



EFFECTIVELY GOVERNING STORMWATER THROUGH REGIONAL COLLABORATION



SESWA
April 2020



WHAT FUELS STORMWATER MANAGEMENT?



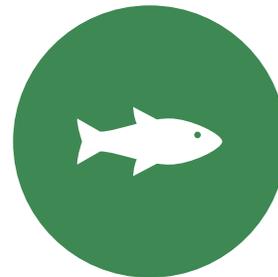
Ordinance Revision and Adoption



MS4 Permits



Public Concern

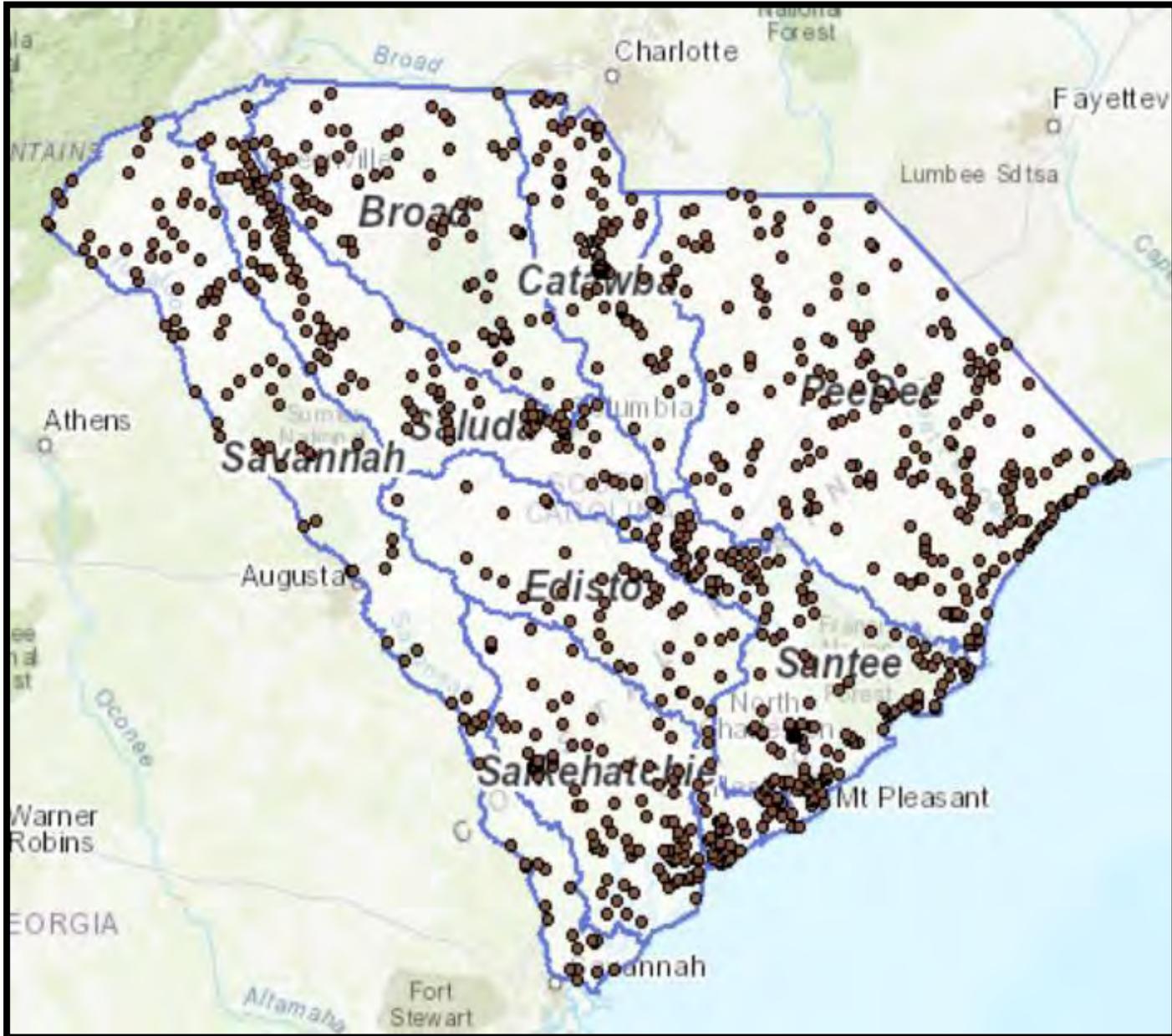


Impaired Waters

2018 DRAFT SC DHEC 303(D) LIST OF IMPAIRED WATERBODIES

- 1,242 impairments
- 1,041 sites

Source: <https://gis.dhec.sc.gov/watersheds/>



SOUTHERN LOWCOUNTRY REGIONAL BOARD (SOLOCO)

Vision

The Vision of the SoLoCo Board is to enhance:

- the building of relationships among elected officials; and
- the communication among the members internal as well as to subdivisions external, and most importantly to the Communities in which we serve.

Our Vision is a vibrant Low Country, a united Low Country and a sustainable Low Country.

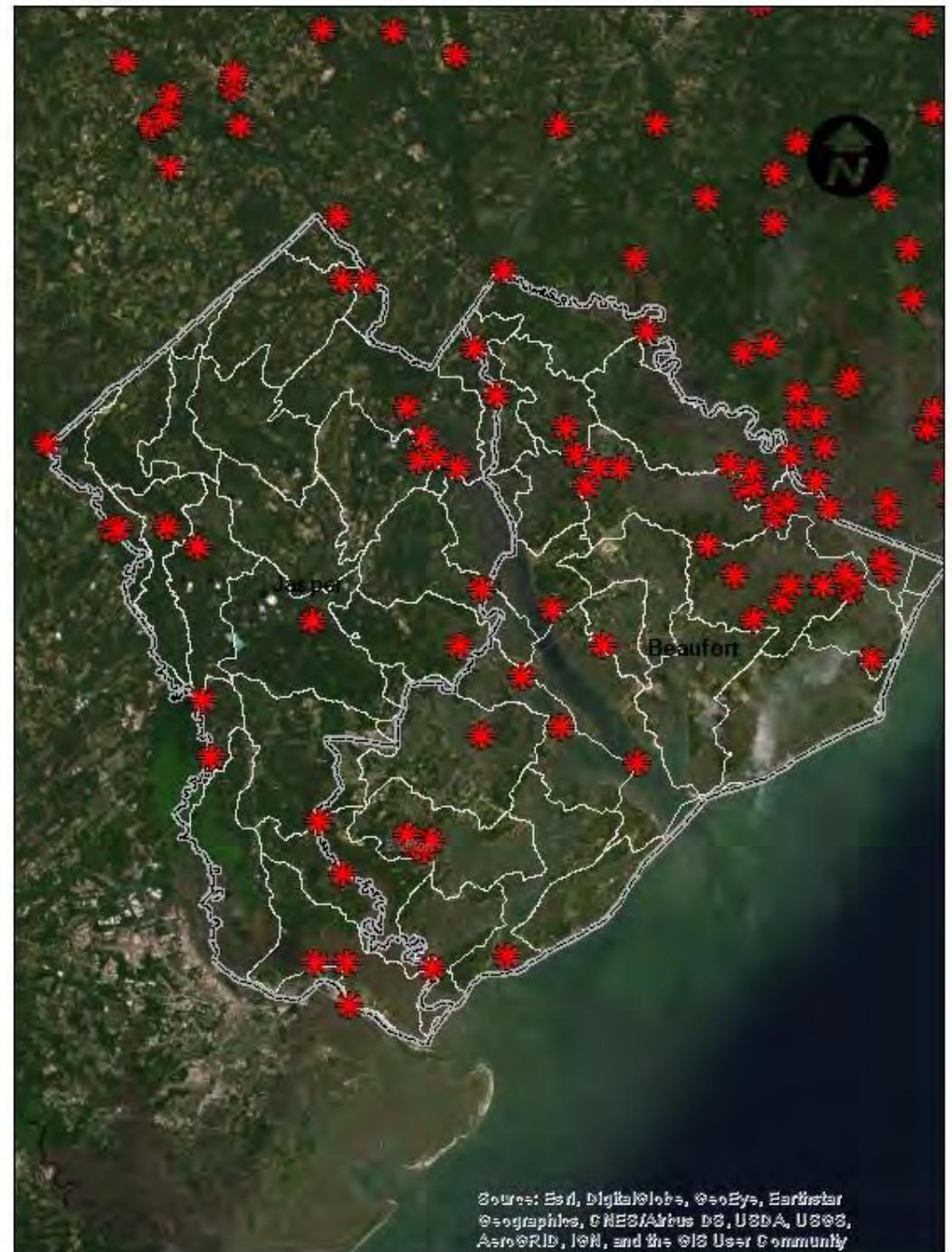
Mission

To create a regional think tank that will identify the problems and opportunities that face the entire southern low country... To discuss the zoning, housing, employment, quality of life and social issues and propose action plans to the appropriate legislative bodies.



SOUTHERN LOWCOUNTRY WATER QUALITY ISSUES

- Waters in Beaufort & Jasper Counties with an impairment *
- Water does not follow jurisdictional boundaries
- 2017 – SoLoCo charged respective staff to summarize & compare stormwater standards to protect natural resources and waterways



STORMWATER TECHNICAL SUBCOMMITTEE: MISSION STATEMENT

To protect and increase the quality of public health, property, and aquatic habitats through collaborative policies and practices to manage both stormwater quantity and quality from our developed and developing areas.

In summary, our mission is:

- Recognize and preserve our unique character and environment.
- Develop and promote a consistent and effective approach to stormwater management throughout the Lowcountry.
- Support continued economic growth throughout the region without increased demand on public investment.

PROJECT TEAM: SOUTHERN LOWCOUNTRY REGIONAL STORMWATER ORDINANCE & DESIGN MANUAL



Beaufort County – lead and contract administrator



Jasper County



City of Beaufort



Town of Bluffton – project manager



City of Hardeeville



Town of Port Royal

Stormwater Technical subcommittee (2017)

Findings:

- Most restrictive/highest criteria are not necessarily “the best”
- Stormwater runoff does not follow political boundaries
- Not every watershed is the same

Recommendation to SoLoCo:

- Develop a **regional** stormwater standard to provide consistent protection of water resources and consistent design requirements that are current “**State of Knowledge**”

CONSULTANT TEAM PROJECT TASKS



Leading the nation with clean water solutions...

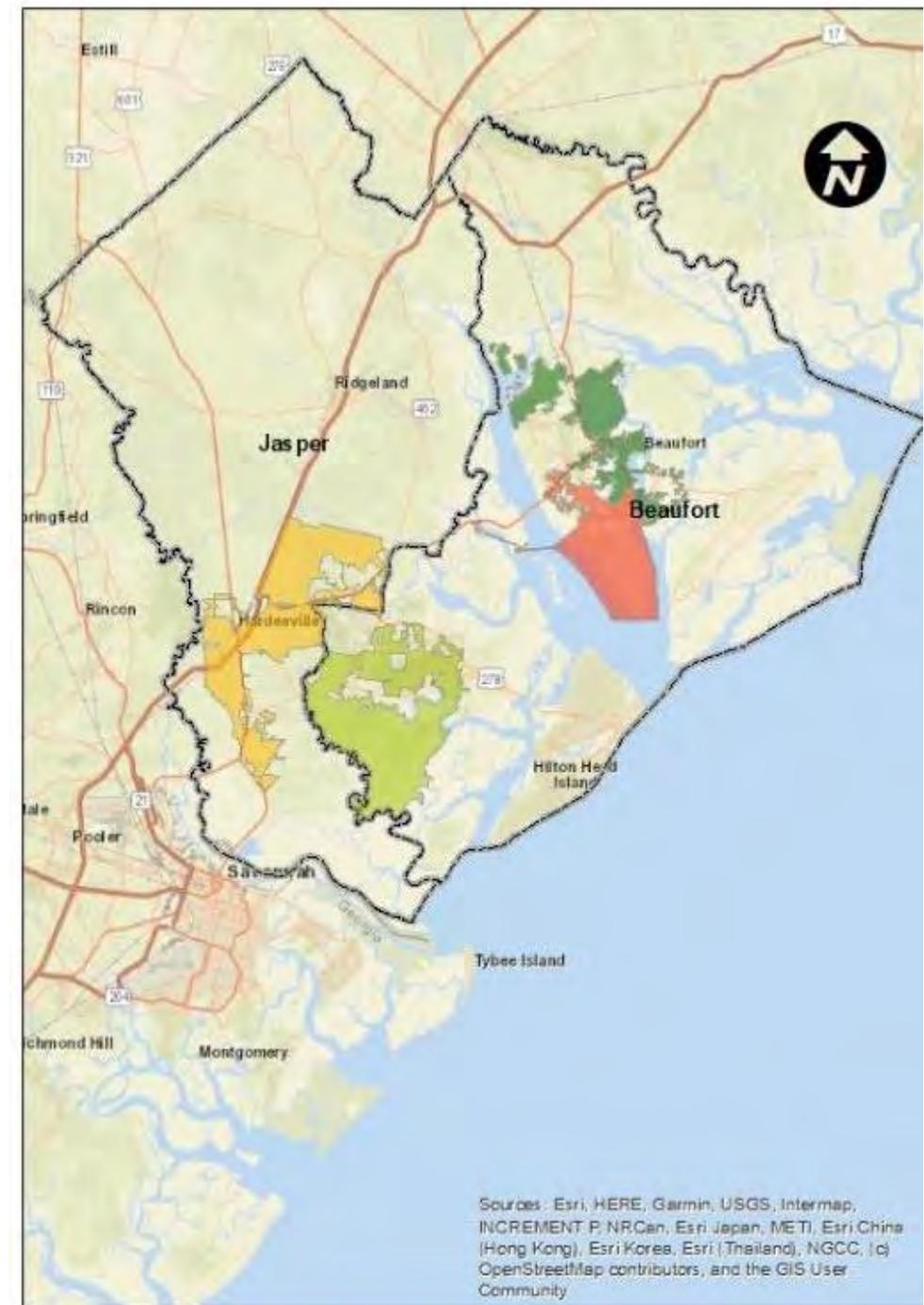


1. Develop	Model Stormwater Ordinance
2. Develop	Comprehensive Stormwater Design Manual
3. Facilitate	Stakeholder and Public Review
4. Deliver	Manual, Calculations Tool, and Training

TASK 1 – MODEL STORMWATER ORDINANCE

Unifies current diversity of municipality requirements due to MS4 permits, need, and community dynamics:

- Allows for “Special Watershed Protection Area” designations and requirements
- Establishes post-construction criteria for volume control (quantity and quality) and design standards
- Provides enforcement for current design through life of the development



TASK 2 – STORMWATER DESIGN MANUAL OVERVIEW

- **Watershed-based** approach, not by jurisdiction
- Incorporate **green infrastructure/low impact development** standards
- Protect existing **natural areas** & incorporate **open space** in new development
- Water quantity and quality credit for 13 BMPs



PREVIOUS COASTAL COLLABORATION

- **Project Team:**
 - National Estuarine Research Reserves, SC Sea Grant Consortium, & Center for Watershed Protection
- **Advisory Committee & Technical Advisors**
 - Counties, municipalities, NOAA, universities, extension, consultants
- **Guidance, not regulatory**
 - Better Site Design
 - 11 Stormwater BMPs

<https://www.scseagrant.org/wp-content/uploads/LID-in-Coastal-SC-low-res.pdf>



LOW IMPACT DEVELOPMENT IN COASTAL SOUTH CAROLINA: A PLANNING AND DESIGN GUIDE



TASK 2 – STORMWATER DESIGN MANUAL CHAPTERS

Chapter 1: Background, Purpose, and Administration

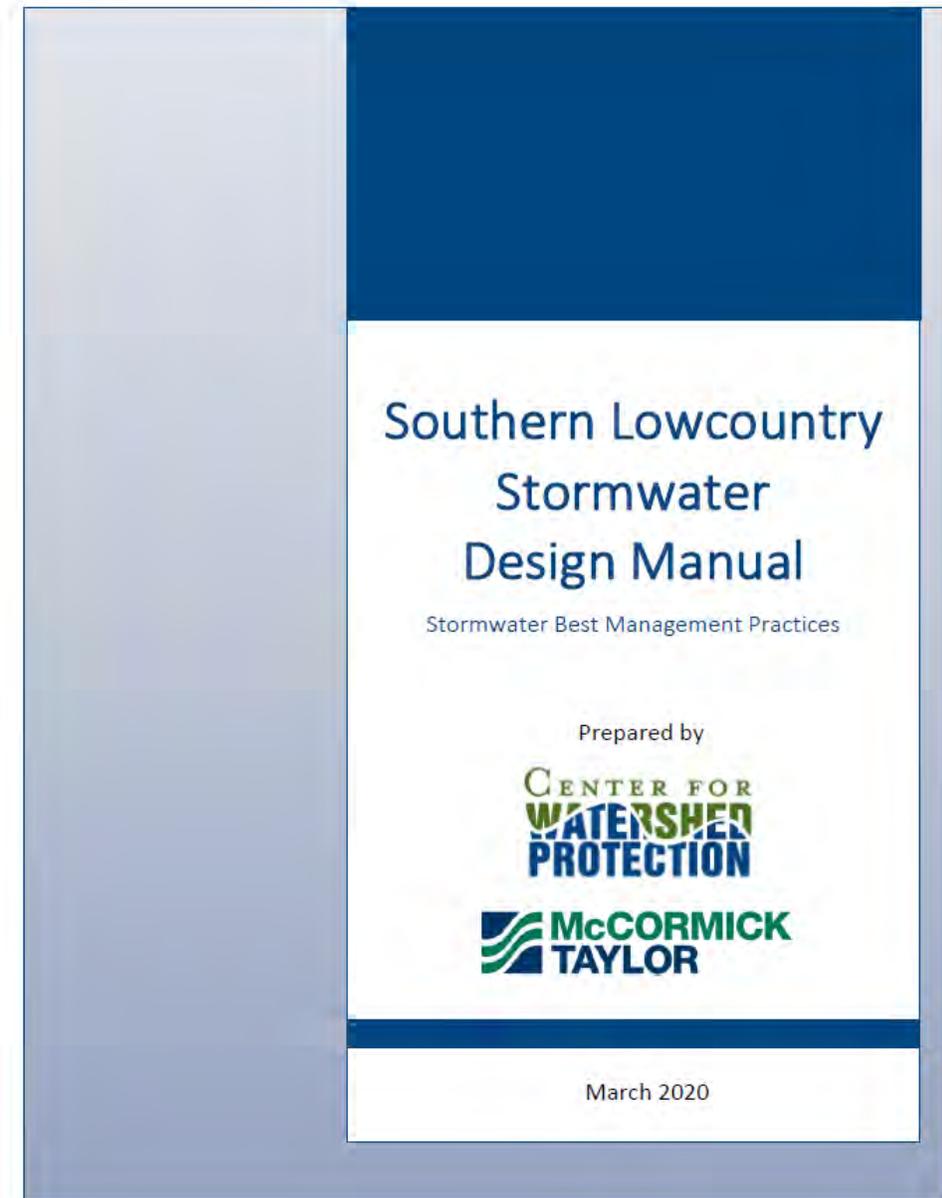
Chapter 2: Design Review and Permitting Process

Chapter 3: Minimum Control Requirements

Chapter 4: Stormwater Best Management Practices

Chapter 5: Erosion and Sediment Control

Chapter 6: Enforcement and Violations



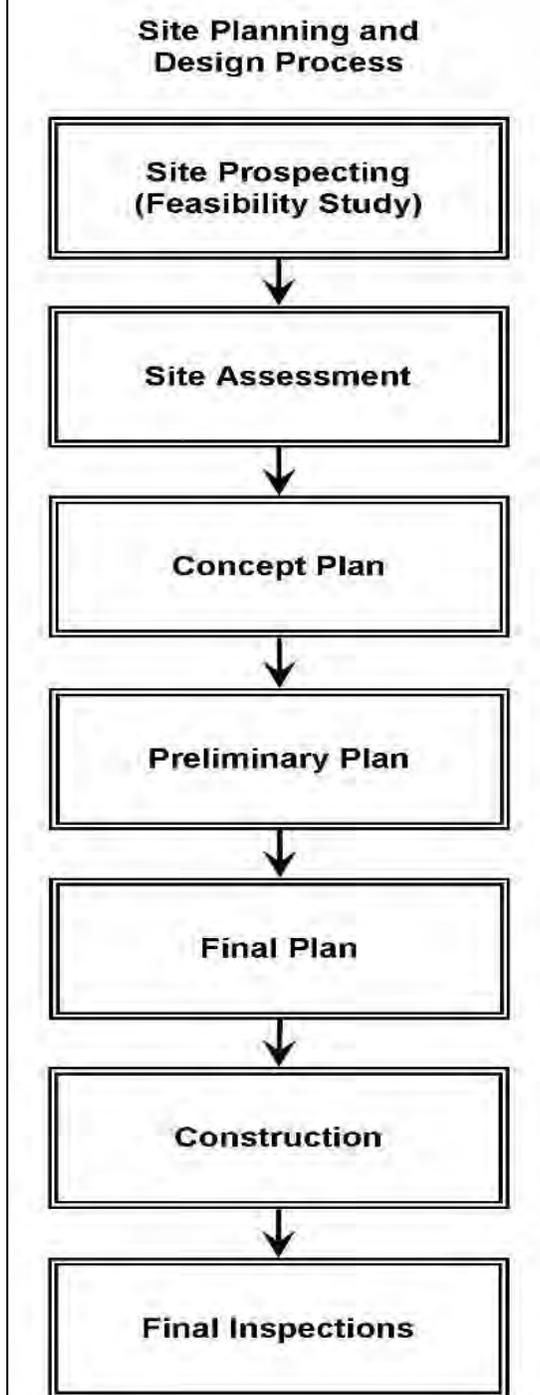
TASK 2 – STORMWATER DESIGN MANUAL APPENDICES

Appendices A – T

- A. Southern Lowcountry Regional Ordinance
- B. Infiltration Testing & Geotech Requirements
- C. Soil Compost Amendment Requirements
- D. Design Checklist
- E. Construction Stormwater Inspection Forms
- F. Maintenance Inspection Checklists Spreadsheet
- G. Compliance Calculator Spreadsheet Instructions
- H. Compliance Calculator
- I. General Design Criteria & Guidelines
- J. Rainwater Harvesting Treatment & Management Requirements
- K. Rainwater Harvesting Calculator
- L. Glossary
- M. References & Resources
- N. Summary of Fed. & State Stormwater Regulations
- O. Maintenance Agreement Template
- P. Reserved
- Q. Reserved
- R. Land Cover Designations
- S. Reserved
- T. Beaufort County Single Family Lot Requirements

DESIGN MANUAL CHAPTER 2: DESIGN & REVIEW PERMITTING

- Better Site Design
- Natural Resources Inventory
- Site Planning and Design Process
 - Integrate natural resource protection and stormwater management (SWM)
 - Assess opportunities for infill and/or redevelopment
- Specifies stormwater management plan submittal requirements
 - To be included on plan sheets
- Stipulates required forms found in Appendices



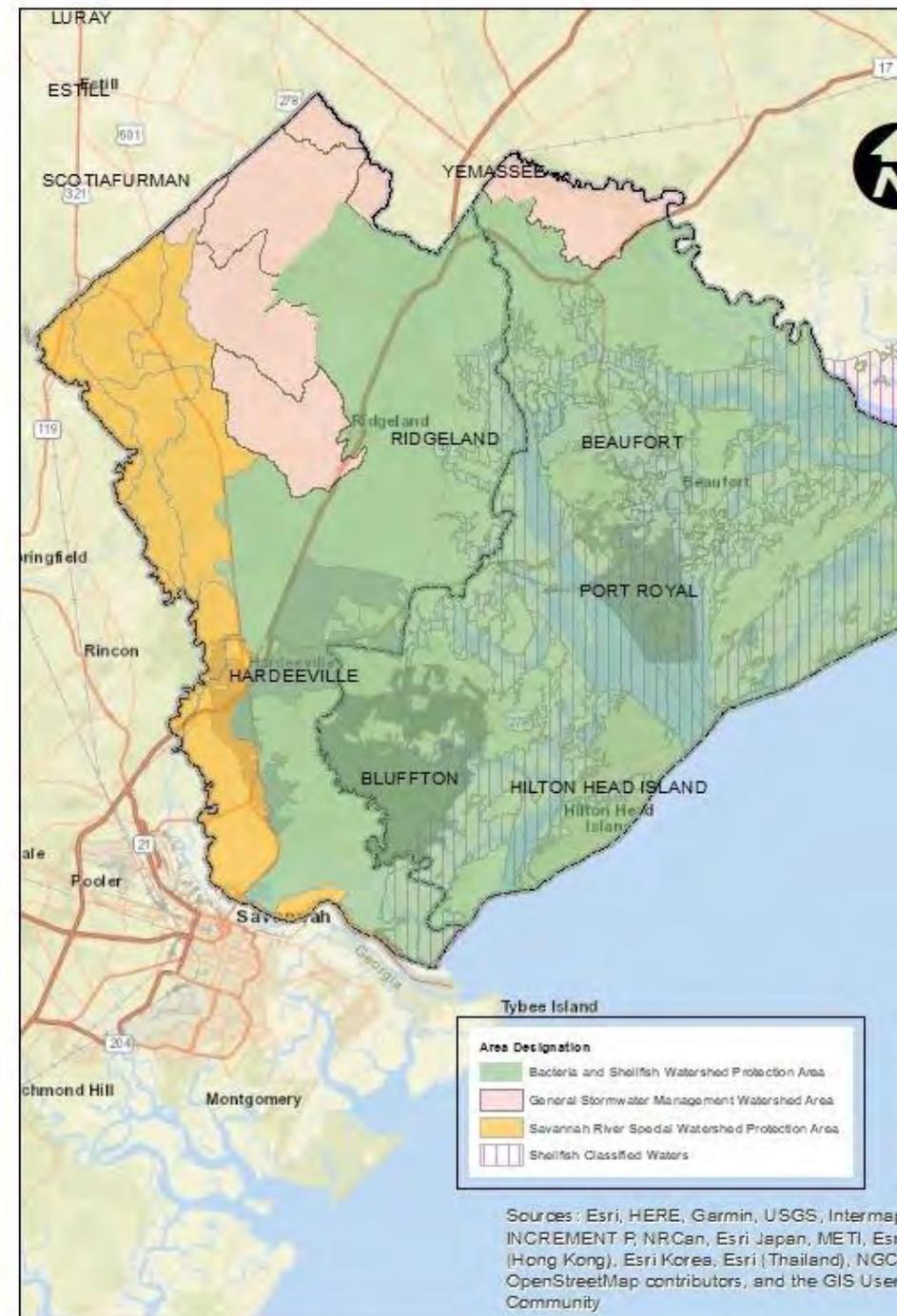
DESIGN MANUAL CHAPTER 3: STORMWATER MANAGEMENT PERFORMANCE REQUIREMENTS

- Water does not follow jurisdictional boundaries, nor do impairments
- Manual defines requirements for three **Watershed Protection Areas** based on watershed boundaries of HUC-12
- Also allows for additional **Special Watershed Protection Areas** based on current or future water quality concerns



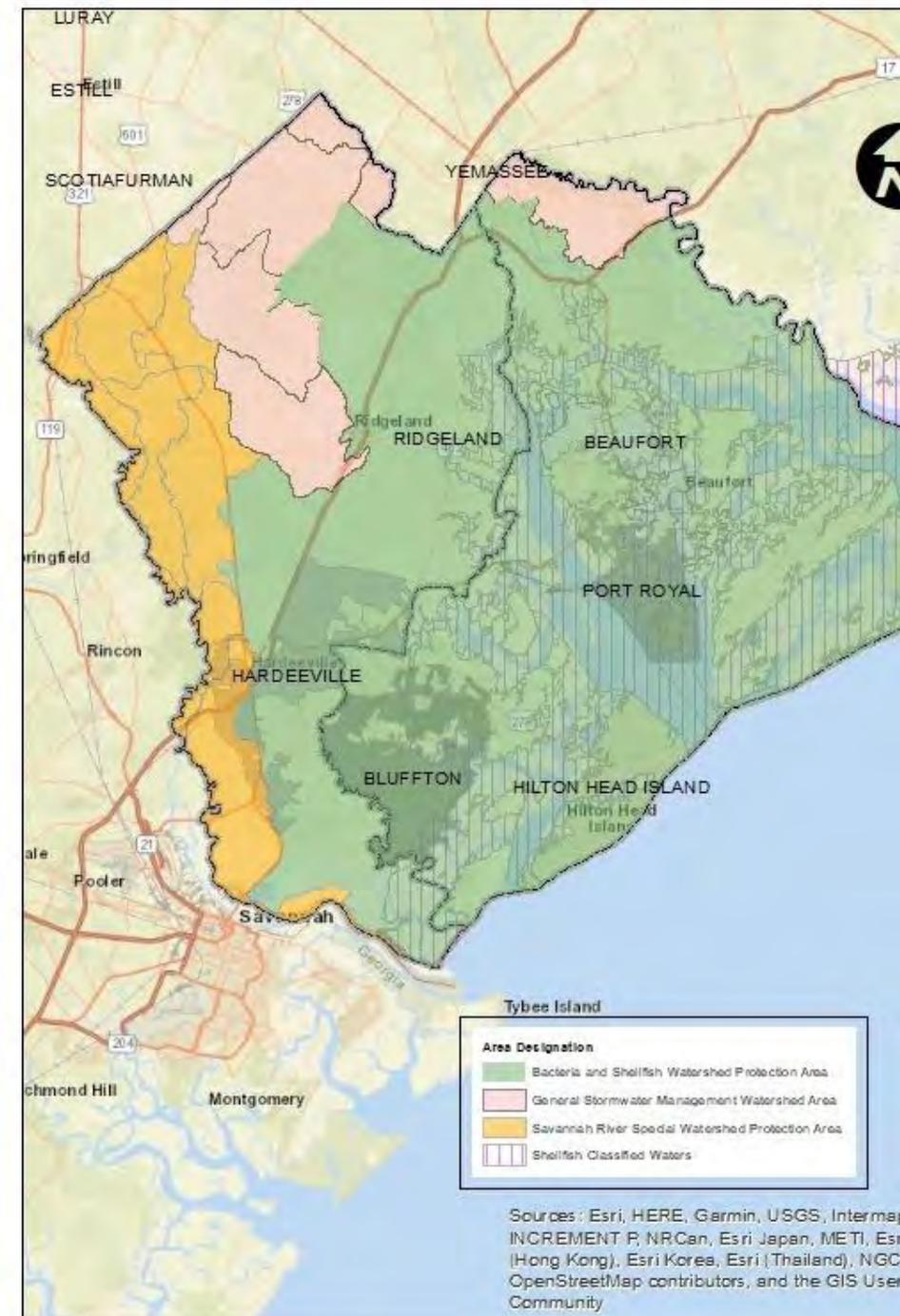
DESIGN MANUAL CHAPTER 3.5.4: SAVANNAH RIVER

- **Rationale:**
 - Proximity to Georgia counties with similar performance requirements
- **Water Quality:**
 - Retain 85th percentile storm on-site (1.16")



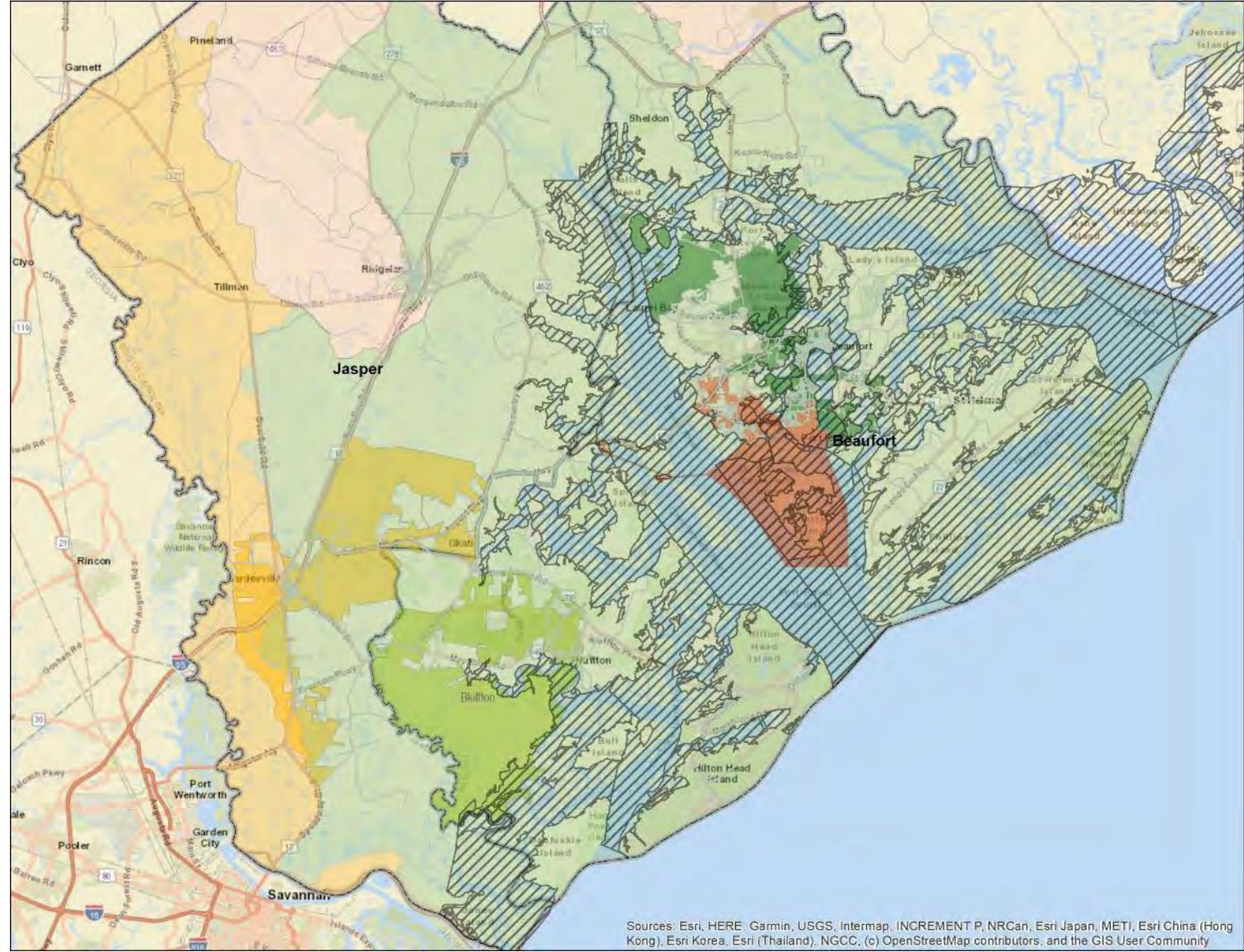
DESIGN MANUAL CHAPTER 3.5.5: TMDL, BACTERIA, AND SHELLFISH

- **Rationale:**
 - Areas are impaired or have TMDLs
 - Receiving waters are classified for shellfish harvesting
- **Water Quality:**
 - Retain 95th percentile storm on-site (1.95")



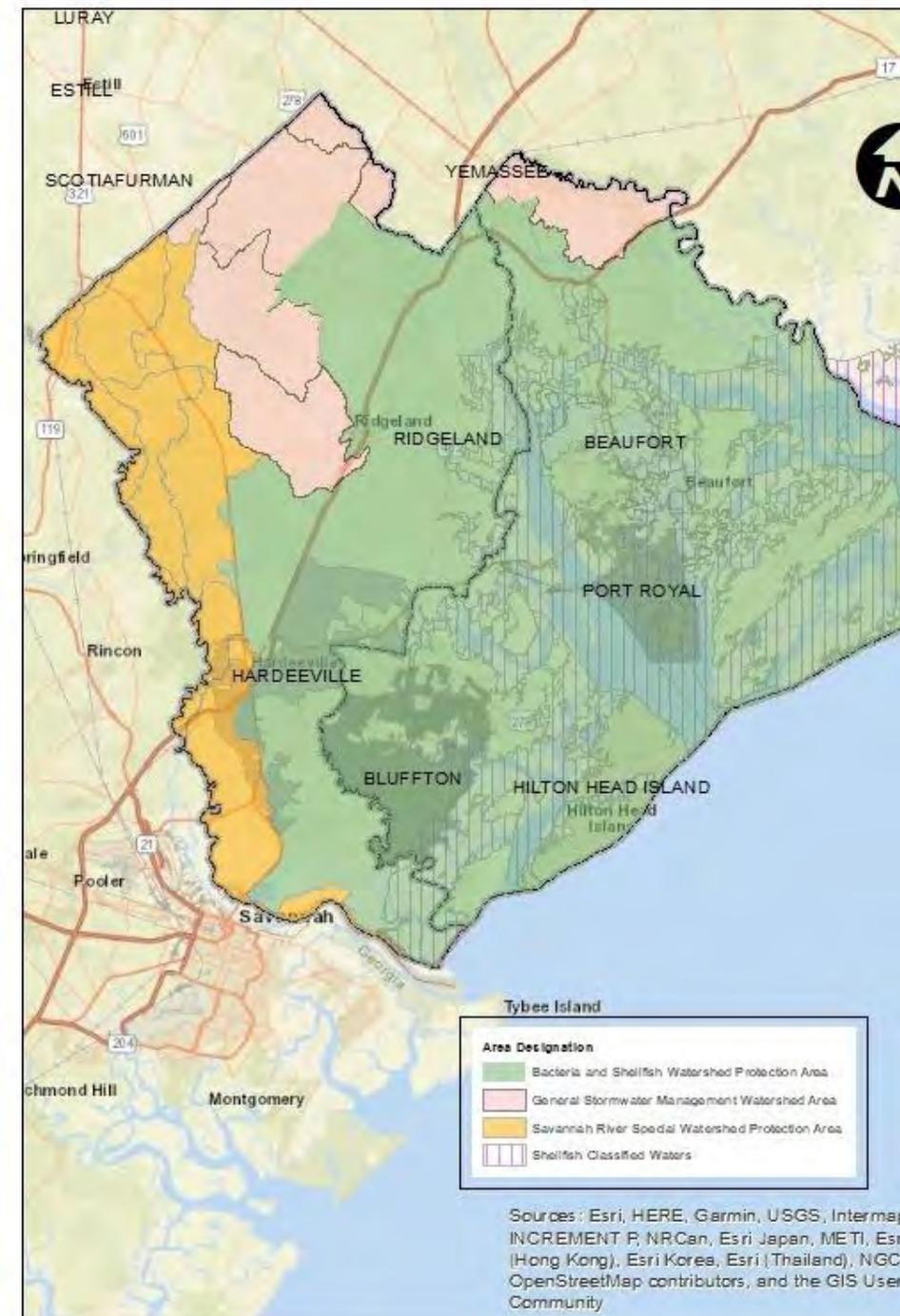
DESIGN MANUAL CHAPTER 3.5.5: SHELLFISH

- Much of Beaufort County is classified for shellfish harvesting and requires higher levels of protection.



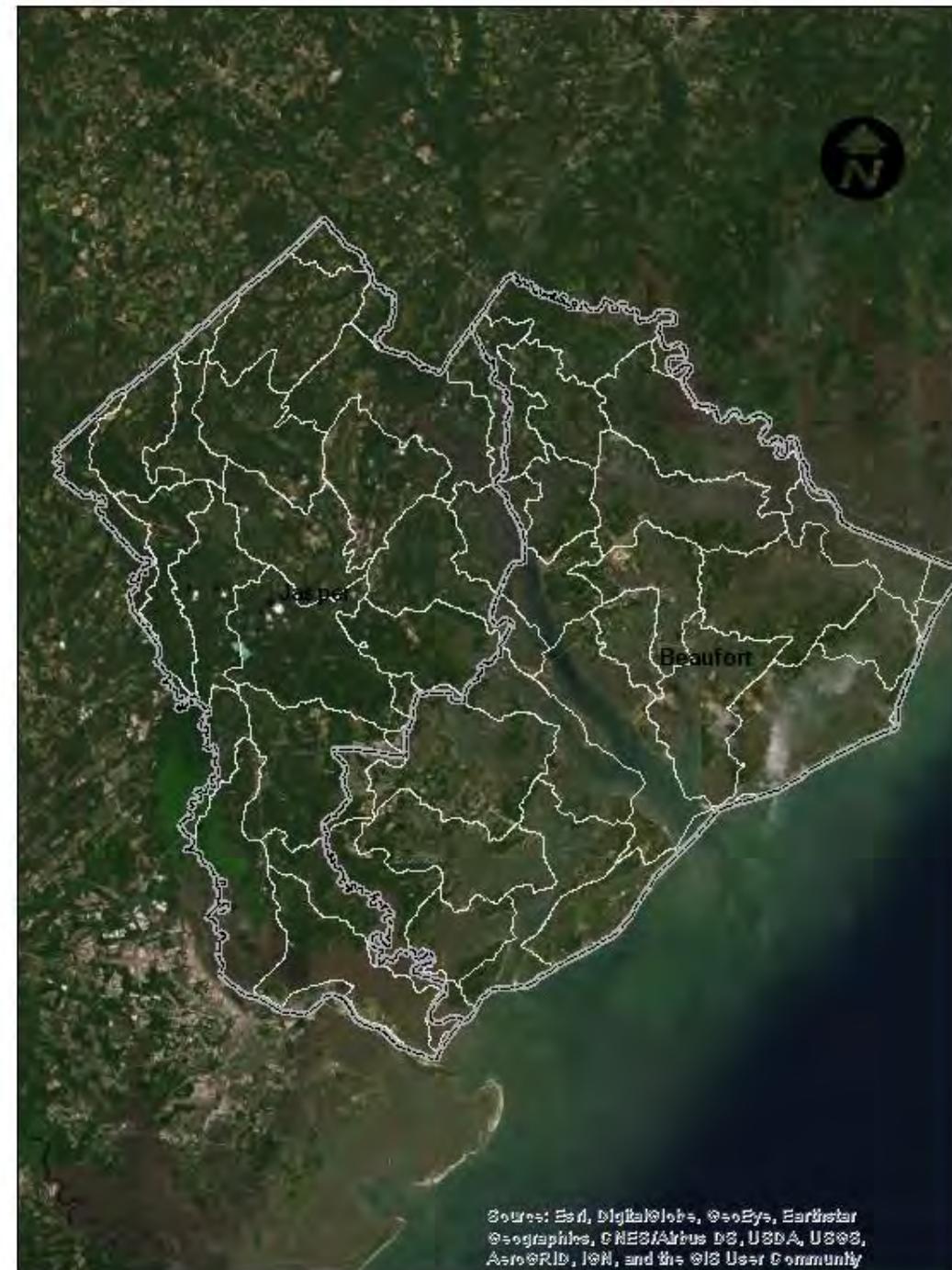
DESIGN MANUAL CHAPTER 3.5.6: GENERAL WATERSHED

- **Rationale:**
 - Previous Jasper County stormwater design manual requirements
- **Water Quality:**
 - Maintain pre-development hydrology for 85th percentile storm (1.16")



DESIGN MANUAL CHAPTER 3: REQUIREMENTS FOR ALL WATERSHEDS

- Complete Natural Resources Inventory
- Implement Better Site Design
- Minimum Pollutant Removal:
 - TSS 80%
 - TN 30%
 - Bacteria 60%
- Control the post-development peak runoff
 - 2, 10, 25-year, 24-hour storm
- Capacity of the existing downstream receiving conveyance
 - Convey the 25-yr storm flows
 - No impact downstream for 100-yr storm



DESIGN MANUAL CHAPTER

3.5.7: TABLE 3.3

BMP RUNOFF REDUCTION

- Water Quality Credits are based on current, available research
- Must follow the design standards for each BMP (Chapter 4)
- Compliance calculator correlates with these values (App. H)

BMP	Water Quality Credits			
	Runoff Reduction	TSS % Removal	Total N % Removal	Bacteria % Removal
Bioretention - No Underdrain	100% ¹	100% ¹	100% ⁶	100% ⁶
Bioretention – Internal Water Storage	75% ¹	85% ¹	85% ⁴	80% ⁵
Bioretention - Standard	60% ²	85% ¹	75% ⁴	80% ⁵
Permeable Pavement - Enhanced	100% ¹	100% ¹	100% ⁶	100% ⁶
Permeable Pavement - Standard	30% ²	80% ¹	45% ⁴	30% ⁶
Infiltration	100% ¹	100% ¹	100% ⁶	100% ⁶
Green Roof	100% ³	100% ⁶	100% ⁶	100% ⁶
Green Roof - Irrigated	50% ³	50% ⁶	50% ⁶	50% ⁶
Rainwater Harvesting	100% ³	100% ⁶	100% ⁶	100% ⁶
Impervious Surface Disconnection	40% ²	80% ¹	40% ⁴	40% ⁶
Grass Channel	10% ²	50% ¹	25% ⁴	30% ⁵
Grass Channel - Amended Soils	20% ²	50% ¹	35% ⁴	30% ⁵
Dry Swale	60% ²	85%	70% ⁴	80% ⁵
Wet Swale	0% ¹	80% ¹	25% ⁴	60% ⁵
Regenerative Stormwater Conveyance	0% ¹	80% ¹	40% ⁶	80% ⁶
Filtering Systems	0% ³	80% ¹	30% ⁴	80% ⁶
Storage Practices	0% ³	60% ¹	10% ⁴	60% ⁵
Stormwater Ponds	0% ¹	80% ¹	30% ⁴	60% ⁵
Stormwater Wetlands	0% ¹	80% ¹	25% ⁴	60% ⁵
Tree Planting and Preservation	see section 4.12			
Proprietary Practices	see section 4.13 and Appendix K			
Conservation Areas	see section 3.2			

DESIGN MANUAL CHAPTER 3.8: EXTREME FLOOD & 10% RULE

- Documentation supporting safe passage of the 100-year post-development flow
- Evaluation must be provided to include downstream analysis to the point which the project comprises 10% of the total contributing drainage area
- Address existing conveyance system capacity and “pinch points” where a pipe/culvert would be overtopped and where the pipe/culvert will need to be upgraded

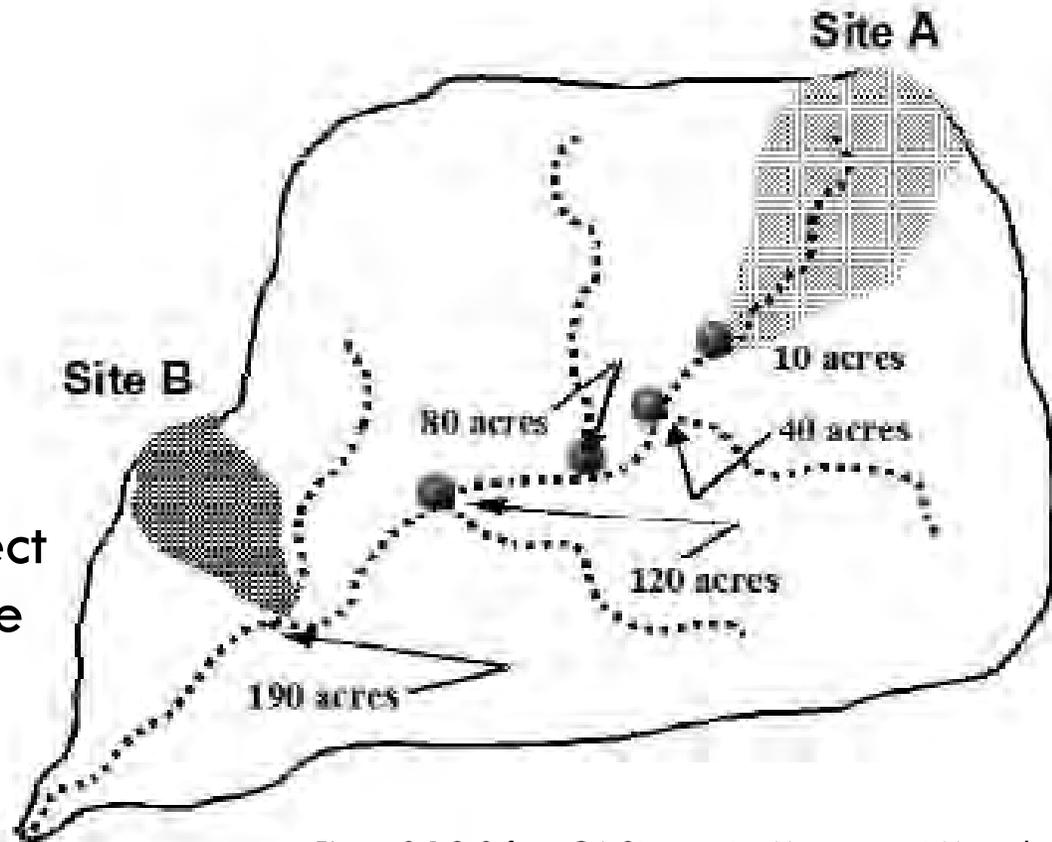


Figure 3.1.9-3 from GA Stormwater Management Manual

DESIGN MANUAL CHAPTER 3: ALTERNATIVES TO ON-SITE STORMWATER MANAGEMENT

- **3.9 Maximum Extent Practicable (MEP)**

- There must a serious and demonstrated attempt to comply with the Manual
- 8 Evaluation points are detailed
- MEP submittal must include documentable evidence of the process the applicant has performed

- **3.10 Off-Site Stormwater Management**

- MEP requirements must be met first on-site
- Off-site or regional practice must be located on property legally dedicated, sized & designed to meet requirements of this manual (stormwater quantity and quality control in same catchment as defined by the local jurisdiction)

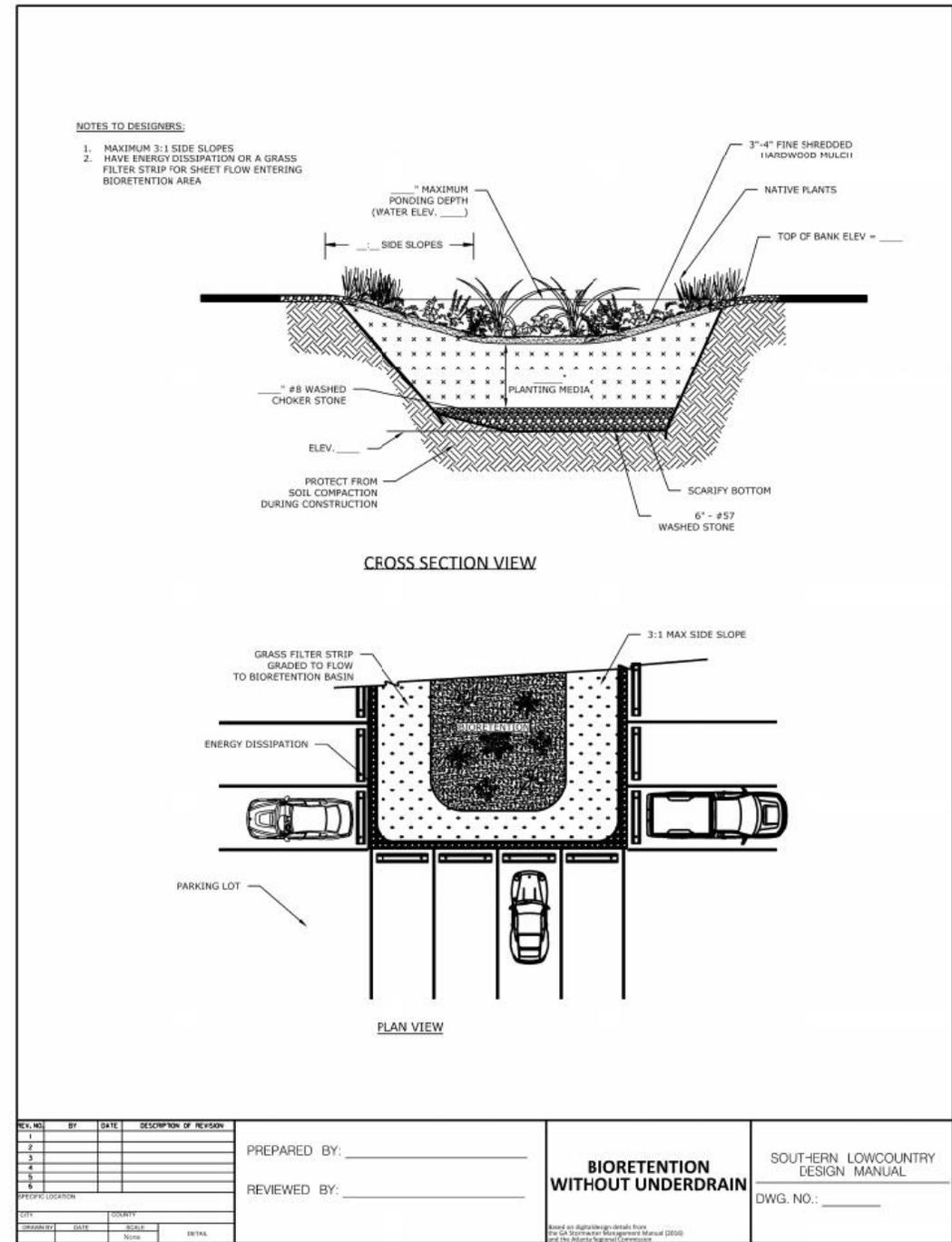
- **3.11 Fee-in-Lieu**

- Assumes there's an entity responsible for managing stormwater off-site
- Fee-in-Lieu will be applied to the same HUC-12

- **3.12 Waivers**

DESIGN MANUAL CHAPTER 4: STORMWATER BEST MANAGEMENT PRACTICES

- Design details for 13 BMPs
- SWRv formulas
- Compliance calculations
- Construction sequence
- Maintenance activities
- Future inspection schedules



STEPS TO ADOPTION

- Integrated Public Involvement Throughout the Process:
 - Initial input from design community at project outset in December 2018
 - Public Comment Period January-February 2020
 - 3 Stakeholder Public Meetings in January 2020
 - Public Education via various regional meeting presentations - TBD
- Final Draft of Southern Lowcountry Regional Stormwater Ordinance and Design Manual submitted to Project Team in spring 2020.
- Each <local jurisdiction> presents Lowcountry Regional Stormwater Ordinance and Design Manual for adoption by its governing body and process.

CONCLUSIONS

- Addressing the **challenges** of regional collaboration at the outset will offer the **greatest benefits** at the project end.
 - Most consistent and effective approach to regulate stormwater at the **watershed scale**
 - Provide **cost-sharing** opportunity
 - Provides **consistency** for design community
- Consultant **facilitation** ensures equal representation as a neutral 3rd party.
- Recognize and plan for adoption challenges which are unique for each partner. Leverage support from **advocacy and stakeholder groups!**





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