

# Flooding Dynamic Modeling for Optimized Planning of CORE MPO Transportation Infrastructure Systems

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# Presentation Outline

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1. Project Team
2. Project Goal & Overview
3. Project Update
  - Committees and Engagement
  - Stormwater Modeling



# Team

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- College of Engineering
  - Matt Bilskie
  - Brian Bledsoe
  - Felix Santiago-Collazo
- Skidaway Institute of Oceanography
  - Clark Alexander
- Carl Vinson Institute of Government
  - Scott Pippin
  - Shana Jones
- Goodwyn Mills Cawood
  - Ed DiTommaso



# Project Goal

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To develop a Project Prioritization Tool that assists with optimizing the planning of new and existing infrastructure to improve reliability and resiliency with additional consideration to economic constraints and social inequities.

The Project Prioritization Tool will be synergized with an updated Road Vulnerability Assessment.

# Road Vulnerability Assessment & Project Prioritization

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## 1. Equity & Livability Objectives

- Include social vulnerability data
- Critical Infrastructure
- Major transportation routes (emergency services)

## 2. Evaluation

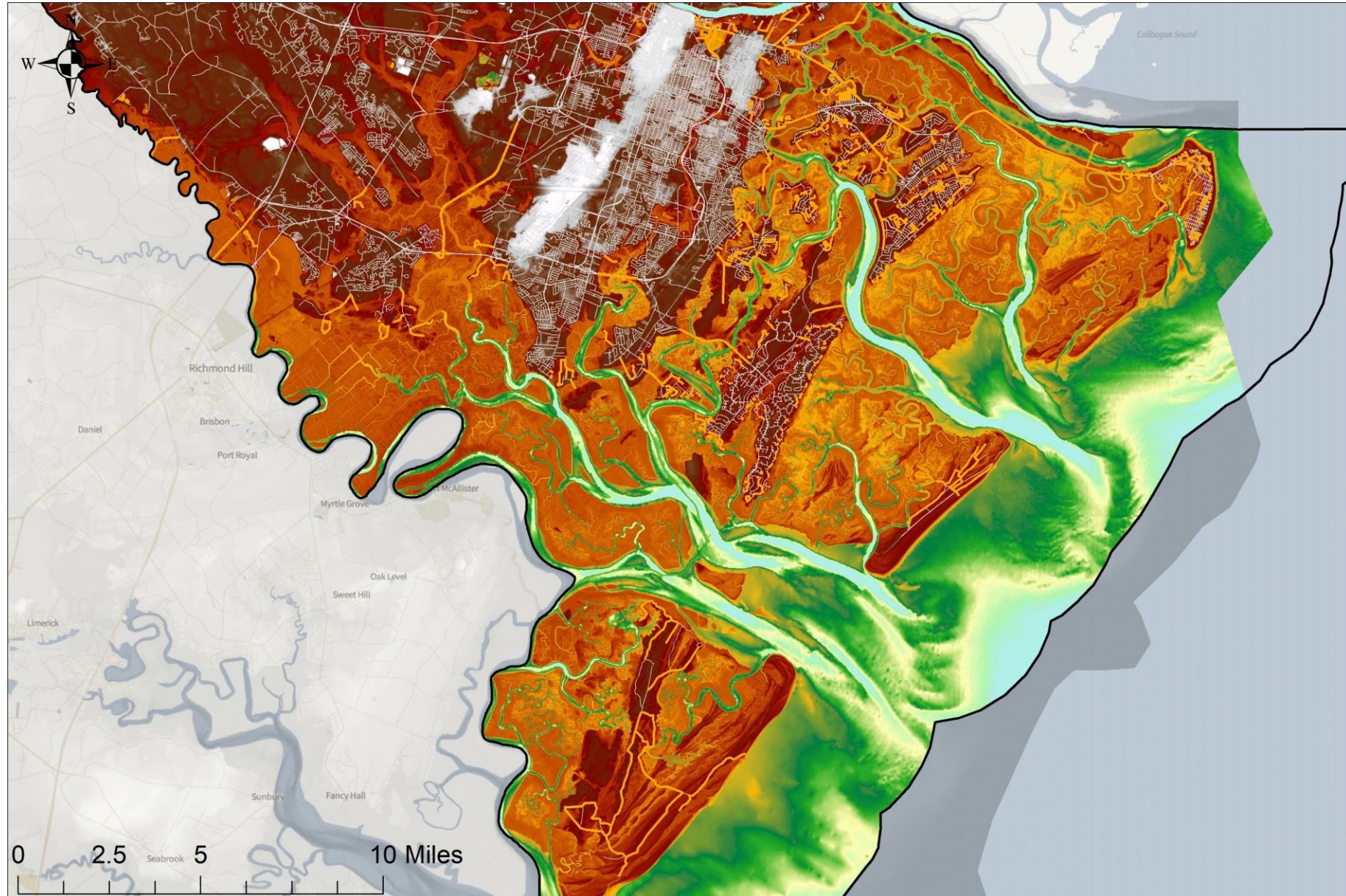
- Develop metrics to inform the Project Prioritization Tool
- Compound flooding (coastal and rainfall)
- Sea Level Rise
- Road classifications & critical facility access

## 3. Financial Stewardship & Project Prioritization

- Prioritize projects to increase resiliency of transportation infrastructure
- Include cost, land use, access, and environmental justice

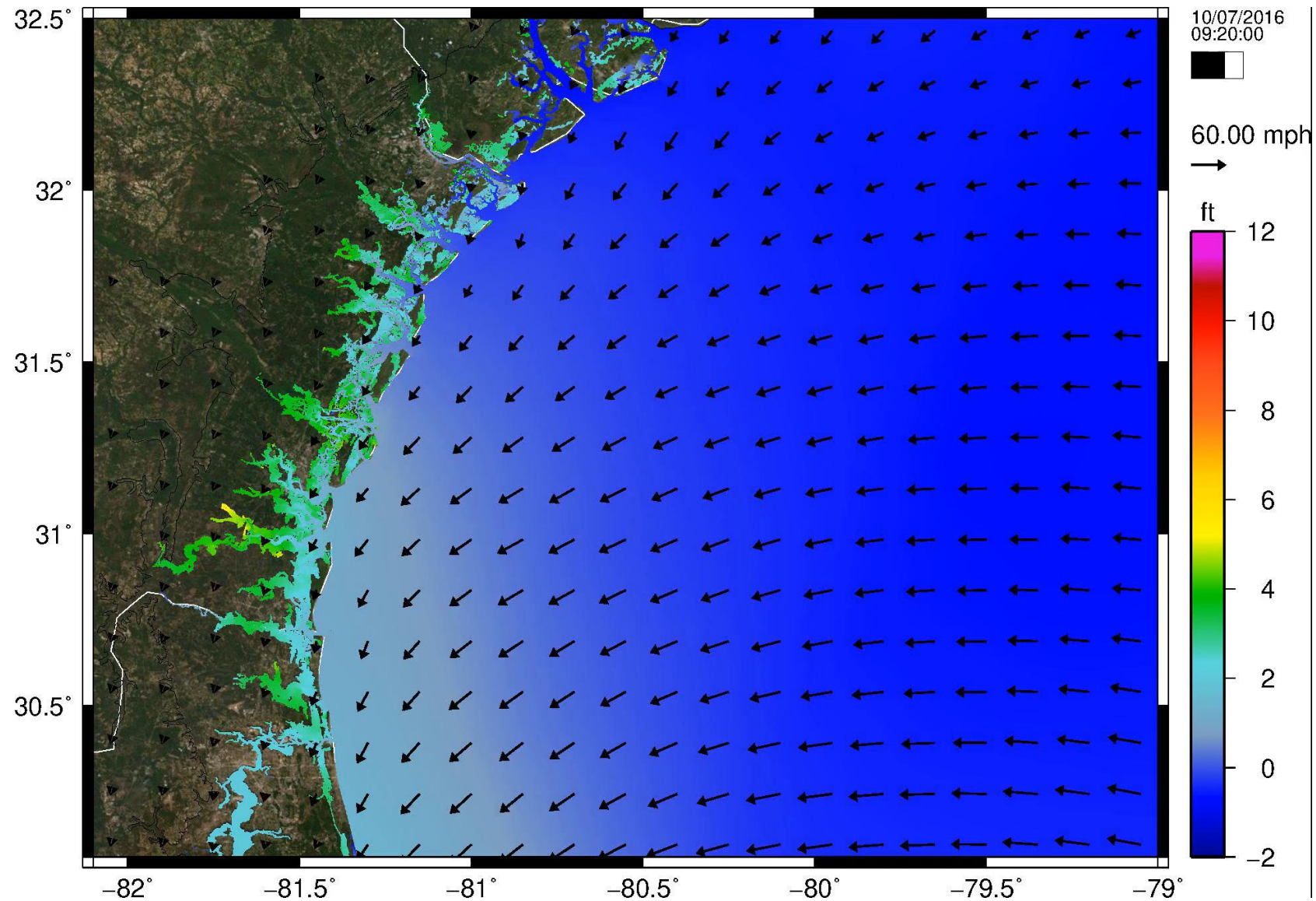


# New Elevation Map (1.5 ft resolution)



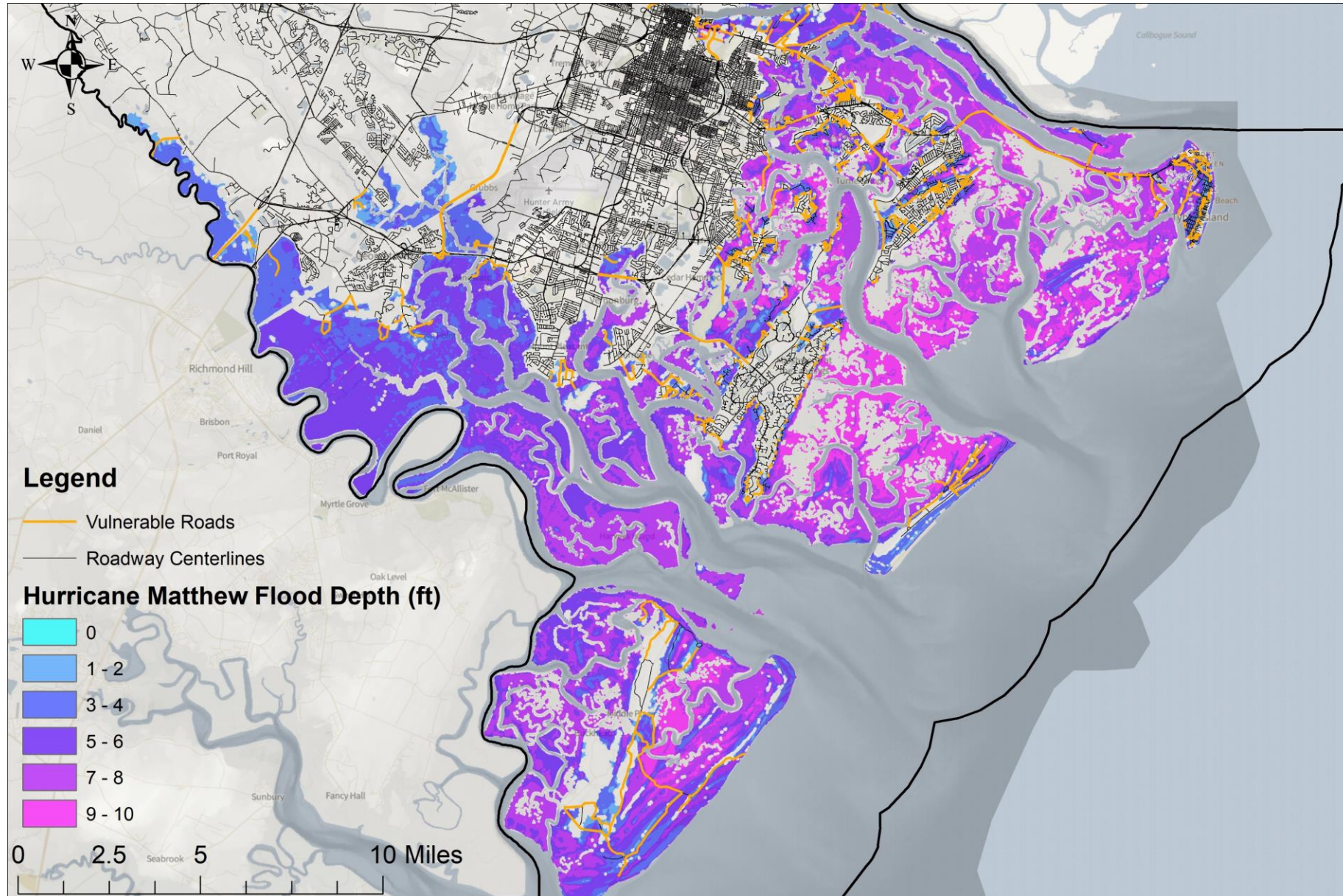


# Hurricane Matthew Simulation





# Example – Hurricane Matthew





# Steering Committee, Stakeholder, and Community Engagement

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- MPO Technical Coordinating Committee will serve as the Steering Committee ultimately directing and accepting the project deliverables.
- Other interested organizations have been invited into a Stakeholder Group to provide data and technical support as well as direction and input.
- Will also engage the general public through at least one public input session.

# Steering Committee & Stakeholder Meetings

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- **October 20, 2022:** introduce the project and project team to the Steering Committee (TCC).
- **February 16, 2023:** project status report to Steering Committee; in-person meeting of the Stakeholder Group.
  - Identify needs for additional meetings with Stakeholders.
- **TBD:** Additional Stakeholder Meetings in groups or individually.
- **TBD:** Community Meeting
- **August 2023:** Present project deliverables to the TCC and MPO Board

# Steering Committee Invitations

NAME	ORGANIZATION
Dawud Shabaka	The Harambee House
Dr. Mildred McClain	The Harambee House
Laureen Boyles	
Diedre Grimm	Ivory Bay
Suzanne Cooler	Chatham County Engineering
Nathaniel Panther, PE	Chatham County Engineering
Jackie Jackson	Chatham County Resilience Program
Randall Mathews	Chatham County Emergency Management
Michael Blakely	Chatham County Floodplain Mgmt
Heath Lloyd	City of Savannah Infrastructure & Development Office
Nick Deffley	<u>City of Savannah</u>
Tom McDonald	City of Savannah Floodplain Mgmt.
Larry Carlile	Fort Stewart/Hunter Army Airfield
Jennifer Kline	GA DNR CRD
Hope Moorner	Georgia Ports Authority
Lee Beckman	Georgia Ports Authority
Brad Saxton	GDOT
Conner Poe	Norfolk Southern, Gov't Relations
Meghan Hennessy	CSX, Site Design

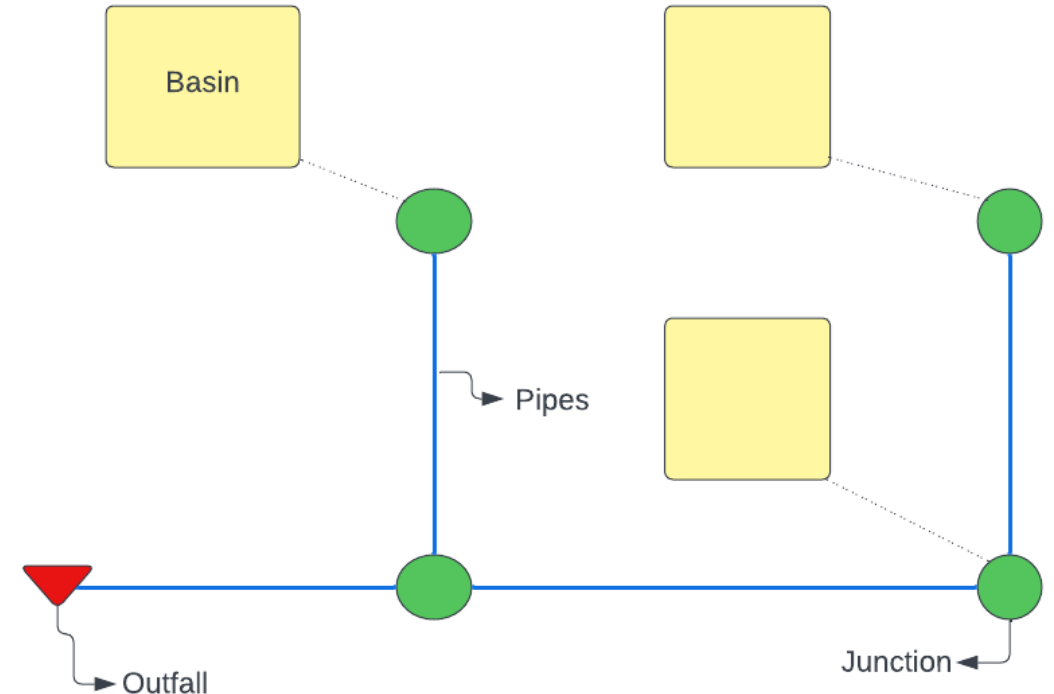
Charles Ackridge	City of Bloomingdale
James Aiello	Airport Engineer Savannah Airport commission
Jim Roberts	Director of Engineering/SAV Airport Commission
Teresa Cancannon	Effingham County
Leon Davenport	City of Pooler
Robbie Byrd	City of Pooler, City Manager
Ashley Goodrich	Chatham Area Transit Authority
Faye DeMassimo	Chatham Area Transit Authority
Randy Dykes	City of Richmond Hill
Les Fussell	City of Richmond Hill
Peter Gulbranson	City of Tybee
LaMeisha Hunter Kelly	City of Rincon
Trent Long	City of Port Wentworth
Steve Davis	City of Port Wentworth
Robert Milie	Town of Thunderbolt
Kyle Wemett	Ft. Stewart/Hunter AAF
Scott Robider	Garden City
Marcus Lotson	MPC
Dr. Estella Shabazz	City of Savannah Alderwoman



# Stormwater Modeling

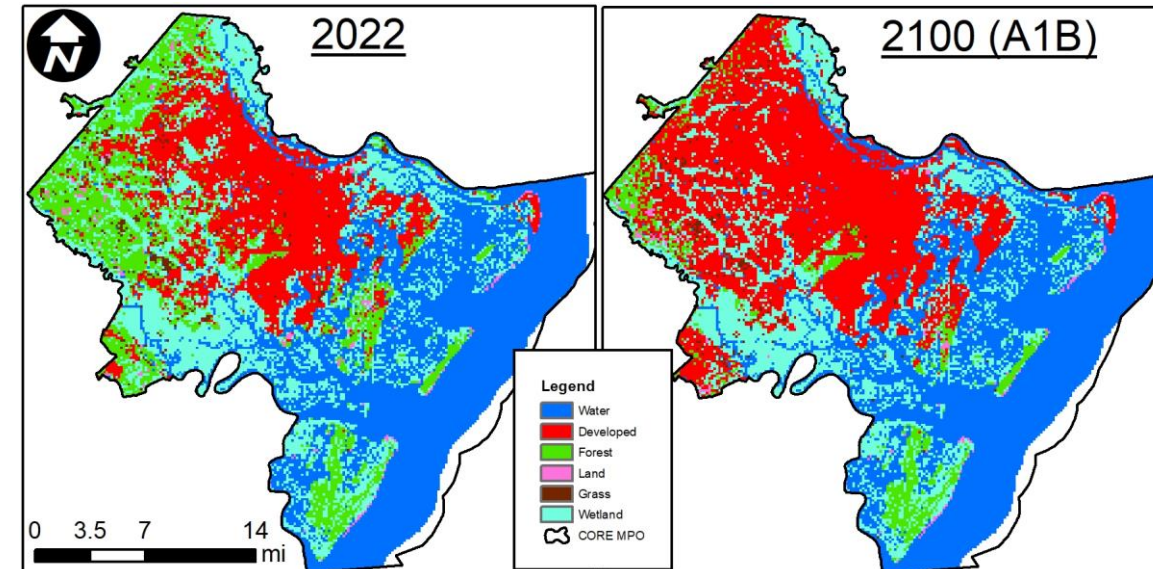
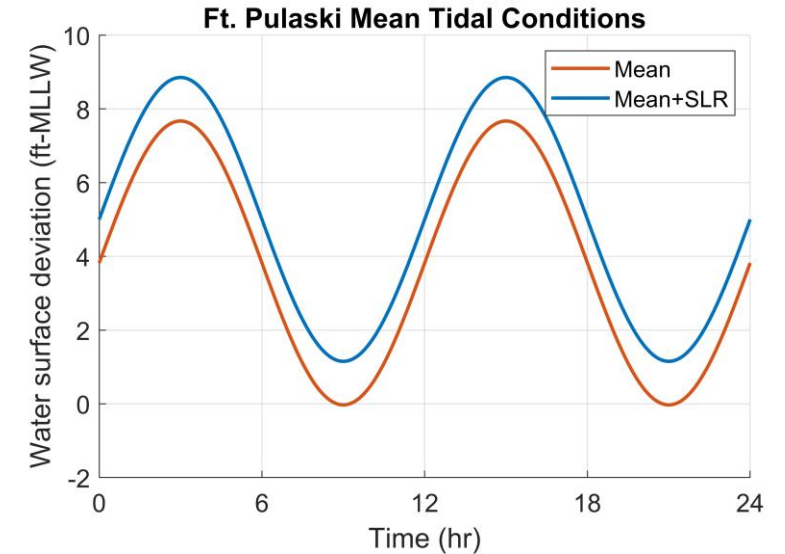
## Stormwater Management Model (SWMM)

- Dynamic rainfall-runoff model
- Simulates runoff quantity and quality
- Design drainage systems
- Spatial variability = small homogeneous sub-basin
- Rain fall into basin → runoff is generated → drains into pipe → routes to outfall
- Output: hydrograph time series



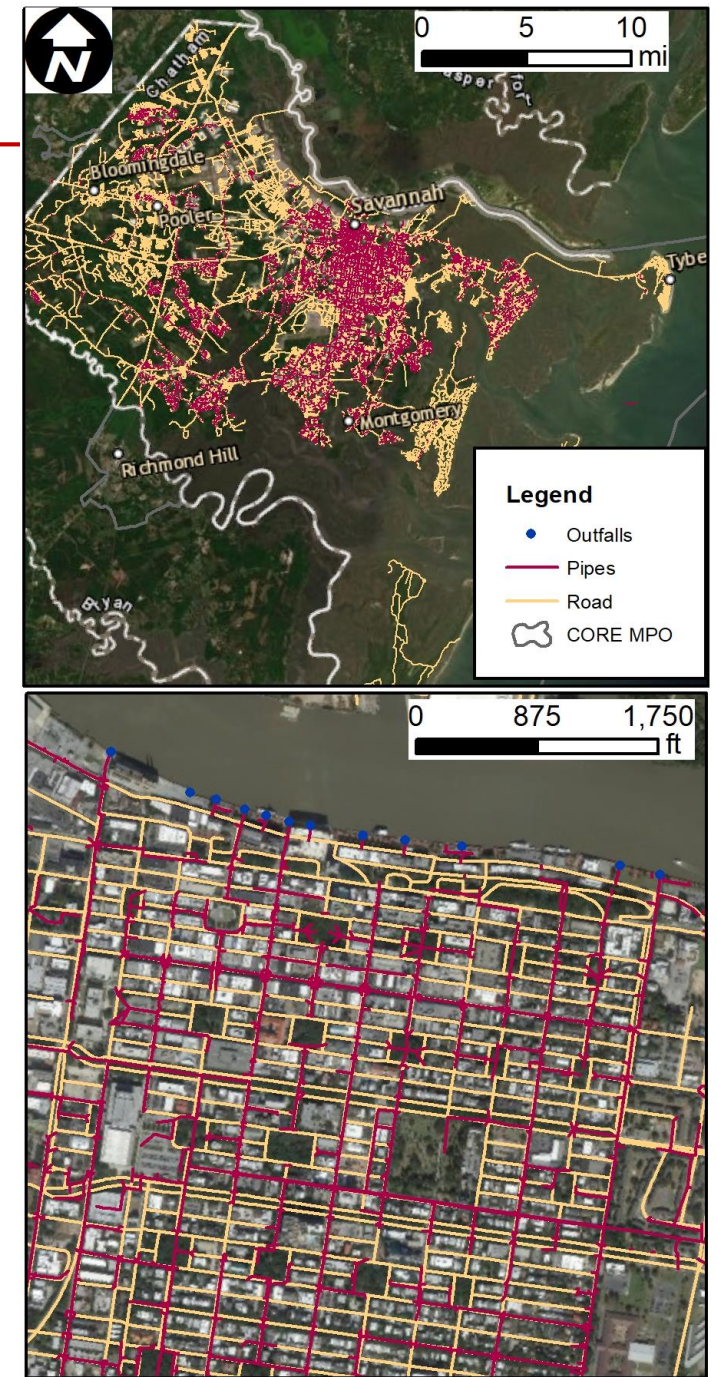
# Application of SWMM

- Assess current vs future conditions:
  - How will SLR creep upward in the stormwater system?
  - How will future LULC affect runoff and its discharge through the outfall?
- Backwater effects from coastal flooding
  - Flap gates can be included
  - Tidal stage curves as boundary for outfall
- Landcover projections effects
  - Modify each basin LULC



# Data Collection

- Existing data
  - Stormwater infrastructure for Chatham County and the City of Savannah:
    - Outfalls, green infrastructure, canals, ditches, pipes, reservoirs, pump stations, tide gates, headwalls, manholes, inlets
  - Road centerline for Chatham County.
  - Stormwater Drainage Basin
- Land Use Land Cover
  - Current and future projections
- Soil type
  - Infiltration parameters





# Thank You

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