

## Calhoun West Drainage Improvement & Sea Level Rise Mitigation Project

*SESWA Presentation  
Hilton Head, SC  
October 4-5, 2018*

# Calhoun West Drainage Improvement & Sea Level Rise Mitigation Project

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CONTENT

# History of City's Drainage Projects

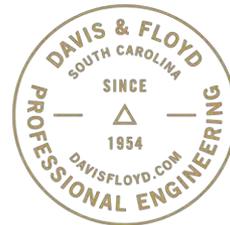
Project Overview

Data Collection

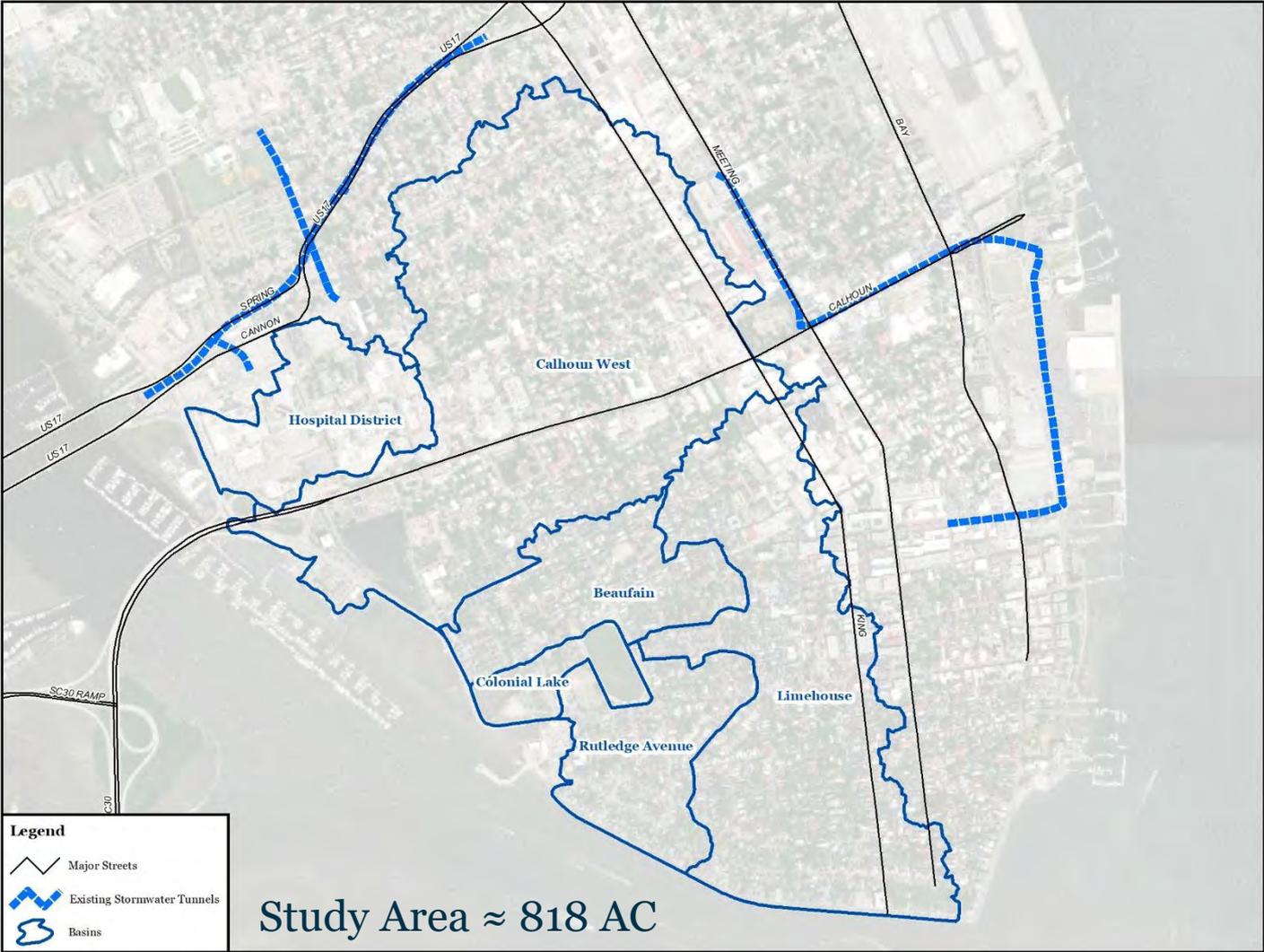
Watershed Assessment

Potential Improvements

Questions & Discussion



# Project Location & Need



# Project Location & Need



# Project Objectives

- **Identify ‘short-range’ alternatives to improve flooding**
- **Develop ‘long-term’ solutions to address stormwater conveyance & tidal flooding**



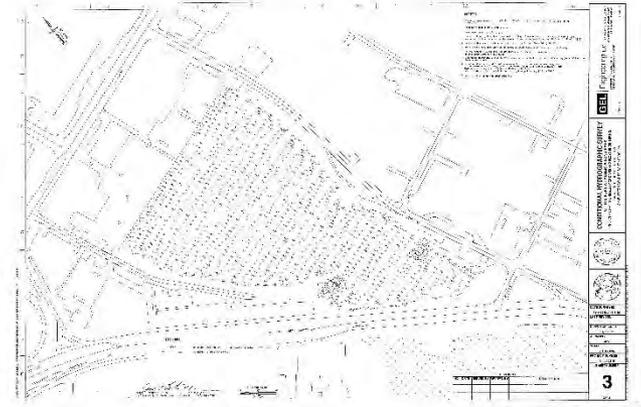
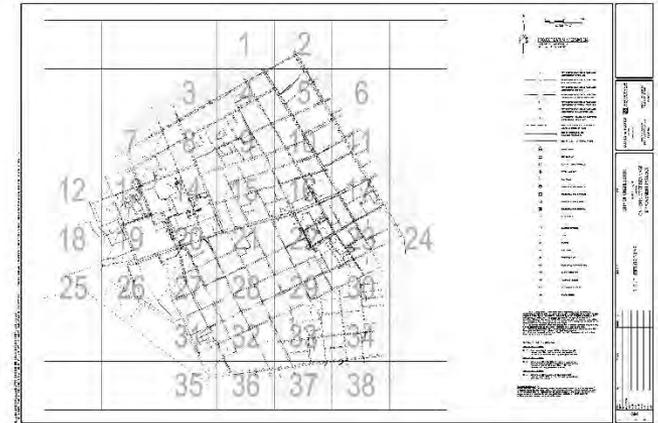
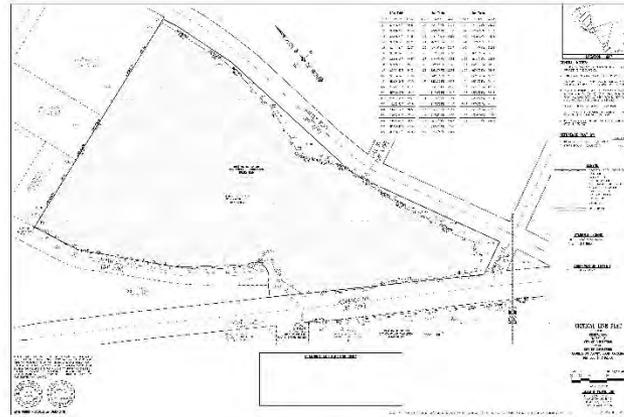
# Project Scope

- Program Management
- Data Gathering
- Watershed Assessment
- Conceptual Design
- Program Delivery



# Data Gathering

- Level D SUE (GEL)
- Hydrographic Survey (GEL)
- Natural Resources (JMT/Tidewater)
- Cultural Resources (Brockington)



# Data Gathering

## Preliminary Geotechnical Investigation

### GENERAL GEOTECHNICAL SUBSURFACE CONDITIONS

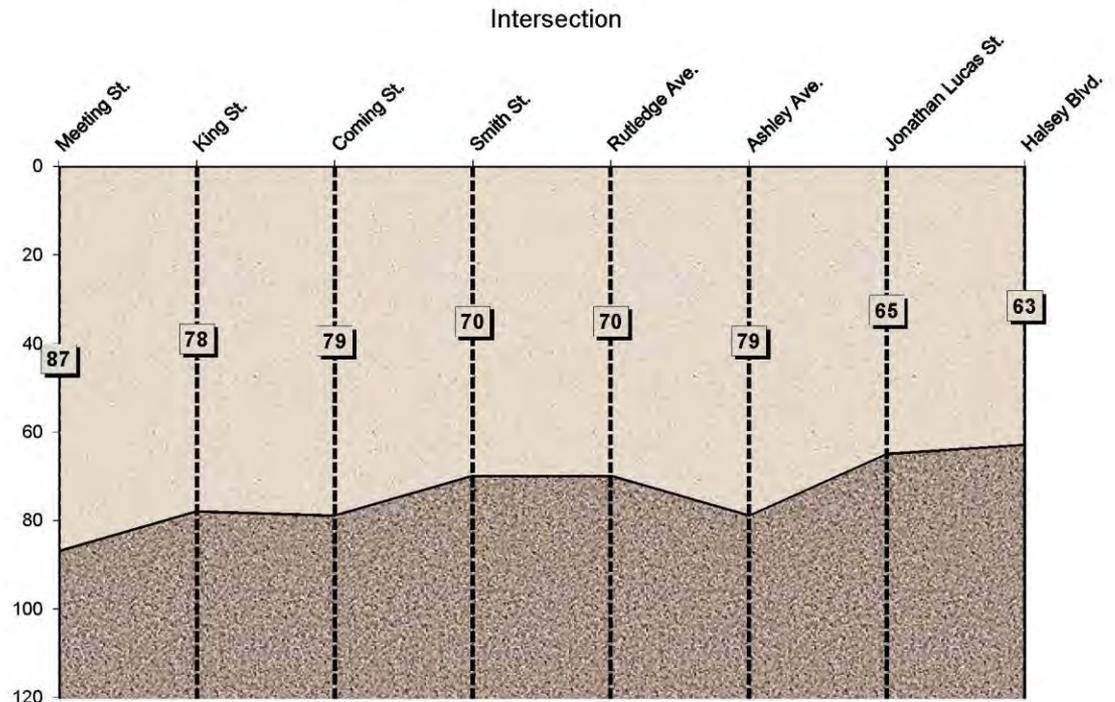
PROPOSED CALHOUN WEST DRAINAGE  
IMPROVEMENT PROJECT  
CHARLESTON, SOUTH CAROLINA

SCI PROJECT 150001  
JUNE 30, 2016



**SOIL CONSULTANTS, INC.**  
ENGINEERS AND GEOLOGISTS  
SINCE 1951

Cooper Marl Stratum  
Along the Alignment of Calhoun Street



# Data Gathering

## Limited Environmental Assessment



1939



1957

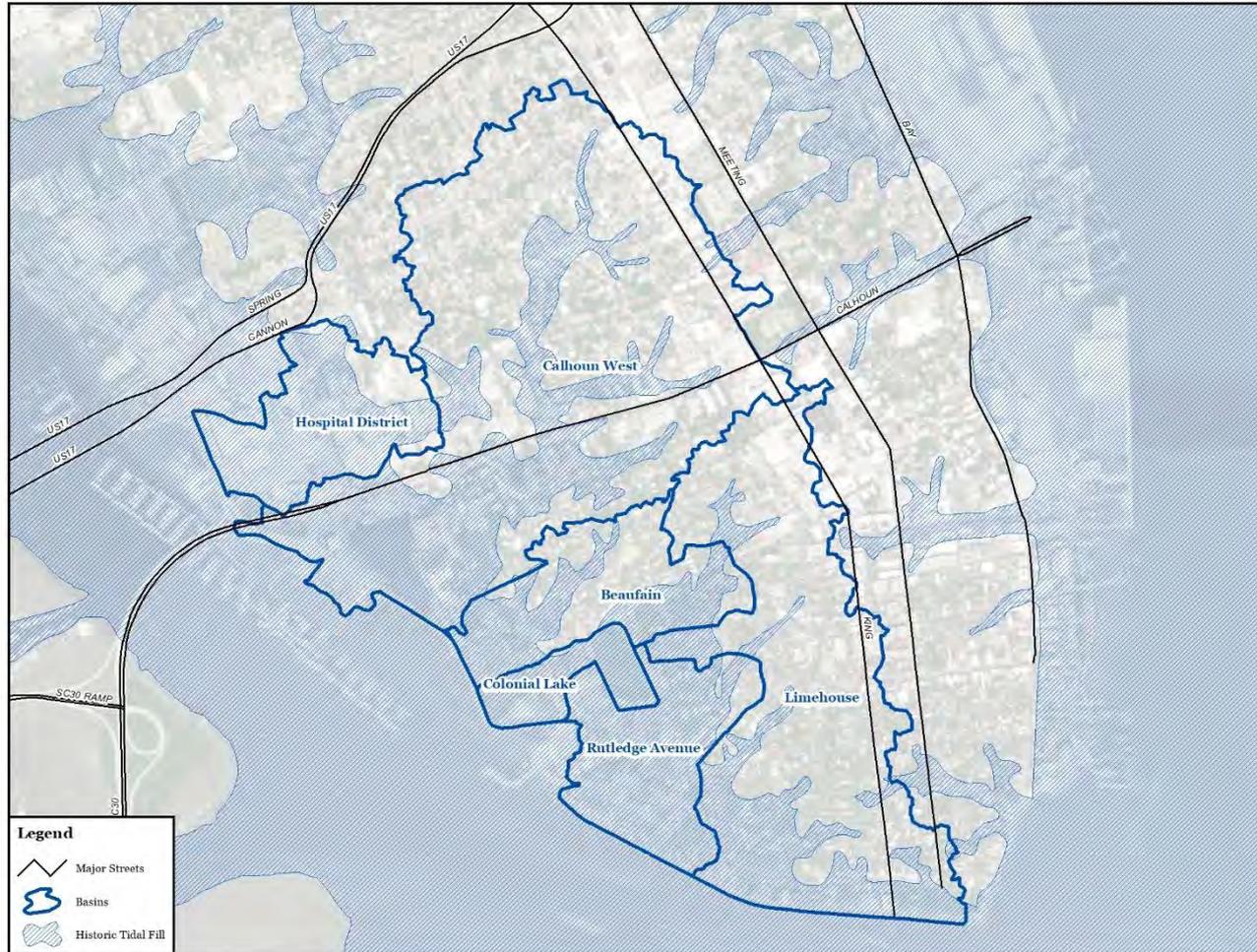


1968



# Data Gathering

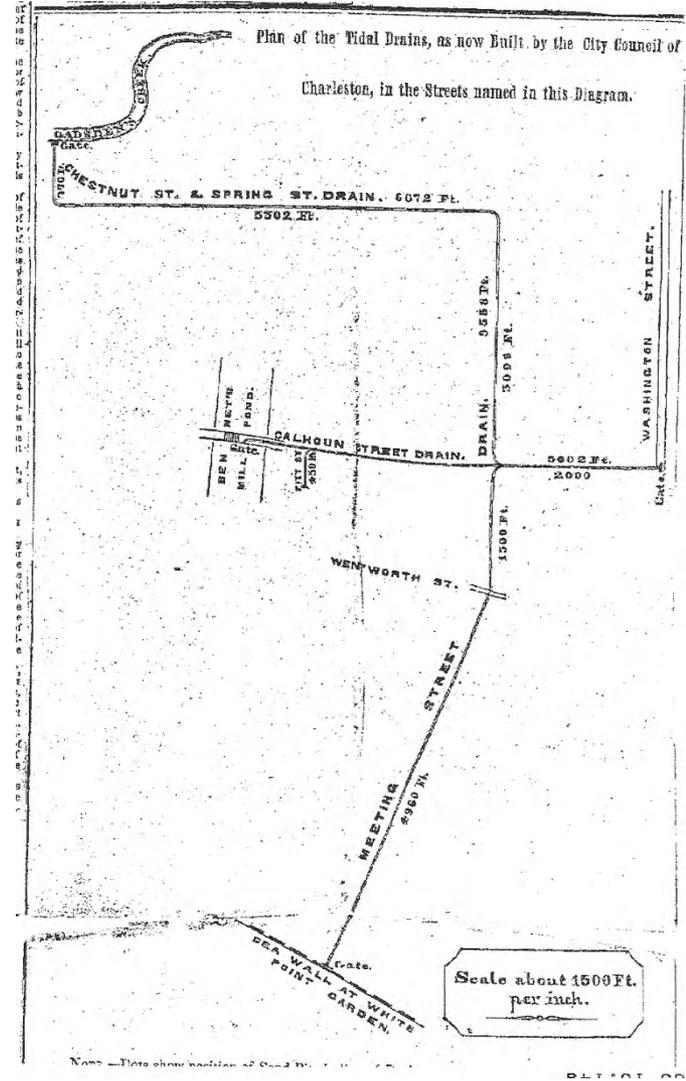
## Original High Water Line – Halsey Map



# Data Gathering

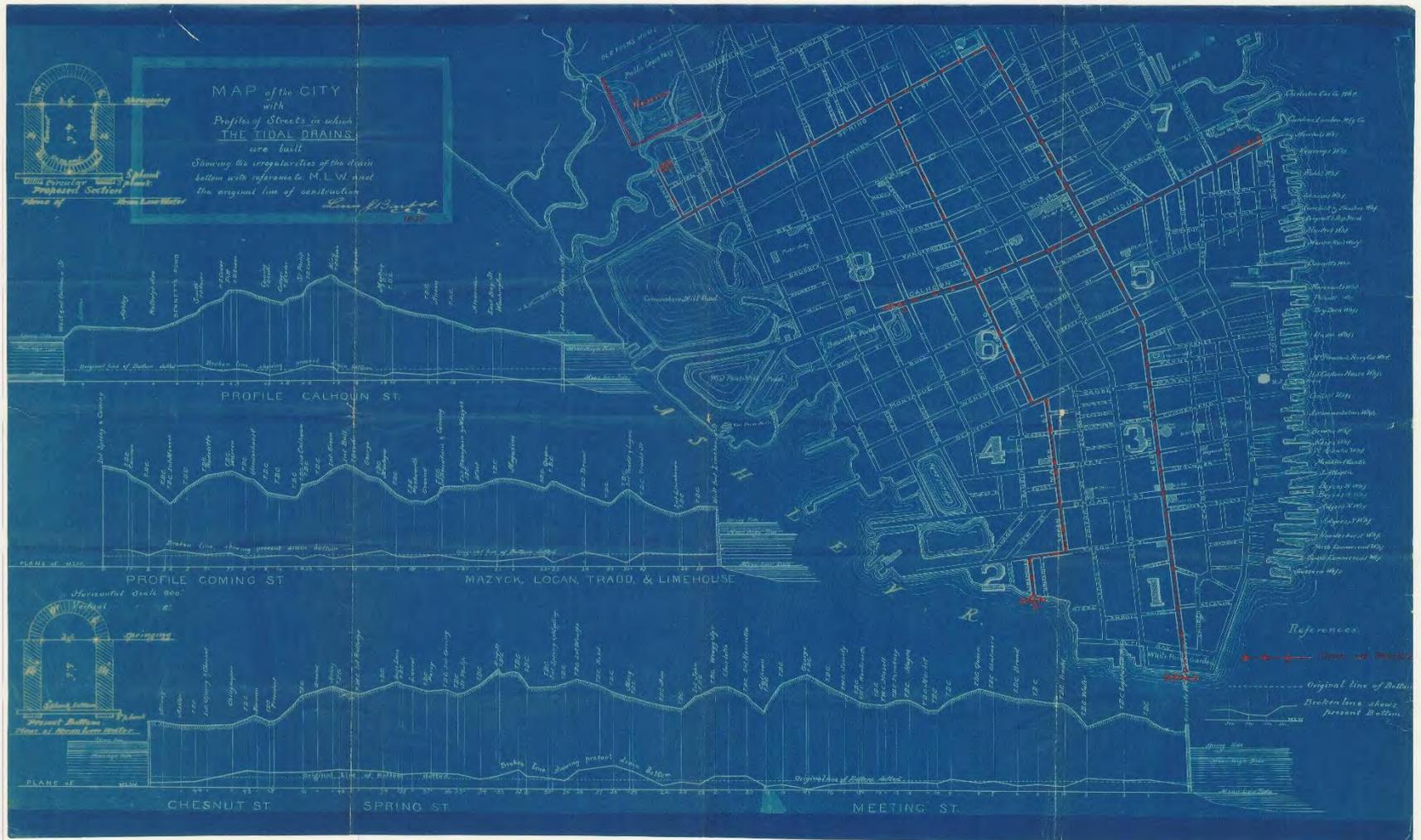
## 1859 Plan of New Tidal Drains

*As now Built by the City Council of Charleston*



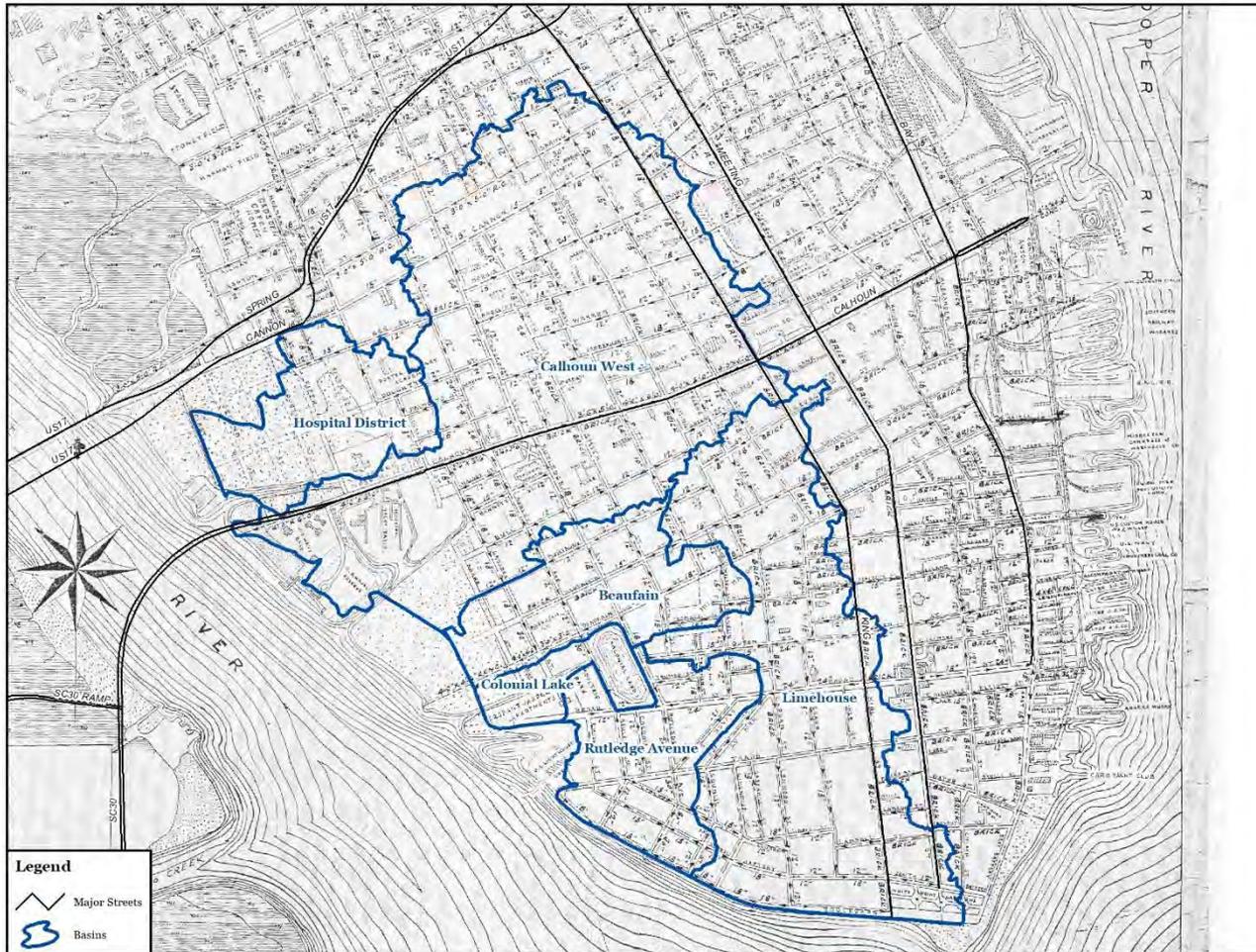
# Data Gathering

## 1878 Tidal Drains



# Data Gathering

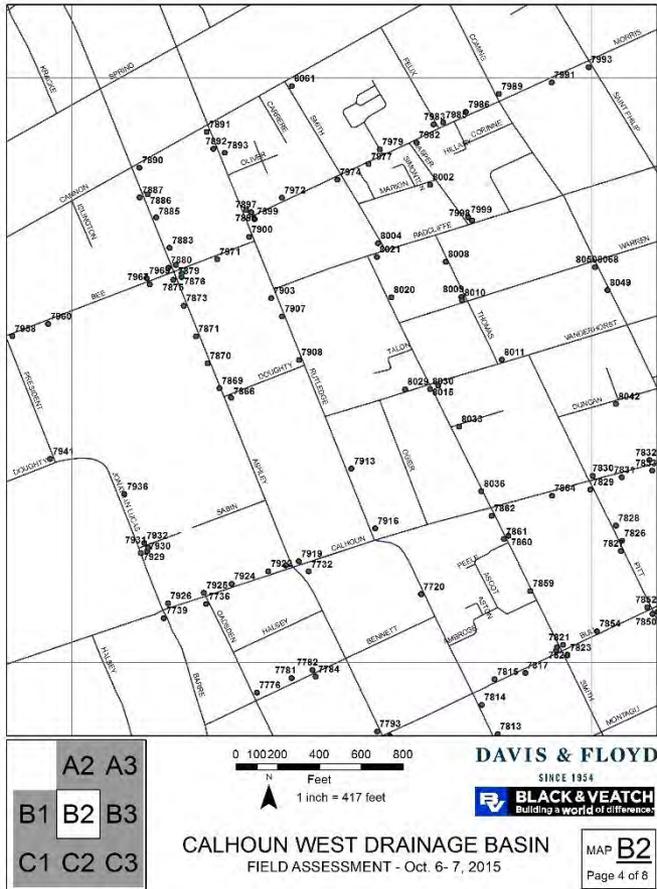
## 1950's Drainage System Map





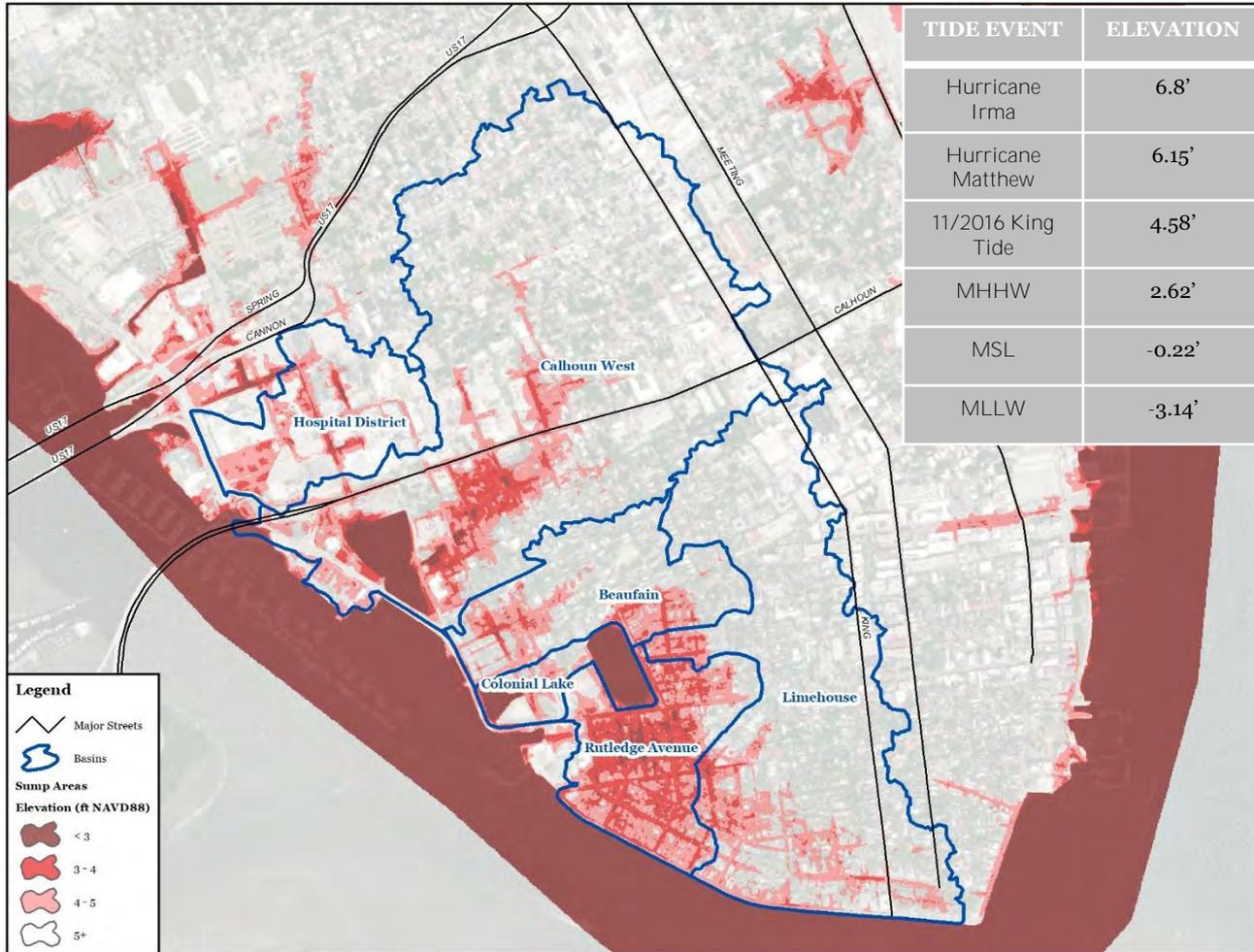
# Data Gathering

## Field Assessment



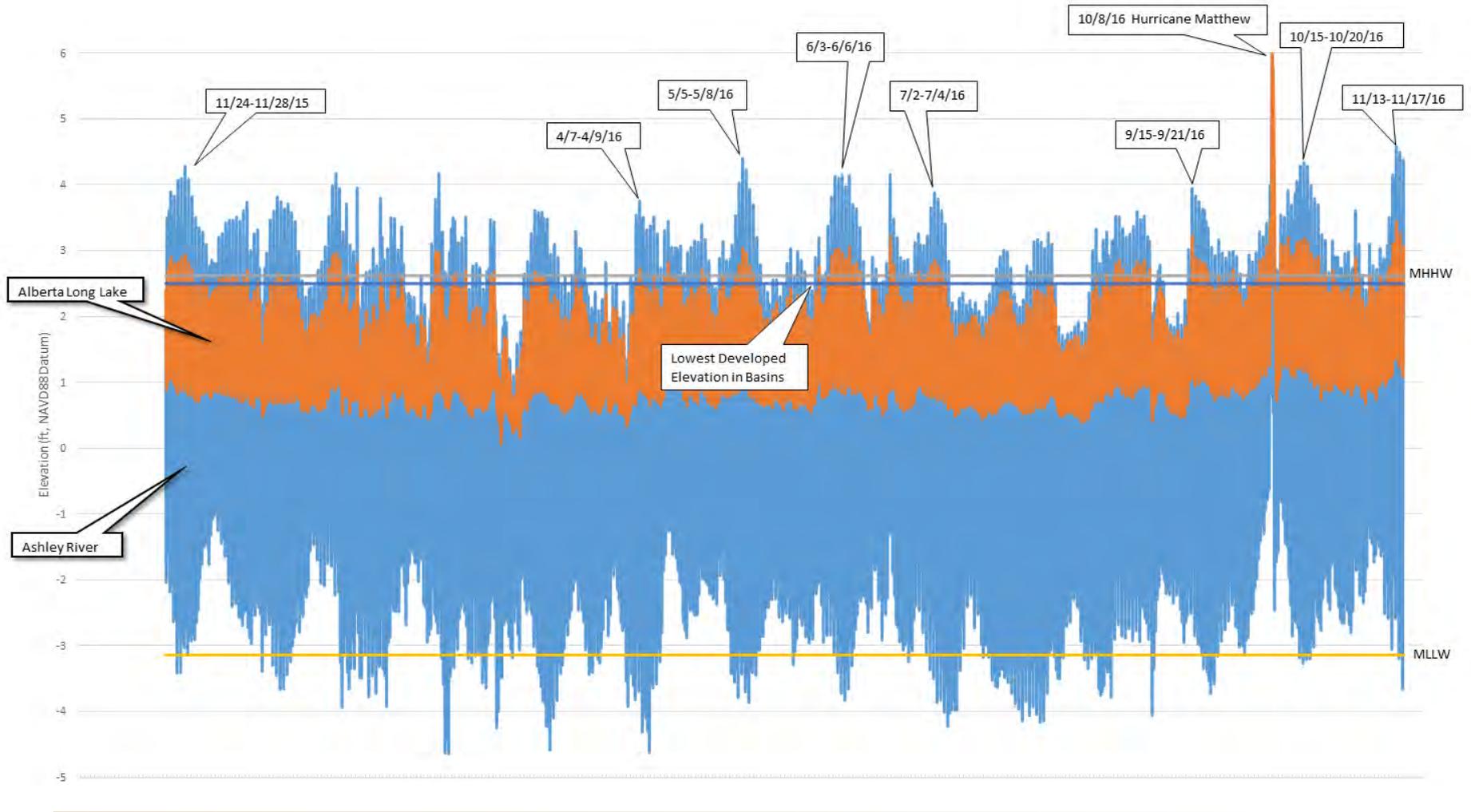
# Data Gathering

## Sump Areas



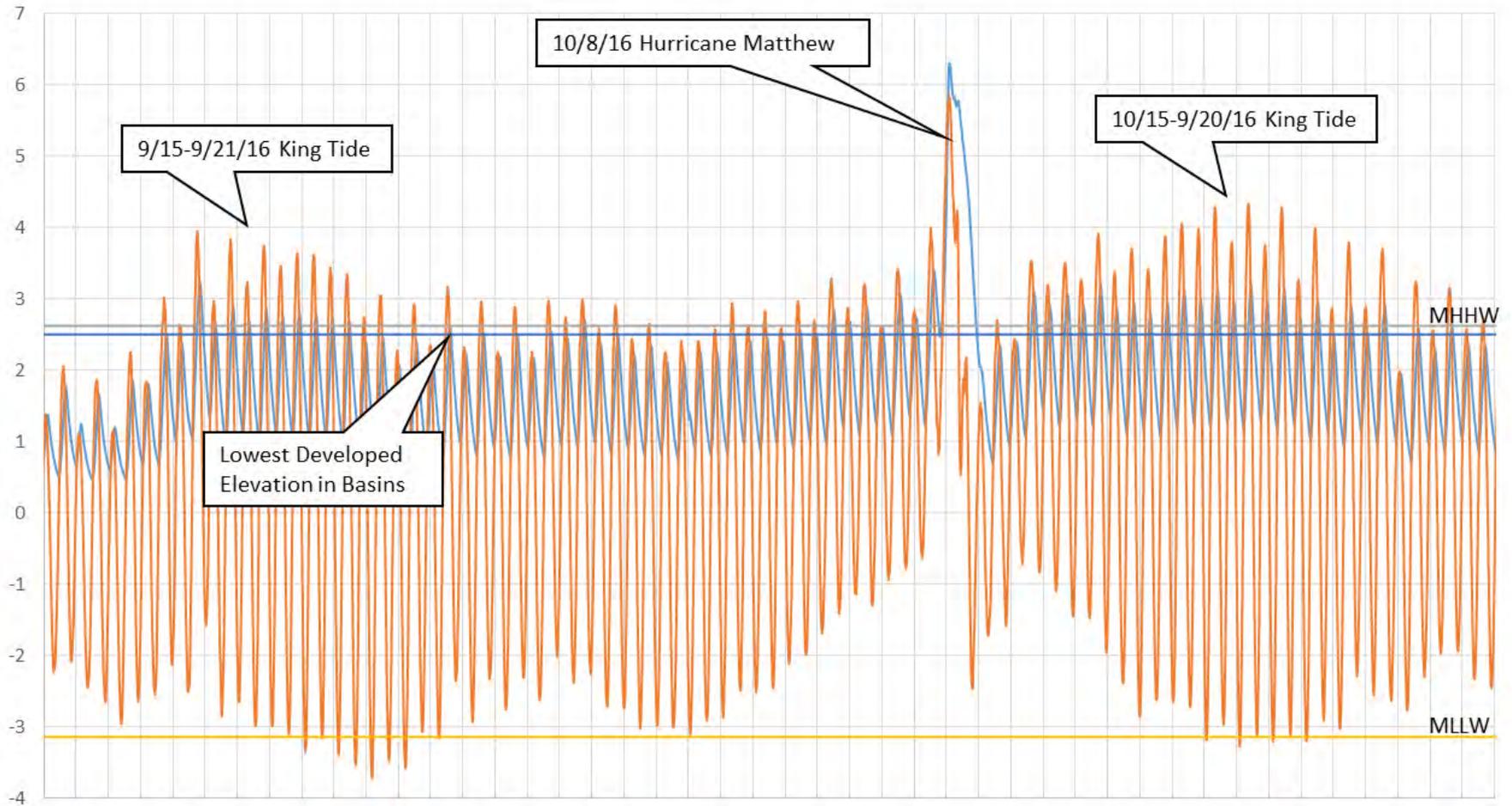
# Data Gathering

## Tidal Observations



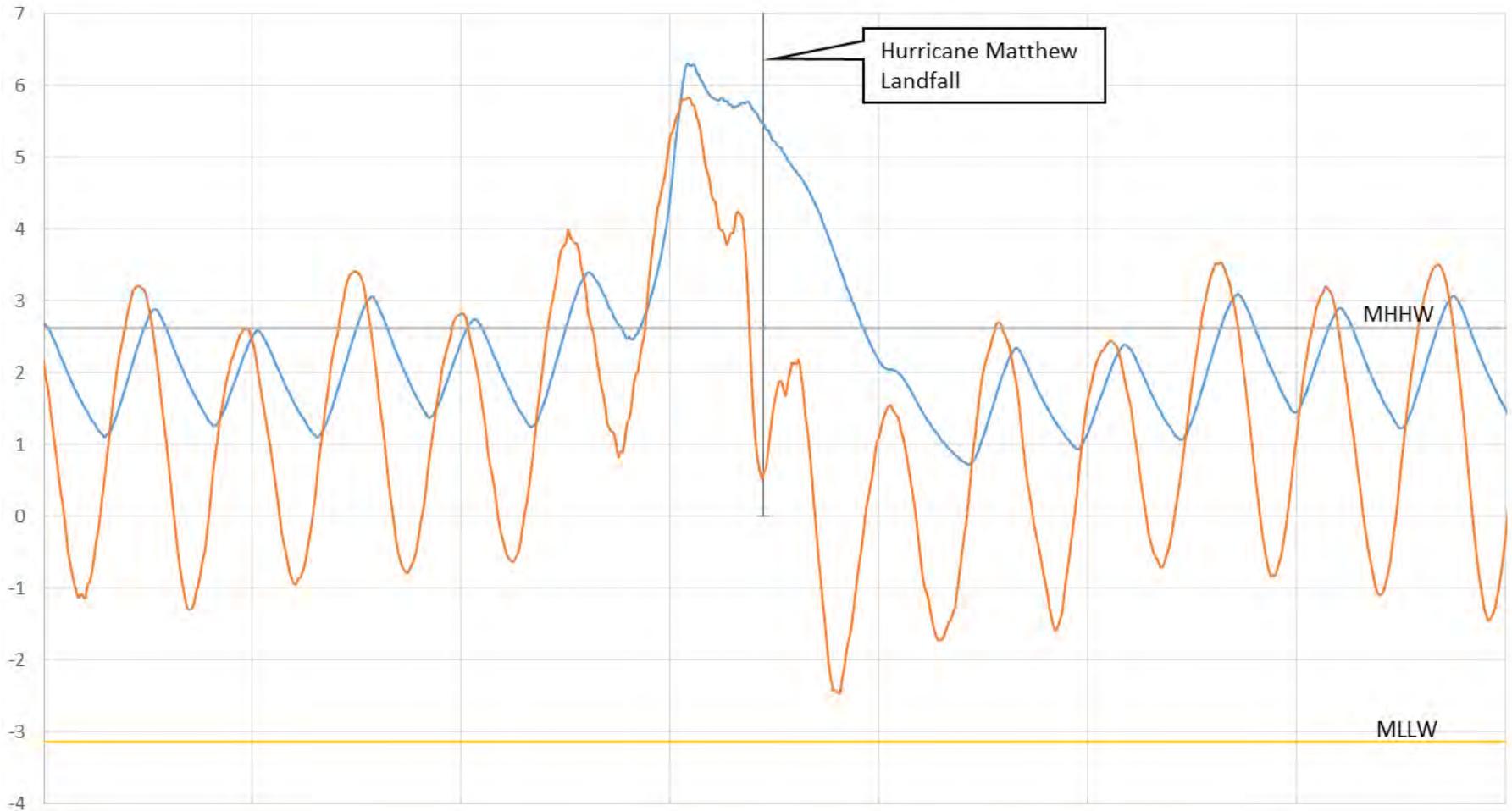
# Data Gathering

## Tidal Observations



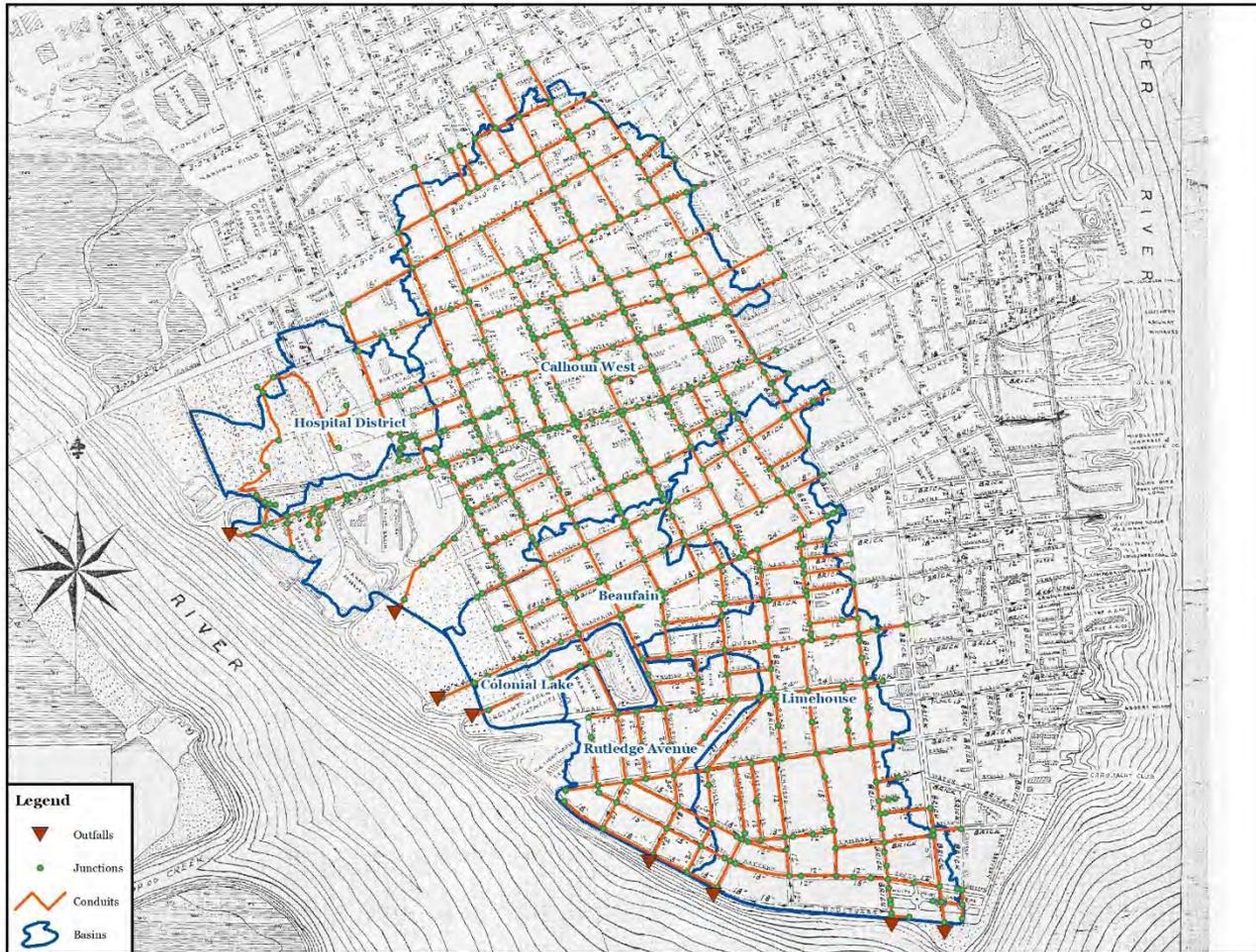
# Data Gathering

## Tidal Observations – Hurricane Matthew



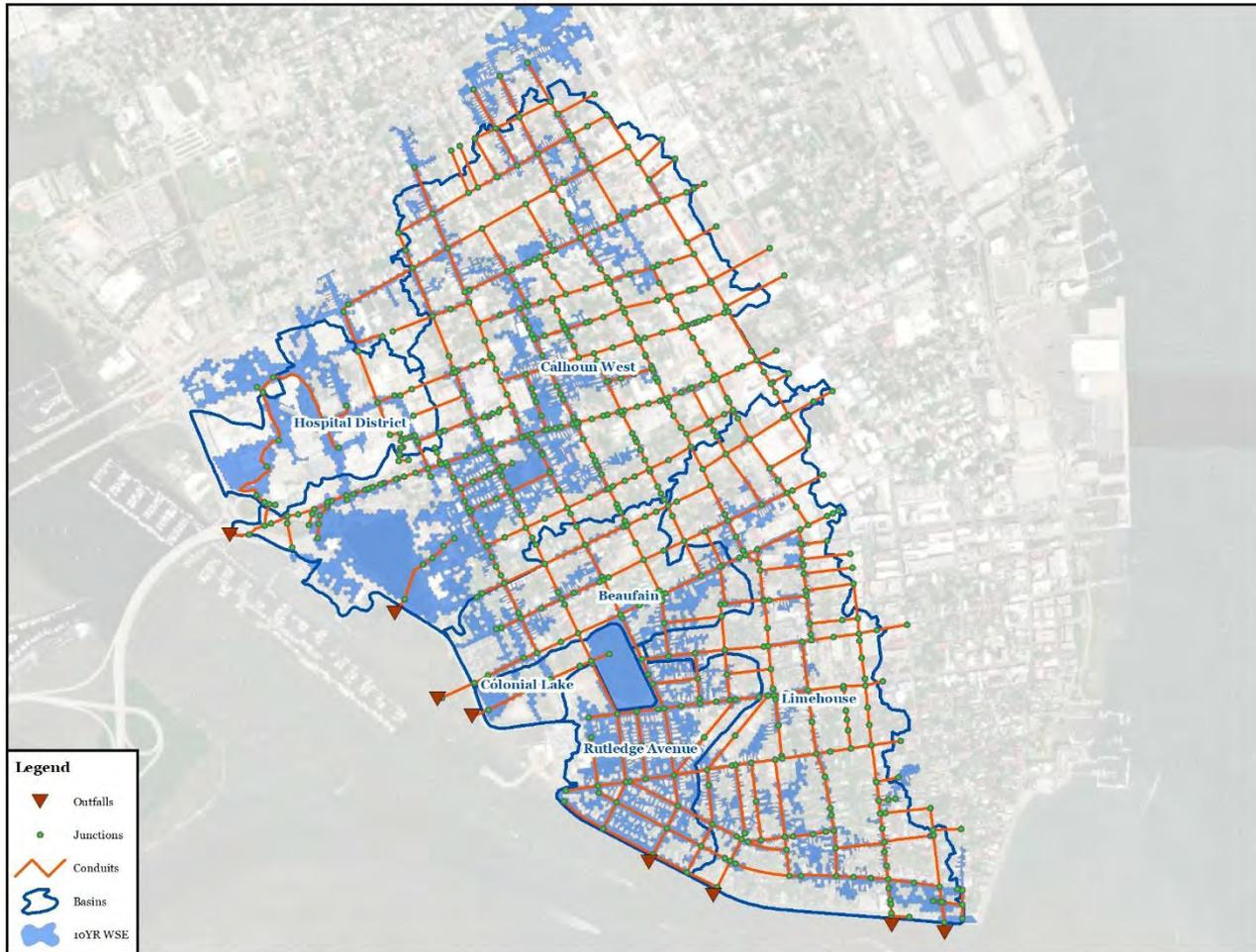
# Watershed Assessment

## Nodal Schematic



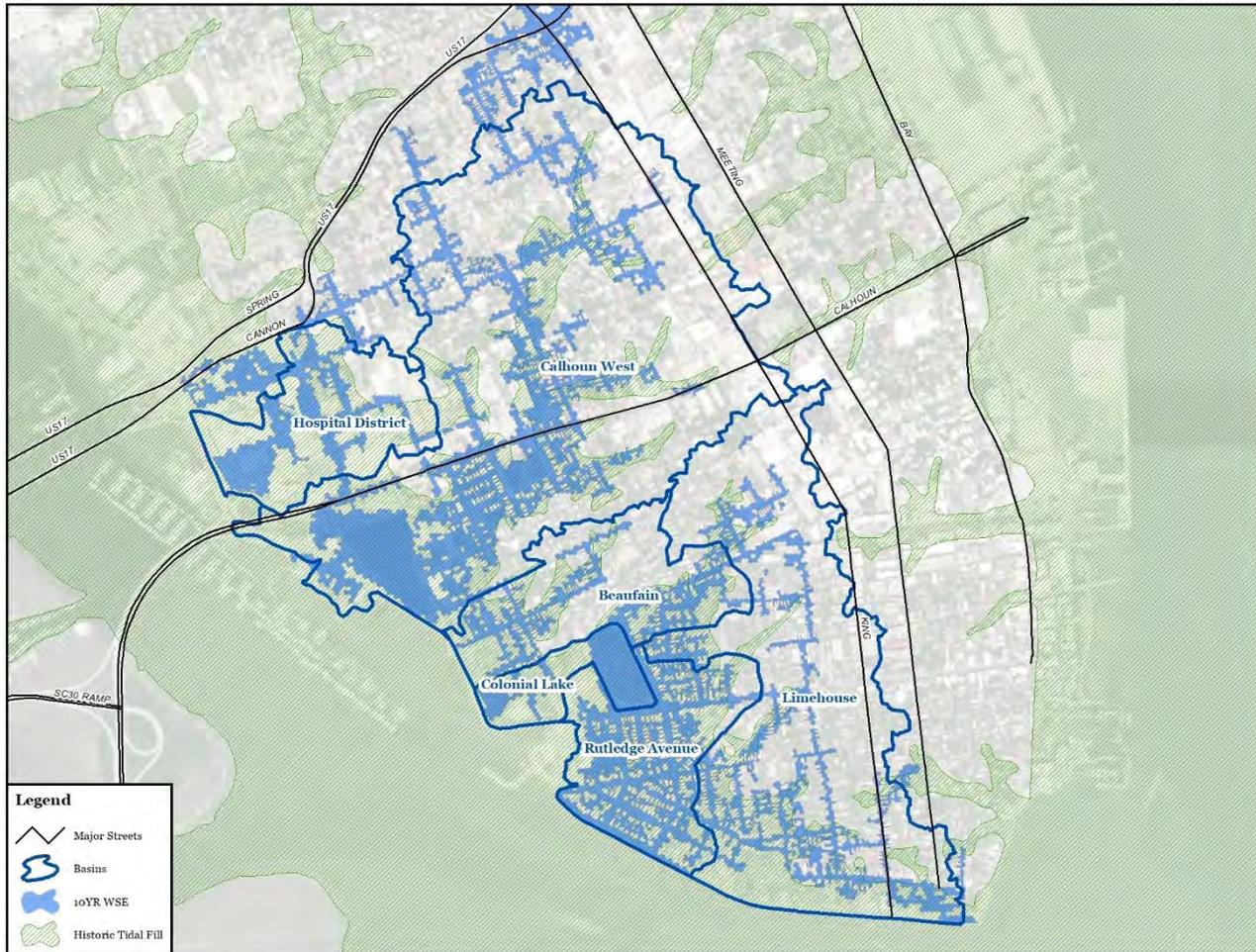
# Watershed Assessment

## 10-YR Inundation Map



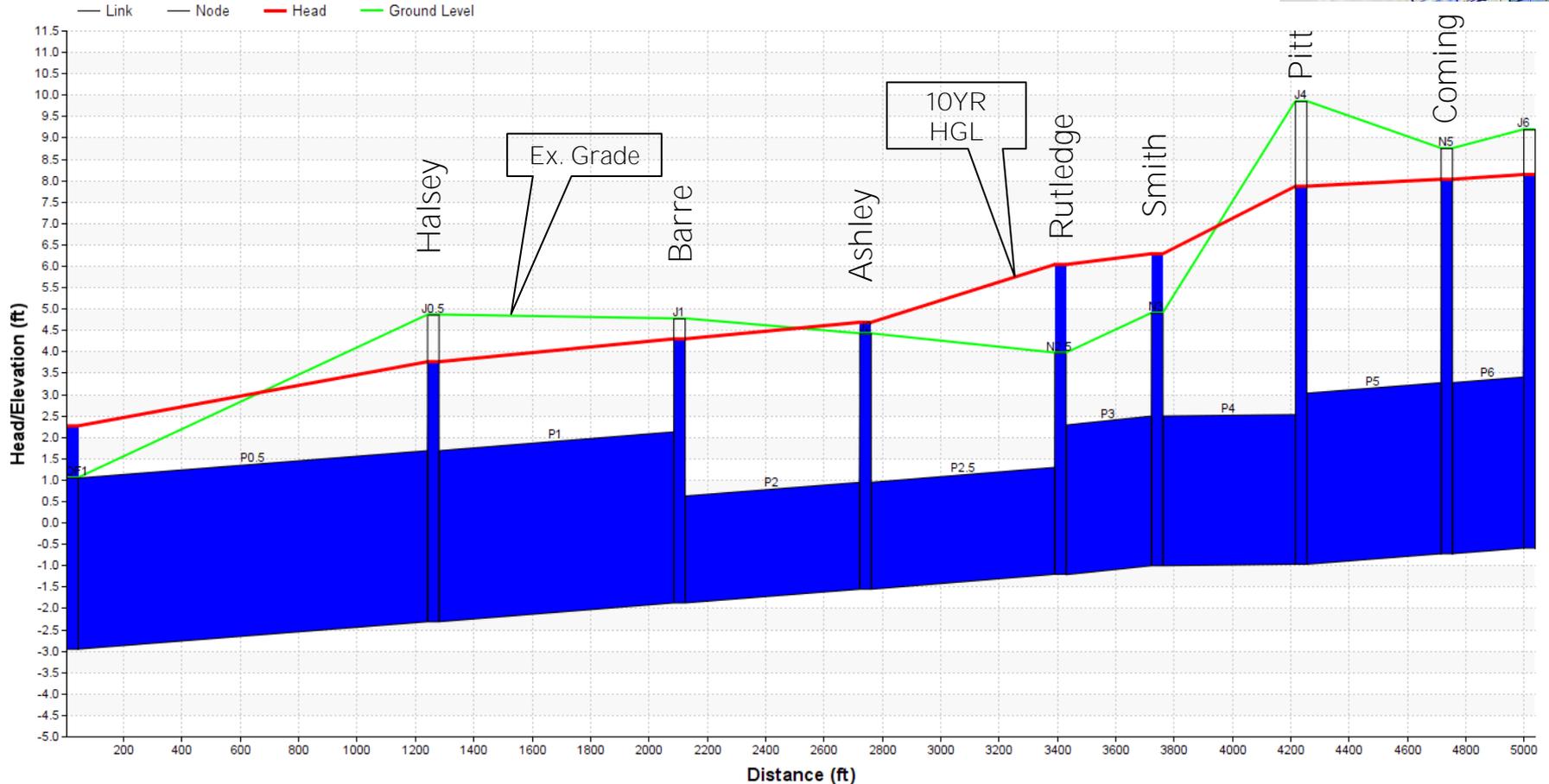
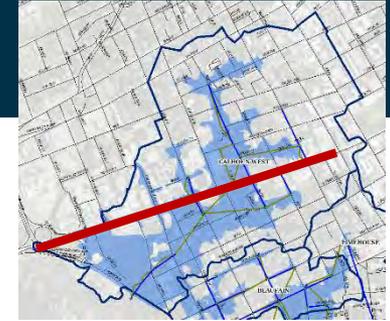
# Watershed Assessment

## Historic Tidal Fill & 10-YR Inundation Map



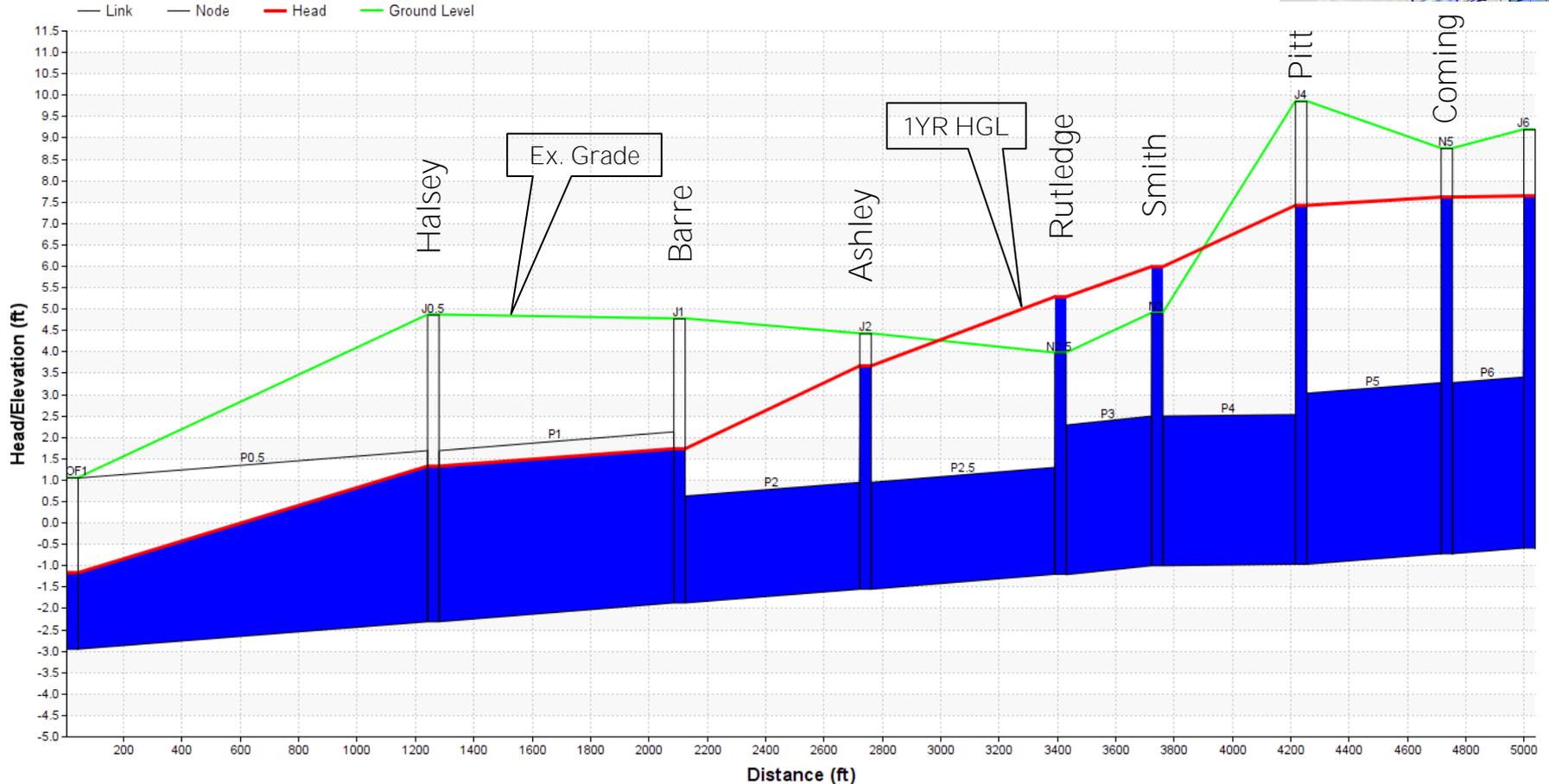
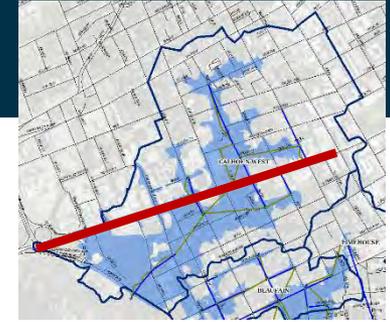
# Watershed Assessment

## Calhoun Street Profile



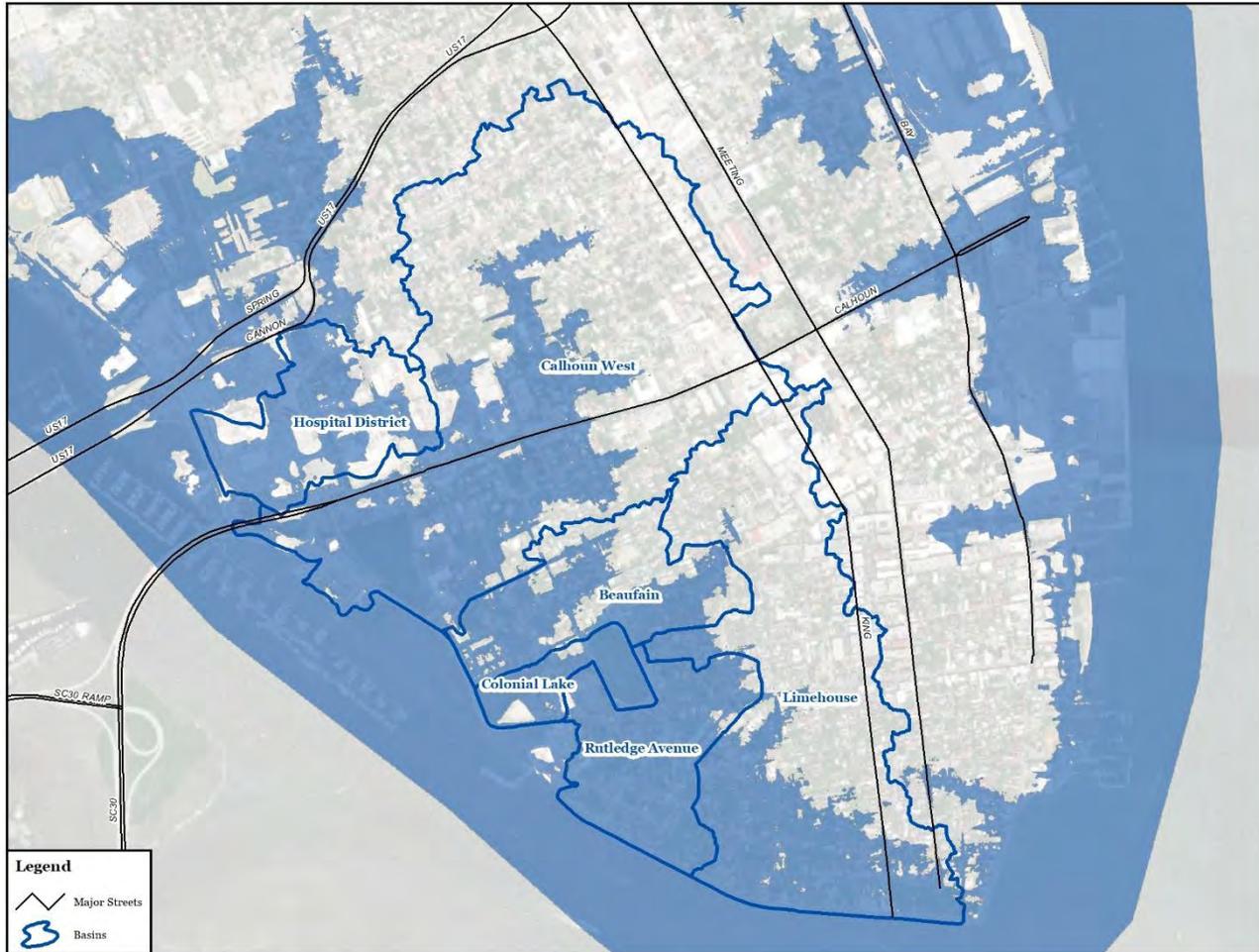
# Watershed Assessment

## Calhoun Street Profile



# Watershed Assessment

## 2.5' Sea Level Rise (City's SLR Strategy)



# Watershed Assessment

## 2.5' Sea Level Rise

- Low Battery Wall ( $\pm 5000$  LF) is **being designed for 2.5' SLR**
- Potential to raise Lockwood Dr.
- Potential Pump Station & Outfall designed to meet SLR requirements



# 'Short-Range' Improvements

- Smaller-scale improvements are being investigated that can be implemented in a shorter time frame
- These include:
  - System inspection, maintenance & repair
  - Temporary pumping
  - Drainage improvements between Alberta Long Lake and Cannon Park
  - Raising streets where possible
- Tidal valves have been replaced at Rutledge, Limehouse, Beaufain, and other outfalls in the study area

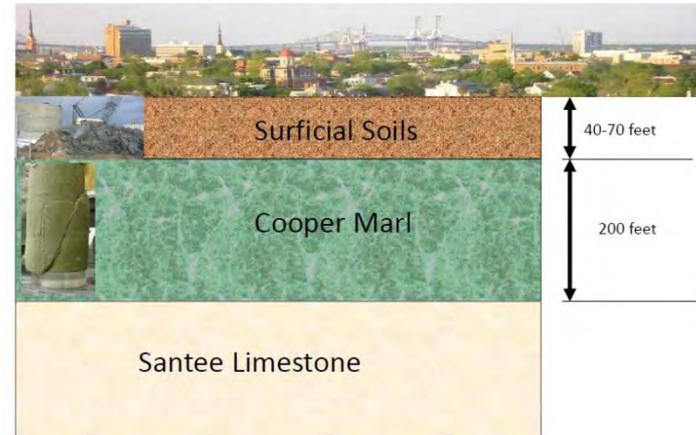


# 'Long-Range' Improvements

- Deep tunnels with pumping appear to be the most viable long-range solutions due to:
  - Remote, low-lying areas
  - Historic urban setting
  - Dense utility grids
  - Poor near-surface soil conditions
- Permitting requirements and funding acquisition will take time
- **Design for 2.5' of Sea Level Rise (per City's Sea Level Rise Strategy)**

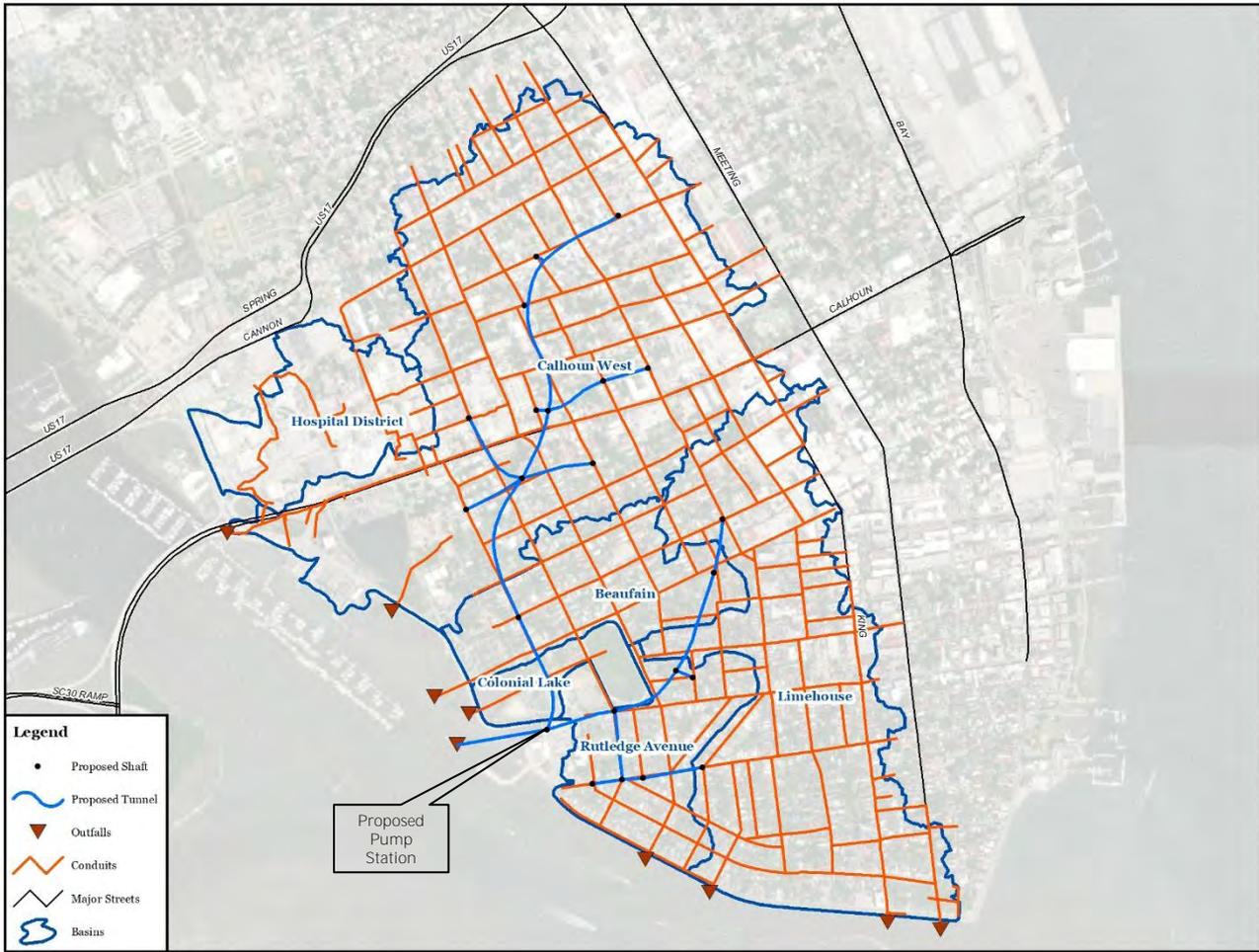


CHARLESTON GEOLOGIC PROFILE



# Conceptual System Layout

## Conceptual Tunnel Layout





# Questions?

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