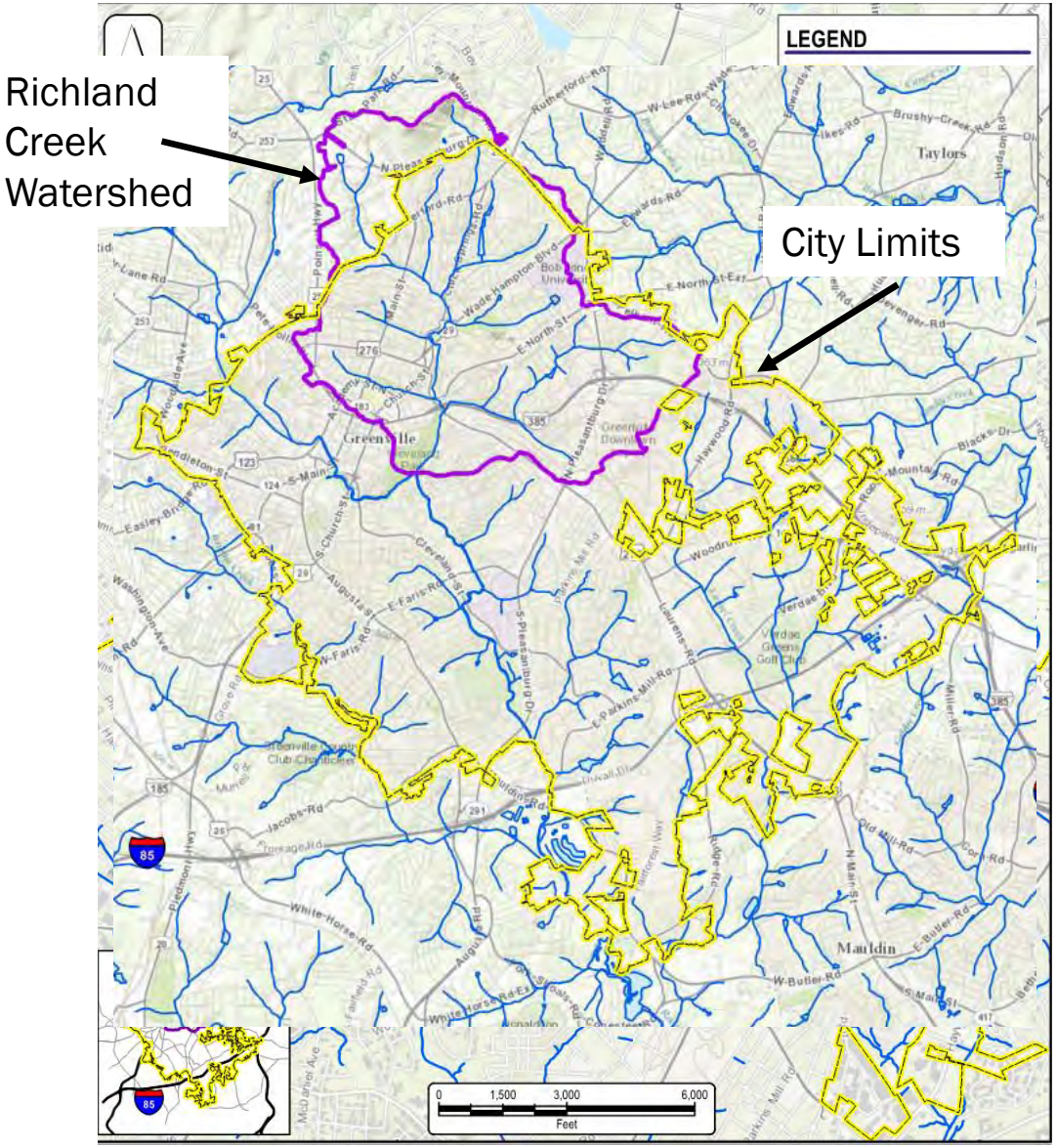
City Limits: 28.8 sq mi

Mostly within the Reedy River Watershed:

- 255 sq mi
- Impaired for fecal
- Potential TMDL for nutrients

Richland Creek Watershed

- Subwatershed of Reedy
- Mostly in City limits
- Drainage area: 8.6 sq mi
- Previously divided into 5 distinct storm sewer basins
- Impaired for Biota (sediment)

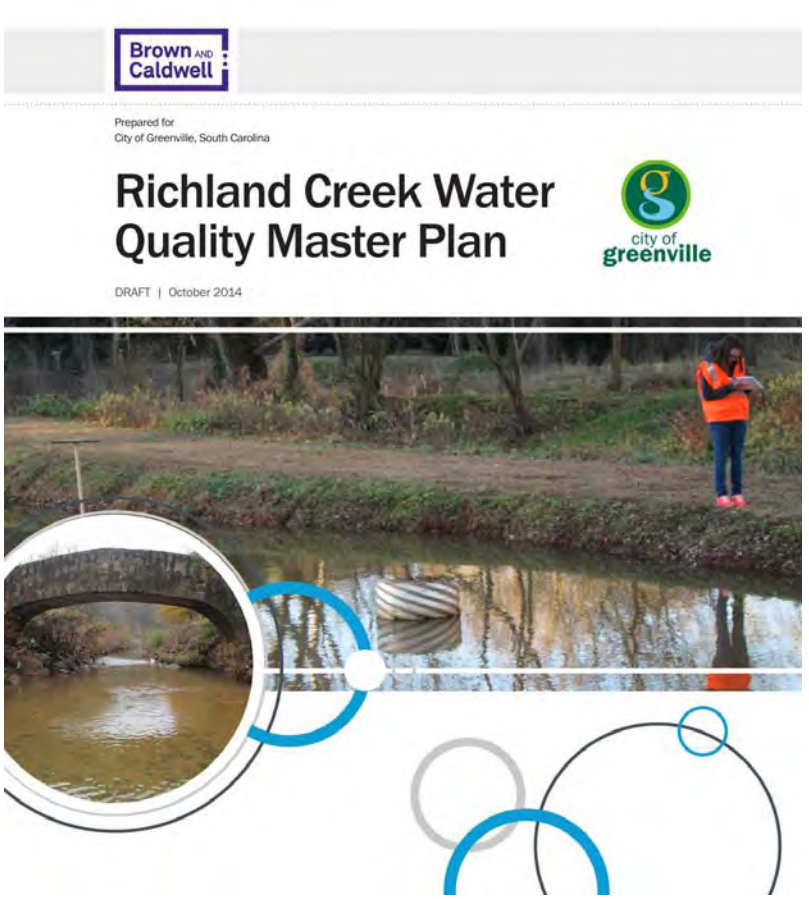


USEPA 9 Key Elements of Watershed Planning

Watershed planning element
Identify causes and sources of pollution that need to be controlled
Determine load reductions needed
Develop management measures to achieve goals
Develop implementation schedule
Develop interim milestones to track implementation of management measures
Develop criteria to measure progress toward meeting watershed goals
Develop monitoring component
Develop information/education component
Identify technical and financial assistance needed to implement plan

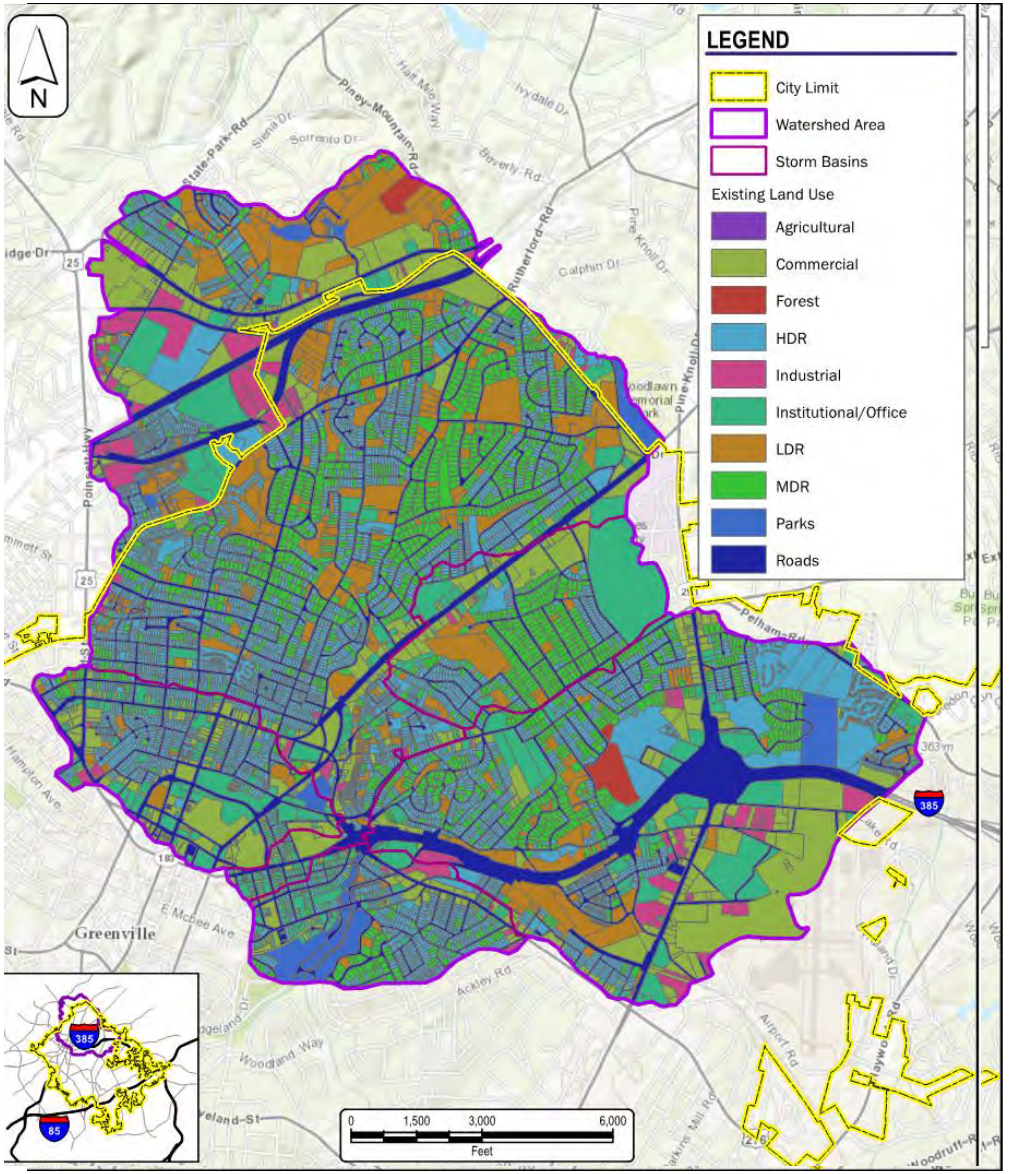
Richland Creek WQ Master Plan

- Desktop inventory of watershed
- Assess stream conditions
- Inventory existing and potential SCMs and GI
- Model baseline and project scenarios for TSS and fecal
  - TSS load reduction - 1,600 lb/acre/year
  - Measure fecal improvement after meeting TSS goal



Evaluation of Watershed Characteristics

- Land Use
  - Commercial – 14%
  - Residential – 50%
  - Institutional – 11%
  - Industrial – 3%
  - Roads – 20%
  - Forest/Parks – 2%
- Cumulative impervious cover = 29 to 50%



Field Inventories

- 16 stream miles walked
- 201 SCMs identified
  - Screened outside City limits, underground detention, < 1.5 ac
  - 69 locations selected for field evaluation
- Parcels screened for GI – parks, schools, other public areas
  - 21 locations on 11 parcels

Watershed Projects

Project Type	Number of Projects	Total Cost
SCM - New	3	$943,000
SCM – Retrofit	46	$11,891,000
GI	14	$2,605,000
Stream	20	$14,928,000
Total	83	$30,367,000



Watershed Goal, Project Evaluation and Modeled Scenarios

Goal

- 1,600 lb/ac/yr at the watershed outlet.

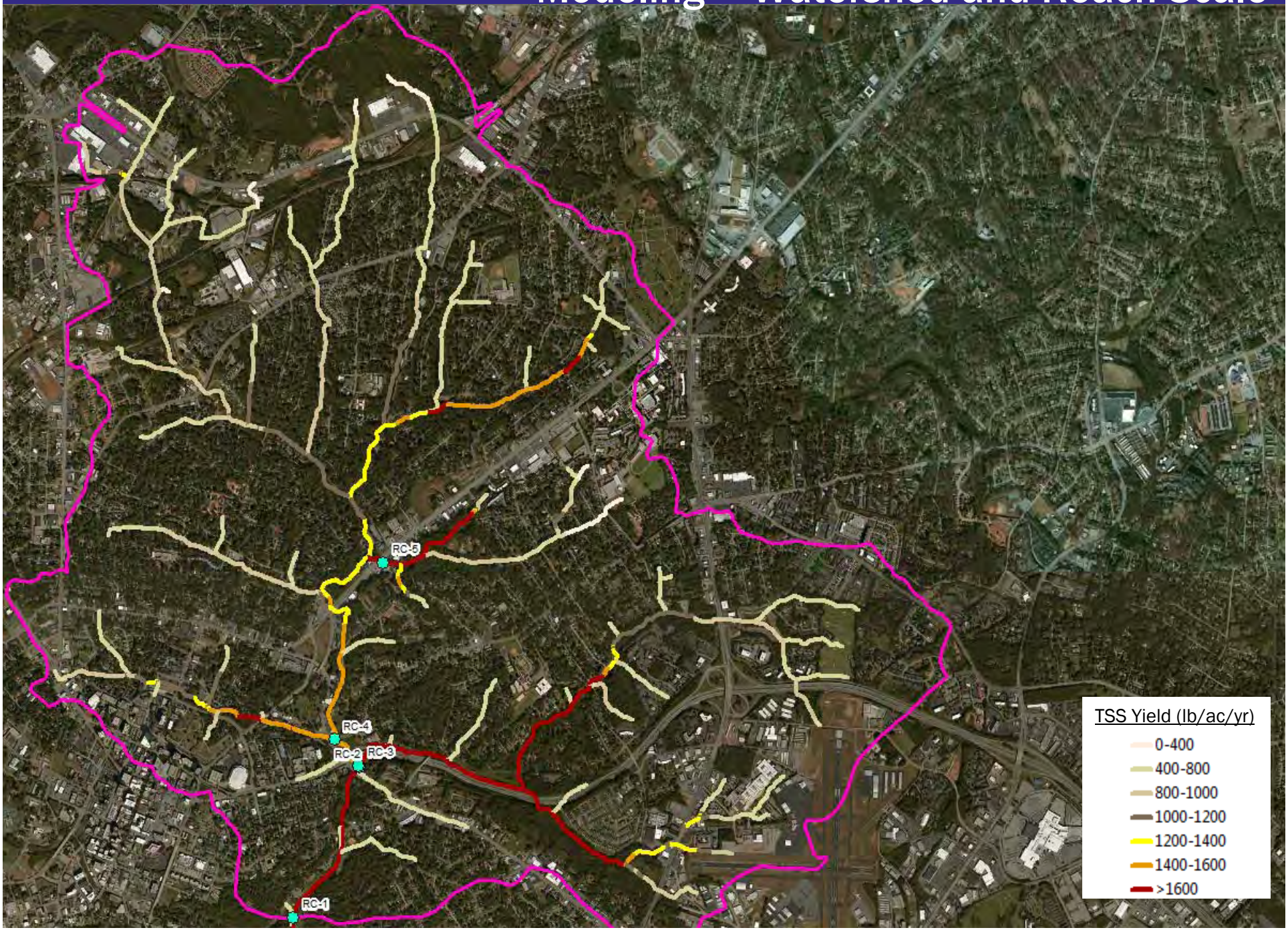
Project Evaluation

$$Project\ Score = \frac{TSS\ load\ reduction}{Estimated\ Project\ Cost} \times 100$$

Modeled Scenarios

- Baseline Conditions
- Baseline Conditions (no point sources from SSOs)
- Scenario 1 – Implement highest scoring projects until goal is met at watershed outlet
- Scenario 2 – Retrofit the Hidden Lake/Overbrook storm basin
- Scenario 3 – Implement highest scoring projects until a set budget is met

Modeling – Watershed and Reach Scale

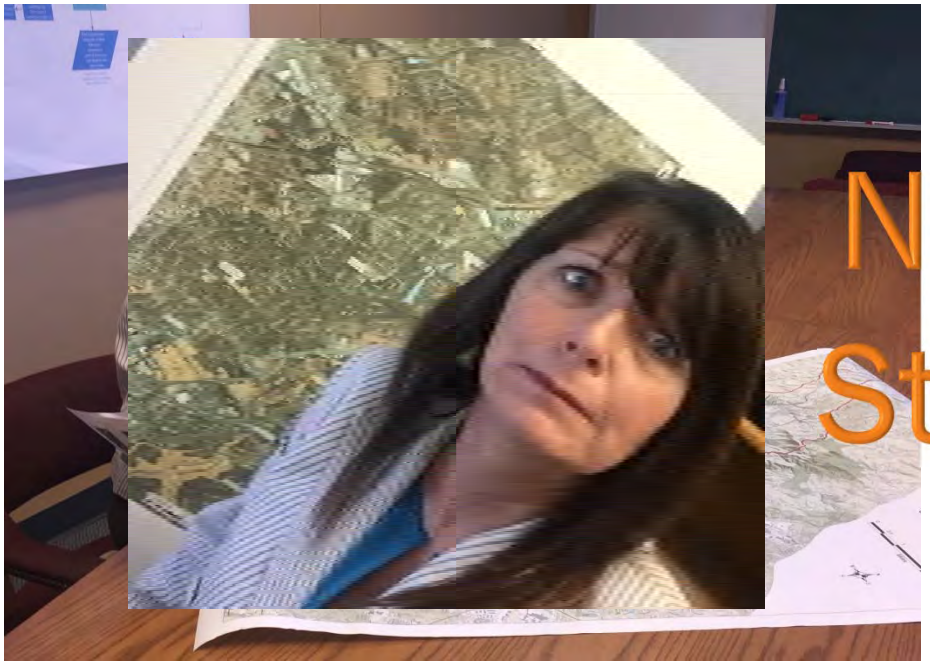


Top Scoring Projects

Project ID	Project Type	Score	Estimated Project Cost	Number of Parcels	Property Ownership
5-20-SCM	SCM-Retrofit	224.2	$266,000	1	Private
5-07-SR	Stream Restoration	51.2	$582,000	1	Private
2-53-SCM	SCM-Retrofit	46.1	$344,000	30	Private
12-40-SCM	SCM-Retrofit	34.9	$559,000	4	Private
12-16-SR	Stream Restoration	32.5	$500,000	4	Private
1-02-SR	Stream Restoration	31.5	$286,000	1	City of Greenville
2-54-SCM	SCM-Retrofit	30.6	$256,000	14	Private
5-27-SCM	New SCM	25.7	$628,000	3	Textile Hall Corp
13-09-SR	Stream Restoration	25.5	$252,000	1	City of Greenville
5-03-SR	Stream Restoration	25.2	$1,054,000	4	Private
5-05-SR	Stream Restoration	23.5	$286,000	1	Private
2-44-SCM	SCM-Retrofit	23.0	$278,000	7	Private
2-17-SR	Stream Restoration	20.2	$267,000	5	Private
5-14-SCM	SCM-Retrofit	19.0	$318,000	1	Private
5-06-SR	Stream Restoration	15.6	$554,000	6	Private
13-10-SR	Stream Restoration	14.6	$333,000	7	Private
2-19-SR	Stream Restoration	13.7	$386,000	4	Private
5-26-SCM	SCM-Retrofit	11.7	$85,000	1	Private – TD Convention Center
2-11-SR	Stream Restoration	11.0	$2,490,000	7	Private, City of Greenville
5-08-SR	Stream Restoration	10.1	$214,000	5	Private

WATERSHED MASTER PLAN COMPLETE!

MODEL



projects

Next Step?

estimates

MAPS

Plan Implementation Meets 319 Grant Funding

Question was how to leverage the Master Plan to secure 319 Grant Funding

USEPA 9 Key Elements of Watershed Planning

	Watershed planning element
✓	Identify causes and sources of pollution that need to be controlled
✓	Determine load reductions needed
✓	Develop management measures to achieve goals
	Develop implementation schedule
	Develop interim milestones to track implementation of management measures
✓	Develop criteria to measure progress toward meeting watershed goals
	Develop monitoring component
	Develop information/education component

Next steps – incrementally address projects through City budget planning and future grants?

EPA 9 Key Elements of Watershed Planning

Why Plans Fail

- Watershed analyzed at too great a scale
- No long term management process
- Recommendations too general
- Not based on measurable or scientific-based goals

Why our Plan Succeeded

- Selection of a subwatershed focused on TSS as a surrogate
- Invested more dollars in technical plans and modeling
- Developed projects with measurable benefits, planning cost estimates, and WQ improvements
- Included long term plan for implementation and monitoring

319 Grant Success

Matched funds for five projects at three locations

$700,000 in matching funds

Included green infrastructure projects which have been a catalyst for partners and positive image

A moment about MONITORING

- *Monitoring should be a first priority!*
- *Best way to understand watershed conditions*
- *Accurate data leads to better goals and solutions*
- *Able to measure improvements and ensure bang for the buck*

Lessons Learned

For Watershed Planning

- Establish nine elements as outlined by EPA guidance
- Sample, sample, sample
- Develop defensible benefit-cost ratio
- Consider implementation sites in prioritizing implementation
- Stream restoration projects are a lot of BANG for the BUCK & the Public love them!

For 319 Success

- Look at requirements for large grant programs and incorporate up front
- Align watershed goals to a single impairment
- Invest in technical plans and modeling
- Be sure projects are located appropriately in relation to state sampling stations
- Consider your own long-term monitoring strategy
- Establish milestones and plans that are realistic
- Determine stakeholders who 'bring something to the table'
- Don't discount value of Green Infrastructure


Questions?