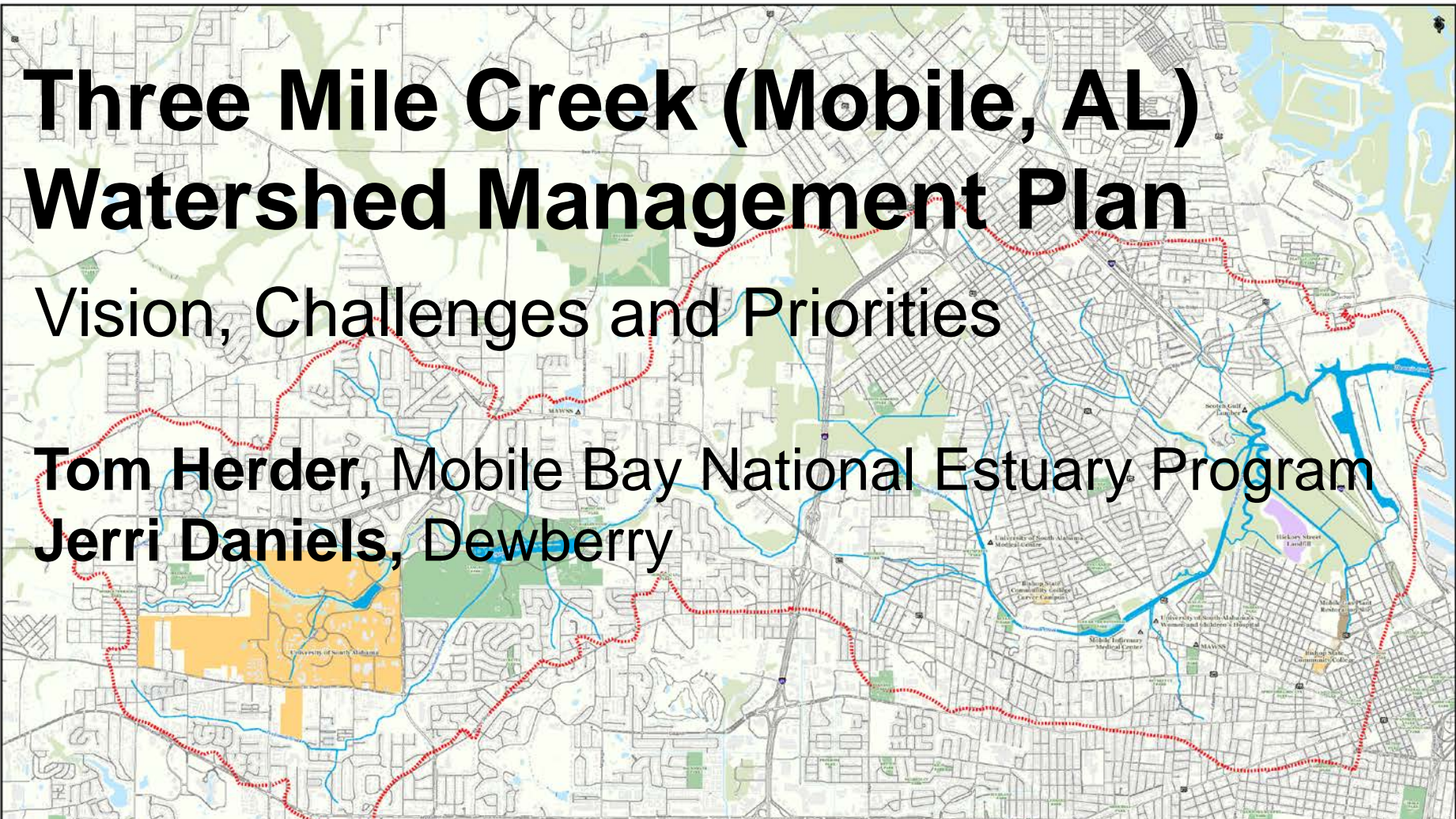


Three Mile Creek (Mobile, AL) Watershed Management Plan

Vision, Challenges and Priorities

Tom Herder, Mobile Bay National Estuary Program
Jerri Daniels, Dewberry



Dewberry

Three Mile Creek Watershed Vicinity

- | Legend | | |
|----------------------------|-----------------------------------|-------------------------|
| Three Mile Creek Watershed | Landmarks | Public Parks |
| Three Mile Creek System | Roads | Universities |
| Water | Building Footprint | Hickory Street Landfill |
| Swamps/Wetlands | Mobile Gas Plant Restoration Site | |

0 0.5 1 2 3 4 Miles

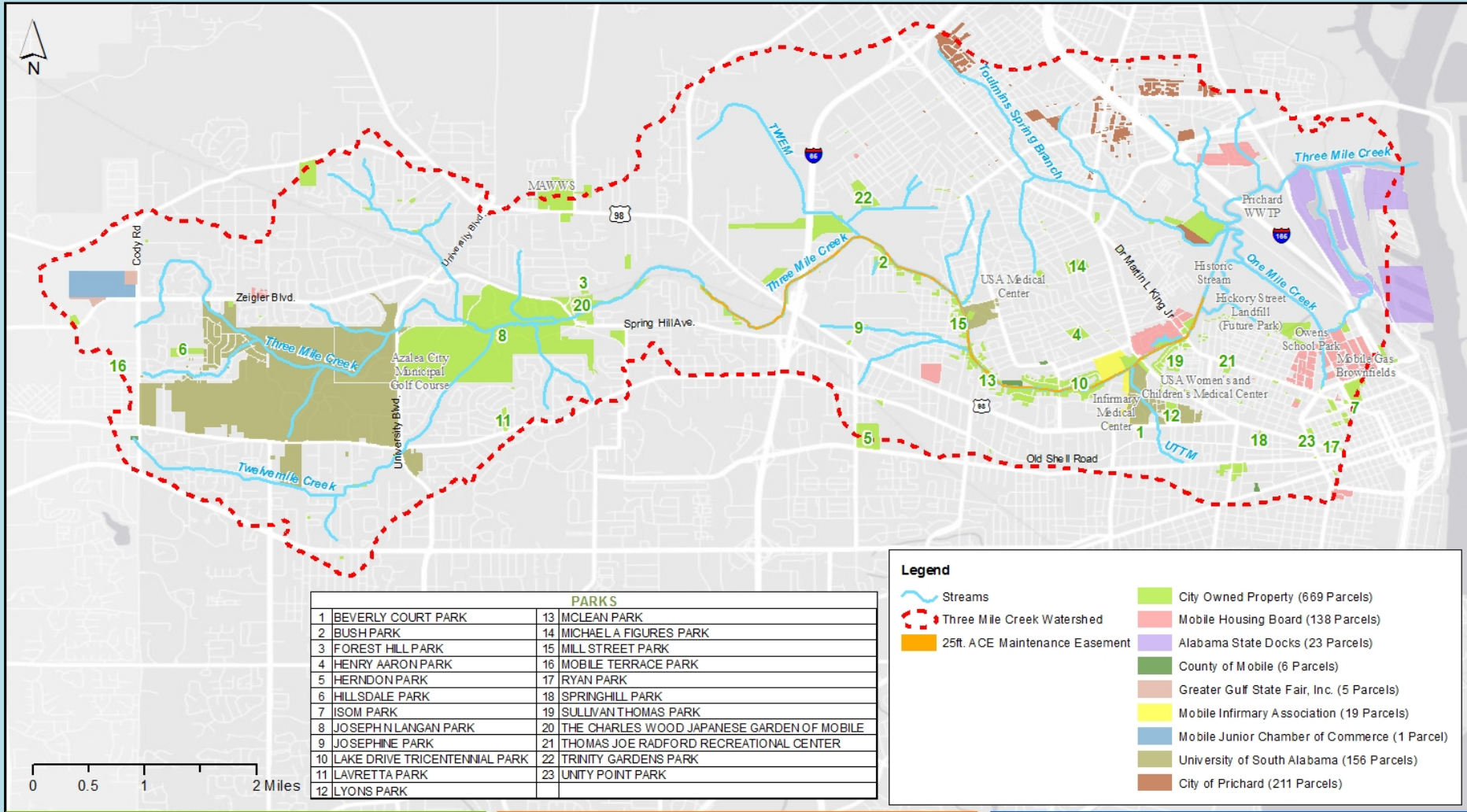
Source: Road, Building, Park, Water and Swamp Data - City of Mobile GIS Department, 2013.
Streams - USGS National Hydrography Dataset, 2013.

Three Mile Creek Watershed
Management Plan



Dewberry

The **Three Mile Creek watershed** drains an area of 30.1 square miles within the cities of Mobile and Prichard, AL. The main channel flows about 14 miles from west Mobile east into the Mobile River. It flows through diverse neighborhoods, *five of seven* City Council and *all three* County Commission Districts, and past important stakeholders that include the University of South Alabama, three hospitals, Bishop State College, and city housing projects.

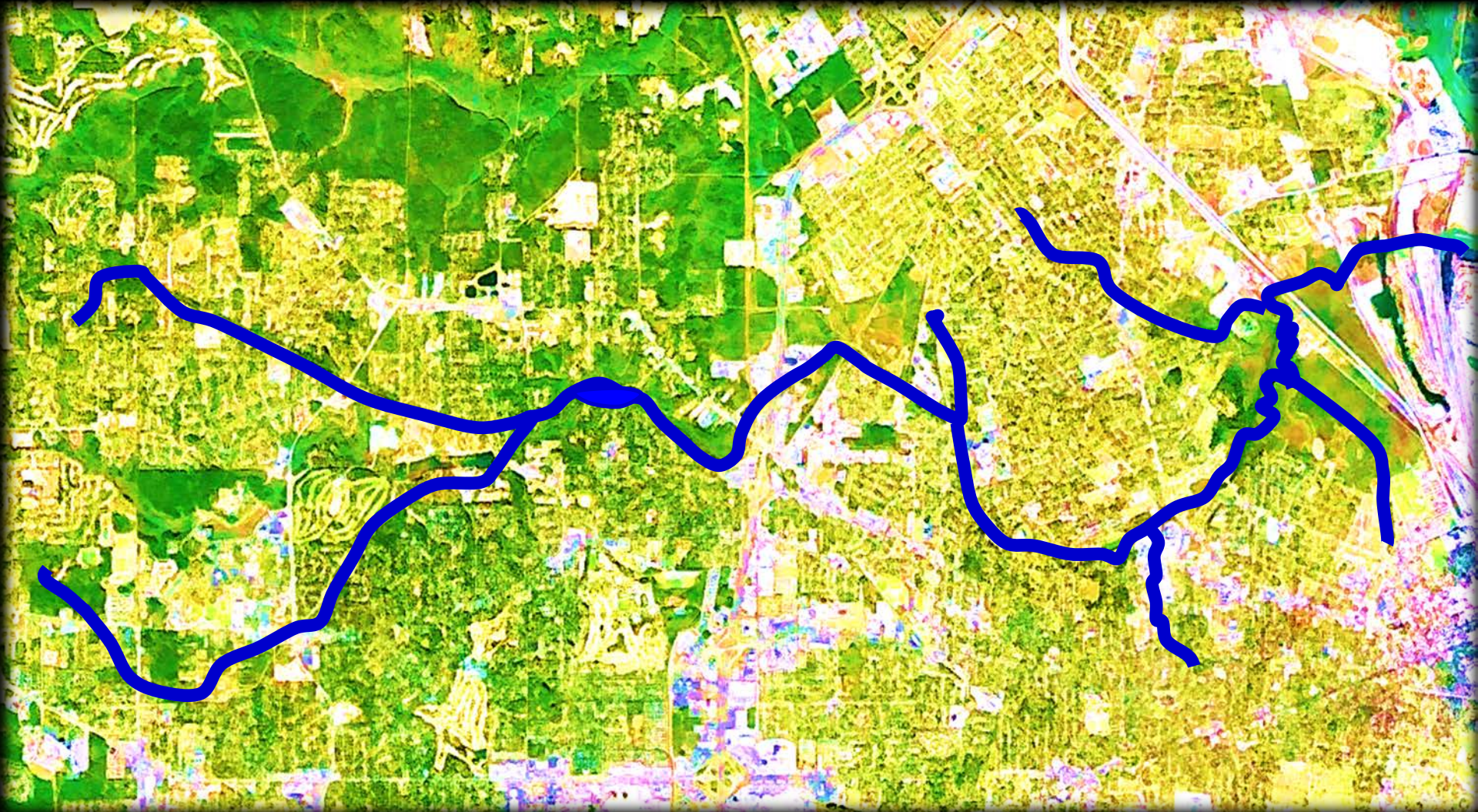


Historically:

- **In the 1700s**, “the Portage on Bayou Chateauguay” provided food and a convenient homesteading opportunity for settlers.
- **By 1814**, Three Mile Creek was the source of water for the City of Mobile.
- **By 1940**, water supply was inadequate and undependable, not only due to lack of sufficient quantity. Quality was impacted by increasing urbanization in the Three Mile Creek watershed. The City turned to Big Creek Lake in the western county.
- **In the 1980s** in response to destructive flooding, the Corps of Engineers made extensive hydrological modifications to TMC that included installation of weirs, 5.6 mi of channel widening and deepening, and construction of a one-mile by-pass channel that resulted in siltation and degradation of a historic stream segment.
- **Between 1996 and present**, TMC has been listed on the Alabama 303(d) list for nutrients, pH, OE/DO, pathogens, and chlordane. Toulmin Springs Branch and an unnamed tributary were listed for ammonia and nutrients. Upper TMC was de-listed for pathogens, and lower TMC for chlordane, since sampling revealed no exceedances. TMDLs were developed for OE/DO in TMC and for pathogens in TSB and the UTTM. Impairments for litter and trash *are not* recognized by ADEM.

The vision...

**Imagine Three Mile Creek flowing
through the heart of Mobile...**





With walking trails along its banks...



A Three Mile Creek greenbelt stretching from the University of South Alabama to Mobile River



Picture neighborhoods along Three Mile Creek being linked to this greenbelt by walking and bike trails.



Dream of a series of anchor parks along Three Mile Creek...some existing, some new



Our Vision is Simple.



**Three Mile Creek will
once again be the life blood
of the City of Mobile.**

**Where once it provided
water to City residents so
they could thrive...**

**...may it once more
be the water that
nourishes our community
and sustains us all.**



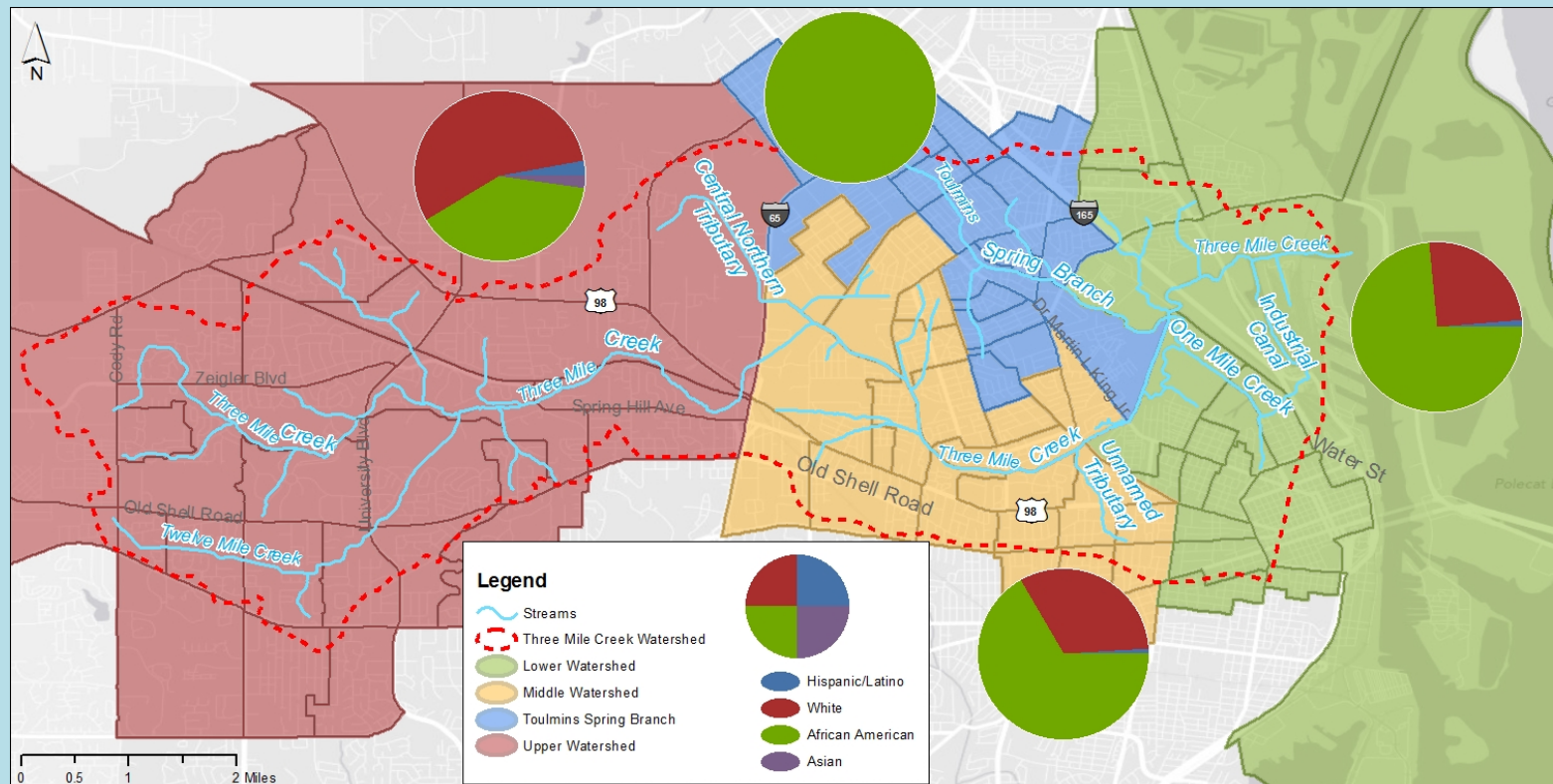
Watershed Management Planning Process

- **Establish goals and objectives.**
- **Evaluate existing studies, literature, and data.**
- **Identify data gaps and collect new data.**
 - Stormwater, groundwater inventory
 - Sea Level Rise & SLAMM Modeling
 - SLR + SLOSH Model
- **Research management measures to address challenges.**
- **Prioritize projects.**
- **Evaluate funding sources.**

Major Challenges

- Stormwater
- Wastewater
- Ecology
- Access
- Climate Adaptation

Demographics vary across the watershed and influence how these challenges will be addressed

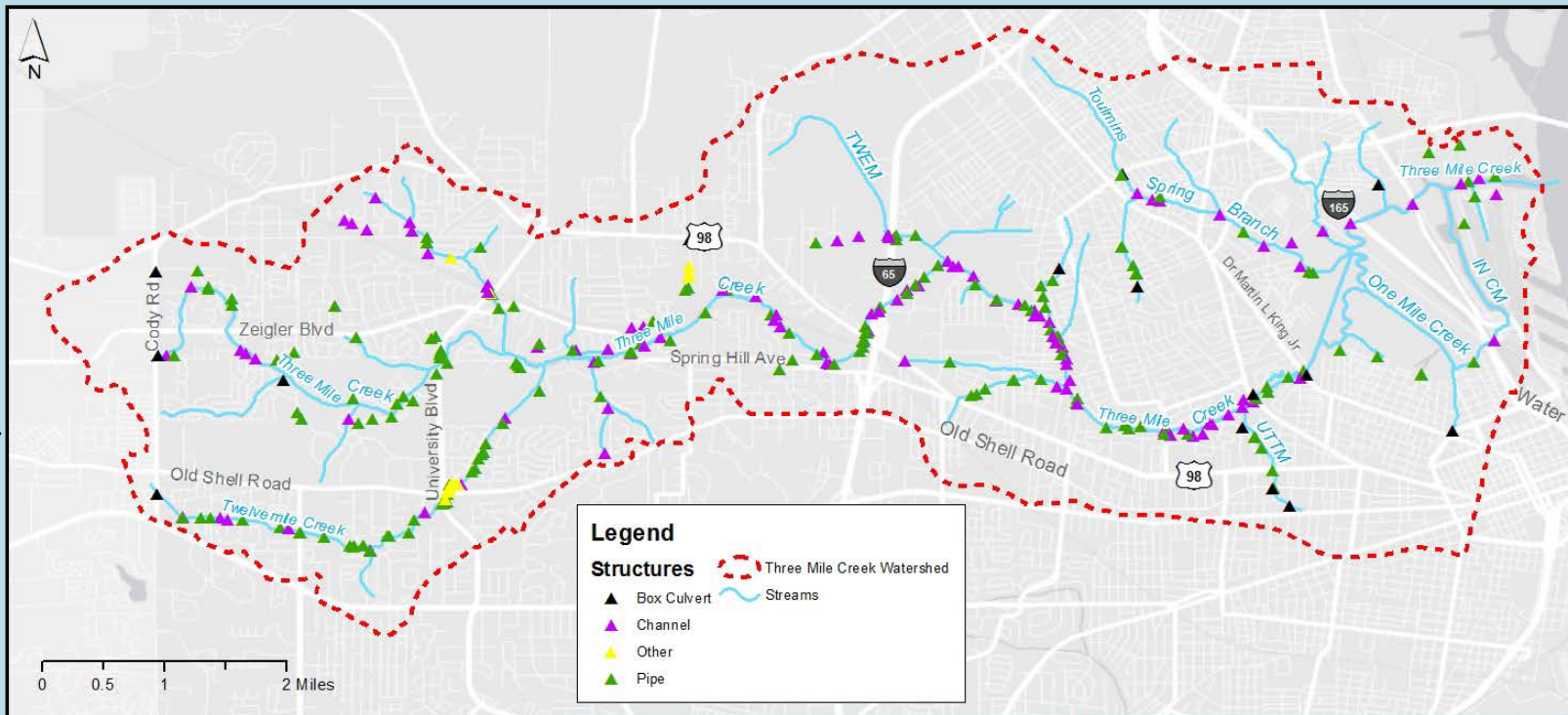


Challenge: Stormwater

- **Effects of stormwater runoff**

- Primary source of trash
- Nutrients
- Oxygen-demanding substances
- Pathogens to the creek during wet weather

City's stormwater outfall inventory was updated with additional data resulting in identification of 123 significant stormwater outfalls



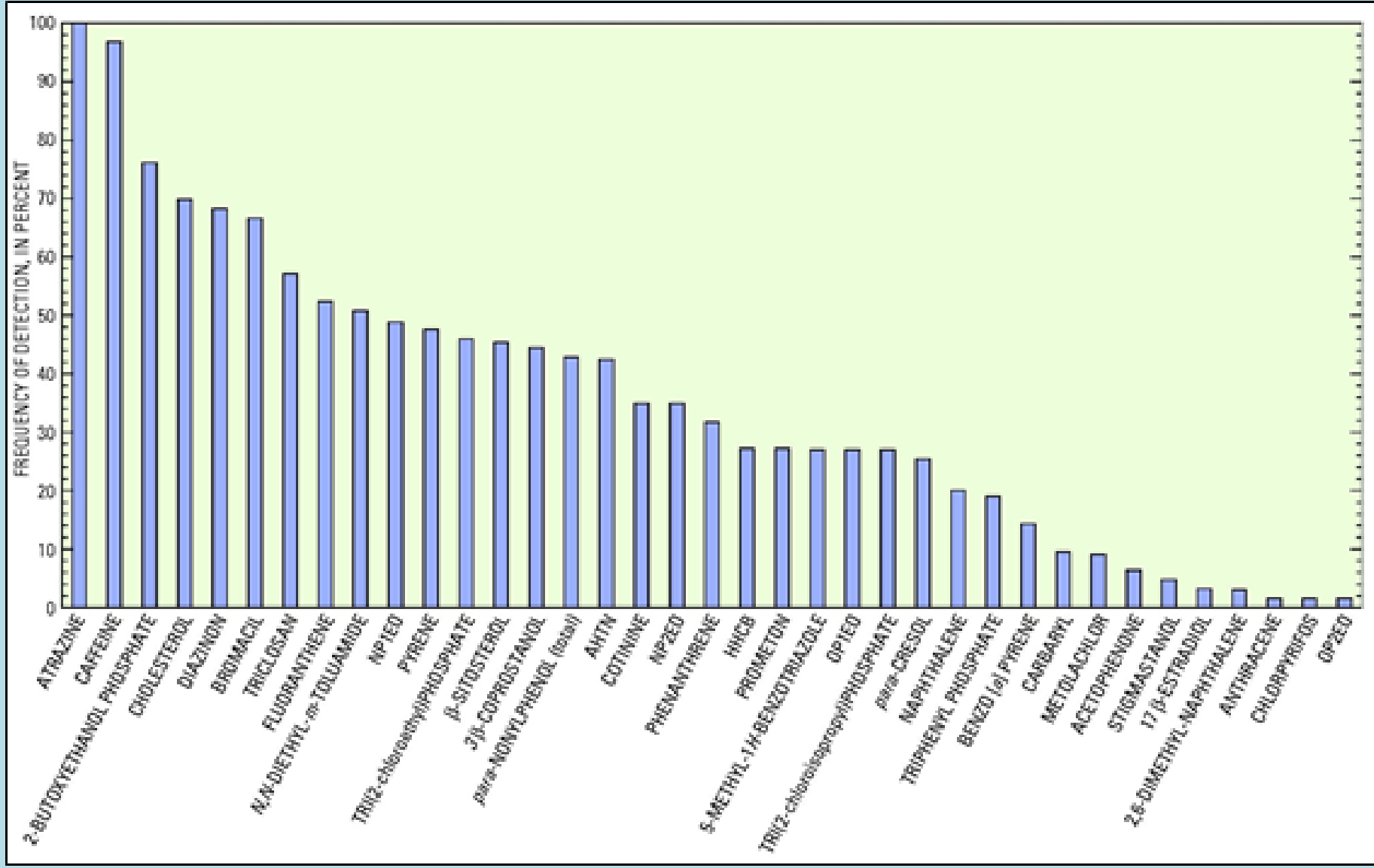


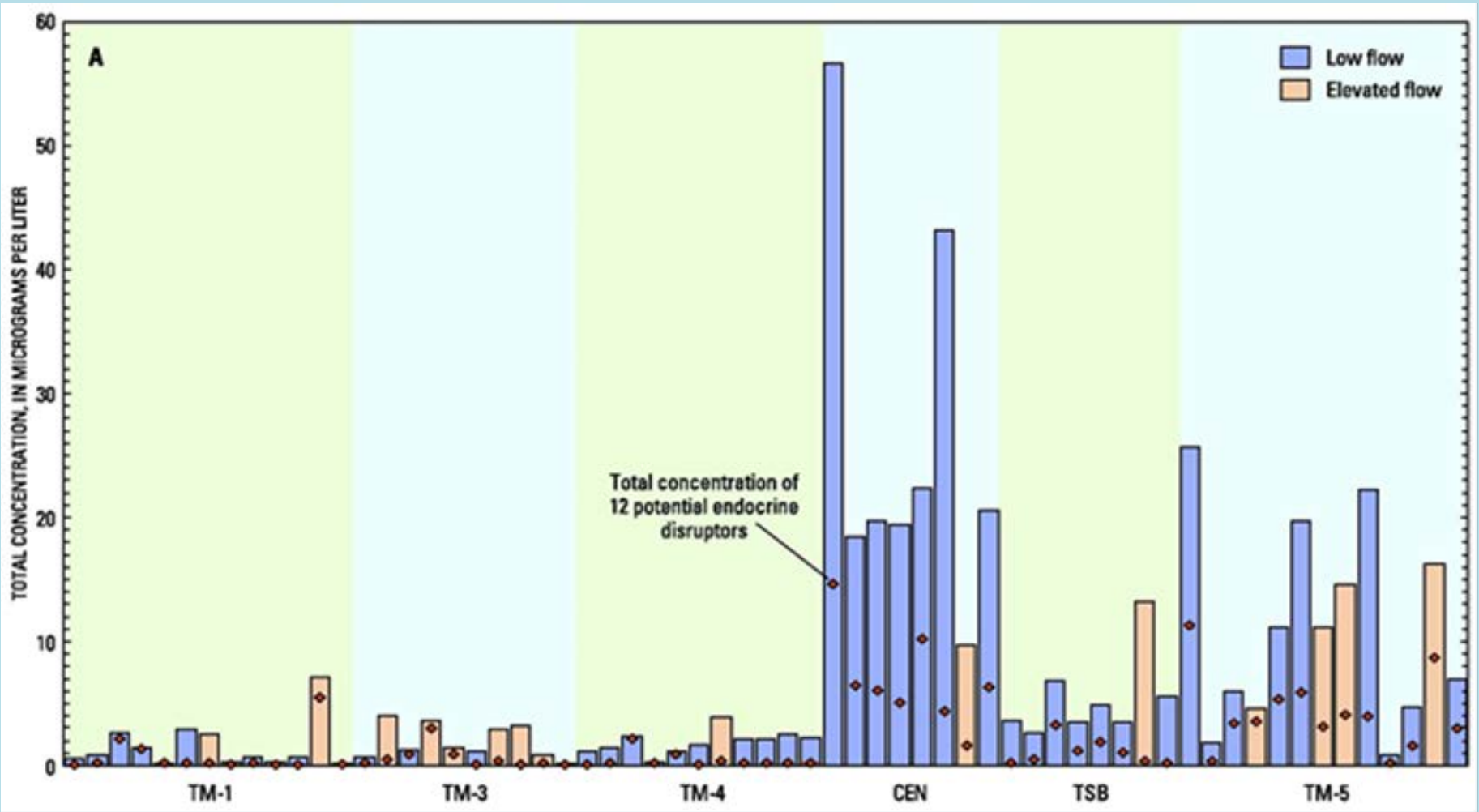
Challenge: Wastewater

- **Illicit Connections and Sanitary Sewer Outfalls**
 - Primarily below MLK Jr. Blvd.
 - Groundwater seepage and direct sanitary discharges
- **Excessive Water Quality Pollutants (pathogens)**
- **Potential groundwater contamination**
 - Hickory Street Landfill
 - Mobile Gas/Sempra remediation site

*Summary of
USA Field
Samples
(Hickory
Street Landfill
Sites 1-4)*

Parameter	Low Value/Location	High Value/Location	Desired Value
COD	13 mg/L at site 2	45 mg/L at site 1	< 20 mg/L
BOD	<2.0 mg/L at site 2	6.9 mg/L at site 4	< 2 mg/L
TN	1.4 mg/L at site 4	2.8 mg/L at both sites 1 and 3	< 0.9 mg/L
TP	0.27 mg/L at site 3	1.3 mg/L at both sites 1 and 2	< 0.04 mg/L
OP	0.11 mg/L at site 2	0.33 mg/L at site 4	< 0.04 mg/L





Challenge: Ecology

- **Abundance of invasive species**

- Island apple snails
- Chinese tallow (popcorn) trees
- Wild taro (Elephant ear)



- **Abundance of aquatic vegetation**

- Densely-matted nuisance vegetation related to nutrient over-enrichment
- Particularly in the downstream segment
- Contributing to low dissolved oxygen



Challenge: Ecology

- **Altered watershed hydrology**

- Loss of floodplain connectivity
- Loss of connected wetland areas
- Reduced length of creek flow path
- Loss of connectivity with historic streamway

- **Altered creek geomorphology**

- Loss of riparian buffers
- Construction of engineered channels and bank stabilization
- Stream bank erosion and sedimentation

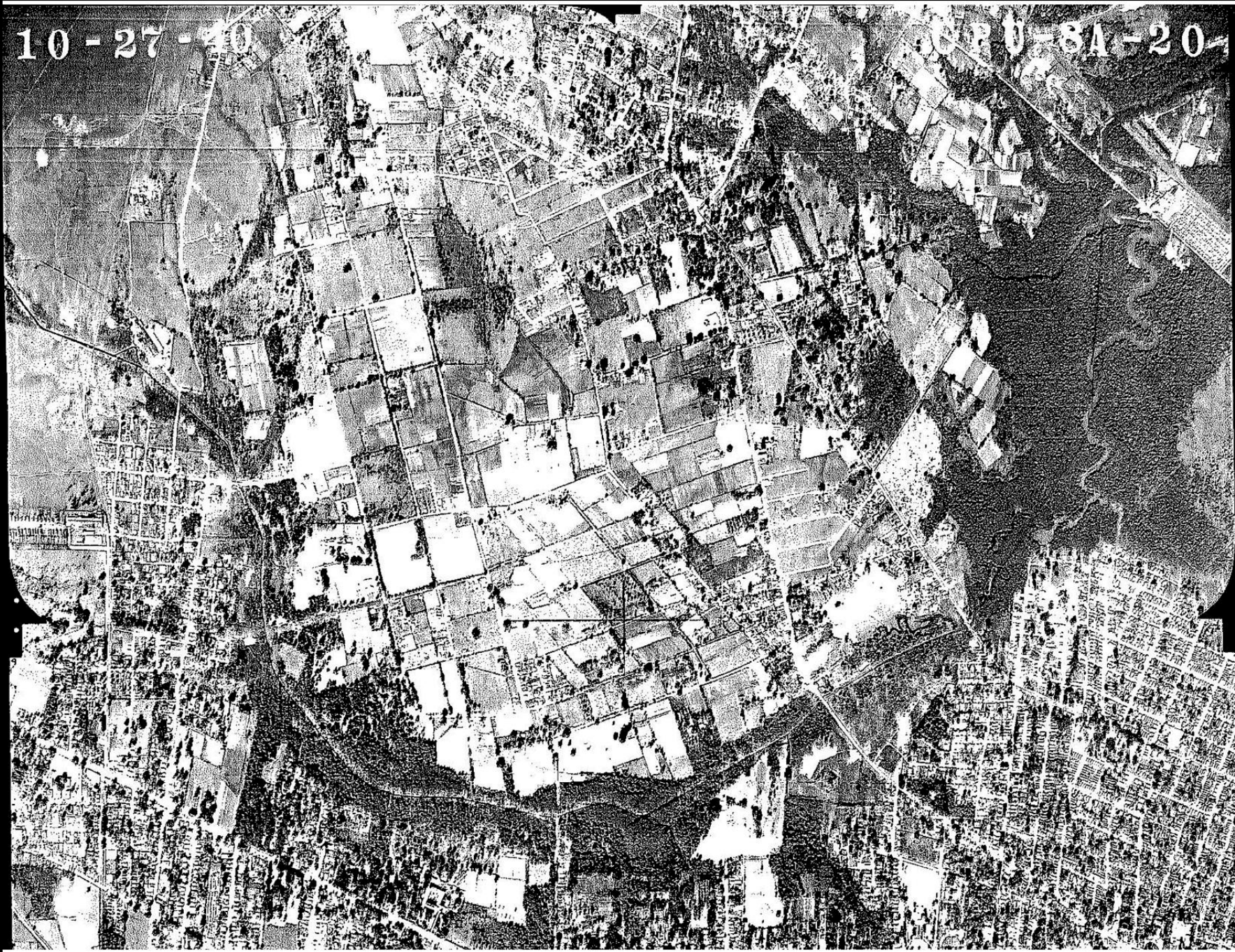






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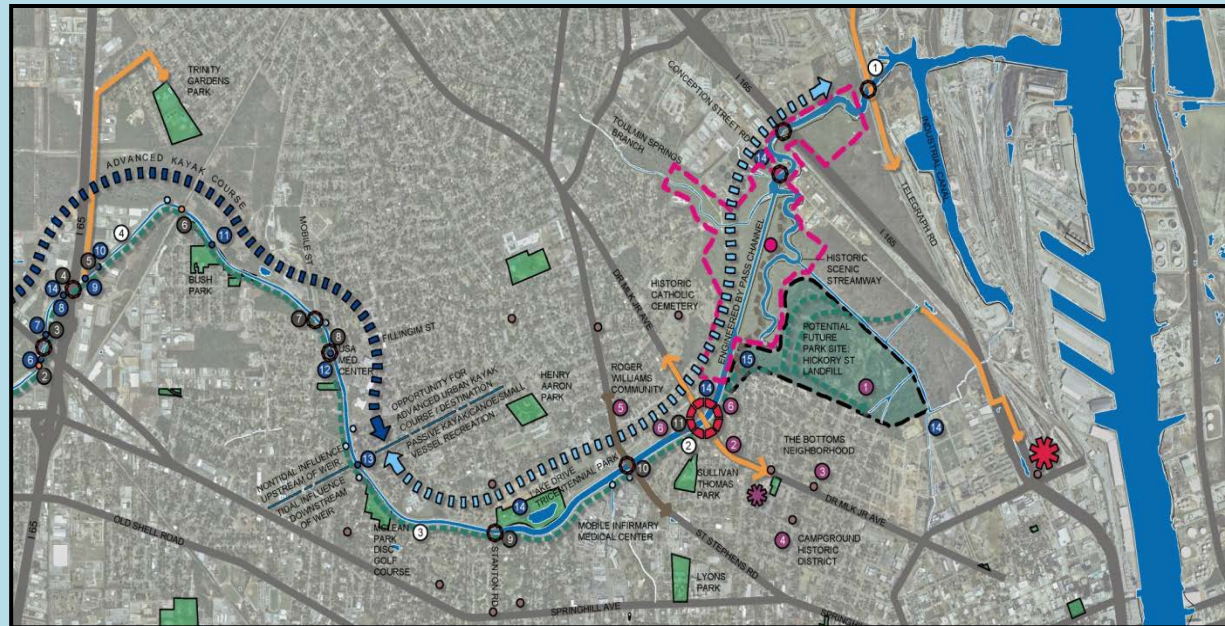


Challenge: Access

- **Lack of recreational access**

- Public access limited to a few locations currently
- Pile weirs, riprap and gabion bank stabilization make use of the creek for water sports difficult

Recreation Opportunities and Constraints Map included in the WMP provides an initial inventory of relevant information to evaluate public access, recreations and ecotourism opportunities along Three Mile Creek (eastern portion of watershed).







Challenge: Climate Adaptation

- **Sea Level Rise**

- Altered balance and distribution of native habitats

- **Increasing Storm Intensity**

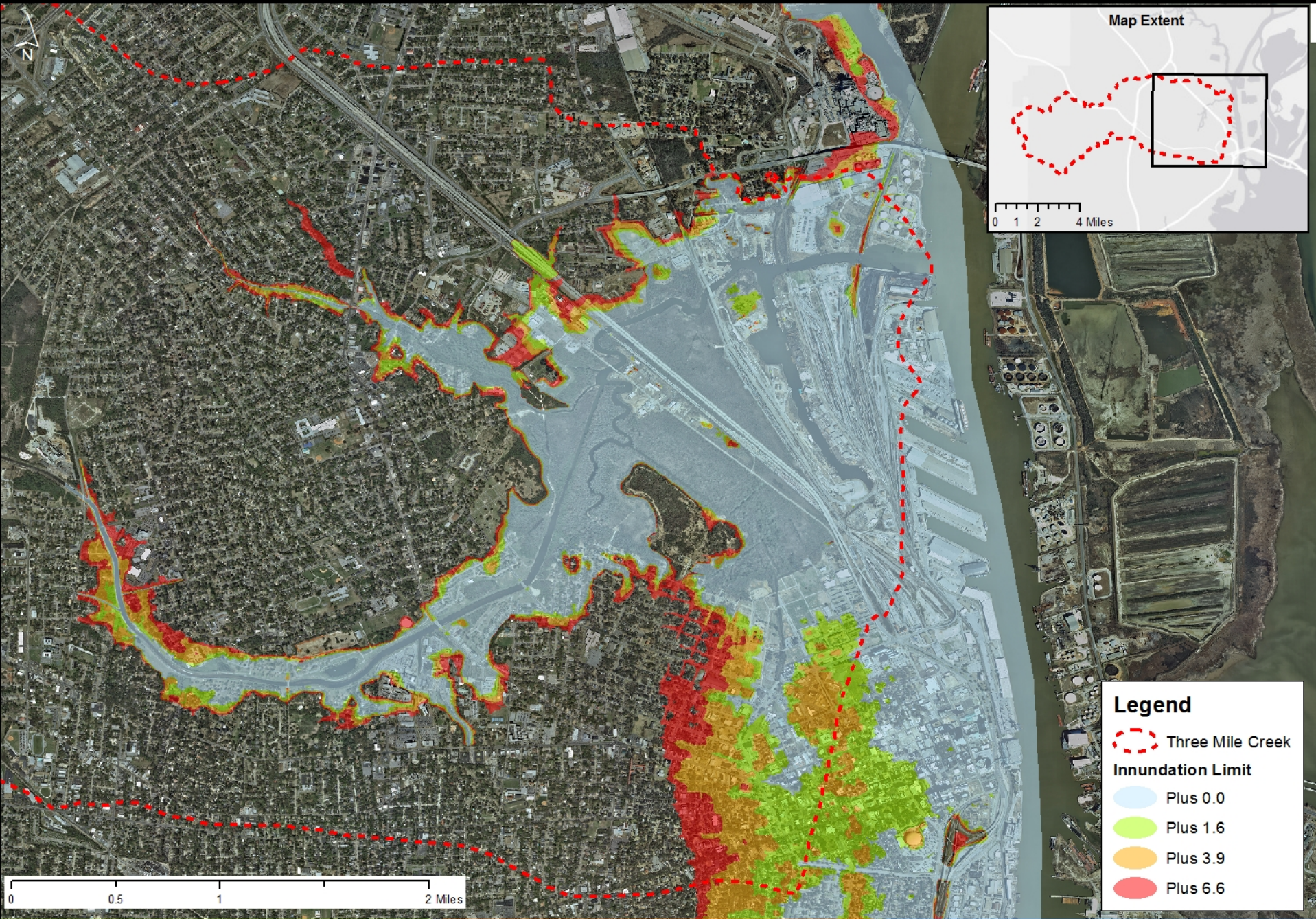
- Higher tidal surges impacting infrastructure

- **Longer and hotter summers**

- More difficult vegetation management

SLR + SLAMM Modeling Conducted, 2.0 meter scenario Habitat Change









SLR SCENARIO 2.0M	Initial (acres)	2025 (acres)	2050 (acres)	Change (Acres, Initial minus 2050 Projection)
Developed Dry Land (upland)	8360.17	8360.17	8360.17	0
Undeveloped Dry Land (upland)	2406.79	2406.31	2402.80	3.99
Nontidal/Cypress Swamp	1790.04	1636.88	1590.30	199.74
Inland Fresh Marsh	71.48	61.36	56.57	14.91
Transitional Marsh/ Scrub Shrub	0.24	81.61	55.17	-54.93
Regularly Flooded Marsh (Saltmarsh)	6.44	89.01	88.14	-81.7
Estuarine Beach	0.80	0.80	0.80	0
Tidal Flat	1.76	1.44	81.18	-79.42
Inland Open Water	80.22	77.69	73.43	6.79
Riverine Tidal Open Water	7.82	4.18	2.98	4.84
Estuarine Open Water	148.14	154.73	163.25	-15.11
Irregularly Flooded Marsh	1.16	1.61	1.75	-0.59
Inland Shore	2.92	2.92	2.92	0
Tidal Swamp	2.41	1.63	0.87	1.54
Total	12880.39	12880.33	12880.33	










Addressing the Challenges: Management Measures

- **Non-structural Best Management Practices**
 - Educational Signs
 - Regulatory Enforcement
- **Structural Best Management Practices**
 - Install Green Infrastructure and other BMPs to capture trash & sediments
 - Remove sediment in USA & Langan Park ponds
 - Stream bank and channel restoration
- **Long-range Sustainability Project Solutions**
- *Total Cost for all = \$65 million to \$188 million*










Top Projects for Implementation

Three Mile Creek Watershed Challenge to be Addressed and CCMP Value	Priority Projects	Summary Description	Cost
Stormwater  Resiliency  Water	Reduce the amount of trash in and entering the creek and tributaries with a focus on One Mile Creek, Toulmins Spring Branch, USA, and Langan Park	<ol style="list-style-type: none"> Utilize utility/trash boat/weed harvester/engage Navy Seabees (6NS) Identify the outfalls that contribute the most trash (8NS, 10NS, 14NS) Install GPRS in strategic locations (1S, 2S, 3S) Citizen involvement and education campaign (7NS, 11NS, 12NS) Add trash capture at USA pond inflow points (6S) Add trash capture at Langan Park pond inflow points (7S) <i>(* If purchase of utility/trash boat/weed harvester is required then add \$800,000 to this Project (15NS, 16NS))</i>	\$2.94M to \$5.34M*
Stormwater, Ecology  Fish  Resiliency  Water	Remove sediment to increase storage capacity and conveyance of stormwater runoff while improving ecological conditions	<ol style="list-style-type: none"> Identify locations of excessive sediment (3NS, 11NS, 12 NS) Remove sediment at strategic locations (4S, 5S, 12S) 	\$18.2M to \$72.7M
Wastewater  Fish  Resiliency  Water	Remove Sanitary System Leaks, SSO, and Illicit Discharges in Toulmins Spring Branch and Unnamed Tributary to Three Mile Creek	<ol style="list-style-type: none"> Identify and remove sanitary system and septic system leakage/overflows into groundwater, creeks and tributaries (1NS) Identify and remove illicit discharges to stormwater and surface water system in watershed (2NS) Focus on Toulmins Spring Branch and UTTM sub-basins and lower portion of watershed (1NS and 2 NS) 	\$1.06M to \$7.2M

Top Projects for Implementation

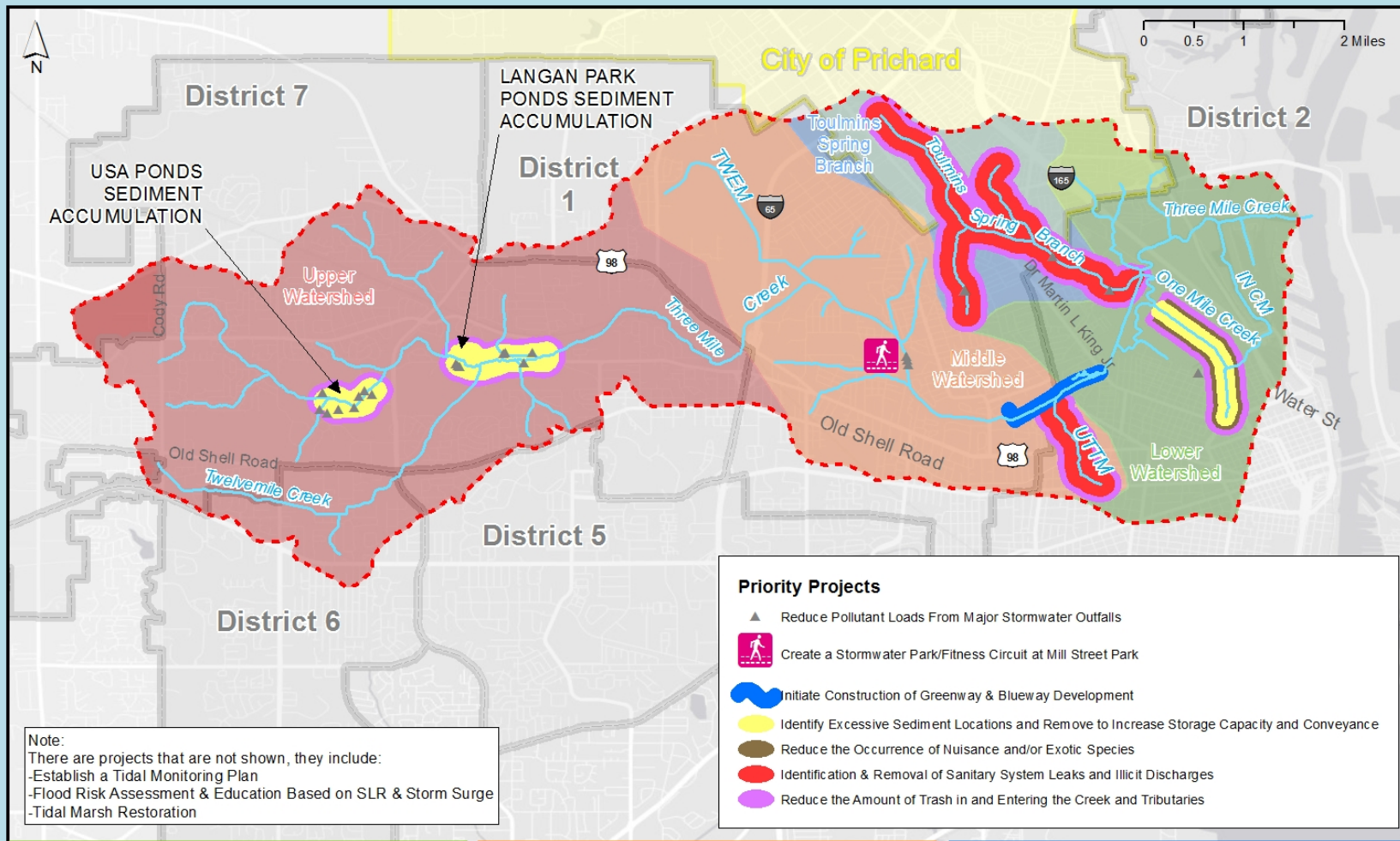
Three Mile Creek Watershed Challenge to be Addressed and CCMP Value	Priority Projects	Summary Description	Cost
Ecology  Coastlines  Fish  Resiliency	Reduce the occurrence of nuisance and/or exotic species with a focus on One Mile Creek	<ol style="list-style-type: none"> 1. Map SAV in watershed and Improve management of exotic/nuisance vegetation in wetland and upland riparian areas adjacent to creek and tributaries (6NS) 2. Develop plan for long term management. (6NS) 3. Utilize previously purchased utility/trash boat/weed harvester (6NS) <i>(* If purchase of utility/trash boat/weed harvester is required then add \$800,000 to this Project (15NS, 16NS))</i> 	\$154,000 to \$285,000*
Access  Access  Heritage	Initiate Construction of Greenway & Blueway Development	<ol style="list-style-type: none"> 1. Establish a greenway along the existing USACE maintenance corridor utilizing the existing bridge at Martin Luther King Jr. Ave. to cross Three Mile Creek (1GW) 2. Anchor the Three Mile Creek blueway and greenway systems at Martin Luther King, Jr. Ave. and Tricentennial Park (1GW) 3. Construct two blueway access points at Tricentennial Park and Martin Luther King, Jr. Ave. (1BW) 	\$255,000 to \$382,000
Access  Access  Heritage	Create a stormwater park/fitness circuit at Mill Street Park	<ol style="list-style-type: none"> 1. Install structural BMPs as part of stormwater park (1S, 2S, 3S) 2. Integrate park access with blueway and greenway trail systems (1BW, 1GW) <i>(* Costs for easement purchase TBD)</i> 	\$546,000 to \$966,000*

Top Projects for Implementation

Three Mile Creek Watershed Challenge to be Addressed and CCMP Value	Priority Projects	Summary Description	Cost
Access  Access  Heritage  Water	Establish a Tidal Monitoring System	<ol style="list-style-type: none"> 1. Identify or establish local tidal level monitoring sites and vegetation plots; monitor and record data in a database yearly (1CA) 2. At three-year intervals, evaluate changes in tidal range over time, vegetation survival/conversion and predictive modeling results to develop implementation plans for other projects (1CA) 	\$90,000 to \$125,000
Climate Adaptation  Coastlines  Resiliency	Flood Risk Assessment and Education based on SLR and storm surge	Incorporate flood risk management and storm surge information in educational outreach program (7NS)	Partnering, TBD
Climate Adaptation  Access  Heritage  Coastlines  Resiliency	Tidal Marsh Restoration	Utilize SLR, Tidal Monitoring data and Surge study results to identify opportunities (areas at risk) for land acquisition and tidal marsh restoration (2CA, 4CA, 5CA)	TBD

Top Projects for Implementation

- All Management Measures = \$65 M to \$188 M
- Total Top Projects Cost = \$23.2 M to \$87.1 M



Top Priority Projects cover all segments of the watershed

Funding Sources

- **Financing Blueprint**

- 65% Public (local government)
- 20% Private (business & industry)
- 15% Community (civic & non-profit)

- **Utilizing the Three Mile Creek Partnership**

- Coordinating body for all initiatives
- Could be a 501(c)(3) Organization

- **“One Mobile” in Action**

Public Funding Sources

- Resources and Ecosystem Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act)
- National Fish and Wildlife Foundation Gulf Environmental Benefit Fund
- Gulf of Mexico Energy Security Act of 2006 (GOMESA)

*Even though funding opportunities related to the Deepwater Horizon incident have clear potential to significantly “jump start” implementation activities, **full and sustained restoration will require a long-term commitment from local government, citizens, and the private sector.***

Recommended Path Forward

- **Sources Analyzed**

- Federal Funding

- EPA, FEMA, NOAA, USACE, USDA, USDOJ, USDOT
- USFWS, USHUD, EDA

- State and Local Funding

- AEMA, ALWCF, GOMESA, CIAP

- Non-Government Organization and Other Private Funding Opportunities

- **Cross-Referenced to all Management Measures**

- 59 Federal Grants Applicable

- 4 (four) State and Local Funding Sources

- 9 (nine) Private Funding Sources

Recommended Path Forward

- **Organizational and O&M Support Financing**
 - Two (2) Loan Instruments
 - Municipal bonds
 - Clean Water State Revolving Funds (SRF)
 - Eight (8) Taxes/Fees
 - Local Taxes
 - Stormwater District Utility Fees
 - Special Assessments
 - Impact Fees
 - Capital Improvement Cooperative Districts
 - Tax Increment Financing Districts
 - Alabama Improvement Districts
 - Environmental Tax Shift
 - One (1) Natural Resource Credit: Wetlands Mitigation Banks

Funding for Top Projects

Priority Projects	Est. Cost (range)	Recommended Support Targets/Authorities:		
		Federal/State Grants (65%)	Local Cost Share (15%)	Private Partnership Support (20%)
Reduce the amount of trash in and entering the creek and tributaries with a focus on One Mile Creek, Toulmins Spring Branch, USA, and Langan Park	\$2.94M to \$5.34M*	EPA NOAA USDA (GOMI) DOD (NAVY Seabees)	General Fund Commitments (County & Municipal) Municipal Bonds Clean Water SRF Stormwater Utility Fee Program Implementation (w/TMC Set-aside)	Private Contributions and Grants Portfolio Development and Management
Remove sediment to increase storage capacity and conveyance of stormwater runoff while improving ecological conditions	\$18.2M to \$72.7M	ACOE NOAA FEMA (HMGP) USDA (GOMI)		
Remove Sanitary System Leaks, SSO, and Illicit Discharges in Toulmins Spring Branch and Unnamed Tributary to Three Mile Creek	\$1.06M to \$7.2M	EPA ADEM		
Reduce the occurrence of nuisance and/or exotic species with a focus on One Mile Creek	\$154,000 to \$285,000*	NOAA USFWS EPA ACOE		

Funding for Top Projects

Priority Projects	Est. Cost (range)	Recommended Support Targets/Authorities:		
		Federal/State Grants (65%)	Local Cost Share (15%)	Private Partnership Support (20%)
Initiate Construction of Greenway & Blueway Development	\$255,000 to \$382,000	ALDOT HUD/CDBG USDA	General Fund Commitments (County & Municipal) Municipal Bonds Clean Water SRF Stormwater Utility Fee Program Implementation (w/TMC Set-aside)	Private Contributions and Grants Portfolio Development and Management
Create a stormwater park/fitness circuit at Mill Street Park	\$546,000 to \$966,000*	Funded under Private Partnership Support		
Establish a Tidal Monitoring System	\$90,000 to \$125,000	RESTORE NFWF EPA NOAA USGS		
Flood Risk Assessment and Education based on SLR and storm surge	Partnering, TBD	FEMA AEMA		
Tidal Marsh Restoration	TBD	RESTORE NFWF EPA NOAA USFWS ACOE		
	\$23.2M to \$87.1M			

Other items in the WMP

- **Outreach Plan**

- Plan adoption
- Continuation of the Goals of the WMP
- Involve, Engage, Educate, Own
- Tailored Messages
- Targeted Audiences
- TMC Partnership

- **Adaptive Management for Projects**

- Stakeholders Role
- 11-Step Process
- Success Clearly Defined

Upcoming Schedule

- Plan & Appendices Available Online:
<http://www.mobilebaynep.com/three-mile-creek>
- Comments accepted through August 8
- Public Presentation in late August
- Implementation of Projects later in 2014

Questions?

Thank you for your time today.