SEAMONWHITESIDE

TOWN OF SULLIVAN'S ISLAND
ISLAND WIDE STORMWATER MASTER PLAN AND INFRASTRUCTURE IMPROVEMENT STRATEGY
OCTOBER 15, 2024

Ryne Phillips, PhD, PE
Project Manager/Point-of-Contact

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Water Resources Lead

- **Background & Project Goals**
- **Stormwater Master Plan**
  - Stormwater Inventory & Data Gathering
  - Community Engagement
  - Existing Conditions Analysis
  - Structure/Pipeline Inspection & Cleaning
  - Alternatives Analysis & Findings
  - Project Recommendations
- **Current Stormwater Improvement Projects**

- **Background**
  - Majority of existing drainage infrastructure installed by SCDOT
  - Not designed to handle today's extreme storm events
  - System in need of maintenance
  - Areas of the island currently not serviced by drainage infrastructure

- **Project Goals**
  - Assess the existing drainage infrastructure and develop a sound comprehensive strategy to mitigate flooding on Sullivan's Island.
  - Realistic and resilient recommendations

- **Field Inventory of Existing Stormwater Infrastructure**
  - GPS-Grade Survey
  - Location, elevation, structure type, etc.
- **Visual Conditions Assessment**
  - Identify immediate maintenance needs
  - Photos collected

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STORMWATER MASTER PLAN AND INFRASTRUCTURE IMPROVEMENT STRATEGY

Project Summary:

Seamon Whiteside and Associates (SW+'s) has been contracted to develop a resilient and comprehensive drainage infrastructure improvement strategy. The intent of this study will be to complete a holistic investigation of the entire island (including the SCIIP and HMGP project areas) to provide an understanding of existing flood conditions, develop solutions to mitigate existing flood conditions, and provide conceptual designs to springboard project implementation once funding becomes available. Based on understanding the Town's needs, the following sections outline SW+'s approach to providing a cost-effective and scientific, yet constructable solution.

Sullivan's Island is a low-lying barrier island that is mostly residential in nature but serves as a recreational haven for tourists and neighboring communities. This unique coastal community is full of history and has done a great job at preserving an outstanding quality of life. However, extreme flood events and aging drainage infrastructure are beginning to create challenges in maintaining and achieving long-term coastal resiliency. As a result, this project is critical for holistically investigating drainage deficiencies and developing a sound comprehensive strategy to address flooding experienced today while also preparing for tomorrow's changing coastal environment.

Existing Conditions:

A considerable portion of the island has existing drainage infrastructure, much of which was installed by the South Carolina Department of Transportation SCDOT). Rather than discounting these systems with a full-blown replacement, which can be costly and burdensome on the community, there may be cost-effective maintenance and/or retrofit solutions that should be explored. Such solutions, as well as new drainage systems in areas without any drainage systems, can be explored with town staff and community members to identify the best and most viable long-term solutions for the community. This is the crowning goal of this project; finding the best and most cost-effective solutions that will enable Sullivan's Island to continue thriving for hundreds of years to come.

Project Staff Contact

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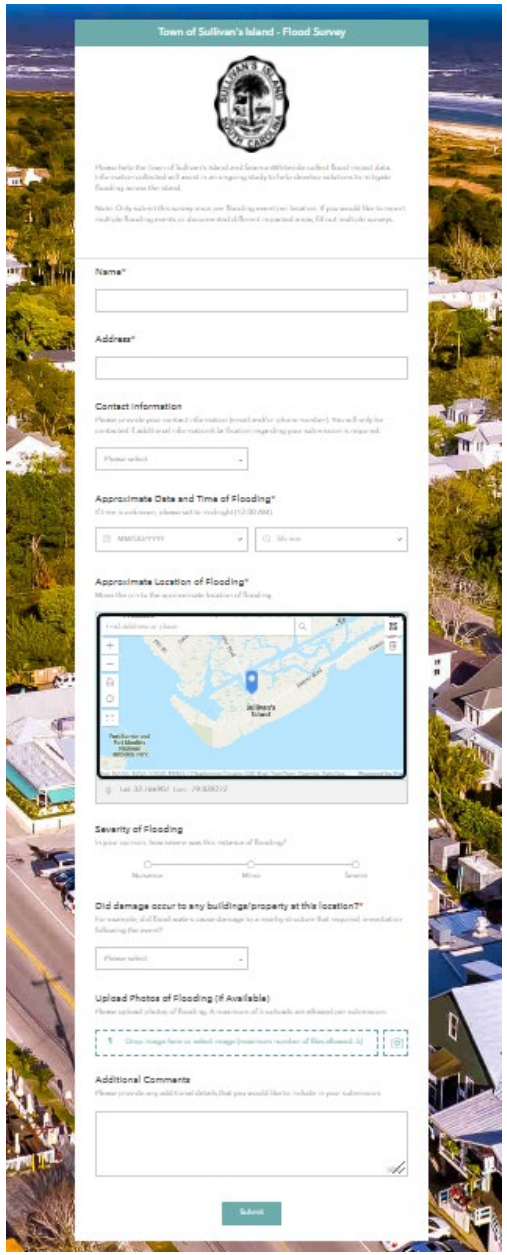
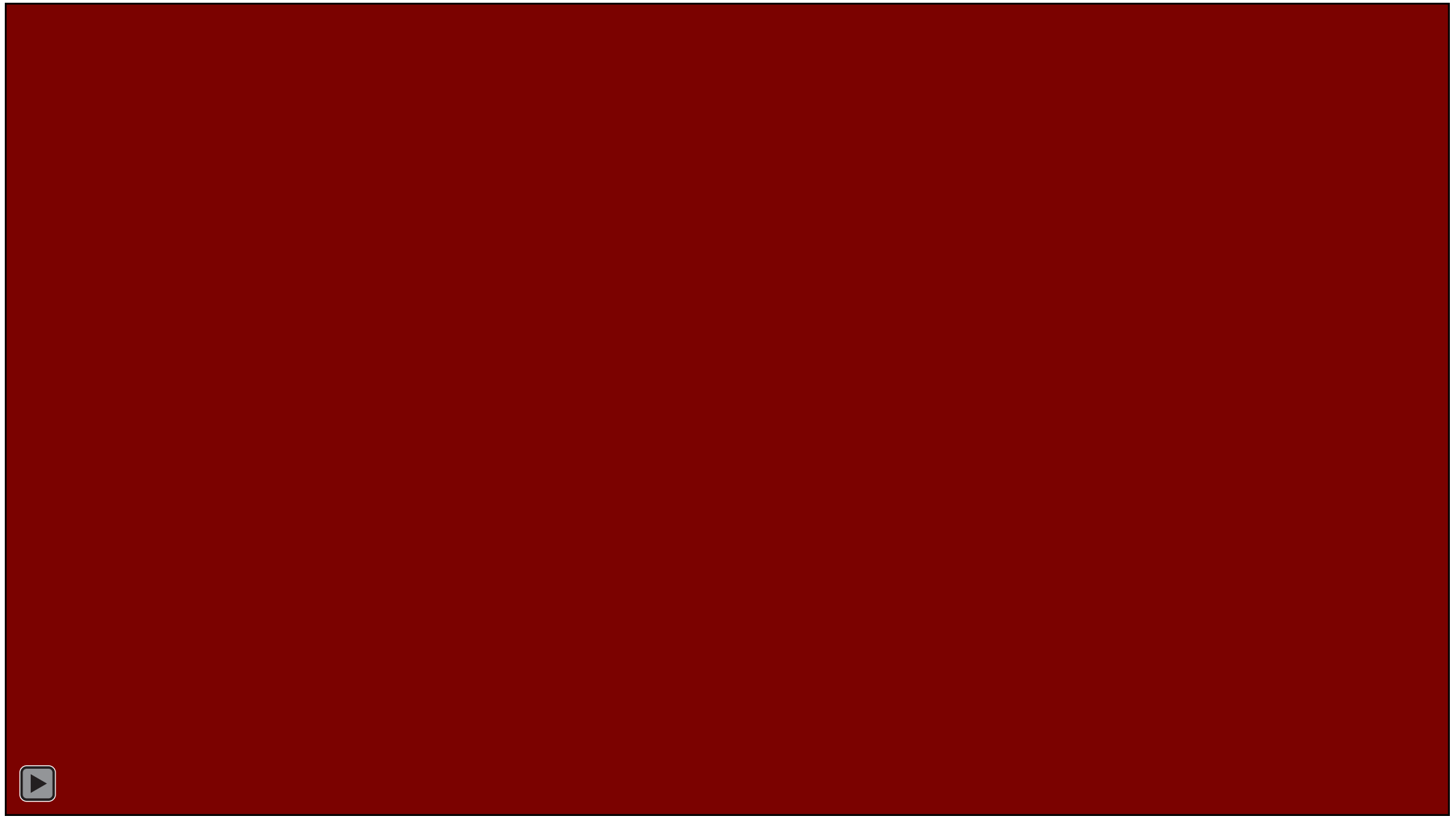
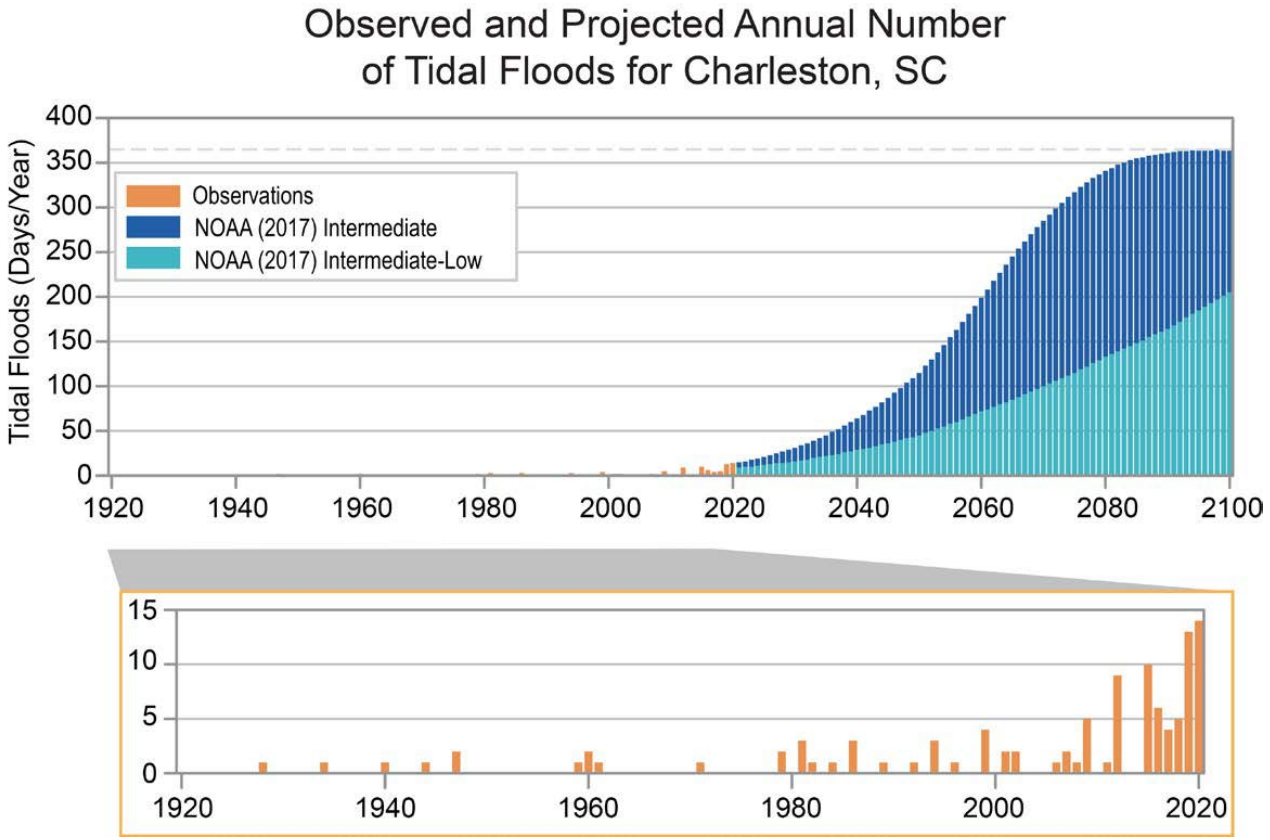
Click Here to Participate in the Flood Survey.

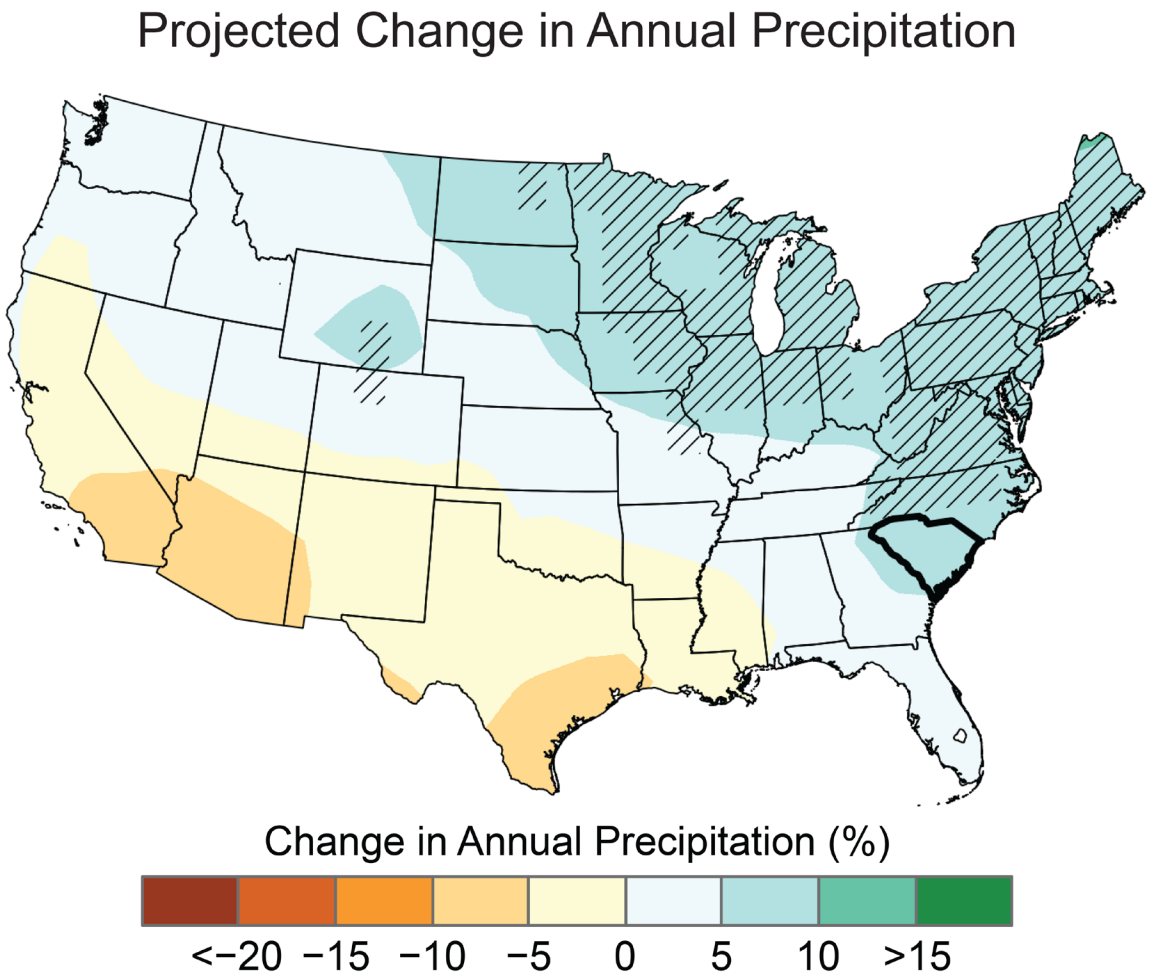
How You Can Help
Please help the Town and Seamon Whiteside collect flood impact data for an ongoing study to help develop solutions to mitigate flooding across the Island.

Note: Only submit this survey once per flooding event per location. If you would like to report multiple flooding events or documented different impacted areas, fill out multiple surveys.






Observed and Projected Annual Number of Tidal Floods for Charleston, SC
Tidal Floods (Days/Year)
400
350
300
250
200
150
100
50
0
Observations
NOAA (2017) Intermediate
NOAA (2017) Intermediate-Low
1920
1940
1960
1980
2000
2020
2040
2060
2080
2100
15
10
5
0
1920
1940
1960
1980
2000
2020


Projected Change in Annual Precipitation
Change in Annual Precipitation (%)
<−20
−15
−10
−5
0
5
10
>15

STRUCTURE/PIPELINE INSPECTION & CLEANING

Potential alternatives evaluated for Station 22 1/2.

- Iterative Process
- Develop Options or "What Ifs"
  - Maintenance
  - Pipe Upgrades
  - Controllable Outfalls
  - Storage Chambers
  - Green Infrastructure
- Investigate System Performance
- Cost Effectiveness
- Long-Term Maintenance

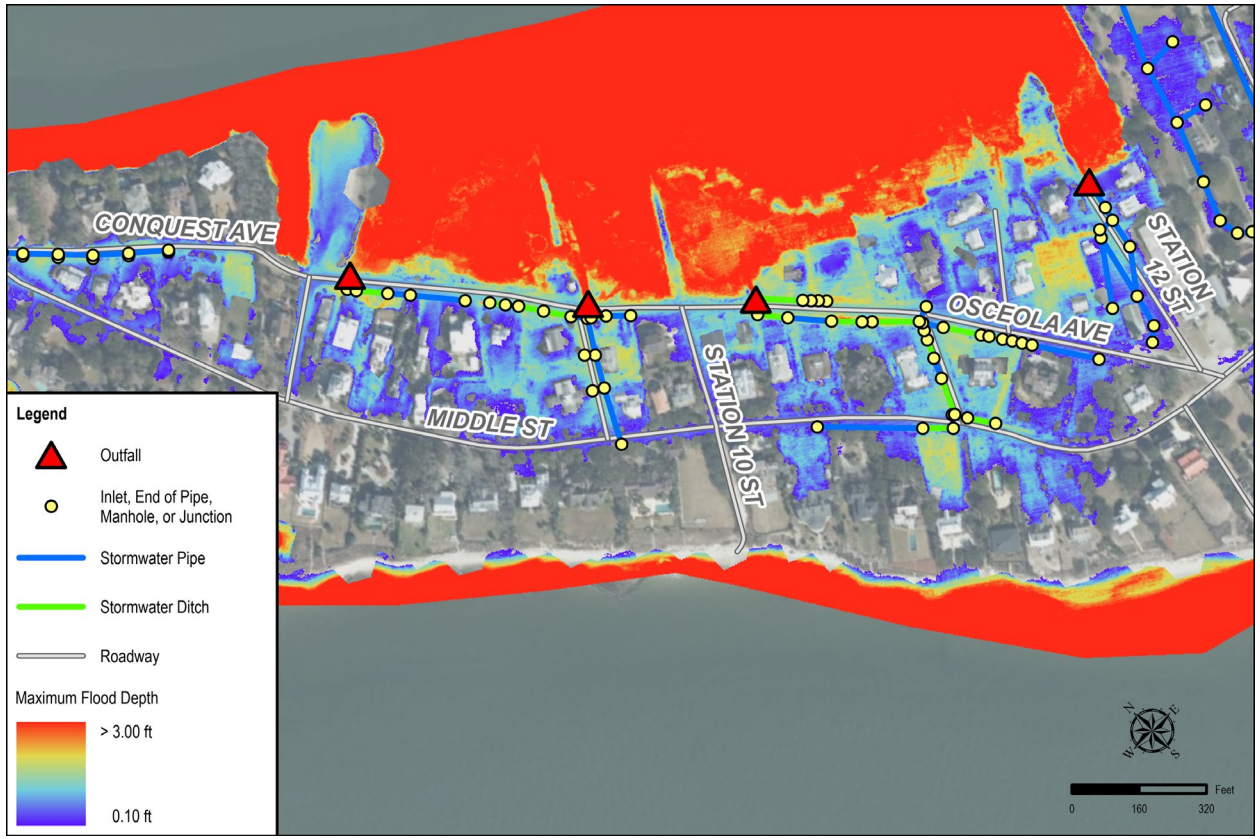
- **Targeting Future Flood Mitigation**
- **1% AEP (100-Year) 24-Hour Rainfall**
  - Increased by 10% to 11.44”
- **50-Year Future Typical Tide**
  - SLR + VLM + 2023 MHHW
  - Peak of 5.65 ft NAVD88
- **Increased Impervious Land Cover**

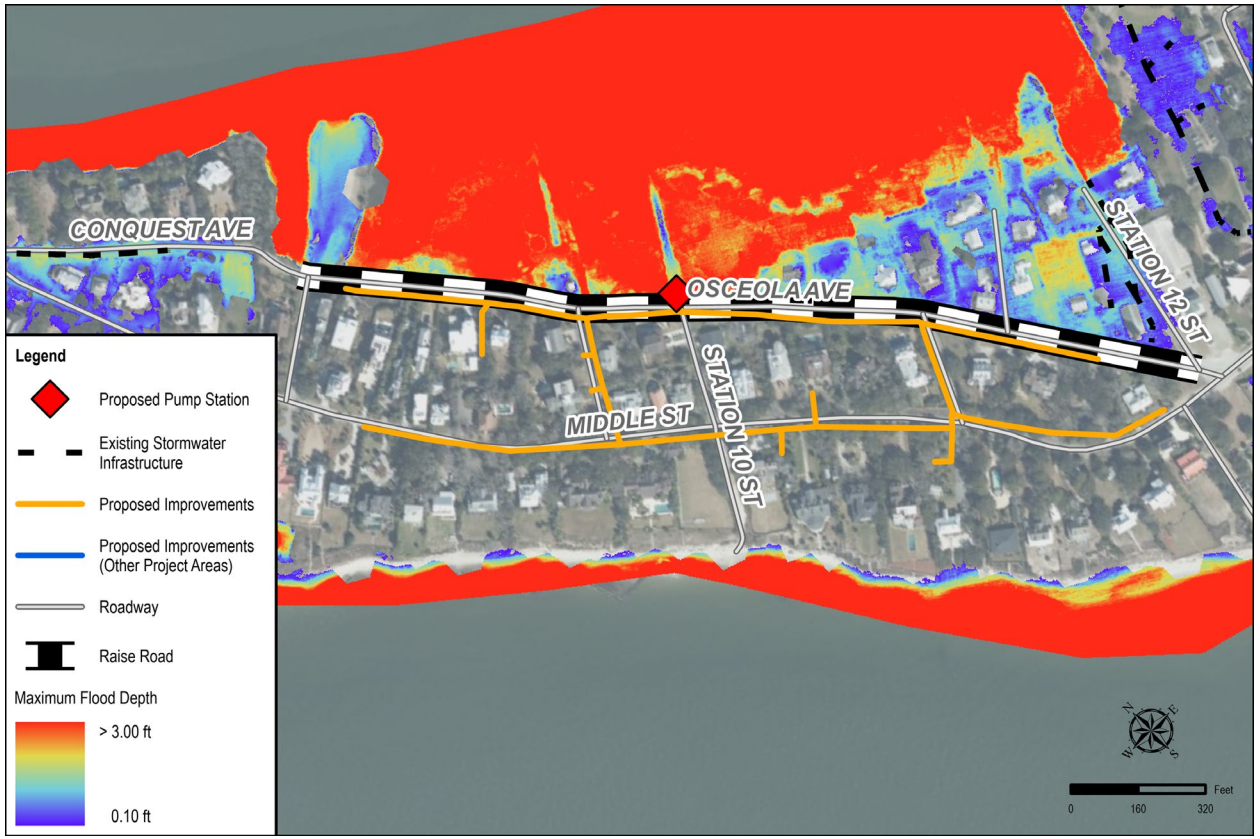
- **18 Projects Recommended**
  - Major drainage improvements
  - Future laterals to increase service areas
- **High Priority Projects Established**
  - Osceola Ave
  - Station 22 ½
  - Station 26 ½
  - ~$20 million in total

Observed flooding in project service area. Photos submitted by various residents.

OSCEOLA AVE

- **Upgraded/expanded collection system**
  - Increased pipe sizes
  - Installation of new inlets
- **Installation of stormwater pump station**
- **Tidal protection along Osceola Ave**
  - Raise roadway elevation to 6 ft NAVD88
  - Alternative would require an extensive vegetated berm
- **~$9.5 million**

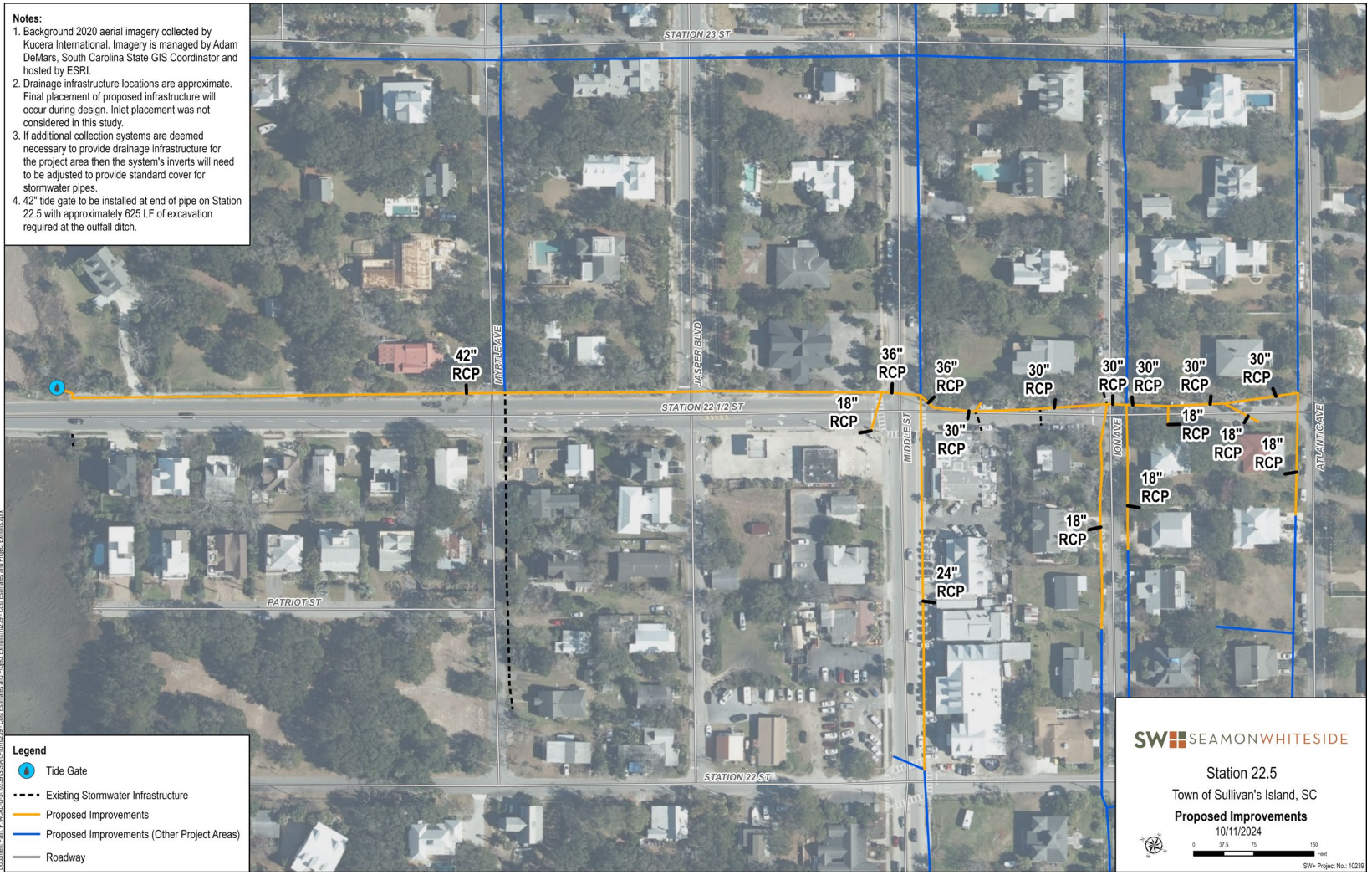




Existing (left) and proposed (right) flood results for the future conditions 100-Year (11.44”) and typical tide (SLR + 2023 MHHW; 5.65’ NAVD88) scenario. Flood results assume all proposed improvements have been implemented.

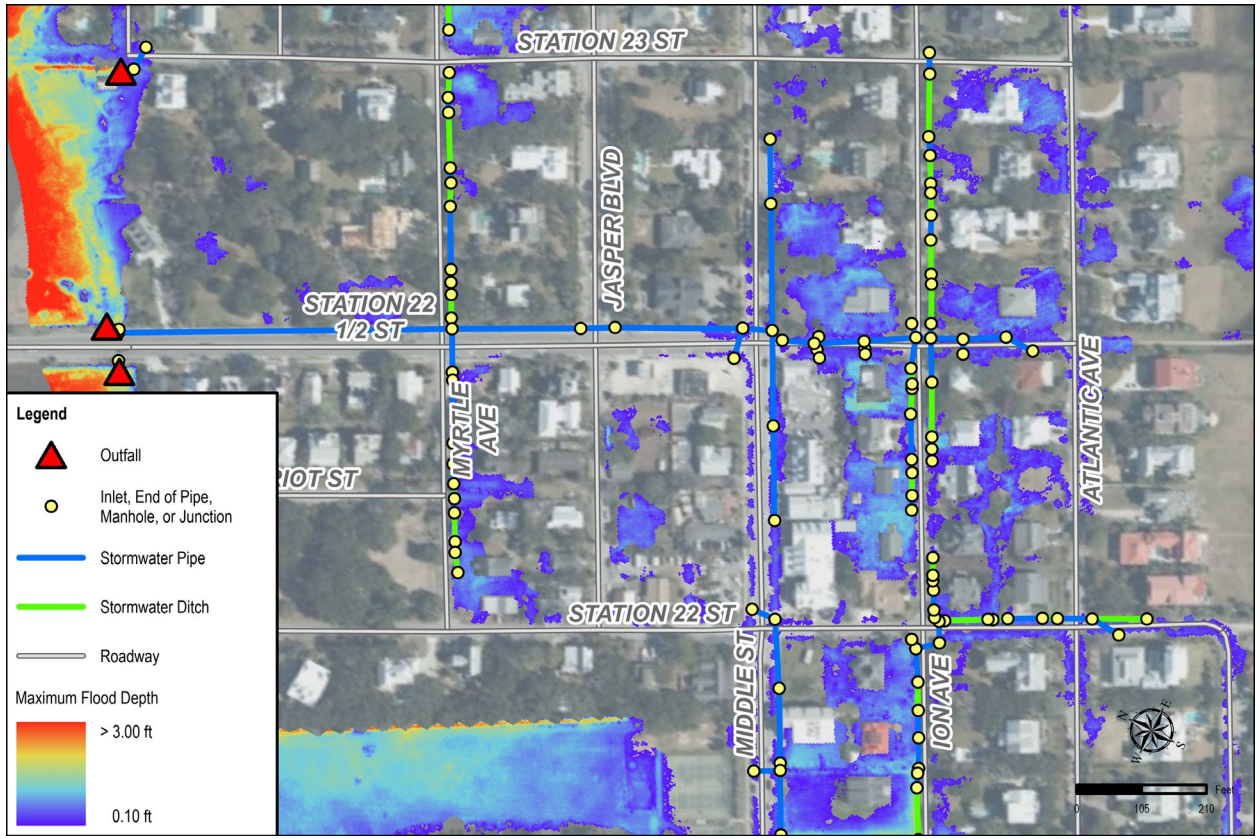
Observed flooding in project service area. Photos submitted by various residents.

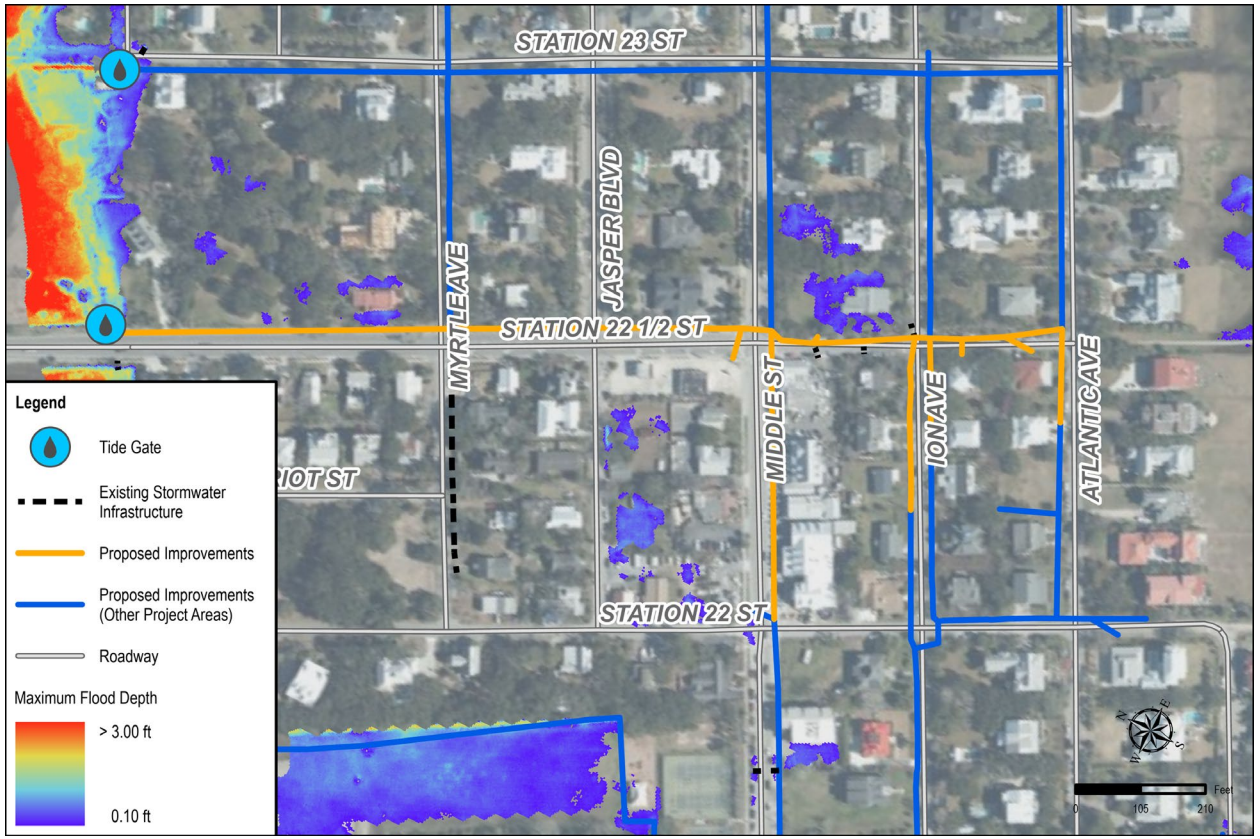
STATION 22 1/2



- **Upgraded/expanded collection system**
  - Increased pipe sizes
  - Installation of new inlets
- **Installation of check valve to prevent tidal backflow**
- **Re-establishment of outfall channel**
- **~$3.7 million**

STATION 22 1/2



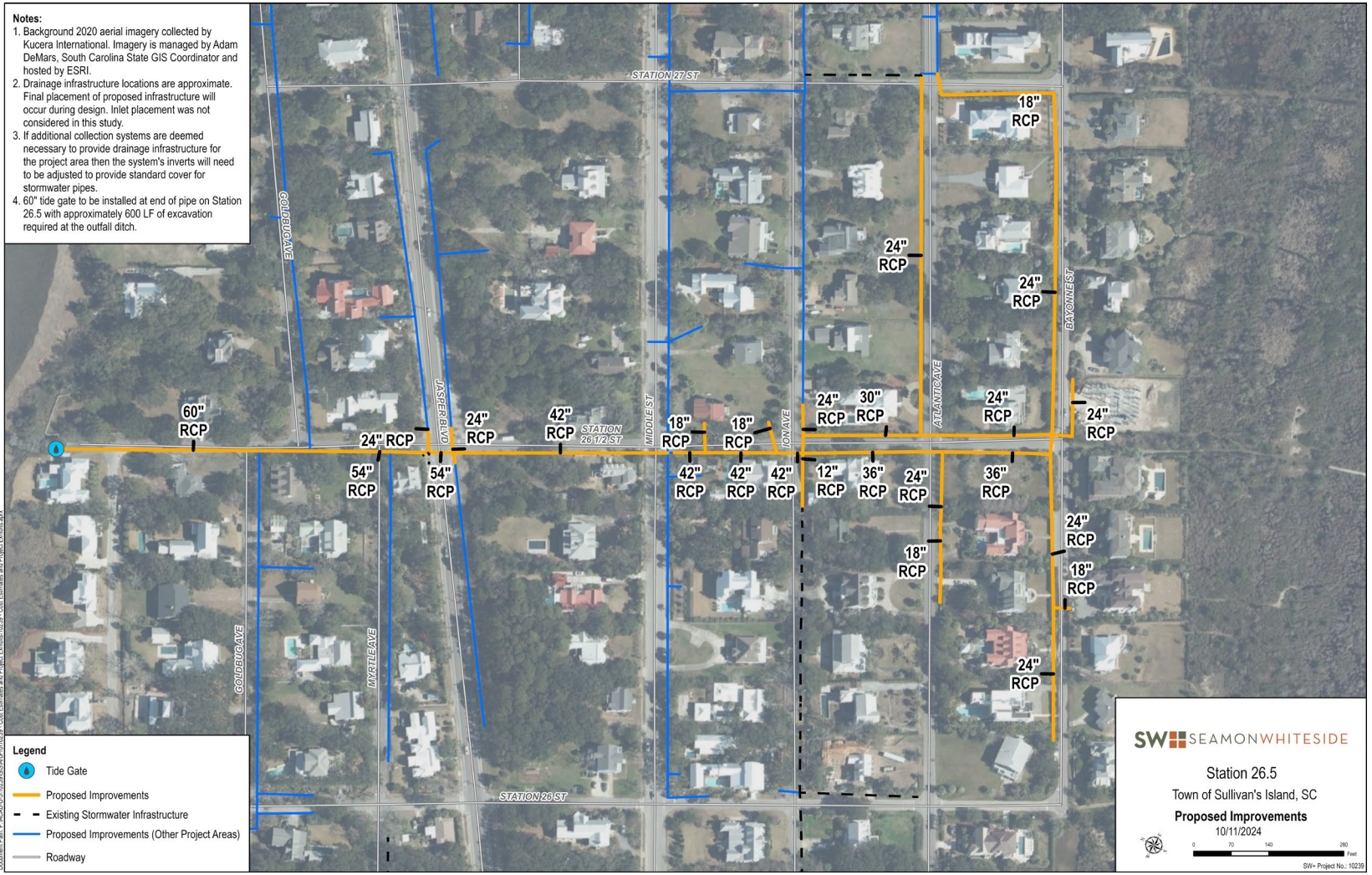


Existing (left) and proposed (right) flood results for the future conditions 100-Year (11.44”) and typical tide (SLR + 2023 MHHW; 5.65’ NAVD88) scenario. Flood results assume all proposed improvements have been implemented.

STATION 26 1/2

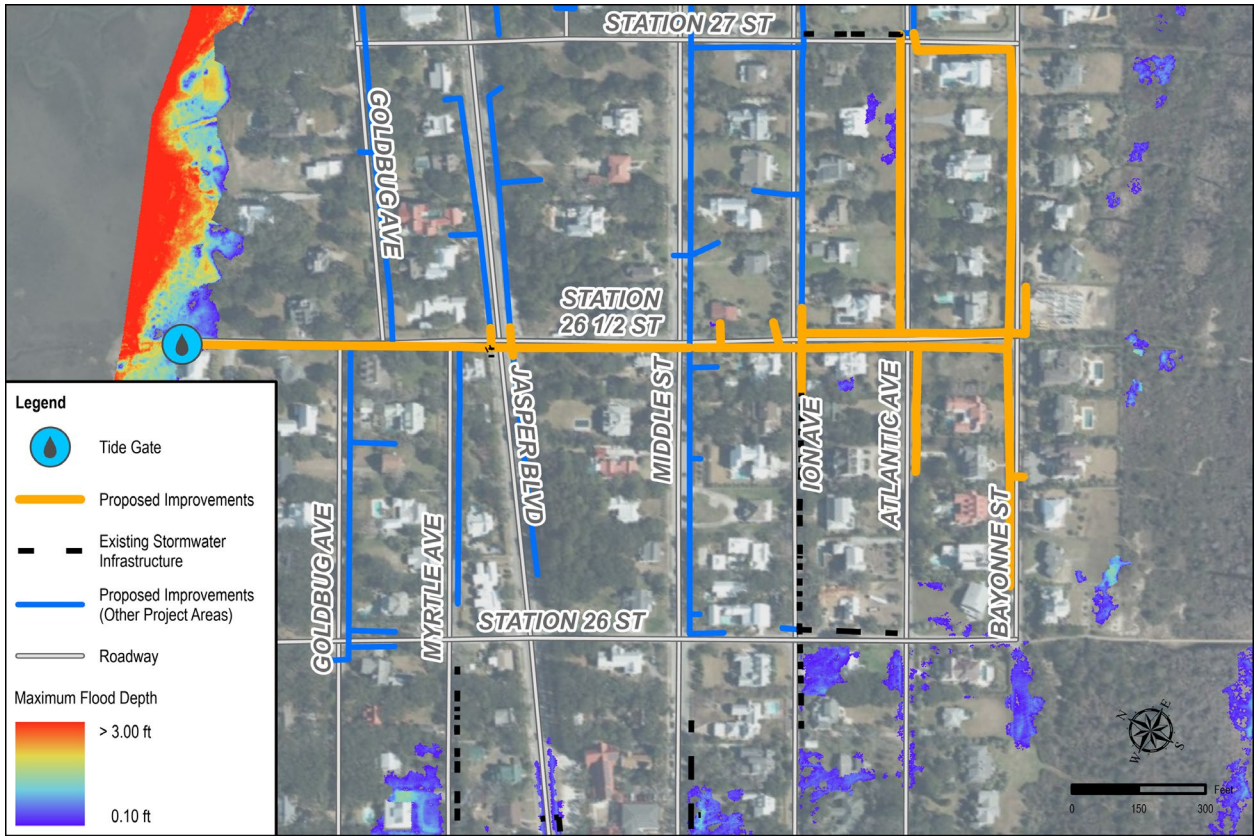
Observed flooding in project service area. Photos submitted by various residents.

STATION 26 1/2



- **Upgraded/expanded collection system**
  - Increased pipe sizes
  - Installation of new inlets
- **Installation of check valve to prevent tidal backflow**
- **Re-establishment of outfall channel**
- **~$6.4 million**

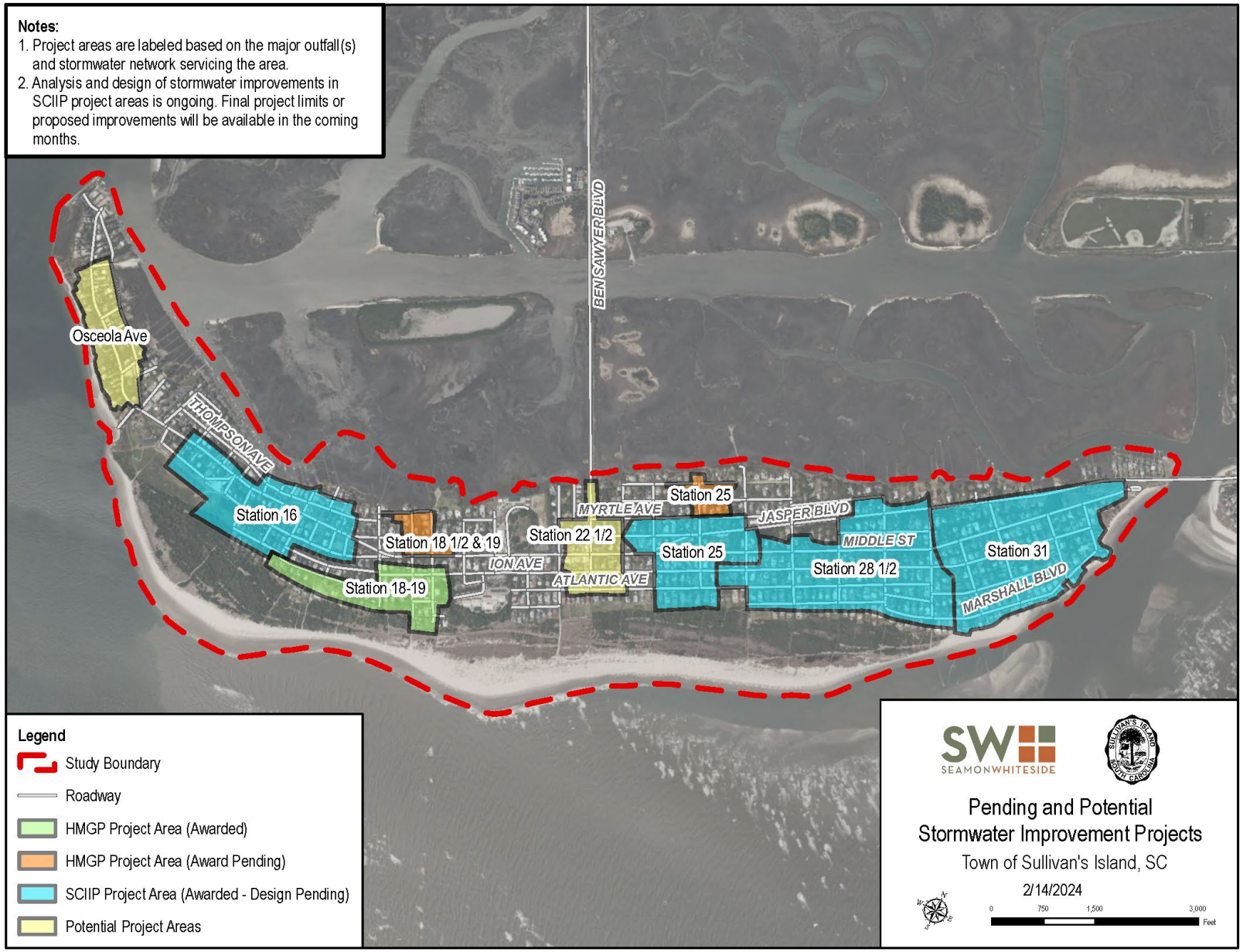
STATION 26 1/2



Existing (left) and proposed (right) flood results for the future conditions 100-Year (11.44”) and typical tide (SLR + 2023 MHHW; 5.65’ NAVD88) scenario. Flood results assume all proposed improvements have been implemented.

- State Grants
- Federal Grants
- Congressional Directed Spending
- Long-Term Low Interest Loans
- Principal Forgiveness Loans

CURRENT STORMWATER IMPROVEMENT PROJECTS



- **SCIIP (In Design)**
  - Station 31
  - Station 28 ½
  - Station 25
  - Station 16
- **HMGP (Awarded)**
  - Station 25
  - Station 18 ½ & 19
- **HMGP (Awarded)**
  - Station 18-19 at Atlantic Ave
- **Potential Project Areas**
  - Station 9 ½ (Permits Submitted)
  - Station 22 ½ (Funding Requested)

- Complete Funding Assessment
- Maintenance Recommendations
- Finalize Plan

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TOWN OF SULLIVAN'S ISLAND
SCIIP ISLAND-WIDE STORMWATER DRAINAGE IMPROVEMENTS
OCTOBER 15, 2024

- Background & Project Goals
- Timeline
- Proposed Improvements/Project Areas
  - STA 16
  - STA 25
  - STA 28 ½
  - STA 31
- Next Steps

- **Background**
  - Town was awarded funding for drainage improvements for Stations 16, 25, 28 ½, and 31
  - Majority of infrastructure installed by SCDOT many decades ago
  - Not designed to handle today's extreme storm events

- **Project Goals**
  - Design and construct drainage improvements
    - Upsizing pipes, extending system where possible, adding inlets, re-establishing outfalls, installing check valves
  - Ensure improvements align with long-term recommendations from the stormwater master plan

TIMELINE

Engineer Procured
January 2024

→ **Survey Completed**
June 2024

→ **Preliminary Design Completed**
August 2024

↓

OCRM and USACE Permits Submitted
August 2024

→ **Final Design Completed**
September 2024

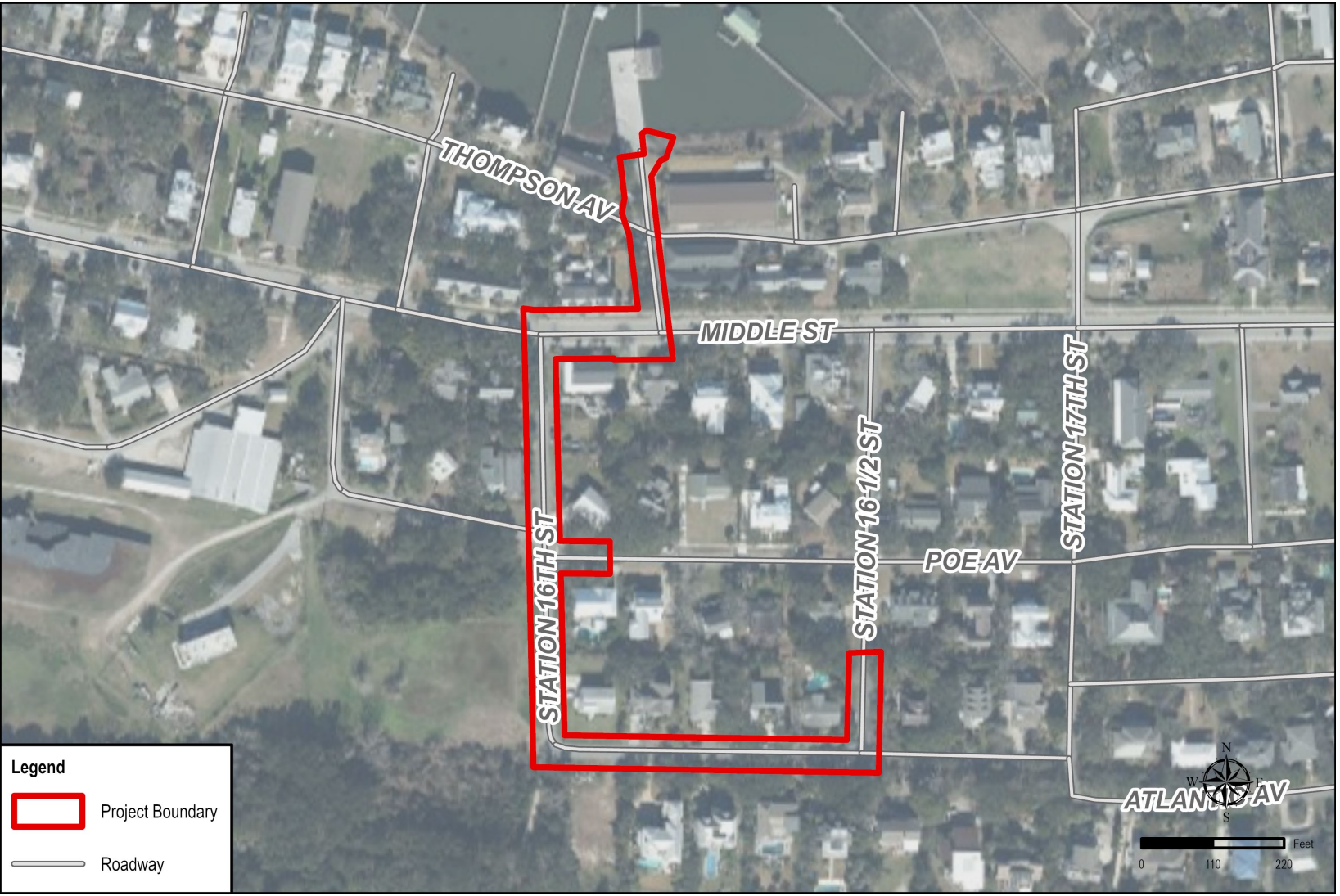
→ **SCDOT and Charleston County Permits Submitted**
September 2024

↓

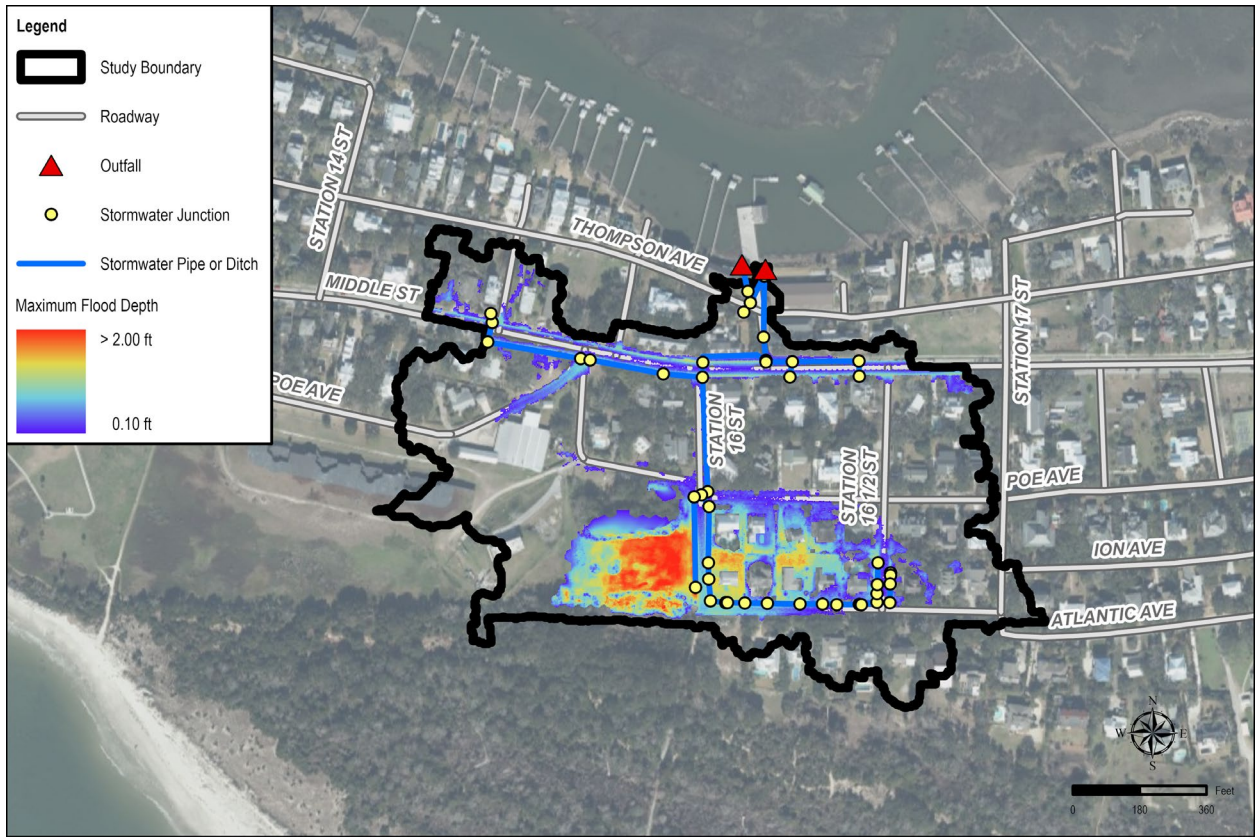
Bids Advertised
December 2024 (Anticipated)

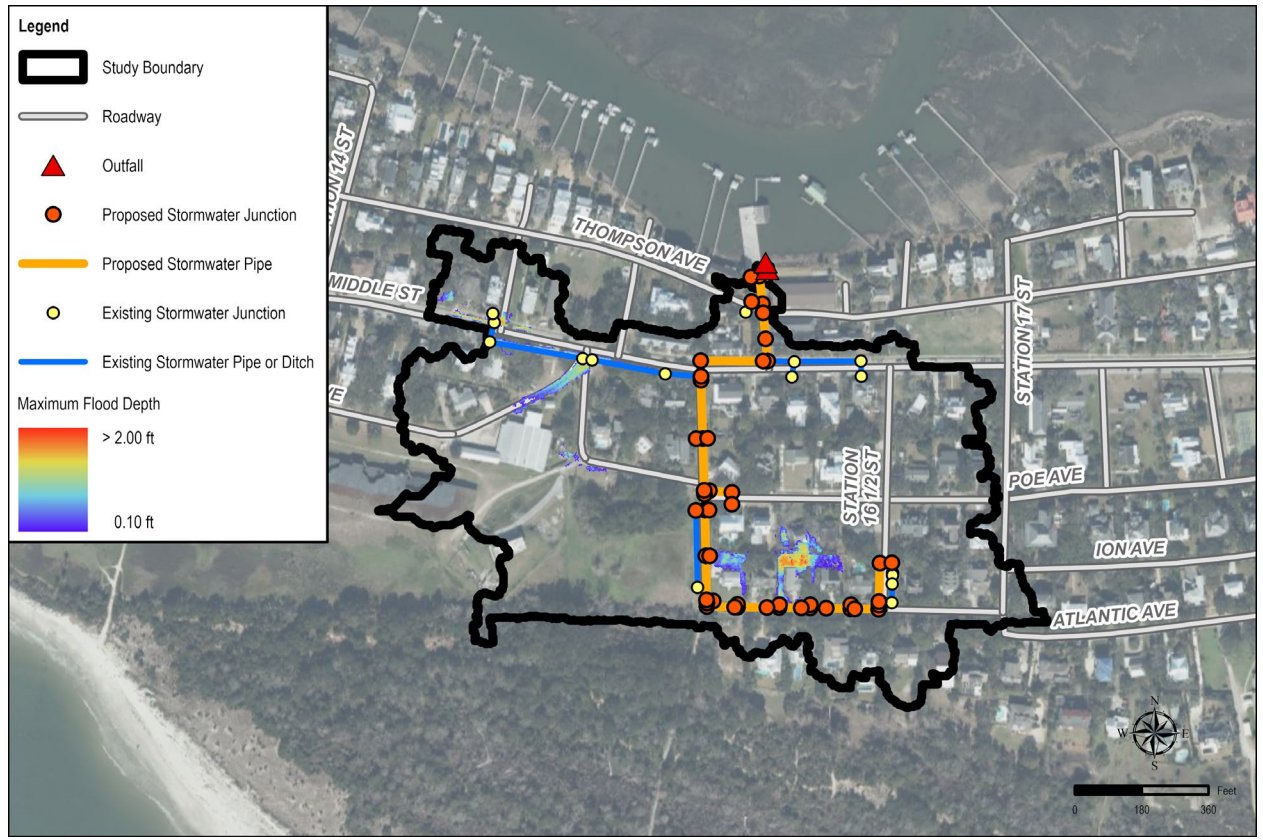
→ **Construction Begins**
March 2025 (Anticipated)

→ **Construction Complete**
May 2026 (Anticipated)



- **Full replacement and improvements from outfall to Station 16 ½**
  - 24” RCP along Atlantic
  - 30”-36” RCP along STA 16
  - 42” RCP at outfall
- **Installation of check valve to prevent tidal backflow**





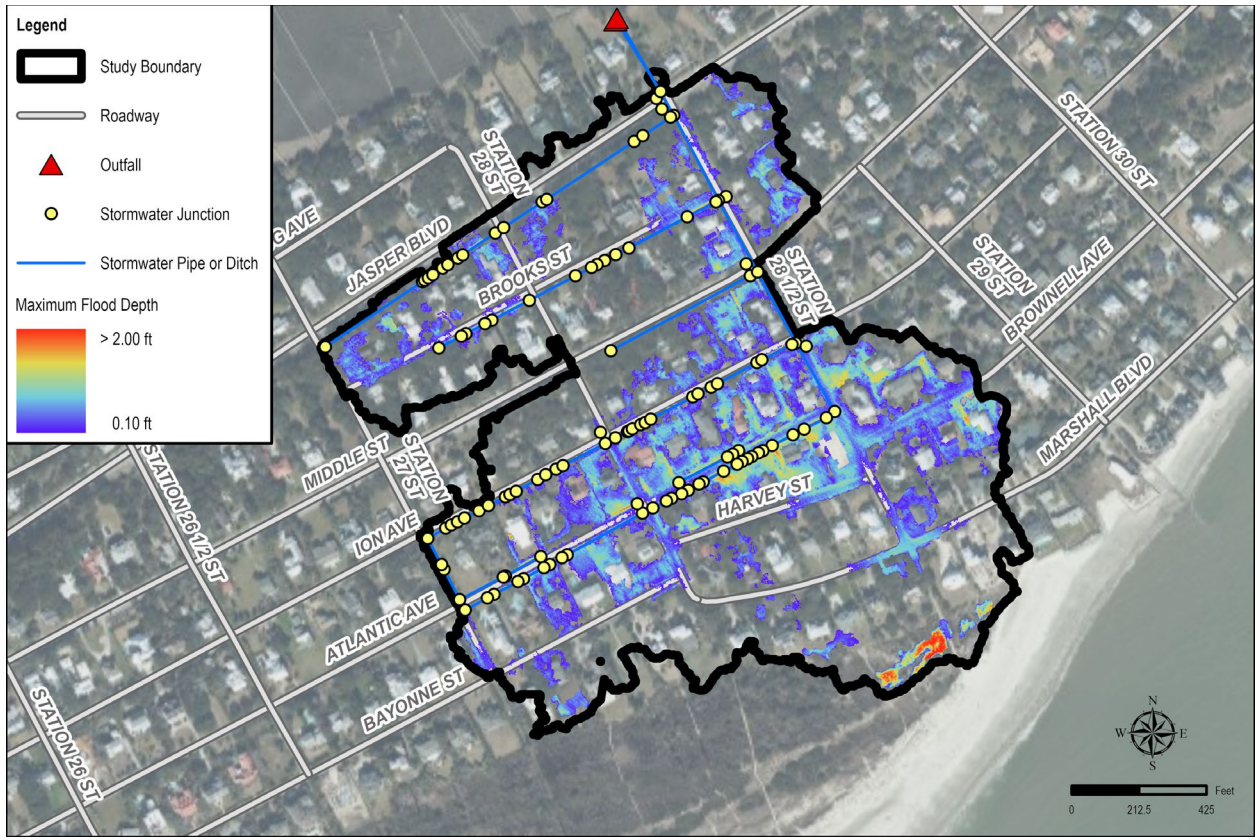
Existing (left) and proposed (right) flood results for the current conditions 100-Year (10.40”) and mean tide (static; -0.35’ NAVD88) scenario. Flood results assume all SCIIP improvements have been implemented.

- **Replacement of damaged pipes and restrictions**
  - Goldbug-Myrtle
  - Jasper-Middle
  - Ion-Atlantic
- **Lining pipe**
  - Raven-Goldbug
  - Myrtle-Jasper
- **Installation of check valve to prevent tidal backflow**
- **Re-establishment of channel in marsh**

Existing (left) and proposed (right) flood results for the current conditions 100-Year (10.40”) and mean tide (static; -0.35’ NAVD88) scenario. Flood results assume all SCIIP improvements have been implemented.

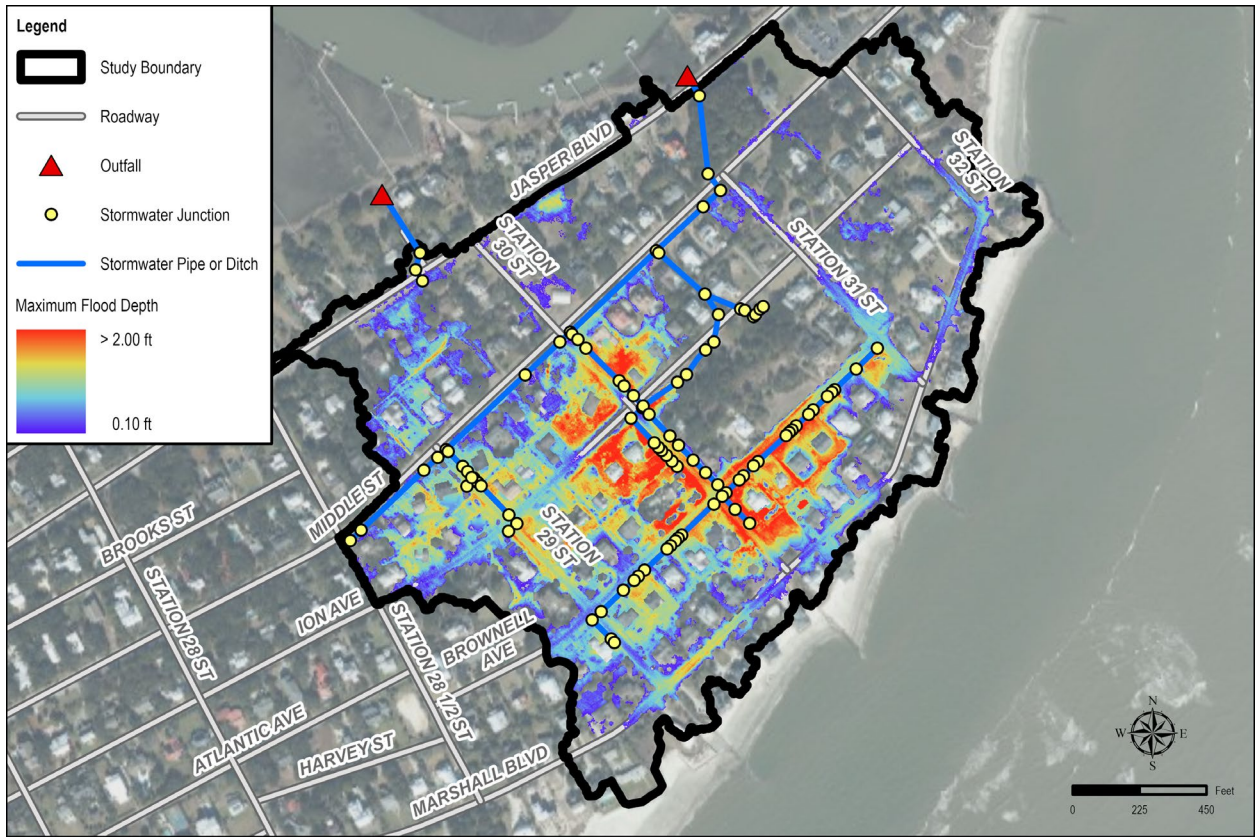
STA 28 1/2

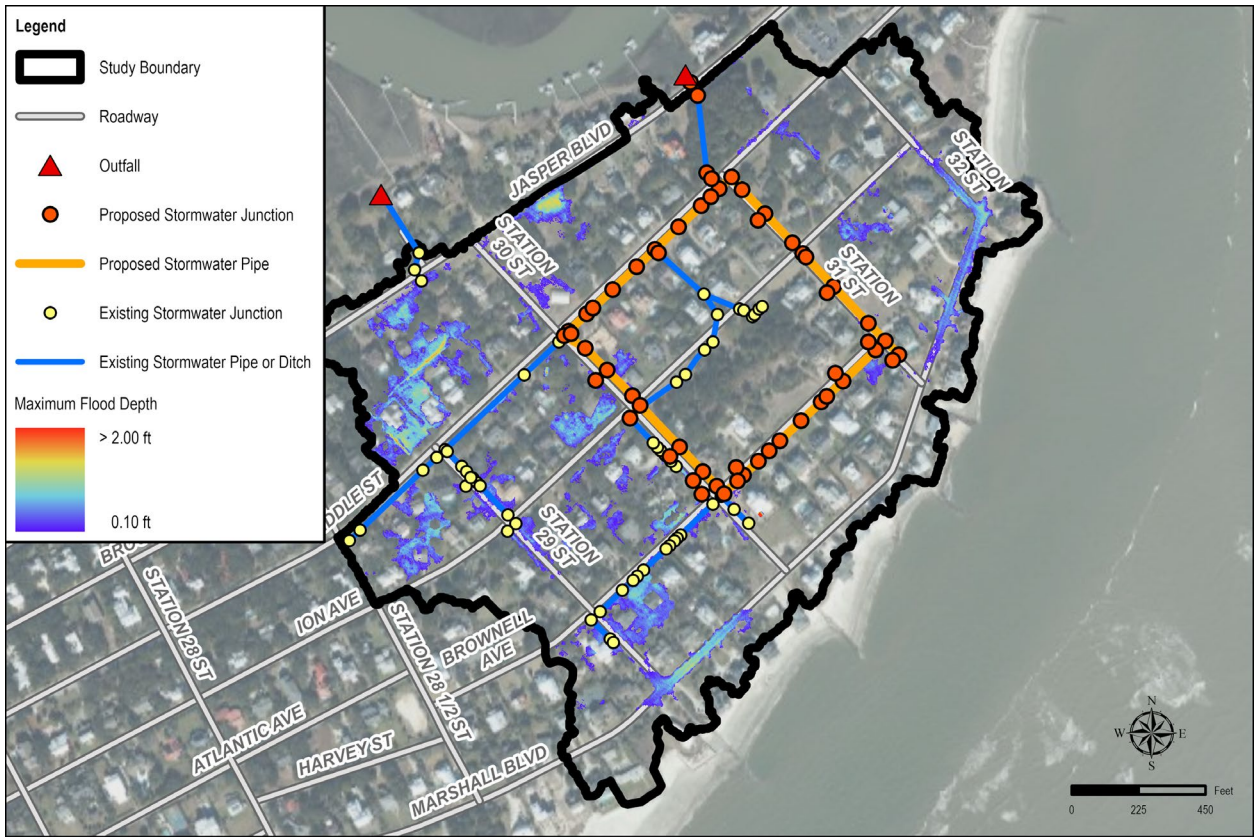
- **Full replacement and improvements from outfall to Station 27**
  - 18”-30” RCP along Atlantic
  - 42”-54” RCP along STA 28 1/2
  - 60” RCP at outfall
- **Expansion of system from Atlantic to Marshall**
- **Installation of check valve to prevent tidal backflow**



Existing (left) and proposed (right) flood results for the current conditions 100-Year (10.40”) and mean tide (static; -0.35’ NAVD88) scenario. Flood results assume all SCIIP improvements have been implemented.

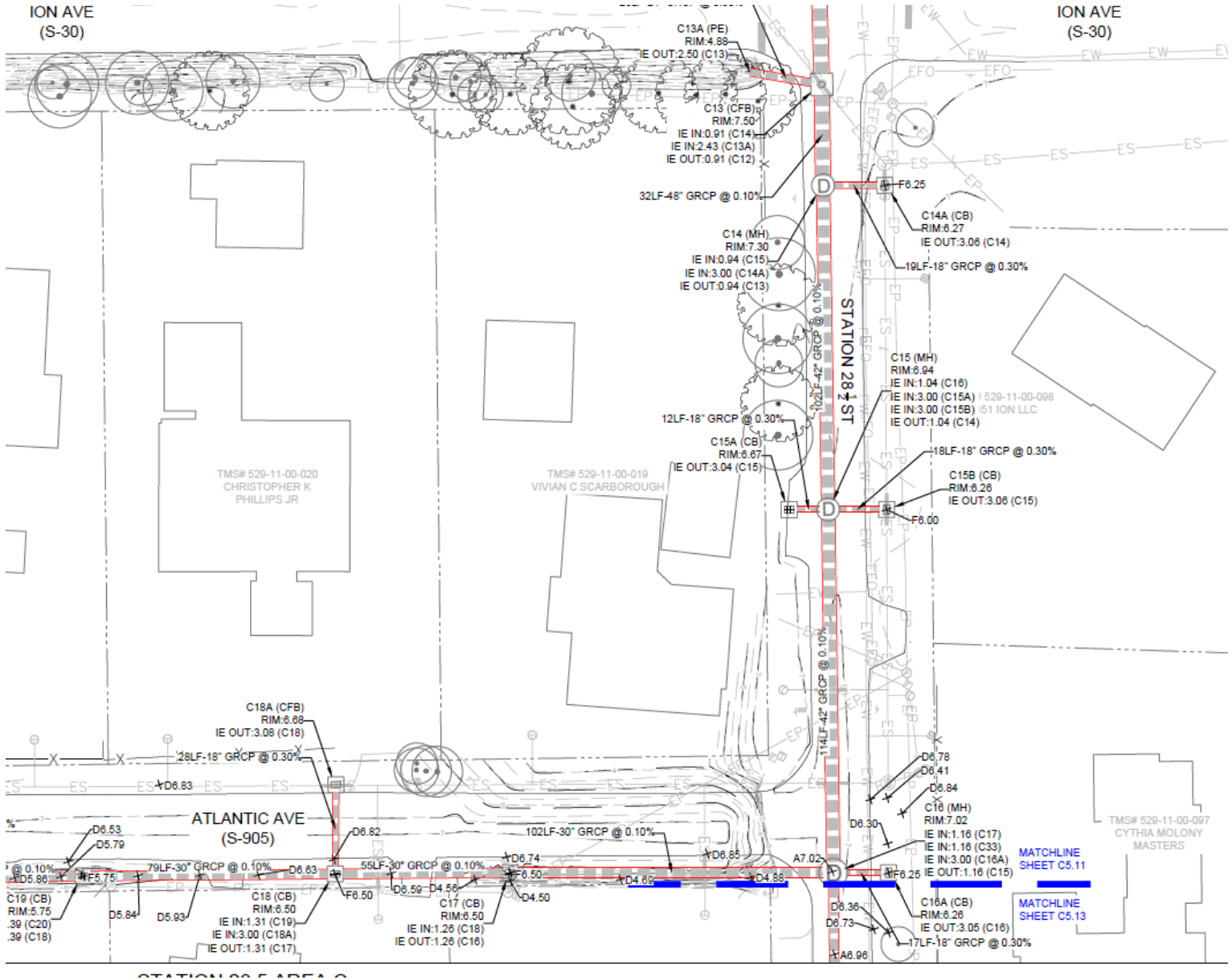
- **Full replacement and improvements from outfall to STA 31 (though STA 30)**
  - 24” RCP along Brownell
  - 24”-30” RCP along Station 30
  - 42” RCP along Middle
  - Dual 42” RCP at outfall
- **Expansion of system along Station 31**
  - 42” RCP along STA 31
  - Stormwater now has two flow directions at STA 30/Brownell intersection
- **Installation of check valves to prevent tidal backflow**
- **Re-establishment of outfall channels**





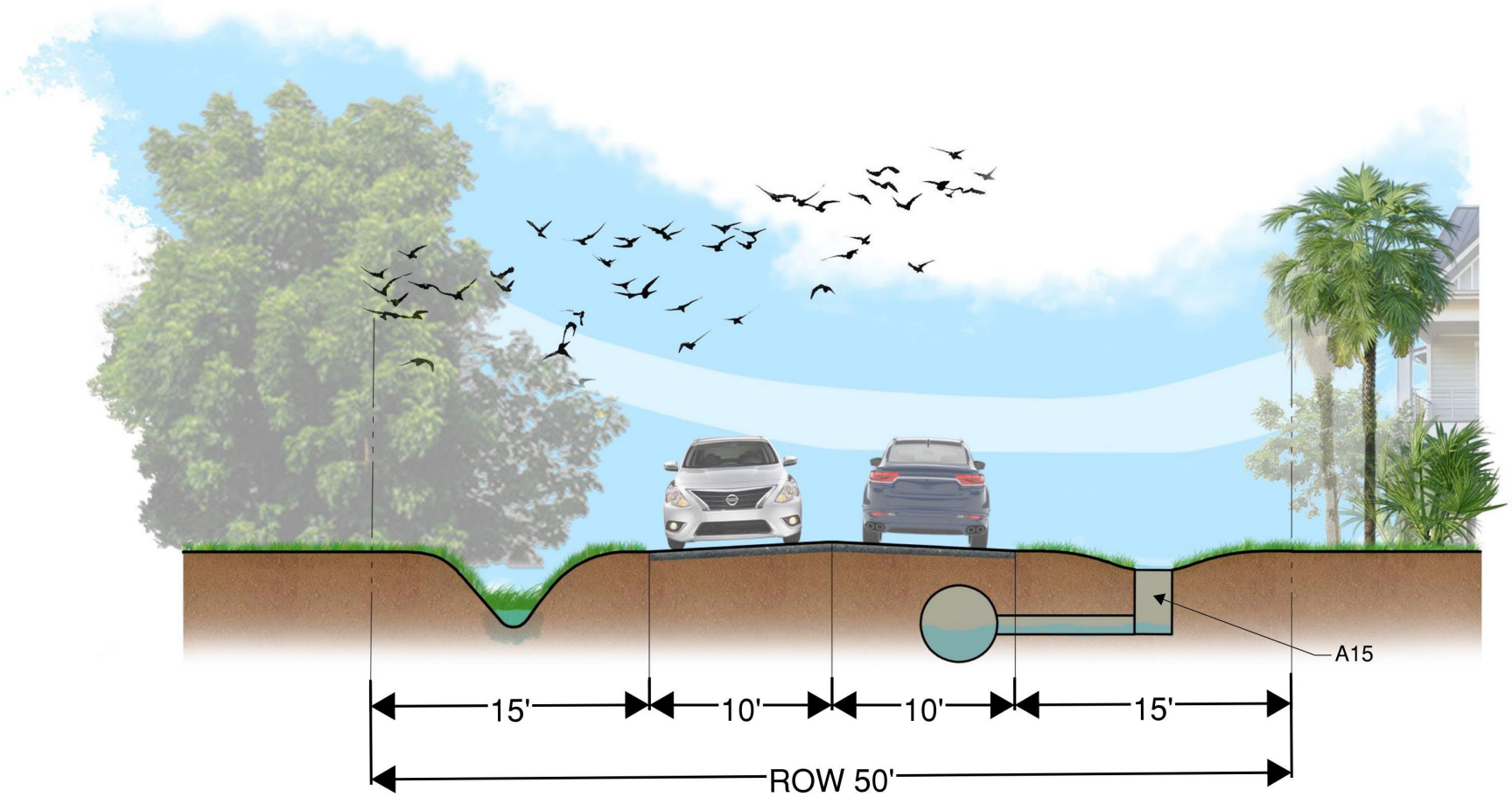
Existing (left) and proposed (right) flood results for the current conditions 100-Year (10.40”) and mean tide (static; -0.35’ NAVD88) scenario. Flood results assume all SCIIP improvements have been implemented.

CONSTRUCTION: WHAT TO EXPECT



- Construction to occur downstream to upstream
- Multiple project areas may be addressed simultaneously
- Majority of work within SCDOT or Town right-of-way
- Traffic control and utility coordination will be major elements

TYPICAL CROSS SECTION: STA 16



STATION 16 (S-906) AREA B

CONSTRUCTION STAGING

- Need to finalize staging areas for each project
- Ideally would have multiple staging areas across the island to service projects simultaneously
- Final locations to be based on town guidance

QUESTIONS REGARDING THE PROJECTS?

Contact Ryne Phillips or Aaron Akin
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aakin@seamonwhiteside.com

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