

# Coastal Vulnerability Assessment

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## **Executive Summary**

In 2019, the City of Atlantic Beach completed its initial Vulnerability Assessment. Since then, state regulations have been introduced to standardize these assessments, State Statute 380.093 has clarified reporting requirements, and our modeling capabilities have significantly improved. As a result, an update to the assessment is now necessary.

Sea levels have risen measurably over the years in Atlantic Beach. The question is how will this rate of sea level rise (SLR) change in the future and how will it affect the City?

To help answer these questions, the City embarked on a study to evaluate the vulnerability of the City regarding nuisance flooding and storm induced flooding from SLR in the 25- and 55-year timeframe. This update includes new modeling for the timeframes. This report details the methodology used to develop a statistically based approach to vulnerability from SLR and assesses the vulnerability of critical facilities and infrastructure. The assessment also included an evaluation of the potential impact to all properties and structures within the City limits.

The results of this effort are a series of maps that are essentially future versions of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps currently used for planning and building requirements today. The analysis reveals that significant impacts from SLR may occur in the not so distant future that will have to be taken into account regarding planning, development, and redevelopment.

This report forms the basis for the next step in planning for the impacts of SLR through the development of an adaptation plan. The adaptation plan will consider policies, planning measures, future projects, etc. to help adapt to and mitigate for impacts to vulnerable areas of the City.

This project was made possible by a Resilient Florida Grant Program (RFGP) provided by the Florida Department of Environmental Protection's (FDEP) Resilient Coastlines Program and a Community Development Block Grant Mitigation Program provided by the Department of Commerce.

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## 1.0 Introduction

### 1.1 Overview

The City of Atlantic Beach is one of three small coastal communities in northeast Florida that make up the “Beaches” of Jacksonville. The City consists of three square miles with a population of approximately 14,000, and is located between two miles of Atlantic Ocean beachfront on the east and the expansive marsh and estuarine environment of the San Pablo Creek/Atlantic Intracoastal Waterway (ICW) on the west. Atlantic Beach is a near fully-developed municipality where the predominant land use is residential consisting of stable and well-established neighborhoods. Figure 1-1 represents the Official Zoning Map.

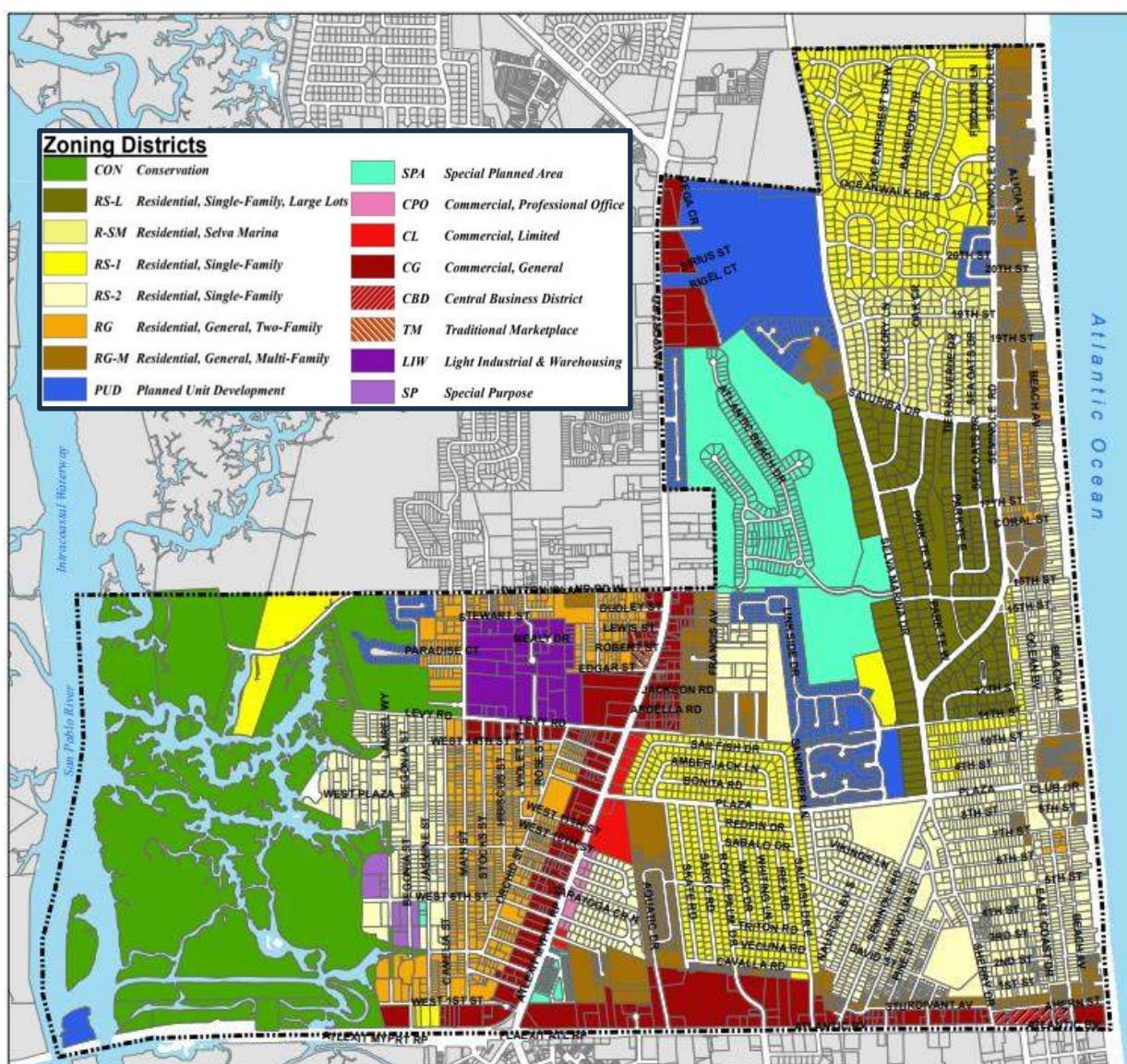


Figure 1-1 – Atlantic Beach Zoning Map (Updated in 2023)

The City of Atlantic Beach contains two commercial corridors: the north side of Atlantic Boulevard (SR10) extending from the ocean west to the ICW, and Mayport Road (SR A1A) extending from Atlantic Boulevard north to the municipal limits of the City at Dutton Island Road.

The City possesses a unique character and “personality” where a high quality of life, diverse recreational activities, preservation of community character and protection of natural resources are priorities to residents and elected officials. Since the City is near full build out, current development consists of redevelopment and scattered infill. In 2019, City staff began observing the development of lots that were historically untouched primarily due to low lying topography and proximity to the 100-year floodplain. This trend has continued and is likely due to a lack of undeveloped land and the continued attractiveness of the area.

## 1.2 Coastal Resiliency Planning in Florida

Scientists from around the world have been studying climate change and the resulting sea-level rise (SLR) impacts for decades. Multiple sources of data are currently available to predict realistic scenarios of future sea levels and their impacts on coastal communities. Some cities, such as Miami, are already seeing impacts from sea-level changes, prompting immediate adaptation measures.

Florida began its first organized adaptation planning efforts in 2009, which led to the Community Planning Act (CPA) in 2011. The CPA gave local governments the option to create adaptation plans. However, the state did not require municipalities to address SLR until 2015 when the “Peril of Flood” statute was passed which required municipalities to address SLR in their comprehensive plans. Atlantic Beach incorporated “Peril of Flood” amendments in to its comprehensive plan in 2019.

In 2018, recognizing the need for coastal communities to assess potential impacts from sea level rise, the Florida Department of Environmental Protection’s Resilient Coastlines Program awarded its 16 resiliency planning grants to coastal communities including Atlantic Beach, resulting in the 2019 Coastal Vulnerability Assessment. The purpose of Atlantic Beach’s grant was to provide funding for planning purposes to help prepare our community for current and future effects of rising sea levels, initially through the preparation of this Vulnerability Assessment. To incorporate all of COAB’s public utility assets, the VA was revised in 2021 to add the area located between Wonderwood Drive and AB city limits.

In the 2022 Florida Statute (F.S.) Section 380.093 update, specific data collection standards for all Vulnerability Assessments were established. Some of these standards include identifying critical community infrastructure and assets that are vulnerable to flooding under existing and projected future conditions and using the National Oceanic and Atmospheric Administration (NOAA) 2022 intermediate low and intermediate SLR projections for the 2050 and 2080 planning horizons. The City has completed this update to satisfy the Statute, to leverage additional grant funding, and as part of its continuing efforts to become a more resilient community.

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### 1.3 About this Project

Globally, the sea level has risen by approximately 8 inches since scientific record-keeping began in 1880. This rate has increased in recent decades to a little more than an inch per decade. Global average sea level has risen by approximately 7 to 8 inches (about 16 to 21 centimeters[cm]) since 1900 with approximately 3 of those inches occurring since 1993. In addition to the global average SLR, local sea level rise – sometimes called “relative sea level rise” – happens at different rates in different places. Local SLR is affected by the global SLR but also by local land motions and the effects of tides, currents, and winds.

Figure 1-2 shows an increase in the global average sea level since 1880 in inches. The blue line, tide gauge data, becomes steeper in more recent decades, indicating an increasing rate of change. The surrounding light blue-shaded area shows upper and lower 95 percent confidence intervals and the orange line shows sea level as measured by satellites for comparison (1993 to 2016). (US Global Change Research Program, 2017)

As sea levels have risen, the incidence of nuisance flooding or “sunny day” flooding during spring tide events at certain times of the year has increased five- to ten-fold since the 1960s in several U.S. coastal cities and rates of increase are accelerating in over 25 Atlantic and Gulf Coast cities. In the City of Atlantic Beach, nuisance flooding resulting in overtapped roads is occurring in areas such as Dutton Island Road and West Plaza.

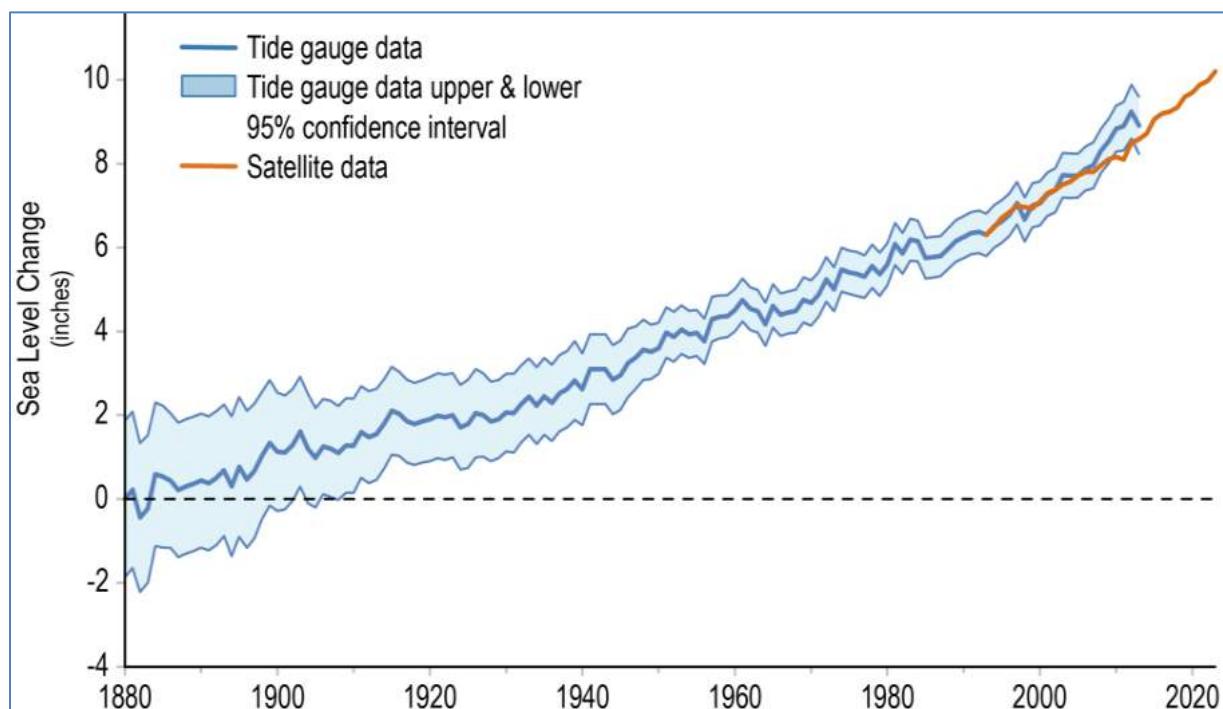


Figure 1-2 – Global Average Sea-Level Change (US Global Change Research Program)

The closest NOAA primary tidal gauge to the City of Atlantic Beach is located at the Mayport Bar Pilot's Dock (NOAA tide gauge No. 8720218) near the ferry slip. Figure 1-3 depicts the relative change in sea level at the Mayport Bar Pilot's Dock over the 90-year history of this station. The current local rate of sea level change is approximately 1 inch every decade. (<https://tidesandcurrents.noaa.gov/sltrends/>)

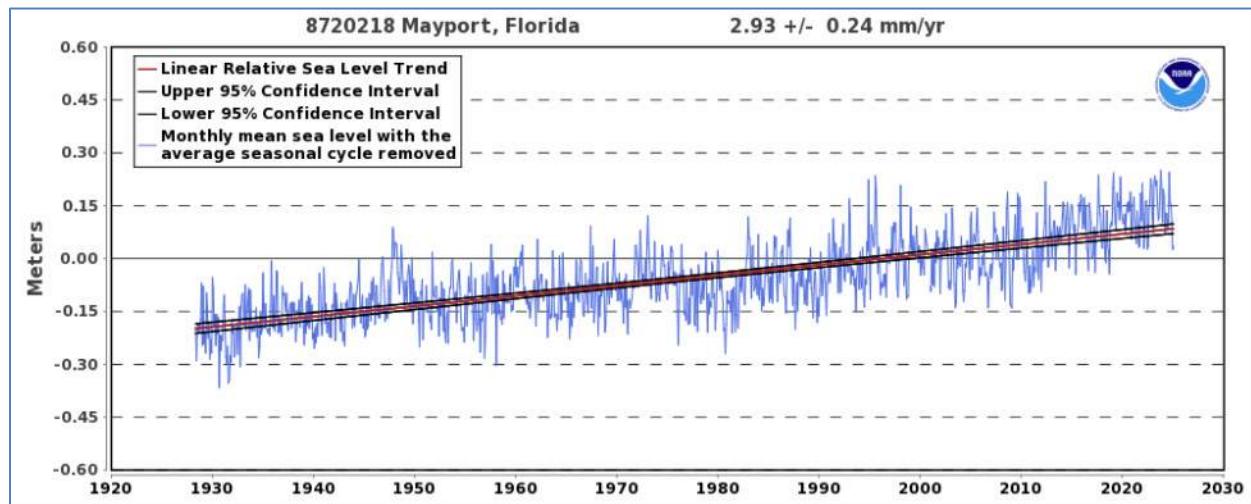


Figure 1-3 – Relative Sea Level Rise – Mayport Bar Pilot's Dock (NOAA)

Although the rate of SLR is uncertain, no uncertainty exists that the sea level is rising in the City of Atlantic Beach. As sea levels rise, incidents of nuisance flooding will increase and flooding due to severe weather events will affect larger areas of the City. To aid in planning and assessing the City's potential vulnerability under future scenarios with higher sea levels, the City conducted a rigorous technical analysis to determine what those effects may be and how they will impact residents and critical infrastructure.

#### 1.4 Scope of the Vulnerability Assessment

The vulnerability assessment focuses on providing a quantitative analysis of property, infrastructure and habitats within the City's municipal boundaries under future predicted sea level scenarios using widely accepted scientific analyses.

To complete the vulnerability assessment update and analyses required to make these predictions, the City selected Jones Edmunds, a consulting firm with many years of local knowledge and experience conducting similar analyses throughout the coastal areas of the southeast United States. Their task was to compile the topographical data, critical and regionally significant asset data, and flood scenario-related data to perform the Vulnerability Assessment as defined in Section 380.093, F.S. According to F.S. and FDEP guidance, the following are requirements for this task:

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- Include all critical assets (e.g. sewage lift stations, schools, evacuation routes, etc.) owned or maintained by the City of Atlantic Beach.
- Use the most recent publicly available digital elevation model (DEM).
- Ensure Geographic Information System (GIS) data adheres to FDEP's GIS Data Standards and data sources are defined in the associated metadata.
- Include the 2022 NOAA intermediate-low and intermediate SLR projections for 2050 and 2080.
- Ensure that storm-surge data is equal to or exceeds the 100-year return-period for a flood event.
- Identify data gaps where missing or low-quality information may limit the VA's extent or reduce the accuracy of the results and rectify any gaps as necessary.

The technical analyses that form the basis of the Vulnerability Assessment began with the current Federal Emergency Management Association (FEMA) Flood Insurance Rate Maps (FIRMs) as the baseline condition and used NOAA 2022 Intermediate-Low and Intermediate SLR scenarios for predicted 2050 and 2080 conditions as follows:

- Mean Higher High Water (MHHW) modeling to predict frequency of nuisance flooding
- Storm surge modeling to predict coastal flooding
- Stormwater modeling to predict upland rain induced flooding
- Composite coastal flooding and upland rain induced flood mapping to delineate future flood hazard areas
- Assessment of property, infrastructure and habitat impacted within flood zones of composite future flood mapping

MHHW is the higher of the two daily tides averaged over a 19-year tidal epoch. Section 2 summarizes the methodology and Sections 3 and 4 present the results of these analyses. Appendices A and B provide a more detailed description of the methodology.

## 2.0 Methodology

### 2.1 General Methodology

For this Vulnerability Assessment, the baseline is the existing MHHW level and the current FEMA FIRMs for the City. The MHHW level, which is the average of the higher of each of the two daily high tides, provides an indication of the frequency of sunny day flooding occurrences due to normal tidal cycles and does not include storm events.

The FIRMs for the City of Atlantic Beach provide a prediction of what the 100-year flood event water levels will be. Although FEMA does not consider SLR when developing a FIRM, they do conduct a rigorous analysis of storm-surge flooding and flooding due to upland inundation from rainfall. FIRMs are currently used to map properties regarding the 100-year flood event to set flood insurance premiums and to determine where stricter building and development standards apply for flood protection.

Given the common use of FIRMs for regulatory purposes and the general familiarity many people have with these maps, this Vulnerability Assessment uses the FEMA methodology to predict the extents of a 100-year flood event in the future considering the effects of SLR. The technical analyses that were the foundation for this Vulnerability Assessment resulted in producing maps of what the FIRM may look like in 25 and 55 years considering SLR. The analysis also incorporated the loss of soil storage that may result from rising sea levels and predicted future build-out conditions within the City boundaries.

Surge analyses were conducted for the Atlantic Ocean and the Intracoastal Waterway sides of the City using the same methodology FEMA used to develop the FIRMs for this area. As water depth increase with SLR, a corresponding increase in wave heights and wave runup occurs. Hence, the surge analyses was analyzed with future water level conditions and not just added to the predicted increased sea-level height.

Upland rainfall-induced flooding was analyzed using the Interconnected Pond Routing (ICPR) model developed for the City's 2018 Stormwater Master Plan Update for every drainage basin within the City. This was necessary given the flat topography of the City and the impacts of tide height on the performance of the drainage systems.

Both analyses used current conditions as a reference check and the intermediate-low and intermediate NOAA 2022 SLR projections. F.S. 380.093(3)(d)(3)(c) establishes planning horizons based on the year of assessment. COAB received FDEP approval to use 2050 and 2080 planning horizons for inundation analyses to develop future 100-year and 500-year storm event predictions. Table 2-1 summarizes the flood scenarios that were included in this assessment. Scenarios highlighted in orange denote the scenarios required by F.S. Flood stages were determined for each of these scenarios, and inundation extents/depths were mapped against the 2018 DEM.

**Table 2-1 - Matrix of Evaluated Flood Scenarios**

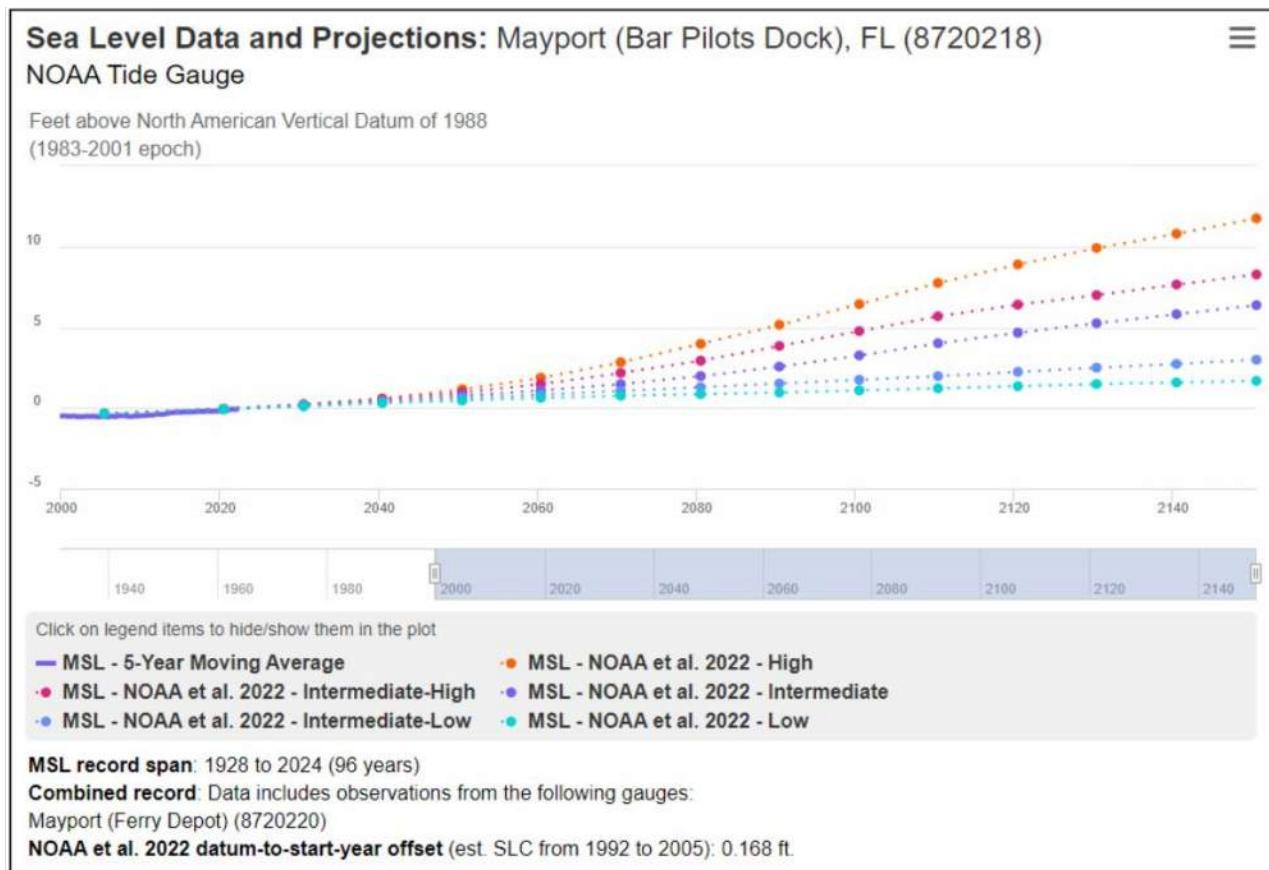
Flooding Type	Tidal Flood Days	MHHW +2 feet	100-Year	500-Year
<b>Tidal/Sunny-Day Flooding</b>				
Existing	X	X		
2050 Intermediate-Low	X	X		
2050 Intermediate	X	X		
2080 Intermediate-Low	X	X		
2080 Intermediate	X	X		
<b>Rainfall-Induced Flooding</b>				
Existing			X	X
2050 Intermediate-Low			X	X
2050 Intermediate			X	X
2080 Intermediate-Low			X	X
2080 Intermediate			X	X
<b>Storm-Surge Flooding</b>				
Existing			X	
2050 Intermediate-Low			X	
2050 Intermediate			X	
2080 Intermediate-Low			X	
2080 Intermediate			X	

## 2.2 Sea Level Rise Projections

The City of Atlantic Beach lies approximately 3 miles south of the Mayport NOAA SLR gauge. The next closest tide station is in Fernandina Beach. The mean sea level at the Mayport gauge exceeds the mean sea level at the Fernandina Beach gauge. Therefore, in accordance with Section 380.093(3)(d)(3)(d), F.S., this VA applies uses Mayport gauge only to the coastal and (ICW) portions of the City.

Section 380.093(3)(d)(2), F.S., requires that Vulnerability Assessments “make use of the best available information through the Florida Flood Hub”. The projections that were released by the Flood Hub at the time of this study did not include the 2080 planning horizon. Based on this, Jones Edmunds used the US Army Corps of Engineers (USACE) Sea Level Analysis Tool (SLAT) to obtain the NOAA 2022 SLR projections for the Mayport Tide station, which are slightly higher (approximately 0.1 foot) than the statewide projections. The NOAA 2022 SLR projections from the Mayport Tide station were used instead of the statewide calculations because they are slightly higher than the statewide values and the gauge is near the City. SLR projections for the intermediate-low and intermediate SLR elevations for 2050 and 2080 were calculated using the

NOAA 2022 SLR projection curves for the Mayport Tide station. SLR estimates at this gauge are presented graphically in Figure 2-1 and in tabular form in Table 2-2.



*Figure 2-1 – Comparison of Projected Sea Level Rise Data Sets at Mayport*

*Table 2-2 - Projected Future Mean Sea Levels - Mayport Bar Pilot's Dock (NAVD88)*

Planning Horizon	Projected SLR (feet)		MSL Elevation (feet-NAVD88)		
	Intermediate-Low	Intermediate	Existing	Intermediate-Low	Intermediate
Existing Conditions	N/A	N/A	2.5	N/A	N/A
2050	0.61	0.74	N/A	3.11	3.24
2080	1.27	1.96	N/A	3.77	4.46

For comparison, Figures 2-2 thru 2-4 present water elevations recorded during Hurricane Matthew in October 2016, Hurricane Irma in September 2017, and Tropical Storm Nicole in November 2022. The highest water level recorded during Hurricane Matthew was 5.23 feet

NAVD88, 5.58 feet NAVD88 during Hurricane Irma and 5.54 feet NAVD88 during Tropical Storm Nicole.

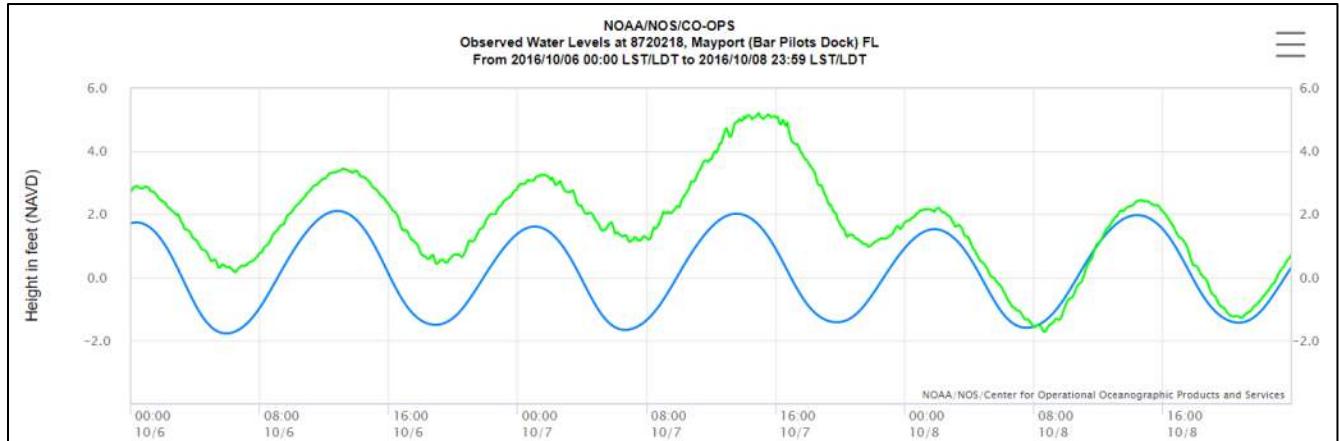


Figure 2-2 - Hurricane Matthew Water Levels - October 2016 at Mayport Bar Pilot's Dock

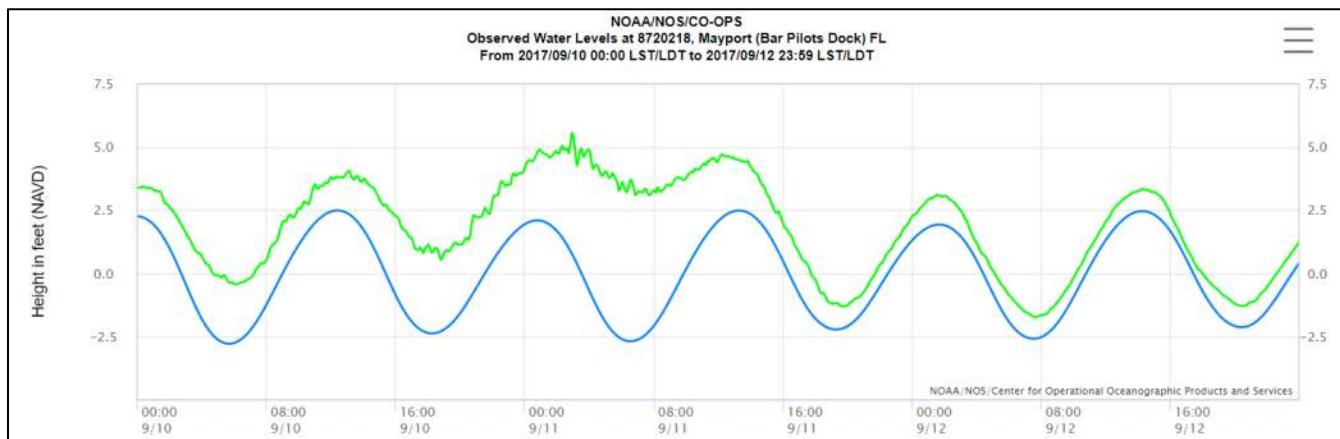
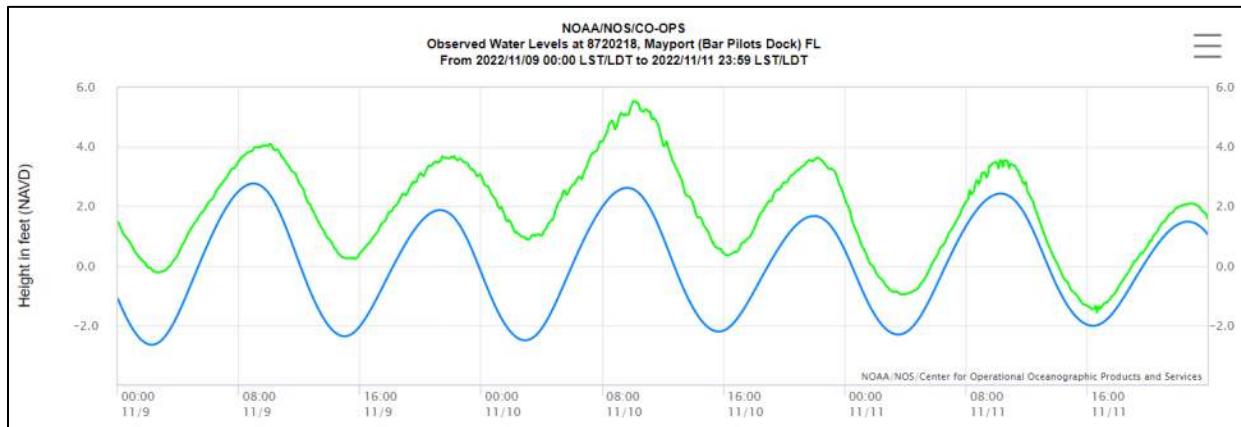


Figure 2-3 – Hurricane Irma Water Levels - September 2017 at Mayport Bar Pilot's Dock

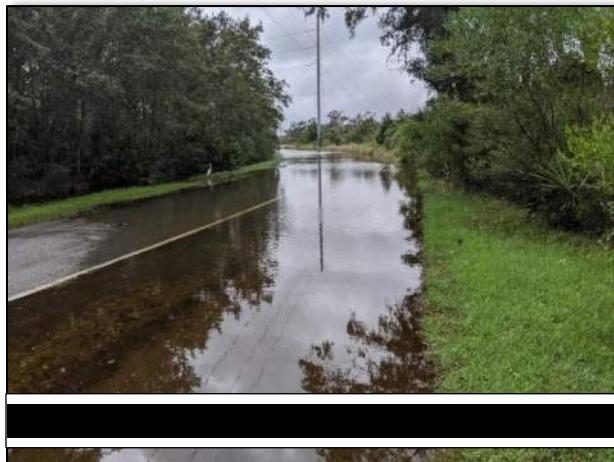


**Figure 2-4 – Tropical Storm Nicole Water Levels – November 2022 at Mayport Bar Pilot’s Dock**

## 2.3 Nuisance Flooding

Nuisance flooding, sometimes referred to as "sunny day" flooding, is flooding that leads to public inconveniences such as road closures. The City currently experiences a limited degree of nuisance flooding in several locations. As sea levels continue to rise, nuisance flooding will become more prevalent and extensive.

For this effort, nuisance flooding is considered to be occurring when the tide level is approximately one foot greater than the MHHW level at Mayport. This occurs at least once every year as can be seen in the statistical summary presented



that are at or below 3-feet elevation include the Dutton Island access road and portions of West Plaza, both areas that currently experience nuisance flooding. Given the 99 percent probability of water levels of at least 1-foot above the MHHW occurring annually basis as shown on Figure 2-5, nuisance flooding in portions of Atlantic Beach is expected to occur at least once every year at a minimum.

in Figure 2-6. This chart indicates a 99% probability of water levels exceeding MHHW by at least 1-foot (0.3 meter [m]) on an annually. Similarly, a 50 percent probability exists of tidal levels exceeding the MHHW by 1.5-feet (0.45 m) in any given year and a 10 percent probability exists of tidal levels exceeding MHHW by 2- feet (0.6 m) in any given year.

The current MHHW level in the City is at elevation 2-feet, and based on observations, nuisance flooding can start to occur when water levels exceed 3-feet. Areas of the City



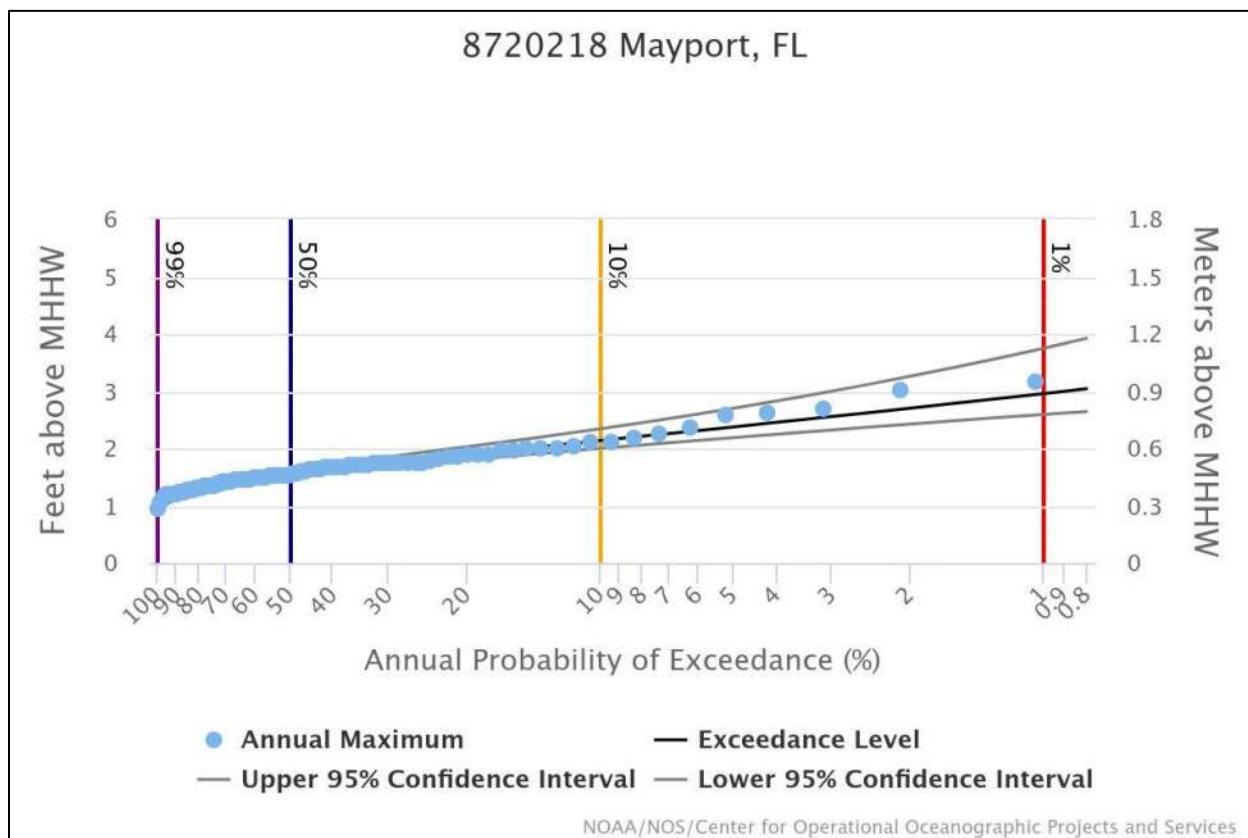


Figure 2-5 - Annual Exceedance Probability Curve - Mayport Bar Pilot's Dock (NOAA)

To estimate nuisance flooding in the future, NOAA's Digital Coast tools were used to overlay 1 foot of water level on top of the predicted future sea levels over the planning period. As updated DEMs become available, the City will undertake a more rigorous analysis of the future frequency and extent of nuisance flooding and will update the Vulnerability Assessment as necessary.

## 2.4 Future Flood Risk

As sea levels rise, an increase in flood risk will generally be experienced. This increased risk is not reflected in the current FEMA FIRMs for the City. Estimating the extent of future risk requires updating the FIRMs to account for impacts related to storm surge and rainfall induced flooding under higher sea level conditions. The following sections describe the methodology used to develop the information required to assess future flood risks for the City.

### 2.4.1 Storm Surge Modeling

Higher sea levels will result in increased storm surge levels and wave heights and will exacerbate nuisance flooding from extreme high tides. The combination of a higher sea level with a storm surge can result in larger storm impacts and coastal vulnerability from a flooding perspective than are currently experienced.

FIRMs are updated on a regular basis (typically every 10 years) and FEMA only considers the existing mean sea level at the time of the update and does not account for SLR. For the Vulnerability Assessment, an analysis based on the FEMA flood mapping protocol was conducted to evaluate coastal flooding and wave risks under projected SLR scenarios for 25, 50 and 100 years.

The storm surge inundation modeling was conducted by ATM using the effective 2018 FEMA Flood Insurance Study (FIS) for Duval County and site-specific modeling using FEMA's Coastal Hazard Analysis and Mapping Program (CHAMP) Version 2.0 model suite, including the FEMA Wave Height Analysis for Flood Insurance Studies (WHAFIS) overland wave propagation model. The site-specific modeling was developed by Geosyntec for the City's VA that was updated in 2021. The future conditions modeling that was completed in 2021 used NOAA 2017 intermediate-high SLR projections to project surge flooding for the 100-year event. For this VA, ATM updated the site-specific model using the NOAA 2022 intermediate-low and intermediate SLR projections for the 2050 and 2080 planning horizons.

The storm-surge modeling utilized existing FEMA stillwater elevation (SWEL) results (waves are not included) for a 100-year event and increased the elevations to account for the projected increase in sea levels in the future. The next step required updating wave transect modeling on top of the increased SWEL elevations to predict 100-year base flood elevations under future higher sea levels. Figure 2-6 depicts a typical FIRM cross-section and the concept of SWEL and wave setup on top of the SWEL. Appendix A contains a detailed description of this approach used in the 2019 Vulnerability Assessment, the 2021 revision and this update .

Wave modeling is very sensitive to water depth, and increased future sea levels will allow larger waves to travel further inland during storms because there is more area inundated with higher future SWEL, as illustrated in Figure 2-7. The result of these analyses were FIRM type flood maps for future higher sea level scenarios.

Table 2-3 summarizes the range of storm-surge flood elevations across the City for each of storm-surge flooding scenarios.

**Table 2-3 - Summary of Surge Elevation Ranges**

Flood Scenario	Surge Elevation Range (feet NAVD88)
100-Year, Existing Conditions	5.2 to 25.3
100-Year, 2050 Intermediate-Low	5.8 to 25.9
100-Year, 2050 Intermediate	5.9 to 26.0
100-Year, 2080 Intermediate-Low	6.4 to 26.5
100-Year, 2080 Intermediate	7.1 to 27.2

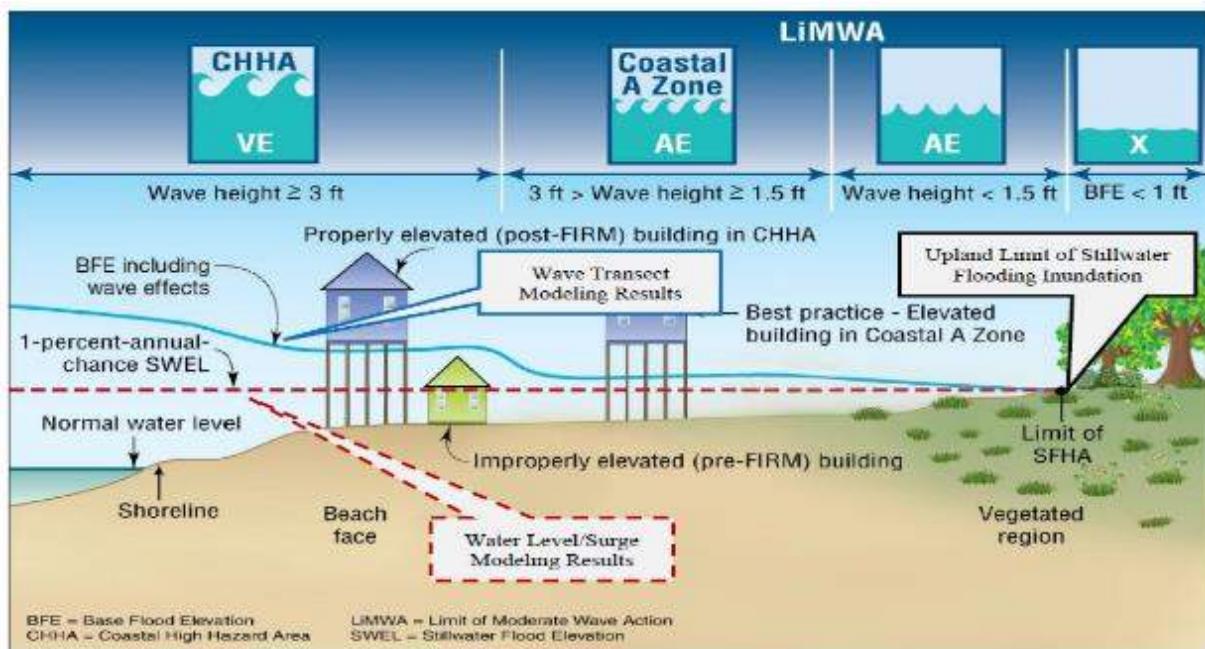


Figure 2-6 – Illustration of a Coastal Wave Transect

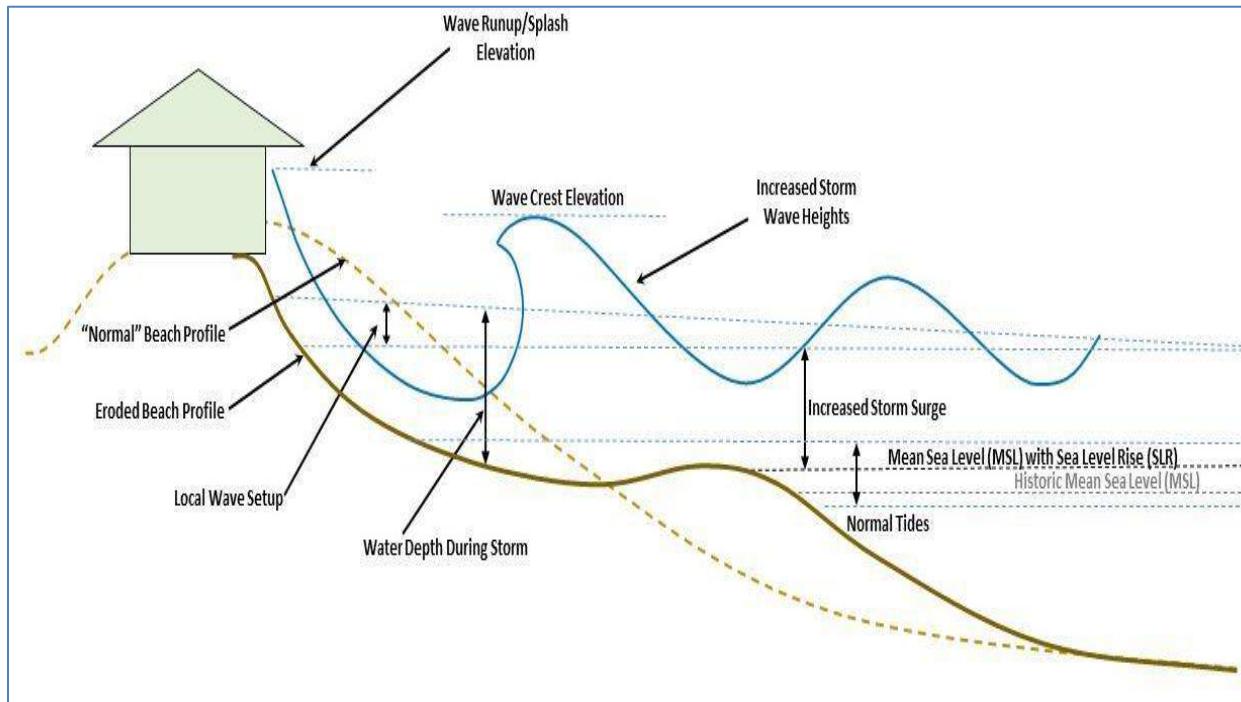


Figure 2-7 – Illustration of Coastal Effects of Sea Level Rise

#### 2.4.2 Stormwater Inundation Modeling

To determine how rainfall-induced flooding may be impacted by SLR and new development within the City, the hydrologic and hydraulic parameters in the ICPR Version 4 (ICPR4) models that were developed during the City's 2018 Stormwater Master Plan update were adjusted to reflect projected increases in impervious area from future development, increased boundary conditions and node initial conditions from rising sea levels, and reduced soil storage from rising sea levels.

The rates of future development that were developed for the City's 2018 Stormwater Master Plan update were used to estimate the impervious area in the City in 2050 and 2080. The estimated future impervious values were applied to the already modeled stormwater drainage basins so that modeled runoff accurately reflects future conditions. Figure 2-8 shows the areas updated for future increases in impervious area for the 2050 and 2080 conditions.



Figure 2-8 – Future Conditions Impervious Update Area (2018 Stormwater Master Plan Update)

The ground water table is also expected to rise with rising sea levels because of consistently higher tides. This increase in ground water levels will reduce the amount of soil storage available

for rainfall to infiltrate and will increase the volume of runoff during storm events. The decrease in soil storage will be more marked in areas directly adjacent to the coastline and will be reduced farther inland. To account for these projected changes, the basin criteria in the stormwater model were adjusted to decrease soil storage capacity in conjunction with expected future sea level elevations.

To model and map rainfall-induced flooding, Jones Edmunds collected NOAA Atlas 14 rainfall data, future conditions rainfall-change factors, and the City of Atlantic Beach's existing rainfall-induced flooding model. Peak stage results from the future drainage conditions models were used to map the predicted rainfall-induced flood risk in the City in 2050 and 2080 for a series of 24-hour rain events including the 100- and 500-year return period rainfall events. Table 2-4 summarizes the rainfall depths for each of the storm events. The City's model uses the Florida Modified Type II Rainfall Distribution for this VA.

**Table 2-4 - Existing Conditions Rainfall Depths**

Storm Event	Rainfall Depth Range (inches)
100-Year/24-hour	12.6
500-Year/24-hour	17.3

To model future conditions rainfall-induced flooding, Jones Edmunds collected rainfall change factors from the Florida International University (FIU) Sea-Level Solutions Center based on the Coordinated Regional Climate Downscaling Experiment (CORDEX) model, which is consistent with the change factors used by the Northeast Florida Regional Planning Council to conduct their regional Vulnerability Assessment. Table 2-5 shows the change factors that were used from the FIU website and the resulting rainfall depth ranges for the required 2050 and 2080 planning horizons.

**Table 2-5 - Rainfall Change Factors and Future Conditions Rainfall Depths**

Storm Event	2050 Change Factor	2080 Change Factor	2050 Rainfall Depth Range (inches)	2080 Rainfall Depth Range (inches)
100-Year/24-hour	1.27	1.36	16.0	17.1
500-Year/24-hour	1.29	1.39	22.3	24.1

The rainfall-induced flood model was developed by the City of Atlantic Beach and Jones Edmunds in 2018 using the modeling software ICPR4. The results were then mapped using the 5-foot-by-5-foot DEM generated from the 2007 City of Jacksonville Light Detection and Ranging (LiDAR) data. Section 380.093, F.S., required this VA to be performed using the most recent LiDAR dataset. Jones Edmunds compared the DEMs from the 2007 and 2018 LiDAR datasets to

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determine if differences between the two would invalidate parts of the model. The differences in the datasets were generally less than 0.5 foot. Areas where differences were greater were confined to new developments that occurred between LiDAR flights. Minimal new developments that were not already accounted for in the City's model have occurred, and none of the new developments have a significant impact on the rainfall-induced flood modeling. The models will be updated if necessary when newer data are available. Appendix B provides a detailed description of this modeling approach from the 2019 VA.

#### **2.4.3 Combined Inundation**

The future storm surge flood risk maps were then combined with the rainfall induced inundation maps for the 100-year return period storm for 2050 and 2080. Appendix C provides these maps. Where there was overlap between the flood risk mapping, the higher inundation estimate from the two mapping efforts was selected. These maps provide for a spatial estimate of future flood risk that will serve as the basis for the Vulnerability Assessment.

Rainfall-induced and coastal storm-surge flood risks are usually evaluated relatively independently because the two forms of flood risk are not fully dependent nor fully independent. Therefore, traditional statistical approaches are not applicable and the standard procedure to deal with this is to evaluate the two independently using common SLR scenarios and then take the higher of the combined identified risk at each location.

## 3.0 Exposure Analysis

### 3.1 Projected Extents of Nuisance Flooding

Figures 3-1 through 3-5 depict nuisance, or sunny day, flooding that the City may experience based on expected SLR. The mapped extent of projected nuisance flooding is based on the annual probability of experiencing tide levels of at least 2feet greater than the MHHW.

Future nuisance flooding is predicted to increase substantially on the western side of the City adjacent to the Intracoastal Waterway and along Sherman Creek and the Aquatic Gardens neighborhood. Nuisance flooding seaward of the mapped extents are expected to be more frequent than an annual event.

### 3.2 Projected 100-Year Event Storm Surge

Figures 3-6 through 3-10 illustrate the projected extent of the storm surge expected from a 100-year storm event in Atlantic Beach in 2050 and 2080. Flood depth rasters were developed for each of the scenarios using the storm-surge flood elevations presented in Section 2.4.1 and the 2018 LiDAR DEM.

### 3.3 Projected Rainfall Induced Flooding

Figures 3-11 through 3-20 illustrate the projected rainfall induced flooding from a 100-year storm in Atlantic Beach for 2050 and 2080. These maps reflect future conditions with increased impervious surface from development. Stormwater infrastructure performance is also compromised and the water table is elevated due to SLR projections. This map is combined with the projected previous storm surge maps to create the projected 100 Year Future Flood Zones used in the Vulnerability Assessment

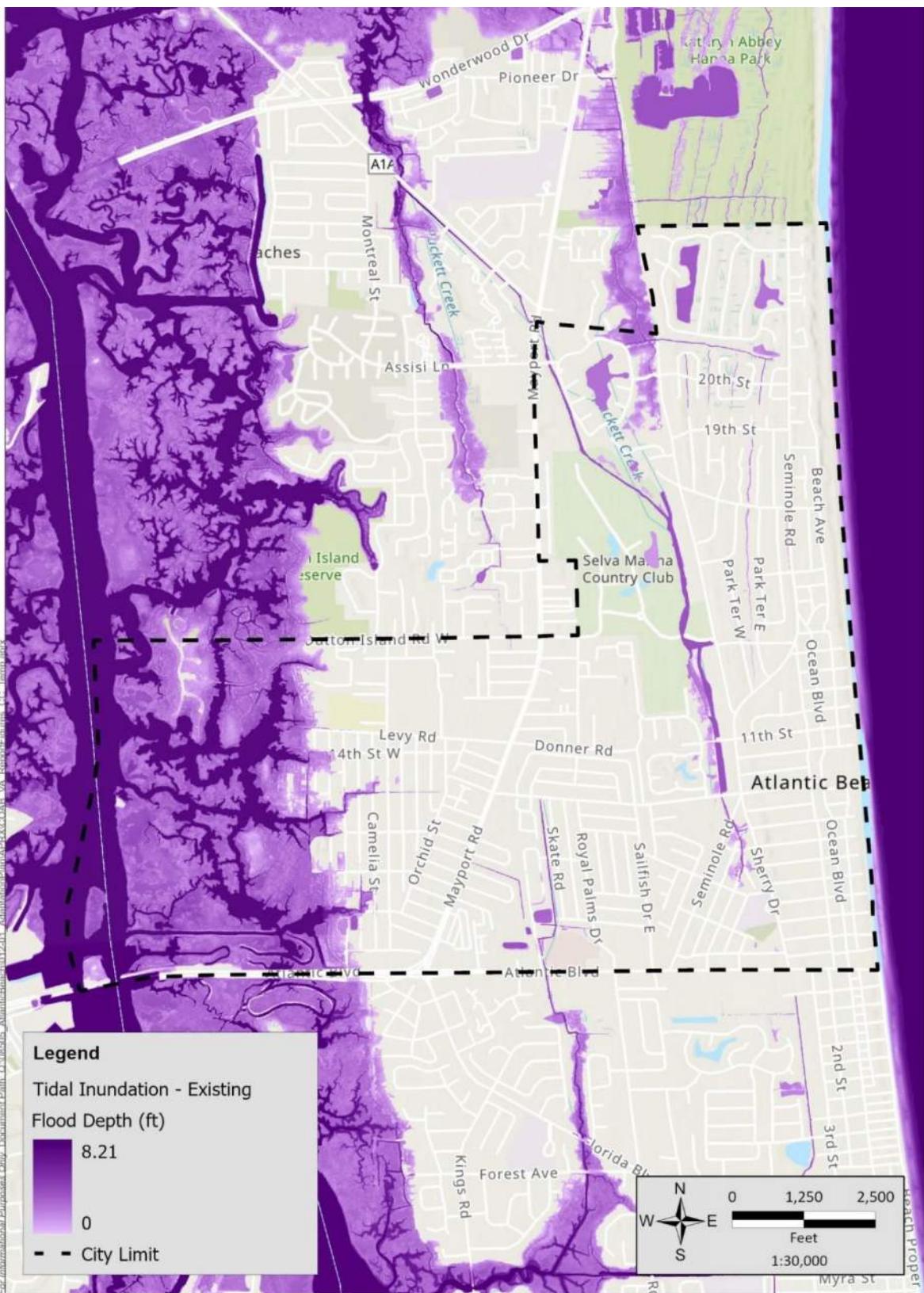


Figure 3-1 – High-Tide Nuisance Flooding Depth Under Existing Conditions (2025)



Figure 3-2 High-Tide Nuisance Flooding Under 2050 Intermediate-Low SLR Conditions (2025)

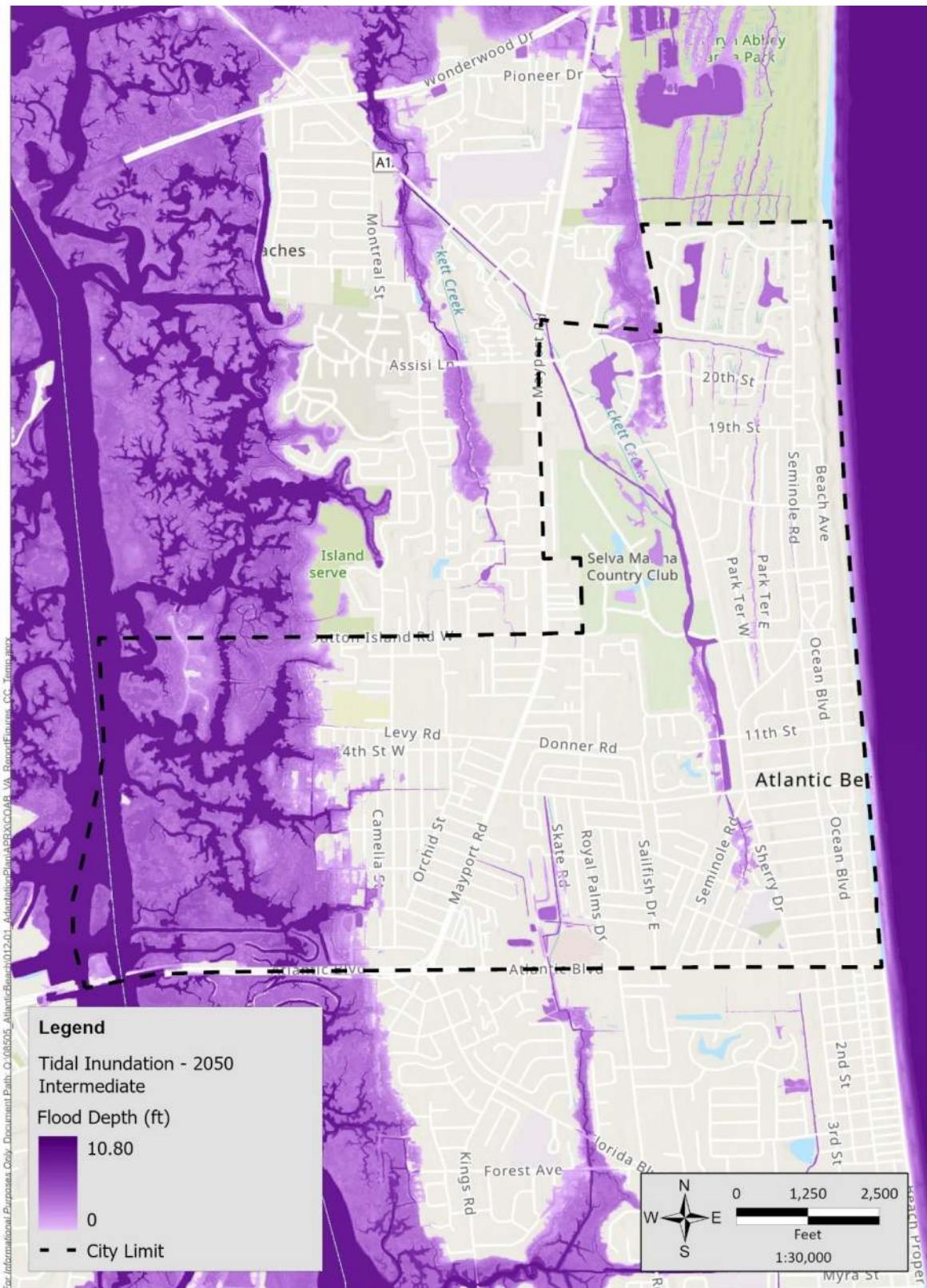


Figure 3-3 – High-Tide Nuisance Flooding Under 2050 Intermediate SLR Conditions (2025)



Figure 3-4 – High-Tide Nuisance Flooding Under 2080 Intermediate-Low SLR Conditions (2025)



**Figure 3-5 – High-Tide Nuisance Flooding Under 2080 Intermediate SLR Conditions (2025)**



Figure 3-6 – 100-Year Storm Surge Flooding Depth Under Existing Conditions (2025)



Figure 3-7 – 100-Year Storm-Surge Flooding Under 2050 Intermediate-Low SLR Conditions (2025)



Figure 3-8 – 100-Year Storm-Surge Flooding Under 2050 Intermediate SLR Conditions (2025)

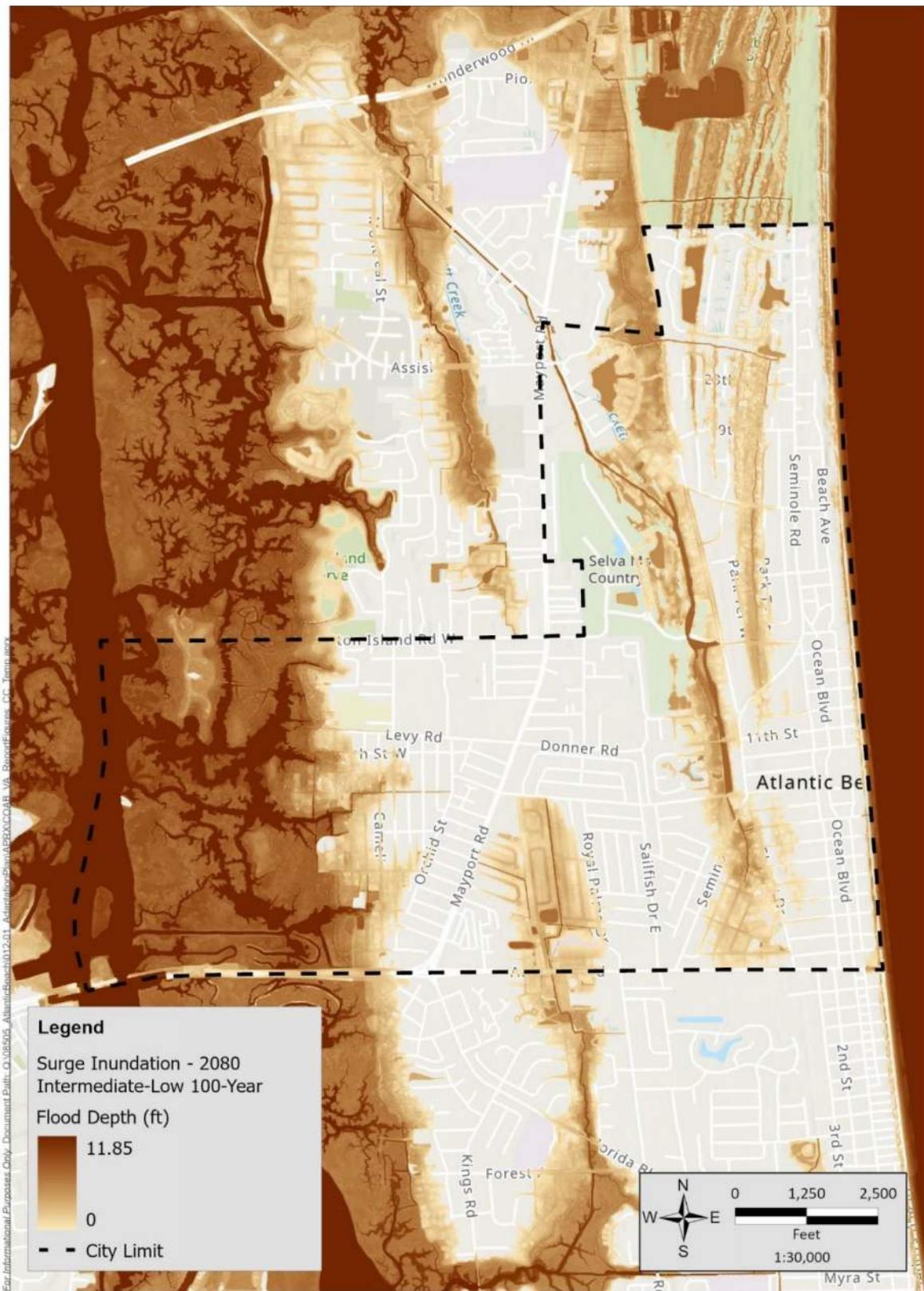


Figure 3-9 – 100-Year Storm-Surge Flooding Under 2080 Intermediate-Low SLR Conditions (2025)

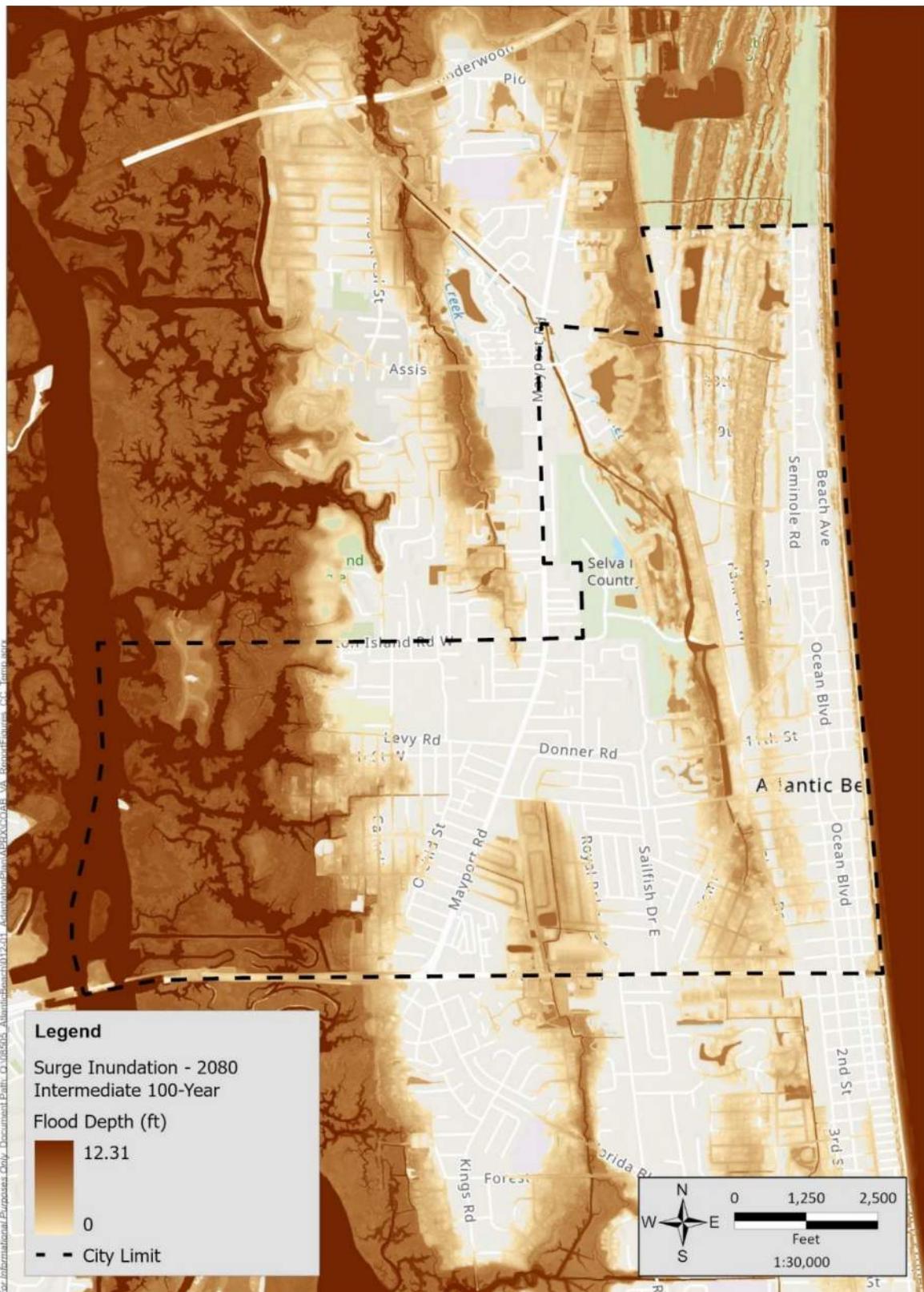


Figure 3-10 – 100-Year Storm-Surge Flooding Under 2080 Intermediate SLR Conditions (2025)

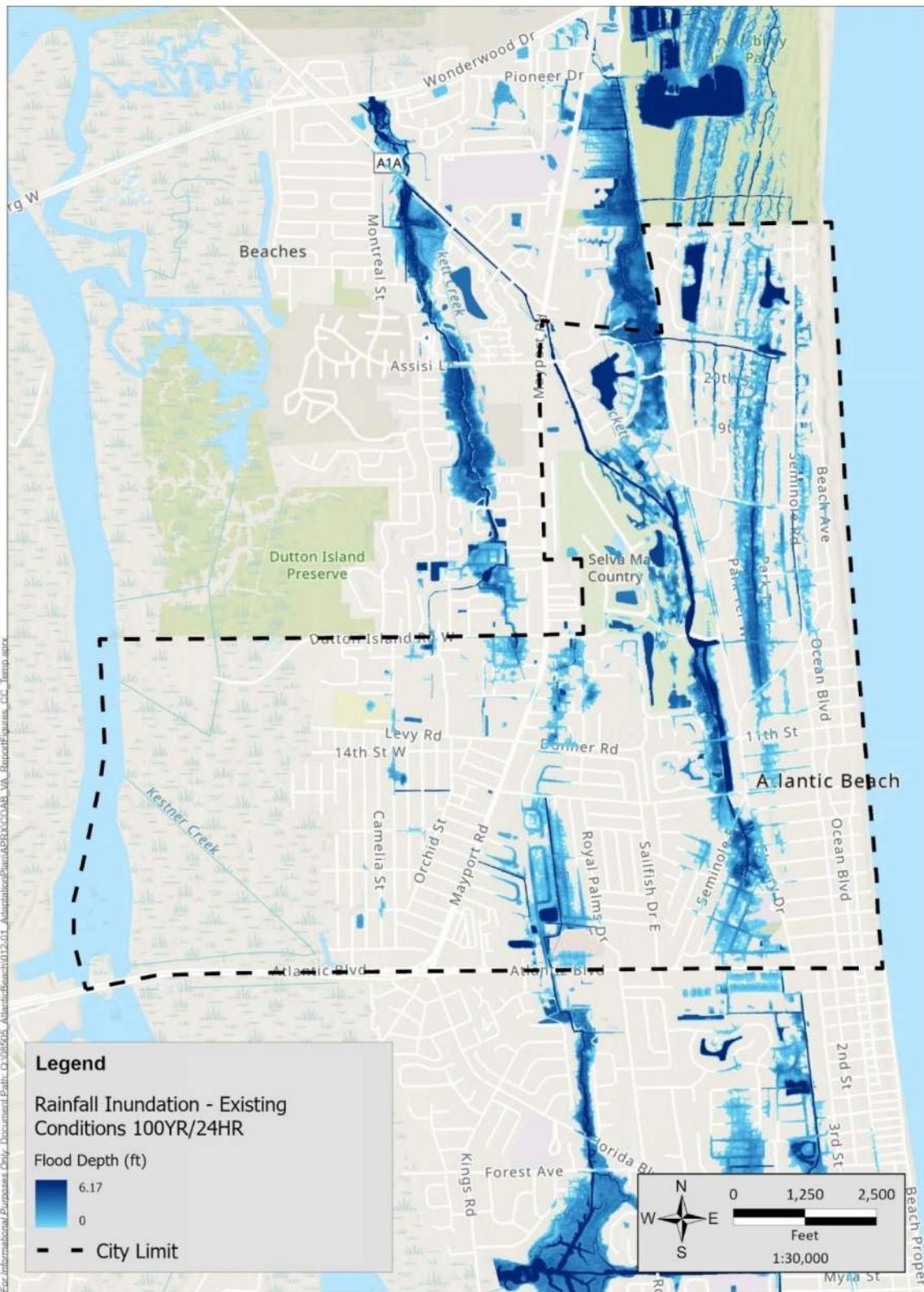


Figure 3-11 – Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event Under Existing Conditions (2025)

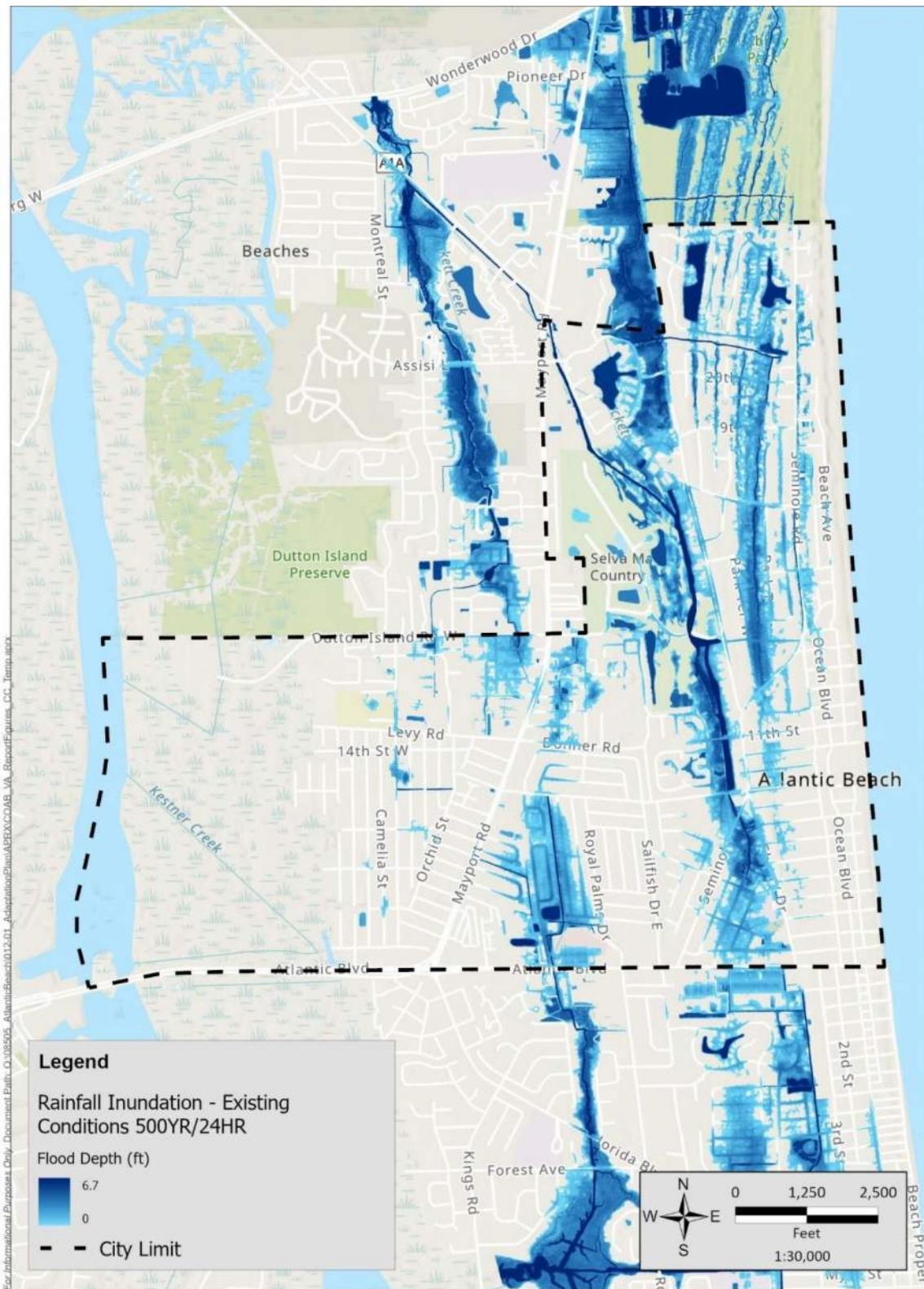


Figure 3-12 – Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event Under Existing Conditions (2025)

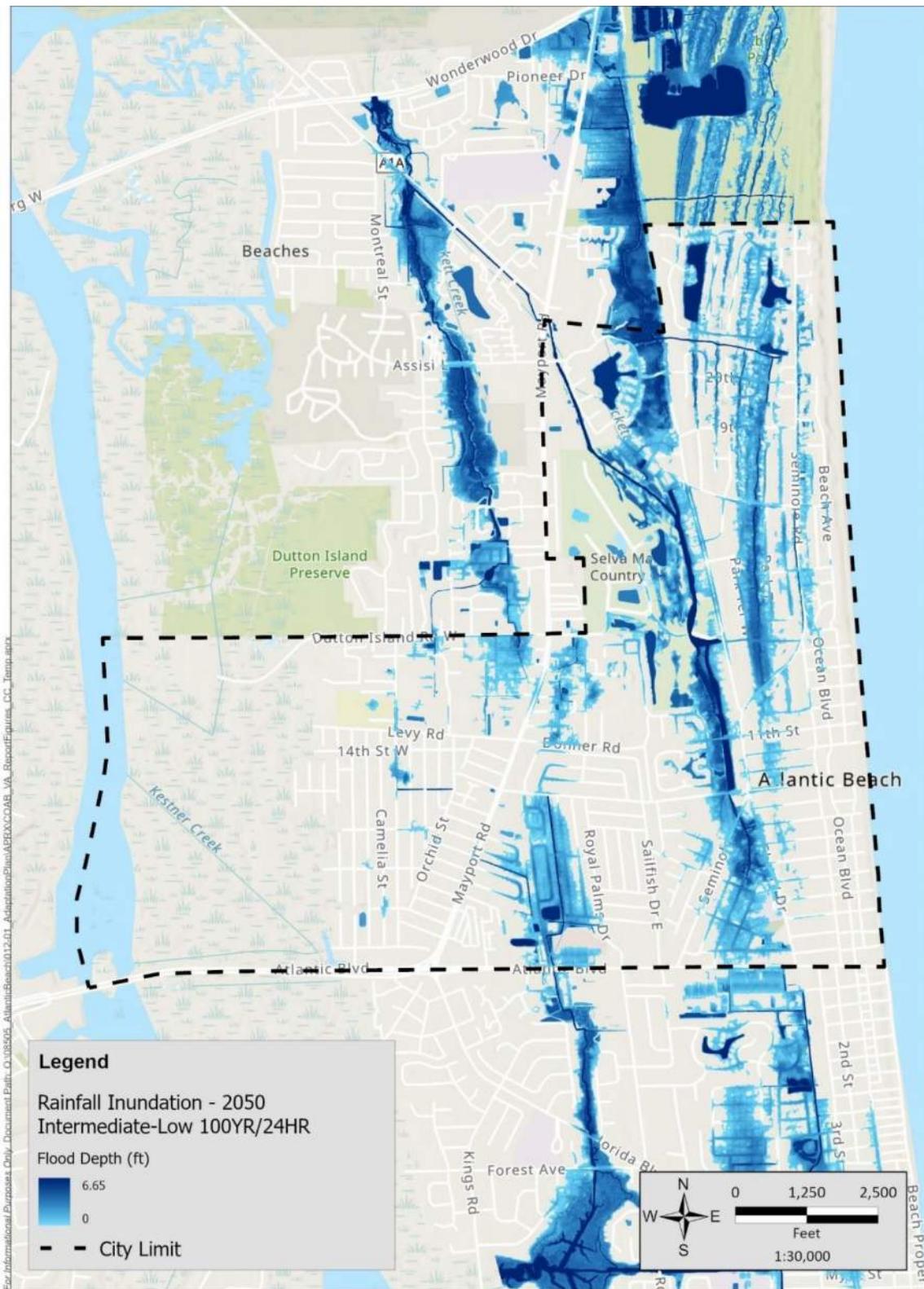
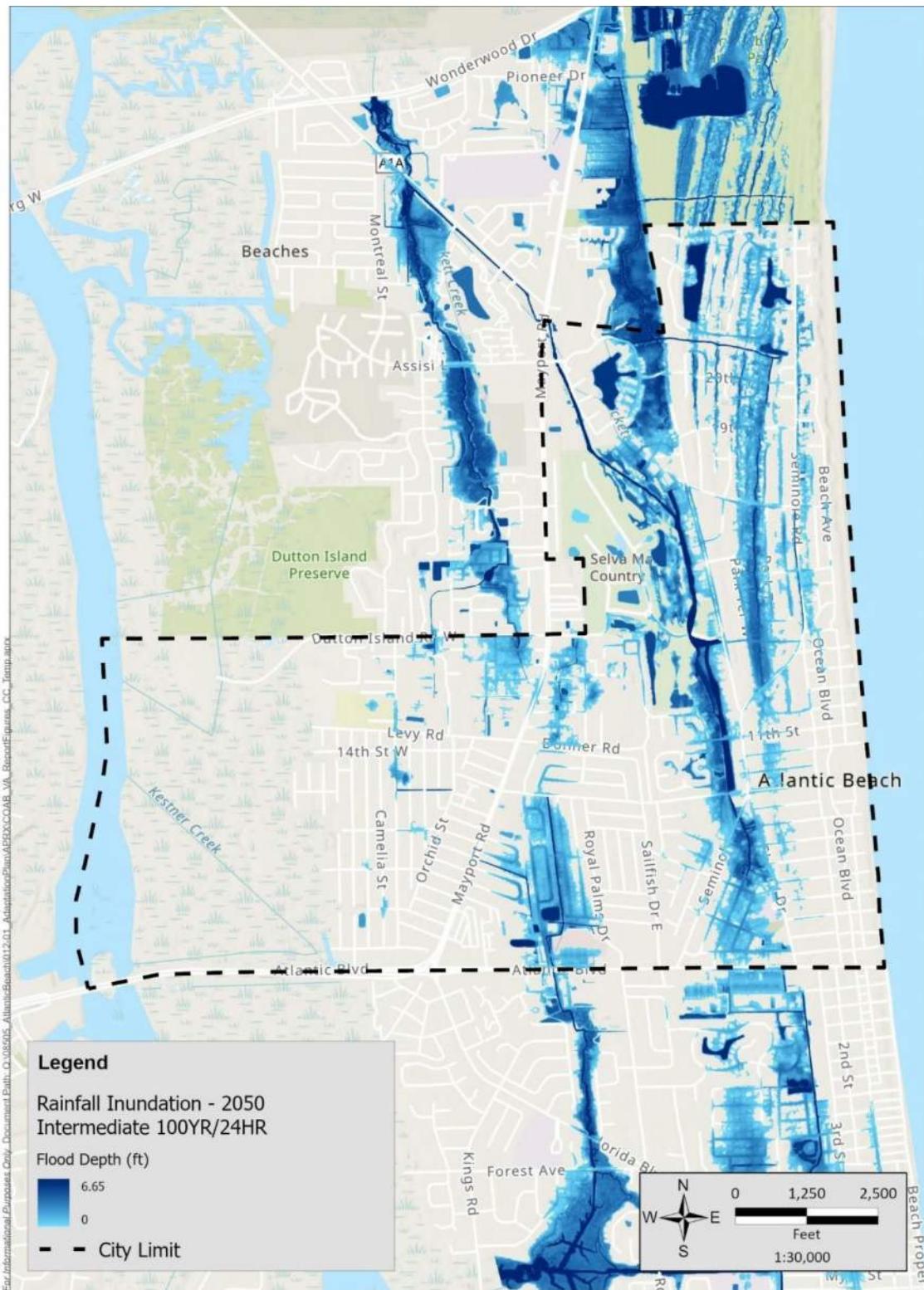


Figure 3-13 – Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event Under 2050 Intermediate-Low SLR Conditions (2025)



**Figure 3-14 – Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event Under 2050 Intermediate SLR Conditions (2025)**

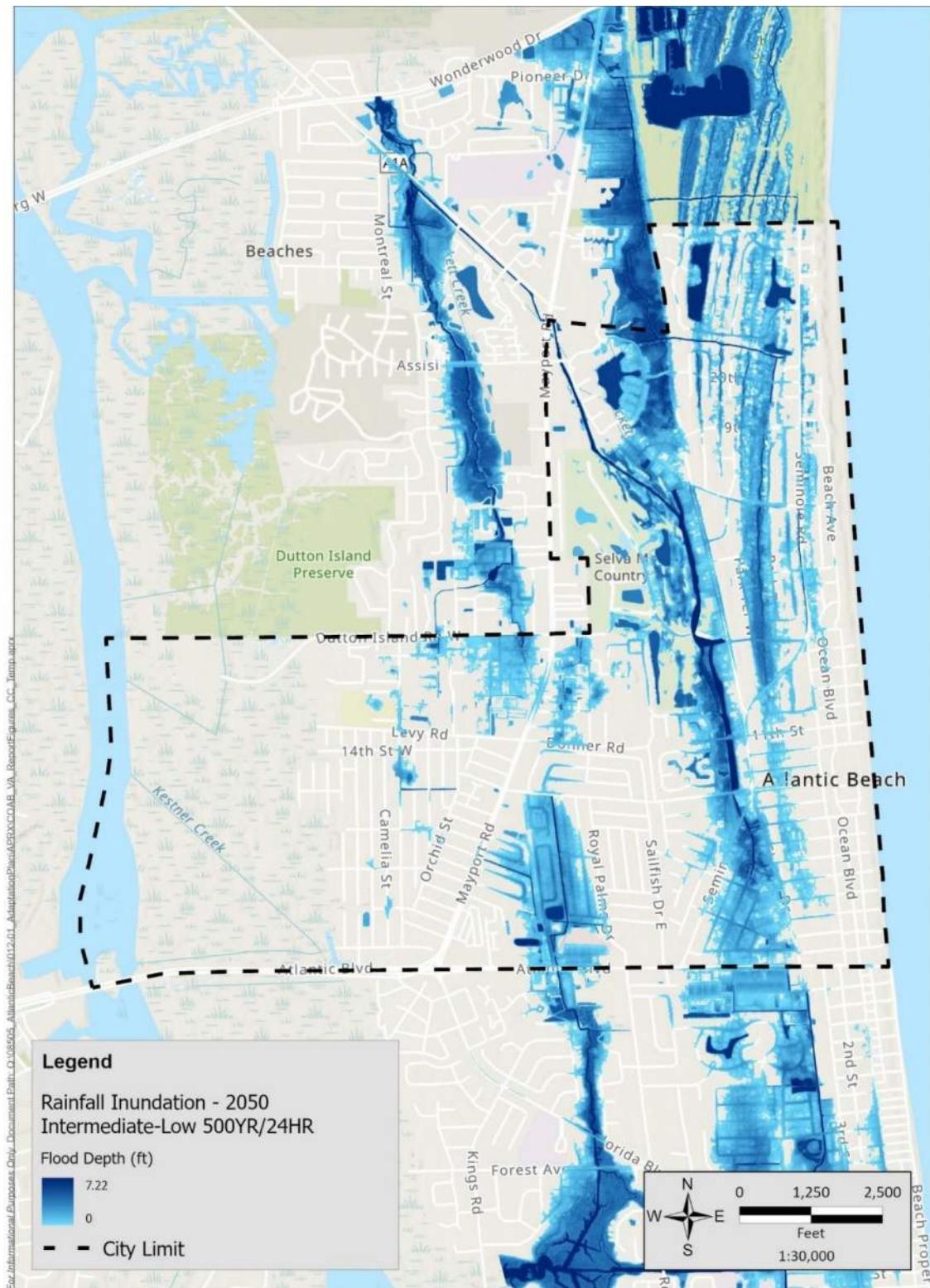


Figure 3-15 – Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event Under 2050 Intermediate-Low SLR Conditions (2025)

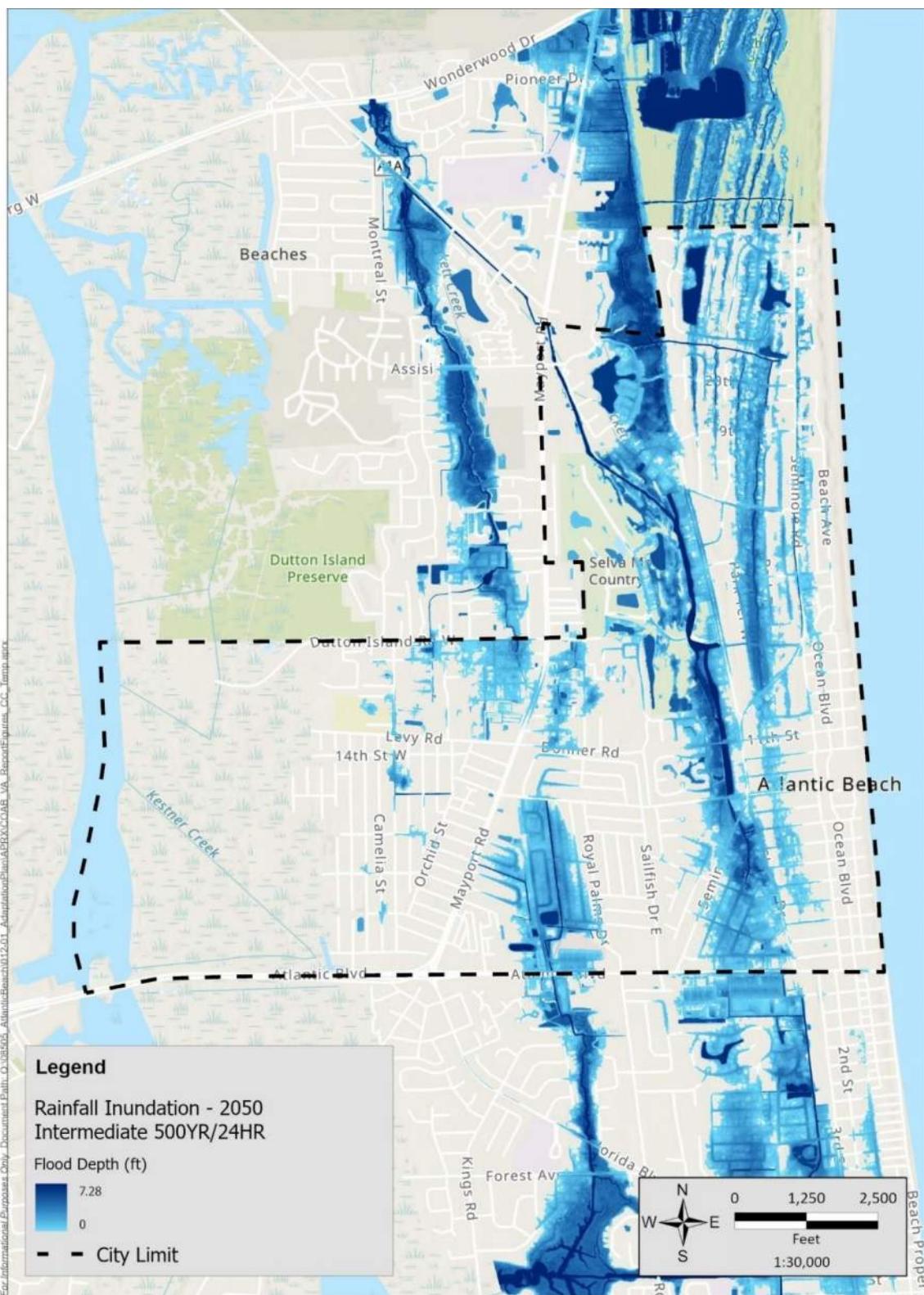


Figure 3-16 – Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event Under 2050 Intermediate SLR Conditions (2025)

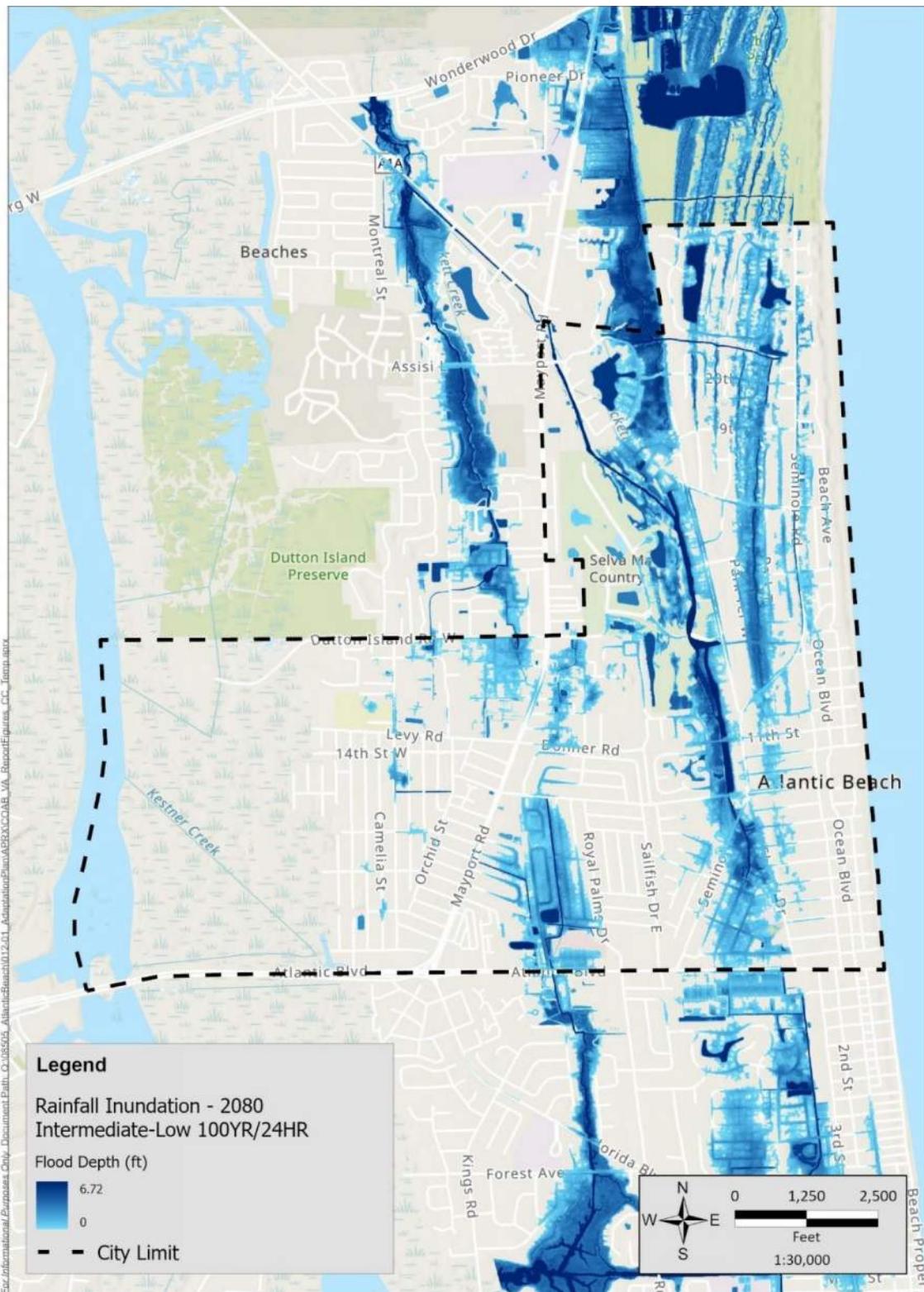


Figure 3-17 – Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event Under 2080 Intermediate-Low SLR Conditions (2025)

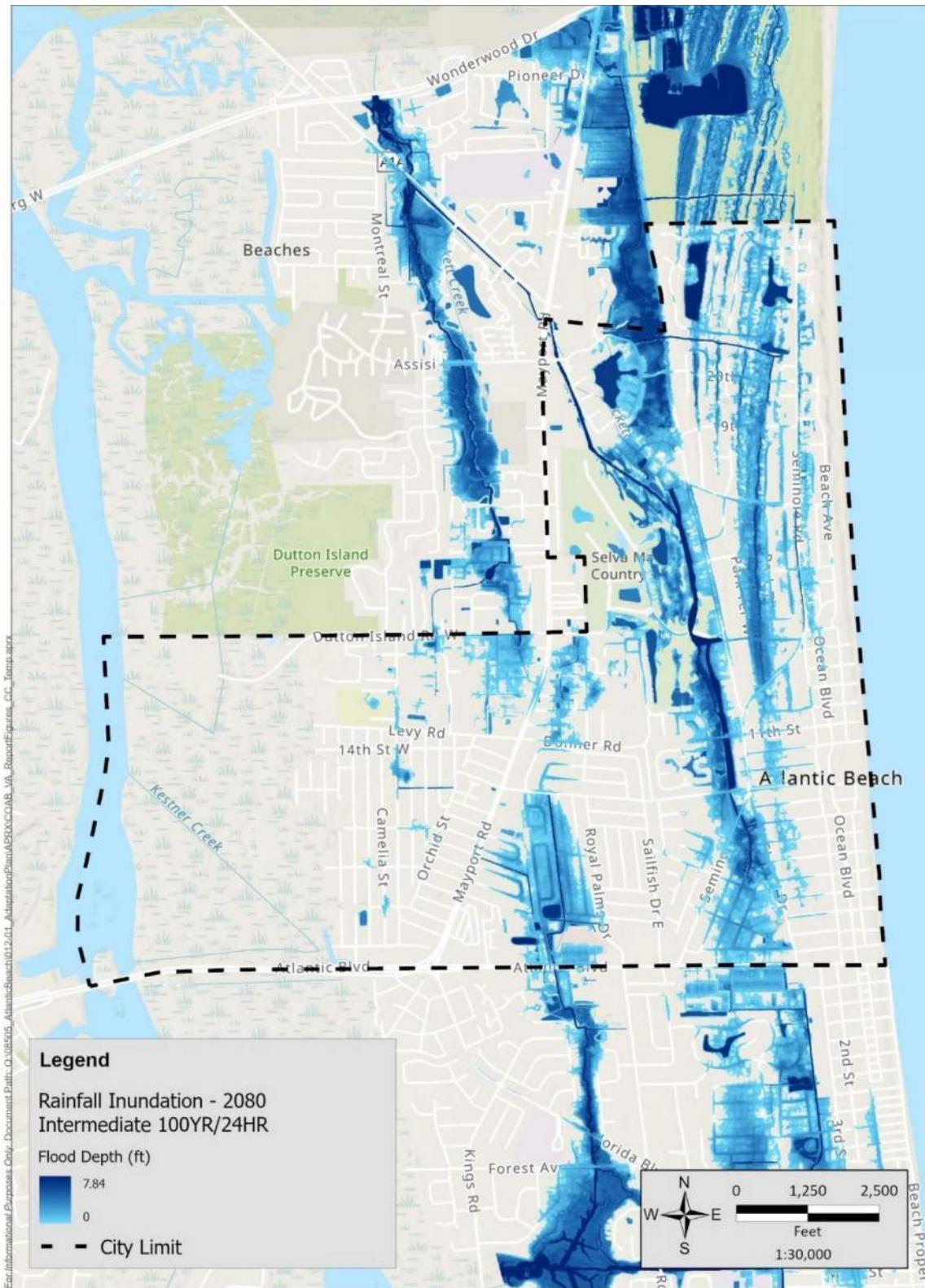
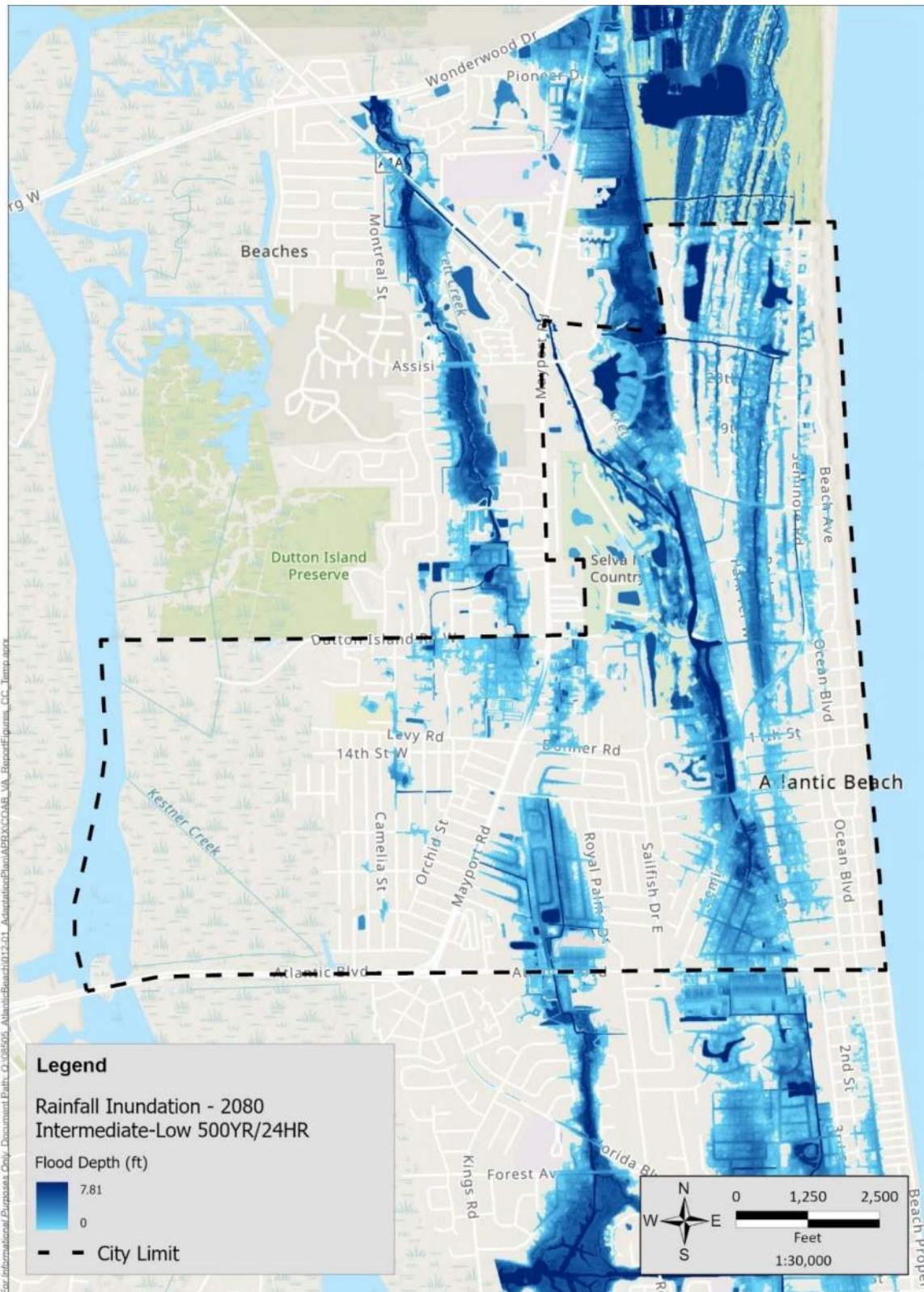


Figure 3-18 – Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event Under 2080 Intermediate SLR Conditions (2025)



**Figure 3-19 – Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event Under 2080 Intermediate-Low SLR Conditions (2025)**

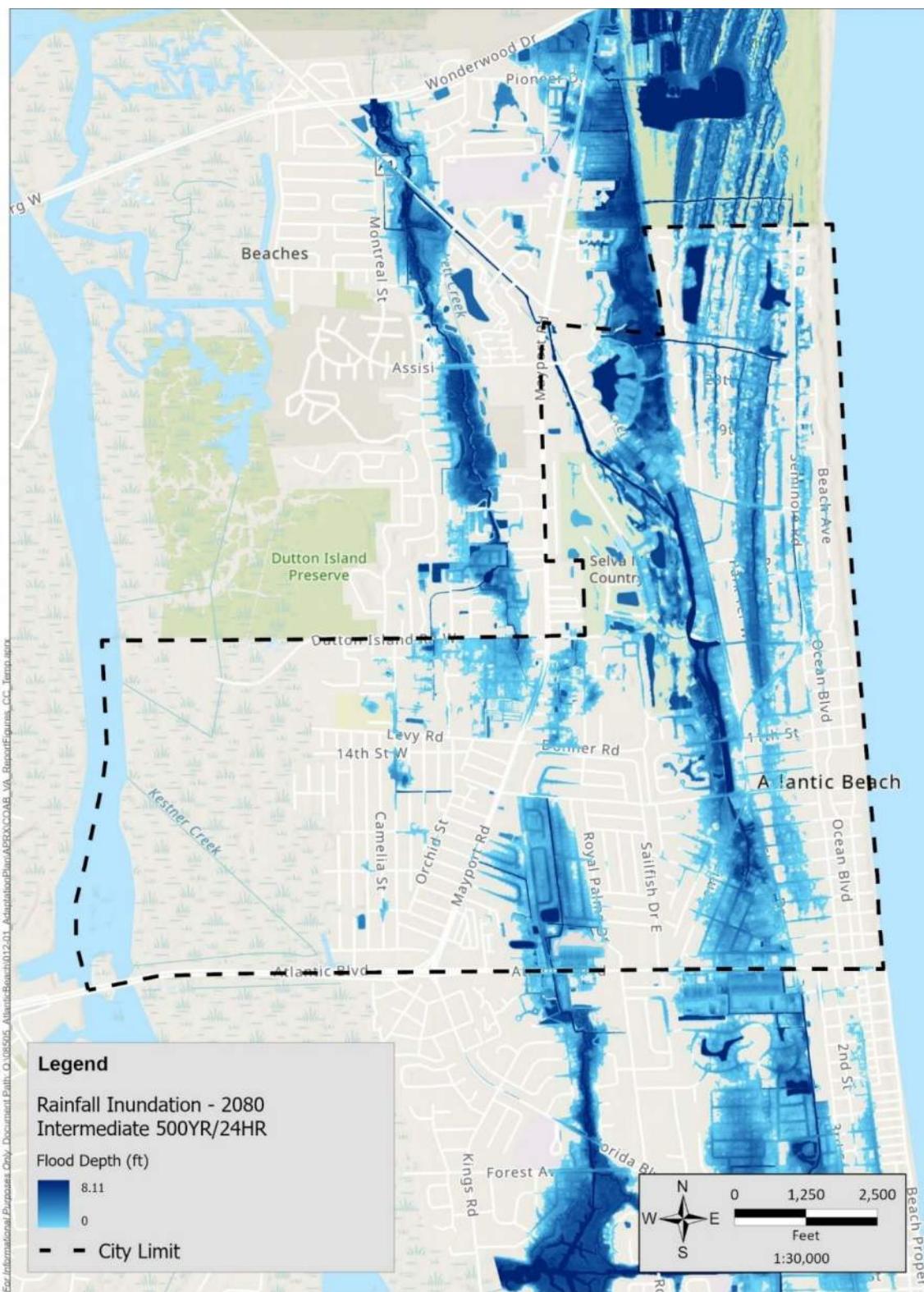


Figure 3-20 – Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event Under 2080 Intermediate SLR Conditions (2025)

## 4.0 Sensitivity Analysis

### 4.1 Properties and Buildings

Based on the projected impacts of SLR, there will likely be additional properties in the future will likely be subject to both nuisance flooding and located within a Special Flood Hazard Area (SFHA), which is the area inundated by flood waters from a 100-year storm event). Table 4-1 illustrates the total value of land and buildings impacted by nuisance flooding and storm surge for 2050 and 2080. For the 100-year flood risk assessment, parcels were only counted if water was projected to reach their center. Counting every parcel touched would have included beach front parcels, which are actually at higher elevations and typically have higher assessed values. All values are provided in 2025 dollars.

*Table 4-1 - Vulnerability of Property*

2050 Intermediate-Low Scenarios	Number of Parcels Impacted (% of All Parcels)	Number of Buildings on Impacted Parcels	Land Value of Impacted Parcels	Building Value of Impacted Parcels	Taxable Value of Impacted Parcels
Nuisance Flooding	625 (10%)	738	\$290,351,970	\$269,609,632	\$282,169,878
Storm Surge	701 (11%)	803	\$234,070,885	\$224,527,108	\$230,900,463

2050 Intermediate Scenarios	Number of Parcels Impacted (% of All Parcels)	Number of Buildings on Impacted Parcels	Land Value of Impacted Parcels	Building Value of Impacted Parcels	Taxable Value of Impacted Parcels
Nuisance Flooding	779 (12%)	667	\$303,272,940	\$280,466,531	\$293,224,628
Storm Surge	776 (12%)	887	\$255,644,673	\$241,941,745	\$248,670,883

2080 Intermediate-Low Scenarios	Number of Parcels Impacted (% of All Parcels)	Number of Buildings on Impacted Parcels	Land Value of Impacted Parcels	Building Value of Impacted Parcels	Taxable Value of Impacted Parcels
Nuisance Flooding	842 (13%)	947	\$360,909,500	\$326,838,789	\$340,582,741
Storm Surge	1,291 (21%)	1,200	\$420,541,921	\$356,443,699	\$365,651,140

2080 Intermediate Scenarios	Number of Parcels Impacted (% of All Parcels)	Number of Buildings on Impacted Parcels	Land Value of Impacted Parcels	Building Value of Impacted Parcels	Taxable Value of Impacted Parcels
Nuisance Flooding	1,276 (20%)	1167	\$489,165,039	\$424,150,388	\$439,807,776
Storm Surge	1,736 (27%)	1,833	\$707,341,778	\$589,529,782	\$605,611,756

Nuisance flooding totals are important because they reflect what is likely to happen at least annually. By 2080, nuisance flooding is predicted to impact 13 percent to 20 percent of properties in Atlantic Beach totaling more than \$439,807,776 in taxable value. In 2080, 21 percent to 27 percent of properties will be impacted by storm surge totaling up to \$605,611,756 in taxable value.

Existing development standards will help mitigate the impacts from SLR on property up to a certain point. These standards relate to the required minimum finished floor elevation (FFE) for all new construction that creates a buffer between flood water and living areas. The City currently requires a minimum FFE of 8.5 feet above mean sea level or 2.5 feet above the 100- year flood elevation or base flood elevation (BFE) in accordance with Chapter 24, Section 24-90(c)(1) of the Land Development Code. However, the buffer provided by FFE standards that currently apply to properties located in an SFHA will be reduced in the future as sea levels rise. Note that many structures currently located in an SFHA were built before these standards were required and will experience higher risk unless they are elevated.

## 4.2 Critical Facilities

### 4.2.1 Critical Facilities Inventory

The list of 39 critical asset types that are required to be included in Vulnerability Assessments is defined in Section 380.093, F.S. The asset types are broken into four asset classes:

- Transportation and Evacuation Routes – airports, bridges, bus terminals, ports, major roadways, marinas, rail facilities, and railroad bridges
- Critical Infrastructure – wastewater treatment facilities and lift stations, stormwater treatment facilities and pump stations, drinking water facilities, water utility conveyance systems, electric production and supply facilities, solid and hazardous waste facilities, military installations, communication facilities, and disaster debris management sites
- Critical Community and Emergency Facilities – schools, colleges and universities, community centers, correctional facilities, disaster recovery centers, emergency medical service facilities, hospitals, law enforcement facilities, local government facilities, logistical staging areas, affordable public housing, risk shelter inventory, and state government facilities

- Natural, Cultural, and Historical Resources – conservation lands, parks, shorelines, surface waters, wetlands, and historical and cultural assets

Critical and regionally significant assets and required background data were assembled from local, state and federal data sources. Appendix D, Table 1 summarizes asset class, asset type, dataset type, source, and data types. Figure 4-1 shows the locations of the 349 identified critical assets. The GIS data for all asset types are stored in a geodatabase that meets the RFGP GIS Data Standards. Table 4-2 summarizes the number of critical and regionally significant assets that were identified by asset type.



**Figure 4-1 - Critical Asset Locations**

**Table 4-2 - Critical and Regional Significant Assets by Type**

Asset Type	Total Number of Assets
Affordable Public Housing	10
Communication Facilities	4
Community Centers	4
Conservation Lands	5
Disaster Debris Site	3
Disaster Recovery Center	1
Drinking Water Facilities	9
Emergency Operations Center	1
Fire Stations	1
Health Care Facilities	10
Historical and Cultural Assets	2
Law Enforcement Facilities	1
Lift Stations	32
Local Government Facilities	3
Logistical Staging Area	2
Parks	16
Risk Shelter Inventory	1
Roads	83
Schools	5
Shorelines	2
Stormwater Facilities	1
Solid and Hazardous Waste Facilities	2
Surface Waters	38
Waste Water Facilities	1
Wetlands	109
<b>Total</b>	<b>346</b>

The City's utility service area extends beyond the City limits to approximately Wonderwood Drive. Critical infrastructure shown on Figure 4-1 outside the City limits are all associated with water and wastewater utility assets.

As required, an elevation was assigned to each of the critical and regionally significant assets. Where data were available, building assets were assigned FFEs from site-specific surveys, construction plans, and/or as-builts found on the St. Johns River Water Management District (SJRWMD) Environmental Resource Permit (ERP) website. Where site-specific FFE data were

not available, FFEs were estimated using the 2018 LiDAR DEM and the asset's building footprint. For assets not associated with buildings (i.e., parks, wetlands, surface waters, etc.), elevations were assigned based on the lowest DEM elevation within the asset footprint. Appendix D, Table 1 also summarizes the elevation data source(s) used for each asset type.

#### 4.2.2 Critical Facilities Sensitivity Analysis

The purpose of the Sensitivity Analysis is to measure the impact of flooding on critical and regionally significant assets, applying the data from the Exposure Analysis to the inventory of critical assets. Requirements for this analysis include:

- An evaluation of the impact of flood severity on each asset class at each flood scenario with an assignment of risk level based on the percentage and number of critical assets affected.
- A list of critical and regionally significant assets that are impacted by flooding. The list must be prioritized by area or immediate need and identify which flood scenario(s) impacts each asset.

For the Sensitivity Analysis, the results from the Exposure Analysis were compared to the elevations of the critical and regionally significant assets. Flood depth and/or number of expected tidal flood days was calculated for each critical asset for every flood scenario. A sensitivity level (high, medium, low) was assigned to each asset for each scenario based on the asset type and the depth of flooding or the number of expected tidal flood days. Table 2 in Appendix D shows the severity levels assigned by critical asset type. Figure 1 through 25 in Appendix D show the sensitivity levels assigned to the critical assets for each flood scenario from the Exposure Analysis.

A probability-of-failure/consequence-of-failure based methodology was used to rank and prioritize the vulnerable critical assets. With the sensitivity level assigned for each event as previously described, a weighting factor was developed for the 25 scenarios analyzed. Flood scenarios that occur sooner and more frequently were assigned a higher weighting factor. Table 3 in Appendix D shows the exposure weighting factors assigned for the 25 scenarios. The high/medium/low (H/M/L) sensitivity levels were assigned point values of 5/3/1 respectively. The sensitivity score for each scenario was then multiplied by its respective exposure weighting factor and the highest scores from the tidal, rainfall, surge, and expected tidal flood days scenarios were totaled. The totals were then normalized by dividing by 40 to generally put scores in the 0 to 10 range. This score characterizes the probability of failure for each asset.

To characterize the consequence of failure, weighting factors were developed by asset type. Each asset type was assigned a flood impact score to characterize the environmental, social, and economic impacts if that type of asset was flooded and not able to function. To weight regionally significant assets higher, assets designated as regionally significant were given a weighting factor of 2.5. Table 4 in Appendix D shows the environmental, social, and economic impact scores assigned to each asset type.

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The normalized flooding score was then multiplied by the sum of the regional significance score and the average of the three impact scores. Based on a distribution of the results, those numeric values were assigned a priority rating of highest, high, medium, low, lowest, or not vulnerable. Table 5 in Appendix D summarizes the priority ratings assigned by asset type. Appendix E shows the results of the Sensitivity Analysis by asset for tidal flooding, Appendix F for rainfall-induced flooding, and Appendix G for surge flooding. The results in the Appendix E, F, and G are sorted by the final priority rating assignment.

#### **4.2.3 Summary of Critical Facilities Vulnerability**

Tables 4-3, 4-4 and 4-5 summarizes the projected vulnerability of critical facilities for the city of Atlantic Beach for the 2050 and 2080 planning horizons. These tables show that rainfall flooding poses the highest risk for critical facilities, which include community centers, emergency operation centers, fire stations, law enforcements facilities, lift stations, roads, and schools.

Table 4-3 - Percentage of Assets Flooded by Asset Type for Tidal Flooding Scenarios

Asset Type	Total Number of Assets	Tidal Flooding					Tidal Flood Days				
		Tidal MHHW+2' Existing Conditions	Tidal MHHW+2' Int-Low 2050	Tidal MHHW+2' Int 2050	Tidal MHHW+2' Int-Low 2080	Tidal MHHW+2' Int 2080	Tidal Flood Days Existing	Tidal Flood Days Int-Low 2050	Tidal Flood Days Int 2050	Tidal Flood Days Int-Low 2080	Tidal Flood Days Int 2080
Affordable Public Housing	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Colleges and Universities	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Community Centers	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Conservation Lands	5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Day Cares	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Disaster Debris Management Sites	3	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
Disaster Recovery Centers	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Emergency Operation Centers	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Fire Stations	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Health Care Facilities	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Historical Cultural Site	1	0%	100%	100%	100%	100%	0%	100%	100%	100%	100%
Law Enforcement Facilities	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lift Stations	33	3%	6%	9%	18%	30%	3%	6%	9%	18%	30%
Local Government Facilities	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Logistical Staging Areas	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Parks	16	50%	50%	50%	50%	56%	50%	50%	50%	50%	56%
Radio Communications Towers	4	0%	25%	25%	25%	25%	0%	25%	25%	25%	25%
Risk Shelter Inventory	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Roads	83	0%	0%	1%	7%	16%	0%	0%	1%	7%	16%
Schools	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Solid and Hazardous Waste Facilities	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Surface Waters	38	47%	50%	50%	55%	66%	47%	50%	50%	55%	66%
Waste Water Facilities	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Water Supply Wells	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Water Treatment Plants	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wetlands	109	83%	84%	84%	86%	90%	83%	84%	84%	86%	90%

Table 4-4 - Percentage of Assets Flooded by Asset Type for Rainfall Flooding Scenarios

Asset Type	Total Number of Assets	Rainfall Inundation									
		Rainfall 100-YR/24-HR Existing Conditions	Rainfall 500-YR/24-HR Existing Conditions	Rainfall 100-YR/24-HR Int-Low 2050	Rainfall 500-YR/24-HR Int-Low 2050	Rainfall 100-YR/24-HR Int 2050	Rainfall 500-YR/24-HR Int 2050	Rainfall 100-YR/24-HR Int-Low 2080	Rainfall 500-YR/24-HR Int-Low 2080	Rainfall 100-YR/24-HR Int 2080	Rainfall 500-YR/24-HR Int 2080
Affordable Public Housing	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Colleges and Universities	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Community Centers	4	0%	0%	0%	25%	0%	25%	0%	25%	25%	25%
Conservation Lands	5	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Day Cares	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Disaster Debris Management Sites	3	0%	33%	33%	33%	33%	33%	33%	33%	33%	33%
Disaster Recovery Centers	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Emergency Operation Centers	1	0%	0%	0%	100%	0%	100%	0%	100%	0%	100%
Fire Stations	1	0%	0%	0%	100%	0%	100%	0%	100%	0%	100%
Health Care Facilities	10	0%	0%	0%	10%	0%	10%	0%	20%	0%	20%
Historical Cultural Site	1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Law Enforcement Facilities	1	0%	0%	0%	100%	0%	100%	0%	100%	0%	100%
Lift Stations	33	30%	42%	42%	42%	42%	45%	42%	48%	42%	48%
Local Government Facilities	3	0%	0%	0%	67%	0%	67%	0%	67%	33%	67%
Logistical Staging Areas	2	0%	0%	0%	50%	0%	50%	50%	50%	50%	50%
Parks	16	50%	50%	50%	50%	50%	50%	50%	50%	56%	56%
Radio Communications Towers	4	0%	0%	0%	25%	0%	25%	0%	25%	25%	25%
Risk Shelter Inventory	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Roads	83	45%	54%	53%	55%	53%	57%	55%	58%	55%	58%
Schools	3	0%	0%	0%	67%	0%	67%	0%	67%	0%	100%
Solid and Hazardous Waste Facilities	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Surface Waters	38	63%	63%	63%	63%	63%	66%	63%	66%	63%	66%
Waste Water Facilities	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Water Supply Wells	6	0%	0%	0%	0%	0%	0%	0%	17%	0%	17%
Water Treatment Plants	3	0%	0%	0%	0%	0%	0%	0%	33%	0%	33%
Wetlands	109	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%

Table 4-5 - Percentage of Assets Flooded by Asset Type for Surge Flooding Scenarios

Asset Type	Total Number of Assets	Storm Surge Flooding (SWEL)				
		Storm Surge 100-YR Existing Conditions	Storm Surge 100-YR Int-Low 2050	Storm Surge 100-YR Int 2050	Storm Surge 100-YR Int-Low 2080	Storm Surge 100-YR Int 2080
Affordable Public Housing	10	0%	0%	0%	0%	0%
Colleges and Universities	1	0%	0%	0%	0%	0%
Community Centers	4	0%	0%	0%	0%	0%
Conservation Lands	5	100%	100%	100%	100%	100%
Day Cares	2	0%	0%	0%	0%	0%
Disaster Debris Management Sites	3	0%	0%	0%	0%	0%
Disaster Recovery Centers	1	0%	0%	0%	0%	0%
Emergency Operation Centers	1	0%	0%	0%	0%	0%
Fire Stations	1	0%	0%	0%	0%	0%
Health Care Facilities	10	0%	0%	0%	0%	0%
Historical Cultural Site	1	100%	100%	100%	100%	100%
Law Enforcement Facilities	1	0%	0%	0%	0%	0%
Lift Stations	33	0%	0%	0%	0%	0%
Local Government Facilities	3	0%	0%	0%	0%	0%
Logistical Staging Areas	2	0%	0%	0%	0%	0%
Parks	16	38%	38%	38%	50%	50%
Radio Communications Towers	4	0%	0%	0%	0%	0%
Risk Shelter Inventory	1	0%	0%	0%	0%	0%
Roads	83	13%	20%	24%	34%	47%
Schools	3	0%	0%	0%	0%	0%
Solid and Hazardous Waste Facilities	2	0%	0%	0%	0%	0%
Surface Waters	38	50%	58%	58%	58%	61%
Waste Water Facilities	1	0%	0%	0%	0%	0%
Water Supply Wells	6	0%	0%	0%	0%	0%
Water Treatment Plants	3	0%	0%	0%	0%	0%
Wetlands	109	84%	87%	87%	87%	88%

## 5.0 Next Steps

### 5.1 Adaptation Planning

There is good news. The City of Atlantic Beach has time plan for the future and minimize the negative impacts associated with SLR. The next step is for the City to begin an adaptation planning process. This process would engage stakeholders to evaluate SLR predictions and consider what actions, if any, should be taken. The Florida Department of Economic Development (DEO) has resources available to assist local governments in this process and multiple communities have already completed their adaptation plans.

DEO describes the following 5 strategies for adaptation planning:

1. **Protection** - Protection strategies involve "hard" and "soft" structurally defensive measures to mitigate the impacts of current and future flooding, such as seawalls or beach renourishment to maintain existing development.
2. **Accommodation** - Accommodation strategies do not act as a barrier to inundation but instead alter the design, construction, and use of structures to handle periodic flooding. Examples include elevating structures and stormwater retrofits that improve drainage or use natural areas to soak up or store water and runoff (i.e., green infrastructure).
3. **Strategic Relocation** - Strategic relocation involves the possible relocation of existing development to safer areas through voluntary or incentivized measures in populated, hazard prone areas that reduce the intensity of development and/or gradually increase setbacks over time. Such options usually involve the transition of vulnerable land from private to public ownership, but may also include other strategies such as transfer of development rights, purchase of development rights, and rolling easements.
4. **Avoidance** - Avoidance involves preemptive actions taken to direct new development away from vulnerable lands to safer areas. Examples include land conservation, conservation easements, transfer of development rights, and increased coastal setbacks.
5. **Procedural** - Procedural strategies aim to generate vulnerability and adaptation information, increase awareness of vulnerabilities and adaptation options, or incorporate such information into plans or policies. Examples include vulnerability assessments, community outreach and education activities, new comprehensive plan language addressing SLR, and real estate disclosures.

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(<https://www.usace.army.mil/Infrastructure-and-Installation-Resilience/Public-Tools-Developed-by-USACE/Sea-Level-Change/>)



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**To:** Shane Corbin and Steve Swann, PE, City of Atlantic Beach  
**From:** Heath Hansell, PE, and Marc Gold, EI  
**CC:** Justin Gregory, PE, Jones Edmunds  
**Date:** May 24, 2019  
**Re:** Final City of Atlantic Beach Coastal Flooding Assessment

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This memo summarizes the methodology and technical analysis utilized to determine future 100-year flood hazards due to anticipated sea level rise (SLR) for the years 2044, 2069, and 2119. The purpose of this analysis is to estimate future coastal flood risks from increased storm surge elevations and wave heights at Atlantic Beach due to rising seas.

ATM's analysis of potential future coastal hazards was conducted using the effective 2018 Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) for Duval County, National Oceanic and Atmospheric Administration (NOAA) 2017 SLR projections, and site-specific modeling using FEMA's Coastal Hazard Analysis and Mapping Program (CHAMP) Version 2.0 model suite, described in the subsequent sections. The Atlantic Beach digital elevation model (DEM), provided by Jones Edmunds, was derived from light detection and ranging (LiDAR) data originally obtained by the Florida Division of Emergency Management (FDEM) in 2007 and processed to a resolution of 5 feet horizontally and an elevation accuracy of 0.6 foot at the 95 percent confidence level. This DEM served as the basis of topographic data for the assessment. Please note that all elevations referred to in this document are in feet and referenced to the North American Vertical Datum of 1988 (NAVD88).

The resulting products of this assessment are the attached four flood maps depicting flood hazard areas of inundation with assigned base flood elevations (BFEs) for the current year and each SLR time horizon: 2044, 2069, and 2119. The digital map data was provided to Jones Edmunds under separate cover.

## **Methodology**

### **FEMA Flood Mapping**

In the United States, present-day flood hazards associated with extreme event coastal storm surge and waves are typically based on FEMA's FIS and FIRMs. These documents analyze rain event flooding, storm surge and wave impacts to provide map exhibits showing the geographical limits and severity of coastal risk. In general, the more severe the risk at any given location, the higher FEMA's recommended flood zone and BFE. In general, FEMA coastal mapping includes two major parts: water level/surge modeling and wave transect modeling.



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### Water Level/Surge Modeling

Water level/surge modeling results in extreme event stillwater flood elevations (SWELs) based on what is commonly referred to as a 100-year storm event. SWEL flood elevations can vary by location and comprise the following:

- Existing mean sea level (MSL) at the time of the study
- Tidal fluctuations
- Extreme event storm surge (including local wave setup)

These SWEL flood elevations do not include storm waves. Storm waves travel on top of the SWEL and will increase flood risks and elevations.

### Wave Transect Modeling

Once the 100-year SWEL is determined, extreme event storm waves are analyzed at select locations along the shorelines (coastal analysis transects). Coastal analysis transects are typically spaced several hundred feet or farther apart and represent detailed cross-sections of the shoreline and upland from the ocean or from inland estuarine areas (flooding source) to higher ground. Figure 1 illustrates a coastal wave transect. Wave transect modeling results in FEMA's BFEs, which include SWEL flood elevations from surge modeling and the elevation of waves on top of the SWEL. The wave transect modeling results (BFE and flood zone type) are interpolated between transects to draw the FEMA flood zones and elevations that comprise FEMA maps.

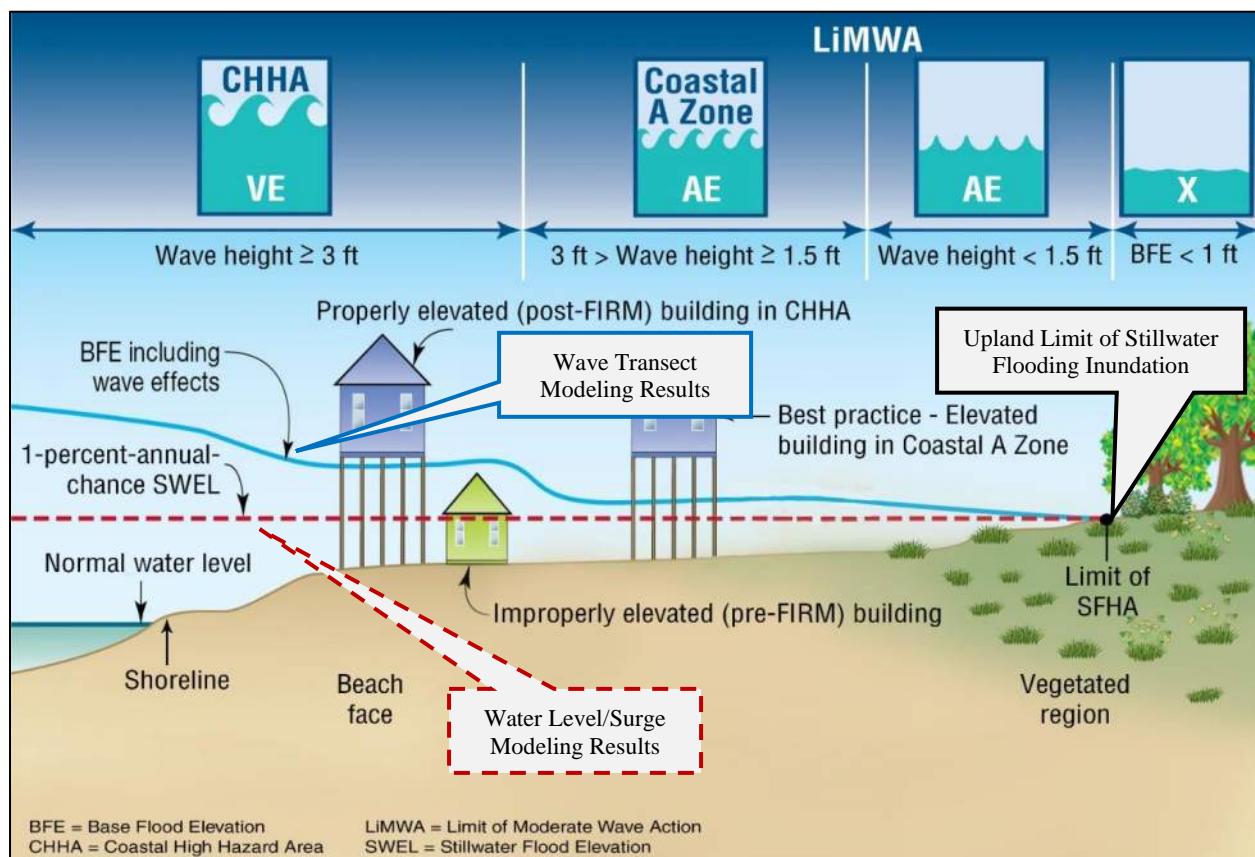


Figure 1. Illustration of a Coastal Wave Transect

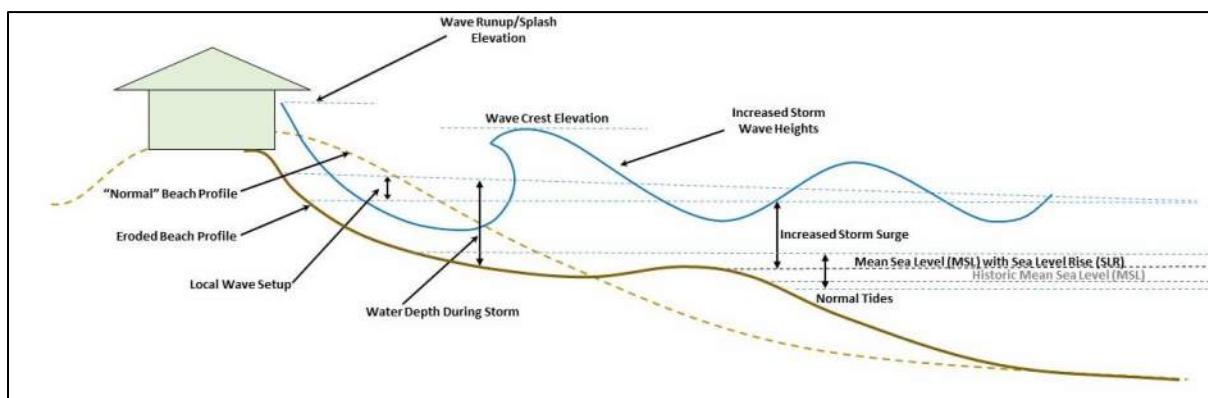


### Accounting for Sea Level Rise

FEMA flood maps are updated on a regular basis (typically every 10 years). FEMA only considers the existing MSL at the time of the update and does not account for future sea levels (i.e., SLR). For the current assessment, ATM conducted an analysis based on the FEMA flood mapping protocol and evaluated coastal flooding and wave risks under a range of SLR scenarios (25, 50, and 100 years into the future). In essence, FEMA-type flood maps were created for future, higher sea level scenarios. This process included:

- Using established SLR predictions from NOAA, U.S. Army Corps of Engineers (USACE), and others to determine the predicted mean level at Atlantic Beach at 25, 50, and 100 years into the future.
- Using existing FEMA SWEL results but increasing the elevations to account for SLR and evaluate future sea level conditions. These elevations were used to create inundation maps that show the limits of extreme event flooding under future sea level conditions.
- Updating wave transect modeling on top of the increased SWEL elevations to predict BFEs under future higher sea levels.
  - Wave modeling is very sensitive to water depth, and increased future sea levels will allow larger waves to travel further inland during storms because there is more area inundated with higher SWEL.
  - These evaluations were used to create FEMA-type flood maps for future higher sea level scenarios.

The process is generally illustrated in Figure 2.



**Figure 2. Illustration of Modeling Effects of SLR**

The following sections provide detailed information on ATM's technical analysis.

### **FEMA Flood Maps and Supporting Data (Existing 100-Year Flood Risks)**

The effective Duval County 2018 FEMA FIRMs and supporting FEMA data served as the basis of the existing/present-day 100-year flood risks for Atlantic Beach.



The 100-year SWEL raster included in the Technical Supporting Data Notebook (TSDN) for the Duval County FIS was downloaded from FEMA's Flood Risk Study Engineering Library (FRISEL) website (<https://hazards.fema.gov/wps/portal/frisel>) and imported into ArcGIS, version 10.6. Figure 3 depicts the 100-year (or 1 percent annual chance) SWEL surface over Atlantic Beach. The SWEL shown in Figure 3 is referred to throughout this memo as the "existing" 100-year SWEL, as these represent the 1 percent annual chance SWEL under present-day conditions (without any additions to the water level to account for SLR).

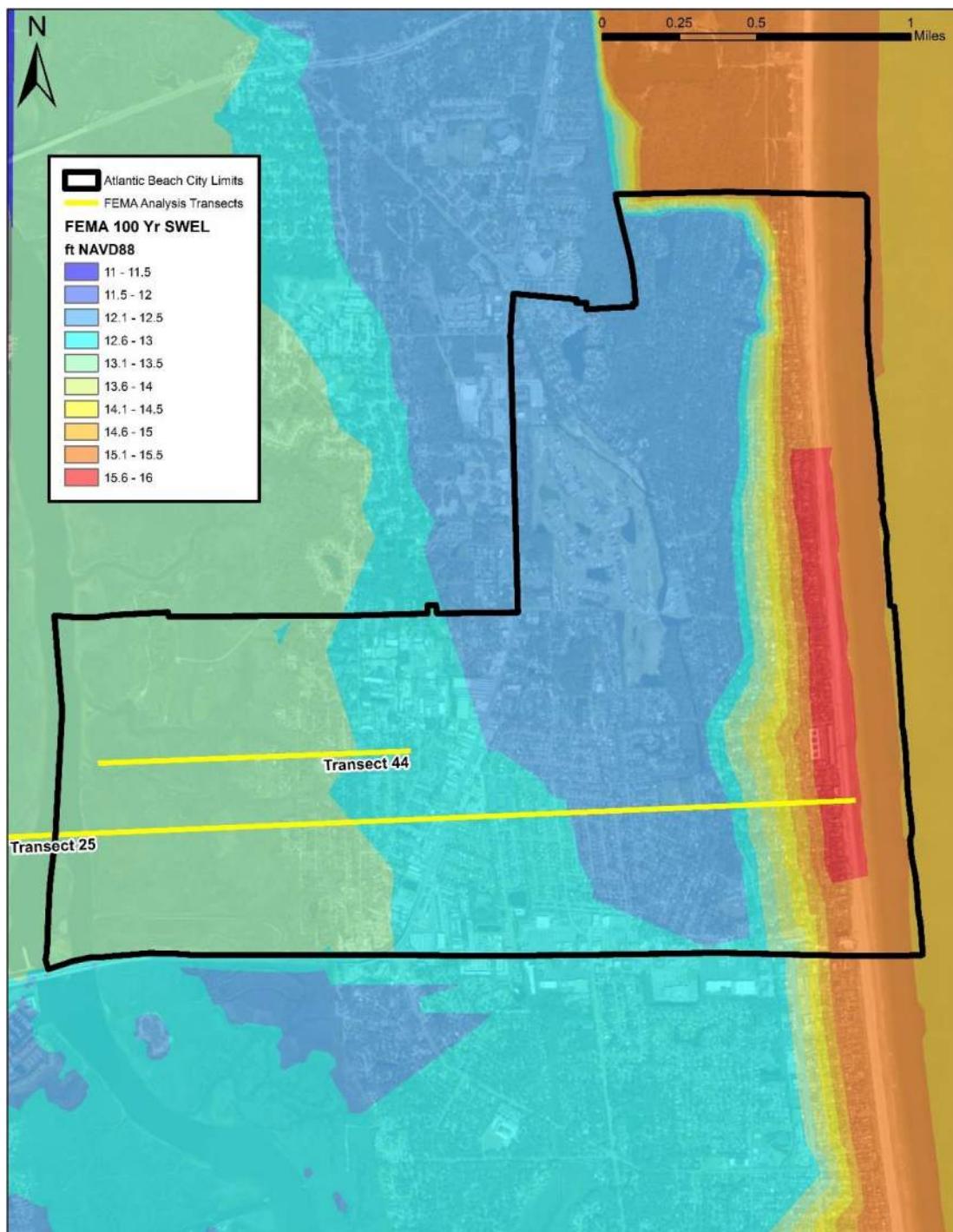


Figure 3. FEMA 100-Year SWEL and FIS Analysis Transects for Atlantic Beach



Based on the most recent FEMA FIS, SWEL (storm surge) values are largest along the open Atlantic Coast. Larger SWEL values are also observed on the western estuarine shoreline due to elevated water levels from the St. Johns River Inlet and the Atlantic Intracoastal Waterway (AIWW) under extreme conditions. The SWEL is essentially the starting water level for coastal flood mapping purposes but does not include wave effects other than wave set-up. The other wave components that need to be considered are wave heights, wave run-up, and overtopping. For coastal communities such as Atlantic Beach, these unaccounted for wave effects from the open coast as well as from back bays and sheltered waterways are added to the SWEL to determine the total BFE depicted on FEMA flood maps.

ATM utilized two existing FEMA wave analysis transects at Atlantic Beach to evaluate wave conditions on top of the future higher sea level SWEL scenarios. Figure 4 presents the transects overlaid on Atlantic Beach topography (ground elevation). For consistency, ATM used the same transect numbering as the FIS. Transect 44 is representative of “sheltered water” and begins in the waterways adjacent to the AIWW and runs east across the marsh and onto the upland of Atlantic Beach. Transect 25 is representative of “open coast” and begins in the Atlantic Ocean and runs west across beach and onto the upland of Atlantic Beach. Both transects are considered representative of the variation of topographic conditions occurring throughout Atlantic Beach. Transect 25 was conservatively selected as the open coast analysis transect due to the relatively lower dune topography and larger SWEL inundation extent observed along the more vulnerable southern shorelines of Atlantic Beach. FEMA wave analysis transects are modeled using inputs such as topography, vegetation, structural/building inputs, SWEL flood elevations, and storm wave height conditions. The updated CHAMP wave modeling for analysis Transects 25 and 44 under future SLR conditions is detailed in subsequent sections.

Based on effective FEMA flood maps, the majority of land within the jurisdictional limits of the City of Atlantic Beach is outside of the Special Flood Hazard Area (SFHA) (Figure 5). Areas outside the SFHA are not predicted to experience flooding or wave hazards during the 100-year storm condition. Areas within the SFHA are assigned BFEs depending on flood study results.

### **Future 100-Year Coastal Flood Hazards**

With anticipated rising sea levels, coastal flood hazards will increase both in terms of higher flood elevations as well as the inland extent to which inundation of extreme flood waters can reach. As greater areas of upland are inundated, larger waves are then able to propagate farther inland, further increasing the potential for storm damage. The following sections summarize the analyses used to assess the future coastal flood hazards from extreme (100-year return period/1% annual chance) surge and wave conditions for Atlantic Beach based on projected sea level increases.

### **SLR Projections**

ATM’s coastal hazard analysis of future sea level conditions utilized the NOAA 2017 Intermediate High Sea Level Rise projection curve for the NOAA tide gauge station at Mayport, FL (see Figure 6).



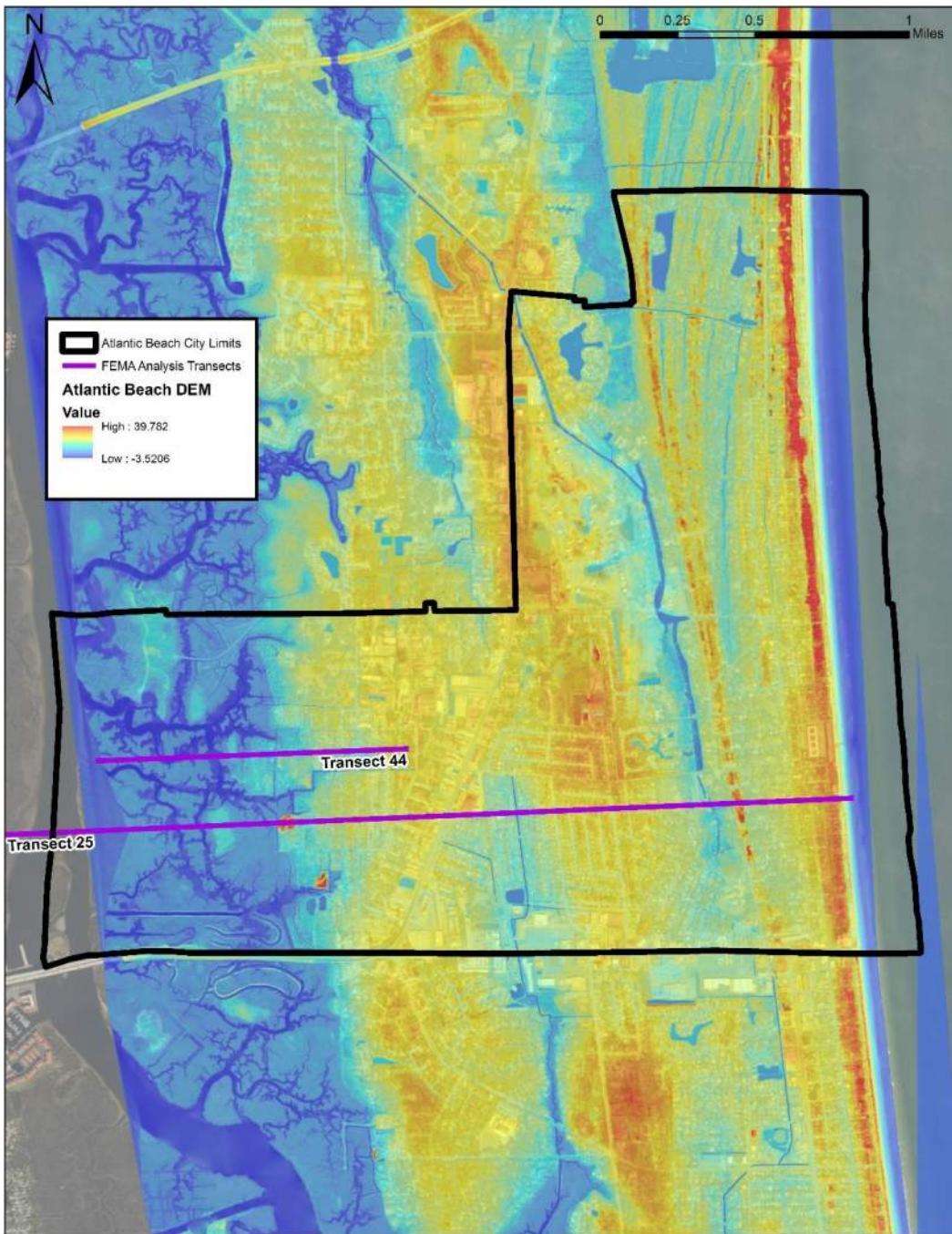


Figure 4. Atlantic Beach Topography and Transects



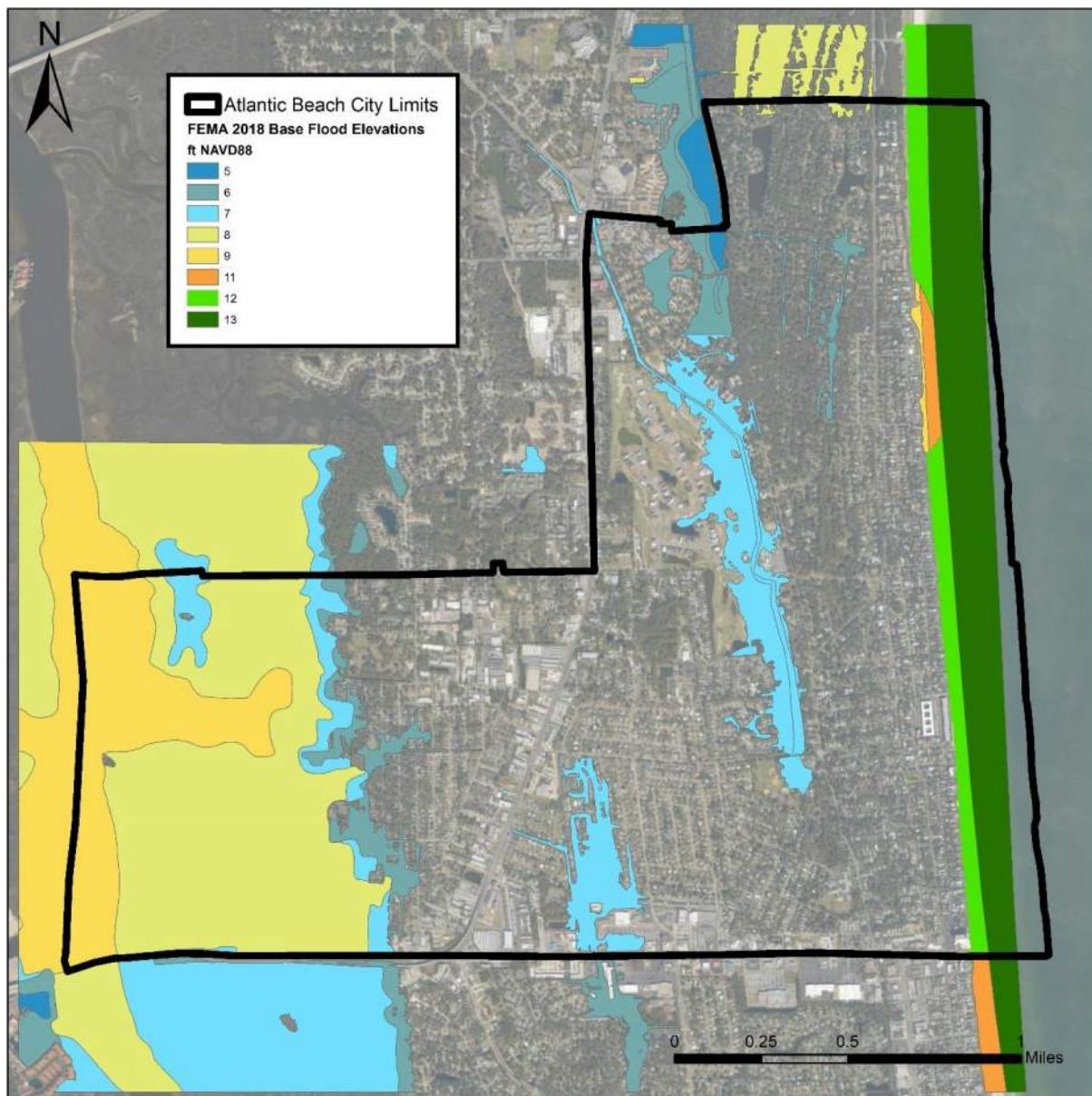


Figure 5. BFE Inundation Map Based on FEMA Effective 2018 Digital FIRM for Atlantic Beach

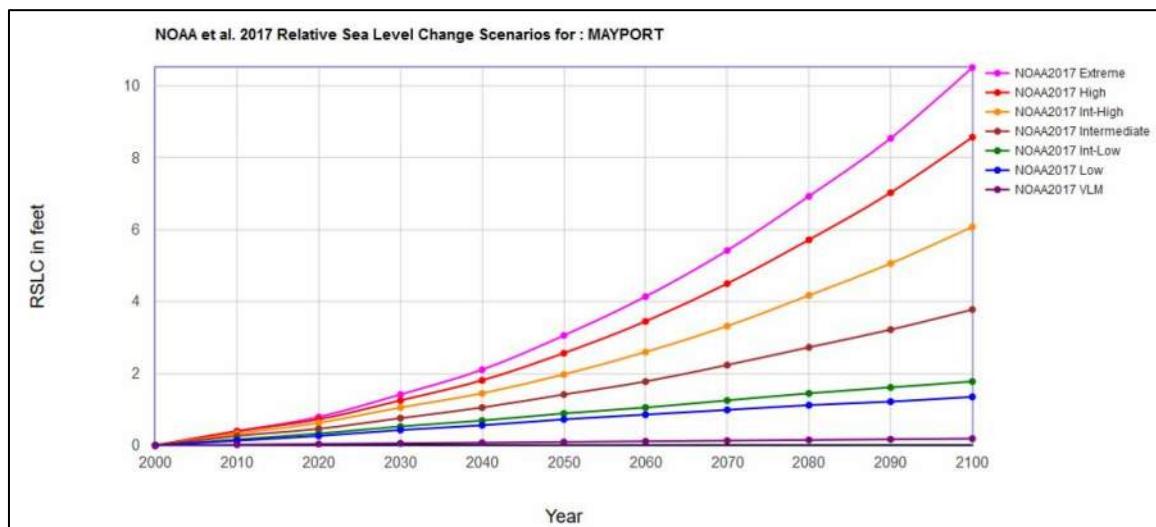


Figure 6. Mayport Gauge - USACE Sea-Level Change Curve Calculator

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The NOAA 2017 SLR curves are based on a year 2000 start date. Upon discussion with Jones Edmunds, it was determined that the SLR curve values should be adjusted for a baseline start date of 2013, since this was the date the effective FEMA FIS and mapping were completed for Duval County and represented existing sea level conditions at that time.

As a result, the curve values were adjusted for the three time-horizon scenarios by subtracting the projected SLR value of 0.39 foot for the year 2013 from the projected 2044, 2069, and 2119 values. The final values used for ATM's analysis are shown in bold in Table 1.

**Table 1. SLR Values for Coastal Hazard Analysis**

Year	Projected SLR (2000 Start Date)	Adjusted Projected SLR (2013 Start Date)
2044	1.65 feet	<b>1.26 feet</b>
2069	3.24 feet	<b>2.85 feet</b>
2119	7.34 feet	<b>6.95 feet</b>

#### Future SWEL and Inundation

Future 100-year SWEL elevations were developed for each time-horizon scenario by adding the values in Table 1 to the existing 100-year SWEL flood elevations from the effective FIS. Next, as a baseline assessment of inundation, a direct comparison of these surfaces to the existing Atlantic Beach topography was conducted.

Figures 7 through 9 present the resulting baseline data showing the areas of inundation/flooding in blue ("Below SWEL") under each SLR scenario. As would be expected, the extent of areas submerged during the 100-year event increase with elevated sea levels further into the future. As Figure 9 shows, almost all of Atlantic Beach will potentially be inundated during an extreme 100-year storm event in the year 2119.

These figures provide very useful information but are not truly representative of future coastal hazards possible for Atlantic Beach, since wave effects (increases in BFEs) and increased flood extents in the areas of combined riverine and coastal flooding were not accounted for. Therefore, the inundation figures were used as a starting point for generating future flood hazards at Atlantic Beach. Based on the updated transect analysis modeling and FEMA flood mapping techniques and guidelines described in the subsequent sections, the inundation maps were assigned BFEs to represent future sea level scenario coastal risks.



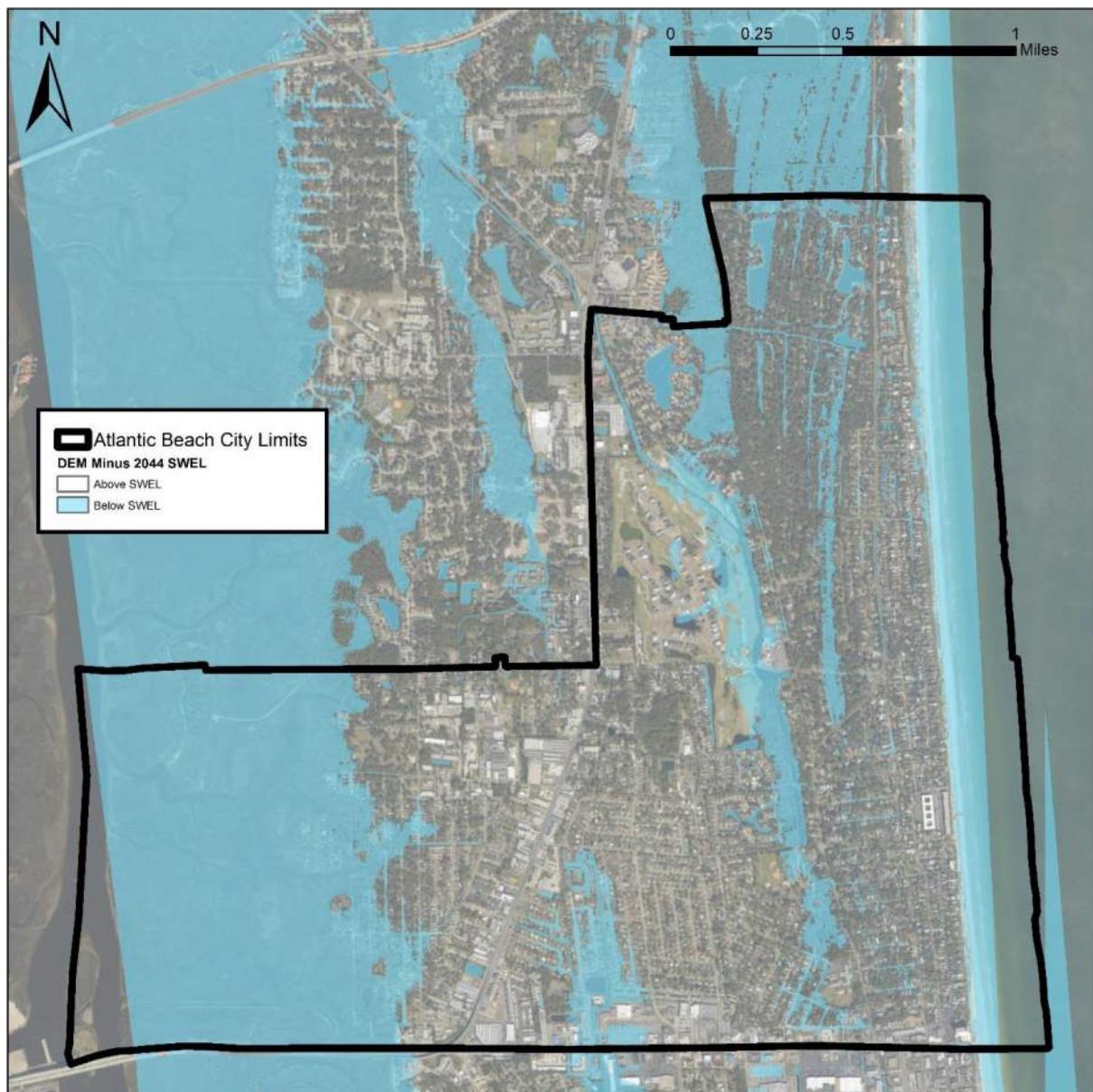


Figure 7. Year 2044 SWEL Inundation (topography below 2044 SWEL)



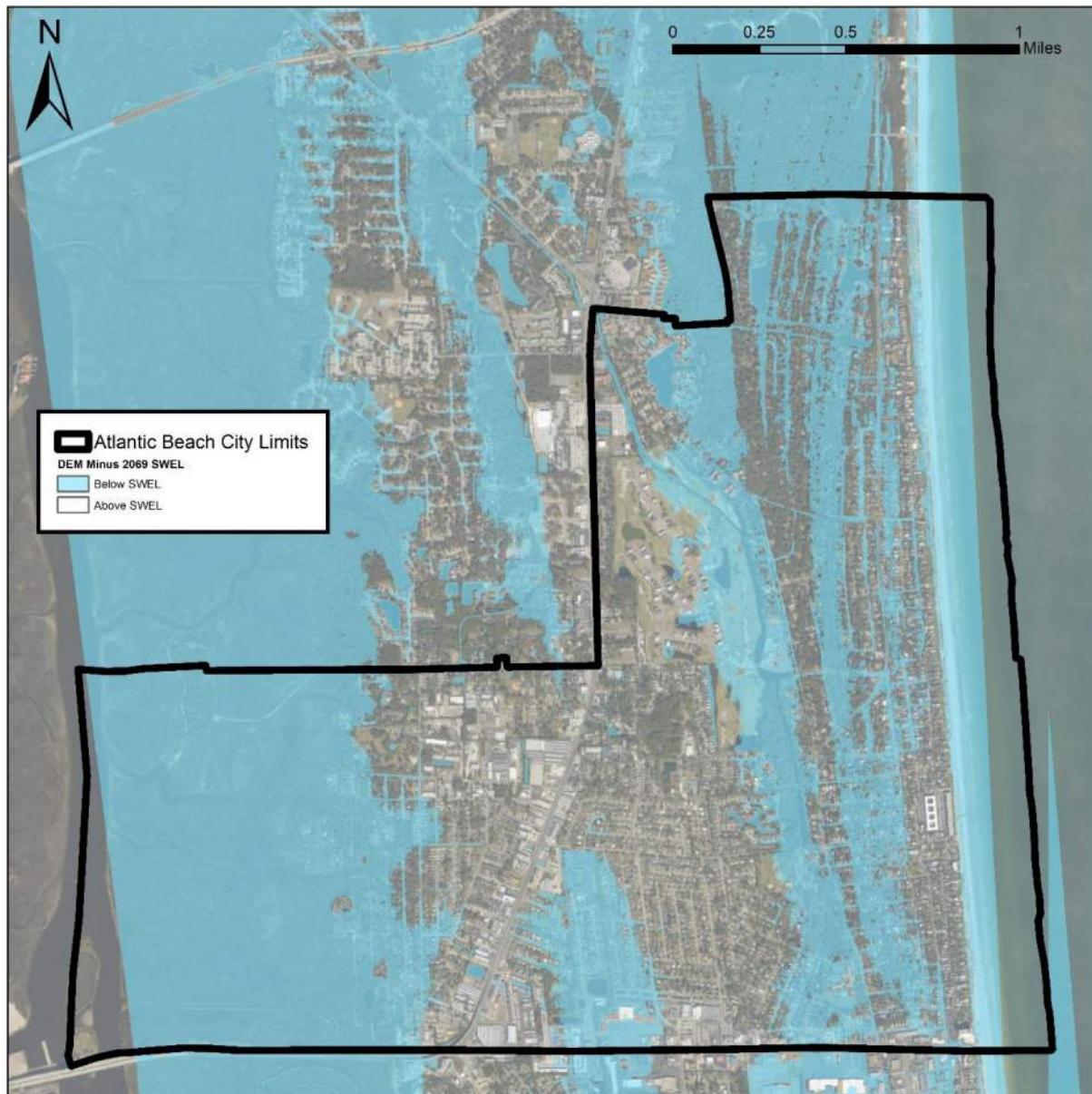
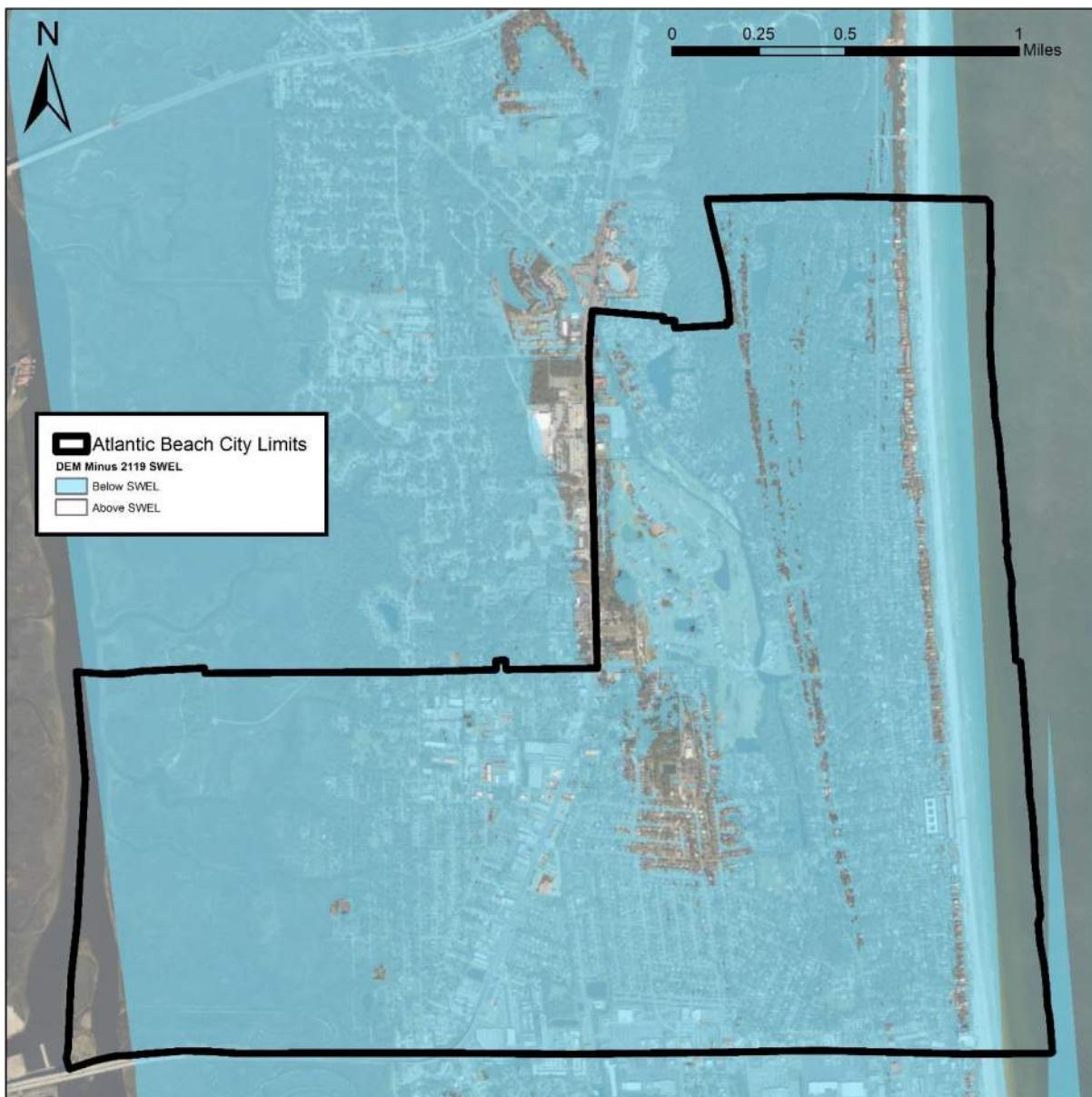


Figure 8. Year 2069 SWEL Inundation (topography below 2069 SWEL)





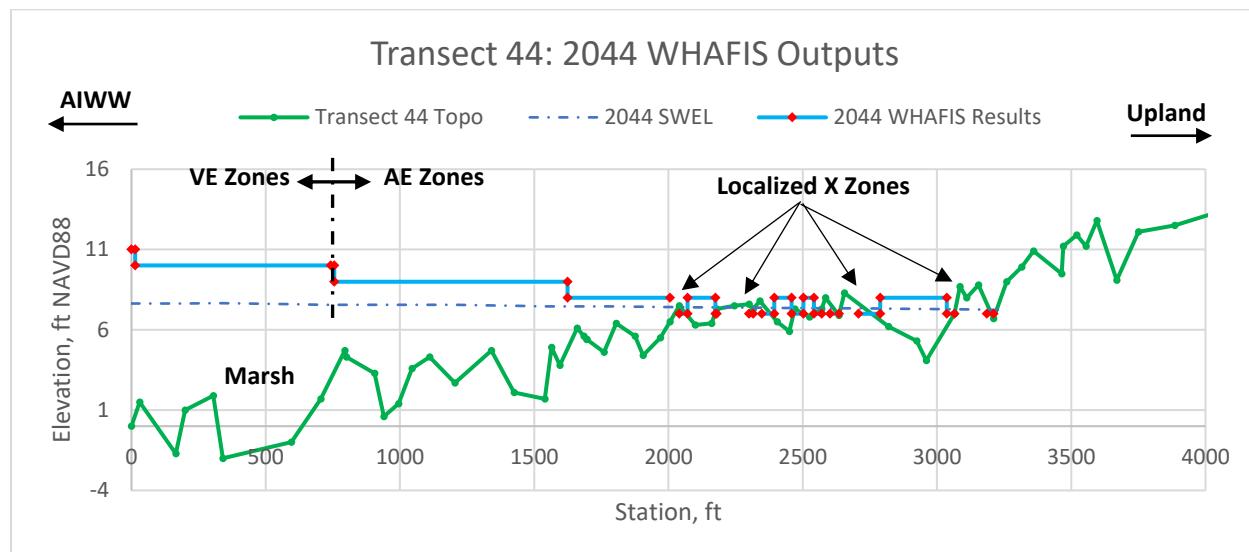
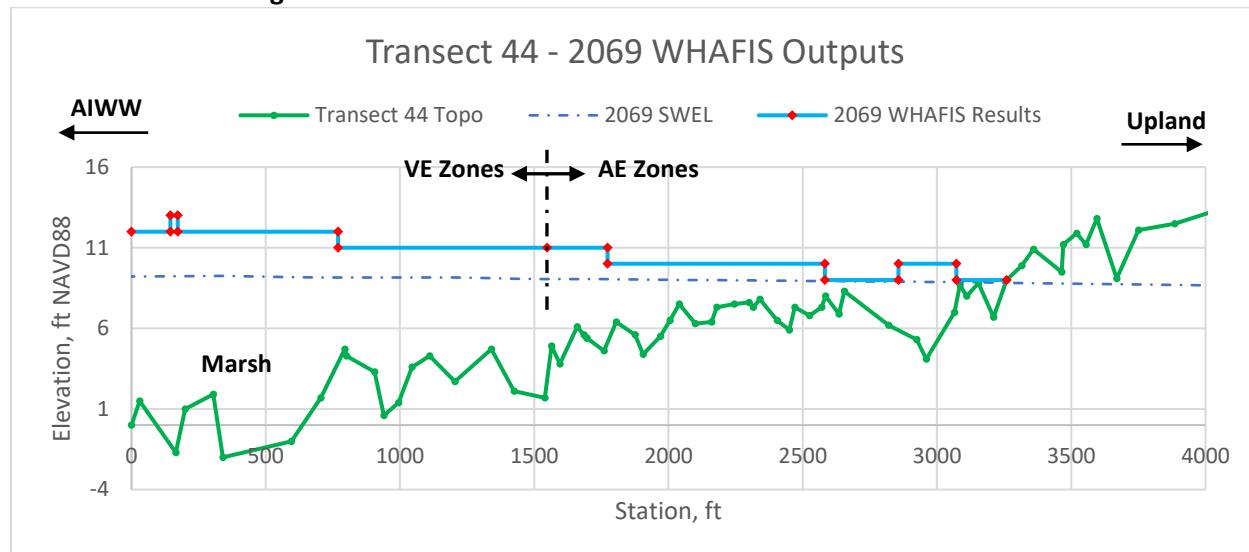
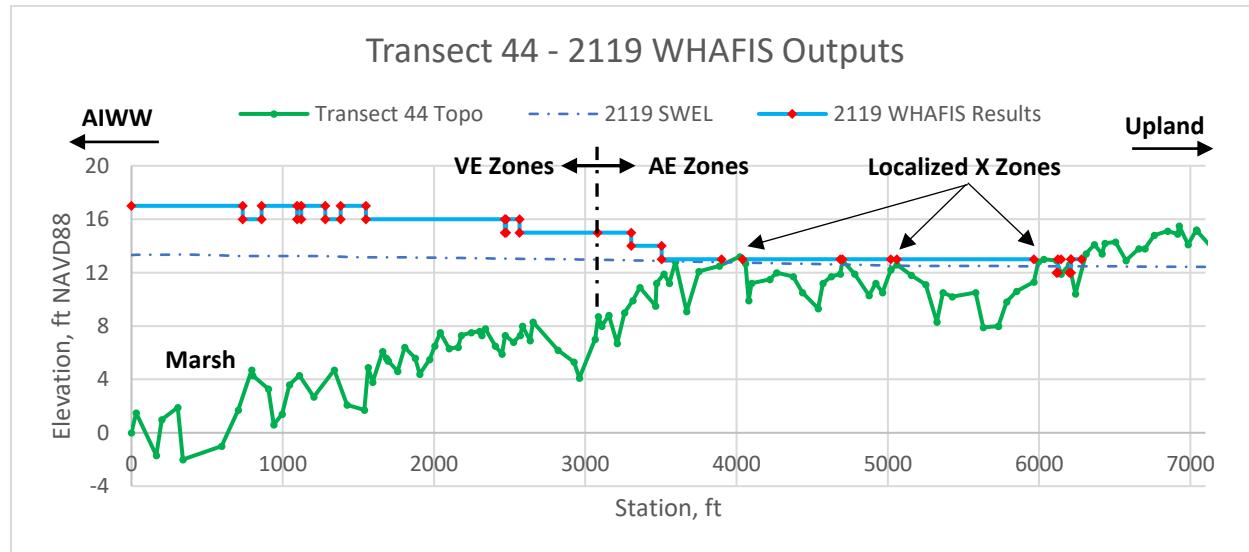
**Figure 9. Year 2119 SWEL Inundation (topography below 2119 SWEL)**

#### **Sheltered Water (AIWW) Flood Hazards**

Flood hazards along the estuarine shoreline due to waves incident from the AIWW were evaluated for Atlantic Beach along Transect 44 using the FEMA Wave Height Analysis for Flood Insurance Studies (WHAFIS) overland wave propagation model. For conservatism, the entire transect was assumed as open space Inland Fetch (IF); no vegetation or obstruction cards were used. The future 100-year SWEL values were extracted along the transect for each scenario using the generated rasters mentioned previously. An input starting significant wave height ( $H_s$ ) of 2.9 feet and a peak wave period ( $T_p$ ) of 2.9 seconds was used based on the effective FEMA FIS. Results of the WHAFIS wave analysis for each SLR scenario are depicted in Figures 10 through 12.

As mentioned previously, larger waves are able to progress farther inland due to rising seas. As a result, BFEs can increase substantially since now there is both elevated water levels and increased wave heights creating a higher wave crest elevation used for determining the total BFE.



**Figure 10. Estuarine Transect WHAFIS Results for Year 2044****Figure 11. Estuarine Transect WHAFIS Results for Year 2069****Figure 12. Estuarine Transect WHAFIS Results for Year 2119**



The output AE zones and VE zones (representative of a 3-foot wave height delineation in this area) are shown based on the WHAFIS results; however, the important focus is the extent and elevation since waves less than 3 feet can cause substantial damage and should be considered for resiliency planning purposes. Similarly, although locations above SWEL are output as X zones and not considered within the floodplain extent, these areas can still be at risk and subject to wave ramping/splash effects.

### **Open Coast (Atlantic Ocean) Flood Hazards**

Flood hazards along the ocean shoreline of Atlantic Beach were assessed at the Transect 25 location. The original and predicted storm-eroded profiles along the open coast are shown in Figures 13 and 14. FEMA flood mapping guidelines require that dunes be eroded under certain extreme event conditions. Based on calculated sand reservoirs in the existing dunes at Transect 25 being less than 540 square feet, FEMA guidelines (FEMA, 2007) dictate that the dune be removed (erosion) for analysis. The eroded profile exhibits a 1 on 50 slope passing through the dune toe per FEMA protocol, and the configuration is consistent with the erosion methods used for Transect 25 in the effective FEMA FIS (IDS 4 and 5).

Following FEMA guidelines, the eroded profile was implemented for all modeling/analysis and resulting mapping, and the erosion configuration was kept consistent for each SLR scenario. No shoreline recession was assumed to take place between the time-horizon projections since it is expected that Atlantic Beach will continue its beach renourishment efforts in the future.

Wave propagation and wave runup were assessed at Transect 25 using the WHAFIS and Runup 2.0 modules in FEMA's CHAMP model suite. The same input 100-year storm wave conditions ( $H_s = 18.7$  feet,  $T_p = 12.8$  sec) that FEMA predicted for the effective FIS (IDS 4 and 5 model files) were used in the updated modeling.

Based on WHAFIS and Runup 2.0 runs at Transect 25, wave runup elevations were significantly higher than wave crest elevations along the open coast under the 2044 and 2069 scenarios. Therefore, along the open coastline, wave runup is the controlling hazard determining flood elevations per FEMA protocol. The final BFE in these areas is the sum of the SWEL and the 2 percent runup value output from Runup 2.0 to give a total water level that is conservatively rounded to a whole foot BFE. The resulting future BFEs determined from Runup 2.0 and the wave runup extents under the 2044 and 2069 scenarios are provided in Figures 13 and 14, respectively.

Under the 2119 scenario, the entire dune topography, as well as the majority of the transect continuing inland, is below the SWEL. Wave runup is not applicable in this situation because waves are able to propagate over the coastal topography in this more vulnerable reach of shoreline south of Atlantic Beach. Under the 2119 SLR projection, WHAFIS outputs are used in determining the coastal flood hazards along Transect 25 (see Figure 15).



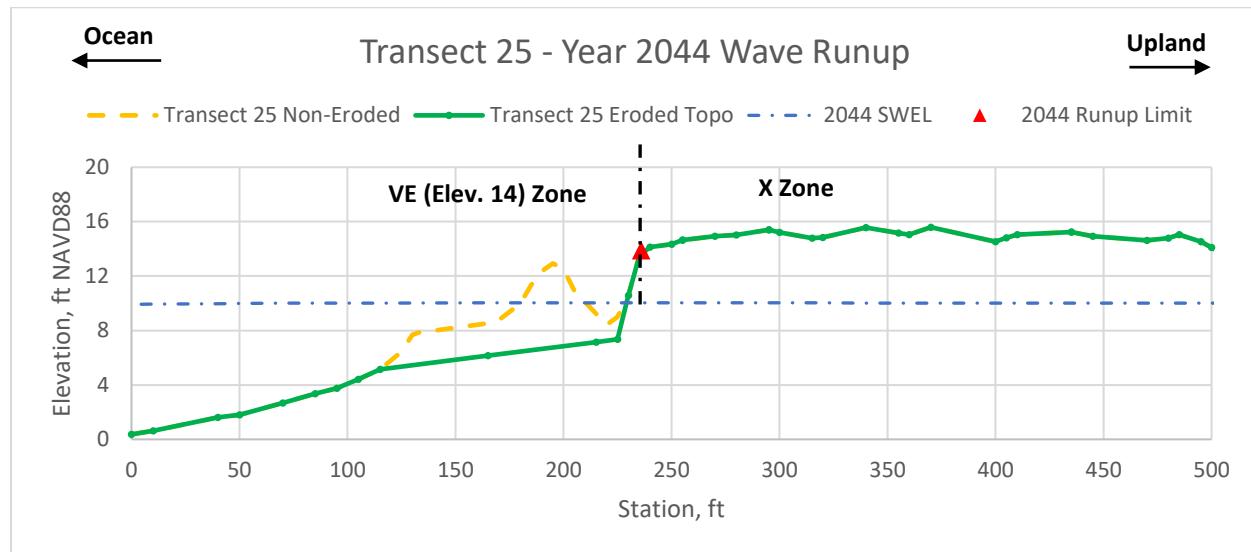


Figure 13. BFEs under the Year 2044 Scenario

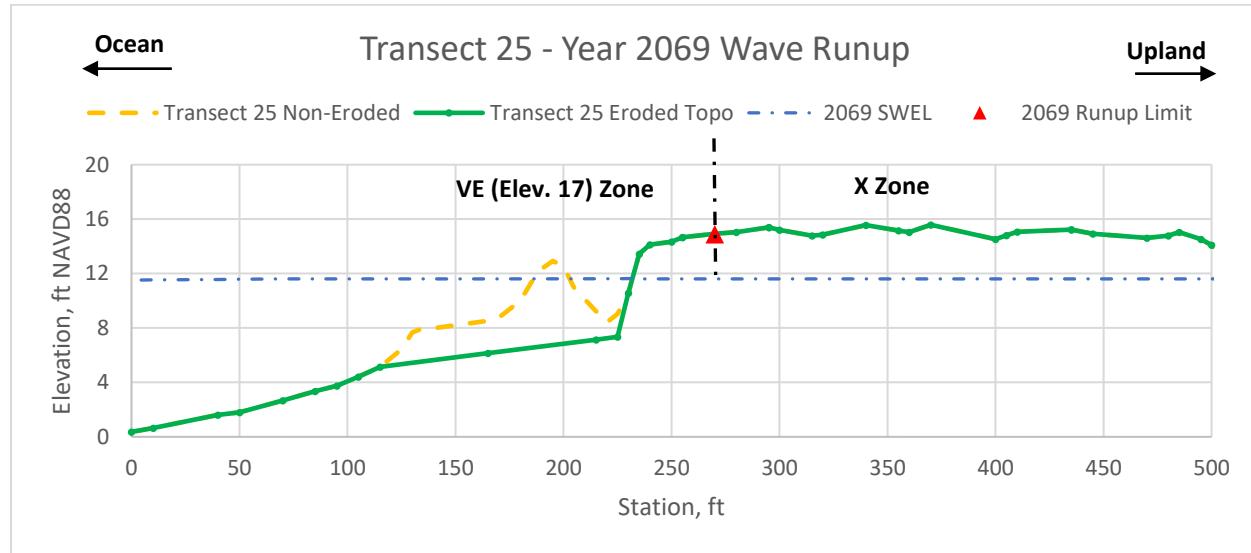


Figure 14. BFEs under Year 2069 Scenario

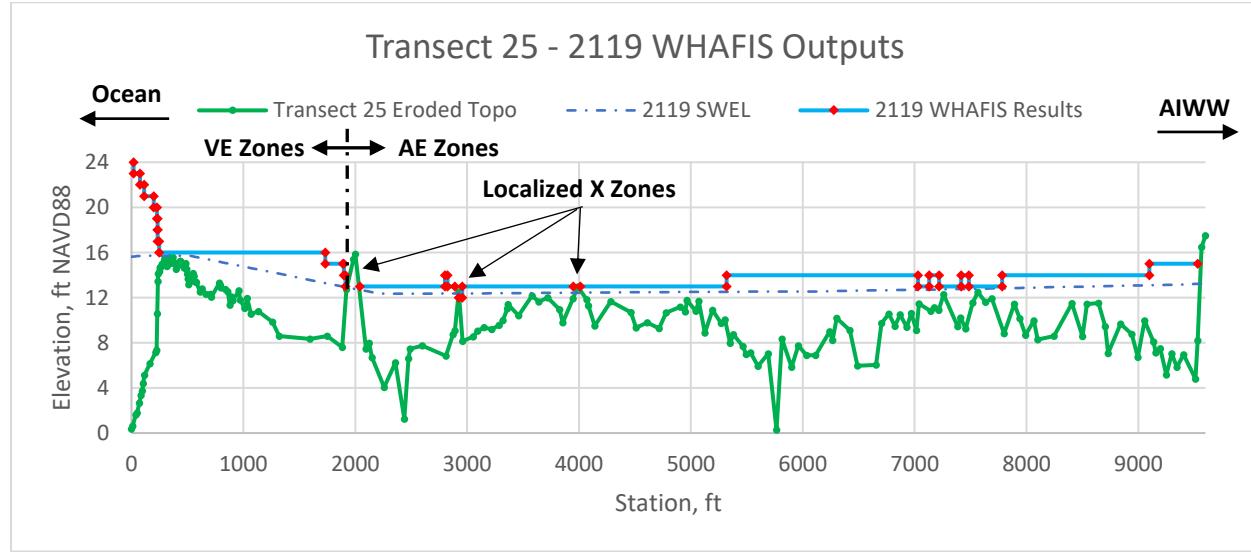


Figure 15. BFEs under the Year 2119 Scenario



### **Merging Results and Flood Map Production**

As previously mentioned, future inundation conditions were used as the starting flood hazard areas for updated BFE flood map production. The final flood maps for each future scenario are based on model results as well as engineering judgment using topography and ATM's knowledge of and experience with CHAMP modeling and the FEMA mapping process.

Additionally, existing/effective FEMA special flood hazard area zone designations were used to aid in determining future BFE flood elevations and extents/coverages. For example, areas that are currently designated as "Combined Riverine and Coastal Mapping" (as specified in the attribute table of FEMA's digital FIRM) were mapped under the future scenario through a conservative comparison of WHAFIS output BFEs and the value of the existing BFE for that particular location plus SLR. The greater of the two values was then assigned to that flooding area, which was extended to meet the contour matching that predicted future BFE.

Interpolation (based on topography and exposure) is used in transitioning to create relatively smooth, continuous flood boundary lines. Conservative mapping techniques considering map scale limitations (based on the existing FIRM scale of 1 inch = 500 feet) were also implemented so that higher BFEs are assigned when model output transitions would suggest lower elevations, but over a very short distance. Areas where the interpolation of model outputs overlap (e.g., the 2119 scenario) similarly used conservative engineering judgment and flood mapping experience in creating the final flood map polygons.

The final Atlantic Beach flood maps representing future coastal flood risk estimated for the years 2044, 2069, and 2119 are presented in Figures 16 through 18 and have been provided digitally as geographic information system (GIS) files.



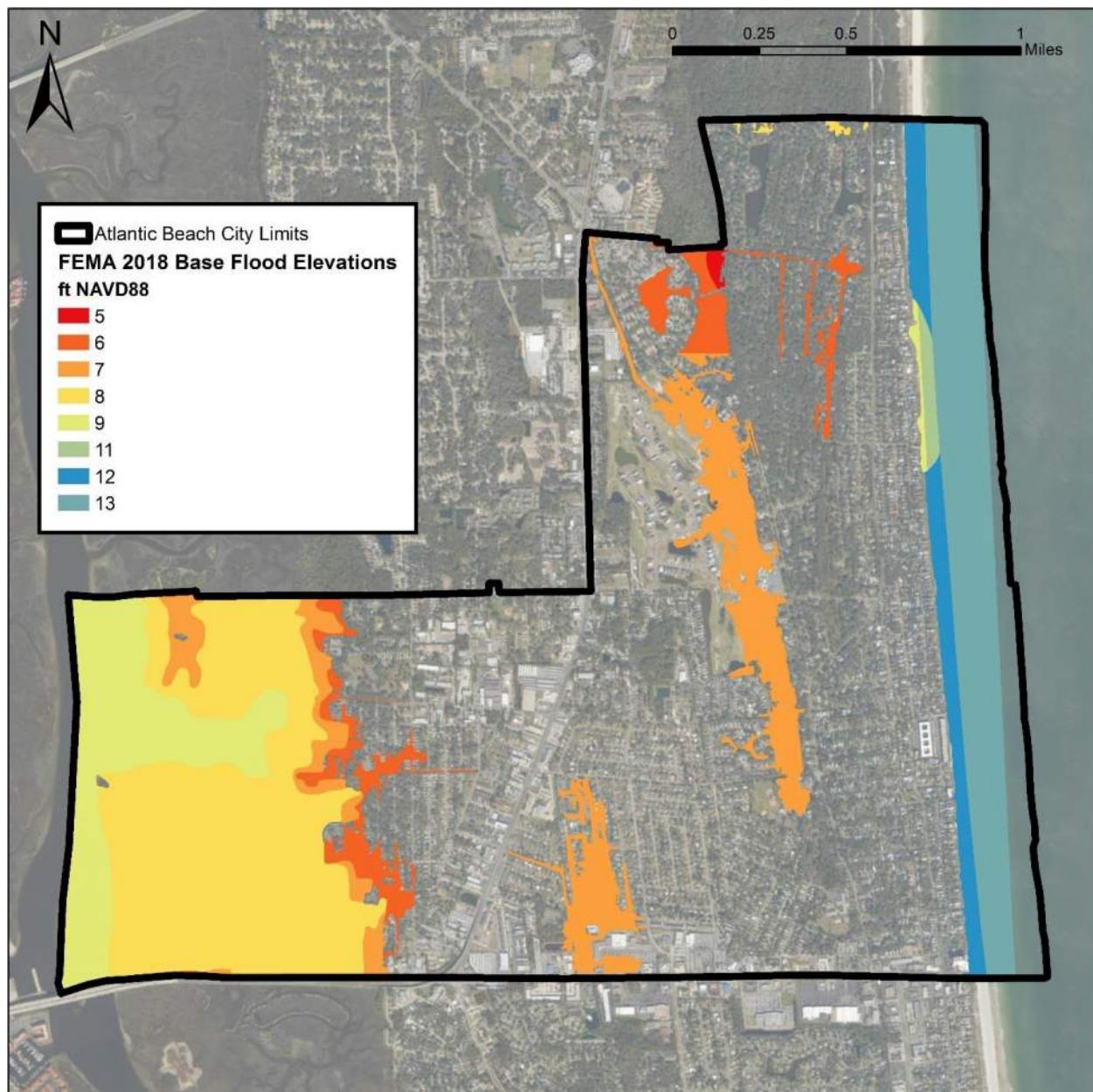


Figure 16. Base Flood Elevation, 2018



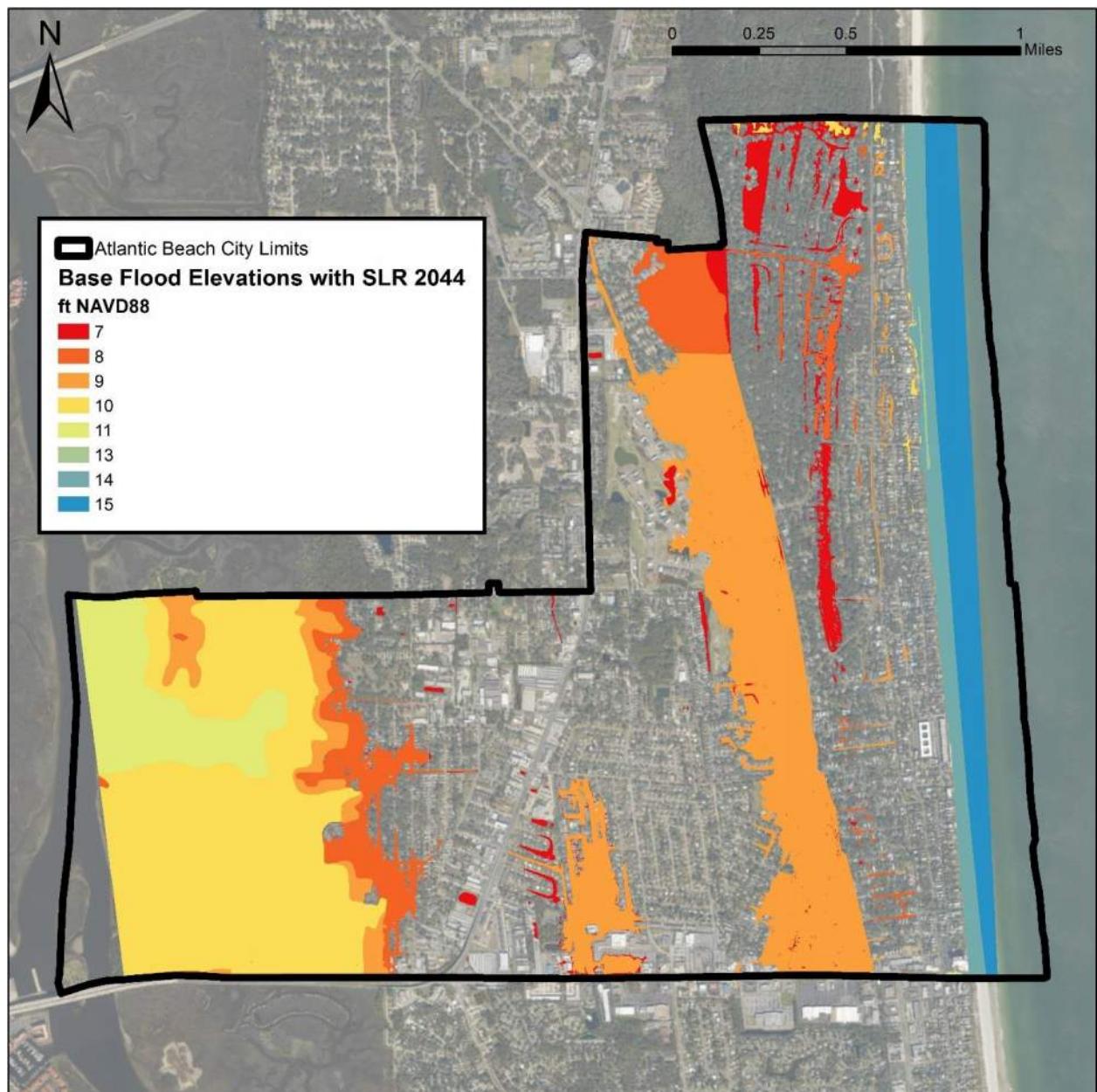


Figure 17. Base Flood Elevation, 2044



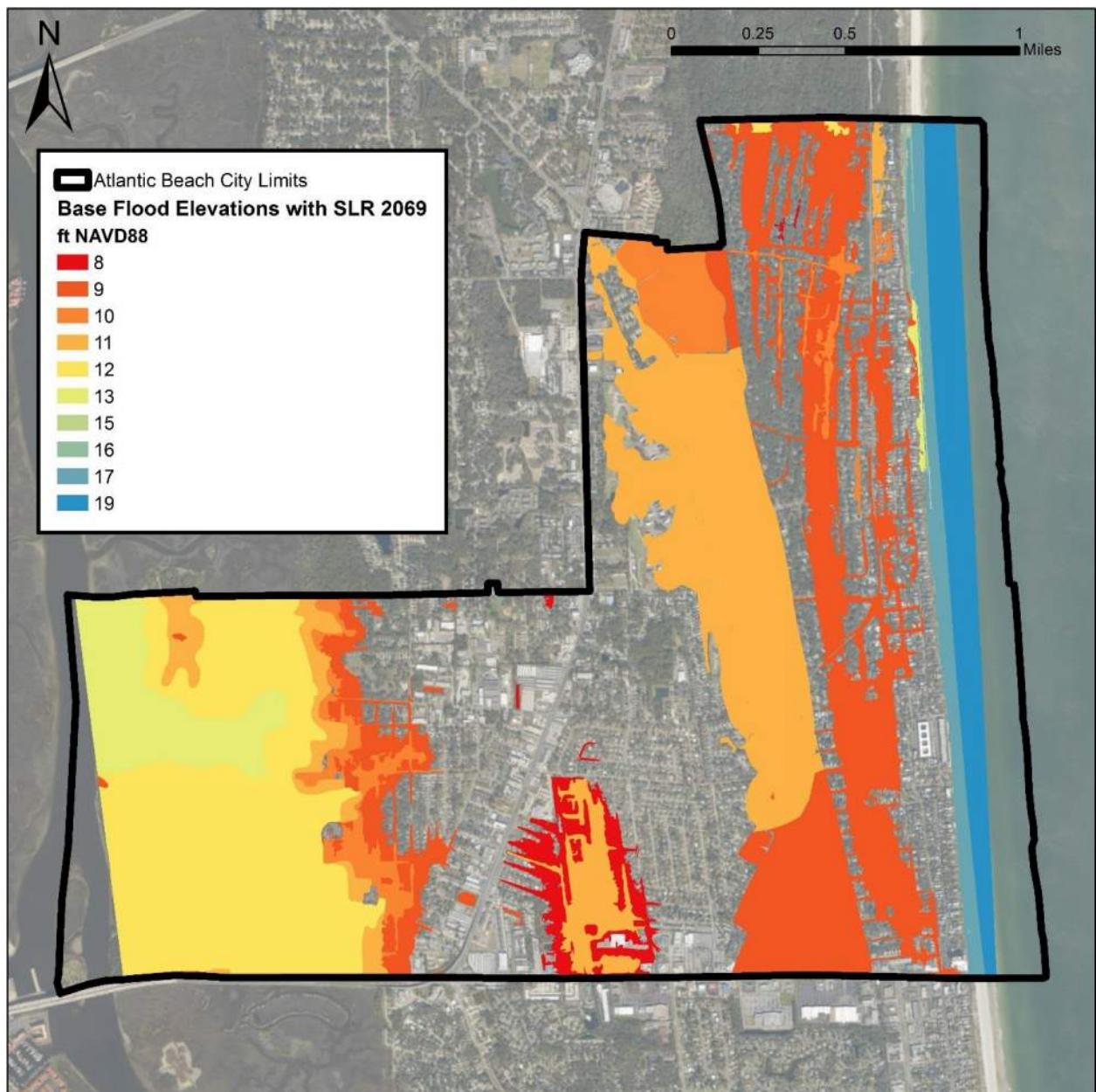


Figure 18. Base Flood Elevation, 2069



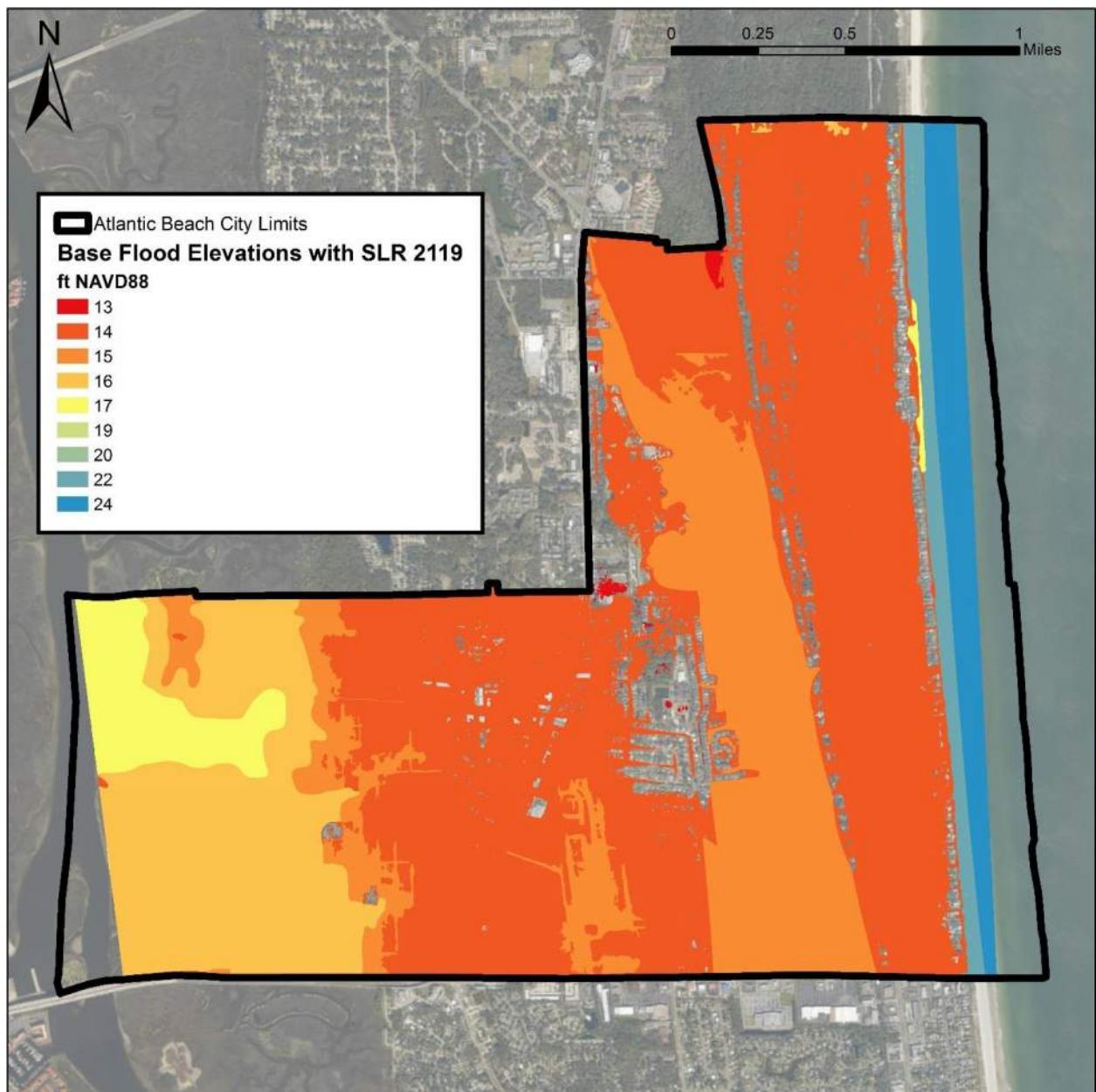


Figure 19. Base Flood Elevation, 2119



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# TECHNICAL MEMORANDUM

**TO:** City of Atlantic Beach

**FROM:** Jarrod Hirneise, PE; Karen Liang, PE, CFM; Justin Gregory, PE; Brett Cunningham, PE

**DATE:** May 21, 2019

**SUBJECT:** Sea Level Task Authorization #09 – Vulnerability Assessment Support – Task 3  
Jones Edmunds Project No. 95239-057-19

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Justin H. Gregory, PE  
Florida PE No. 69831

(Relating to the results of the rainfall-induced flood analysis presented in this Technical Memorandum)

## 1 INTRODUCTION

The City of Atlantic Beach selected Jones Edmunds and Applied Technology & Management, Inc. (ATM) to perform an analysis of future flood risk under projected sea-level rise scenarios to support the City's Vulnerability Assessment. As part of Task 1 of this project, the City asked Jones Edmunds to review sea-level rise projections and recommend future sea-level rise values for the 25-, 50-, and 100-year planning horizons. As part of Task 2 of this project, the City asked ATM to use the recommended sea-level rise projections from Task 1 to evaluate the future flood risk from coastal storm surge and map the 100-year flood risk for the 25-, 50-, and 100-year future conditions. For Task 3 the City asked Jones Edmunds to use the recommended sea-level rise projections to evaluate the future rainfall-induced flood risk for three return period storms for the 25-, 50-, and 100-year future conditions. This task also included mapping the future rainfall-induced flood risk for each of the future conditions scenarios and mapping the 100-year return period combined storm surge and rainfall-induced flood risk for each of the planning horizons. This Technical Memorandum summarizes Task 3.

## 2 FUTURE CONDITIONS STORMWATER MODELING APPROACH

Jones Edmunds developed 2044, 2069, and 2119 drainage conditions models for the 10-, 25-, and 100-year/24-hour return period storm events to see what future drainage conditions within the City may be and to determine how rainfall-induced flooding may be impacted by sea-level rise and new development within the City. To develop these models, Jones Edmunds adjusted hydrologic and hydraulic parameters in the Interconnected Pond Routing (ICPR) Version 4 models that were developed during the City's 2018 Stormwater Master Plan update to reflect projected increases in impervious area from future development, increased boundary conditions and node initial conditions from rising sea levels, and reduced soil storage from rising sea levels. The following sections summarize how each of these changes was considered.

### 2.1 FUTURE IMPERVIOUS AREA UPDATES

Jones Edmunds used the rates of future development that were developed for the City's 2018 Stormwater Master Plan update to estimate the impervious area in the City in 2044, 2069, and 2119. The estimated future impervious values were applied to the modeled stormwater drainage basins so that modeled runoff accurately reflects future conditions.

Basin curve numbers (CNs) were updated to reflect hydrologic conditions resulting from projected future increases in impervious area for the 2044, 2069, and 2119 conditions in the residential area shown in Figure 1. According to City staff, this area has experienced increases in imperviousness on residential parcels that the City expects will continue. Many of the parcels in this area currently have less impervious surface coverage than the maximum allowable limit of 45 percent. For the future conditions modeling completed during the 2018 Stormwater Master Plan update, we assumed that 40 percent of the residential parcels that currently have less than 45 percent impervious surface coverage would be built-out to 45 percent by 2030 and that 45 percent of the remaining 60 percent of the parcels would be built-out to 45 percent by 2045. This assumption was made based on City staff's understanding of the redevelopment rates in this area when the Stormwater Master Plan update modeling was completed.

For the future conditions modeling completed in this task, we assumed that the 2044 hydrologic conditions would be the same as the 2045 conditions used during the Stormwater Master Plan update. For the 2069 and 2119 scenarios we assumed that 45 percent of the remaining parcels below the 45 percent limit would continue to be built-out between 2045 and 2069 and between 2069 and 2119. Using these assumptions, 67 percent of the parcels would be built-out in 2044, 82 percent of the parcels would be built-out in 2069, and 90 percent of the parcels would be built-out in 2119. The new impervious area was applied to the basins spatially for each scenario so that it was correctly assigned based on the number of parcels available for redevelopment in each basin.

**Figure 1 Future Conditions Impervious Update Area**

## 2.2 BOUNDARY CONDITION UPDATES FROM SEA-LEVEL RISE

Jones Edmunds used the intermediate-high values from the National Oceanic and Atmospheric Administration (NOAA) 2017 sea-level rise projections recommended in Task 1 to update the tidal boundary conditions for the future drainage condition models. Tidal boundary conditions in the 2018 Stormwater Master Plan update model were set at elevation 2.0 feet NAVD88 based on mean higher high tide data from Florida Department of Environmental Protection's (FDEPs) Bar Pilots Dock St. Johns River tide station (ID 872-0218) and from FDEPs Pablo Creek tide station (ID 872-0267).

Based on the intermediate-high values from the NOAA 2017 sea-level rise projections, we increased the tidal boundary conditions and model node initial stages where necessary according to the projected increases in sea level in 2044, 2069, and 2119 for the future conditions scenarios. Table 1 summarizes the updated boundary condition elevations and projected sea-level rise increases.

**Table 1 Summary of Boundary Condition Updates**

Scenario	Projected Sea Level Rise (feet)	Tidal Boundary Stage* (feet NAVD88)
2044	1.06	3.06
2069	2.65	4.65
2119	6.75	8.75

\*Predicted future mean higher high water level

## 2.3 CHANGES IN RUNOFF DUE TO REDUCTION IN SOIL STORAGE

Jones Edmunds adjusted basin Natural Resources Conservation Service (NRCS) CN parameters to reflect hydrologic conditions with decreased soil storage from higher groundwater tables created by rising sea levels. We expect that surficial groundwater levels will be higher because of consistently higher tides. This increase in groundwater levels will reduce the amount of soil storage available for rainfall to infiltrate and will increase the volume of runoff during storm events. The decrease in soil storage will be more marked in areas directly adjacent to the coastline and will be reduced further inland.

We assumed that locations directly connected to the boundary condition will experience groundwater table increases equivalent to the increases in boundary conditions from sea-level rise in Section 2.2. We also assumed that the increase in groundwater table elevation will decrease at a linear rate and that the increases would become negligible and be 0 at 1 mile inland from the boundary condition, which included Sherman's Creek and Hopkins Creek. These assumptions were based on our engineering judgement. A detailed groundwater model would be required to understand the spatial effects of sea-level rise on groundwater table elevations but is not included in the scope and budget of this project.

We calculated the increase in groundwater table elevation throughout the watershed based on this linear relationship. We used the increase in groundwater table elevation and soil parameters from the University of Florida's Institute of Food and Agricultural Sciences (UF IFAS) Florida Soil Characterization Data Retrieval System database to calculate the soil storage reduction that would occur and the resulting total soil storage available for runoff infiltration under the sea-level rise scenarios. We then used Technical Release 55 (TR-55) CN relationships to calculate the resulting open land CNs that would result from the reduced soil storage capacity. Finally, we recalculated weighted CNs that accounted for impervious areas for all model basins. The average CN increased from 81 in the Existing Conditions Model to 90 in the 2044 Conditions Model, 97 in the 2069 Conditions Model, and 99 in the 2119 conditions model.

## 3 FLOOD RISK MAPPING

### 3.1 RAINFALL-INDUCED INUNDATION MAPPING

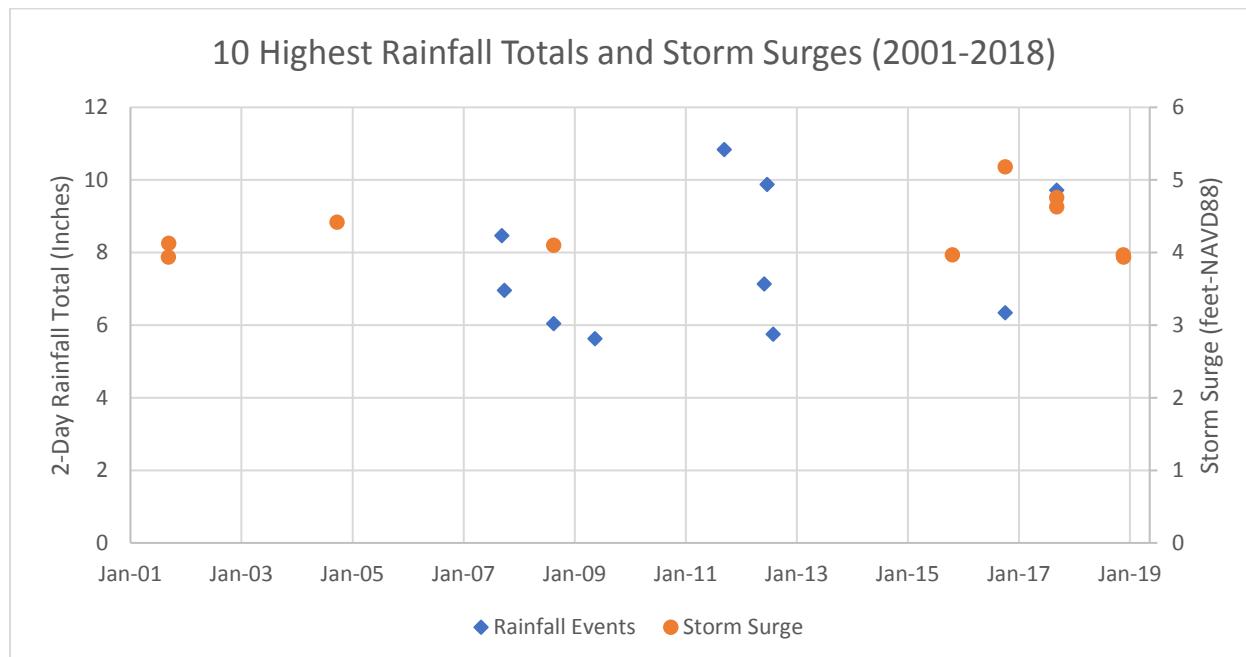
Node peak stage results from the future drainage conditions models were used to map the predicted rainfall-induced flood risk in the City in 2044, 2069, and 2119 for the 10-, 25-, and 100-year return period 24-hour rainfall events. The results were mapped using the 5-foot-by-5-foot digital elevation model (DEM) generated from the 2007 City of Jacksonville Light Detection and Ranging (LiDAR) data. The DEM did not account for grading changes that have occurred since the LiDAR was collected, including the grading changes at the Atlantic Beach Country Club. Polygons were plotted where the node peak stages were greater than the DEM elevation. Gaps and holes in the polygons greater than 2,500 square feet were filled and polygons less than 2,500 square feet were deleted. Figures 1, 2, and 3 show results of the rainfall-induced inundation mapping completed for the 10-, 25-, and 100-year return period 24-hour storms.

### 3.2 COMBINED RAINFALL AND COASTAL INUNDATION MAPS

Jones Edmunds combined the future storm surge flood risk maps that were produced by ATM for Task 2 and the rainfall-induced inundation maps for the 100-year return period storm produced by Jones Edmunds. Figure 5 compares ATM's storm surge flood extents for 2044, 2069, and 2119. Figure 6, 7, and 8 show the combination of rainfall-induced inundation and surge-and-wave-induced flooding for 2044, 2069, and 2119. Where there was overlap between the flood risk mapping, we selected the higher inundation estimate from the two mapping sources. These maps provide the City with a spatial estimate of future flood risk that can be used in the City's vulnerability assessment. Figure 9 is a comparison of the inundation extent of the 2044, 2069, and 2119 conditions.

Rainfall-induced flood risk and coastal surge flood risk are usually evaluated relatively independently because the two forms of flood risk are neither fully dependent or fully independent. Therefore, traditional statistical approaches are not applicable. The standard workaround to the problem is to evaluate the two relatively independently and then take the higher of the combined identified risk at each location.

**Figure 2      Occurrence of 10 highest rainfall totals and storm surges in Atlantic Beach between 2001 and 2018.**



### 4 REFERENCES

NOAA. 2017. *NOAA Technical Report NOS CO-OPS 083, National Oceanic and Atmospheric Administration, Global and Regional Sea Level Rise Scenarios For The United States* (NOAA et al. 2017). Available at <https://tidesandcurrents.noaa.gov/publications/tech rpt83 Global and Regional SLR Scenarios for the US final.pdf>.

US Army Corps of Engineers (USACE). 2017. *Sea-Level Change Curve Calculator, Version 2017.55*. Revised July 18, 2017. Available at: [http://corpsmapu.usace.army.mil/rccinfo/slcc/slcc\\_calc.html](http://corpsmapu.usace.army.mil/rccinfo/slcc/slcc_calc.html).

Figure 3

## City of Atlantic Beach Rainfall Based Inundation - 10-Year/24-Hour

Atlantic Beach Vulnerability Assessment Support

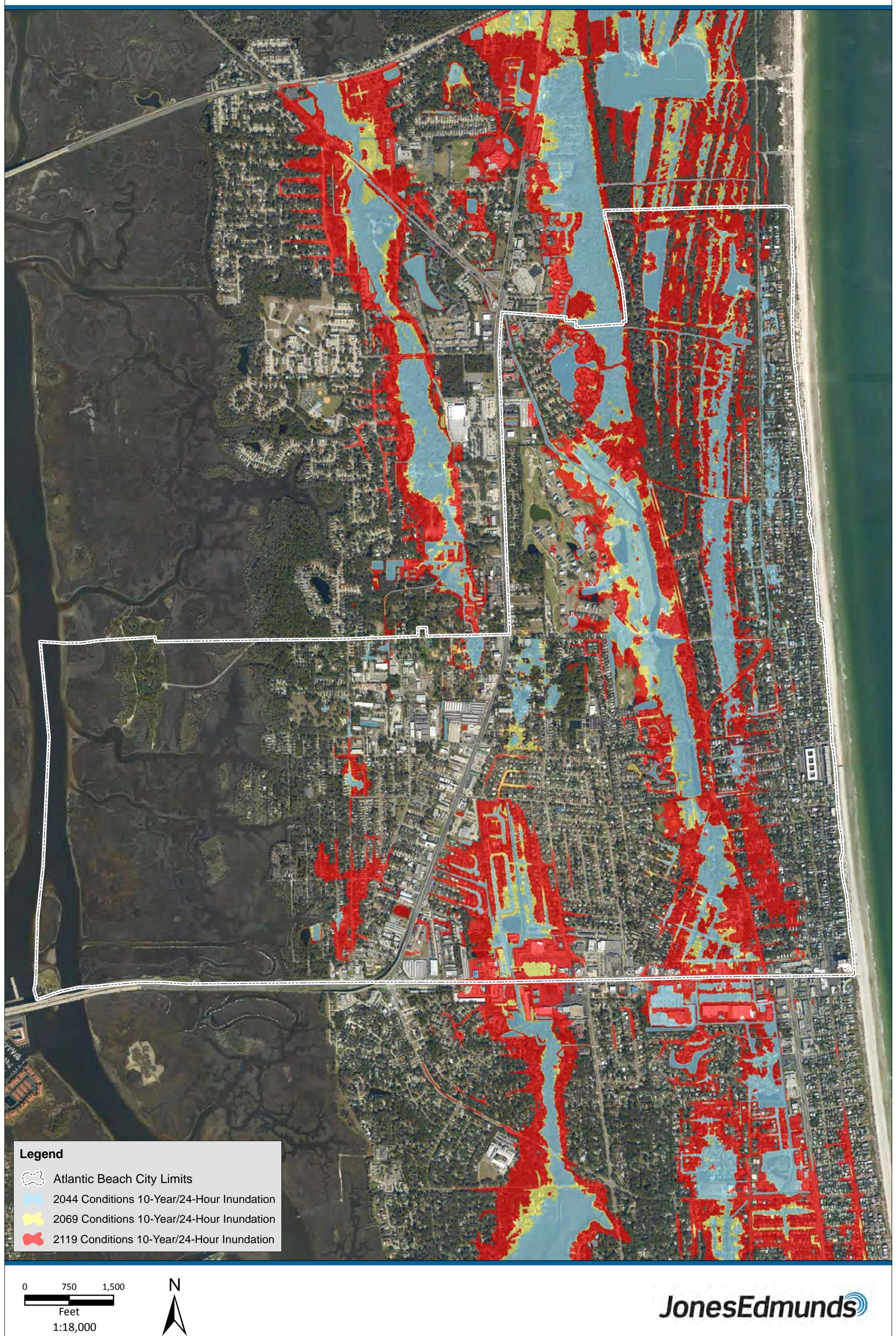


Figure 4

## City of Atlantic Beach Rainfall Based Inundation - 25-Year/24-Hour

Atlantic Beach Vulnerability Assessment Support



Figure 5

## City of Atlantic Beach Rainfall Based Inundation - 100-Year/24-Hour

Atlantic Beach Vulnerability Assessment Support



Figure 6

## City of Atlantic Beach Surge Based Inundation - 100-Year

Atlantic Beach Vulnerability Assessment Support

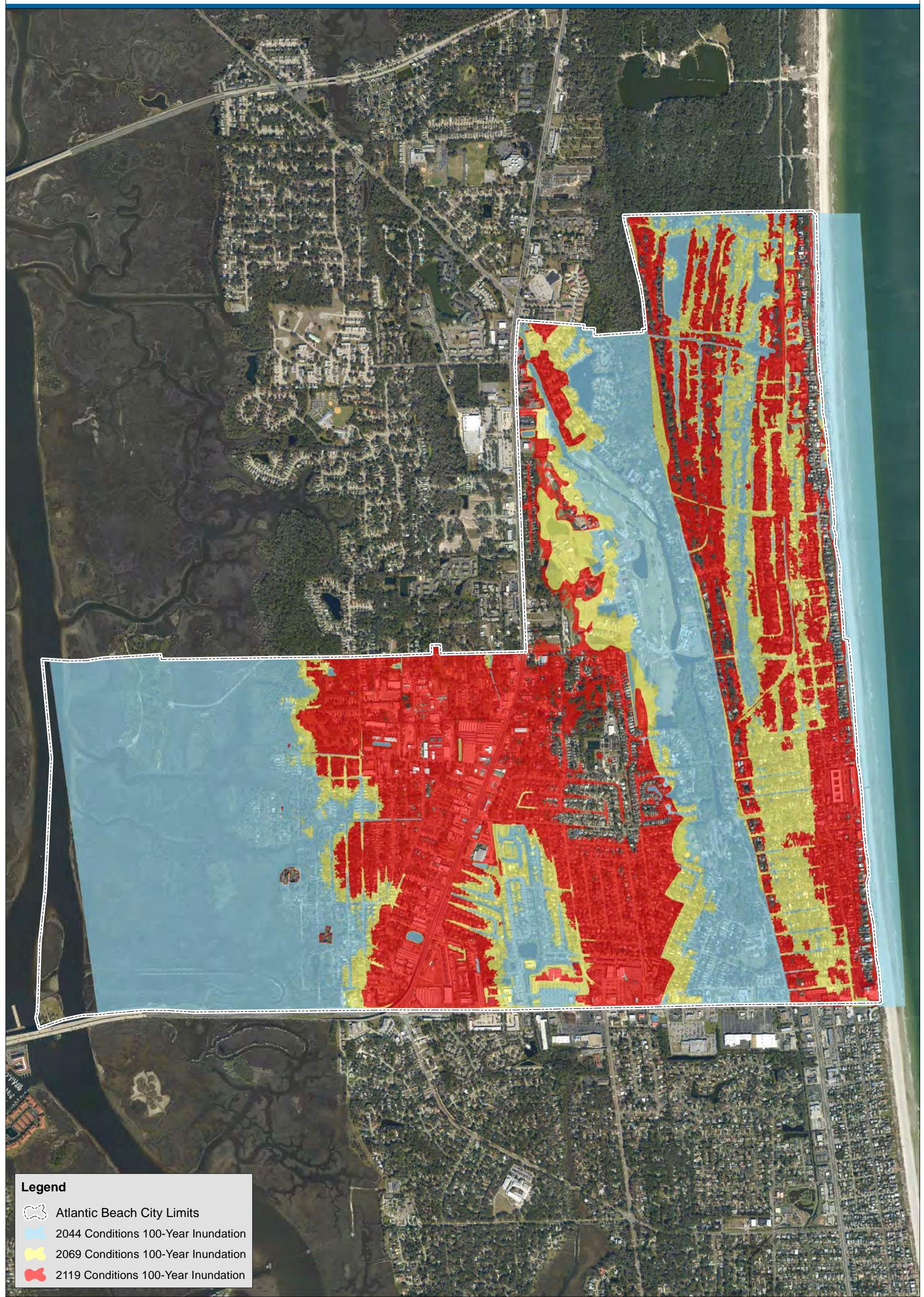


Figure 7

## City of Atlantic Beach Rainfall vs. Surge Inundation - 2044 Conditions 100-Year Inundation

Atlantic Beach Vulnerability Assessment Support



Figure 8

## City of Atlantic Beach Rainfall vs. Surge Inundation - 2069 Conditions 100-Year Inundation

Atlantic Beach Vulnerability Assessment Support

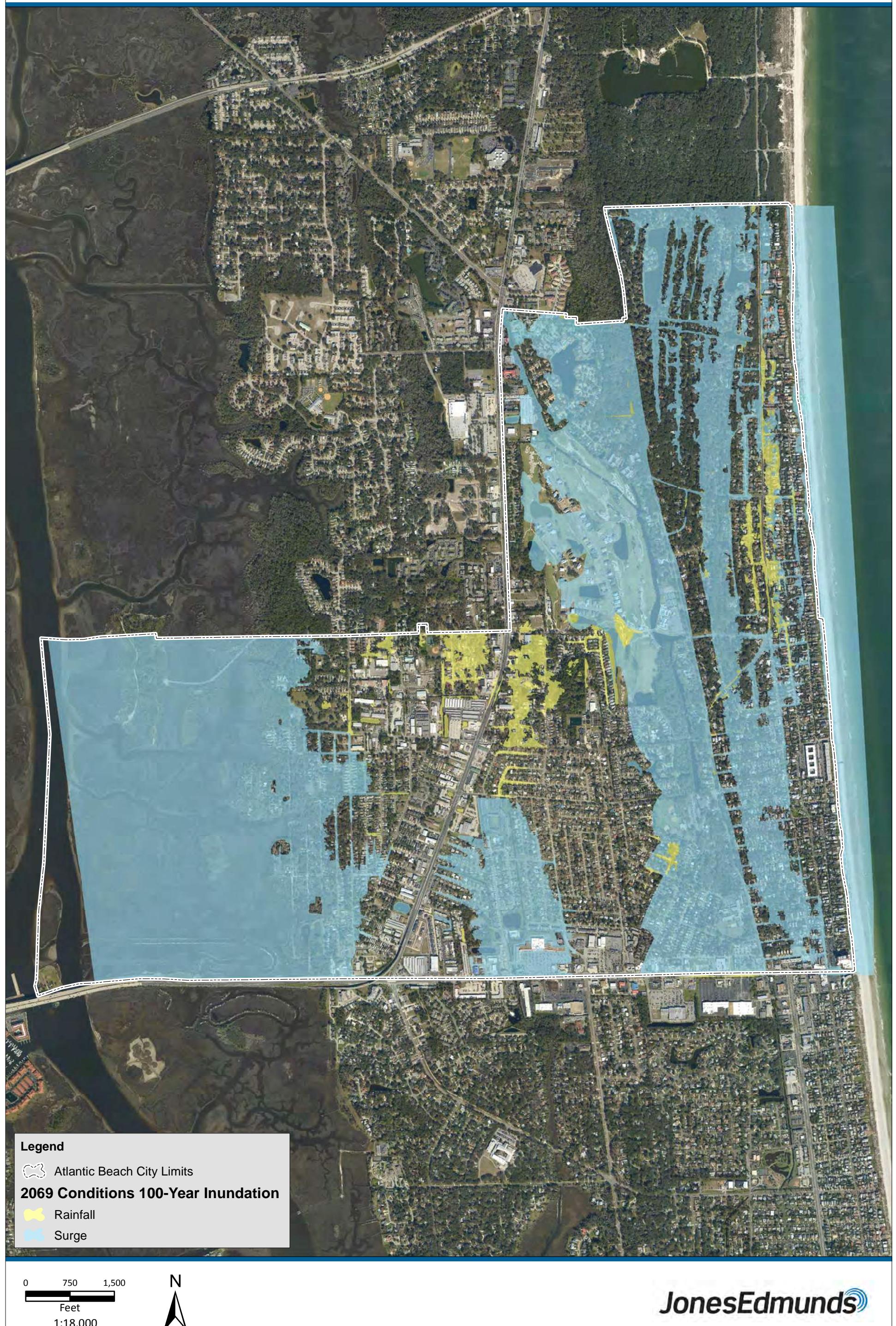


Figure 9

**City of Atlantic Beach Rainfall vs. Surge Inundation - 2119 Conditions 100-Year Inundation**

Atlantic Beach Vulnerability Assessment Support

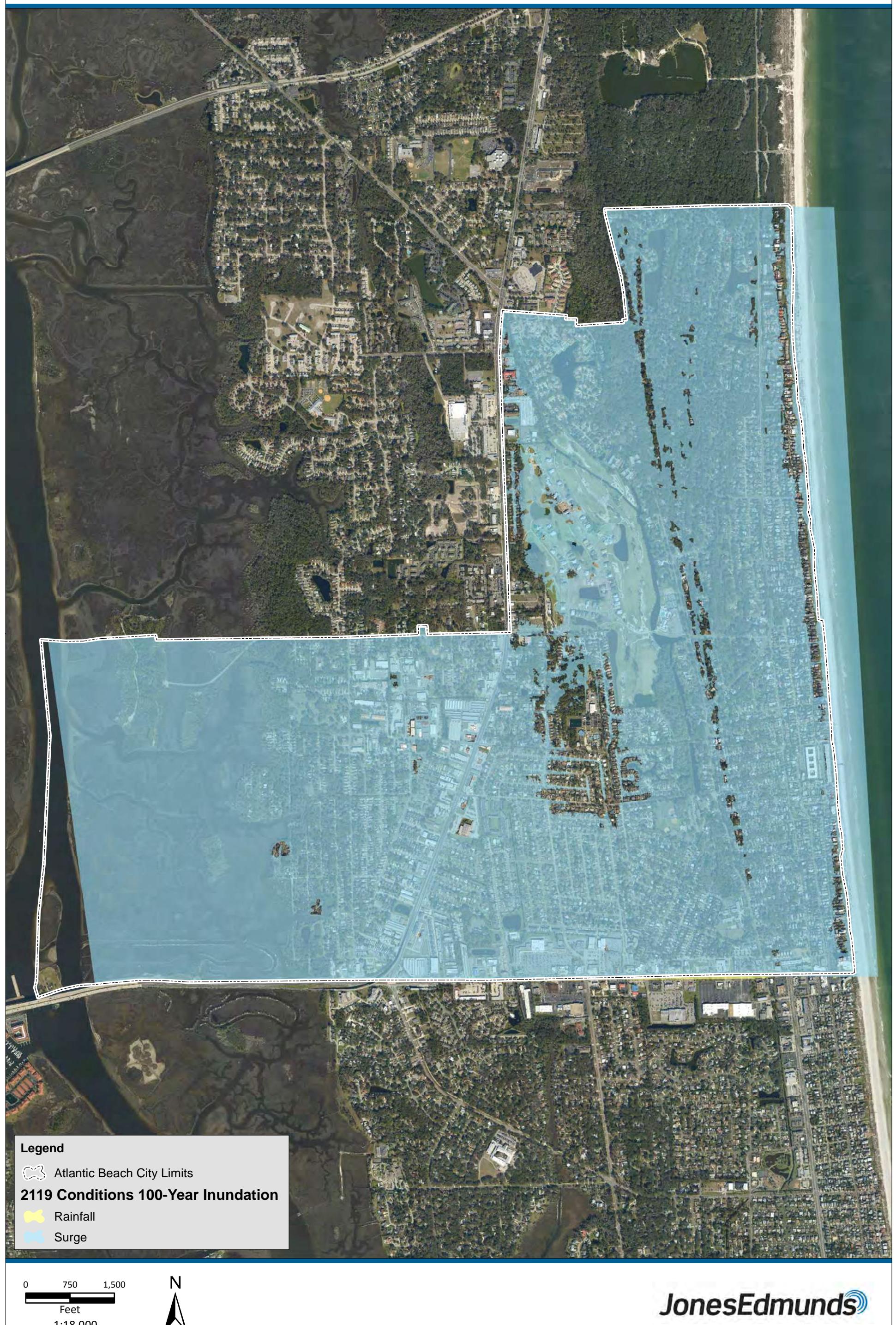
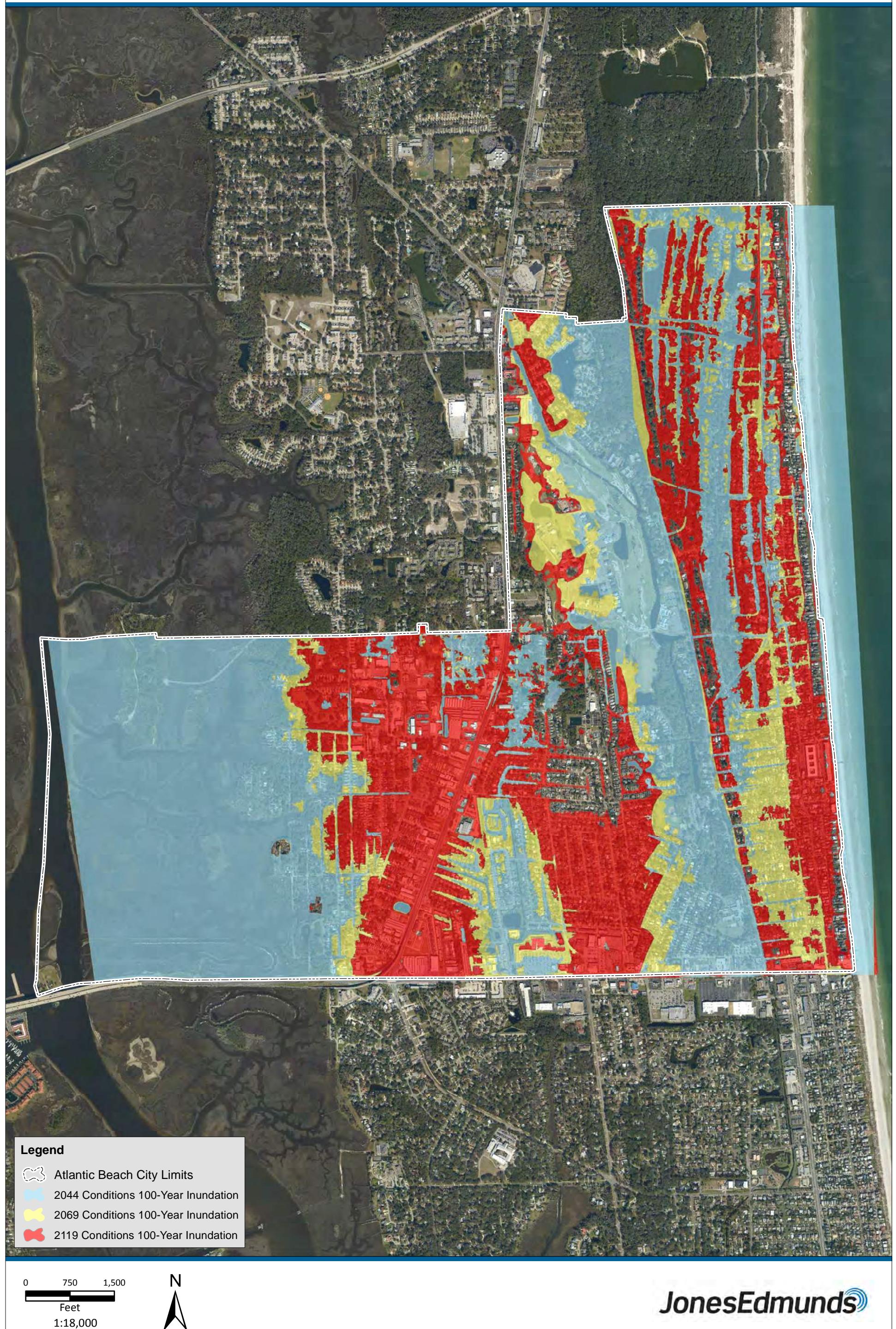


Figure 10

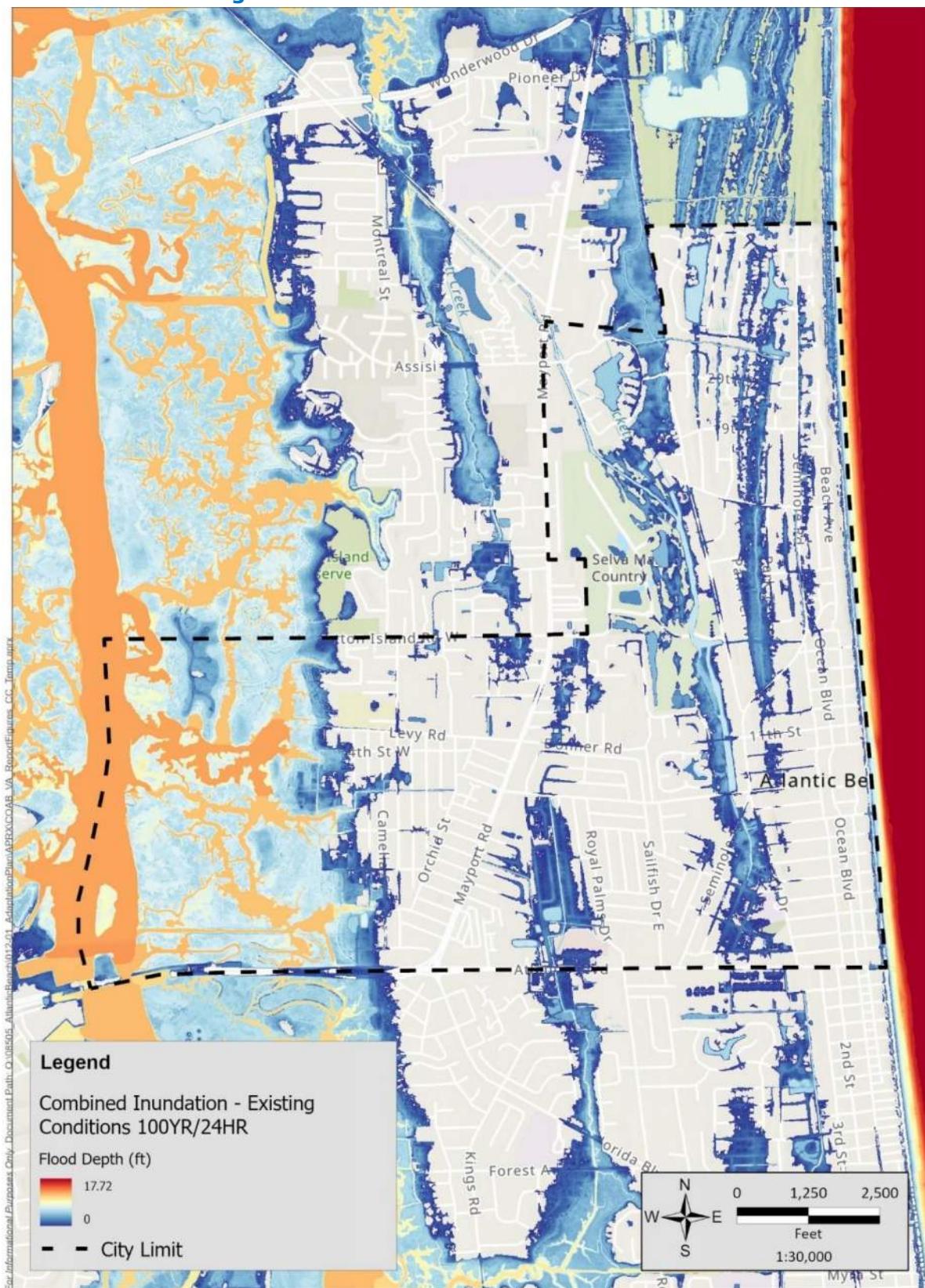
## City of Atlantic Beach Inundation By Combined Rainfall And Surge Comparison - 100-Year

Atlantic Beach Vulnerability Assessment Support



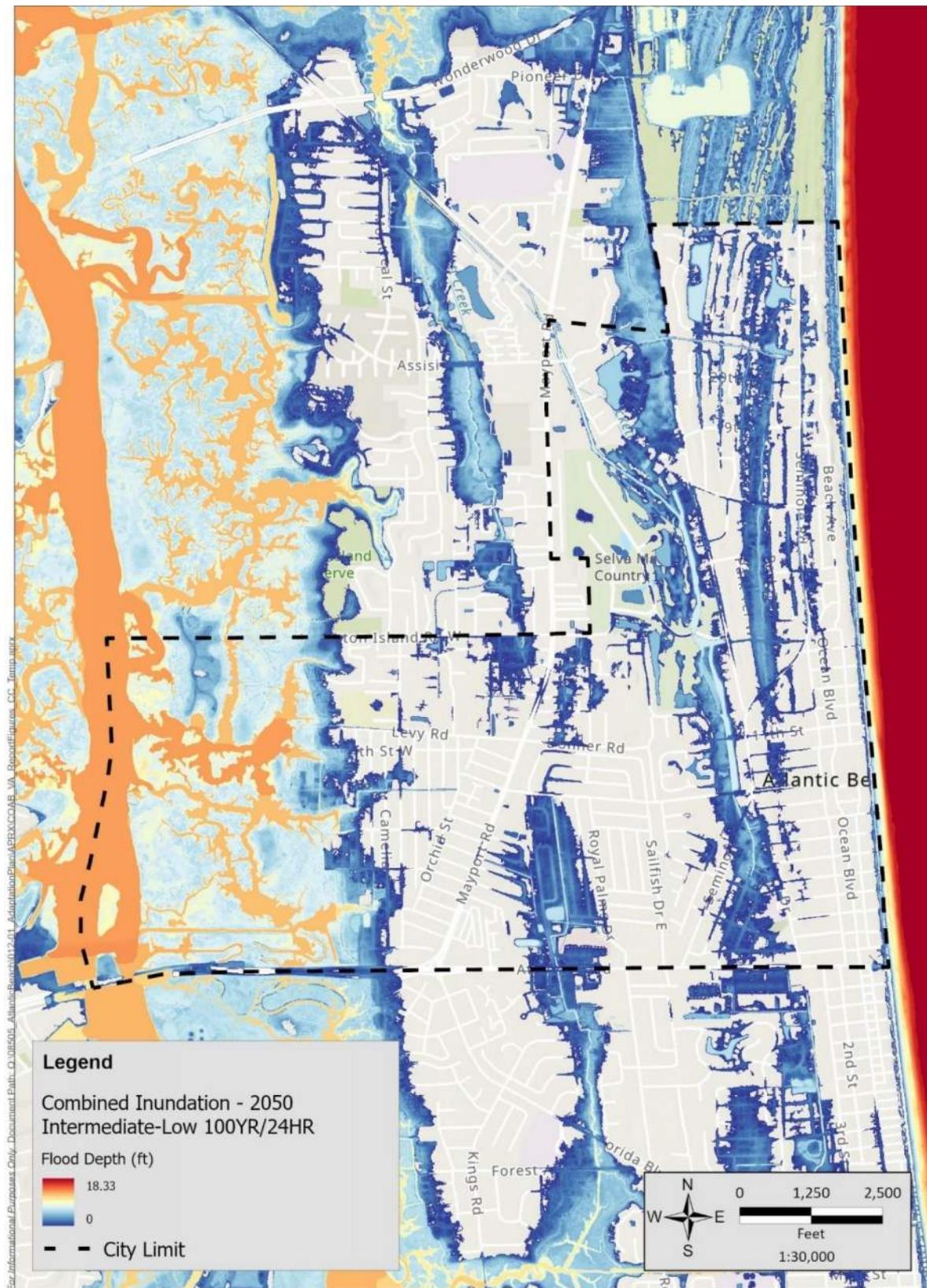
## Appendix C – Future 100-Yr Flood Risk Maps

**Figure 1 Combined Flooding for the 100-Year, 24-Hour Storm Event Under Existing Conditions**



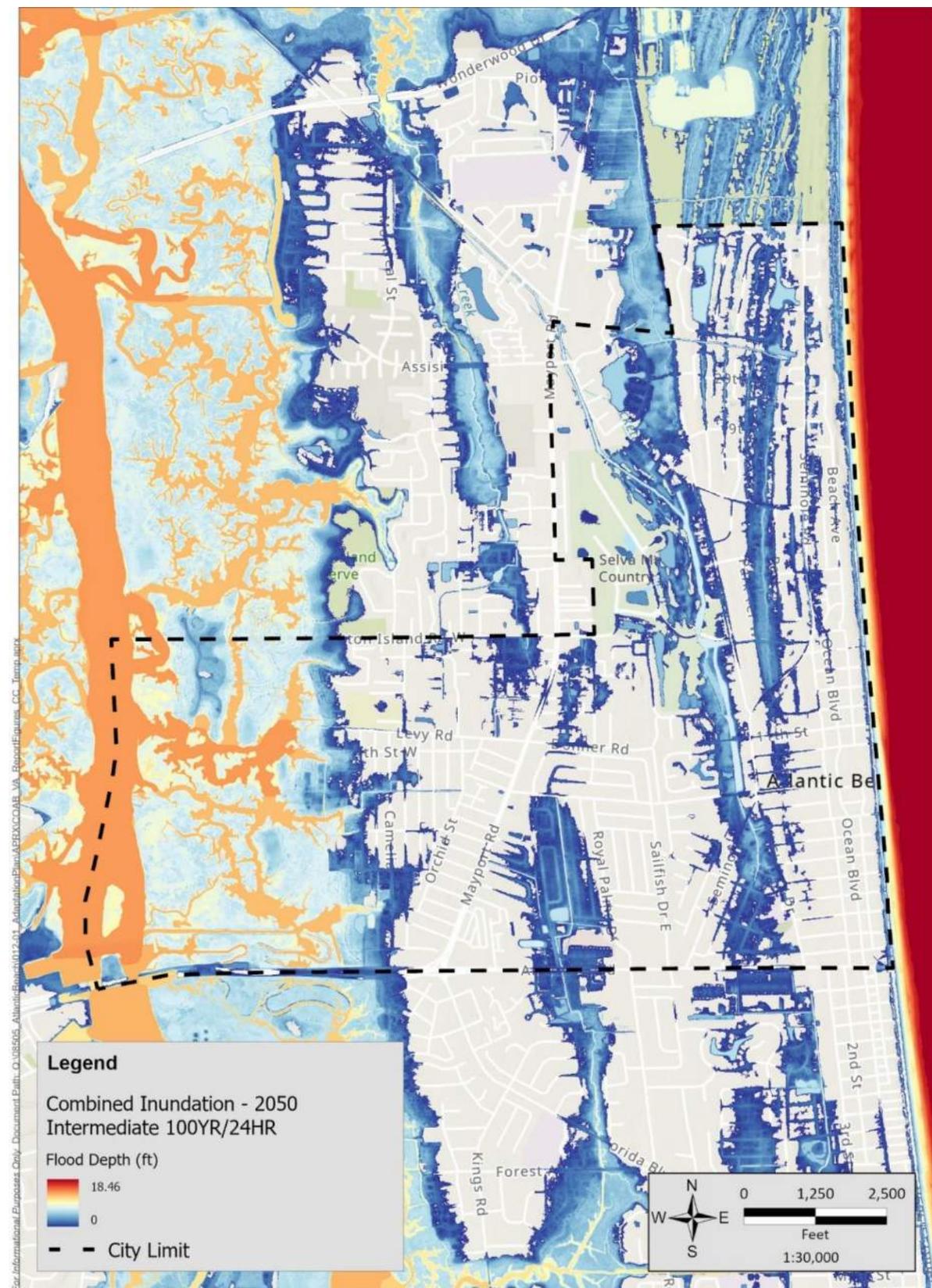
## Appendix C – Future 100-Yr Flood Risk Maps

**Figure 2 Combined Flooding for the 100-Year, 24-Hour Storm Event Under 2050 Intermediate-Low SLR Conditions**



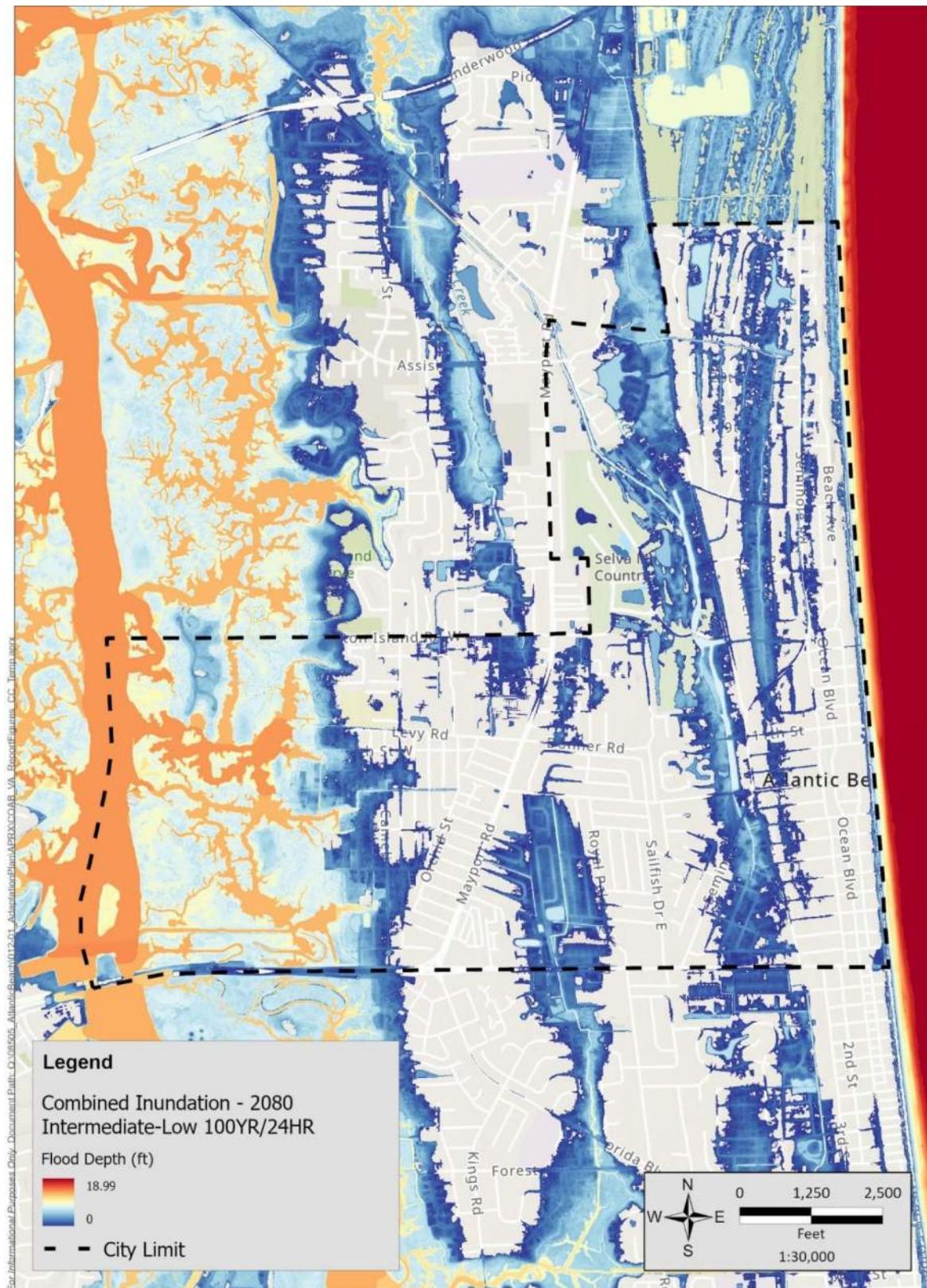
## Appendix C – Future 100-Yr Flood Risk Maps

**Figure 3 Combined Flooding for the 100-Year, 24-Hour Storm Event Under 2050 Intermediate SLR Conditions**



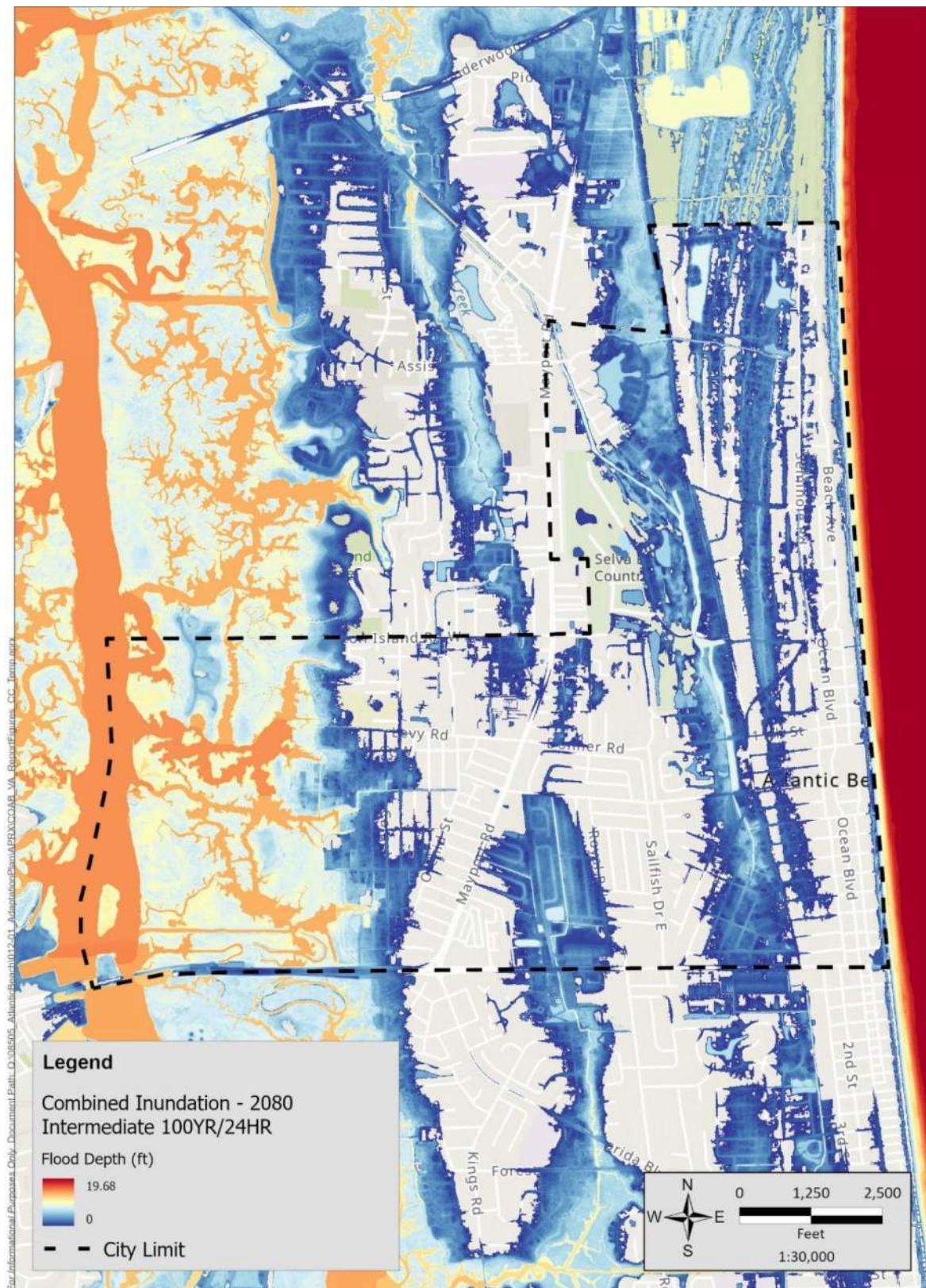
## Appendix C – Future 100-Yr Flood Risk Maps

**Figure 4 Combined Flooding for the 100-Year, 24-Hour Storm Event Under 2080 Intermediate-Low SLR Conditions**



## Appendix C – Future 100-Yr Flood Risk Maps

**Figure 5 Combined Flooding for the 100-Year, 24-Hour Storm Event Under 2080 Intermediate SLR Conditions**



## Appendix D – Sensitivity Analysis Tables and Figures

**Table 1 Critical and Regionally Significant Assets**

Asset Class	Asset Type	Dataset	Source	Data Type	Elevation Source
Transportation and Evacuation Routes	Airports	N/A			N/A
	Bridges	N/A			N/A
	Bus Terminals	N/A			N/A
	Ports	N/A			N/A
	Major Roadways	Major Roadways	FDOT	Lines (GIS)	2018 FDEM LiDAR DEM
		Critical Roads from COAB	COAB	Lines (GIS)	
	Marinas	N/A			N/A
	Railways	N/A			N/A
	Railroad Bridges	N/A			N/A
Critical Infrastructure	Wastewater Treatment Facilities and Lift Stations	Wastewater Facilities	FDEM	Points (GIS)	2018 FDEM LiDAR DEM
		Facilities	FEMA	Points (GIS)	2018 FDEM LiDAR DEM
		Pump_Lift_Stations	COAB	Points (GIS)	2018 FDEM LiDAR DEM
		Sewer_Plant	COAB	Points (GIS)	2018 FDEM LiDAR DEM
		Wastewater Treatment Plant Facilities	JE Review	Points (GIS)	2018 FDEM LiDAR DEM
	Stormwater Treatment Facilities and Lift Stations	N/A			N/A
	Drinking Water Facilities	Facilities	FDEP	Points (GIS)	2018 FDEM LiDAR DEM
		Potable_Water_Well	COAB	Points (GIS)	
		Water_Plant	COAB	Points (GIS)	
		Water Treatment Plant Facilities	JE Review	Points (GIS)	
	Electric Production and Supply	N/A			N/A
	Solid and Hazardous Waste Facilities	Solid Waste Facilities	FDEM	Points (GIS)	2018 FDEM LiDAR DEM
		Solid Waste Facilities	FDEP	Points (GIS)	
	Military Installations	N/A			N/A
	Communications Facilities	Radio Towers	FDEM	Points (GIS)	2018 FDEM LiDAR DEM
	Disaster Debris Management Sites	Disaster Debris Sites	COAB	Points (GIS)	2018 FDEM LiDAR DEM

## Appendix D – Sensitivity Analysis Tables and Figures

Asset Class	Asset Type	Dataset	Source	Data Type	Elevation Source
Critical Community and Emergency Facilities	Schools	School Sites	FEMA	Points (GIS)	SJRWMD ERP/2018 FDEM LiDAR DEM Building Footprint Extract
		Public Schools	FDEM	Points (GIS)	
		Day Cares	FDEM	Points (GIS)	
		Day Cares	Jones Edmunds Data Review	Points (GIS)	
	Colleges and Universities	N/A			N/A
	Community Centers	Municipal_Facilities	COAB	Points (GIS)	2018 FDEM LiDAR DEM Building Footprint Extract
	Correctional Facilities	N/A			N/A
	Disaster Recovery Centers	Disaster Recovery Centers	COAB	Points (GIS)	N/A
	Emergency Medical Service Facilities	N/A			N/A
	Emergency Operation Centers	Emergency Operations Centers	COAB	Points (GIS)	N/A
	Fire Stations	Fire Stations	FEMA	Points (GIS)	SJRWMD ERP
		Fire Stations	FDEM	Points (GIS)	
	Health Care Facilities	Health Care Facilities	FDEM	Points (GIS)	SJRWMD ERP/2018 FDEM LiDAR DEM Building Footprint Extract
		Health Care Facilities	Jones Edmunds Data Review	Points (GIS)	
		Health Care Facilities	FEMA	Points (GIS)	
	Hospitals	N/A			N/A
	Law Enforcement Facilities	Municipal_Facilities	COAB	Points (GIS)	SJRWMD ERP
	Local Government Facilities	Municipal_Facilities	COAB	Points (GIS)	SJRWMD ERP/2018 FDEM LiDAR DEM Building Footprint Extract
	Logistical Staging Areas	Logistical Staging Areas	COAB	Points (GIS)	N/A
	Affordable Public Housing	Affordable Housing Locations	Jones Edmunds Data Review	Points (GIS)	N/A
	Risk Shelter Inventory	N/A			N/A
	State Government Facilities	N/A			N/A

## Appendix D – Sensitivity Analysis Tables and Figures

Asset Class	Asset Type	Dataset	Source	Data Type	Elevation Source
Natural, Cultural, and Historical Resource	Conservation Lands	SJRWMD-Owned Conservation Easements	SJRWMD GIS Datahub	Polygons (GIS)	N/A
		Regulatory Conservation Easements	SJRWMD GIS Datahub	Polygons (GIS)	
		Other SJRWMD-Owned Lands	SJRWMD GIS Datahub	Polygons (GIS)	
		FNAI Conservation Lands	FNAI/COAB	Polygons (GIS)	
	Parks	Parks	FDEP	Polygons (GIS)	2018 FDEM LiDAR DEM
		Parks	Open Street Map	Polygons (GIS)	
		Parks	Jones Edmunds Data Review	Polygons (GIS)	
	Shorelines	Florida Shoreline	FWC	Lines (GIS)	2018 FDEM LiDAR DEM
	Surface Waters	Surface Waters	Florida NHD	Polygons (GIS)	2018 FDEM LiDAR DEM
	Wetlands	Wetlands/Riverine	SJRWMD	Polygons (GIS)	2018 FDEM LiDAR DEM
			NWI	Polygons (GIS)	
	Historical and Cultural Assets	Historical and Cultural Assets	SHPO	Points (GIS)	2018 FDEM LiDAR DEM
		Structures	SHPO	Points (GIS)	
		Sites	SHPO	Polygons (GIS)	

## Appendix D – Sensitivity Analysis Tables and Figures

**Table 2 Exposure Level for Critical Assets**

Asset Type	Flood Depth Criteria			Flood Depth (in)			Expected Tidal Flood Days Criteria		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
Airports	Exceeds critical elevation	Within 6 inches of critical elevation	Within 6-12 inches of critical elevation	0	-6	-12	30	15	0.1
Bridges	Greater than 12 inches above critical elevation.	Between 6-12 inches above critical elevation.	Greater than critical elevation but less than 6 inches.	12	6	0	30	15	0.1
Bus Terminals	Building flooding or greater than 12 inches of flooding on paved surface	No building flooding and 6-12 inches on paved surface	Between 0-6 inches on paved surface	12	6	0	30	15	0.1
Ports	Building flooding or greater than 12 inches of flooding on paved surface	No building flooding and 6-12 inches on paved surface	Between 0-6 inches on paved surface	12	6	0	30	15	0.1
Roads	Greater than 12 inches of flooding	Between 6-12 inches	Between 0-6 inches	12	6	0	30	15	0.1
Marinas	Greater than 12 inches of flooding	Between 6-12 inches	Between 0-6 inches	12	6	0	30	15	0.1
Rail Facilities	Building flooding or greater than 12 inches of flooding on paved surface	No building flooding and 6-12 inches on paved surface	Between 0-6 inches on paved surface	12	6	0	30	15	0.1
Railroad Bridges	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Traffic Signal	Greater than 12 inches of flooding	Between 6-12 inches	Between 0-6 inches	12	6	0	30	15	0.1
Wastewater Facilities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Lift Stations	Greater than 12 inches of flooding	Between 0-12 inches	Within 6 inches of flooding	12	0	-6	30	15	0.1
Stormwater Facilities	Greater than 12 inches of flooding	Between 0-12 inches	Within 6 inches of flooding	12	0	-6	30	15	0.1
Water Treatment Plants	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Water Supply Wells	Greater than 12 inches of flooding	Between 0-12 inches	Within 6 inches of flooding	12	0	-6	30	15	0.1
Ground Storage Tanks	Greater than 12 inches of flooding	Between 0-12 inches	Within 6 inches of flooding	12	0	-6	30	15	0.1
Water Distribution Pumps	Greater than 12 inches of flooding	Between 0-12 inches	Within 6 inches of flooding	12	0	-6	30	15	0.1
Electric Facilities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Electric Substations	Greater than 12 inches of flooding	Between 6-12 inches	Between 0-6 inches	12	6	0	30	15	0.1
Solid and Hazardous Waste Facilities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Military Installations	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Radio Communications Towers	Greater than 12 inches of flooding	Between 6-12 inches	Between 0-6 inches	12	6	0	30	15	0.1
Disaster Debris Management Sites	Greater than 6 inches	Between 3-6 inches	Between 0-3 inches	6	3	0	30	15	0.1
Schools	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Day Care Facilities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Colleges and Universities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Community Centers	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Correctional Facilities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Disaster Recovery Centers	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Emergency Medical Service Facilities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Emergency Operation Centers	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Logistical Staging Areas	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Fire Stations	Within 12 inches of flooding	Within 18 inches of flooding	Within 24 inches of flooding	-12	-18	-24	30	15	0.1
Health Care Facilities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Hospitals	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Law Enforcement Facilities	Within 12 inches of flooding	Within 18 inches of flooding	Within 24 inches of flooding	-12	-18	-24	30	15	0.1
Local Government Facilities	Within 12 inches of flooding	Within 18 inches of flooding	Within 24 inches of flooding	-12	-18	-24	30	15	0.1

## Appendix D – Sensitivity Analysis Tables and Figures

Asset Type	Flood Depth Criteria			Flood Depth (in)			Expected Tidal Flood Days Criteria		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
Affordable Public Housing	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Risk Shelter Inventory	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
State Government Facilities	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Conservation Lands	Greater than 24 inches	Between 18-24 inches	Between 12-18 inches	24	18	12	30	15	0.1
Parks	Greater than 36 inches	Between 24-36 inches	Between 12-24 inches	36	24	12	30	15	0.1
Park Assets	Greater than 6 inches	Between 3-6 inches	Between 0-3 inches	6	3	0	30	15	0.1
Shorelines	Greater than 24 inches	Between 18-24 inches	Between 12-18 inches	24	18	12	30	15	0.1
Surface Waters	Greater than 24 inches	Between 18-24 inches	Between 12-18 inches	24	18	12	30	15	0.1
Wetlands	Greater than 24 inches	Between 18-24 inches	Between 12-18 inches	24	18	12	30	15	0.1
Historical and Cultural Structure - High Priority	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Historical and Cultural Structure	Greater than 0	Within 3 inches of flooding	Within 6 inches of flooding	0	-3	-6	30	15	0.1
Historical Cultural Site – High Priority	Greater than 18 inches	Between 9-18 inches	Between 0-9 inches	18	9	0	30	15	0.1
Historical Cultural Site	Greater than 18 inches	Between 9-18 inches	Between 0-9 inches	18	9	0	30	15	0.1

## Appendix D – Sensitivity Analysis Tables and Figures

**Table 3** **Exposure Weighting Factors**

Flood Scenario	Exposure Type Factor	Planning Horizon Scale Factor	Total Exposure Factor	Rank
Tidal Flooding - Existing	6	5	30	4
Tidal Flooding - 2050 - Intermediate-Low		4	24	8
Tidal Flooding - 2050 - Intermediate		3	18	15
Tidal Flooding - 2080 - Intermediate-Low		2	12	21
Tidal Flooding - 2080 - Intermediate		1	6	30
Rainfall Flooding - 100-Year - Existing	4	6	24	8
Rainfall Flooding - 500-Year - Existing	3		18	15
Rainfall Flooding - 100-Year - 2050 Intermediate-Low	3	4	12	21
Rainfall Flooding - 500-Year - 2050 Intermediate-Low	1		4	35
Rainfall Flooding - 100-Year - 2050 Intermediate	3	3	9	26
Rainfall Flooding - 500-Year - 2050 Intermediate	1		3	36
Rainfall Flooding - 100-Year - 2080 Intermediate-Low	3	2	6	30
Rainfall Flooding - 500-Year - 2080 Intermediate-Low	1		2	39
Rainfall Flooding - 100-Year - 2080 Intermediate	3	1	3	36
Rainfall Flooding - 500-Year - 2080 Intermediate	1		1	40
Surge Flooding - 100-Year - Existing	4	6	24	8
Surge Flooding - 100-Year - 2050 Intermediate-Low	3	4	12	21
Surge Flooding - 100-Year - 2050 Intermediate	3	3	9	26
Surge Flooding - 100-Year - 2080 Intermediate-Low	3	2	6	30
Surge Flooding - 100-Year - 2080 Intermediate	3	1	3	36
Tidal Flood Days - Existing	8	5	40	1
Tidal Flood Days - 2040 Intermediate-Low		4	32	3
Tidal Flood Days - 2040 Intermediate-High		3	24	8
Tidal Flood Days - 2070 Intermediate-Low		2	16	17
Tidal Flood Days - 2070 Intermediate-High		1	8	28

## Appendix D – Sensitivity Analysis Tables and Figures

**Table 4 Flood Impact Scores**

Asset Type	Impact Scores		
	Environmental	Social	Economic
Airports	0	5	5
Bridges	0	5	5
Bus Terminals	0	3	3
Ports	0	3	5
Roads	0	5	5
Marinas	0	3	3
Rail Facilities	0	3	5
Railroad Bridges	0	3	5
Waste Water Facilities	5	5	5
Lift Stations	3	5	3
Stormwater Facility	5	3	3
Water Treatment Plants	1	5	5
Water Supply Wells	1	5	5
Ground Storage Tanks	1	5	5
Water Distribution Pumps	1	5	5
Electric Facilities	0	5	5
Solid and Hazardous Waste Facilities	3	3	1
Military Installations	0	5	1
Radio Communications Towers	0	1	1
Disaster Debris Management Sites	0	5	1
Schools	0	5	5
Day Cares	0	5	3
Colleges and Universities	0	5	3
Community Centers	0	3	1
Correctional Facilities	0	5	1
Disaster Recovery Centers	0	5	3
Emergency Medical Service Facilities	0	5	3
Emergency Operation Centers	0	5	5
Logistical Staging Areas	0	5	5
Fire Stations	0	5	3
Health Care Facilities	0	5	1
Hospitals	0	5	3
Law Enforcement Facilities	0	5	3
Local Government Facilities	0	3	3
Affordable Public Housing	0	3	1
Risk Shelter Inventory	0	5	1
State Government Facilities	0	3	3

## Appendix D – Sensitivity Analysis Tables and Figures

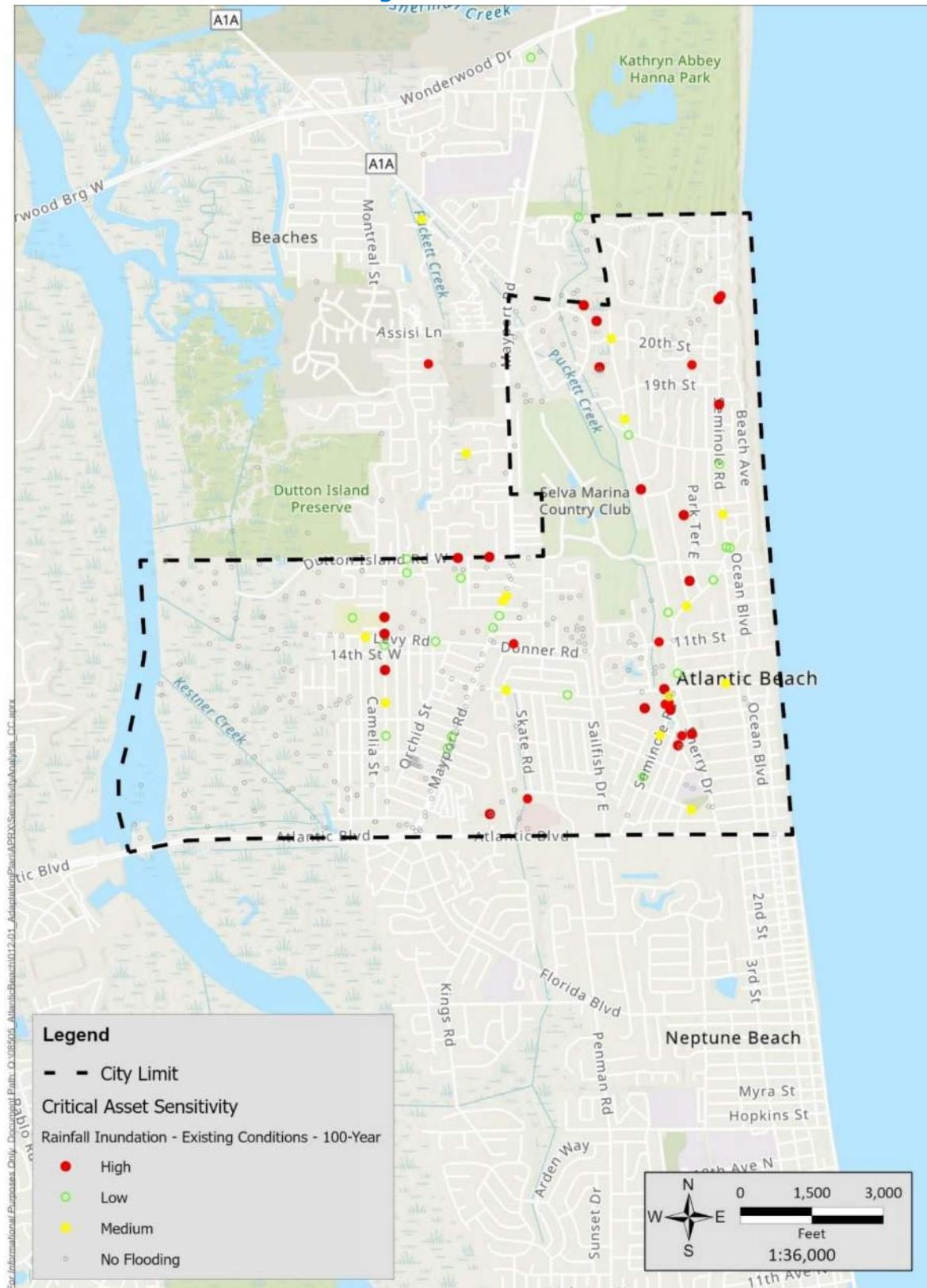
Asset Type	Impact Scores		
	Environmental	Social	Economic
Conservation Lands	0	0	0
Parks	0	1	0
Shorelines	3	3	1
Surface Waters	3	1	1
Wetlands	3	1	1
Historical and Cultural Structure	0	1	1
Historical Cultural Site	0	1	1

**Table 2 Priority Ratings by Asset Type**

Asset Type	Total	Priority Rating					
		Highest	High	Medium	Low	Lowest	N/A
Affordable Public Housing	10						10
Communication Facilities	4			1		1	2
Community Centers	4				1		3
Conservation Lands	5						5
Disaster Debris Site	3	1					2
Disaster Recovery Center	1						1
Drinking Water Facilities	9				1	1	7
Emergency Operations Center	1				1		
Fire Stations	1		1				
Health Care Facilities	10					3	7
Historical and Cultural Assets	2			1		1	
Law Enforcement Facilities	1			1			
Lift Stations	32	8	3	5	2	1	13
Local Government Facilities	3	2					1
Logistical Staging Area	2			1			1
Parks	16				8	4	4
Risk Shelter Inventory	1						1
Roads	83	10	19	11	11	7	25
Schools	5			1	1	1	2
Shorelines	2						2
Stormwater Facilities	1					1	
Solid and Hazardous Waste Facilities	2					1	1
Surface Waters	38					1	37
Waste Water Facilities	1						1
Wetlands	109						109
<b>Total</b>	<b>346</b>	<b>21</b>	<b>23</b>	<b>21</b>	<b>25</b>	<b>22</b>	<b>234</b>

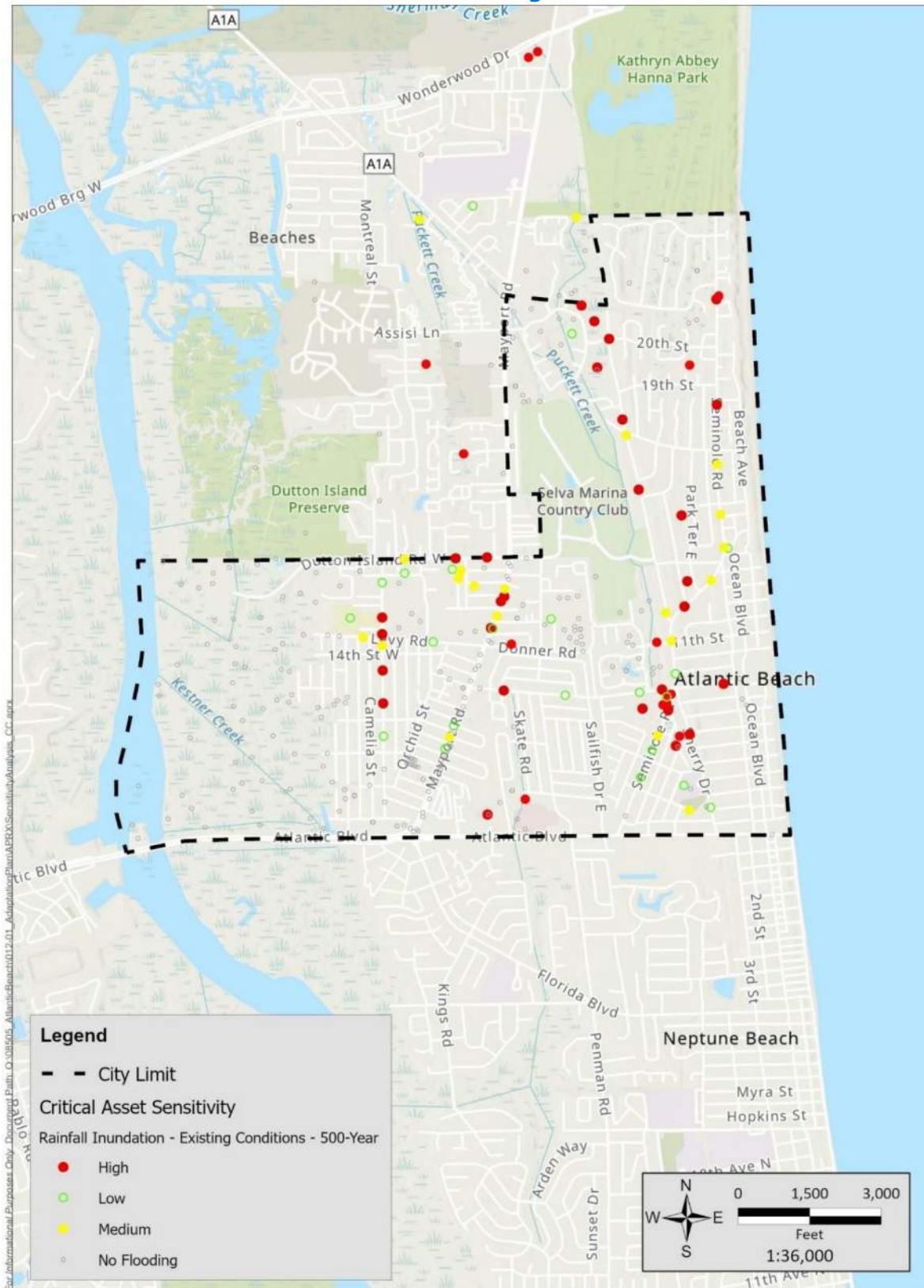
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 1 Sensitivity Results for Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event under Existing Conditions**



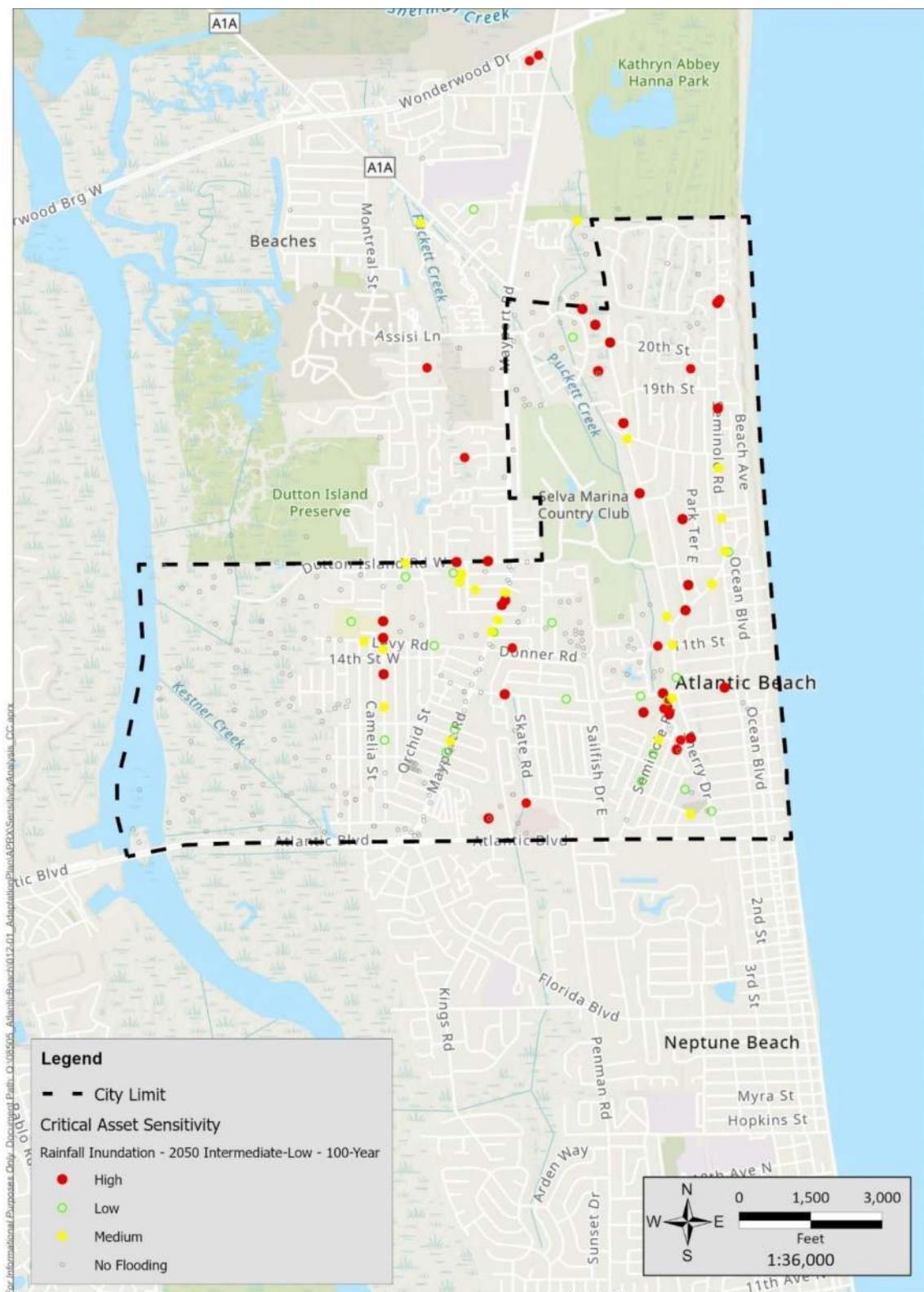
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 2 Sensitivity Results for Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event under Existing Conditions**



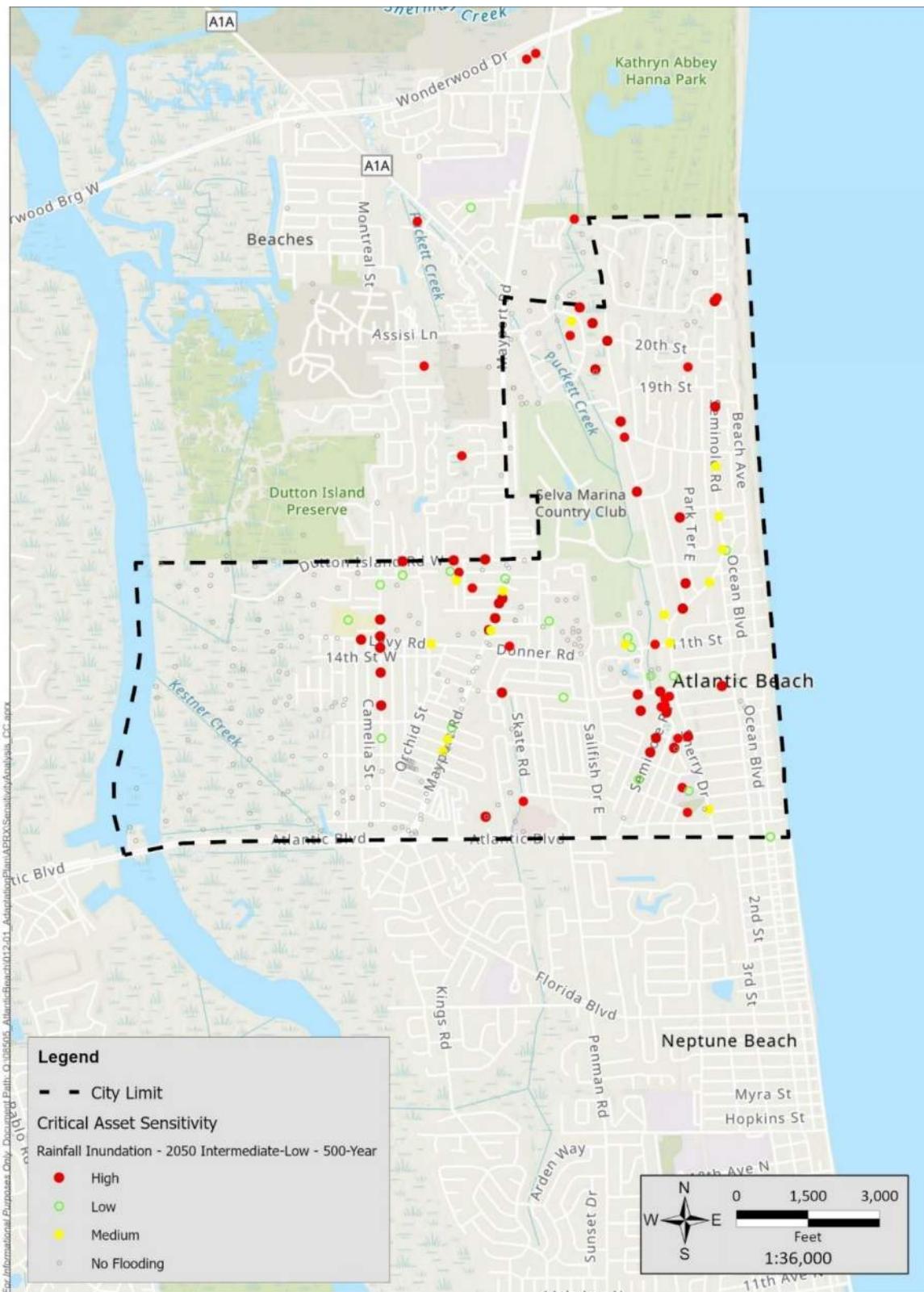
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 3 Sensitivity Results for Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event under 2050 Intermediate-Low SLR Conditions**



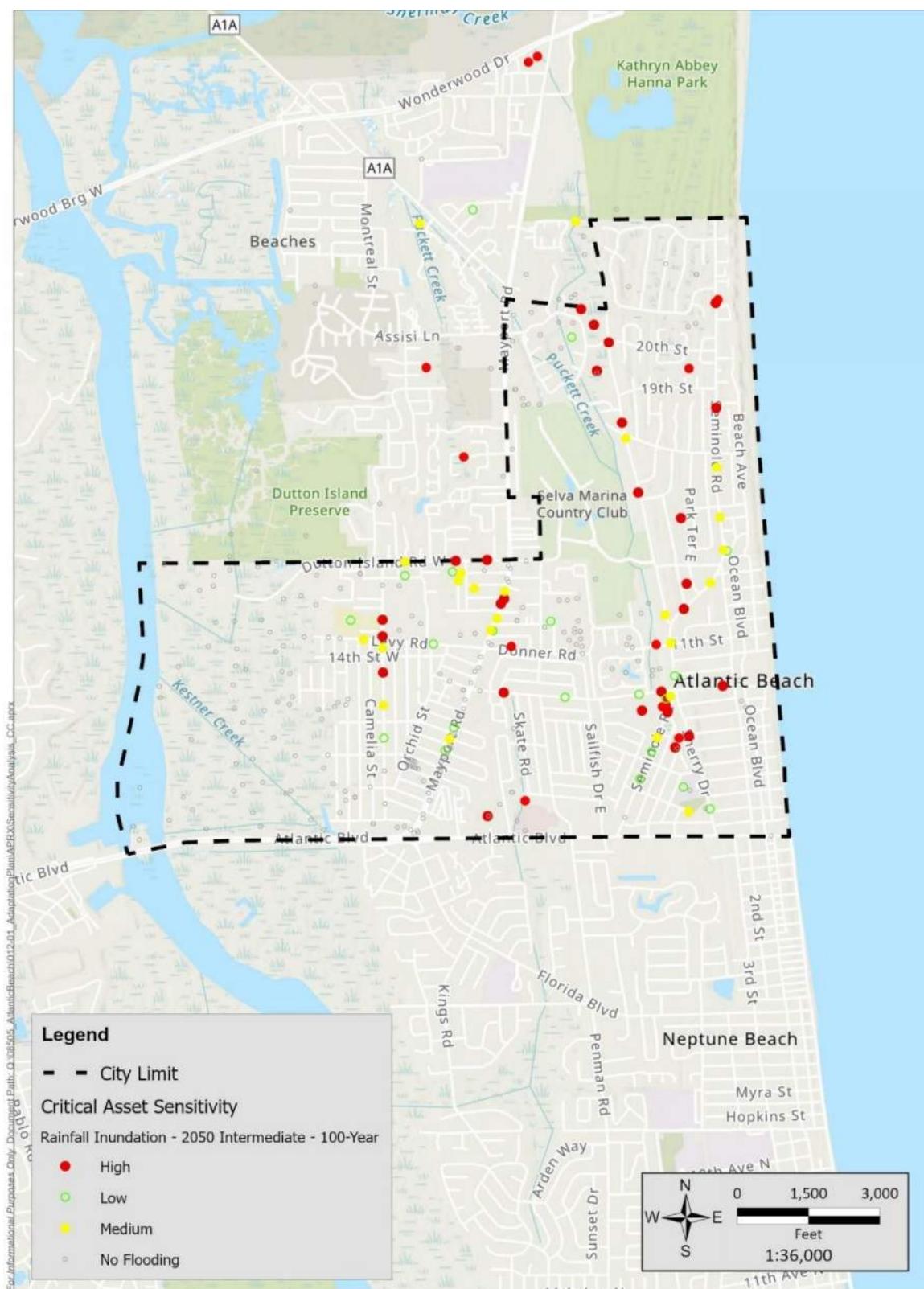
## Appendix D – Sensitivity Analysis Tables and Figures

#### Figure 4 Sensitivity Results for Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event under 2050 Intermediate-Low SLR Conditions



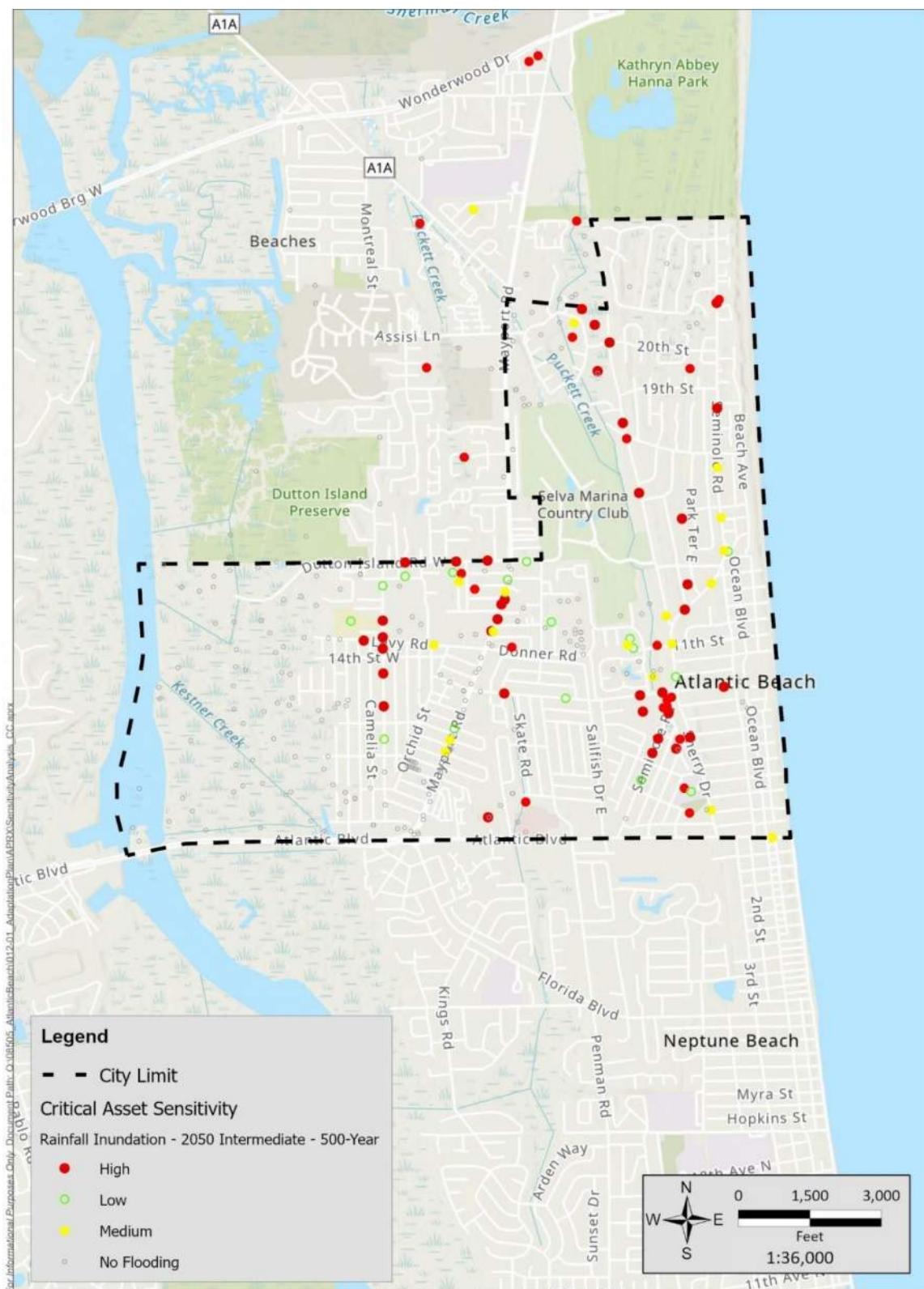
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 5 Sensitivity Results for Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event under 2050 Intermediate SLR Conditions**



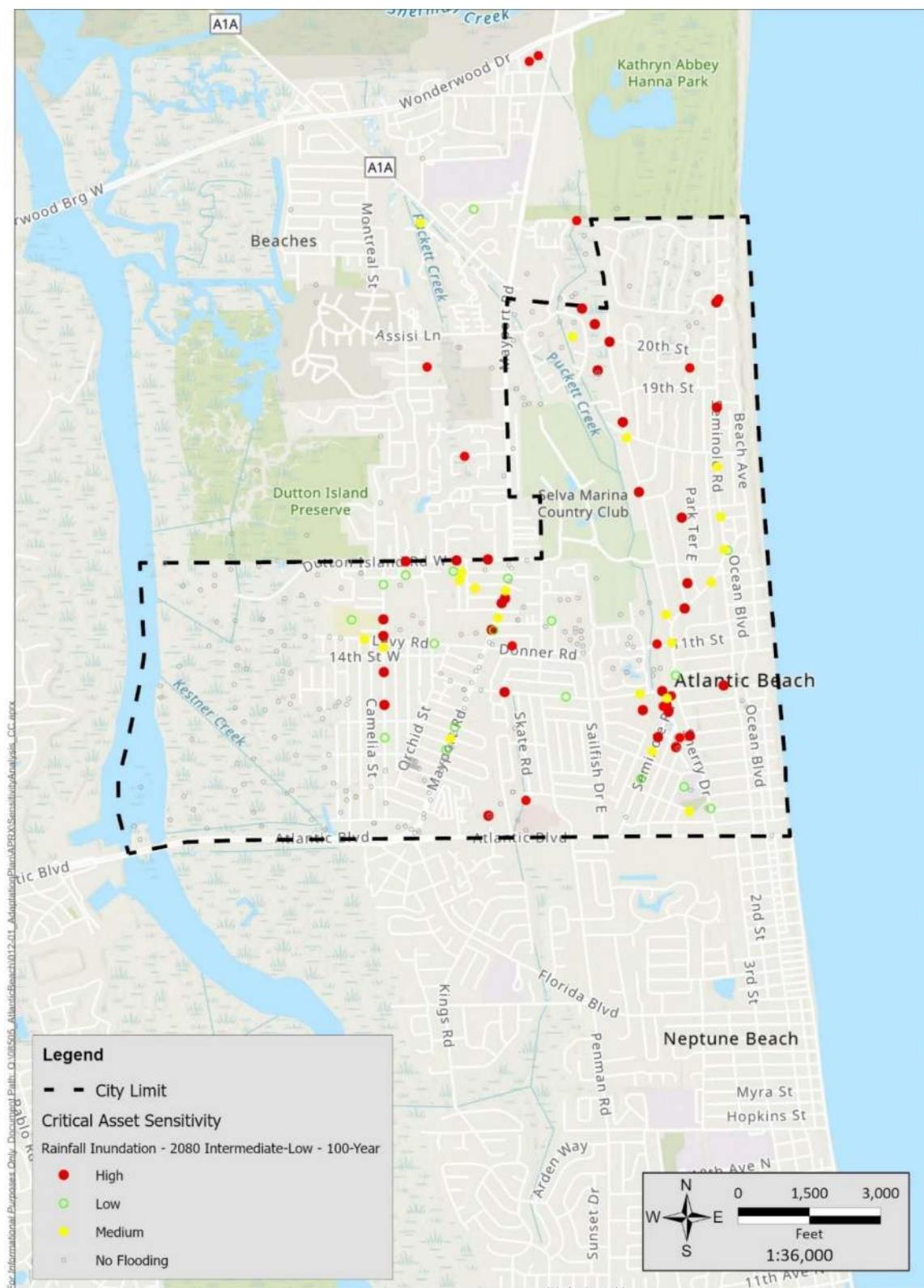
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 6 Sensitivity Results for Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event under 2050 Intermediate SLR Conditions**



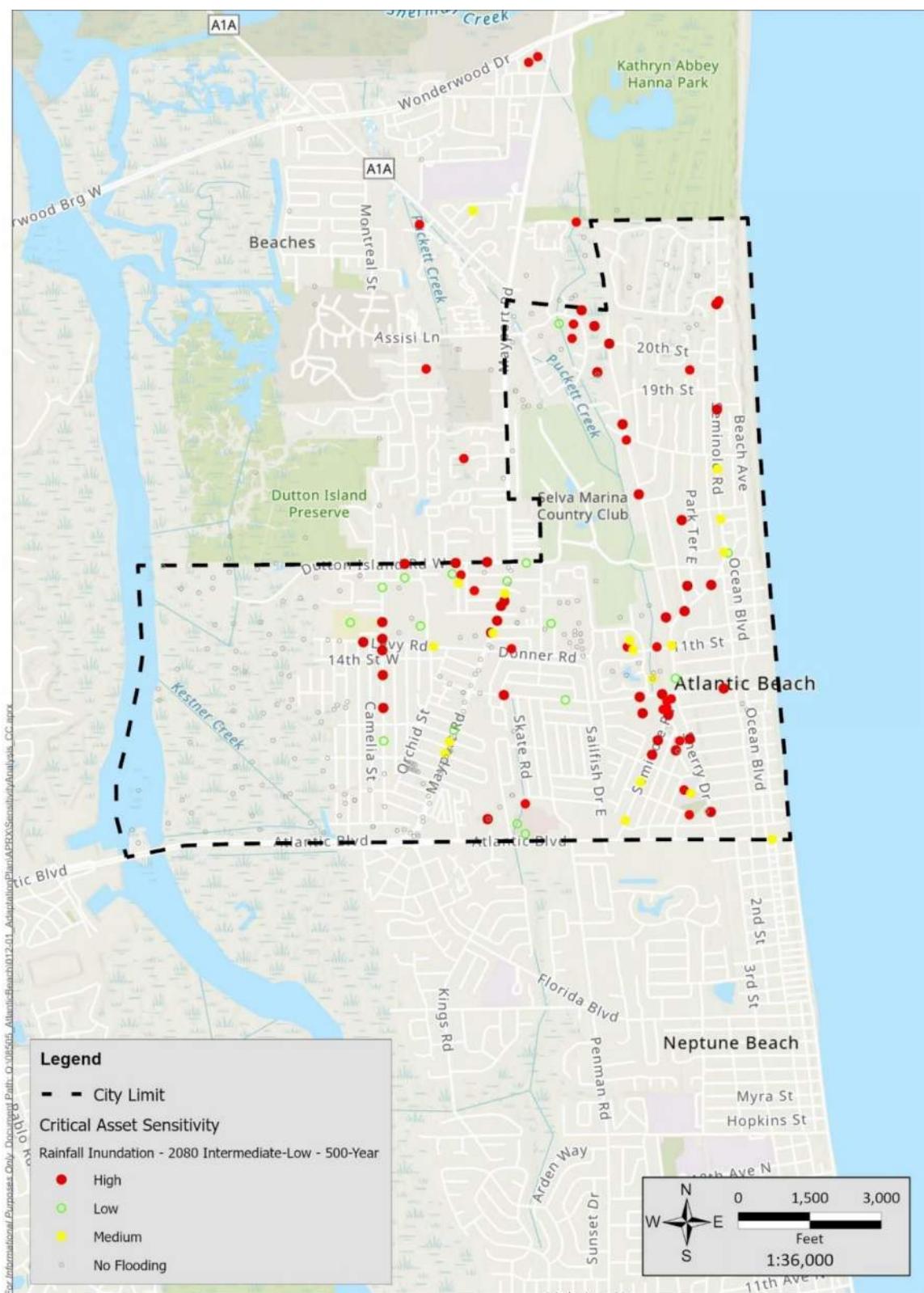
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 7 Sensitivity Results for Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event under 2080 Intermediate-Low SLR Conditions**



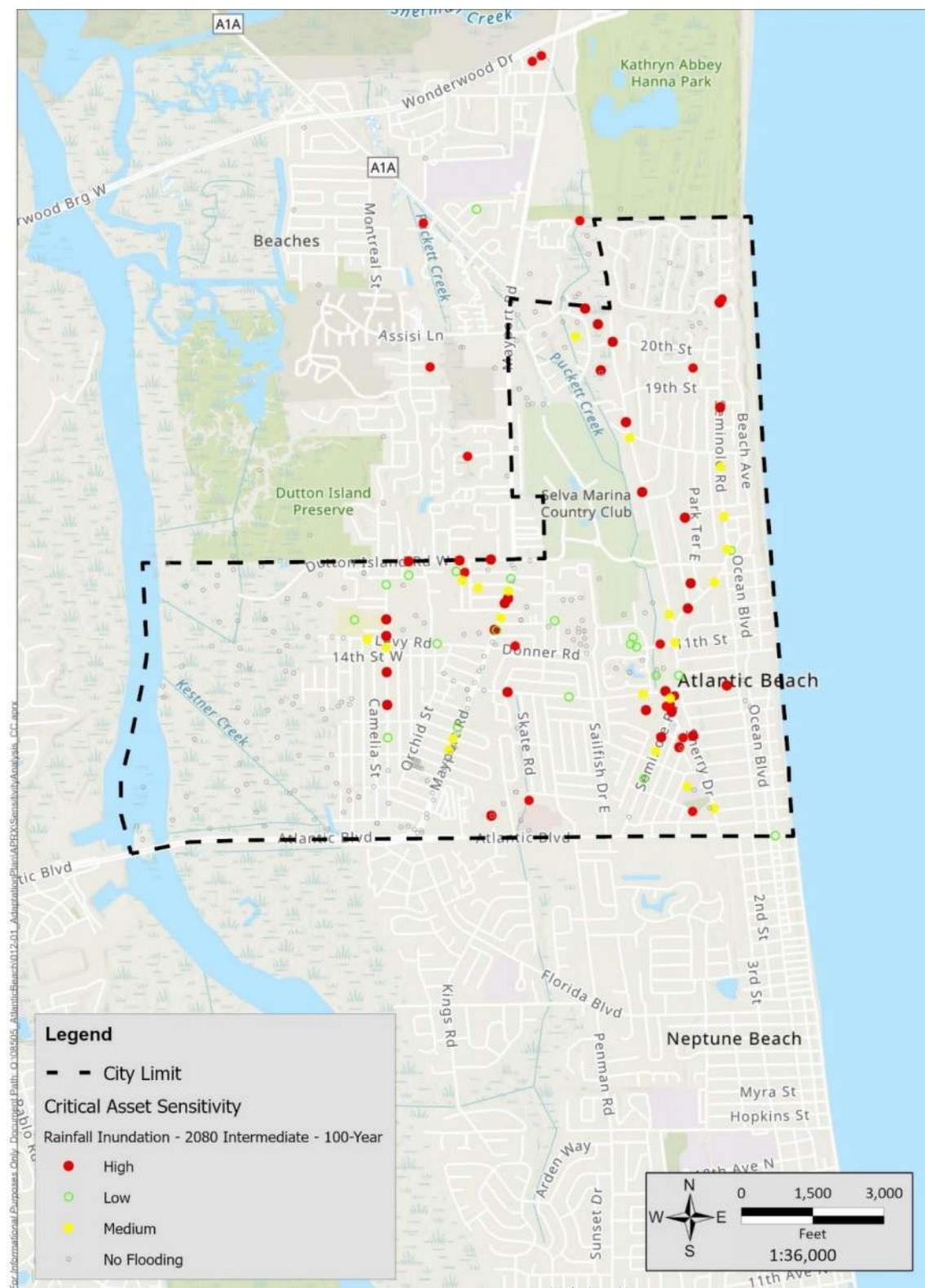
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 8 Sensitivity Results for Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event under 2080 Intermediate-Low SLR Conditions**



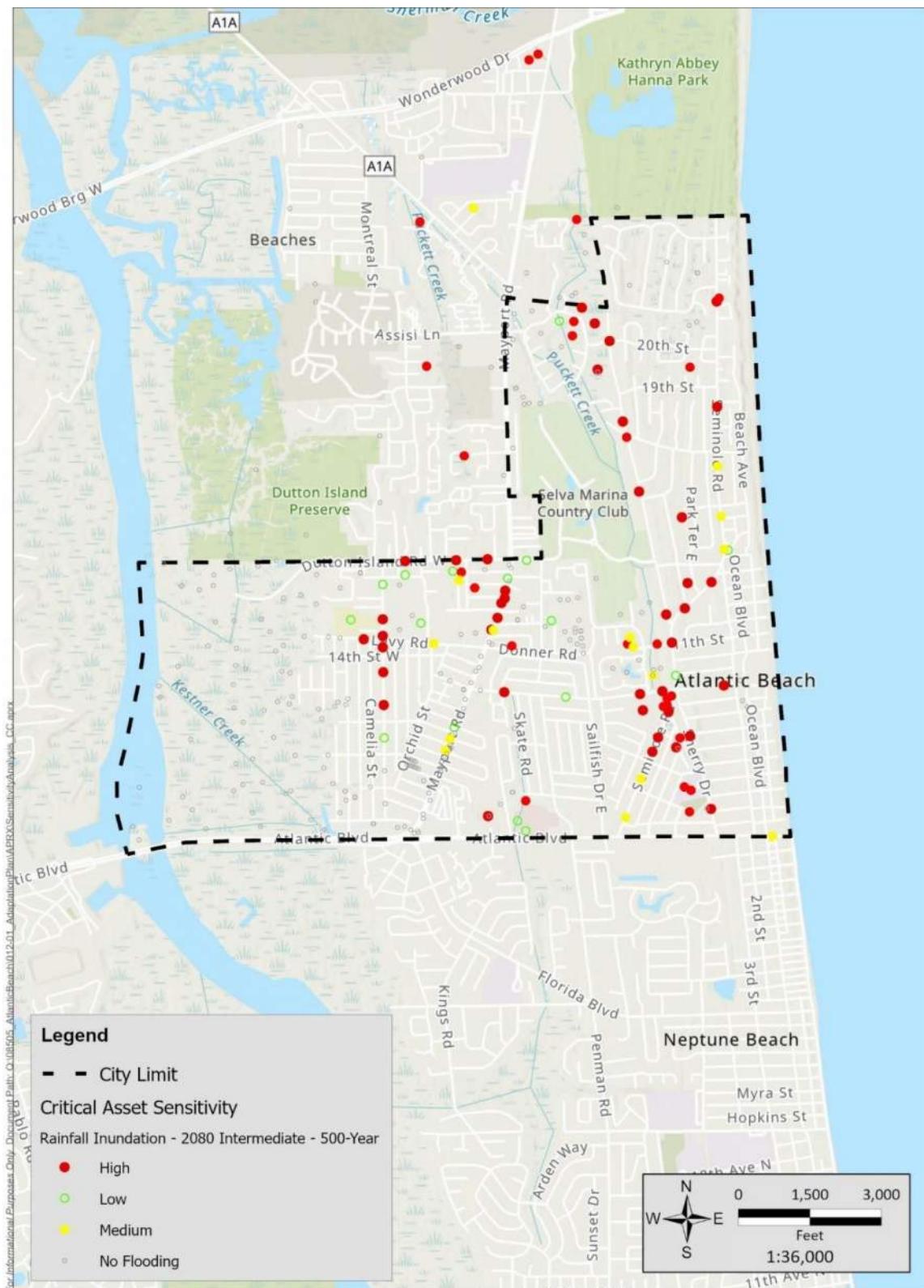
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 9 Sensitivity Results for Rainfall-Induced Flooding for the 100-Year, 24-Hour Storm Event under 2080 Intermediate SLR Conditions**



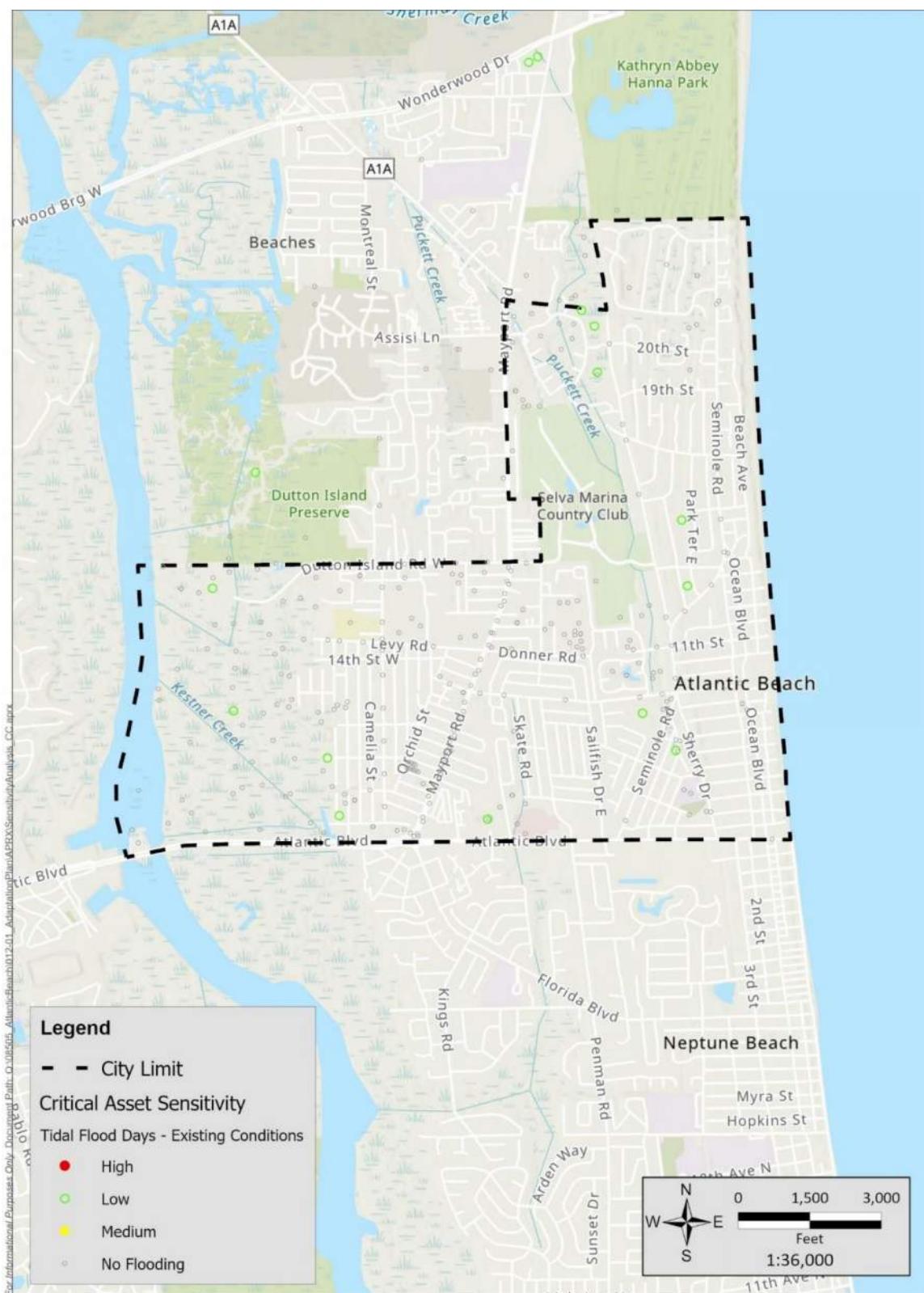
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 10 Sensitivity Results for Rainfall-Induced Flooding for the 500-Year, 24-Hour Storm Event under 2080 Intermediate SLR Conditions**



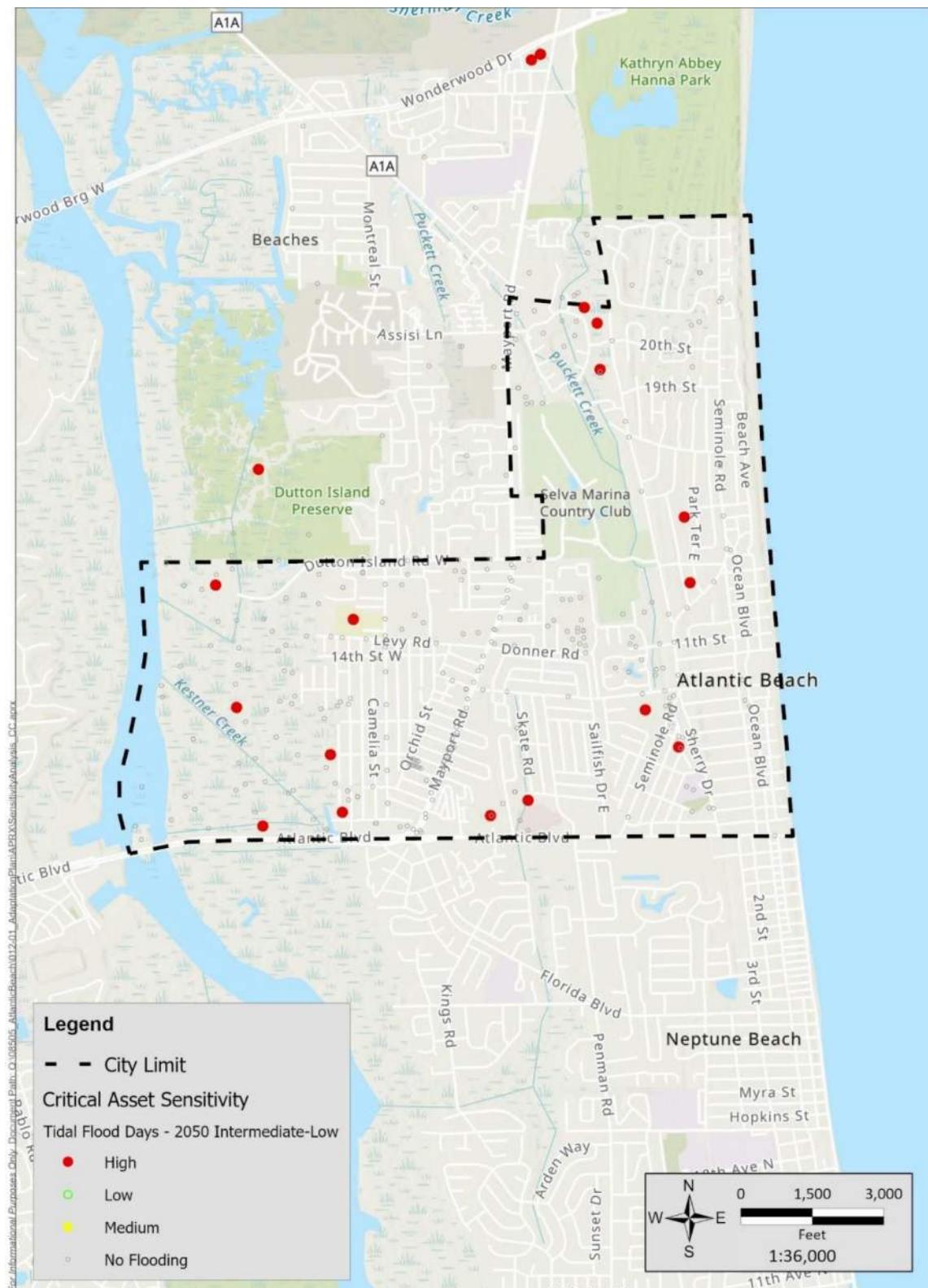
## Appendix D – Sensitivity Analysis Tables and Figures

## Figure 11 Sensitivity Results for High Tide Flooding Days under Existing Conditions



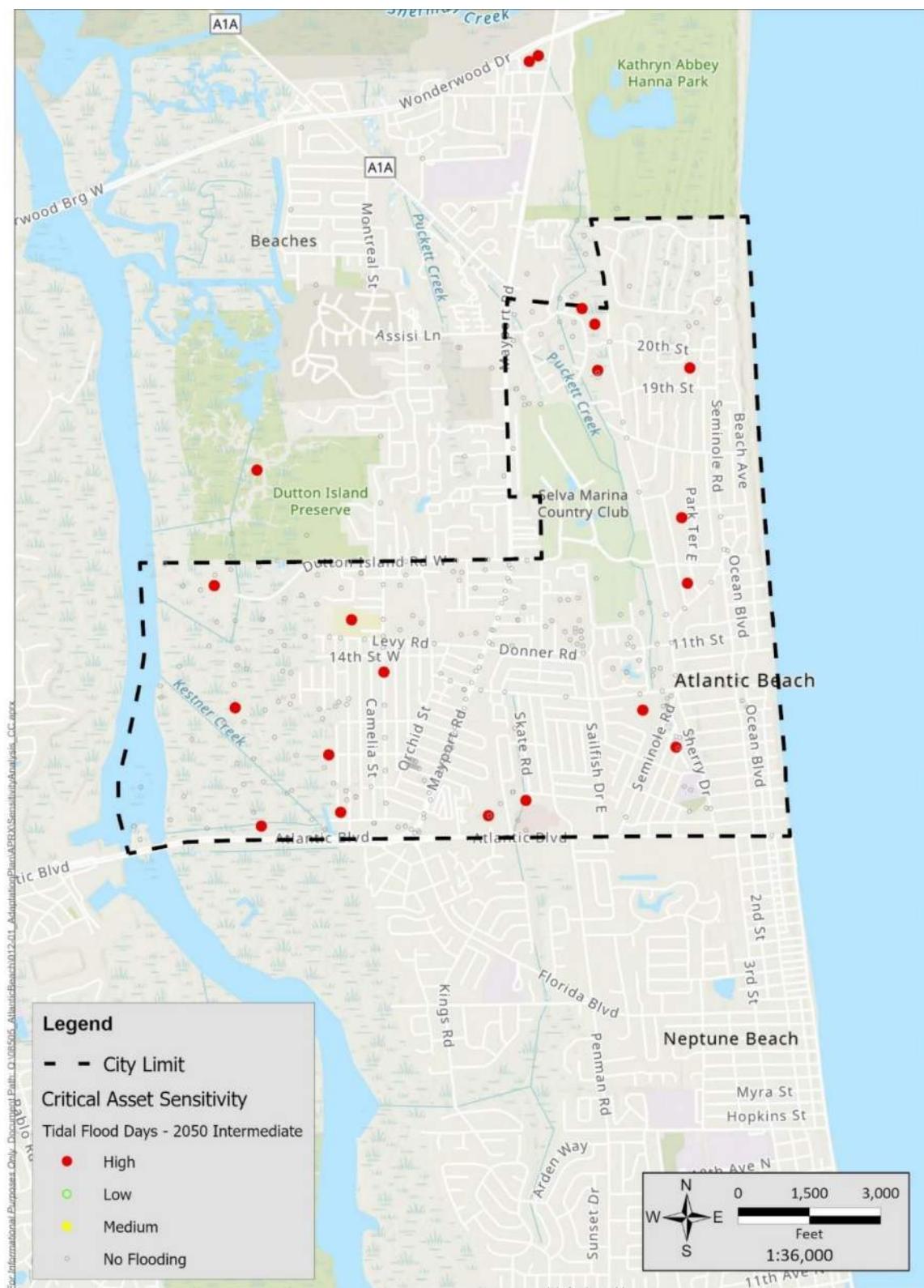
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 12 Sensitivity Results for High Tide Flooding Days under 2050 Intermediate-Low SLR Conditions**



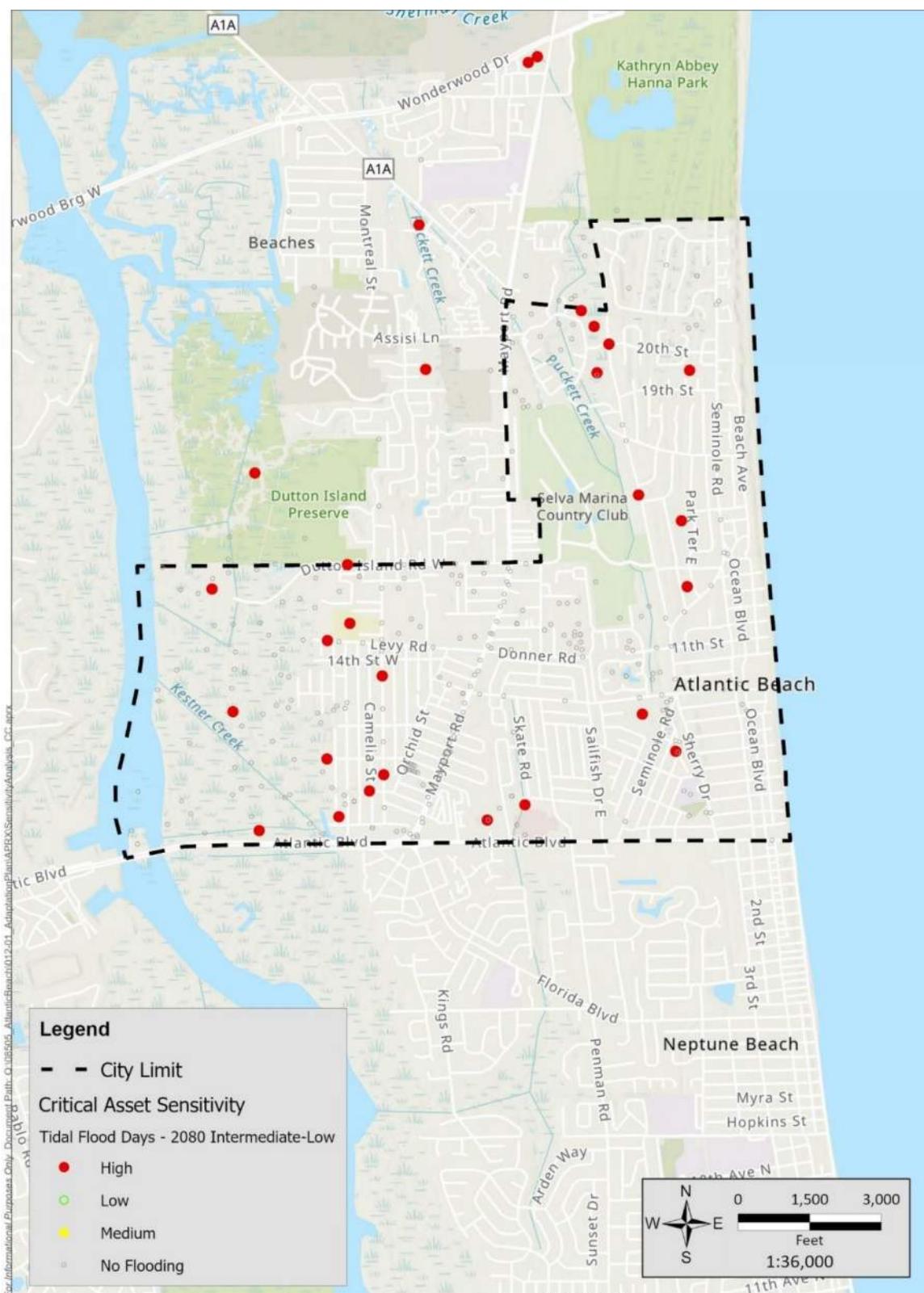
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 13 Sensitivity Results for High Tide Flooding Days under 2050 Intermediate SLR Conditions**



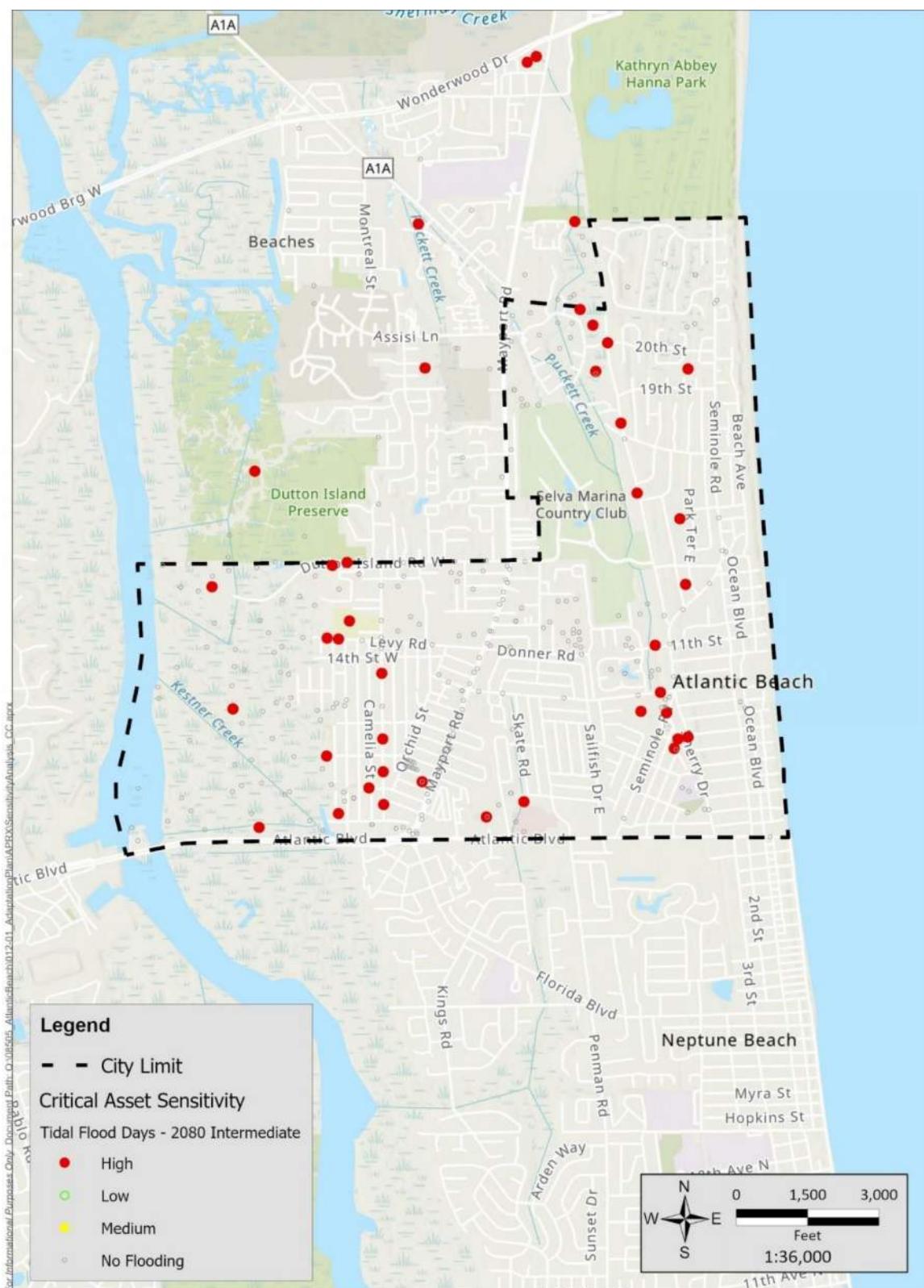
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 14 Sensitivity Results for High Tide Flooding Days under 2080 Intermediate-Low SLR Conditions**



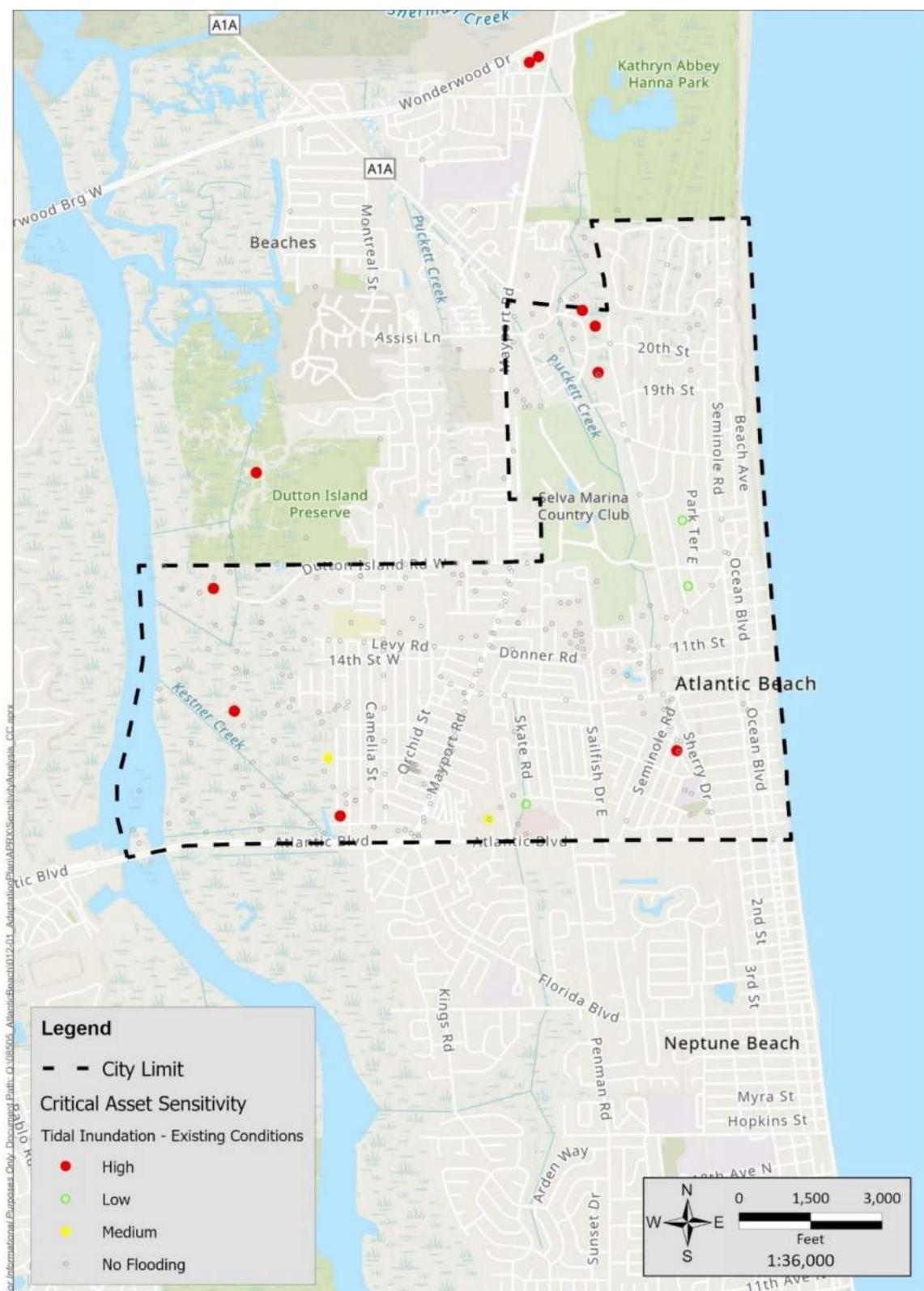
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 15 Sensitivity Results for High Tide Flooding Days under 2080 Intermediate SLR Conditions**



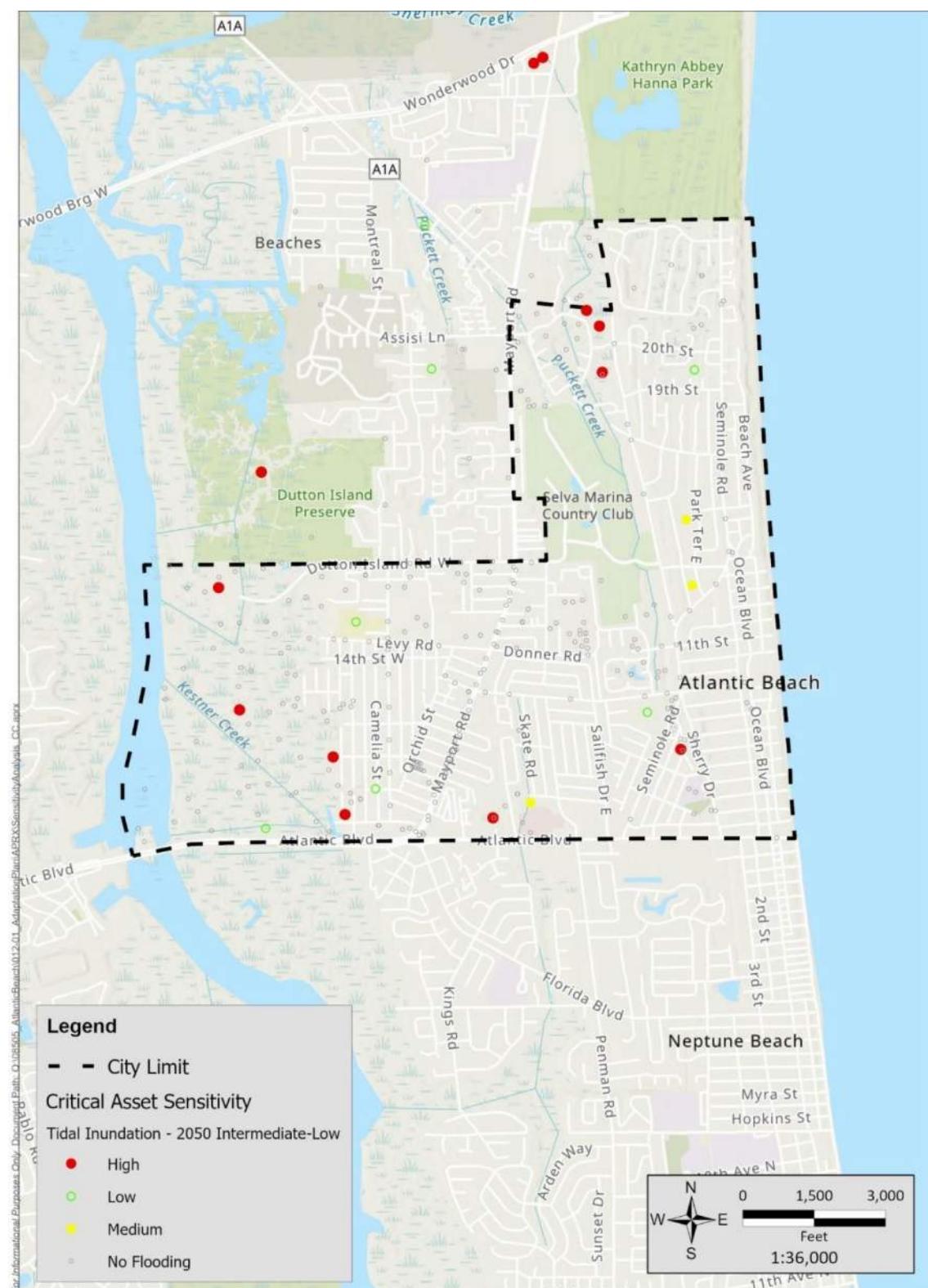
## Appendix D – Sensitivity Analysis Tables and Figures

## Figure 16 Sensitivity Results for High Tide Flooding Depth under Existing Conditions



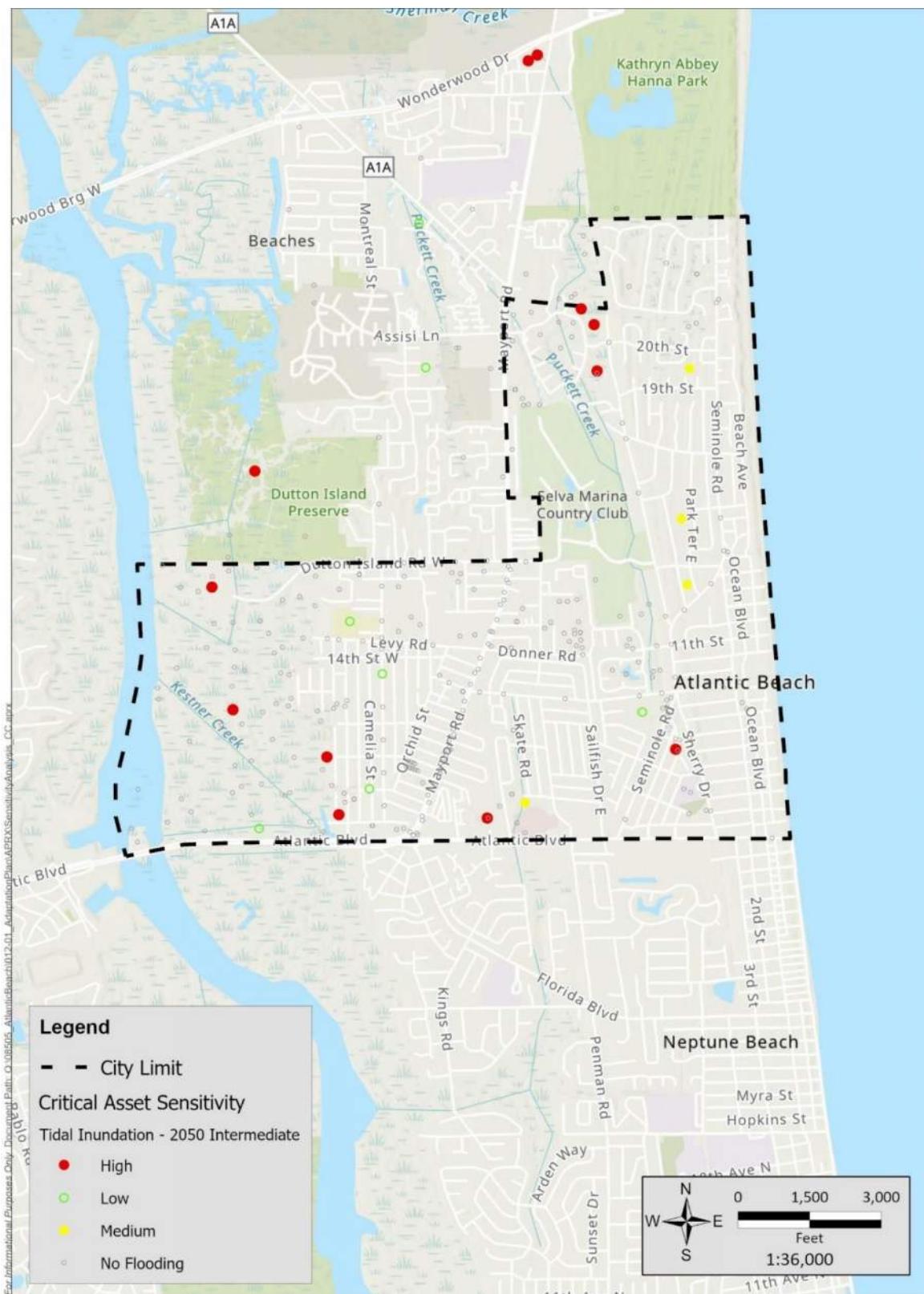
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 17 Sensitivity Results for High Tide Flooding Depth under 2050 Intermediate-Low SLR Conditions**



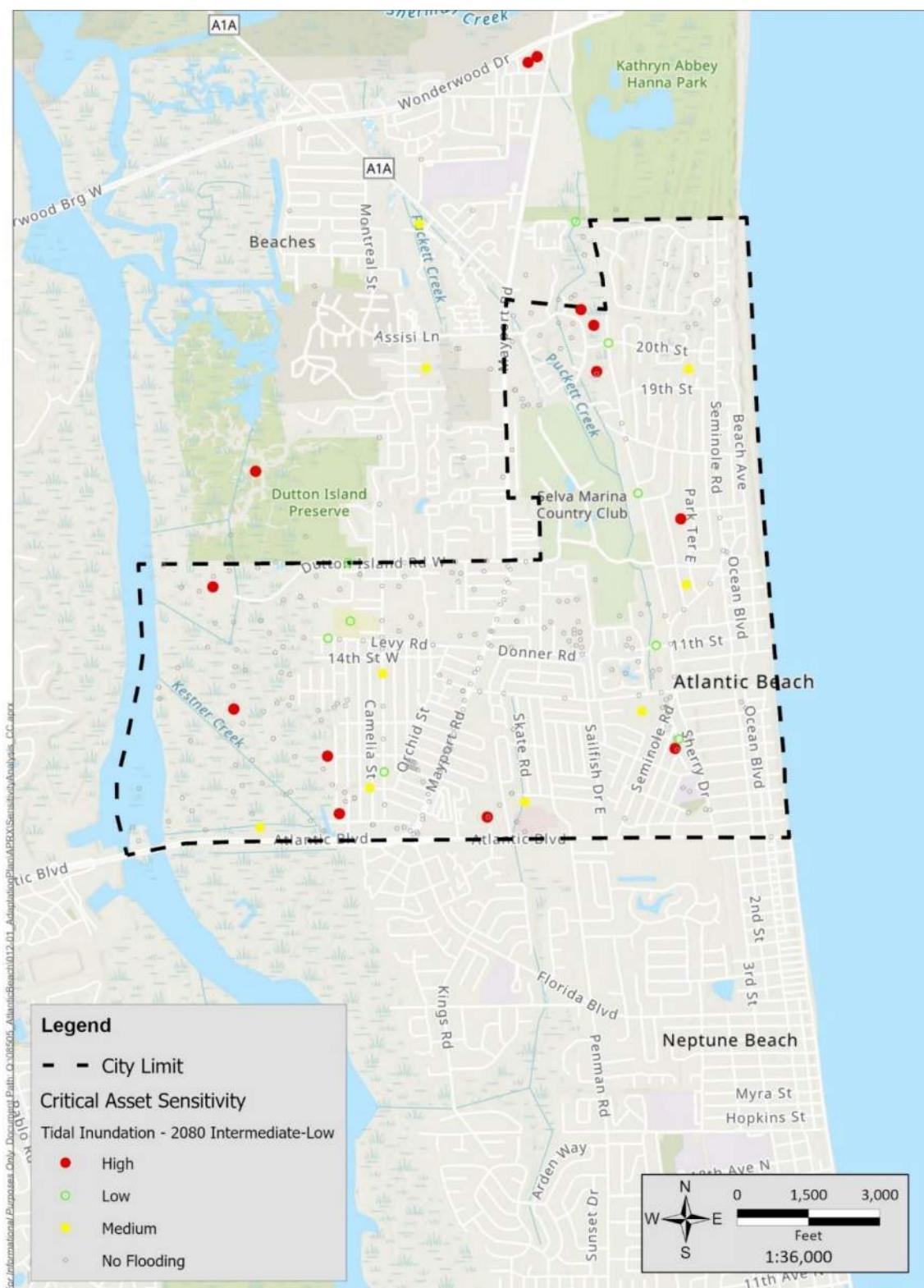
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 18 Sensitivity Results for High Tide Flooding Depth under 2050 Intermediate SLR Conditions**



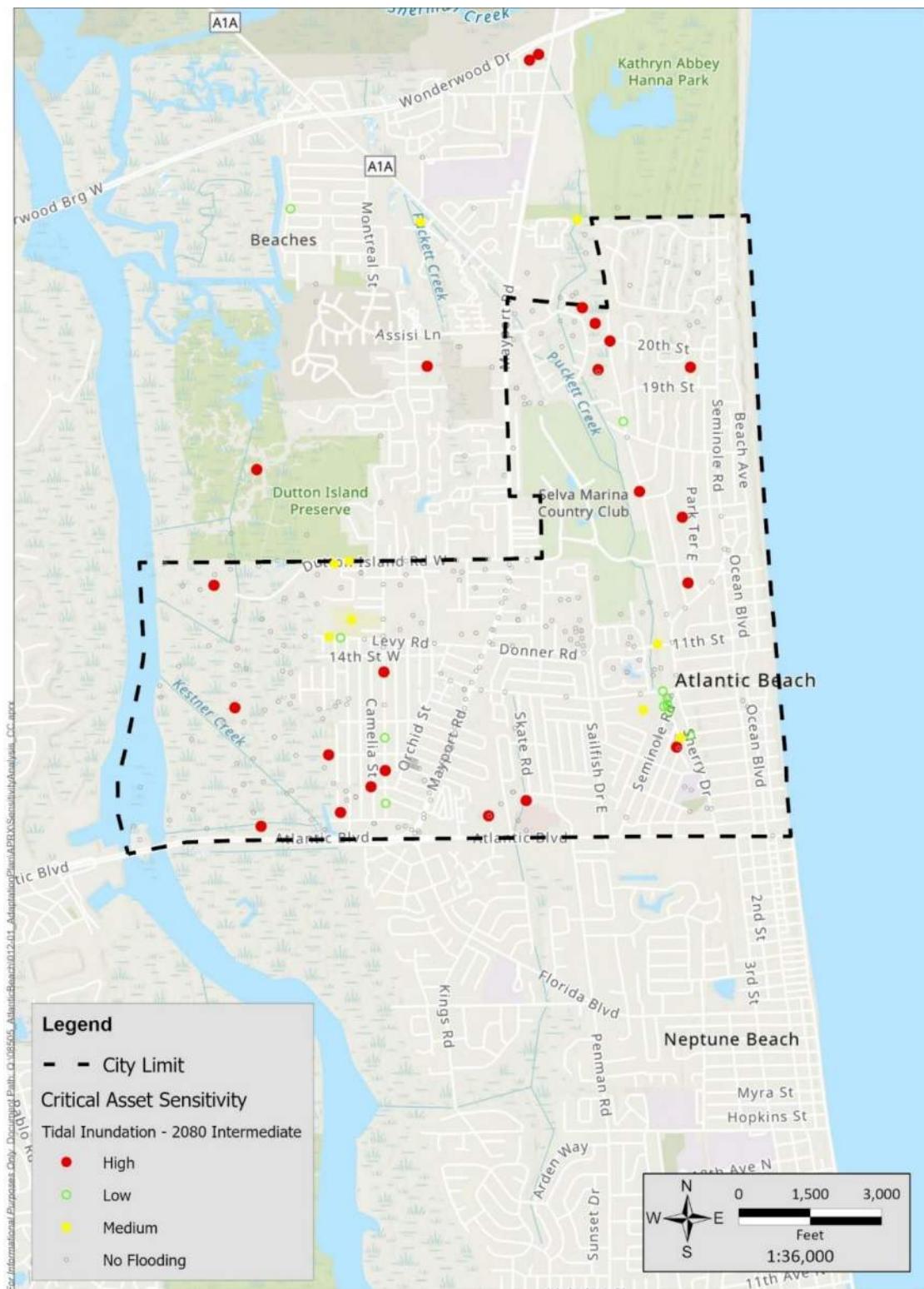
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 19 Sensitivity Results for High Tide Flooding Depth under 2080 Intermediate-Low SLR Conditions**



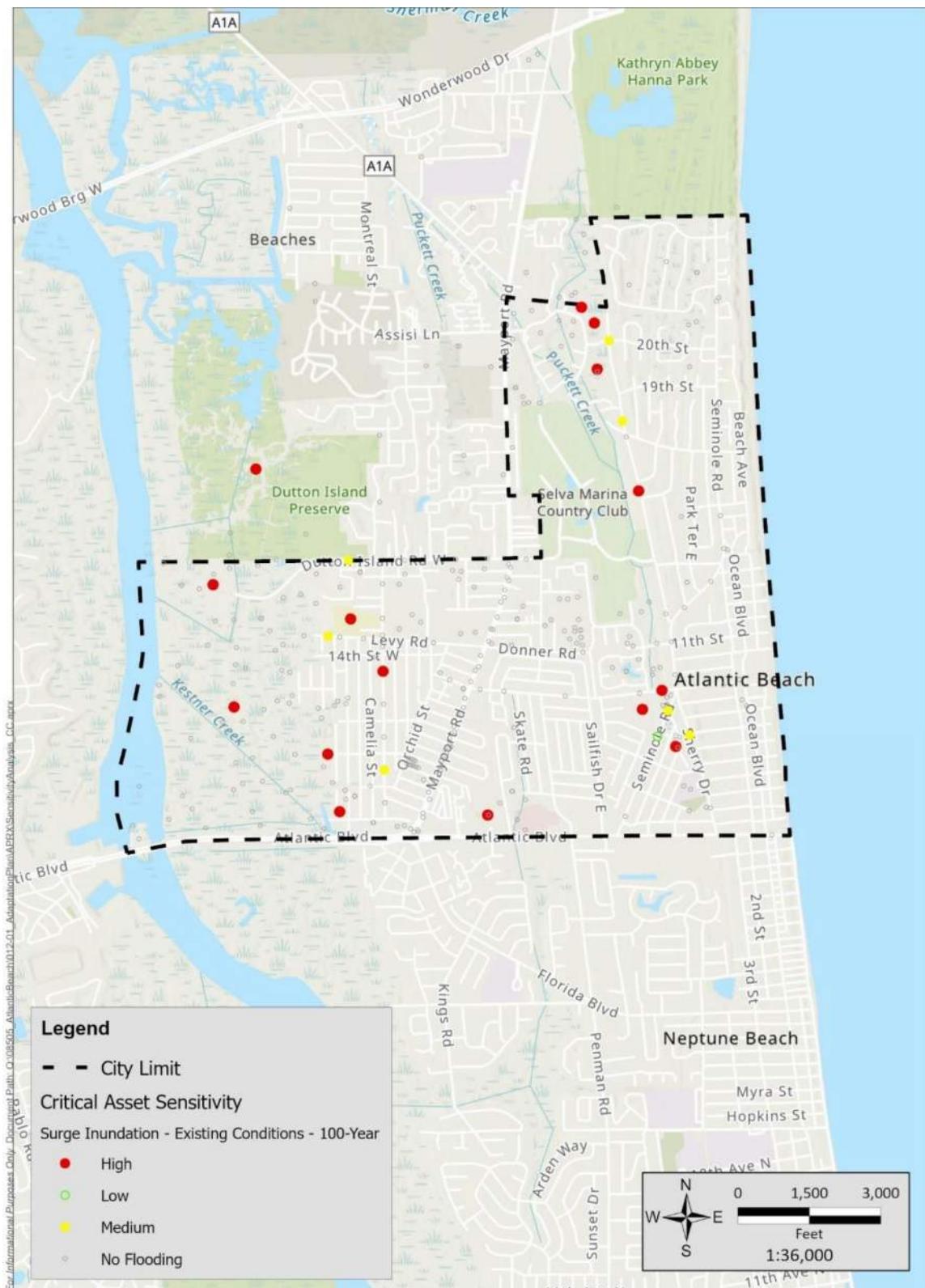
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 20 Sensitivity Results for High Tide Flooding Depth under 2080 Intermediate SLR Conditions**



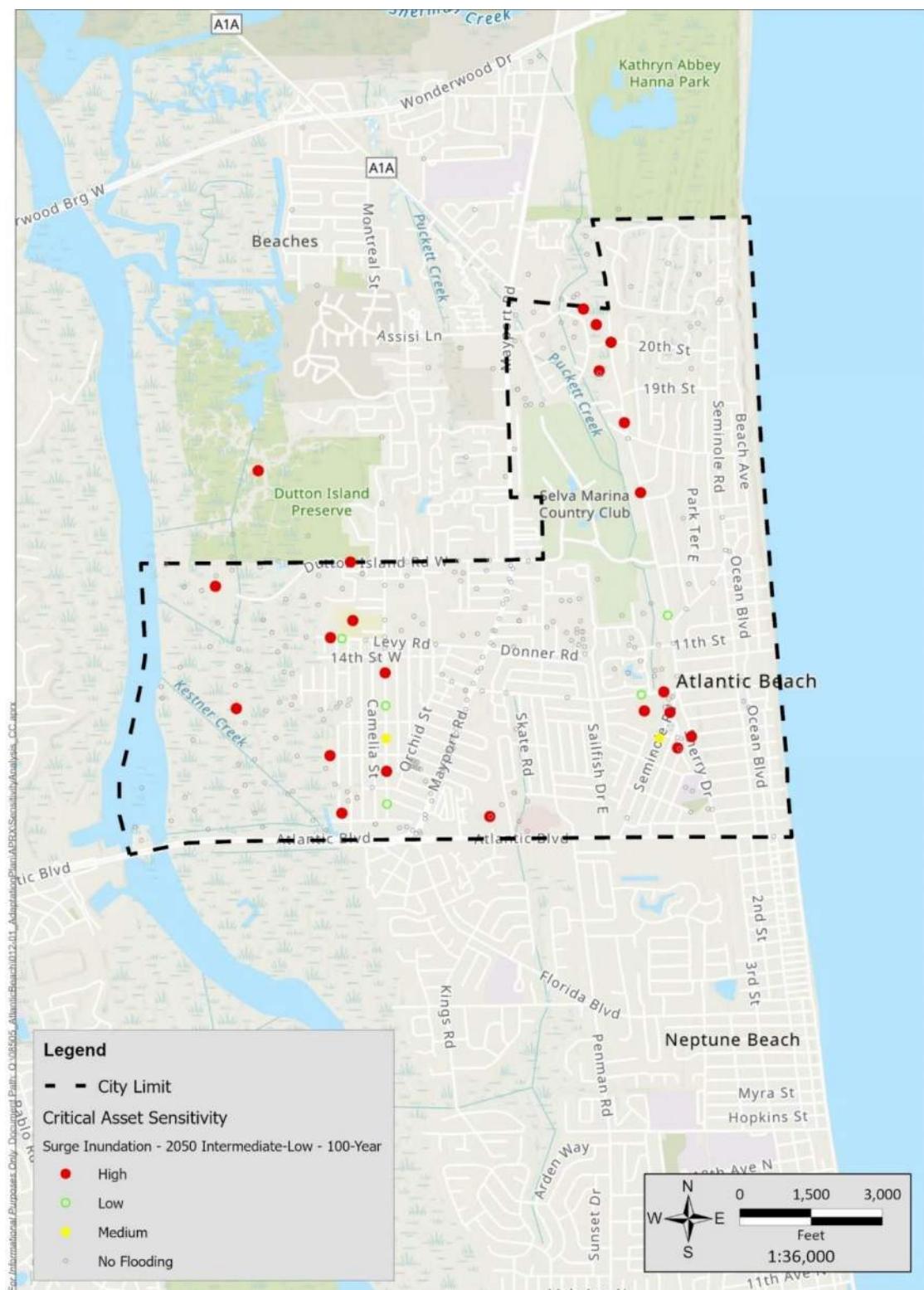
## Appendix D – Sensitivity Analysis Tables and Figures

## Figure 21 Sensitivity Results for 100-Year Storm Surge Flooding under Existing Conditions



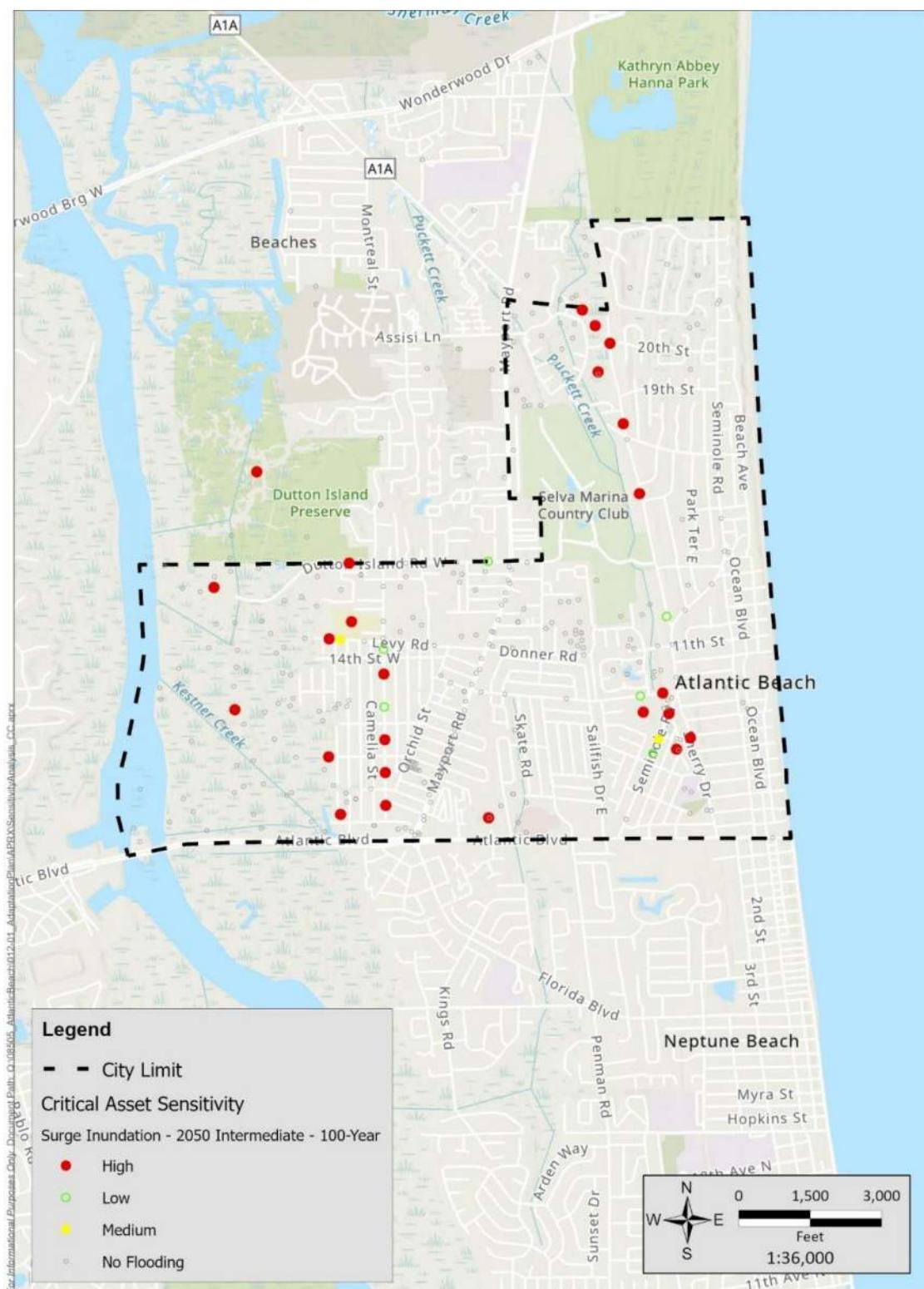
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 22 Sensitivity Results for 100-Year Storm Surge Flooding under 2050 Intermediate-Low SLR Conditions**



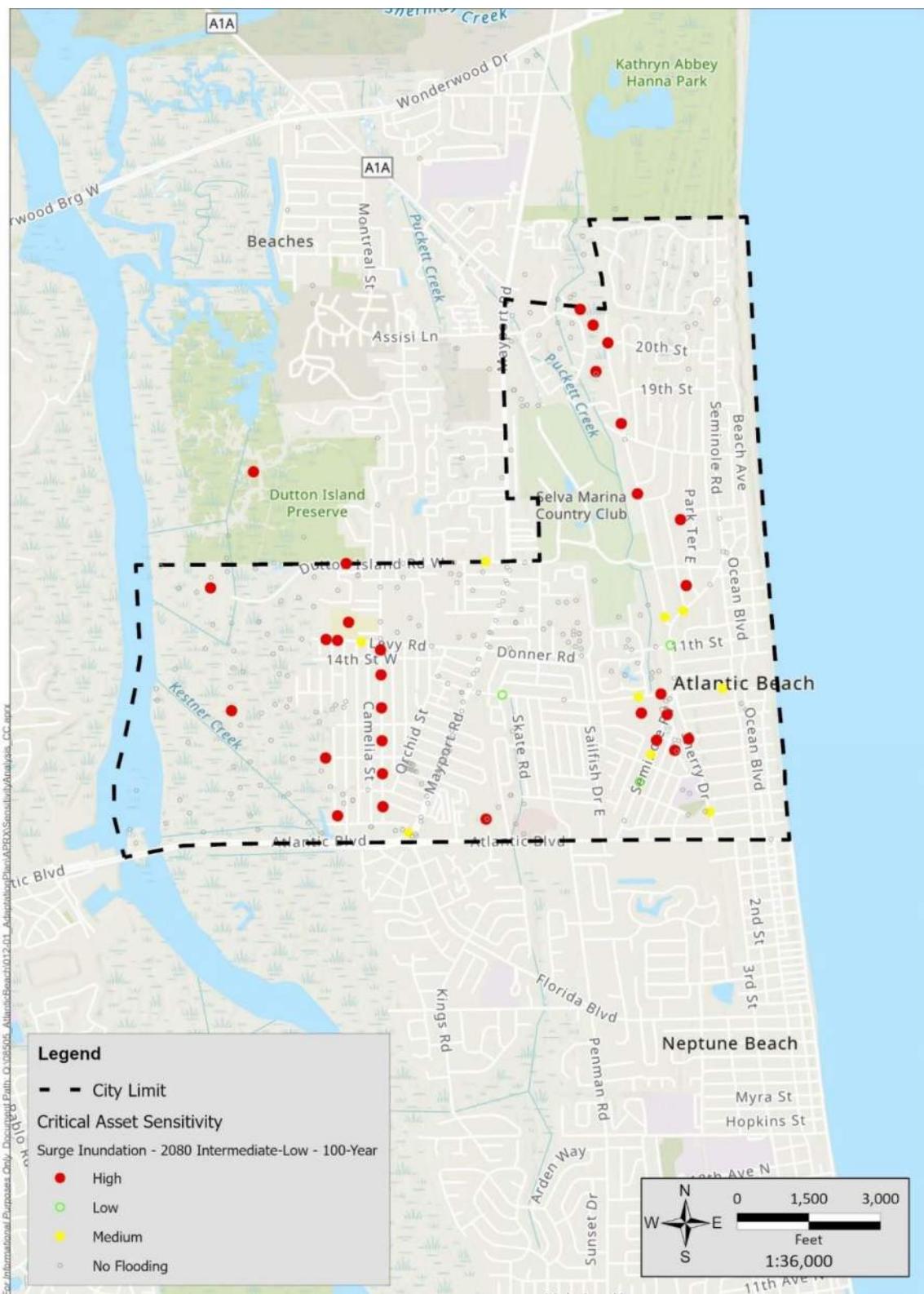
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 23 Sensitivity Results for 100-Year Storm Surge Flooding under 2050 Intermediate SLR Conditions**



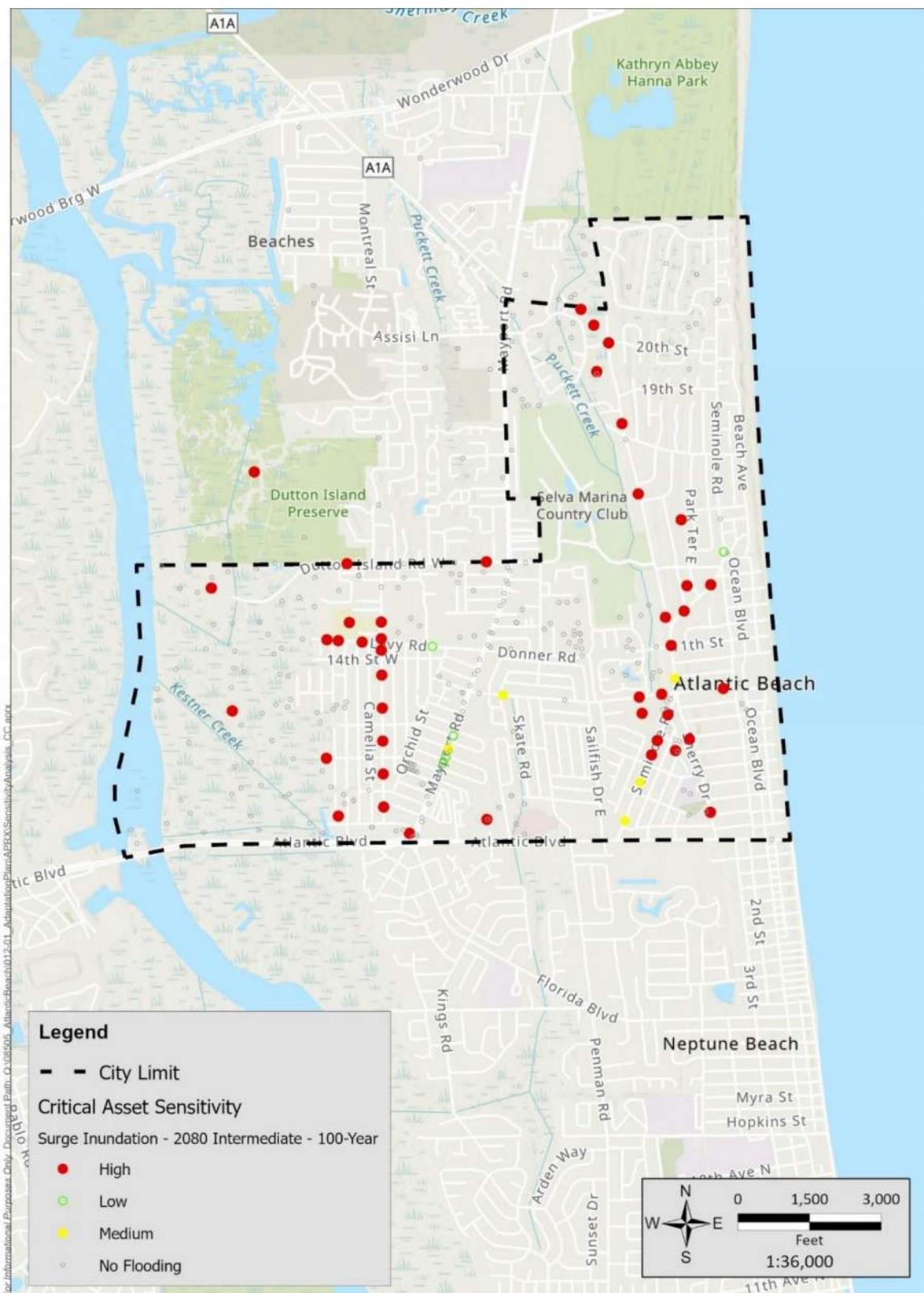
## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 24 Sensitivity Results for 100-Year Storm Surge Flooding under 2080 Intermediate-Low SLR Conditions**



## Appendix D – Sensitivity Analysis Tables and Figures

**Figure 25 Sensitivity Results for 100-Year Storm Surge Flooding under 2080 Intermediate SLR Conditions**



## SENSITIVITY RESULTS FOR TIDAL FLOODING

Asset Class	Asset Type	Asset Type lookup	Asset Name	Asset Owner	Unique ID	Regionally Significant	Elevation Source	Asset Elevation	Tidal MHHW Existing Conditions	Tidal MHHW Int-Low 2050	Tidal MHHW Int 2050	Tidal MHHW Int-Low 2080	Tidal MHHW Int 2080	Priority Rating	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1006	No	2018 Duval DEM	5.35	Not Flooded	Not Flooded	Flooding Outsid	Low	High	Highest	
Transportation and Evacuation Routes	Critical Roadway	Roads	DUTTON DR	City of Atlantic Beach	1009	No	2018 Duval DEM	5.63	Flooding Outside	Flooding Outsid	Flooding Outsid	Low	Medium	Highest	
Transportation and Evacuation Routes	Critical Roadway	Roads	SELVA MARINA DR	City of Atlantic Beach	1011	No	2018 Duval DEM	6.24	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	Highest	
Transportation and Evacuation Routes	Critical Roadway	Roads	SELVA MARINA DR	City of Atlantic Beach	1012	No	2018 Duval DEM	5.27	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	SELVA MARINA DR	City of Atlantic Beach	1013	No	2018 Duval DEM	5.29	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	LEVY RD	City of Atlantic Beach	1016	No	2018 Duval DEM	5.57	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	Medium	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	SHERRY DR	City of Atlantic Beach	1019	No	2018 Duval DEM	6.24	Not Flooded	Not Flooded	Flooding Outsid	Flooding Outsid	Low	Low	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1021	No	2018 Duval DEM	6.3	Flooding Outside	Flooding Outsid	Flooding Outsid	Flooding Outsid	Low	Highest	
Transportation and Evacuation Routes	Critical Roadway	Roads	PLAZA DR	City of Atlantic Beach	1029	No	2018 Duval DEM	6.16	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Low	Highest	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1033	No	2018 Duval DEM	5.19	Not Flooded	Not Flooded	Low	Medium	High	Highest	
Critical Community and Emergency Facility	Debris Site	Disaster Debris Management Sites	Buccaneer LS Yard	City of Atlantic Beach	DD1002	No	2018 Duval DEM	3.4	High	High	High	High	High	High	Highest
Critical Community and Emergency Facility	Local Government Building	Local Government Facilities	Commission Chambers	City of Atlantic Beach	LG1001	Yes	ERP 36367-7 EREG_623479C	8.29	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	Low	Highest
Critical Community and Emergency Facility	Local Government Building	Local Government Facilities	Atlantic Beach City Hall	City of Atlantic Beach	LG1002	Yes	ERP 36367-7 EREG_623479C	8.21	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Low	Highest	
Critical Infrastructure	Lift Station	Lift Stations	LS-L	City of Atlantic Beach	WW1002	No	2018 Duval DEM	5.4	Not Flooded	Low	Low	Medium	High	High	Highest
Critical Infrastructure	Lift Station	Lift Stations	LS-F	City of Atlantic Beach	WW1007	No	2018 Duval DEM	4.9	Low	Medium	Medium	Medium	High	High	Highest
Critical Infrastructure	Lift Station	Lift Stations	LS-A	City of Atlantic Beach	WW1009	No	2018 Duval DEM	5.8	Not Flooded	Not Flooded	Not Flooded	Low	Medium	Highest	
Critical Infrastructure	Lift Station	Lift Stations	LS-B	City of Atlantic Beach	WW1010	No	2018 Duval DEM	6.1	Not Flooded	Not Flooded	Not Flooded	Low	Medium	Highest	
Critical Infrastructure	Lift Station	Lift Stations	LS-G	City of Atlantic Beach	WW1013	No	GPS Survey	5.23	Not Flooded	Low	Medium	Medium	High	High	Highest
Critical Infrastructure	Lift Station	Lift Stations	BUC MASTER LS	WW1300	No	2018 Duval DEM	3.5	High	High	High	High	High	High	Highest	
Critical Infrastructure	Lift Station	Lift Stations	Lakeside-LS	WW1306	No	2018 Duval DEM	5.6	Not Flooded	Low	Low	Medium	Medium	Medium	Highest	
Critical Infrastructure	Lift Station	Lift Stations	Mimosa Cove-LS	WW1310	No	2018 Duval DEM	5.3	Not Flooded	Low	Low	Medium	High	High	Highest	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1001	No	2018 Duval DEM	7.94	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1003	No	2018 Duval DEM	6.48	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1004	No	2018 Duval DEM	7.95	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1005	No	2018 Duval DEM	6.16	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	CHURCH RD	City of Atlantic Beach	1007	No	2018 Duval DEM	8.46	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	CHURCH RD	City of Atlantic Beach	1008	No	2018 Duval DEM	7.79	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	LEVY RD	City of Atlantic Beach	1017	No	2018 Duval DEM	7.74	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1022	No	2018 Duval DEM	8.29	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1027	No	2018 Duval DEM	7.62	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	PLAZA DR	City of Atlantic Beach	1030	No	2018 Duval DEM	8.31	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	PLAZA DR	City of Atlantic Beach	1031	No	2018 Duval DEM	7.97	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1036	No	2018 Duval DEM	7.03	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1044	No	2018 Duval DEM	8.59	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1050	Yes	2018 Duval DEM	9.51	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1052	Yes	2018 Duval DEM	9.6	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1056	Yes	2018 Duval DEM	9.8	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1066	Yes	2018 Duval DEM	9.55	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1079	Yes	2018 Duval DEM	8.44	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1082	Yes	2018 Duval DEM	10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Critical Community and Emergency Facility	Fire Department	Fire Stations	Atlantic Beach Fire Department	City of Atlantic Beach	FS1001	Yes	ERP 36367-7 EREG_623479C	8.36	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	High	
Critical Infrastructure	Lift Station	Lift Stations	LS-C	City of Atlantic Beach	WW1011	No	2018 Duval DEM	9.9	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Critical Infrastructure	Lift Station	Lift Stations	LS-N	City of Atlantic Beach	WW1014	No	2018 Duval DEM	7.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	
Critical Infrastructure	Lift Station	Lift Stations	Courtyards-LS	City of Atlantic Beach	WW1016	No	2018 Duval DEM	6.2	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	Medium	High
Transportation and Evacuation Routes	Critical Roadway	Roads	LEVY RD	City of Atlantic Beach	1015	No	2018 Duval DEM	6.38	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1024	No	2018 Duval DEM	8.1	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1025	No	2018 Duval DEM	7.88	Not Flooded	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	SELVA MARINA DR	City of Atlantic Beach	1034	No	2018 Duval DEM	7.6	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1035	No	2018 Duval DEM	9.51	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1040	No	2018 Duval DEM	6.9	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1041	No	2018 Duval DEM	6.38	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	DUTTON DR	City of Atlantic Beach	1042	No	2018 Duval DEM	9.24	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1045	No	2018 Duval DEM	9.55	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1046	No	2018 Duval DEM	8.89	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium	
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1070	Yes	2018 Duval DEM	8.61</td							

## SENSITIVITY RESULTS FOR TIDAL FLOODING

Asset Class	Asset Type	Asset Type lookup	Asset Name	Asset Owner	Unique ID	Regionally Significant	Elevation Source	Asset Elevation	Tidal MHHW Existing Conditions	Tidal MHHW Int-Low 2050	Tidal MHHW Int 2050	Tidal MHHW Int-Low 2080	Tidal MHHW Int 2080	Priority Rating
Critical Community and Emergency Facility	Emergency Center	Emergency Operation Centers	Atlantic Beach Police Department	City of Atlantic Beach	EO1000	No	ERP 36367-7 EREG_623479C	8.36	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Low
Natural, Cultural and Historic Resources	Park	Parks	Howell Park	City of Atlantic Beach	PK1001	No	2018 Duval DEM	1.27	High	High	High	High	High	Low
Natural, Cultural and Historic Resources	Park	Parks	Johansen Park	City of Atlantic Beach	PK1003	No	2018 Duval DEM	2.96	Low	Medium	Medium	Medium	High	Low
Natural, Cultural and Historic Resources	Park	Parks	Jack Russell Park	City of Atlantic Beach	PK1006	No	2018 Duval DEM	3.53	Not Flooded	Low	Low	Medium	Medium	Low
Natural, Cultural and Historic Resources	Park	Parks	Tideviews Preserve	City of Atlantic Beach	PK1009	No	2018 Duval DEM	-2.7	High	High	High	High	High	Low
Natural, Cultural and Historic Resources	Park	Parks	Atlantic Beach Dog Park	City of Atlantic Beach	PK1011	No	2018 Duval DEM	0.88	Medium	High	High	High	High	Low
Natural, Cultural and Historic Resources	Park	Parks	Marsh Overlook	City of Atlantic Beach	PK1012	No	2018 Duval DEM	1.52	Medium	High	High	High	High	Low
Natural, Cultural and Historic Resources	Park	Parks	Johansen Park	City of Atlantic Beach	PK1014	No	2018 Duval DEM	2.59	Low	Medium	Medium	High	High	Low
Natural, Cultural and Historic Resources	Park	Parks	DUTTON ISLAND PRESERVE PARK	City of Atlantic Beach	PK1016	No	2018 Duval DEM	-2.7	High	High	High	High	High	Low
Critical Community and Emergency Facility	School	Schools	ATLANTIC BEACH ELEMENTARY SCHOOL	Duval County School Board	SC1002	Yes	ERP 38805-2 EREG_680035	8.49	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low
Critical Infrastructure	Lift Station	Lift Stations	LS-J	City of Atlantic Beach	WW1005	No	2018 Duval DEM	11.5	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low
Critical Infrastructure	Lift Station	Lift Stations	Schooners Bay-LS		WWV1303	No	2018 Duval DEM	7	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Low
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1026	No	2018 Duval DEM	8.48	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Transportation and Evacuation Routes	Critical Roadway	Roads	DUTTON DR	City of Atlantic Beach	1043	No	2018 Duval DEM	11.15	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1047	Yes	2018 Duval DEM	10.52	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1048	Yes	2018 Duval DEM	8.84	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1054	Yes	2018 Duval DEM	8.52	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1057	Yes	2018 Duval DEM	9.01	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1081	Yes	2018 Duval DEM	9.03	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Critical Infrastructure	Radio Communications Tower	Radio Communications Towers	WTP #1	City of Atlantic Beach	CF1004	No	2018 Duval DEM	8.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 1	City of Atlantic Beach	DW1011	Yes	2018 Duval DEM	8.6	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Critical Community and Emergency Facility	Assisted Living Facility	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO HC1003		No	ERP 17822-8 EREG_667773;	8.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Critical Community and Emergency Facility	Assisted Living Facility	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO HC1005		No	ERP 17822-8 EREG_667773;	8.40	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Critical Community and Emergency Facility	Assisted Living Facility	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO HC1008		No	ERP 17822-3 EREG_654948;	7.9	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Natural, Cultural and Historic Resources	SCHOOL, UNIVERSITY, COLLEGE	Colleges and Universities	ATLANTIC BEACH ELEMENTARY SCHOOL	DUVAL COUNTY SCHOOL BOARD	HR1184	No	ERP 38805-2 EREG_680035	9.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Natural, Cultural and Historic Resources	Park	Parks	Donner Park	City of Atlantic Beach	PK1005	No	2018 Duval DEM	9.11	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Natural, Cultural and Historic Resources	Park	Parks	Jordan Park	City of Atlantic Beach	PK1007	No	2018 Duval DEM	11.17	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Natural, Cultural and Historic Resources	Park	Parks	FDOT Stormwater Pond	FDOT	PK1010	No	2018 Duval DEM	5.71	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Natural, Cultural and Historic Resources	Park	Parks	WATERS PARK	City of Atlantic Beach	PK1013	No	2018 Duval DEM	8.38	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Critical Community and Emergency Facility	School	Schools	ATLANTIC BEACH ELEMENTARY SCHOOL	Duval County School Board	SC1001	Yes	ERP 38805-2 EREG_680035	9.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Critical Infrastructure	Facility	Solid and Hazardous Waste Facilities	ENVIRONMENTAL RECOVERY GROUP, LTD	251 LEVY RD GROUP LLC	SH1002	No	2018 Duval DEM	11.50	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Critical Infrastructure	Lift Station	Lift Stations	Neptune Beach LS	City of Neptune Beach	SW1028	No	2018 Duval DEM	9.60	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Lowest
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	Atlantic Beach Surface Water	SELVA LAKES ASSOCIATION INC	SW1028	No	2018 Duval DEM	3.12	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Lowest
Critical Infrastructure	Lift Station	Lift Stations	West End-LS		WWV1304	No	2018 Duval DEM	6.60	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	Lowest
Transportation and Evacuation Routes	Critical Roadway	Roads	W PLAZA	City of Atlantic Beach	1010	No	2018 Duval DEM	10.51	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	PLAZA DR	City of Atlantic Beach	1038	No	2018 Duval DEM	9.41	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	PLAZA DR	City of Atlantic Beach	1039	No	2018 Duval DEM	9.95	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Flooding Outsid	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1049	Yes	2018 Duval DEM	9.67	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1053	Yes	2018 Duval DEM	9.38	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1055	Yes	2018 Duval DEM	9.17	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1058	Yes	2018 Duval DEM	9.07	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1059	Yes	2018 Duval DEM	9.45	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1061	Yes	2018 Duval DEM	10.03	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1062	Yes	2018 Duval DEM	11.06	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1063	Yes	2018 Duval DEM	9.45	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1064	Yes	2018 Duval DEM	10.91	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1067	Yes	2018 Duval DEM	9.95	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1068	Yes	2018 Duval DEM	9.49	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1069	Yes	2018 Duval DEM	9.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1071	Yes	2018 Duval DEM	11.31	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1072	Yes	2018 Duval DEM	11.15	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1073	Yes	2018 Duval DEM	10.54	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1074	Yes	2018 Duval DEM	9.82	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1075	Yes	2018 Duval DEM	10.46	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1077	Yes	2018 Duval DEM	9.01	Not Flooded	Not Flooded	Not Flooded</			

## SENSITIVITY RESULTS FOR TIDAL FLOODING

Asset Class	Asset Type	Asset Type lookup	Asset Name	Asset Owner	Unique ID	Regionally Significant	Elevation Source	Asset Elevation	Tidal MHHW Existing Conditions	Tidal MHHW Int-Low 2050	Tidal MHHW Int 2050	Tidal MHHW Int-Low 2080	Tidal MHHW Int 2080	Priority Rating
Natural, Cultural and Historic Resources	Regulatory Conservation Easement	Conservation Lands	B Parcel B	St. Johns River Water Management District	CL1004	No	2018 Duval DEM	1.82	High	High	High	High	High	N/A
Critical Community and Emergency Facility	Debris Site	Disaster Debris Management Sites	WWTF #1Yard	City of Atlantic Beach	DD1000	No	2018 Duval DEM	14.30	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Critical Community and Emergency Facility	Debris Site	Disaster Debris Management Sites	Public Works Yard	City of Atlantic Beach	DD1001	No	2018 Duval DEM	15.10	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Critical Community and Emergency Facility	Disaster Recovery	Disaster Recovery Centers	Atlantic Beach Public Works Department	City of Atlantic Beach	DR1000	Yes	2018 Duval DEM	14.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Treatment Plant	Water Treatment Plants	Water Plant #2	City of Atlantic Beach	DW1001	Yes	2018 Duval DEM	12.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 5	City of Atlantic Beach	DW1005	Yes	2018 Duval DEM	12.30	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 3	City of Atlantic Beach	DW1006	Yes	2018 Duval DEM	11.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Treatment Plant	Water Treatment Plants	Water Plant #3	City of Atlantic Beach	DW1015	Yes	2018 Duval DEM	10.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 2	City of Atlantic Beach	DW1025	Yes	2018 Duval DEM	15.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 2R	City of Atlantic Beach	DW1026	Yes	2018 Duval DEM	12.60	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 3WR	City of Atlantic Beach	DW1027	Yes	2018 Duval DEM	10.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Assisted Living Facility	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO	HC1001	No	ERP 17822-4 EREG_945588	10.40	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Pharmacy	Health Care Facilities	Walgreens Pharmacy	Walgreens	HC1002	No	ERP 39169-3 EREG_857892	12.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Assisted Living Facility	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO	HC1004	No	ERP 17822-8 EREG_667773	9.40	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Health Center	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO	HC1006	No	ERP 17822-8 EREG_667773	14.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Health Center	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO	HC1007	No	ERP 17822-4 EREG_945588	10.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Home Health Care Center	Health Care Facilities	Health Care and Medical Patient Advocate Jax	EQUITY ONE ATLANTIC VILLAGE INC	HC1010	No	2018 Duval DEM	8.50	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Primary Care	Health Care Facilities	Baptist Primary Care - Atlantic Beach	EQUITY ONE ATLANTIC VILLAGE INC	HC1011	No	GPS Survey	8.59	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Local Government Building	Local Government Facilities	Atlantic Beach Public Works Department	City of Atlantic Beach	LG1003	Yes	2018 Duval DEM	14.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Logistical Area	Logistical Staging Areas	Public Works Yard	City of Atlantic Beach	LSA1000	No	2018 Duval DEM	15.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Park	Parks	Rose Park	City of Atlantic Beach	PK1002	No	2018 Duval DEM	10.09	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Park	Parks	Bull Memorial Park	City of Atlantic Beach	PK1004	No	2018 Duval DEM	10.79	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Park	Parks	Veteran's Memorial Park	City of Atlantic Beach	PK1008	No	2018 Duval DEM	9.98	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Park	Parks	HOWARD PARK	City of Atlantic Beach	PK1015	No	2018 Duval DEM	10.98	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Critical Community and Emergency Facility	Risk Shelter	Risk Shelter Inventory	Marshside Community Center	City of Atlantic Beach	RS1002	No	2018 Duval DEM + 0.5' Rise	12.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Day Care	Day Cares	Monument Christian Academy	MONUMENT HOUSE OF FAITH CHURCH	SC1003	No	2018 Duval DEM	12.30	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Preschool	Day Cares	Community Presbyterian Preschool	COMMUNITY PRESBYTERIAN CHURCH	SC1004	No	ERP 103917-1 EREG_60100	11.20	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Facility	Solid and Hazardous Waste Facilities	BENNETT PROPERTY	BOSCO ENTERPRISES LLC	SH1001	No	2018 Duval DEM	13.40	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	Atlantic Beach Surface Water	SELVA LAKES ASSOCIATION INC	SW1001	No	2018 Duval DEM	4.31	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	Atlantic Beach Surface Water	City of Atlantic Beach	SW1002	No	2018 Duval DEM	1.68	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	STATE OF FLORIDA DEPARTMENT OF TRANS	SW1003	No	2018 Duval DEM	-3.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A	
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	NAVAL CONTINUING CARE RETIREMENT FO	SW1004	No	2018 Duval DEM	1.07	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A	
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	Atlantic Beach Surface Water	City of Atlantic Beach	SW1005	No	2018 Duval DEM	-2.70	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	NAVAL CONTINUING CARE RETIREMENT FO	SW1006	No	2018 Duval DEM	2.32	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A	
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	OCEANWALK ASSOCIATION INC	SW1007	No	2018 Duval DEM	2.42	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	OCEANWALK ASSOCIATION INC	SW1008	No	2018 Duval DEM	1.54	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	SELVA LAKES ASSOCIATION INC	SW1009	No	2018 Duval DEM	6.72	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1010	No	2018 Duval DEM	1.11	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	HENRY DAVID W	SW1011	No	2018 Duval DEM	7.40	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1012	No	2018 Duval DEM	0.88	Not Flooded	Flooding Outside	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	FLORIDA DEPARTMENT OF TRANSPORTATI	SW1013	No	2018 Duval DEM	2.56	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1014	No	2018 Duval DEM	1.14	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	FLORIDA DEPARTMENT OF TRANSPORTATI	SW1015	No	2018 Duval DEM	5.71	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	ATLANTIC BEACH COUNTRY CLUB INC	SW1016	No	2018 Duval DEM	6.36	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	LITTLE DIANE ANGELA	SW1017	No	2018 Duval DEM	7.13	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	SUNRISE COMMUNITY EVANGELICAL FREE	SW1018	No	2018 Duval DEM	1.01	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1019	No	2018 Duval DEM	13.78	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1020	No	2018 Duval DEM	12.24	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1021	No	2018 Duval DEM	13.8	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1022	No	2018 Duval DEM	15.91	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1023	No	2018 Duval DEM	14	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1024	No	2018 Duval DEM	7.86	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	AT											

Appendix E - Critical Asset Sensitivity Analysis for Tidal Flooding

## SENSITIVITY RESULTS FOR TIDAL FLOODING

## SENSITIVITY RESULTS FOR TIDAL FLOODING

Asset Class	Asset Type	Asset Type lookup	Asset Name	Asset Owner	Unique ID	Regionally Significant	Elevation Source	Asset Elevation	Tidal MHHW Existing Conditions	Tidal MHHW Int-Low 2050	Tidal MHHW Int 2050	Tidal MHHW Int-Low 2080	Tidal MHHW Int 2080	Priority Rating
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1092	No	2018 Duval DEM	-2.7	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1093	No	2018 Duval DEM	-2.7	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1094	No	2018 Duval DEM	-2.7	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1095	No	2018 Duval DEM	-2.7	Flooding Outside ( Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1096	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1097	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1098	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1099	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1100	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1101	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1102	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1103	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1104	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2SS3P	-9999	WL1105	No	2018 Duval DEM	1.98	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2SS3P	-9999	WL1106	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2SS3P	-9999	WL1107	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Freshwater Forested/Shrub Wetland	Wetlands	PFO1/4R	-9999	WL1108	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Deepwater	Wetlands	E1UBL	-9999	WL1109	No	2018 Duval DEM	-3.5	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-H	City of Atlantic Beach	WW1001	No	2018 Duval DEM	11.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-E	City of Atlantic Beach	WW1003	No	2018 Duval DEM	9.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-K	City of Atlantic Beach	WW1004	No	2018 Duval DEM	10.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-M	City of Atlantic Beach	WW1015	No	2018 Duval DEM	9.80	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Wastewater Treatment Plant	Waste Water Facilities	WWTF #1	City of Atlantic Beach	WW1021	Yes	2018 Duval DEM	15.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Wonderwood Ln-LS		WW1301	No	2018 Duval DEM	8.30	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Gavagan -LS		WW1302	No	2018 Duval DEM	9.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Montreal-LS		WW1305	No	2018 Duval DEM	11.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Navy-LS		WW1307	No	2018 Duval DEM	7.30	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	NAVY JR ENLISTED		WW1308	No	2018 Duval DEM	7.80	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	PAN AM-LS		WW1309	No	2018 Duval DEM	13.50	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Aspin Ridge-LS		WW1312	No	2018 Duval DEM	9.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Featherwood-LS		WW1313	No	2018 Duval DEM	10.20	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-Q		WW1314	No	2018 Duval DEM	9.80	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A

Appendix F - Critical Asset Sensitivity Analysis for Rainfall-Induced Flooding

## Sensitivity Results for Rainfall Flooding

Appendix F - Critical Asset Sensitivity Analysis for Rainfall-Induced Flooding

## ACTIVITY RESULTS FOR RAINFALL FLOODING

Appendix F - Critical Asset Sensitivity Analysis for Rainfall-Induced Flooding

## ACTIVITY RESULTS FOR RAINFALL FLOODING

Appendix F - Critical Asset Sensitivity Analysis for Rainfall-Induced Flooding

## SITIVITY RESULTS FOR RAINFALL FLOODING

## SENSITIVITY RESULTS FOR STORM SURGE FLOODING

Asset Class	Asset Type	Asset Type lookup	Asset Name	Asset Owner	Unique ID	Regionally Significant	Elevation Source	Asset Elevation	Storm Surge 100-YR Existing Conditions	Storm Surge 100-YR Int-Low 2050	Storm Surge 100-YR Int-High 2050	Storm Surge 100-YR Int-Low 2080	Storm Surge 100-YR Int-High 2080	Priority Rating
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1006	No	2018 Duval DEM	5.35	Medium	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	DUTTON DR	City of Atlantic Beach	1009	No	2018 Duval DEM	5.63	Medium	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	SELVA MARINA DR	City of Atlantic Beach	1011	No	2018 Duval DEM	6.24	Medium	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	SELVA MARINA DR	City of Atlantic Beach	1012	No	2018 Duval DEM	5.27	High	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	SELVA MARINA DR	City of Atlantic Beach	1013	No	2018 Duval DEM	5.29	Medium	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	LEVY RD	City of Atlantic Beach	1016	No	2018 Duval DEM	5.57	Medium	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	SHERRY DR	City of Atlantic Beach	1019	No	2018 Duval DEM	6.24	Medium	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1021	No	2018 Duval DEM	6.3	Medium	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	PLAZA DR	City of Atlantic Beach	1029	No	2018 Duval DEM	6.16	High	High	High	High	High	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1033	No	2018 Duval DEM	5.19	High	High	High	High	High	Highest
Critical Community and Emergency Facility	Debris Site	Disaster Debris Management Sites	Buccaneer LS Yard	City of Atlantic Beach	DD1002	No	2018 Duval DEM	3.4	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Highest
Critical Community and Emergency Facility	Local Government Building	Local Government Facilities	Commission Chambers	City of Atlantic Beach	LG1001	Yes	ERP 36367-7 EREG_623479C	8.29	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Highest
Critical Community and Emergency Facility	Local Government Building	Local Government Facilities	Atlantic Beach City Hall	City of Atlantic Beach	LG1002	Yes	ERP 36367-7 EREG_623479C	8.21	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Highest
Critical Infrastructure	Lift Station	Lift Stations	LS-L	City of Atlantic Beach	WW1002	No	2018 Duval DEM	5.4	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Highest
Critical Infrastructure	Lift Station	Lift Stations	LS-F	City of Atlantic Beach	WW1007	No	2018 Duval DEM	4.9	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Highest
Critical Infrastructure	Lift Station	Lift Stations	LS-A	City of Atlantic Beach	WW1009	No	2018 Duval DEM	5.8	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Highest
Critical Infrastructure	Lift Station	Lift Stations	LS-B	City of Atlantic Beach	WW1010	No	2018 Duval DEM	6.1	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Highest
Critical Infrastructure	Lift Station	Lift Stations	LS-G	City of Atlantic Beach	WW1013	No	GPS Survey	5.23	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Highest
Critical Infrastructure	Lift Station	Lift Stations	BUC MASTER LS	City of Atlantic Beach	WW1300	No	2018 Duval DEM	3.5	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Highest
Critical Infrastructure	Lift Station	Lift Stations	Lakeside-LS	City of Atlantic Beach	WW1306	No	2018 Duval DEM	5.6	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Highest
Critical Infrastructure	Lift Station	Lift Stations	Mimosa Cove-LS	City of Atlantic Beach	WW1310	No	2018 Duval DEM	5.3	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Highest
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1001	No	2018 Duval DEM	7.94	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1003	No	2018 Duval DEM	6.48	Not Flooded	Low	Low	High	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1004	No	2018 Duval DEM	7.95	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1005	No	2018 Duval DEM	6.16	Not Flooded	Medium	High	High	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	CHURCH RD	City of Atlantic Beach	1007	No	2018 Duval DEM	8.46	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High
Transportation and Evacuation Routes	Critical Roadway	Roads	CHURCH RD	City of Atlantic Beach	1008	No	2018 Duval DEM	7.79	Not Flooded	Not Flooded	Low	Medium	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	LEVY RD	City of Atlantic Beach	1017	No	2018 Duval DEM	7.74	Not Flooded	Flooding Outsid	Flooding Outsid	Medium	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1022	No	2018 Duval DEM	8.29	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1027	No	2018 Duval DEM	7.62	Not Flooded	Not Flooded	Not Flooded	Medium	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	PLAZA DR	City of Atlantic Beach	1030	No	2018 Duval DEM	8.31	Not Flooded	Not Flooded	Low	Medium	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	PLAZA DR	City of Atlantic Beach	1031	No	2018 Duval DEM	7.97	Not Flooded	Not Flooded	Not Flooded	Medium	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1036	No	2018 Duval DEM	7.03	Low	Medium	Medium	High	High	High
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1044	No	2018 Duval DEM	8.59	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1050	Yes	2018 Duval DEM	9.51	Not Flooded	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1052	Yes	2018 Duval DEM	9.6	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1056	Yes	2018 Duval DEM	9.8	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1066	Yes	2018 Duval DEM	9.55	Not Flooded	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1079	Yes	2018 Duval DEM	8.44	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1082	Yes	2018 Duval DEM	10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High
Critical Community and Emergency Facility	Fire Department	Fire Stations	Atlantic Beach Fire Department	City of Atlantic Beach	FS1001	Yes	ERP 36367-7 EREG_623479C	8.36	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High
Critical Infrastructure	Lift Station	Lift Stations	LS-C	City of Atlantic Beach	WWV1011	No	2018 Duval DEM	9.9	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Flooding Outsid	High
Critical Infrastructure	Lift Station	Lift Stations	LS-N	City of Atlantic Beach	WWV1014	No	2018 Duval DEM	7.7	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	Flooding Outsid	High
Critical Infrastructure	Lift Station	Lift Stations	Courtyards-LS	City of Atlantic Beach	WWV1016	No	2018 Duval DEM	6.2	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	High
Transportation and Evacuation Routes	Critical Roadway	Roads	LEVY RD	City of Atlantic Beach	1015	No	2018 Duval DEM	6.38	Not Flooded	Low	Medium	High	High	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1024	No	2018 Duval DEM	8.1	Not Flooded	Not Flooded	Not Flooded	Not Flooded	High	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1025	No	2018 Duval DEM	7.88	Not Flooded	Not Flooded	Low	High	High	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	SELVA MARINA DR	City of Atlantic Beach	1034	No	2018 Duval DEM	7.6	Not Flooded	Low	Low	Medium	High	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1035	No	2018 Duval DEM	9.51	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1040	No	2018 Duval DEM	6.9	Not Flooded	Not Flooded	Low	High	High	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	MAIN ST	City of Atlantic Beach	1041	No	2018 Duval DEM	6.38	Not Flooded	Low	High	High	High	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	DUTTON DR	City of Atlantic Beach	1042	No	2018 Duval DEM	9.24	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1045	No	2018 Duval DEM	9.55	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	SEMINOLE RD	City of Atlantic Beach	1046	No	2018 Duval DEM	8.89	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Low	Medium
Transportation and Evacuation Routes	Critical Roadway	Roads	MAYPORT RD	FDOT	1070	Yes	2018 Duval DEM	8.61	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Medium
Critical Infrastructure	Radio Communications Tower	Radio Communications Towers	QUEEN OF PEACE RADIO, INC.	Private	CF1003	No	2018 Duval DEM	4.9	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Medium
Natural, Cultural and Historic Resources	Cemetery	Historical Cultural Site	BEACHES MEMORIAL GARDENSX</											

Appendix G - Critical Asset Sensitivity Analysis for Surge Flooding

## SENSITIVITY RESULTS FOR STORM SURGE FLOODING

## SENSITIVITY RESULTS FOR STORM SURGE FLOODING

Asset Class	Asset Type	Asset Type lookup	Asset Name	Asset Owner	Unique ID	Regionally Significant	Elevation Source	Asset Elevation	Storm Surge 100-YR Existing Conditions	Storm Surge 100-YR Int-Low 2050	Storm Surge 100-YR Int-Low 2050	Storm Surge 100-YR Int-Low 2080	Storm Surge 100-YR Int-Low 2080	Priority Rating
Natural, Cultural and Historic Resources	Regulatory Conservation Easement	Conservation Lands	B Parcel B	St. Johns River Water Management District	CL1004	No	2018 Duval DEM	1.82	High	High	High	High	High	N/A
Critical Community and Emergency Facility	Debris Site	Disaster Debris Management Sites	WWTF #1Yard	City of Atlantic Beach	DD1000	No	2018 Duval DEM	14.30	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Critical Community and Emergency Facility	Debris Site	Disaster Debris Management Sites	Public Works Yard	City of Atlantic Beach	DD1001	No	2018 Duval DEM	15.10	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Critical Community and Emergency Facility	Disaster Recovery	Disaster Recovery Centers	Atlantic Beach Public Works Department	City of Atlantic Beach	DR1000	Yes	2018 Duval DEM	14.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Treatment Plant	Water Treatment Plants	Water Plant #2	City of Atlantic Beach	DW1001	Yes	2018 Duval DEM	12.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 5	City of Atlantic Beach	DW1005	Yes	2018 Duval DEM	12.30	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 3	City of Atlantic Beach	DW1006	Yes	2018 Duval DEM	11.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Treatment Plant	Water Treatment Plants	Water Plant #3	City of Atlantic Beach	DW1015	Yes	2018 Duval DEM	10.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 2	City of Atlantic Beach	DW1025	Yes	2018 Duval DEM	15.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 2R	City of Atlantic Beach	DW1026	Yes	2018 Duval DEM	12.60	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Potable Water Well	Water Supply Wells	Well ID 3WR	City of Atlantic Beach	DW1027	Yes	2018 Duval DEM	10.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Assisted Living Facility	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO	HC1001	No	ERP 17822-4 EREG_945588	10.40	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Pharmacy	Health Care Facilities	Walgreens Pharmacy	Walgreens	HC1002	No	ERP 39169-3 EREG_857892	12.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Assisted Living Facility	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO	HC1004	No	ERP 17822-8 EREG_667773	9.40	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Health Center	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO	HC1006	No	ERP 17822-8 EREG_667773	14.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Health Center	Health Care Facilities	Fleet Landing	NAVAL CONTINUING CARE RETIREMENT FO	HC1007	No	ERP 17822-4 EREG_945588	10.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Home Health Care Center	Health Care Facilities	Health Care and Medical Patient Advocate Jax	EQUITY ONE ATLANTIC VILLAGE INC	HC1010	No	2018 Duval DEM	8.50	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Primary Care	Health Care Facilities	Baptist Primary Care - Atlantic Beach	EQUITY ONE ATLANTIC VILLAGE INC	HC1011	No	GPS Survey	8.59	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Local Government Building	Local Government Facilities	Atlantic Beach Public Works Department	City of Atlantic Beach	LG1003	Yes	2018 Duval DEM	14.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Logistical Area	Logistical Staging Areas	Public Works Yard	City of Atlantic Beach	LSA1000	No	2018 Duval DEM	15.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Park	Parks	Rose Park	City of Atlantic Beach	PK1002	No	2018 Duval DEM	10.09	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Park	Parks	Bull Memorial Park	City of Atlantic Beach	PK1004	No	2018 Duval DEM	10.79	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Park	Parks	Veteran's Memorial Park	City of Atlantic Beach	PK1008	No	2018 Duval DEM	9.98	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Park	Parks	HOWARD PARK	City of Atlantic Beach	PK1015	No	2018 Duval DEM	10.98	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Critical Community and Emergency Facility	Risk Shelter	Risk Shelter Inventory	Marshside Community Center	City of Atlantic Beach	RS1002	No	2018 Duval DEM + 0.5' Rise	12.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Day Care	Day Cares	Monument Christian Academy	MONUMENT HOUSE OF FAITH CHURCH	SC1003	No	2018 Duval DEM	12.30	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Community and Emergency Facility	Preschool	Day Cares	Community Presbyterian Preschool	COMMUNITY PRESBYTERIAN CHURCH	SC1004	No	ERP 103917-1 EREG_60100	11.20	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Facility	Solid and Hazardous Waste Facilities	BENNETT PROPERTY	BOSCO ENTERPRISES LLC	SH1001	No	2018 Duval DEM	13.40	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	Atlantic Beach Surface Water	SELVA LAKES ASSOCIATION INC	SW1001	No	2018 Duval DEM	4.31	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	Atlantic Beach Surface Water	City of Atlantic Beach	SW1002	No	2018 Duval DEM	1.68	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	STATE OF FLORIDA DEPARTMENT OF TRANS	SW1003	No	2018 Duval DEM	-3.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A	
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	NAVAL CONTINUING CARE RETIREMENT FO	SW1004	No	2018 Duval DEM	1.07	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A	
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	Atlantic Beach Surface Water	City of Atlantic Beach	SW1005	No	2018 Duval DEM	-2.70	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	NAVAL CONTINUING CARE RETIREMENT FO	SW1006	No	2018 Duval DEM	2.32	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A	
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	OCEANWALK ASSOCIATION INC	SW1007	No	2018 Duval DEM	2.42	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	OCEANWALK ASSOCIATION INC	SW1008	No	2018 Duval DEM	1.54	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	SELVA LAKES ASSOCIATION INC	SW1009	No	2018 Duval DEM	6.72	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1010	No	2018 Duval DEM	1.11	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	HENRY DAVID W	SW1011	No	2018 Duval DEM	7.40	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1012	No	2018 Duval DEM	0.88	Not Flooded	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	FLORIDA DEPARTMENT OF TRANSPORTATI	SW1013	No	2018 Duval DEM	2.56	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1014	No	2018 Duval DEM	1.14	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	FLORIDA DEPARTMENT OF TRANSPORTATI	SW1015	No	2018 Duval DEM	5.71	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	ATLANTIC BEACH COUNTRY CLUB INC	SW1016	No	2018 Duval DEM	6.36	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	LITTLE DIANE ANGELA	SW1017	No	2018 Duval DEM	7.13	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	SUNRISE COMMUNITY EVANGELICAL FREE	SW1018	No	2018 Duval DEM	1.01	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1019	No	2018 Duval DEM	13.78	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1020	No	2018 Duval DEM	12.24	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1021	No	2018 Duval DEM	13.8	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1022	No	2018 Duval DEM	15.91	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1023	No	2018 Duval DEM	14	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BEACH SURFACE WATER	City of Atlantic Beach	SW1024	No	2018 Duval DEM	7.86	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Surface Waters	Surface Waters	ATLANTIC BE											

## Appendix G - Critical Asset Sensitivity Analysis for Surge Flooding

## SENSITIVITY RESULTS FOR STORM SURGE FLOODING

## SENSITIVITY RESULTS FOR STORM SURGE FLOODING

Asset Class	Asset Type	Asset Type lookup	Asset Name	Asset Owner	Unique ID	Regionally Significant	Elevation Source	Asset Elevation	Storm Surge 100-YR Existing Conditions	Storm Surge 100-YR Int-Low 2050	Storm Surge 100-YR Int-Low 2050	Storm Surge 100-YR Int-Low 2080	Storm Surge 100-YR Int-Low 2080	Priority Rating
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1092	No	2018 Duval DEM	-2.7	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1093	No	2018 Duval DEM	-2.7	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1094	No	2018 Duval DEM	-2.7	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1095	No	2018 Duval DEM	-2.7	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	Flooding Outsid	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1096	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1097	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1098	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1099	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1100	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1101	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1102	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1103	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2EM1N	-9999	WL1104	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2SS3P	-9999	WL1105	No	2018 Duval DEM	1.98	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2SS3P	-9999	WL1106	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Wetland	Wetlands	E2SS3P	-9999	WL1107	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Freshwater Forested/Shrub Wetland	Wetlands	PFO1/4R	-9999	WL1108	No	2018 Duval DEM	-2.7	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Natural, Cultural and Historic Resources	Estuarine and Marine Deepwater	Wetlands	E1UBL	-9999	WL1109	No	2018 Duval DEM	-3.5	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-H	City of Atlantic Beach	WW1001	No	2018 Duval DEM	11.90	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-E	City of Atlantic Beach	WW1003	No	2018 Duval DEM	9.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-K	City of Atlantic Beach	WW1004	No	2018 Duval DEM	10.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-M	City of Atlantic Beach	WW1015	No	2018 Duval DEM	9.80	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Wastewater Treatment Plant	Waste Water Facilities	WWTF #1	City of Atlantic Beach	WW1021	Yes	2018 Duval DEM	15.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Wonderwood Ln-LS		WW1301	No	2018 Duval DEM	8.30	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Gavagan -LS		WW1302	No	2018 Duval DEM	9.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Montreal-LS		WW1305	No	2018 Duval DEM	11.10	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Navy-LS		WW1307	No	2018 Duval DEM	7.30	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	NAVY JR ENLISTED		WW1308	No	2018 Duval DEM	7.80	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	PAN AM-LS		WW1309	No	2018 Duval DEM	13.50	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Aspin Ridge-LS		WW1312	No	2018 Duval DEM	9.00	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	Featherwood-LS		WW1313	No	2018 Duval DEM	10.20	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A
Critical Infrastructure	Lift Station	Lift Stations	LS-Q		WW1314	No	2018 Duval DEM	9.80	Not Flooded	Not Flooded	Not Flooded	Not Flooded	Not Flooded	N/A