Integrated Stormwater Management for Local Governments

2019 APA-AL|MS Annual Conference

Kevin Day, CFM

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Waggoner Engineering

Steve Hohulin, AICP

Mr. Hohulin has over 40 years of experience helping communities plan for and execute detailed, focused and integrated Community Master Plans. His regional approach to community planning has allowed his clients to successfully address environmental, quality of life, economic development, aesthetic, growth and municipal finance issues in a comprehensive and coordinated fashion.

His work is especially known for providing clients not only with an attractive and achievable vision for the community, but also with a detailed, step-by-step implementation strategy to allow his clients to actually achieve their vision and not just have a series of “pretty-pictures”.

This work has led to 14 of his clients being listed among the top 20 fastest growing economies in the country.

Waggoner Engineering

Zoffee Dahmash, PE, BCEE

Mr. Dahmash is a well-recognized professional that spent the majority of his career not only learning about the diverse field of watershed planning and restoration but also promoting awareness of the impacts of improper land use and management.

During his professional career at MDEQ, he was instrumental in the development and implementation of the Mississippi's Nonpoint Source Pollution (NPS) Program, the Basin Management Approach (BMA) to water quality management, and pioneered the establishment of watershed-based land use management approaches and concepts throughout the state. His experience has included an array of hands-on projects dealing with watershed protection and restoration, education and outreach, and demonstration of innovative Best Management Practices (BMPs) to control the impacts of agriculture, construction, urban stormwater, and hydro-modification land-use sources.

Zoffee's resume includes projects involving erosion and sediment control, integrated urban stormwater management, low impact and green infrastructure approaches, nutrient reduction, natural streambank stabilization techniques, and leadership of several coastal watershed protection and restoration projects.

Waggoner Engineering

Kevin Day, CFM

Mr. Day joined the Planning Division of Waggoner Engineering in 2006 as a Planning Designer. He has over 35 years of planning experience working on a broad range of both public and private development projects.

From regional disaster recovery programs, long-range transportation plans and economic development projects. These includes the Mississippi Gulf Region Water and Wastewater Plan, the Mississippi Flood Map Modernization Initiative, and the Katrina/Rita Disaster Recover Programs for Louisiana and Mississippi.

He is member of the Association of State Floodplain Managers (ASFPM) and the Association of Floodplain Managers in Mississippi (AFMM).

Integrated Stormwater Management

What is Integrated Stormwater Management (ISWM)

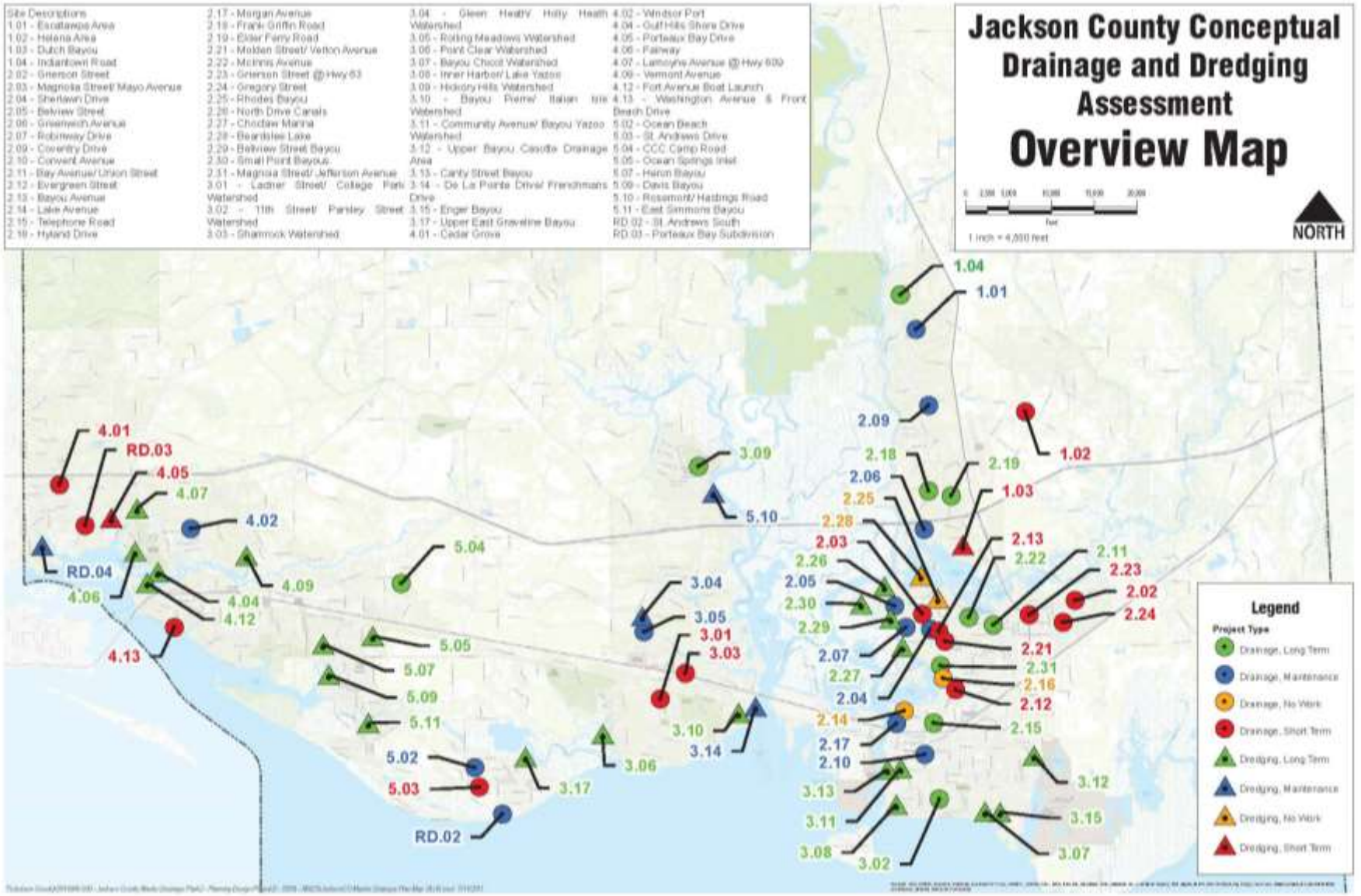
ISWM requires new types of collaboration and a change of practices beginning from the strategy and master-planning phase to the realization phase. It is a comprehensive, ecosystem-based approach to stormwater management.

Principles

1. Stormwater is resource. (It's not just drainage or flood management issues)
2. Identify and protect existing ecosystems. (Natural Wetlands)
3. Mimic the pre-development hydrology (evapotranspiration, stream flow, infiltration, water quality and quantity)

Developing a Watershed Based Stormwater Management Program

Storm Assessment



Developing a Watershed Based Stormwater Management Program

Storm Assessment

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Storm Assessment

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Jackson Co. Conceptual Drainage and Dredging Assesment

Opinion of Probable Cost — **Mar 2017**

Site 3.10 - Bayou Pierre/Italian Isle Watershed

Pay Item	Unit	Quantity	Unit Cost	Total Cost
Mobilization	LS	1	$ 68,000.00	$ 68,000.00
Typical Dredging and Disposal Dredge Material at Greenwood Island BUS (includes $2.00/CY Tipping Fee)	CY	23,000	$ 20.00	$ 460,000.00
Non-Typical Dredging and Disposal Dredge Material at Greenwood Island BUS (includes $2.00/CY Tipping Fee)	CY	19,000	$ 35.00	$ 665,000.00
Hydrographic Survey (Pre/Post Construction)	LS	1	$ 10,000.00	$ 10,000.00
Turbidity Barrier	LF	180	$ 20.00	$ 3,600.00
			Estimated Construction Costs	$ 1,206,600.00
			Engineering Costs (Design, Inspection, Construction Testing, etc.)	$ 180,990.00
			Permitting	$ 5,000.00
			15% Contigency	$ 208,888.50
			Total Estimated Project Cost	**$ 1,601,478.50**

Methodology

- Each project was priced as if bid independently
- As these are conceptual OPCs, unit prices were increased to accommodate additional items that might occur on a detailed bid form
- Unit costs for Dredging Excavation were confined to two categories:
  - Typical Dredging Method
  - Non-Typical Dredging Method
- The Engineering Costs were estimated to be 15%
- Right-of-Way/Easement Acquisition costs for each OPC were included
- Permitting costs were included based on whether the site was within an environmentally sensitive area
- A 15% contingency was added to each OPC

Developing a Watershed Based Stormwater Management Program

Storm Assessment

Project prioritized based upon:

- Regulatory and Compliance
- Optimized Life Cycle Costs
- Operational Efficiencies
- Growth & Economic Development
- Sustainability Initiatives
- Levels of Service/Flood Reductions
- Customer/Community Benefit
- Quality of Life
- System Design & Performance

Developing a Watershed Based Stormwater Management Program

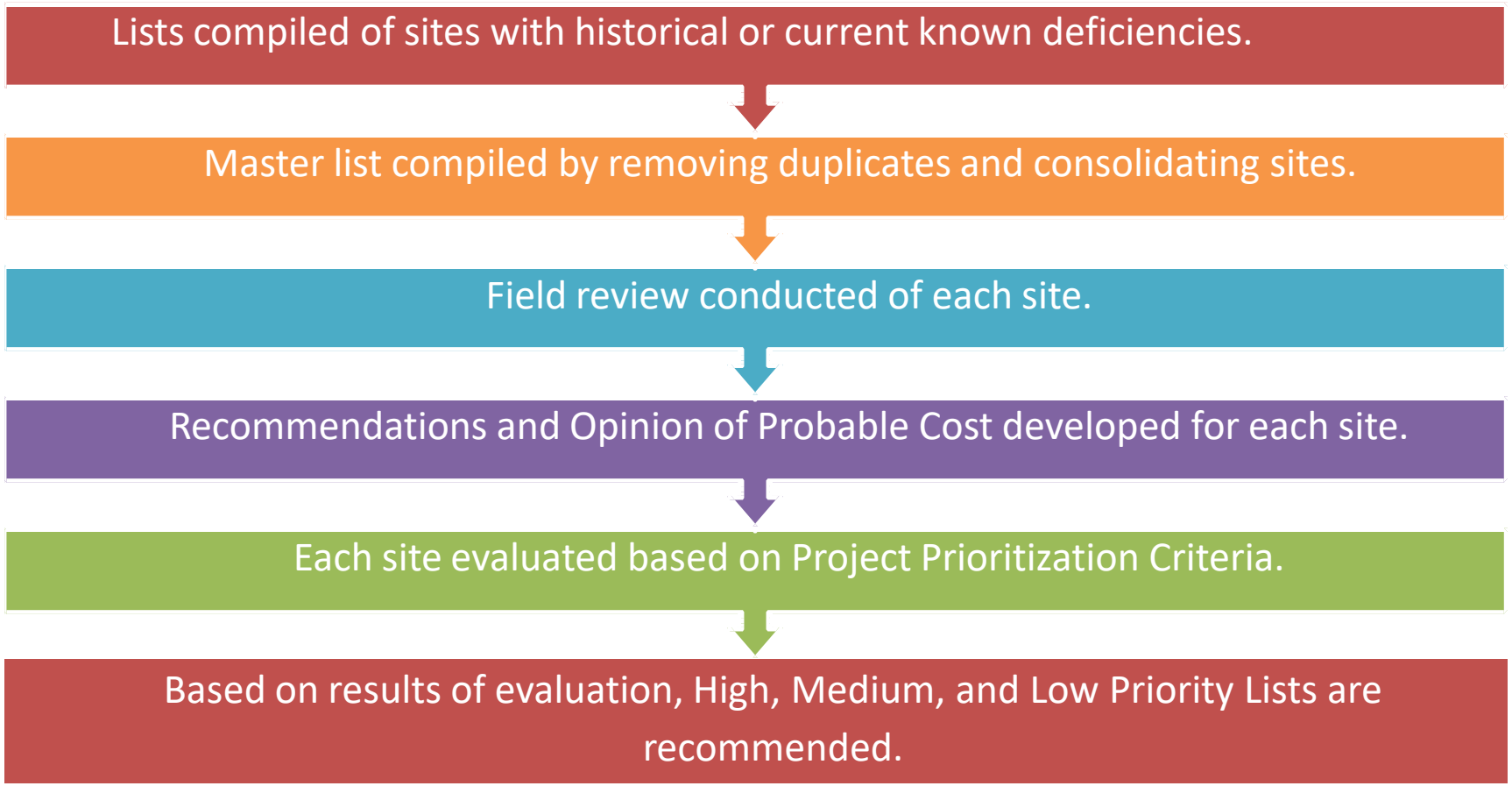
Priority Implementation Plan

Project No.	Project Name	GOMESA Project Type	Timeline					Other Potential Funding*	Permit(s) Required	Ready for Construction				More Study Required
			Study	Design	Permits	Land Acquisition	Implementation			Preliminary Engineering	Design	Permit Acquisition	Land Acquisition	
1.02	Helena Area	Flood Proofing, Hydrologic Restoration	1 year	9 months	1 year	1 year	1.5 years	1	Wetlands, MDOT				some ROW needed	Yes
1.03	Dutch Bayou	Channel Dredging, Restoration Dredging	---	6 months	1 year	---	1 year	1, 4	Wetlands, Dredging, Upland Disposal				---	---
2.02	Grierson Street	Flood Proofing, Bank Stabilization	---	9 months	6 months	6 months	6 months	1	Wetlands				some ROW needed	---
2.03	Magnolia St/Mayo Ave	Flood Proofing, Hydrologic Restoration	---	1 year	1 year	1 year	1 year	1	Wetlands				some ROW needed	---
2.12	Evergreen St	Flood Proofing, Restoration Dredging, Bank Stabilization	---	1.5 years	1 year	1.5 years	2 years	1	Wetlands, Dredging, Upland Disposal				some ROW needed	---
2.13	Bayou Ave	Flood Proofing, Restoration Dredging, Hydrologic Restoration	---	6 months	6 months	1 year	1 year	1	Wetlands				some ROW needed	---
2.21	Molden St/Verlon Ave	Flood Proofing, Bank Stabilization	---	1 years	6 months	1 years	1 year	1	Wetlands				some ROW needed	---
2.23	Grierson St at Hwy 63	Flood Protection, Hydrologic Restoration, Bank Stabilization	---	1 years	1.5 years	2 years	1 year	1	Wetlands, MDOT				some ROW needed	---
2.24	Gregory St	Flood Proofing, Bank Stabilization, Channel Realignment	2-3 years	6 months	6 months	1 year	1 year	1	Wetlands				some ROW needed	Yes
2.26	North Drive Canals	Restoration Dredging	---	Completed	6 months	---	6 months	1	Dredging, Upland Disposal				---	---
3.01	Ladner St/College Park	Flood Proofing, Hydrologic Restoration, Bank Stabilization	1-2 years	6 months	6 months	1 year	2 years	1	Wetlands				some ROW needed	Yes
3.03	Shamrock Watershed (under Hwy 90)	Flood Proofing, Bank Stabilization	---	6 months	1 year	2 years	1.5 years	1	Wetlands, MDOT				some ROW needed	---
3.06	Point Clear (East Graveline Bayou)	Restoration Dredging	---	1.5 years	2 years	6 months	1 year	1, 12	Dredging, BUS				---	---
3.07	Bayou Chicot	Restoration Dredging	---	1.5 years	1 year	---	1 year	1, 12	Dredging, BUS				---	---
4.01	Cedar Grove	Flood Protection, Hydrologic Restoration	---	6 months	6 months	6 months	1 year	1	Wetlands				some ROW needed	---
4.02	Windsor Point	Bank Stabilization, Flood Proofing	---	Completed	---	Completed	6 months	1, 13	None			---		---
4.05.a	E. Prong, Porteaux Bay Dr	Restoration Dredging	---	Completed	Completed	---	6 months	1, 3, 12	Dredging, BUS				---	---
4.05.b	West & Center Prong, Porteaux Bay Dr	Restoration Dredging	---	6 months	6 months	---	6 months	1, 3, 12	Dredging, BUS				---	---
4.06	Fairway Dr, Gulf Hills	Restoration Dredging	---	6 months	6 months	---	6 months	1	Dredging, BUS				---	---
4.13	Washington Ave/Front Beach Dr	Flood Protection, Flood Protection	---	9 months	1.25 years	1 year	1.5 years	1, 11	Wetlands				some ROW needed	---
5.02	Ocean Beach - Center St to North St	Infrastructure Improvements, Flood Proofing	---	Completed	6 months	1 year	9 months	1	Wetlands				some ROW needed	---
5.03	St Andrews Dr - North Tantallon Dr	Flood Proofing, Hydrologic Restoration	---	9 months	9 months	1 year	1 year	1	Wetlands				some ROW needed	---
5.09	Davis Bayou (Remaining)	Restoration Dredging	---	3 years	2 years	---	2 years	1, 12	Dredging, BUS				---	---
RD.03 (4)	Porteaux Bay Subdivision	Bank Stabilization, Flood Proofing	---	1.5 years	1 year	2 years	2 years	1	Wetlands				some ROW needed	---
RD.05(4)	Lemoyne Blvd Erosion Control	Bank Stabilization, Flood Proofing	---	Completed	Completed	Completed	9 months	1	Wetlands					---

Note: For study sites, the timeline for project implementation has been estimates as best as possible without knowing the recommendations from the study. These estimates are subject to change.

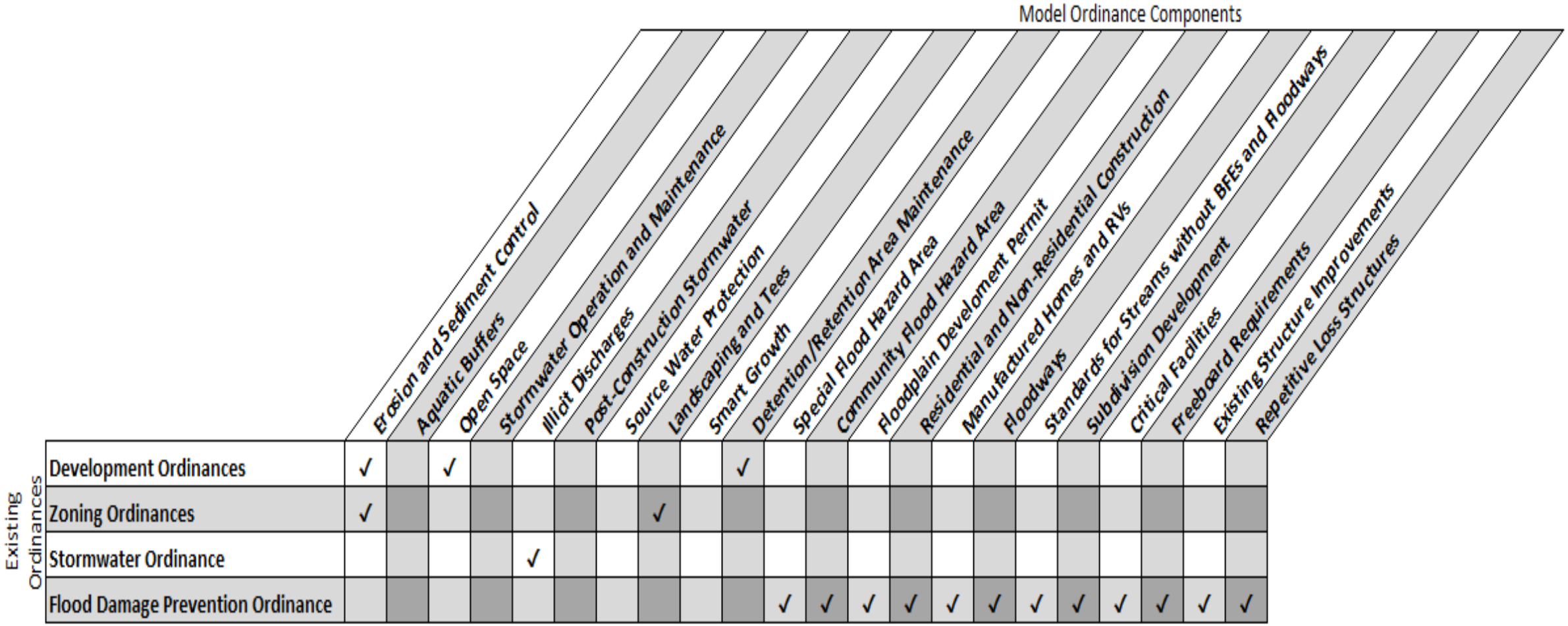
*Other Potential Funding Sources Key: 1 (Mississippi GOMESA); 2 (RESTORE), 3 (RESTORE NFWF GEBF); 4 (MsCIP); 5 (Tidelands); 6 (GOMA); 7 (USEPA GoM Program); 8 (USACE 219); 9 (NRCS EWP); 10 (CELCP); 11 (MDOT); 12 (FEMA); 13 (NRCS)

Developing a Watershed Based Stormwater Management Program



Developing a Watershed Based Stormwater Management Program

Priority Implementation Plan



Developing a Watershed Based Stormwater Management Program

- [x] **Stormwater Management Planning**
- [x] **Developing a Watershed Based Stormwater Program**
  - Building Public Support
  - Data Collection and Evaluation
  - Characterization and Quantification
  - Development of Program Priorities
  - Prioritization and Targeting
  - Implementation
  - Develop 5-Year Plan for Implementation
  - Next Steps

Integrated Stormwater Management

Stormwater Management Planning

- [x] Water does not recognize man-made boundaries. Therefore water management must work at all jurisdictional scales. Countiies, States, Districts, Cities, Towns, and Neighborhoods.
- [x] Actions and events can occur outside your boundary
- [x] Upstream development may affecting you downstream
- [x] Planning may need to happen outside your boundary
- [x] Using a watershed-based approach is the most effective way to manage stormwater. Most communities are not contained in a single watershed

Integrated Stormwater Management

Stormwater Management Planning

It's about the time it takes water to travel.

- ☑ Rural – Water moves slower - Days – Weeks – Months
- ☑ Urban – Water moves quicker -Minutes - Hours – Days

- ☑ Rural land is relatively inexpensive
- ☑ Urban or developed land is relatively more expensive

Integrated Stormwater Management

Stormwater Management Planning

The traditional stormwater management approach of concentrating flow and rapidly moving it downstream by way of hard (grey) engineered systems are not meeting community needs.

- ☑ Higher costs of hard infrastructure
- ☑ Higher costs of operations and maintenance (life cycle)
- ☑ Potential costs of property damage and economic losses
- ☑ Potential loss of life

Integrated Stormwater Management

Watershed Based Planning

- ☑ Identify the watersheds impacting your community
- ☑ Quantify the impacts of each watershed
- ☑ Prioritize impact and costs/benefits
- ☑ Look for solutions inside and outside your boundaries
- ☑ Evaluate solutions based on your (and others) Comprehensive Master Plan goals
- ☑ Look for other partners/jurisdictions
- ☑ Look for economic and Quality of Life improvements (both inside and outside your boundaries)

Wrap Up

- [x] Regional issues require regional solutions
- [x] No two communities' situations or economies are alike
- [x] Work toward joint solutions/funding
- [x] Educate the public and public officials
- [x] Thinking "outside the box" often requires thinking outside your borders.

Q&A

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